

Towards global guidelines for restoring the resilience of forest landscapes in drylands

Forests play crucial ecological, social and economic roles in drylands, but in many regions they have become degraded. Worldwide, millions of hectares of dryland forest landscapes need to be restored to help tackle global challenges such as poverty, climate change, soil erosion and desertification. In collaboration with its partners, therefore, FAO is preparing guidelines for restoring the resilience of forest landscapes in drylands, to be published in the second half of 2013. This brochure describes the main elements of the guidelines.





Why dryland forests?

Drylands are defined¹ as those regions where:

- evapotranspiration exceeds precipitation (no matter the amount of precipitation);
- water scarcity limits the production of crops, forage, wood and ecosystem services.

Forests and trees in drylands play significant roles in conserving biodiversity. They harbour many unique species that are adapted to extreme ecological conditions, and they provide ecosystem goods and services that are essential for people's livelihoods and well-being (see Box 1). If well managed and properly valued, forests and trees in drylands can help alleviate poverty, provide options for adapting to climate change, limit erosion, and prevent and combat desertification. By supporting the millions of people who live in the world's dry areas, forests and trees in drylands can contribute to the FAO mandate of achieving food security.



Yet dryland forests are caught in a spiral of deforestation, fragmentation, degradation and desertification, driven by adverse land-use policies and subsidies, poor governance, and a general lack of understanding of the importance and vulnerability of these ecosystems coupled with a lack of investment in their sustainable management and restoration. Climate change is another huge and growing concern in drylands. The decrease in rainfall and increase in extreme weather conditions in some dryland regions predicted by the Intergovernmental Panel on Climate Change will lead to severe water scarcity and are likely to cause a vicious cycle of land and forest degradation and unsustainable livelihoods.



1 The ecosystem roles of forests and other wooded lands in drylands

Forests and other wooded lands (such as scattered trees and shrubs in grasslands) are vital for maintaining the ecological balance and improving people's livelihoods in dry landscapes.

- They play a key role in hydrologic cycles that supply water to a large portion of the world's population. Dryland mountains, often called "water towers" or "water castles", can generate runoff and groundwater recharge over large distances. Dryland mountains are the source of many of the world's greatest rivers, including the Nile, the Colorado, the Yangtze and the Mekong.
- Drylands are home to unique agrosilvopastoral systems – "cultural landscapes" – that are effective models for integrated sustainable land use and nature conservation in regions with very limited soil and water resources. Examples include the cork oak forests, holm oak forests and dehesas of the western Mediterranean region, the *Argania* woodlands of Morocco and Algeria, and the gum Arabic belt of the Sahel and the Horn of Africa.
- Even in hyper-arid regions, there are "keystone" tree, shrub and perennial mega-herb species with high ecological value that are critical to the structure and function of those regions. Keystone species are "habitat modifiers" that play primary roles in ecosystems and function as "islands of fertility" by providing germination and growth opportunities for plants, acting as food for fauna, and greatly enhancing species diversity. Examples of keystone species in drylands are the leguminous tree desert ironwood (*Olneya tesota*) in the Sonora Desert; tara (*Caesalpinia spinosa*) in the fog forests of the Peruvian coastal desert; the phoenix palm (*Phoenix* spp.) in desert oases in North Africa and western Asia; and the dwarf jade plant (*Portulacaria afra*) in South Africa.

Why guidelines?

FAO was requested by its member countries² to conduct, in collaboration with its member countries and local and international partner organizations, a comprehensive analysis, evaluation and documentation of relevant afforestation, reforestation and restoration projects and programmes in drylands. The study found that dryland restoration offers real opportunities for environmental and economic gain because it:

- helps increase the resilience of landscapes, ecosystems and social systems to global change (see Box 2);
- helps increase the natural capital on which rural livelihoods depend;
- if well planned and managed, can respond to the interests and needs of a variety of stakeholders.



2 Resilience

Resilience can be described as the capacity of a social or ecological system to absorb disturbance and reorganize while undergoing change so as to still retain the same functions, structure, identity and feedbacks. Closely linked to resilience is the concept of adaptive capacity, which refers to the ability of people to deal with changes in the environment by observation, learning and altering their interactions with the environment. The sustainable use of ecosystem goods and services requires understanding and consideration of the resilience of ecosystems and their limits. Human activities that adversely affect ecosystem resilience, such as by reducing biodiversity, overexploiting natural resources and generating pollution (including greenhouse gases), are increasingly causing regime shifts in ecosystems, often to less desirable and degraded conditions. Therefore, building resilience requires a good understanding of the complex biophysical and socio-economic linkages and the human drivers behind desertification and biodiversity loss in drylands.



²i.e. in sessions of the FAO Near East Regional Forestry and Range Commission in 2011 and 2012 and the FAO Committee on Forestry in 2012.

The global guidelines for restoring the resilience of forest landscapes in drylands are being developed for:

- decision-makers from the forest and rural development sectors;
- managers of afforestation, reforestation and forest restoration programmes and projects;
- officers and technicians of international and regional organizations, bilateral and multilateral development cooperation agencies and non-governmental organizations.

The initiative is contributing to the implementation of the ten-year strategy (2008–2018) of the United Nations Convention to Combat Desertification (UNCCD); the Convention on Biodiversity Strategic Plan for Biodiversity for 2011–2020; and the adaptation and mitigation efforts being made within the United Nations Framework Convention on Climate Change.

The guidelines will help in achieving the global target set out in the Bonn Challenge to restore 150 million hectares of degraded lands worldwide by 2020. They will also contribute to ongoing initiatives supported by FAO and partners, such as:

- the programme in support of the African Union's Great Green Wall for the Sahara and the Sahel Initiative, which involves more than 20 countries in North Africa and the Sahel, and other dryland restoration initiatives in Africa;
- the Collaborative Partnership on Mediterranean Forests and the Committee on Mediterranean Forestry Questions (known as Silva Mediterranea), particularly in the framework of its working group on combating desertification and restoring forest ecosystems in arid zones;
- The FAO Forestry Programme in Central Asia and neighbouring countries;
- The Turkish Action Plan in the framework of the United Nations Action Programme for the Least Developed Countries.



The process

The process to produce the guidelines was launched in May 2012 in Konya, Turkey, at an international workshop convened by the Turkish Ministry of Forestry and Water Affairs, FAO, Turkish Cooperation and Coordination Agency (TIKA) and the German Agency for International Cooperation. The event brought together over 90 international experts on drylands restoration from forestry departments, research institutions, the private sector and non-governmental organizations, representing 24 countries in Africa, Central Asia, the Near East and the Mediterranean region, as well as international development agencies and other technical and financial partners.

With the financial support of TIKA, a second international workshop was organized in Dakar, Senegal, in February 2013 by FAO, Senegal's Ministry of Environment and Sustainable Development and its technical institutions, the Turkish Ministry of Forestry and Water Affairs, and the African Union Commission. This workshop gathered over 80 international experts on drylands restoration with the aim of:

- contributing to the formulation of guidelines for building resilient forest landscapes in drylands based on the expertise and experience of participants;
- identifying gaps and challenges that need to be addressed and appropriate actions to be taken to build resilient forest landscapes in Great Green Wall countries.



The approach to developing the guidelines was based on:

- an analysis of lessons learned and experiences from afforestation, reforestation and restoration projects and programmes in the field;
- the application of a comprehensive forest restoration monitoring tool (Box 3) developed by FAO;
- the results and recommendations of the Konya and Dakar workshops;
- the outcomes of a regional workshop on forest genetic resources held in Ouagadougou in July 2012;
- feedback on a draft version received from a network of experts through online consultation and a side-event organized at the 21st session of the FAO Committee on Forestry in Rome, Italy, in September 2012.



3 The FAO forest restoration monitoring tool

The newly developed FAO forest restoration monitoring tool provides a quick and easy checklist to assess elements of success and failure in forest restoration for use by technical staff. It can easily be understood by non-specialists and can provide “scores”, if required, to indicate progress over time. It aims to:

- provide a harmonized reporting system on the effectiveness of forest restoration to provide consistent, high-quality data on lessons learned and allow tracking of progress over time;
- facilitate the sharing of know-how on effective restoration approaches, strategies, methodologies and techniques among dryland regions.

The guidelines in a nutshell

The guidelines are structured according to four major strategic components.

1. Putting in place an enabling environment to address the underlying causes of forest degradation and desertification in drylands

Policy

- Establishing supportive governance mechanisms
- Improving national policies and legal frameworks
- Strengthening intersectoral cooperation and partnerships
- Supporting the institutional development of grassroots organizations

Capacity development and education

- Raising awareness of approaches to landscape restoration
- Supporting multidisciplinary and applied research
- Implementing strategies for long-term multisectoral capacity development
- Supporting the development of training modules on forest landscape restoration based on up-to-date research findings and including them in the curricula of training institutions
- Supporting the development and sustainable functioning of tree seed centres and nurseries
- Strengthening extension services and promoting farmer-to-farmer extension approaches
- Establishing networks and forums for sharing knowledge and skills

Sustainable financing

- Promoting long-term cost-sharing strategies to fund restoration programmes, including public and private sources and contributions from local people
- Developing innovative funding mechanisms such as payments for ecosystem services (e.g. watershed services, biodiversity conservation and carbon sequestration)
- Incorporating restoration costs in development initiatives and conservation efforts
- Creating community-based enterprises addressing the entire value chain (from seed to end-product)
- Promoting alternative cost-effective technologies



2. Planning

Formulating restoration priorities and goals

- Conducting biophysical and socio-economic baseline studies, including in-depth multistakeholder analyses and studies on land and forest tenure
- Undertaking GIS analysis and mapping to assess restoration needs, plan restoration actions and monitor their impacts
- Defining and balancing ecological, economic, social and cultural objectives
- Planning at the landscape level
- Selecting priority sites and interventions
- Defining cost-effective restoration options and technical operations, for example assisted natural regeneration, farmer-managed natural regeneration, enrichment planting and direct sowing
- Defining tradeoffs between socio-economic interests and sustainable land uses
- Improving ecosystem services across the full range of land uses

Supporting the active participation of relevant stakeholders

- Involving people as a central element of landscapes
- Supporting multistakeholder and multisectoral mechanisms for collaborative planning and action
- Identifying clearly the roles and responsibilities of each stakeholder in planning and implementation
- Defining the costs and socio-economic benefits for each stakeholder
- Developing strategic cooperation among private-sector investors, land managers, the public sector and civil-society actors



Selecting the right species and related genetic material for the right place and ensuring high-quality reproduction material

- Selecting species using participatory approaches with local communities and relevant stakeholders
- Selecting high-value species (trees, shrubs and herbaceous species) based on a combination of socio-economic and environmental criteria and benefits that can serve multiple purposes
- Favouring the use of native and adaptive species
- Carefully considering the use of exotic species to ensure minimal negative effects on local ecosystems
- Undertaking provenance evaluation studies of the genetic material in targeted sites (e.g. adaptation to drought and soil type, resistance to disease and fire, and the variability of the genetic pool), where possible making use of existing studies to avoid the duplication of effort
- Supporting the production and use of high-quality reproduction material and high genetic diversity

3. Field implementation

- Favouring assisted/farmer-managed natural regeneration
- Combining assisted natural regeneration with direct sowing or planting
- Using agroforestry and conservation agriculture technologies
- Implementing measures for
 - soil and water conservation
 - erosion control
 - forest protection and rotational grazing
 - forest management
- Using innovative technologies for improving plant production in nurseries and on-site planting and field operations, including with respect to
 - planting operations and technologies to improve site conditions
 - planting density
 - sowing seeds
 - planting period
 - soil preparation for seedlings
 - watering during planting and maintenance operations
 - planting techniques that mimic ecological interactions
- Managing fire
- Developing and implementing management plans for restored areas



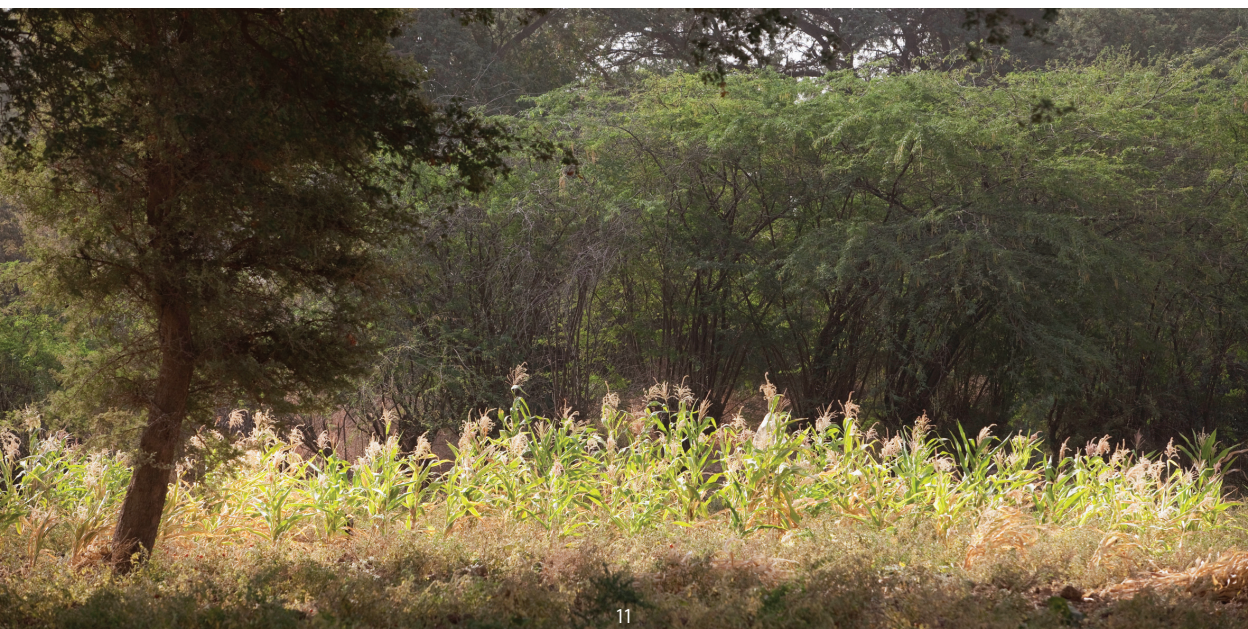
4. Monitoring and evaluation

- Incorporating objectives, performance standards and protocols for monitoring in restoration plans;
- Monitoring forest landscape restoration programmes over long periods to detect major environmental and socio-economic processes and dynamics
- Monitoring, backed by the compilation of lessons learned, to inform adaptive management and the sharing of know-how

What's next

FAO is reviewing the full draft version of the guidelines, taking into consideration the inputs of participants at the Dakar workshop. The revised version should be circulated to participants for additional comments by the end of May 2013. The final version of the guidelines will be launched at the 11th Conference of the Parties to the UNCCD in September 2013.

FAO will continue to work with the supporting network established in Konya and Dakar to explore opportunities and programmes for the field implementation of the guidelines, in coordination with the committee that was set up in Dakar to follow up on the implementation of the recommendations and actions identified at the Dakar workshop. The committee is chaired by Senegal and co-chaired by Burkina Faso and comprises one representative per country, one representative of FAO and one representative of TIKA.



Key supporters

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Contact

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or go to the following websites:

www.fao.org/forestry/aridzone/restoration

www.fao.org/partnerships/great-green-wall

www.fao.org/forestry/silvamed