SAHARA AND SAHEL OBSERVATORY

SUMMARY FOR DECISION-MAKERS

AFRICAN LAND: THE DEGRADATION AND THE ABSOLUTE REQUIREMENT OF SUSTAINABLE MANAGEMENT

An integrated approach to protect and restore our land

With the financial support
of the Agence Française de Développement

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Table of Contents

Preamble .....

Introduction **5**

I- Land degradation **6**

I.1.- Factors and forms of degradation 6

I.1.1- Factors of degradation 6

I.1.2- Forms of degradation 6

I.2- Overview 7

I.2.1- Land degradation assessment 7

I.2.2-Interpretation and general synthesis 8

I.3- Multidimensional impacts 10

II- Sustainable land management **11**

II.1- Basic Principles 11

II.2- Strategies for SLM implementation for the restoration of degraded land 15

II.2.1- Interdependence between sustainable management and land restoration 15

II.2.2- Strategies and assessment of restoration possibilities 15

II.3- Importance of local SLM know-how and good practices 17

II.4- SLM efforts and prerequisites for achieving Land Degradation Neutrality - LDN 20

II.4.1- National LDN targets and objectives 20

II.4.2- Commitments to LDN in Africa 20

II.4.3- Obstacles to the SLM implementation 21

II.4.4- Scaling up sustainable land management 21

III- Recommendations for land restoration and sustainable management **22**

III.1- Imminent priority to halt land degradation 22

III.2- Skills development and promotion of innovations 24

III.3- International and regional coordination 24

III.4- Mobilization of the resources and partnerships 25

III.5- Promotion of local knowledge and awareness raising 25

III.6- Proactive, science-based approach 26

Conclusion and call to action **26**

Bibliographic references **28**

Preamble

Under the framework of Agenda 2063, Africa is resolutely advancing toward ambitious sustainable development, placing the sustainable management of its natural resources at the forefront of its priorities. This strategy is vital to tackling the continent's socio-economic and environmental challenges. However, this commitment is facing a significant obstacle: land degradation, which affects nearly two-thirds of Africa's arable land, thereby threatening food security and social harmony.

Preserving land is more than an environmental responsibility - it is a strategic necessity. The agricultural sector, which supports approximately 70% of livelihoods and contributes 35% to the continent's GDP, is particularly vulnerable to land degradation. Each hectare of degraded land weakens economies and endangers the well-being of future generations. This reliance underscores the pressing need to adopt sustainable practices that enhance economic resilience and improve community living standards.

In order to face this multifaceted crisis, sustainable land management (SLM) seems like a strategic priority, transcending environmental concerns to become a critical geopolitical and economic issue. This work summarizes the "African Land: the degradation and the absolute requirement of sustainable management" book and the outcomes of the International Conference held by the Sahara and Sahel Observatory (OSS) in Tunis in June 2024. Collaboration with key stakeholders, including the OSS Strategic Orientation Committee (SOC) and the African Group of Negotiators on Desertification, has significantly enriched the proposed measures.

This summary is more than a practical guide; it is a call to urgent action. It paves the way for a future where environmental sustainability aligns with economic prosperity, and every policy decision acts as a catalyst for restoring land, empowering communities, and leaving a lasting legacy for future generations.

Armored landscape playing a protective role against erosion in the Niamey area, Niger

Introduction

Land degradation is a complex and pervasive process that stems primarily from human activities and profoundly affects biodiversity, soil fertility, and ecological balance. This accelerating degradation jeopardizes food security and undermines the livelihoods of growing populations. It is true that natural phenomena are a contributing element, still, the primary drivers are intensive agricultural practices, rapid urbanization, deforestation, and the overexploitation of water resources. If no serious measures are taken, by 2050, 90% of global land will bear the mark of human activity, intensifying extreme weather events, forced migration, conflicts over natural resources, and social and political instability.

The African continent is particularly vulnerable, facing an environmental crisis of alarming proportions. Nearly 65% of its productive land is already degraded, and 45% is at risk of desertification. These figures underscore the critical challenges Africa faces in safeguarding its vital natural resources. The consequences make one's blood run cold: economic losses amounting to tens of billions of dollars every year, declining agricultural yields, and increasing precariousness for rural populations, 62% of whom depend directly on these fragile ecosystems.

In this pressing context, sustainable land management (SLM) emerges as a vital strategic tool. SLM not only rehabilitates degraded land but also enhances ecosystem resilience against climate challenges and demographic pressures.

However, implementing SLM initiatives effectively is facing serious challenges, rooted in diverse environmental, socio-economic, and institutional realities. Key obstacles include outdated or insufficient data, inadequate assessment methods, inconsistent political commitment, and limited funding.

This document calls upon decision-makers to urgently adopt a unified and determined approach, aligned with Sustainable Development Goal (SDG) Indicator 15.3.1. It offers actionable recommendations to combat land degradation across Africa, emphasizing the importance of local and continental initiatives while calling for large-scale, coordinated efforts to preserve natural resources and secure a sustainable future for the generations to come.

Dune fixation to prevent silting, Southern Tunisia

I- Land degradation

I.1- Factors and forms of degradation

Land degradation is a multifaceted phenomenon that takes various forms, ranging from erosion and salinization to biodiversity loss and soil depletion. It occurs across different scales, from localized shifts to significant landscape alterations. The specific manifestations of degradation are often identified through "focal points", highlighting key components of terrestrial systems such as soil, water, and biota. This degradation arises from dynamic interactions between biophysical and socio-economic factors, with both natural and anthropogenic drivers often intertwined and challenging to dissociate. Desertification cannot be linked to a single cause, for it stems from the interaction of natural processes and human activities. Even though natural phenomena may occur sporadically, their effects are exacerbated by drivers such as climate change, which accelerates land degradation. Once initiated, land degradation triggers multiple effects that disrupt other components of terrestrial systems. One critical consequence is the diminished capacity of ecosystems to store carbon, which further contributes to climate instability. This reciprocal relationship between land degradation and climate change highlights the need to adopt a holistic approach to understand and address the adverse impacts of environmental change.

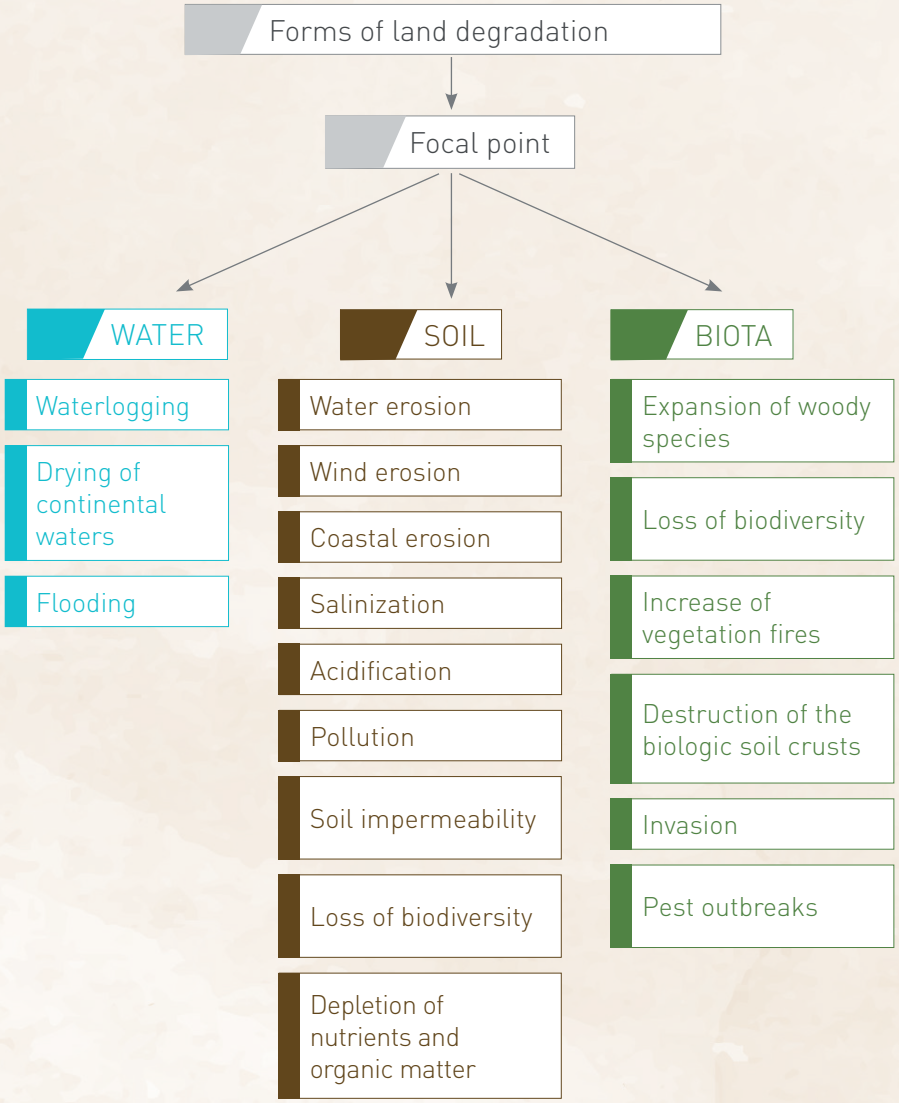
I.1.1- Factors of degradation

Climate-related land degradation includes gradual changes in temperature, rainfall and wind, as well as the intensification of extreme events (cyclones, sandstorms, etc.). These climate changes modify vegetation, trigger soil erosion and impact vegetation cover, which is a key element in limiting water and wind erosions. Factors such as rain, wind and sea level rise also contribute to erosion, particularly in coastal areas. These effects can be aggravated by natural conditions such as aridity or lack of vegetation.

In addition to these climate factors, anthropogenic factors exert significant pressure on land and contribute significantly to its degradation. In Africa, land degradation is largely linked to human activities, ranging from land conversion and local mining to the global effects of climate change. Rapid population growth, with a projected population of 2.4 billion by 2050 (United Nations, 2024), is increasing pressure on land, leading to intensive agricultural and livestock practices that reduce soil fertility. Unsustainable agricultural practices, rapid urbanization, land abandonment and migration are exacerbating soil erosion, acidification and loss of soil quality. Urbanization, often poorly planned, is driving urban sprawl, loss of vegetation cover and exposing soils to further degradation.

I.1.2- Forms of degradation

Land degradation takes many forms, affecting essential components of ecosystems, including water, soil and biota. Speaking of water, phenomena such as waterlogging, drying up of inland waters and flooding lead to degradation of water resources, disrupting the ecological balance. In addition, several types of soil degradation can be observed, including (water, wind and coastal) erosion, as well as salinization and acidification processes. These factors also lead to soil pollution, soil impermeability, loss of biodiversity, and depletion of nutrients and organic matter. Finally, biota degradation is marked by the expansion of woody species, loss of biodiversity and increased wildfires. Other threats include the destruction of biological soil crusts, invasion of harmful species and pest outbreaks, which further disrupt ecosystems and compromise their resilience. Together, these forms of land degradation highlight the need to implement sustainable resource management measures to preserve the health of ecosystems.



Forms of land degradation; adaptation inspired by Olsson & al., 2019

I.2- Overview

Africa has often been associated with apocalyptic images of drought and land degradation. While some of these images may be closer to cliché than generality, the reality of the sprawling spread of degradation and desertification raises serious concerns about the future of the continent.

In response to these concerns, the international community has mobilized to rigorously assess the extent and severity of this degradation, anticipate and implement effective solutions for prevention, conservation and restoration. The literature presents a wide range of data and information on aspects related to land degradation, although a significant disparity persists between the available figures. In order to overcome this disparity, the United Nations Convention to Combat Desertification (UNCCD) has established an evolving framework to align the monitoring and assessment of land degradation. This framework, which is part of Sustainable Development Goal (SDG) 15.3, aims to achieve Land Degradation Neutrality (LDN). It is based on indicator 15.3.1, to measure the proportion of land that is degraded over total land area.

I.2.1- Land degradation assessment

In order to identify areas of degradation, the UNCCD recommends the use of three key variables, selected for their ability to reflect the ecological services provided by terrestrial natural capital. These sub-indicators allow for a more consistent and standardized assessment of land status, thereby facilitating decision-making and land restoration actions at the global scale:

1. "Transformational" variable – **land cover change;**
2. "Fast" ecological variable – **land productivity dynamics;**
3. "Slow" ecological variable – **soil organic carbon stocks.**

The reporting framework for SDG indicator 15.3.1 proposed by the UNCCD relies on the use of satellite data from international sources that are freely available at low and medium resolutions, while recommending that Parties to the Convention use finer data at national and local scales. Thus, the accuracy of the SDG 15.3.1 indicator depends on the accuracy and quality of the data used as input.

In Africa, the low/medium spatial resolution satellite data recommended for calculating the SDG 15.3.1 indicator, do not capture an accurate picture of vegetation and ecosystem service losses and gains, and thus the true link with land degradation/restoration.

Given the complexity of assessing land degradation, the Sahara and Sahel Observatory has initiated a reflection in collaboration with the African Union, international bodies, including the UNCCD and the UN Food and Agriculture Organization (FAO), as well as sub-regional institutions such as the Permanent Inter-State Committee for Drought Control in the Sahel (CILSS), the International Commission for the Congo-Oubangui-Sangha Basin (CICOS), the IGAD Climate Prediction and Applications Center (ICPAC), and the Regional Center for Mapping Resources for Development (RCMRD). Other national institutions and research centers have also participated in this initiative, aimed at improving the reporting process for SDG indicator 15.3.1, as part of a multi-scale approach based on:

- Supporting countries through reporting process assistance projects;
- Integrating high spatial resolution data into the assessment of SDG 15.3.1 sub-indicators, namely 30m spatial resolution data instead of the currently default data (300m – 1km) used by African countries;
- Integrating very high spatial resolution data to characterize the state of land degradation/restoration in the islands;
- Raising awareness on issues related to land degradation.

This approach resulted in the production of an improved indicator kit integrating:

- The production of land cover maps covering Africa from Landsat data for the reference years 2000, 2015 and 2021;
- The assessment of land productivity using 30 m spatial resolution Landsat data;
- The estimation of carbon stock from more accurate land cover data produced by the OSS.

"The OSS commitment is part of the support to African countries, and aims to promote the use of finer satellite data for reporting, while ensuring support for technical and institutional strengthening to achieve LDN."

Pending the validation of this kit by African sub-regional and national bodies in a participatory and collaborative process, the preliminary results show a first accurate picture of land degradation, generally aligned with national reports.

I.2.2- Interpretation and general synthesis

Due to many factors such as overexploitation, overgrazing, deforestation and inefficient irrigation, land degradation represents a complex threat to livelihoods, requiring an accurate assessment of its scale, severity and evolution. While assessment methods vary across contexts, there is no consensus on a single approach. Current indicators, such as SDG 15.3.1, are limited and can only make the distinction between "degraded" and "non-degraded" land, requiring high-resolution data to capture the specificities of fragmented agricultural landscapes, particularly in Africa.

NORTH AFRICA

Arid, semi-arid and dry sub-humid zones

North Africa is facing climate change resulting in irregular rainfall and drought. The combination of forest fires, agricultural and urban expansion to the detriment of forests and protected areas, water and wind erosion with population growth putting additional pressure on natural resources, human practices and inappropriate agricultural techniques, represents the main causes of land degradation.

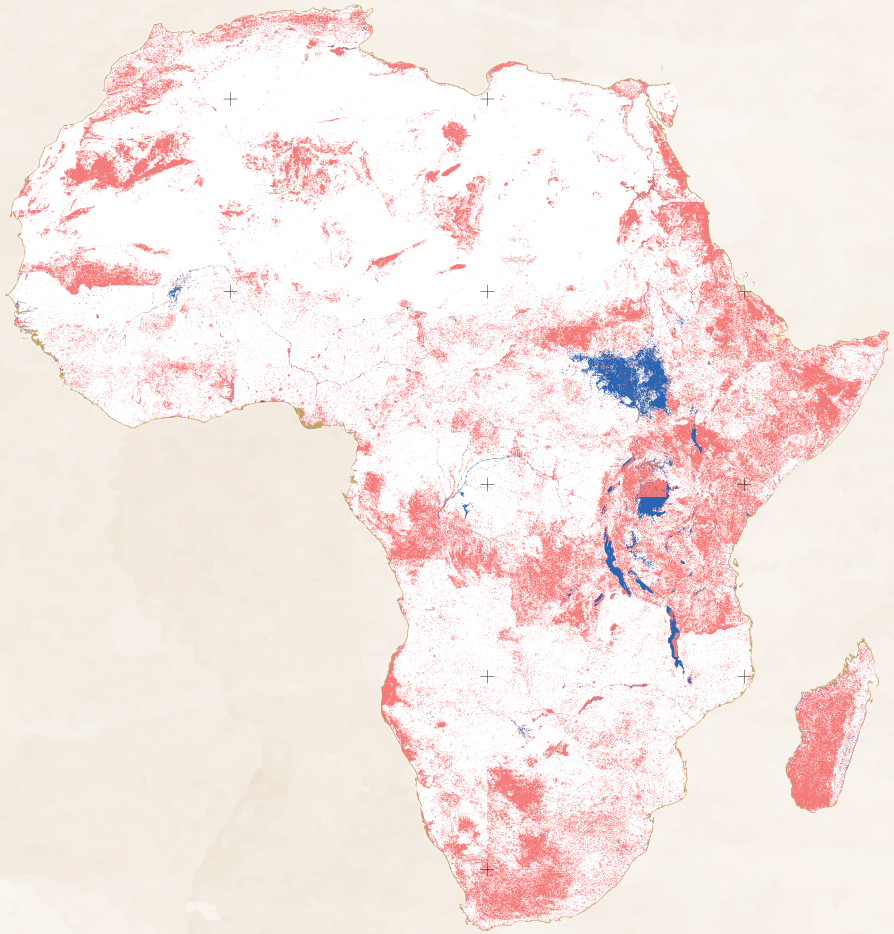
WEST AFRICA

Major river areas

Located in the area of major rivers, the Niger basin faces multiple threats of degradation from climate and anthropogenic origins. One of the major problems of the river is siltation caused, on the one hand, by water and wind erosion (the most frequent forms in the Sahel) and, on the other hand, by drought, desertification and pressure of man and livestock on the environment. Various regions of the area are facing desertification, aridity and heavy torrential rainfall causing erosion and threatening homes and arable land.

SOUTHERN AFRICA

Three major degradation problems are threatening Southern Africa's land: deforestation, invasive species and the encroachment of woody species (in savannahs, grasslands and woodlands). These issues are exacerbated by intersecting factors, namely climate change and anthropogenic activities such as charcoal wood production. South Africa, Angola and Namibia face the risk of sea level rise and coastal erosion.



Land degradation map in Africa, based on SDG indicator 15.3.1 (OSS, 2024)

EAST AFRICA

Horn of Africa

Two major factors are responsible for land degradation in the Horn of Africa: climate change, particularly drought, and human activities, conflicts and migration in particular, having led to changes in land use and coverage. Rapid population growth, which has more than doubled since the 1960s, has contributed significantly to this degradation through increased land clearance for agriculture and deforestation for construction and household energy needs. Additionally, the Horn of Africa is home to the world's largest pastoralist groups, which, combined with a growing population and livestock herd, and longer and more frequent droughts, has led to overgrazing and shortage of quality pastures.

CENTRAL AFRICA

Congo Basin

The Congo Basin is famous with its tropical forests which are undergoing considerable degradation. The deforestation is the consequence of the expansion of subsistence activities (agriculture, charcoal production and the practice of burning) in the first place, followed by population growth and accelerated urbanization.

Mining is also a cause of deforestation in the Congo Basin region, which is home to considerable anthropogenic activities where arable land has replaced forests.

Measurement challenges include the use of vegetation indices as proxies for productivity, which are often inadequate in drylands, and the need for better data to estimate soil carbon stocks. Currently, the best approach combines Earth Observation (EO) data, local expertise and country specificities to effectively assess land degradation and guide restoration decisions. In Africa, the development of a monitoring indicator toolkit should remain an adaptive process, integrating additional indicators, such as erosion and fire-affected areas, to better understand the complexity of land degradation.

The map above, produced by the OSS in 2024, provides a general overview on the degradation in Africa. It also summarizes the main causes of this phenomenon in each sub-region of the continent.

I.3- Multidimensional impacts

Land degradation is a major obstacle to sustainable development on the African continent. Its repercussions, at various levels, generate economic, social and environmental impacts that compromise the quality of life of African populations.

The economy: Globally speaking, land degradation affects approximately 3.2 billion people and generates an annual loss of approximately US$300 billion. With significant economic losses of US$7/ha for pastures, US$38/ha for rainfed crops and US$250/ha for irrigated crops, it represents a serious problem for Africa. Indeed, 70% of the population depends on agriculture, which contributes 35% to GDP. In sub-Saharan Africa, 65% of productive land is affected, affecting approximately 485 million people. This region accounts for 22% of the global cost of degradation, i.e. US$66 billion.

This situation is accompanied by an aggravated poverty, particularly affecting vulnerable populations, with rural impoverishment rates reaching up to 54.7% in some regions.

Failure to address this insidious and complex phenomenon could result in economic losses estimated at US$4.6 trillion by 2030, highlighting the urgency of a rapid response. Nevertheless, targeted investments in sustainable land management could generate up to US$2.83 trillion, transforming this crisis into a real opportunity for sustainable development (ELD Initiative, 2015).

Food security: The current state of land in Africa poses a serious threat to food security in Africa, jeopardizing the continent's ability to feed a rapidly growing population. Yields of staple crops such as maize, sorghum and millet have fallen by 20 to 50 % in recent decades, an alarming trend as we approach a projected population of 2.4 billion by 2050.

This crisis is not just about a decline in the quantity of food produced; it is also compromising the nutritional quality of the food available. Furthermore, the erosion of dietary diversity and traditional agricultural knowledge is further exacerbating food insecurity, leaving vulnerable communities face-to-face with increasing difficulties in accessing sufficient and nutritious food. Without immediate and effective action, Africa is heading towards a major food crisis.

Public health: Soil and water pollution, exacerbated by forest conversion to agricultural land and mining activities, are contaminating natural resources, causing thousands of premature deaths each year due to respiratory diseases aggravated by dust storms. Furthermore, land degradation impacts mental health, compromising the psychological well-being of communities, particularly in rural areas where lifestyles are closely linked to the well-being of the environment. Without immediate action, this crisis threatens the quality of life of millions of people.

Social stability: An estimated 10 million people have been displaced in the last decade due to environmental degradation, exacerbating tensions between communities and fueling poverty and insecurity. This situation acts as a catalyst for violent conflicts, particularly in areas where institutions are fragile and unable to peacefully manage disagreements over limited resources. Periods of drought and scarcity of natural resources increase

the risk of conflicts, exemplified by growing tensions between pastoralist and agricultural communities. In addition, land degradation contributes to internal migration, as people seek new opportunities to face precarious economic conditions. Without timely intervention, these dynamics threaten the peace and security of the populations. (IOM, 2009).

Ecosystem services: Land degradation is leading to a decline in essential ecosystem services, jeopardizing human survival and environmental sustainability. Biodiversity erosion, characterized by rapid species decline, is undermining African ecosystems, which are home to 25% of the world's biodiversity. Deforestation, habitat fragmentation and desertification are threatening endemic species, some of which are still poorly known. This loss of biodiversity affects vital services such as crop pollination, disease regulation, water purification and carbon sequestration. In addition, degraded ecosystems are less resilient to climate change, increasing the vulnerability of communities dependent on these resources (IPBES, 2018).

II- Sustainable land management

The impacts of land degradation on people's quality of life and the significant costs to African economies underscore the urgency of addressing this issue. According to the UNCCD, combating land degradation encompasses activities aimed at integrated land development for sustainable development. This includes: (i) preventing and/or reducing land degradation, (ii) rehabilitating partially degraded land, and (iii) restoring degraded land. In this fight, sustainable land management emerges as a key solution to reverse degradation trends. It is now a priority for many governments, international Organizations and civil society actors. SLM is not limited to a single method, but includes a set of integrated, sustainable and participatory methods, strategies and practices. It represents a broad concept to avoid, reduce and/or reverse land degradation (Critchley et al., 2021; Sanz et al., 2017).

The definition of SLM adopted here includes the concept of degraded land restoration. These key notions are promoted by the UNCCD and other Institutions and Initiatives with a view to achieving Land Degradation Neutrality.

II.1- Basic Principles

The use and scaling up of SLM practices in Africa aim to maintain and improve livelihoods while protecting natural resources and ecosystem functions. In addition, SLM can generate a variety of simultaneous benefits, such as climate change mitigation through the accumulation of organic matter in soil and vegetation, climate change adaptation by developing systems that can buffer variability and shocks, resilience and disaster risk reduction, improved hydrological function of land, restoration of biodiversity, and increased production (Critchley et al., 2021). Indeed, many SLM practices address the causes and consequences of land degradation, desertification, and climate change (Sanz et al., 2017).

These practices include structural measures such as cross-cutting barriers, agronomic solutions such as soil mulching, vegetative interventions such as agroforestry, as well as management strategies for grazing and peatland protection. SLM practices include approaches and technologies (WOCAT).

Several technology groups have been identified based on initiatives and databases such as the World Landscape of Conservation Approaches and Technologies - WOCAT, TerraAfrica, the World Bank SLM Source Book, FAO's Climate Smart Agriculture and IPCC assessment reports. They all provide a wealth of information on how to apply and adapt technologies to meet various needs (Sanz et al., 2017). After reviewing documents produced by reference institutions such as UNCCD, WOCAT and FAO, the OSS offers a selection of the most significant technology groups that are most relevant to Africa's needs.

SLM technology: A physical land management practice that controls land degradation and improves land productivity and/or other ecosystem services. A technology consists of one or more measures, such as agronomic, vegetative (biological), structural and management measures.

SLM approach: Defines the ways and means used to promote and implement one or more SLM technologies, including technical and material support, stakeholders' participation and role. An approach may refer to a project/program or to activities initiated by land users themselves.

Source, WOCAT

Economic and ecological valorization of an invasive species, Typha in Benin

General information on the main SLM technology groups in Africa (Liniger & al., 2011 ; Sanz & al., 2017)

Main SLM technology groups	Definition and principles	Applicability
Integrated Soil Fertility Management	It aims to manage soils by combining different methods of amendment and conservation of water and soil (CWS). It is based on the following 3 principles: (1) maximizing the use of different organic sources of fertilizer; (2) minimizing nutrient losses; (3) optimizing the use of mineral fertilizers according to the needs and economic availability.	ISFM is necessary in areas with low or rapidly decreasing soil fertility. Due to the wide variety of ISFM techniques, there are no specific climate restrictions for their application, except in arid areas where water is always a limiting factor. ISFM is particularly appropriate in mixed crop and livestock systems.
Minimal ground disturbance	Minimum soil disturbance refers to no-till or low soil disturbance crops, only in small strips and/or at shallow depth, and direct seeding (WOCAT, 2016). It is an agricultural system that preserves, improves and makes more efficient the use of natural resources. Proven practices preserve the soil, but also its humidity and trap carbon (FAO).	Minimal soil disturbance works for a wide range of food and cash crops. It is suitable for a variety of agroecological zones and farming systems: regions with low or high rainfall; degraded soils; multiple cropping systems and systems with labor shortages or low external inputs. It has good diffusion potential in arid environments due to its ability to save water.
Agroforestry	Agroforestry integrates the use of sustainable woody plants with agricultural crops and/or livestock for a variety of benefits and services, including better use of water and soil resources, multiple fuels, food and forage resources and habitat for associated species.	Agroforestry is suitable for arid areas suffering from strong winds and wind erosion, and for less fertile soils (park systems, intercropping, windbreaks). Multi-stage systems are suitable for areas with excessive rainfall leading to water erosion, soil compaction, expensive inputs (fertilizers), spread of pests and diseases. The extent and forms of agroforestry practiced vary depending on the country.

Main SLM technology groups	Definition and principles	Applicability
Management of grazing pressure	This relates to the management of grazing on natural or semi-natural meadows, meadows with trees and/or light forests. Animal owners may have a permanent residence while their livestock move to distant grazing areas, depending on the resource availability. Grazing pressure management practices provide strategies for conserving or enhancing native grass, improving forage production, restoring soil quantity and quality, improving plant communities and reducing overall operating costs. Enclosure, bourgou culture, transhumance are some examples of these practices.	Rangeland management and improvement is a production system for drylands where productivity is relatively low due to aridity, altitude, temperature, or a combination of these factors.
Water Management	It is the management of water resources, including surface, ground and rainwater, to promote their efficient use and protect them from pollution and overexploitation. It also involves the removal of excess water from the soil surface or root/drainage zone, using sustainable irrigation systems and water harvesting. Water management practices can help increase the capacity of the soil to receive, hold, release and deliver water, and can reduce soil erosion. This might include rainwater harvesting and small-scale irrigation management (by small farmers).	Water management can be applied to land use types where water resources are present, such as cropland and forest/woodland, in different ways, depending on the SLM overall objective.

II.2- Strategies for SLM implementation for the restoration of degraded land

II.2.1- Interdependence between sustainable management and land restoration

Globally speaking, SLM and land restoration are two interdependent and inseparable concepts. Land restoration is one of the tools that can be used to achieve SLM, for it can contribute to improving the long-term productivity and sustainability of land use systems. It is essential for restoring terrestrial ecosystems and is at the heart of maintaining or restoring life on land. When applied on productive land, appropriate SLM practices can lead to higher and more stable yields.

The role of SLM in restoration efforts falls within the context of achieving a land degradation-neutral world by 2030. However, it can have a significant impact on ecosystem restoration only if it is widely disseminated, covering a critical mass of land and people, and if the practices introduced are maintained and adapted over time. A combination of SLM practices is needed to achieve results (Critchley et al., 2021).

Restoration includes a wide range of land management interventions, from reducing societal impacts in production landscapes to fully restoring native ecosystems. Examples of ecosystem restoration include managing agriculture to reduce soil erosion, installing urban greenways, and cleaning up mine-contaminated soils (UNEP, 2021).

Restoration can be active, through planting native species or mixtures of native and non-native species, and through assisted natural regeneration. It can also be passive, through removing the causes of degradation to allow or encourage natural regeneration. For example, a variety of silvicultural methods and treatments can be applied as part of restoration efforts

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II.2.2- Strategies and assessment of restoration possibilities

The first step in an ecosystem restoration program is to analyze the baseline state, including the level of degradation. At this stage, it is crucial to determine the reference ecosystem that will guide restoration interventions. This reference ecosystem (or restoration target), is established mainly from spatial data and participatory techniques (Gann et al., 2019).

Then, to identify the dynamics of degradation and assess its magnitude and the progress made in restoring the site, it is necessary to develop a reference model. Indeed, degradation and restoration are relative concepts. The questions to ask are: "Degraded compared to what?" and "Restored to have what?" (IPBES, 2018). The reference model allows the ecosystem to be described using measurable indicators, thus facilitating comparison with the site to be restored. (Gann et al., 2019).

Jessours technique, Tunisia

The steps that make up the process of identifying a reference model are (Durbecq, 2020):

- **The creation** of a geographic area boundary in which habitat types similar to the restoration sites are found;
- **The identification** of the environmental factors structuring the non-degraded communities in this geographic area;
- **The comparison** of the environmental factors between the non-degraded and degraded sites;
- **The selection** of the non-degraded sites most similar to the restoration sites in terms of environmental factors and use them as reference sites.

Considerations for a restoration program include (Gann et al., 2019):

- **Including** a diversity of ecosystems, if the site is large or has varied topography;
- **Using** multiple references to reflect ecosystem dynamics or projected changes over time, particularly for ecosystems with complex dynamics that may require multiple models to describe different possible restoration outcomes;
- **Adjusting** the reference model over time based on program monitoring results.

The assessment of restoration potential involves the identification of the ecological need, degree of degradation or risk status of the ecosystem, social need, types of potential restoration interventions, cost and economic benefits, and legal, institutional, policy and financial limitations and opportunities (IUCN & WRI, 2014).

Fencing, a management and conservation technique, El Mahbess, Tunisia

Finally, implementing a land restoration plan involves the identification of the most appropriate interventions for the restoration to be carried out. These interventions will be based on stakeholder input, ecological relevance, legal, regulatory and governance requirements and constraints, as well as scale and cost-effectiveness (UNEP, 2021; CBD & SER, 2019).

II.3- Importance of local SLM know-how and good practices

Over the centuries, the African populations have developed local know-how to adapt to different forms of land degradation and sustainably manage their resources. The diversity of Africa's local know-how and cultural heritage, closely linked to the natural environment, constitute a strategic asset for the sustainable development of the continent.

Traditional practices that contribute to SLM vary from one region to another, and change according to the ecosystem richness, the diversity of agroecological conditions and the specific needs of the area.

In the Sahel, countries have long adopted relevant local know-how to maintain soil fertility, optimize productivity and protect crops. These practices include crop rotation, fallow, conservation of good seeds, use of goat waste as fertilizer, monitoring of the seasons and soil types for the proper distribution of crops, etc. (OSS, 2017).

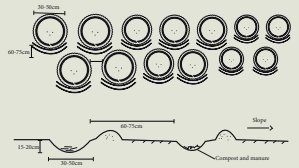
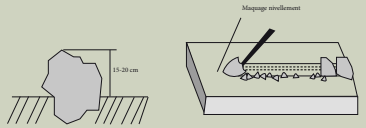
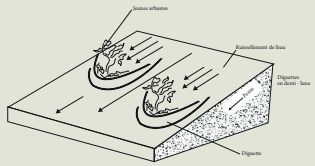
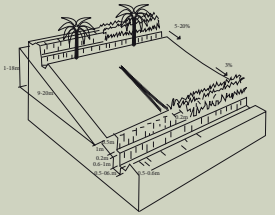
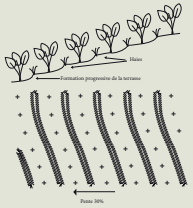
Local populations also use soil rehabilitation techniques developed for drylands, such as zaï (small pits to capture water and enrich the soil), stone bunds, mulching, penning, haymaking, crop association/rotation, etc.

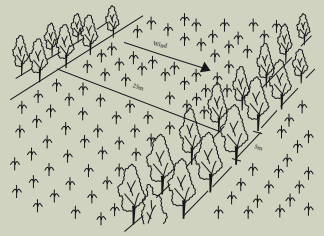
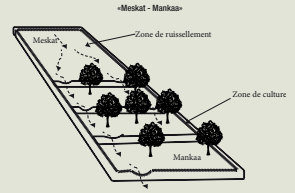
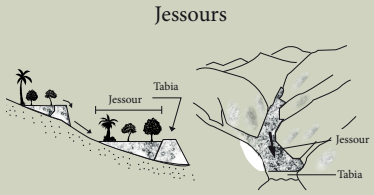
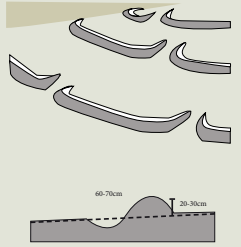
Many of these traditional techniques have been successful and proven in Africa and can be important components of smallholder farmers' climate change adaptation strategy (IIED, 2011).

Knowledge exchange and awareness in the forest community of Koankin, Burkina Faso

Discussions with local populations on water-related issues, Djibouti

Some local SLM techniques and know-how in Africa (Diop & al., 2022 ; OSS, 2017 ; Liniger & al., 2011).

Name	Areas of use	Description	Illustration
Zaï	North, West and East Africa - Native to West Africa	Catchment of runoff water through holes in order to feed a plant planted in the middle and to facilitate infiltration into groundwater. The method consists of digging a hole to receive rainwater, manure and seeds.	
Stone bunds or stone lines	West Africa, Eastern and Southern Africa	Slowing runoff and increasing water infiltration to improve production in semi-arid areas. At the same time, sediments are retained behind these semi-permeable barriers.	
Half Moon	West and East Africa	Increase water infiltration, rehabilitation of degraded land, soil stabilization and reduction of water erosion by digging half-moon shaped holes following the slope and contour lines of the land.	
Terrace farming ("Fanya juu" terrace)	East Africa, Togo, Cameroon, Sudan, Morocco, steep areas across Africa	Popular and successful cross-sectional measures in the small-scale agriculture sector. Contour dikes are constructed by projecting earth upward from trenches located just below. This design leads to the gradual formation of terraces with a flat or slightly forward-inclined bed. Reduction of soil and water losses and improvement of plant growth conditions.	
Live hedges	Kenya, Cameroon, Rwanda	Increase in the quality of water conservation and integrated management of soil fertility, and reduction of bank erosion through the plantation of one or more species of trees or shrubs.	

Name	Areas of use	Description	Illustration
Windbreak	For areas with high wind speed (more than 35km/h)	Tree and shrub barriers that protect against wind damage: reduction of wind speed, protection of plant development (agricultural crops and forages), improvement of microenvironments to increase plant growth, demarcation of field boundaries and increased carbon storage.	
Meskat	North Africa	Increase in the amount of water received by crops by using the uncultivable surface of the hills as an impluvium and by planting trees in the valleys and at the bottom of the slopes.	
Jessour	North Africa	Increasing the retention of runoff water and bedload materials in the soil, as well as reducing water erosion by constructing earthen dykes. The structure is reinforced downstream by a drystone wall with a variable height depending on the flow.	
Soil/earth dykes (or "ridges" in southern Africa)	West and South Africa	Soil conservation by constructing an earth dyke along contour lines by digging a canal and creating a small ridge below. These dykes are built gradually and maintained annually by adding earth to the dyke. Unlike stone lines, they perfectly prevent water runoff by blocking its movement.	

II.4- SLM efforts and prerequisites for achieving Land Degradation Neutrality - LDN

II.4.1- National LDN targets and objectives

Decision 3/CoP 12 (UNCCD, 2015) called upon all Parties to the Convention to formulate national targets to achieve LDN based on their specific national circumstances and development priorities. After this decision, the UNCCD Global Mechanism established the global Target Setting Program (TSP) for all countries to set national baselines, identify voluntary targets and associated actions to achieve LDN by 2030, and monitor progress towards its goals.

The voluntary national targets for Land Degradation Neutrality are the same as those set at baseline. Neutrality is generally the minimum target: countries may choose to set a more ambitious target, namely: improving terrestrial natural capital compared to the baseline to increase the amount of healthy and productive land.

48 countries of the region engaged in the process of setting LDN targets, and have defined and approved voluntary national targets through the consultation of the working group (LDN- TSP national report).

However, many countries of the region that have set voluntary LDN targets, did not have a monitoring mechanism for implementation, tools to assess progress, or accurate local data on the national indicators relevant to calculating SDG indicator 15.3.1.

II.4.2- Commitments to LDN in Africa

In order to monitor progress towards achieving Land Degradation Neutrality by 2030, countries estimated baseline levels of land degradation for the period 2000-2015, against the three agreed sub-indicators and defined their intervention measures. These analyses were carried out using a combination of global and national data, depending on the country resources. The sources and data available on these sub-indicators are derived from global observation systems, allowing a more accurate and relevant assessment of land degradation at the country level. These three sub-indicators could be combined or reinforced by national level indicators.

In African countries and according to the national reports submitted to the UNCCD, more than 3,400,000 km² need to be restored as part of the LDN targets. The countries with the largest commitments are located in West Africa. The pledged area could be significant, for the African region has nearly 2,630,000 km² of degraded land.

In this context, it is necessary to highlight that restoration and LDN targets, National Biodiversity Strategies and Action Plans (NBSAPs) and Nationally Determined Contributions (NDCs) are interlinked. This allows for optimal synergies to be achieved between the three Rio Conventions. In most cases, measures to achieve the LDN target will also benefit biodiversity conservation, as well as climate change adaptation and mitigation.

The countries' commitments in their reports were categorized as follows:

- Improving productivity of agricultural areas and croplands;
- Reducing deforestation/increasing forest areas;
- Improving land productivity and soil organic carbon stocks;
- Restoring and sustainably managing pastoral land, grasslands, savannahs and rangelands;
- Regenerating denuded land;
- Reducing the rate of soil surface loss through erosion.

It is essential that commitments made under Land Degradation Neutrality meet ecological restoration standards. Countries often adopt afforestation measures that are easy to implement and cost-effective. However, restoration success should not be assessed solely in terms of the number of hectares being restored or trees planted, but also in terms of the improvement of terrestrial natural capital and ecosystem services restored.

II.4.3- Obstacles to the SLM implementation

Despite all promises, implementing sustainable land management at scale faces several challenges:

Lack of data and monitoring: The absence of effective monitoring systems and the lack of reliable data on land conditions hinder informed decision-making. This gap makes it difficult to accurately assess the extent of degradation, plan targeted interventions, and track progress.

Finance gap: Current investments in sustainable land management fall far short of what is needed. Funding to reverse land degradation and combat desertification in Africa (Sustainable Development Goal 15.3) is lacking by more than $300 billion per year. This funding gap significantly limits the scale and impact of sustainable land management initiatives (WRI, 2021)

Low political commitment: Despite international commitments, sustainable land management is rarely a priority on national policy agendas. This lack of political will translates into a lack of consistent policies, appropriate regulatory frameworks and adequate budget allocations.

Coordination and scaling challenges: Fragmentation of efforts and lack of coordination between different actors limit the impact of existing initiatives. Local successes often struggle to be replicated at a larger scale due to institutional constraints, the diversity of local contexts and the lack of effective mechanisms to share knowledge and good practices.

II.4.4- Scaling up sustainable land management

Scaling up SLM presents a significant opportunity to advance the goals of the United Nations 2030 Agenda and the principles of the UNCCD. By promoting soil conservation, responsible management of natural resources and strengthening ecosystem resilience, this approach directly contributes to SDG Goal 15 to protect, restore and promote sustainable use of terrestrial ecosystems. By promoting sustainable agricultural practices, scaling up SLM supports poverty reduction (SDG 1), food security (SDG 2), and the promotion of sustainable economic growth (SDG 8). The expansion of SLM in Africa is well aligned with the aspirations of the 2030 Agenda, reinforcing commitments to a more equitable, resilient and environmentally sustainable future.

Half-moon technique, Niger

Effectively scaling up SLM requires recognition and ownership of its benefits by land users, or access to appropriate incentives. For example, for poor farmers, the adoption of land restoration practices will depend on a variety of factors, including long-term, political and financial, commitment, to implement SLM programs. Land tenure regulation, access to land and local governance also play a crucial role, as does the effective participation of the beneficiaries in policy development, strategy planning and implementation. Alignment with local practices, existing production systems, cultural values, and community aspirations is essential. Adverse biophysical conditions, such as climate and soils, as well as technical challenges, market opportunities, and local social dynamics, represent additional obstacles.

Scaling up good practices remains a major concern in the field of land management. Land conservation and restoration solutions that have proven effective are not always widely adopted due to changing contexts and the region-specific needs. It is imperative to set up ambitious programs for the co-production of good practices, ensuring initial financing conditions, a consolidated and sustainable policy framework, and a convenient market for value chains. Capacity building, not only through state technical channels, but also within communities through exchange and demonstration platforms, is essential. In this context, knowledge management and experience sharing, access to land and the mobilization of domestic funds are essential levers to promote the scaling up of SLM good practices.

III- Recommendations for land restoration and sustainable management

Africa is home to huge natural resources but is vulnerable to the impacts of climate change and unsustainable practices. African States have made commitments, including through the UNCCD, to restore millions of hectares of land by 2030. These commitments require coordinated international, national and local efforts, as well as adequate financing to ensure a successful transition to more sustainable land management systems.

Through these recommendations, concrete avenues for land restoration and the establishment of sustainable agricultural practices are identified, while ensuring integrated management of natural resources.

III.1- Imminent priority to halt land degradation

Act quickly to prevent land degradation

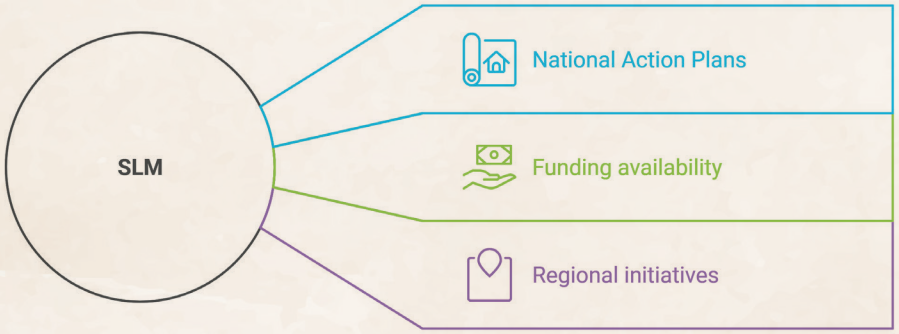
Inaction to face land degradation results in exponential costs, making restoration efforts more complex and costlier as time passes. It is therefore crucial to implement rapid and effective interventions to restore land before it reaches a point of no return, threatening agricultural productivity and people's quality of life.

Implement national action plans

African countries must live up to their SLM commitments by implementing their National Action Plans to Combat Desertification (NAPs/CD) and LDN strategies. This involves capacity building for local and national institutions to better manage natural resources, while adopting specific measures such as soil conservation and the promotion of sustainable agriculture.

However, the success of these actions depends on the availability of financing, whether through own resources or international cooperation. Regional initiatives such as the Great Green Wall and AFR100 are essential to slow down degradation and restore millions of hectares by 2030.

Pathways to Sustainable Land Management in Africa



Foster access to financing

Access to financing is often complex and represents a major obstacle to the implementation of land restoration programs. Many countries rely on international experts to prepare financing files, which generates significant costs. It is crucial to train local experts on financing mechanisms, such as the Global Environment Facility (GEF), the Adaptation Fund (AF) or the Green Climate Fund (GCF), in order to strengthen their self-management.
Large-scale initiatives, such as the AFR100 initiative or the Great Green Wall, can mobilize larger resources, thus attracting public and private investments. They can have a massive impact, create knowledge sharing platforms and mobilize international support.

Promote relevant traditional techniques

Traditional African agricultural techniques, such as terrace farming systems or fallow practices, have proven effective in combating land degradation. Adapted to local conditions, these methods should be integrated into national SLM strategies.

Economic incentives could encourage farmers to adopt environmentally friendly practices and cut with intensive production methods that deplete natural resources. By valuing this traditional knowledge, African countries can not only strengthen the resilience of their agricultural systems, but also preserve biodiversity and improve productivity in the long run.

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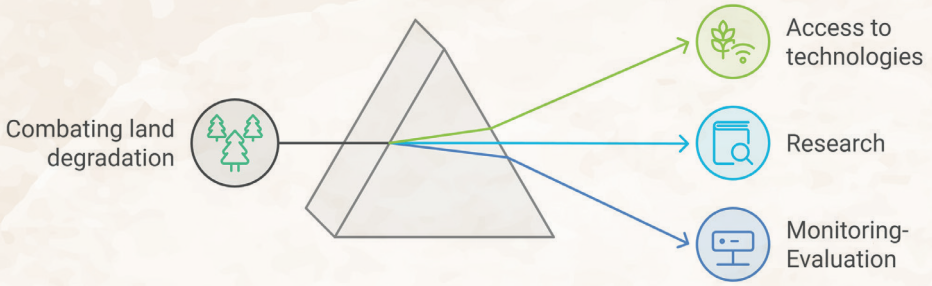
Community involvement cycle in land restoration

III.2- Skills development and promotion of innovations

Promote technology transfer and capacity building

To address the challenges of land degradation, it is imperative to facilitate access to innovative technologies and knowledge. This requires investments in scientific research and the development of techniques adapted to African contexts. In addition, monitoring-evaluation systems must be put in place to assess the impact of agricultural practices on the environment and land productivity.

Contending with land degradation: access to technologies, research and monitoring-evaluation



Adopt advanced technologies to assess and monitor land degradation

African governments should leverage technological innovations, such as Earth Observation systems, for accurate assessment of land degradation. These tools help better target interventions, monitor soil conditions, and measure the impact of restoration efforts. Their widespread adoption will establish more effective land management and strengthen the resilience of agricultural systems.

Establish robust monitoring-evaluation systems

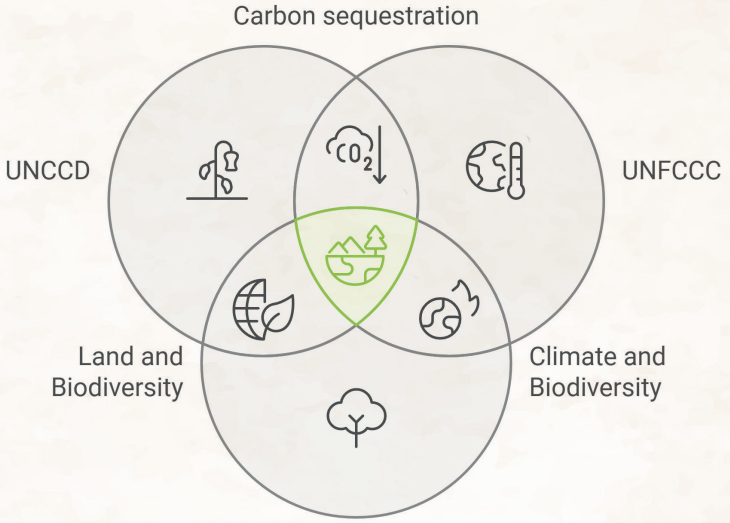
The implementation of monitoring-evaluation systems should be a priority to measure the effectiveness of sustainable land management practices. These systems will provide accurate data on progress, allowing decision-makers to make real-time adjustments to the strategies and ensure sustainable results. The data collected will also be used to assess land degradation neutrality outcomes.

III.3- International and regional coordination

Ensure synergy between the three Rio conventions

Sustainable land management is closely linked to the objectives of the three international Rio conventions: The Convention to Combat Desertification (UNCCD), the United Nations Framework Convention on Climate Change (UNFCCC) and the Convention on Biological Diversity (CBD). A coordinated approach between these conventions is essential to achieve global sustainable development goals, particularly in terms of carbon sequestration, mitigation of greenhouse gas emissions and preservation of biodiversity.

Integrated sustainable land management



Standardize thematic maps at the regional scale

It is essential to standardize thematic mapping between African countries, by harmonizing assessment methods and defining smart and integrated scales of interpretation to make data comparable. This approach will also foster regional and international cooperation to combat land degradation and support restoration initiatives.

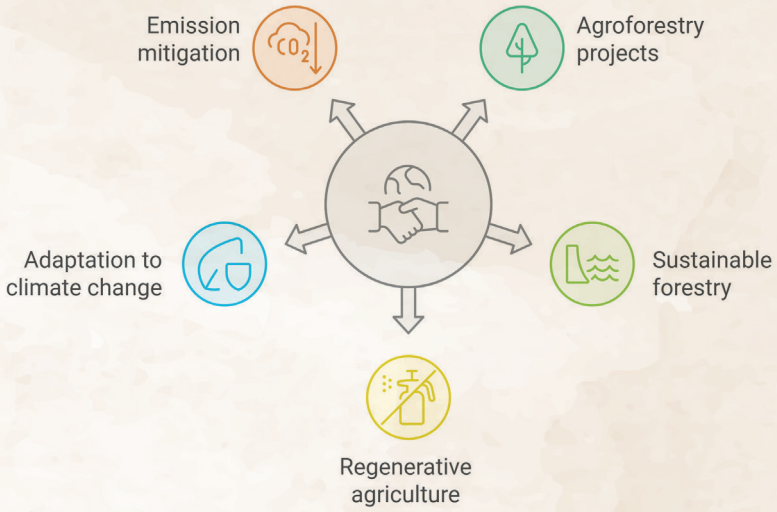
III.4- Mobilization of the resources and partnerships

Multiply public-private partnerships (PPPs)

Mobilizing finance for land restoration also requires the involvement of the private sector. Agroforestry, sustainable forestry, and regenerative agriculture projects can attract private sector investment while ensuring positive impacts on the environment and local communities. These public-private partnerships are essential to increase agricultural yields, while promoting climate change adaptation and greenhouse gas mitigation.

In addition, strategic cooperation between private investors, land managers, and civil society is highly important to encourage sustainable management and restoration of degraded land in Africa.

Private sector involvement in land restoration



Key role of civil society

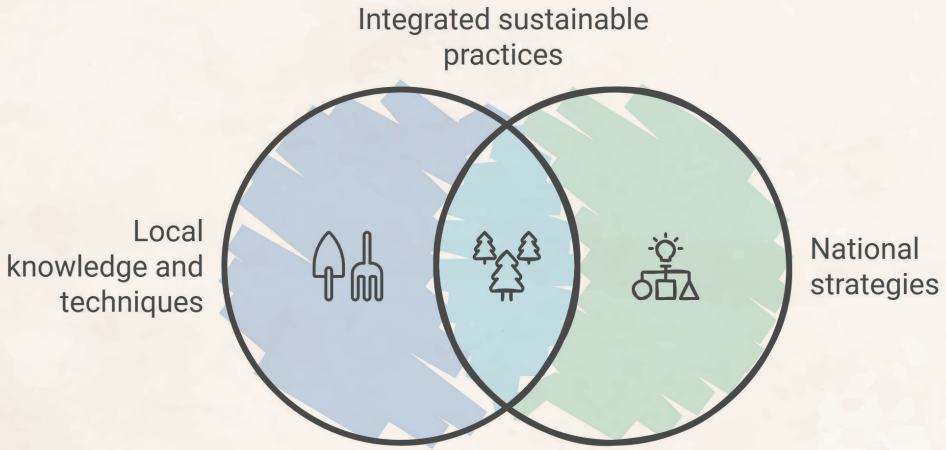
Civil society Organizations have a key role to play in land restoration. They promote cooperation between the governments, NGOs, and local communities, while raising awareness of the importance of natural resources conservation. In addition, they are often at the forefront of mobilizing international funding and implementing reforestation and resources management projects.

III.5- Promotion of local knowledge and awareness raising

Integrate and promote local knowledge and ancestral techniques

Local knowledge and ancestral techniques, such as traditional cropping systems and soil conservation practices, must be fully integrated into national sustainable land management strategies. These methods, proven in local contexts, contribute to the resilience of agricultural systems and the preservation of natural resources. It is necessary to create information sharing platforms to promote the dissemination of these good practices.

Integration of local knowledge for sustainability



Awareness raising and targeted communication

Awareness campaigns should be developed to encourage the adoption of sustainable agricultural practices. This includes education on soil conservation methods, crop diversification, and protection of water resources.

These initiatives should start on the ground, within the communities, and gradually roll out to broader levels, thus ensuring their ownership and effectiveness.

Awareness must also highlight the importance of operational know-how, by valuing the concrete and adapted practices of local communities. By recognizing traditional knowledge holders as essential partners, these actions will not only ensure the success of ecological restoration, but also strengthen the resilience of agricultural systems to environmental challenges, while promoting sustainable development that is truly rooted in the field realities.

III.6- Proactive, science-based approach

Land restoration and sustainable management actions must be based on sound scientific evidence and a proactive approach. Decision-makers must draw on research findings to implement strategies that are adapted to local and regional contexts, anticipating future challenges posed by land degradation and climate change. This approach will ensure targeted and effective interventions, optimizing positive impacts on land and communities.

Proactive land management

Conclusion and call to action

Land degradation in Africa is an environmental and socio-economic emergency with profound impacts on agricultural productivity, food security, biodiversity and the stability of vulnerable communities. Given the magnitude of this challenge, the adoption of sustainable and resilient solutions, as proposed in this summary, is essential. Rigorous monitoring of indicator 15.3.1 of the Sustainable Development Goals, consolidated by the use of satellite data and dynamic mapping, constitutes a powerful set of tools to assess the state of the land and strategically guide restoration efforts.

Innovative practices such as agroforestry, sustainable pasture management and reforestation, combined with the ancestral knowledge of local communities, have proven their effectiveness in restoring soil fertility, optimizing carbon sequestration and consolidating the resilience of African ecosystems. However, the success of these initiatives depends on increased synergy between the governments, local communities, civil society Organizations and international institutions, accompanied by impactful awareness-raising and communication campaigns.

It is imperative that all stakeholders mobilize now to reverse land degradation. Governments must translate their commitments into ambitious National Action Plans, supported by innovative and inclusive financing mechanisms. Investment in cutting-edge technologies for monitoring and building local capacities are crucial to ensure the effectiveness of sustainable land management strategies.

Each public or private, local or international actor, is called upon to play a decisive role in this collective mobilization. Sustainable land management in Africa goes beyond simply responding to ecological and economic challenges; it paves the way for a more prosperous and equitable future for future generations. Together, let us make the commitment to restore African land and guarantee a sustainable future for all.

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