

## Conserving biodiversity to achieve the goals of the Great Green Wall

To fulfil its goals the Great Green Wall will need to adapt green economic growth to the unique conditions of the drylands, place greater emphasis on sustainable management of biodiversity and ecosystems, and give a higher priority to land health as the basis for food and water security. Countries of the Great Green Wall will also need to place greater emphasis on resilience and risk management that is adapted to the high level of uncertainty found in these dryland environments.

Recommendations for mainstreaming biodiversity to achieve the goals of the Great Green Wall are clustered under the following four areas:

**1. Mainstream Sustainable Land Management in the agriculture sector to achieve Land Degradation Neutrality**, including investments in scaling up sustainable land management and landscape restoration, promoting innovation in small and medium-sized enterprises for sustainable agriculture, and developing financial services that are adapted to the needs of both male and female farmers and pastoralists to enhance their investments in SLM.

**2. Establish institutional arrangements that enable landscape restoration and sustainable management**, including adequately resourced and mandated inter-sectoral coordination mechanisms and local institutions, with access to technical and financial resources and capacity building.

**3. Strengthen governance, tenure and resource rights at the local level**, by promoting local governance over natural resources through participatory planning and devolution of decision-making, building capacity to strengthen local governance and resource tenure, reinforcing the rights of women as natural resource managers and ensuring legal institutions have the resources to support implementation of national land laws.

**4. Monitor biodiversity and ecosystem function to evaluate Great Green Wall investments and policies** through public funding to monitor biodiversity and ecosystem function, investment in measuring soil organic carbon as an indicator of SLM, climate change mitigation and biodiversity, promoting research into the role of sustainable land management in conserving biodiversity, and validating local knowledge on sustainable land management.

## Conclusion

The Great Green Wall can deliver against commitments to combatting desertification, including achieving Land Degradation Neutrality, while simultaneously conserving biodiversity, mitigating climate change, and strengthening climate change adaptation. However, the value of biodiversity in sustainable land management and for safeguarding ecosystem services needs to be widely understood in order to identify the best investment options for countries as a whole.

Genuine synergies can be found between environment and development goals that make the Great Green Wall a national investment priority. Much of the territory of the Great Green Wall could eventually be classified as a mosaic of different types of protected area: protected for the sustainable management of Sahelian landscapes to provide food, water and energy, to support the livelihoods of its many residents, and to safeguard the great beauty and diversity of Sahelian landscapes and cultures.



### Contacts :

Jonathan Davies : [jonathan.davies@iucn.org](mailto:jonathan.davies@iucn.org)  
Bora Masumbuko : [bora.masumbuko@iucn.org](mailto:bora.masumbuko@iucn.org)



# Biodiversity and the Great Green Wall

## Managing nature for sustainable development in the Sahel



The Great Green Wall of the Sahara and Sahel is an African flagship initiative to combat desertification, reduce poverty, and to address the effects of climate change. The initiative has been envisioned by African leaders and is led by the Africa Union, and is supported by rapidly increasing investment on the ground in many countries. The Great Green Wall is envisioned by many actors as vast mosaic of healthy, productive landscapes from West to East Africa, supporting resilient livelihoods and contributing to multiple environmental and development targets.

*Biodiversity and the Great Green Wall* explores the dependence of humanity on nature and the importance of biodiversity for wellbeing and sustainable development in the Sahel. The report is written to raise awareness of the critical role for biodiversity in achieving the goals of the Great Green Wall. It presents new evidence of the links between biodiversity, ecosystem services and human welfare, and demonstrates the importance of biodiversity for sustainable agriculture, providing arguments for the connection between the agricultural and environmental sectors.

The report examines how elements of biodiversity conservation can be mainstreamed in all aspects of natural resource

management, and how this can be achieved through the Great Green Wall. It examines how Sustainable Land Management, which is a central pillar of combating desertification, conserves the biodiversity upon which the productivity of agro-ecosystems depend. The report explores how integrating biodiversity into sustainable land management in the drylands of the Sahel requires unique attention to soil water and fertility management. It shows that adapting to the challenges of maintaining soil moisture and soil fertility and minimising evaporative water losses in the drylands requires innovative approaches to protecting ecosystems by conserving biodiversity, including the vast array of biodiversity found in the soil.

The report concludes that nature's benefits, referred to also as ecosystem services, are determined to a large extent by biodiversity. The core message is that human wellbeing and economic development depend on mainstreaming elements of biodiversity conservation in all aspects of natural resource management. As a result, conserving biodiversity through sustainable land management in the Great Green Wall contributes to economic development, job creation and poverty reduction.



# The Great Green Wall : restoring ecosystems for sustainable development in the Sahel

Sahelian drylands face a number of economic, environmental and social challenges. Climate change projections, although highly uncertain, point towards major changes in future weather patterns. Poverty is widespread, levels of human development are low, and future population growth is projected to be high. Pressure on natural resources and demand for food, water and energy are growing. Food production is increasing in the Sahel, due to expansion of the area cultivated and modest improvements in productivity. However, productivity gains are not keeping up with growing demand, while at the same time many gains have been

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## Biodiversity in the Sahel

To understand the state and the importance of biodiversity in the Sahel requires looking beyond the most visible species and understanding the wider diversity of species both below and above ground that determine how ecosystems function. The Great Green Wall was conceptualised as a wall of biodiversity that would strengthen resilience at the southern fringe of the Sahara Desert. However, the Wall is about much more than trees and is usually envisioned as a landscape mosaic of sustainable land use, including sustainable crop farming, pasture management, forests, wetlands, conservation areas and more.

A frequently overlooked component of biodiversity is that found in the soil, including bacteria, invertebrates and fungi. This soil biodiversity comprises the largest component of biodiversity in the Sahel, even if it is the most poorly understood. Soil biodiversity is the engine of ecosystem function, determining carbon and nitrogen cycles as well as hydrological cycles, and thereby determining the productivity and resilience of land.

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## Biodiversity conservation as a foundation for ecosystem services in the Great Green Wall

Land degradation and depletion of soil biodiversity contributes to increased aridity of the land and disruption of water cycles. Over-harvesting of water also has profound environmental consequences, leading to drying up of wetlands and other water sources. These impacts are exacerbated by climate change and contribute to reducing resilience throughout the region.

Traditional farming and herding practices have been well adapted to the challenges of aridity and climate uncertainty in the Sahel but they have been eroded by policies that do not prioritise risk management. Agricultural intensification has been particularly damaging to resilience and biodiversity, although there are signs of a trend towards more widespread support for sustainable intensification and scale up of SLM. Many dryland societies have strong values of environmental custodianship and a rich knowledge of their environment and they rely heavily on a range of biodiversity. Re-enabling communities to use this knowledge can be a powerful way to address biodiversity and to build resilience in the Sahel.

achieved using agricultural practices that contribute to land degradation and therefore undermine long-term agricultural output.

The combination of agricultural expansion, changing rainfall patterns, and human settlement all contribute to the risk of desertification and land degradation in the Sahel. This contributes in turn to declining ecosystem functions, which result in reduced agricultural growth, increased human vulnerability, and aggravated risk of drought and other environmental hazards.

The Sahel and Sahara support an impressive array of biodiversity, including a large number of endemic species: species that are not found elsewhere on the planet. Biodiversity has adapted to the drylands in many different ways, and particularly to the seasonality, scarcity and variability of rainfall. Agrobiodiversity in the Sahel has also adapted to the conditions and is vital for the livelihoods and the resilience of rural dryland populations.

Biodiversity is declining rapidly throughout the Sahel and experts project that the Sahel region will be more affected by habitat destruction in the coming century than almost anywhere else on earth. Human population growth combined with increasing wealth and investment are the major factors behind biodiversity declines in the Sahel. A major factor in biodiversity loss is agricultural expansion and particularly the spread of land management practices that do not conserve soil biodiversity or integrate above-ground biodiversity. Human settlements are also expanding and cast a long shadow on the surrounding environment.

Restoring biodiversity through ecological restoration contributes to major gains in ecosystem services. Soil biodiversity is critical for the supply of ecosystem services, and its protection must be central to achieving Land Degradation Neutrality in the Sahel, and meeting the objectives of the Great Green Wall. Sustainable land management practices protect the ecosystem functions that sustain productivity. Clearing land for cultivation may initially increase food production, but it comes at a significant cost in terms of water supply, climate regulation, carbon sequestration, forest resources, pollination, and many more services.

Biodiversity in the Sahel protects hydrological and nutrient cycles. Vegetation cover can play a major role in reducing surface flows of water and improving infiltration of water, while soil biodiversity improves both infiltration and water storage in the soil. As a result biodiversity directly contributes to reducing the occurrence and the severity of flood and drought. Despite low biomass above ground, the relative proportion of biomass that is below ground is high and there is a tendency to under value soil carbon stocks.

# Conserving dryland biodiversity in the Great Green Wall

Sustainable land management and restoration both depend on protection and restoration of biodiversity. Biodiversity conservation cannot therefore be the exclusive preserve of environmental and wildlife agencies, but becomes a shared responsibility of many sectors, including agriculture and water. Agricultural agencies, for example, need to ensure that farming practices protect the biodiversity and ecosystem services on which farming depends. Water agencies similarly need to ensure that water management does not compromise hydrological cycles.

Sustainable agriculture offers one of the most important ways to achieve the goals of the Great Green Wall, by simultaneously protecting biodiversity and ecosystem services, raising agricultural productivity, and promoting the resilience of people and ecosystems. Sustainable land management practices often rely on protecting biodiversity to boost soil organic carbon, soil nitrogen, and soil moisture. Practices like agroforestry and low tillage agriculture are based on indigenous practices that have been revived and improved to protect soil moisture and fertility of crop lands as well as providing supplementary benefits. Other SLM practices, such as contour

bunds and zai, also contribute to building up soil moisture and organic matter in order to improve productivity and resilience. Protected areas, whether owned or managed by communities, State authorities or private land owners, can play a major role in protecting sustainable land management practices that address desertification and drought. The full range of protected area types needs to be considered, which requires an attitude change in the conservation sector to respect the role of protected agricultural lands in conserving biodiversity and ecosystem services. Grazing lands are particularly well suited to being recognised as protected areas, since sustainable management of grassland biodiversity is an important management objective. About 5% of the Sahel—an estimated 224,825 km2—is formally protected which is far below Aichi Target 11 of 17%<sup>1</sup>. Community based conservation measures have a lot of potential to be expanded in the region. Many societies manage their environment to augment its heterogeneity and their conservation and sustainable land management practices can be bolstered through the use of appropriate protected area status. Community conserved areas can also play an important role in protecting agrobiodiversity in the Sahel.

## Barriers and opportunities to promoting biodiversity in the Great Green Wall

The drylands of the Sahel are facing an unprecedented rate and scale of change, which offers both threats and opportunities for sustainable development. Population growth and demographic change are causing changes in production patterns, pressure on natural resources, and increasing demands on nature. Whether demographic change and economic growth are a threat or an opportunity depends to some extent on how well sustainability criteria are embedded in agricultural production and other aspects of development.

Given the high level of uncertainty over climate change, and the likelihood that the climate will also become more unpredictable, traditional mechanisms of risk management are of ever-greater importance. Failure to respect local knowledge and to uphold local resource rights has left many land managers incapable of sustainably managing their land. However, new approaches to local governance and capacity building are leading to widespread revival of traditional risk management strategies. This points the way forward for wide-spread adoption of sustainable land management, which can be more effectively mainstreamed in core agricultural development plans.

Many land managers in the Sahel are constrained by the legacy of low investment in basic development. Stronger human capital, particularly basic education for both women and men, could catalyse wider adoption of sustainable land management practices. This would be supported by building capacity, in institutions and amongst communities, to achieve more equitable local resource governance and secure tenure. Combining support for community institutions with stronger tenure and resource governance may be

the strongest foundation for resilient development in the Great Green Wall.

Capacity building, awareness raising, and policy guidance are also needed to help public servants embrace a broader vision of the Great Green Wall that expands beyond individual sectors. Landscape management approaches have gained popularity in recent years and they can enable a more balanced and optimal management of resources on a large scale. This is important to achieve the most efficient and sustainable use of land resources that are expected to satisfy multiple competing demands, including production of food and fuel and provision of safe water.

The goals of the Great Green Wall can be undermined by persistent misunderstanding of the drylands. Actors have conflicting visions of development and there is an ongoing bias towards capital-intensive agriculture at the expense of sustainable land management and community resilience and risk management. Particular emphasis is needed on managing biodiversity and soil organic carbon to achieve more efficient management of dryland soil and water.

Overall it is important to popularise an alternative vision of sustainable landscape management that is based on multifunctionality. This means managing land simultaneously for its multiple benefits to society. The Great Green Wall is a powerful opportunity to achieve such a vision, by promoting sustainable land management and restoration on a vast scale. Achieving such an integrated approach will be crucial to achieve the goals of stronger resilience and risk management.



<sup>1</sup> Aichi Target 11. By 2020, at least 17 per cent of terrestrial and inland water, and 10 per cent of coastal and marine areas, especially areas of particular importance for biodiversity and ecosystem services, are conserved through effectively and equitably managed, ecologically representative and well-connected systems of protected areas and other effective area-based conservation measures, and integrated into the wider landscapes and seascapes.