

The background image is a photograph of a dry, eroded landscape. In the foreground, there is a small, shallow streambed filled with brown, silty water. The banks are composed of light-colored, sandy soil that has been eroded into small gullies and rills. Some dry, dark sticks and twigs are scattered across the streambed and banks. In the middle ground, there are some sparse, green shrubs and small trees. The background shows rolling hills under a clear blue sky. The overall scene suggests a dry, arid environment where soil erosion is a significant concern.

PLURIFOR PROJECT

SOIL DEGRADATION RISK WORKSHOP

**Practical guidance for development plans to manage
soil degradation risk in forestry**

Soil has a great importance regarding forest (and other systems) productivity, and other ecosystem services.

Type of **ecosystems services** and the **soil functions**

Supporting services – primary production, nutrient cycling and soil formation

Provisioning services – supply of food, fibre, fuel, timber and water; raw earth material; surface stability; habitat and genetic resources;

Regulating services – water supply and quality, carbon sequestration, climate regulation, control of floods and erosion;

Cultural services – aesthetic and cultural benefits derived from soil use

FOREST RY MANAGEMENT, SOIL QUALITY AND ECOSYSTEM SERVICES

FORESTRY MANAGEMENT



MODIFICATIONS IN SOIL PROPERTIES



MODIFICATIONS IN SOIL FUNCTIONAL PROCESSES

(disponibilidade de água e nutrientes, arejamento, crescimento radicular, ciclo e armazenamento de carbono)



FUNCTIONAL RESPONSE OF ECOSYSTEMS

(regeneração, composição de espécies e fixação de N, habitat e fauna, qualidade da água, produtividade, armazenamento de C, produção de madeira)



ECOSYSTEM SERVICES

(Ex. Industria florestal, biodiversidade, recreio, água)

Soil functions are threatened by soil degradation: erosion (the most serious example of soil degradation), organic matter losses, soil sealing, nutrient loss, biodiversity loss, acidification, soil structure breakdown, soil compaction, landslides.

Once damaged, soil ability to recover from disturbances is low and in many cases impossible.

It is crucial to promote the concept of **sustainable soil management** and provide guidance to all stakeholders on how to translate it into practice.

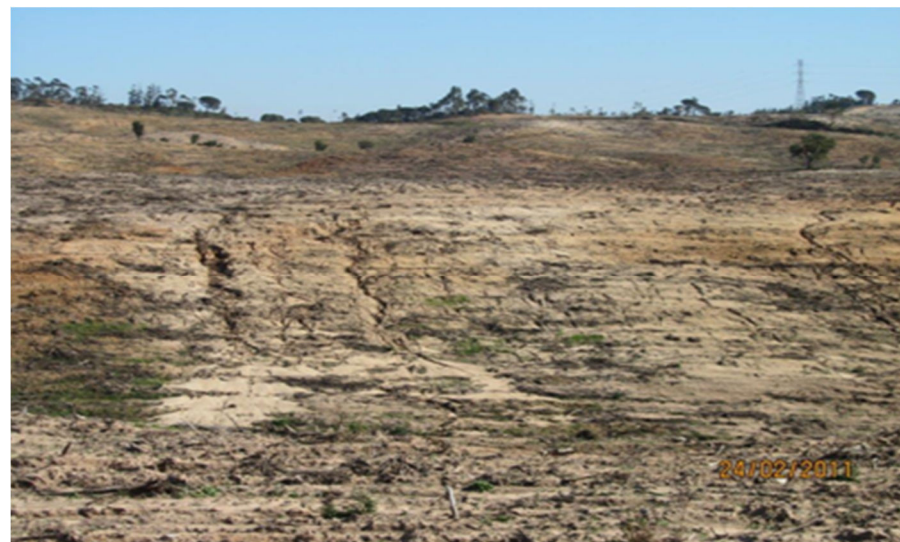
SOIL SUSTAINABLE MANAGEMENT: soil management is sustainable if the supporting, provisioning, regulating and cultural services provided by soil are maintained or enhanced without significantly impairing either soil functions that enable those services or biodiversity. The balance between the supporting and provisioning services for plant production and the regulating services the soil provides for water quality and availability and for atmospheric green house gas composition is a particular concern (*World Soil Charter*)

Forests have a high protective capacity against soil degradation (erosion, soil organic matter loss, compaction, biodiversity loss...). Soils of forest ecosystems under continuous cover management show low and infrequent levels of disturbance, providing multiple ecosystems services, growing medium for trees, carbon storage, climate change adaptation and mitigation, recreation.

However, soil degradation can be a serious problem in forest land, especially in conditions of unregulated exploitation and in intensively managed forests..

Increasing population growth and demand for wood and fibres, increasing concurrence in global markets exacerbates the pressure on forest ecosystems. This usually leads to forest management intensification and forest management activities which threat soil functions, that is, soil quality [e. g. nutrient depletion, especially when whole tree harvesting or stump are practiced; intensive soil cultivation, machine traffic on vulnerable soils may result in accelerated erosion, increased loss of sediments to water courses, reduction of carbon stocks and increased soil compaction]

AS DIFERENTES ACTIVIDADES DE GESTÃO DOS SISTEMAS FLORESTAIS PODEM IMPLICAR A DEGRADAÇÃO DO SOLO PELA EROSÃO HÍDRICA





The wise management of soil in forest land is crucial for the maintenance of soil functions and ecosystem services. The sustainable soil management is an integral part of sound forest management.

Sustainable soil management implies:

Minimal rates of soil erosion, stable soil structure, sufficient surface cover, store of organic carbon is stable or increasing, appropriate availability and flows of nutrients, water is efficiently on filtrated and stored, a full range of biological functions (soil biodiversity), soil management systems rely on optimized and safe use of inputs.

Sustainable soil management shall contribute to addressing global challenges, and meeting international commitments

- **2030 agenda for sustainable development**
[land-degradation neutral world]
- **Climate change adaptation and mitigation**
- **Commitment to combat desertification and mitigate effects of drought**