



Food and Agriculture
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Soil is a non-renewable resource

Its preservation is essential for food security and our sustainable future



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Soil is a finite resource, meaning its loss and degradation is not recoverable within a human lifespan. As a core component of land resources, agricultural development and ecological sustainability, it is the basis for food, feed, fuel and fibre production and for many critical ecosystem services. It is therefore a highly valuable natural resource, yet it is often overlooked. The natural area of productive soils is limited – it is under increasing pressure of intensification and competing uses for cropping, forestry, pasture / rangeland and urbanization, and to satisfy demands of the growing population for food and energy production and raw materials extraction. Soils need to be recognized and valued for their productive capacities as well as their contribution to food security and the maintenance of key ecosystem services.

KEY CHALLENGES

Soil degradation is caused by unsustainable land uses and management practices, and climate extremes that result from various social, economic and governance drivers. Today, 33 percent of land is moderately to highly degraded due to the erosion, salinization, compaction, acidification and chemical pollution of soils. The current rate of soil degradation threatens the capacity of future generations to meet their most basic needs. Current demographic trends and projected growth in global population (to exceed 9 billion by 2050) are estimated to result in a 60 percent increase in demand for food, feed and fibre by 2050. There is little opportunity for expansion in the agricultural area, except in some parts of Africa and South America. Much of the additional available land is not suitable for agriculture, and the ecological, social and economic costs of bringing it into production will be very high. Sustainable management of the world's agricultural soils and sustainable production have therefore become imperative for reversing the trend of soil degradation and ensuring current and future global food security.

HOW CAN WE SAVE OUR SOILS?

The sustainable use and management of soils is linked to many different areas of sustainable development – poverty reduction, hunger eradication, economic growth and environmental protection. Promoting the sustainable management of soils can contribute to healthy soils and thus to the effort of eradicating hunger and food insecurity and to stable ecosystems. There is an urgent need to stop land degradation in its various forms and establish frameworks for sustainable soil management systems.

The Intergovernmental Technical Panel on Soils of the Global Soil Partnership recommends the following actions:

- Provide suitable technologies, sustainable and inclusive policies, effective extension programmes and sound education systems so that more is produced with less;
- Include soil protection and reclamation and sustainable land management projects in the current emerging markets that provide an economic value to those actions that produce ecosystem services;
- Recognize the increasing need to preserve soils and have governments make corresponding investments;
- Promote management practices for climate change adaptation and mitigation, and resilience to changing weather patterns and extremes;
- Promote strong regulations and effective control by governments in order to limit the accumulation of contaminants beyond established thresholds for human health and eventually to remediate contaminated soils;
- Increase the area under sustainable soil management practices, enhance the restoration of degraded soils, and promote “sustainable production intensification” through adapted biological resources, increasing soil fertility, water use efficiency, ensuring sustainable use of inputs and recycling of agricultural by-products;
- Support the development of national soil information systems to assist decision-making on sustainable land and natural resources uses;
- Increase investment in sustainable soil management by overcoming obstacles including tenure security and user rights, access to knowledge and financial services; Strengthen the implementation of capacity development and education programmes on sustainable soil management.

KEY TERMS



Land management concerns all operations, practices and treatments used to protect the land and enhance the goods and services provided by the ecosystem the land is part of.



Soil management is an integral part of land management and may focus on differences in soil types and soil characteristics to define specific interventions that are aimed to enhance the soil quality for the land use selected.



Soil degradation is defined as a change in the soil health status resulting in a diminished capacity of the ecosystem to provide goods and services for its beneficiaries



Soil governance and policy concerns policies and strategies and the processes of decision-making by nation states and local governments on how the soil is utilised. Globally, governance of the soil has been focused on agriculture due to increased food insecurity in the most populated regions on earth.



Ecosystem services are defined as the benefits provided by ecosystems to humans. They can play many roles, including: Supporting (e.g. soil formation, nutrient cycling, primary production); Provisioning (e.g. food, fresh water, fuelwood, fiber, biochemicals, genetic resources); Regulating (e.g. climate regulation, disease regulation, water regulation, water purification, pollination); Cultural (e.g. spiritual and religious, recreation and ecotourism, aesthetic, inspirational, educational, sense of place, cultural heritage).



Soil health has been defined as “the continued capacity of the soil to function as a vital living system, within ecosystem and land-use boundaries, to sustain biological productivity, promote the quality of air and water environments, and maintain plant, animal, and human health”



Transboundary Agro-ecosystem Management Programme for the Kagera River Basin

The *Kagera Transboundary Agro-ecosystem Management Programme* (Kagera TAMP) is a regional project comprising four East African countries that share the Kagera river basin: Burundi, Rwanda, Tanzania and Uganda. The agro-ecosystems in the region are facing increasing pressures as a result of climate change, rapid population growth, and agricultural and livestock intensification—the basin's land and freshwater resource bases are threatened by land degradation, declining productive capacity, deforestation and encroachment of agriculture into wetlands. This in turn negatively impacts the associated biodiversity and populations whose livelihoods and food security depend on those resources. The Kagera TAMP project aims to adopt an integrated ecosystems approach for the management of land resources in the Kagera Basin in order to generate local, national and global benefits, particularly increased food security and improved rural livelihoods. Restoration of degraded lands, carbon sequestration, climate change adaptation and mitigation, protection of international waters, agro-biodiversity conservation and sustainable, improved agricultural production are all top priorities for the programme. The approaches and methods being introduced include farmer field schools, community active planning, transboundary management, catchment/watershed management, sustainable land management innovation and adaptation, tools for land resources assessment and payments for ecosystems services.

The Great Green Wall Initiative

It is estimated that 83 per cent of rural people in Sub-Saharan Africa depend on the land for their livelihoods, but 40 per cent of Africa's land resources are currently degraded. Poverty, hunger, unemployment, forced migration, conflict and security issues are just some of the many threats arising from this situation. Endorsed in 2007 by African Heads of State and Government, *the Great Green Wall for the Sahara and the Sahel Initiative* (GGWSSI) aims to tackle the detrimental impact of land degradation and desertification in the Sahelo-Saharan region by supporting local communities in the sustainable management and use of forests, rangelands and other natural resources in drylands. Action plans are in place in Burkina Faso, Chad, Djibouti, Eritrea, Ethiopia, the Gambia, Mali, Niger, Nigeria and Senegal, while those of Algeria, Egypt, Mauritania and Sudan are in the making. In Senegal, the planting of 11 million trees contributed to the restoration of 27 000 hectares of degraded land, while multi-purpose gardens enabled women to increase their income and produce food for their families at the same time. Dune fixation is being successfully rolled out in Mauritania. Mali, Burkina Faso and Niger work together with Royal Botanic Gardens of Kew on the production of the most suitable trees, shrubs and herbs to turn degraded land into productive areas.



FAO IN ACTION



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Action Against Desertification programme

The *Action Against Desertification* programme is a €41 million, 4.5-year programme to bolster sustainable land management and restore drylands and degraded lands in Africa, the Caribbean and the Pacific.

The programme is crucial in fighting hunger and poverty, fostering stability and building resilience to climate change in some of the world's most vulnerable areas, the programme sponsors say. In Africa, the programme will build on the GGWSSI, supporting agro-forestry and promoting income-generation activities. Both the Caribbean and the Pacific face similar challenges as Africa: unsustainable land management practices have caused soil loss, degraded natural habitats, contributed to the loss of biodiversity and reduced natural buffers to droughts and floods. Action Against Desertification will concentrate on Haiti in the Caribbean and Fiji in the Pacific, and be an example of increasing South-South cooperation by building on lessons learned from Africa's Great Green Wall Initiative to help local communities adopt improved sustainable land- and forest-management practices, while enhancing capacities of governmental and non-governmental organizations to support these efforts.

KEY FACTS

- By 2050, agricultural production must increase by 60 percent globally – and by almost 100 percent in developing countries – in order to meet food demand alone.
- 33 percent of soil is moderately to highly degraded due to erosion, nutrient depletion, acidification, salinization, compaction and chemical pollution.
- A shortage of any one of the 15 nutrients required for plant growth can limit crop yield.
- In most developing countries, there is little room for expansion of arable land: virtually no spare land is available in South Asia and the Near East/North Africa.
- Where land is available, in sub-Saharan Africa and Latin America, more than 70 percent suffers from soil and terrain constraints.
- More efficient use of water, reduced use of pesticides and improvements in soil health can lead to average crop yield increases of 79 percent.



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