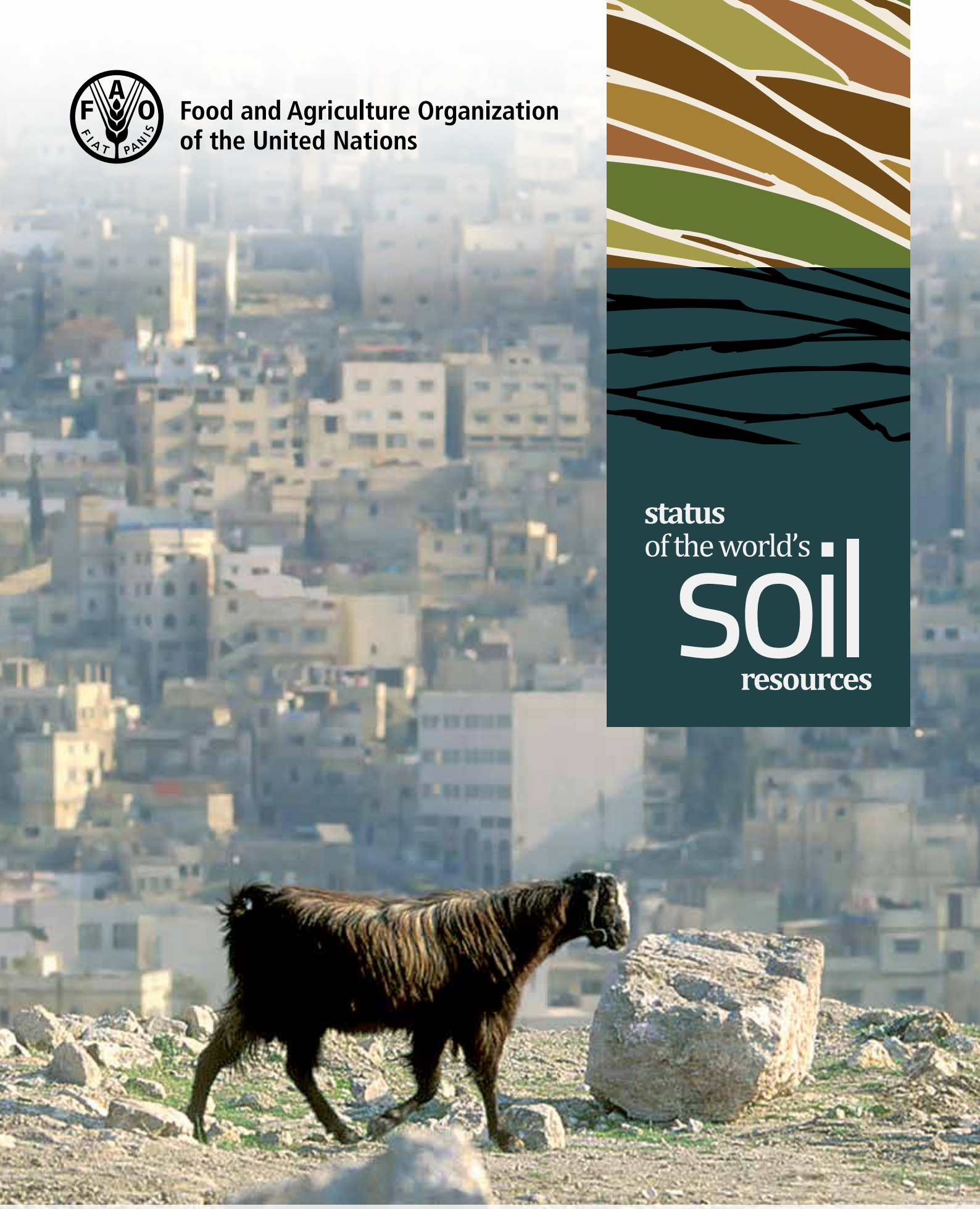
Food and Agriculture Organization
of the United Nations

status of the world's soil resources



GLOBAL SOIL PARTNERSHIP

itps
INTERGOVERNMENTAL TECHNICAL PANEL ON SOILS

2015
International Year of Soils

status of the world's soil resources

The overwhelming conclusion of the first-ever comprehensive report on the world's soil resources, prepared by the Intergovernmental Technical Panel on Soils (ITPS), is that **the majority of the world's soil resources are in only fair, poor or very poor condition...** and that conditions are getting worse in far more cases than they are improving.

Further loss of productive soils will severely damage food production and food security, amplify food-price volatility, and potentially plunge millions of people into hunger and poverty. But the report also offers evidence that this loss of soil resources and functions can be avoided.

Careful soil management, using proven methods and technologies, can increase the food supply and provide a valuable lever for climate regulation and safeguarding ecosystem services.

life **depends** on soils

Soils are the foundation of food production and food security. And soils also provide other ecosystem services that are vital for the functioning and resilience of Earth's environment.

They store vast quantities of carbon, helping regulate CO2 emissions and climate processes. **They function as Earth's largest water filter and storage tank, controlling the quantity and quality of freshwater resources.** They cycle and store nitrogen, phosphorus and other essential nutrients. And they host a quarter of the planet's biodiversity.

soils are

Over 35 percent of the planet's ice-free surface has been cleared of natural vegetation to grow crops or graze livestock, exposing it to sharp increases in erosion and steep losses in soil organic carbon, soil nutrients, and biodiversity.

endangered

Rapid growth of cities, industries, and industrialized agriculture has accelerated losses of soil organic carbon and biodiversity; contaminated soils with excess salt, acidity, and heavy metals; and sealed them permanently under asphalt and concrete.

the state of the world's soils **is** not good

Most of the world's soils are only in fair, poor, or very poor condition. And their condition is getting worse in far more cases than it is improving.

Erosion carries away 25 to 40 billion tonnes of topsoil every year, significantly reducing crop yields and the soil's ability to store and cycle carbon, nutrients, and water. If action is not taken to reduce erosion, total crop yield losses projected by the year 2050 would be equivalent to removing 1.5 million km2 of land from crop production – or roughly all the arable land in India.

the solution exists sustainable soil management

Proven technologies exist that can curtail and even reverse degradation of the Earth's vital soil resources.

Erosion can be brought down to sustainable levels, for example, by reducing or eliminating tillage and using crop residues and cover crops to protect the soil surface.

The challenge for policy makers is to develop and implement policies that will foster adoption of sustainable land use and soil management practices.

life
depends on soils

Soils are the foundation of food production and food security, supplying plants with nutrients, water, and support for their roots.

In addition to their role in food production, soils provide other ecosystem services that are vital for the stability and resilience of Earth's environment.

Soils function as Earth's largest water filter and storage tank, filtering and cleaning tens of thousands of cubic kilometres of water that pass through them each year.

Soils store more carbon than is contained in all aboveground vegetation and regulate emissions of carbon dioxide and other greenhouse gases.

Soils cycle and store nutrients such as nitrogen and phosphorus that plants need to grow and that are the molecular building blocks for all forms of life.

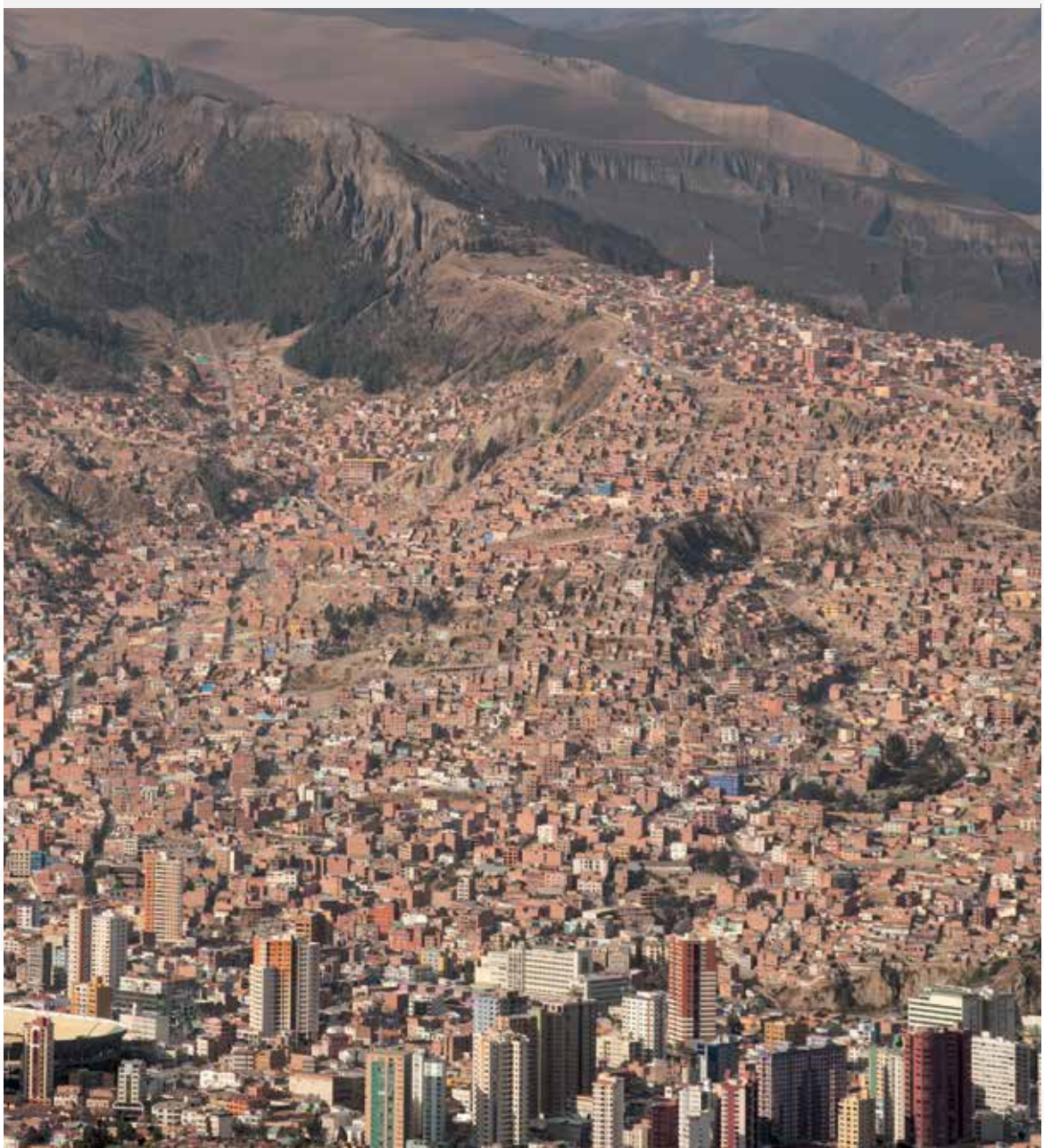
Soils host a tremendous diversity of organisms that play key roles in soil formation, nutrient cycling, regulation of carbon and water, and other vital ecosystem processes.

But human pressures on soil resources are reaching critical limits. Further degradation and loss of soil resources will threaten plant production and food security, imperil the availability and quality of water resources, diminish the biodiversity that is essential for environmental processes and resilience, and accelerate climate change.

soils **are** endangered

The primary drivers of soil change and the biggest threats to healthy and productive soils are the rapid and continuing growth of human population and economies.

In order to feed a population that grew from 600 million in the year 1700 to 1.6 billion in 1900 and 7.3 billion today, over 35 percent of the Earth's ice-free land area has been converted to agriculture. Soils that have been cleared of natural vegetation to grow crops or graze livestock suffer from sharp increases in erosion and steep losses in soil organic carbon, soil nutrients, and biodiversity. Rapid growth of cities, industries, and industrialized agriculture has degraded increasingly wide areas by accelerating losses of soil organic carbon and biodiversity; contaminating soils with excess salt, acidity, and heavy metals; compacting them under heavy machinery; and sealing them permanently under asphalt and concrete.



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Erosion carries away 25 to 40 billion tonnes of topsoil every year, significantly reducing crop yields and the soil's ability to store and cycle carbon, nutrients, and water.

Annual crop losses due to erosion have been estimated at 0.3 percent of crop yields. If action is not taken to reduce erosion, a total reduction of over 10 percent could be projected by 2050. This yield loss would be equivalent to removing 1.5 million km2 of land from crop production – or roughly all the arable land in India.

Lack of soil nutrients is the greatest obstacle to improving food production and soil function in many degraded landscapes. In Africa, all but three countries extract more nutrients from the soil each year than are returned through use of fertilizer, crop residues, manure, and other organic matter.

Accumulation of salts in the soil reduces crop yields and can completely eliminate crop production. Human-induced salinity affects an estimated 760,000 km2 of land worldwide – an area larger than all the arable land in Brazil.

Soil acidity is a serious constraint to food production worldwide. The most acidic topsoils in the world are located in areas of South America that have experienced deforestation and intensive agriculture.

Regional assessments of 10 leading threats to soil functions and productivity report twice as many threats for which conditions are poor (32) than they do cases where conditions are good (16) – and only eight where the trend is improving, versus 29 where it is getting worse.

the solution exists

sustainable

soil management

Proven technologies exist that can curtail and even reverse degradation of the Earth's vital soil resources.

Erosion can be brought down to sustainable levels by reducing or eliminating tillage and using crop residues and cover crops to protect the soil surface.

Similarly, soils suffering from nutrient deficits can be restored and yields increased by returning crop residues and other organic matter to the soil, employing crop rotations with nitrogen-fixing crops, and making judicious use of organic and mineral fertilizers.

The challenge for policy makers is to develop and implement policies that will foster adoption of sustainable land use and soil management practices. This includes policies that will:

• support development of soil information systems;
• integrate knowledge of soil and land resources into formal education;
• strengthen research, development, and extension programs; and
• employ a combination of regulations and incentives to improve land use management.

The current trajectories in soil condition have potentially catastrophic consequences. But the ITPS believes that countries can change these trajectories and has identified four priorities for action:

1 Minimize further degradation of soils and restore the productivity of soils that are already degraded in regions where people are most vulnerable

2 Stabilize global stores of soil organic matter, including both soil organic carbon and soil organisms

3 Stabilize or reduce global use of nitrogen and phosphorus fertilizer, while increasing fertilizer use in regions of nutrient deficiency

4 Improve our knowledge about the state and trend of soil conditions

If effective policies are implemented in these areas, by the time the second report on the Status of the World's Soil Resources is published in 2020, substantial progress will have been made to protect and restore soil resources, the ecosystem services they provide, and the life they sustain.

the
TIME
for
ACTION
is now

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