



30  
ans  
years  
au service de l'Afrique  
serving Africa

# SUMMARY FOR POLICY MAKERS

## AFRICAN ECOSYSTEMS BETWEEN DEGRADATION AND RESTORATION

What you keep in memory, will shape the future

With the financial support of the:



# SUMMARY FOR POLICY MAKERS

## AFRICAN ECOSYSTEMS BETWEEN DEGRADATION AND RESTORATION

What you keep in memory, will shape the future

With the financial support  
of the Agence Française de Développement - AFD

May 2023

© Sahara and Sahel Observatory - OSS, 2023

Summary for policy makers

**African ecosystems between degradation and restoration.** What you keep in memory, will shape the future/OSS ; AFD. \_ Tunis, 2023.\_ 12p.

*"The analyses and conclusions of this document are elaborated under the sole responsibility of their writers. They do not necessarily reflect the official position of the Agence Française de Développement (AFD)."*

## INTRODUCTION AND CONTEXT

Given the commitments relating to the Convention on Biological Diversity (CBD), the management of ecosystems and the protection of biodiversity have come to the forefront of political concerns. As a result, the international community has declared 2021-2030 the "Decade on Ecosystem Restoration".

The purpose of this initiative is not only to draw the attention of all players to the dangers of the ecosystem degradation and the biodiversity erosion for the future of humanity, but also to have their forces united in a global effort to halt, reduce and reverse the process of degradation and ensure a sustainable future for all.

It is all the more crucial for African countries, whose economy is primarily based on natural capital. In this regard, the Sahara and Sahel Observatory (OSS) has published the "African ecosystems : between degradation and restoration" documentary book that presents the African ecosystems, describes the state of their degradation and gives prospects for their restoration.

This summary targets decision-makers and is a contribution to the international efforts made under this decade. It aims to support this initiative, particularly in African countries.

## I- ECOSYSTEMS AND BIODIVERSITY OF THE AFRICAN COUNTRIES

The African continent is home to 119 terrestrial ecoregions and 93 freshwater or wetland ecoregions (UNEP and AU, 2019). According to UNEP, there are eight major terrestrial biomes in Africa. These biomes are made up of ecosystems stretching from mangroves to deserts and from mediterranean and tropical forests to subtropical

and mountainous grasslands and savannas. These ecosystems have a tremendous ecological, social, economic and cultural importance at national, regional and global levels (Figure 1).



Figure 1 - Map of the main biomes in Africa

These ecologically highly rich regions are home to a remarkable biodiversity, hosting 8 of the 34 centers of living beings and amounting to about a quarter of the planet's biodiversity (UNEP, 2016). West African forests have been recognized as one of the world's major biodiversity hotspots.

The continent is also home to a quarter of the planet's mammal species with the greatest diversity of large mammals in the world, including the elephant, the African buffalo, the black rhino, the white rhino, the warthog, the lion, the leopard, the cheetah, the zebra, the wildebeest, the giraffe, the hippo and the gorilla. Furthermore, it is home to at least one sixth of the world's plant endemic species and several food crops, particularly barley, millet, sorghum, teff, fonio, coffee, roibos, cowpea and palm oil.

Such a wealthy legacy provides important and multiple ecosystem services that help provide the African populations with the means of subsistence necessary for their well-being and economic development. For example, the economic value of mangroves in West Africa, East Africa and Central Africa is respectively evaluated at 4,500, 5,000 and 3,500 \$/km<sup>2</sup>/year. The economic value of the inland surface water and water bodies in West Africa is estimated at 40,000 \$/km<sup>2</sup>/year (IPBES, 2018).

## II- THREATS OF AFRICAN ECOSYSTEMS' DEGRADATION

The areas of some ecosystems and habitats on the African continent have considerably narrowed, such as mangroves, humid and dry forests and seasonal wetlands, which have all hugely decreased over the past twenty years. The declines amount to approximately 1% loss per year and more than 3 million ha of natural habitats in the continent are ruined each year (UNEP-WCMC, 2016). Here is why the abundance of species has been continuously declining in African countries. In 2014, a total of 6,419 animals and 3,148 plants were on the IUCN Red List of Endangered Species. About 21% of freshwater species are listed as threatened (Darwall *and al.*, 2011) and 45% of fish and 58% of freshwater plants are overexploited (IUCN, 2014). Additionally, the IUCN Red List Index for African birds shows a decline over the past 25 years, meaning that these birds are increasingly at risk of extinction (Bird Life International, 2020).

Generally speaking, the combined population of vertebrate species would have declined by approximately 39% since 1970 (WWF, 2014). On the other hand, declines in West and Central Africa are faster than declines in East or Southern Africa (Craigie *and al.*, 2010).

### II.1- DIRECT DRIVERS OF ECOSYSTEM DEGRADATION

Several factors stand behind the direct degradation of ecosystems. Table 1 summarizes these factors

*Table 1 - Direct drivers of ecosystem degradation*

Direct drivers	Examples of direct driver sub-categories
Grazing land and land management	Change in the extent of grazing land, type of livestock, stocking rate, rotation regimes, supplementary feeding, irrigation and water management, grazing land improvement, etc.
Cropland and agroforestry management	Change in the extent of cropland and agroforestry systems, including wetland drainage, crop type, crop rotation and/or sequence, soil management, crop and fallow cycles, farm inputs, irrigation.
Forest management and tree planting	Change in the extent of managed and planted forests, harvesting intensity, rotation regimes, silvicultural techniques, etc.
Extraction of non-timber products	Harvesting firewood, hunting, harvesting edible natural products, fodder, aromatic and medicinal plants and other products, etc.
Changing fire regimes	Change in the occurrence, intensity, season and times of fires, including fire suppression.
Introduction of invasive species	Production and use of GMOs, import of ornamental plants, unintentional introductions, etc.
Development of extractive industries	Mine types, extraction and refining techniques, pollutant releases and spoil disposal, rehabilitation, land development, etc.
Urbanization and industrial development	Land clearing, dams and hydropower stations, roads and railways, development of other infrastructure, irrigation, etc.

## II.2- INDIRECT DRIVERS OF ECOSYSTEM DEGRADATION

There are multiple indirect factors of ecosystem degradation. Table 2 summarizes these factors.

*Table 2 - Indirect drivers of ecosystem degradation*

Indirect drivers	Examples of indirect driver sub-categories
Demographic	Population growth rate, population migration and mobility (to urban centres), density, age pyramid.
Economic	Demand and consumption, poverty, marketing and trade, urbanization, industrialization, labor markets, prices and finance.
Science, knowledge and technology	Education, indigenous and local knowledge, taboos, investment in research/development, access to technology, innovation, communication and awareness-raising.
Institutions and governance	Public policies (regulatory and incentives), property rights, customary law, certification, international agreements and conventions (trade, environment, etc.), skills of formal and informal institutions (social capital).
Cultural	Worldviews, values, religion, consumer behavior, diet, worship.

## II.3- CLIMATE CHANGE: AMPLIFIER OF ECOSYSTEM DEGRADATION

The greatest threat of climate change is its ability to act as an amplifier, exacerbating the effects of other drivers of ecosystem degradation and modifying the occurrence, intensity and extent of extreme events as well as the appearance of epidemics, the development of pests and pathogens and the growth of invasive species.

Digital modeling and field observation data prove that climate change is seriously affecting the African biodiversity. We can see the change in the distribution of certain species as the climate changes (Foden *et al.*, 2007). It exacerbates land degradation, especially in low-lying coastal areas, river deltas and arid areas. Moreover, the available data show that during the 1961-2013 period, the average area of drought-struck drylands registered a 1% increase per year, with high interannual variability. In 2015, about 500 million people lived in areas that were affected by desertification during the 1980-2000 period. Besides South and East Asia, most of these populations are found in Africa, especially in the circum-Saharan region and in North Africa (IPCC, 2021).



*Panorama View of the Kota Falls, Natitingou, Benin*

### III- RECOMMENDATIONS FOR THE RESTORATION AND SUSTAINABLE MANAGEMENT OF AFRICAN ECOSYSTEMS

Today, the restoration of African ecosystems is proving to be an absolute necessity, even if it is technically difficult to achieve and financially expensive. The conservation of the invaluable natural assets, meeting the biodiversity commitments, through adaptive, multi-stakeholder and multi-level governance, and the integration of indigenous and local knowledge will help the African countries make progress in achieving their development aspirations.

Here follow the OSS recommendations making it possible to reconcile economic and population growth with the protection, conservation and enhancement of biodiversity and ecosystem services to improve the ecosystems' climate change resilience:

#### III.1- APPROACHES AND CONCEPTS

**Restoring according to the ecosystem approach:** this approach offers a top strategy for the integrated management of soil, water and living resources that fosters their equitable conservation and sustainable use. It recognizes that human populations are a full component of many ecosystems and requires adaptive management to deal with the dynamic and complex nature of ecosystems, in the absence of full knowledge or understanding of their mode of operation.

#### Forest restoration in Tanzania

The East Usambara landscape is located in northeastern Tanzania and represents one of the largest forest blocks in the area. About 135,000 people live in the landscape and directly depend on the ecosystem goods and services provided by the forest. These forests have become increasingly fragmented due to land clearing, fires and illegal logging.

In order to halt the loss of biodiversity, to improve the livelihoods of the local population and to restore and maintain the multiple services of the forests, a forest landscape restoration project was implemented between 2004 and 2014.

The project focused on the creation of forest reserves, in partnership with the local communities. It took place on village lands to improve connectivity between existing protected areas. A number of alternative income-generating activities have been developed with the communities.

The project made it possible to reduce deforestation by 88% and communities have become more actively involved in saving the forests that became less fragmented. A forest corridor has been established between two main forest reserves and forest fires decreased by 97% in the forest reserves on village lands. The households had better incomes thanks to the alternative income-generating activities.

This program shows that conservation advantages can be combined with social and economic benefits and that restoring forests can bring immediate benefits to people and longer term benefits to the ecosystem (Mansourian *et al.*, 2019).

**Managing ecosystems according to a more inclusive and sustainable approach:** it is an integrated approach, which takes into account socio-cultural, political, economic and environmental factors. It must be designed within the multifunctional and global framework, involving stakeholders and users in all phases of preparation, planning and development, and implementation of action programs.

### Combatting silting in Mauritania

The Nouakchott region in Mauritania has been particularly affected by desertification that led to reduced arable and grazing land and forests as well as weaker water supply and brought a major threat to infrastructure.

Programs and projects, taking into account all the technical, socio-economic, legal and institutional factors have been implemented at the national level with the support of development partners. In 1999, Mauritania launched a rehabilitation and tree plantation expansion program near Nouakchott. The dunes were mechanically stabilized and then permanently fixed thanks to the plantation of perennial herbaceous and ligneous vegetation with the first rains. This preliminary rehabilitation work made it easier to restore the ecosystem at a later stage.

The participatory approach brought together the administrative and municipal authorities, the technical services as well as the managers of the cooperatives and NGOs and the communities directly affected by the silting in the targeted areas. Local communities and national authorities have played an important role in planning and implementing the activities and in choosing the appropriate local plant species.

A total of 400,000 seedlings were produced in nurseries and used to fix 857 ha of fragile land between 2000 and 2007. Significant natural regeneration by herbaceous species was achieved in and around the treated areas. This helped preserve human infrastructure and protect the farms and grazing land from silting.

*Silting protection installations with native woods, Mauritania*



**Changing the development paradigm through the WEFE nexus approach (Water/Energy/Food/Ecosystem):** this approach is based on the understanding of synergies and the regulated negotiation of equitable trade-offs between competing uses of water, land and energy resources and offers additional benefits in terms of gender equity, community development, youth employment and entrepreneurship while respecting the environment.

### The Great Green Wall Initiative for the Sahara and the Sahel

The Great Green Wall Initiative for the Sahara and the Sahel (GGWISS) is a framework of cooperation to face the main environmental challenges, particularly desertification, climate change and land degradation that are real threats to socio-economic development, social harmony, stability and security of the Sahel-Saharan States.

The GGWISS vision is to catalyze the transformation of the Sahel-Saharan areas through the creation of Rural Poles of Production and Sustainable Development in 2025. It is a multisector, holistic and ecosystemic approach, combining activities of sustainable land management, restoration of production foundations and local economic development, with a view to transforming the Sahel-Saharan areas into viable economic poles.

**Paying particular attention to local knowledge and know-how:** it is a strategy that promotes the empowerment and capacities of the populations and provides them with the necessary means to develop and implement projects for the restoration and development of ecosystems and the preservation of biodiversity.



**Taking into account financial and ecological constraints** so as not to engage in businesses that are doomed to failure. State or private investment is very often times necessary. In addition, restoration is sometimes difficult to achieve in unfriendly environments due to ecological constraints such as aridity, excessive stocking pressure or conflicts over property rights.

**Reducing pressure on natural resources:** Exploring and promoting options for alternative tourism less vulnerable to climate variability, such as cultural tourism. Countries with developed coastal tourism should develop alternative tourist destinations to inland areas.

### Restoration of the degraded forest of Bandia in Senegal

Used in rangeland and for the production of firewood and charcoal, the Bandia forest, located in the Sahel-Sudanian zone, was in a very degraded state at the end of the 1970s with weak natural regeneration in the areas used. This forest had to contend with agricultural activities, illegal firewood collection, overgrazing and quarrying.

In the early 1980s, 500 ha of the Bandia forest was awarded to a private investor, who fenced off the area to have it protected. Three to four years later, the fenced site experienced rapid regeneration, which encouraged the investor to join new partners and start an ecotourism experience. A restoration protocol was established and included the defense and protection of 3,000 ha of forest as well as the introduction of animals.

It took less than five years from the start of this Assisted Natural Regeneration (ANR) to see the very sparse tree and shrub vegetation turn into densely wooded savannah and achieve an exceptional development of trees and shrubs in the area. The wild species reproduced well and their populations increased considerably to the point that the company had to import fodder and water from outside the area during the dry season.

The Bandia Reserve has become an important tourism destination, welcoming more than 45,000 visitors a year from all over the world. Some of the animals have been transferred from the Reserve to the Saloum Delta National Park to start another ecotourism initiative.

**Expanding protected areas:** Terrestrial protected areas are one of the most successful measures for the conservation and passive restoration of ecosystems. They improve the representativeness and effectiveness of biodiversity management. There are about 7,000 terrestrial protected areas covering a 4,245 km<sup>2</sup> surface or 14.18% of the land surface of Africa.

### Conservation of the Madagascar rosewood: *Dalbergia normandii*

A rare species conservation project has been set up in 2017 with a view to reducing the threats over 21 economically important but threatened species at 18 sites in Madagascar and helping reverse this trend.

This project specifically targets the conservation of rosewood, a tree species most trafficked in the world in terms of value and volume (UNEP, 2020). *Dalbergia normandii*, a rare tree found in low to mid-altitude rainforests in Madagascar that is severely depleted and on the verge of extinction in many parts of the island, is one of the species targeted by this project.

This project made it possible to strengthen the spontaneous regeneration of all targeted species within the framework of ecological restoration. Thousands of *Dalbergia normandii* seedlings have been produced using the air layering technique which was developed in 2019 by a Malagasy farmer. This strategy helps the roots grow from the plant branches which can then be transplanted with a 100% success rate (WWF, 2021b).

### III.2- DEVELOPMENT POLICIES

**Strengthening joint transboundary measures relating to the sustainable management of shared natural resources:** such measures are particularly important for the conservation of migrant species as well as for the collaborative governance of shared river basins and whose effective conservation and sustainable use are crucial for the African countries. With more than 60 watersheds of trans-boundary rivers, the African countries will have to take into account the “conflict risk” in sharing these waters between the countries and the users.

**Working for the poverty reduction and the promotion of diversified livelihood:** the measures recommended for the conservation of ecosystems and the restoration of degraded ones are particularly the intensification, diversification and increase in non-agricultural sources of family income, payment for ecosystem services and the search for alternative tourism, such as cultural tourism.

**Advocating for action by investing in ecosystem management and resilience capacities:** results from restoration efforts in several African ecosystems have revealed the value and relevance of action rather than inaction that could have huge impact on the current society and especially on future generations. The many success stories show that it is possible to stabilize ecosystem functions, diversify livelihoods and reduce gender disparities. Every African country and the international community are thus required to take action and mobilize the necessary funds to advocate for action.

**Establishing consistent legal, institutional and policy frameworks between the different sectors and stakeholders:** the establishment of socio-economic incentives for the measures to be applied and for the public and stakeholders to be involved. Besides, the institutions in charge of monitoring the management of natural resources shall have enough authority and the necessary means for the accomplishment of this mission.



*Group of women in traditional dress in the Awoja catchment area, Uganda*

### III.3- REGIONAL ECONOMIC COMMUNITIES AND AFRICAN ORGANIZATIONS

**Regional economic communities and African organizations:** they are called upon to play a key role in adopting sound and environmentally friendly development space layout plans. They should also support the development of adequate investment protocols and guarantees and work for better consistency between national resource management policies and applicable regulations.

**Trans-boundary businesses:** they need to build their capacities to foster cooperation between governments, businesses and civil society actors. They must also strengthen their management capacities, in order to better define realistic investment plans.

**African and international financial institutions:** they are called upon to develop new tools for assessing ecological risks and to support them with new investment mechanisms. Economic incentives should not prevail over ecosystem conservation and restoration. They must, first, take into account the priorities of the 2030 Agenda, namely : poverty reduction and job creation.

**Development agencies:** they must build the capacity of African countries to find self-sustaining solutions to their problems. These agencies can also provide stronger support for the development of innovative local partnerships and ecological management approaches.

**Non-governmental organizations:** they should advocate for the benefits of protecting and managing African ecosystems through the provision of targeted information and by mobilizing key decision-makers to make sure that environmental and ecological sensitivity issues are taken into account in the planning processes.

**Local communities:** their involvement in governance systems needs to be strengthened to limit illegal hunting and trade of iconic wildlife, through awareness-raising activities, the integration of biodiversity values into government policies, appropriate incentives and other measures that would encourage stakeholders to give the right place to biodiversity and ecosystem services conservation and sustainable use.

**Coordinate the efforts of the countries:** to come as one and address strategic issues, such as the trading operating rules for setting commodity and carbon prices. The role of Africa in the supply of raw materials is indeed very important and its strategic importance is likely to increase.



*Tree nursery, in the Kelim Taboki sub-watershed (Awoja watershed), Uganda*

### III.4- SCIENTIFIC RESEARCH AND ICT

**Capitalizing on the achievements, filling the information gap** and strengthening access to information is very important for it makes it possible to accurately assess the state and trends, threats and needs in terms of conservation of the biodiversity in Africa. National data providers play a crucial role in strengthening the science-policy interface, regularly monitoring and reporting on biodiversity indicators in support of decision-making processes.

**Promoting research, development and transfer of technological innovations** as a means of decision support and efficient application of ecosystem restoration techniques. Research and higher education institutions are called upon to support development organizations by carrying out analyzes and studies and developing methods and instruments to support better-informed decision-making in ecosystem restoration and management.

**Developing methodologies and analytical tools** to better understand and evaluate the benefits that people derive from ecosystems, such as the short, medium and long-term costs associated with biodiversity loss and degradation, as well as the costs and benefits associated with avoiding, mitigating and reversing land degradations.

**Providing knowledge, tools and skills** on land condition monitoring to managers and planners.

**Identifying the most effective policy instruments and institutional and governance systems** to avoid, reduce and reverse ecosystem degradation taking into consideration local environmental, social, cultural and economic conditions.

**Developing and increasing awareness of nature's contribution to people** through awareness-raising, knowledge sharing and valuing and understanding of the importance of ecosystem goods and services for inclusive sustainable development.

## CONCLUSION

Measures to avoid or mitigate the degradation of ecosystems and biodiversity can be effective and more cost-effective than reversing and restoration actions.

However, if prevention fails, it is necessary to adopt restoration and pressure reduction measures on degraded ecosystems. The relevance of such measures varies depending on the state of degradation and the types of threats.

Restoration requires consideration of several factors as well as site-specific institutional capacities. It is worth noting that there is no global decision support tool that applies to all situations.



*Burned Aleppo pine forest in Jendouda,  
Tunisie*



OSS, May 2023



**SAHARA  
AND SAHEL  
OBSERVATORY**

Boulevard du Leader Yasser Arafat  
P.O. Box 31, 1080 Tunis Carthage, Tunisia  
Phone: (+216) 71 206 633/634  
Fax: (+216) 71 206 636  
Email: [boc@oss.org.tn](mailto:boc@oss.org.tn)

 @OSS\_Comms  
 @osscommunity  
 @company/osscommunity  
[www.oss-online.org](http://www.oss-online.org)

