



Food and Agriculture
Organization of the
United Nations

Global Soil Partnership

2012-2022



Sustainable
soil management
in action



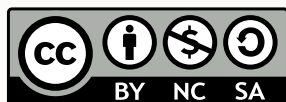
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Restoring a healthy balance to the soils we need to survive and thrive

Soil is fundamental to life on Earth.

Healthy soil is a dynamic living ecosystem: a composition of minerals and organic matter containing air, water, and organisms. Ninety-five percent of the food we eat is grown from soil and it is fast becoming spoilt by unsustainable human activity. Thirty-three percent of all soils around the world are degraded and it is our collective responsibility to safeguard their vital resources.

Over the past decade, the Global Soil Partnership (GSP) has become an internationally recognized mechanism composed of 194 FAO Members and over 500 partners committed to sustainable soil management. Our mandate is to improve and maintain the health of at least 50 percent of the world's soils by 2030 and beyond.

Our mission is to improve soil governance to guarantee healthy and productive soils. We do so by making sure soils can provide the right set of essential ecosystem services and functions needed for food security, climate change mitigation and biodiversity conservation.



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A look at the facts

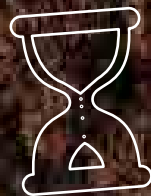
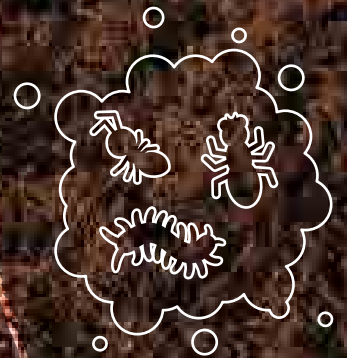
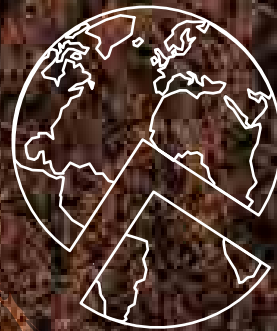
Soils are one of the main global reservoirs of biodiversity, harbouring **25%** of the world's species.

Over **one-third** of soils around the world are degraded.

It can take up to **1 000 years** to produce just a few centimetres of topsoil.

A spoon of soil contains **millions** of organisms.

95% of our food is directly or indirectly produced on our soils.



The world's cultivated soils have lost between **25 to 75%** of their original carbon stocks, which is released into the atmosphere in the form of carbon dioxide (CO₂).

The equivalent of one soccer pitch of soil is eroded every **five seconds**.

If we do not deliver change now, degradation is on course to hit a high of **90%** of all soils by 2050.

The costs of managing soil pollution range from **thousands to billions** of USDs each year.

Sustainable soil management can lead to an average crop yield increase of **58%**.



The scientific base

The Intergovernmental Technical Panel on Soils (ITPS) - which serves the GSP and countries - is made up of 27 soil experts representing regions worldwide.

It acts as an advisory body to the GSP, providing scientific advice and technical know-how on global soil issues. Since its' outset in 2013, the ITPS has been instrumental in advocating for the inclusion of sustainable soil management onto global agendas to meet the objectives of the UN's

Sustainable Development Goals (SDGs) and the three Rio Conventions on biodiversity, climate change and desertification.

Every year, the GSP holds a Plenary Assembly that gathers FAO Members, GSP partners as well as representatives from the GSP's seven regional soil partnerships located on every continent.

The Assembly is the Partnership's main decision-making body crafting annual plans of action and setting priorities for the global soil agenda.

INTERGOVERNMENTAL TECHNICAL PANEL ON SOILS



Soil has not been officially... been widely used for... the performance... physical/chemical... of healthy soils... focus on soils in... supporting adequate production... can truly still maintaining... soil together in... and Soil, 2008; Doran... are not limited to services... soil health as synonymous... of soil for food and... systems and healthy... and healthy's support... and minor quality and... through these two... takes a distinction between... functions on the soil as a... and preservation of these... and types of soil degradation...

ITPS DEFINITION OF SOIL HEALTH
The Intergovernmental Technical Panel on Soils (ITPS) defines soil health as "the ability of the soil to sustain... the productivity, diversity, and environmental... of terrestrial ecosystems". In managed... systems, soil health can be... through the implementation of... management practices. As with human health, there is no... functions on the soil as a... and preservation of these... and types of soil degradation...

The ITPS notes this definition of soil health and hopes... to widely used and adopted by... institutions, governments, academia, etc. In line with... call for action issued by Lehmann et al. (2020),... and socio-economic benefits of healthy soils... for future generations. Consequently, the ITPS... Global Soil Partnership are working on the... indicators and harmonized laboratory... are applicable in all countries and... promotion, conservation and restoration of soil health...

Soil health is the backbone... of soil for food and... systems and healthy... and healthy's support... and minor quality and... through these two... takes a distinction between... functions on the soil as a... and preservation of these... and types of soil degradation...

SOIL ORGANIC CARBON AND NITROGEN

REVIEWING THE CHALLENGES FOR CLIMATE CHANGE MITIGATION AND ADAPTATION IN AGRI-FOOD SYSTEMS

The global nitrogen cycle has been severely modified... nitrogen fixation... and completely understood...

An adequate supply of soil organic carbon and nitrogen is essential to maintain crop yields and the nutritional value of the agricultural system. However, the global agricultural system needs... to be reduced to meet population needs... while maintaining crop yields and nutritional value...

THE ROLE OF CARBON AND NITROGEN IN THE AGRI-FOOD SYSTEM

Carbon (C) and nitrogen (N) participate directly in a wide variety of soil processes that... are key to the food system... maintenance of soil... and the carbon (C) and nitrogen (N) cycles...



Soil organic carbon (SOC) and nitrogen (N) are essential... to maintain crop yields and the nutritional value... of the agricultural system...

The synthesis of N was a major discovery... of the 20th century... and enabled... of synthetic fertilizers...

Over 100 Mt of soil are affected by salinity and sodicity... according to the available information... of which... are saline...

Although soil maps can provide valuable interpretative information... they do not represent the full extent of salinization... information can be quite localized...

SALT-AFFECTED SOILS ARE A GLOBAL ISSUE

Salinized soils (SAS) is a term that describes both saline soils and sodic soils...

Over 100 Mt of soil are affected by salinity and sodicity... according to the available information... of which... are saline...

Although soil maps can provide valuable interpretative information... they do not represent the full extent of salinization... information can be quite localized...



SPECTROSCOPY: TOWARDS ECO AND HUMAN FRIENDLY SOIL ANALYSES

This letter aims to show how spectroscopy can offer a fast, reliable, and cost-effective method to provide the large amount of data necessary for decision making in... agricultural systems...

Soils are primarily heterogeneous and naturally exhibit both horizontal and vertical variability... as well as varying over time... and application and deposition processes...

Building knowledge about soil health is imperative when... the present state... a large number of laboratory analyses... and temporal variability... information on soil quality...



SPECTROSCOPY: TOWARDS ECO AND HUMAN FRIENDLY SOIL ANALYSES

This letter aims to show how spectroscopy can offer a fast, reliable, and cost-effective method to provide the large amount of data necessary for decision making in... agricultural systems...

Soil spectroscopy or dry chemistry is an evolving technology for... rapid, cost-effective and non-destructive characterization of soil... with matter (Nabati et al., 2015). However, spectroscopic... are combined with the conventional laboratory... methods...

Building knowledge about soil health is imperative when... the present state... a large number of laboratory analyses... and temporal variability... information on soil quality...



URBANISATION AND SOIL SEALING

Urbanisation is a complex process driven by socio-economic factors... covering a wide range of rates and spatial patterns... over the world...

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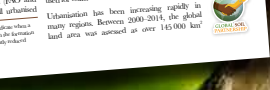
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Speaking up for soils ...together

The GSP is comprised of a series of technical networks:

The International Network of Soil Information Institutions develops national soil information systems, produces country driven soil data products, and supports the move towards evidence-based and data driven policymaking.



The International Network of Black Soils is a knowledge-sharing platform for countries with black soils to discuss common issues related to the conservation and sustainable management of these highly fertile soils and the need to foster technical exchanges.



The Global Soil Laboratory Network builds the capacities of laboratories to produce reliable data on soils by harmonizing methods, units, and information on soil analysis. The Network also strives to integrate rapid and cost-effective systems to measure soil properties through its initiative on soil spectroscopy.



The International Network on Fertilizer Analysis builds and strengthens the capacity of laboratories in fertilizer analysis and aims to enhance fertilizer quality standards worldwide while upholding health and safety.



The International Network of Salt-Affected Soils provides an information hub for countries with salt-affected soils to adopt sustainable management practices for food security, agricultural sustainability, and climate change mitigation.



The International Network on Soil Biodiversity was established to advance the sustainable use and conservation of soil biodiversity, bringing together experts in this field and existing initiatives to create a global observatory that instigates action to halt the loss of the enormous variety of life below ground.



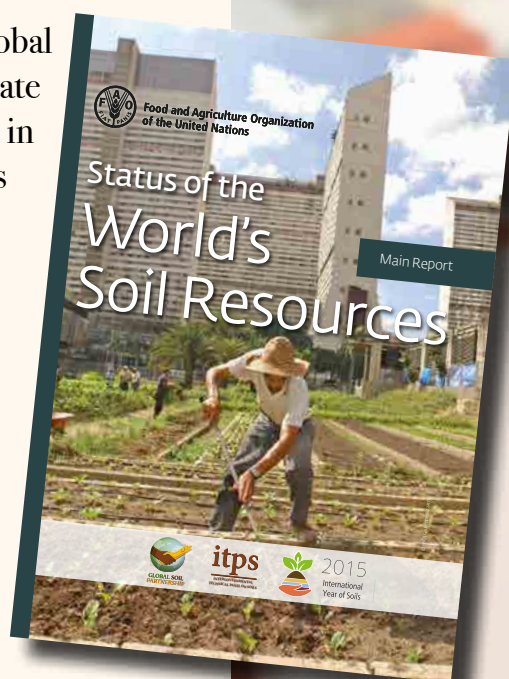
The International Network on Soil Pollution is the newest GSP Network. It is committed to moving towards a pollution-free world through the improvement and dissemination of knowledge, the development of standards and methodologies, and technical cooperation to salvage polluted soils.



Spotlighting our studies

The GSP has published some prominent technical reports, these include:

The **Status of the World's Soil Resources** offering a global perspective on the current state and trends of soils, their role in providing ecosystem services and the threats they face.

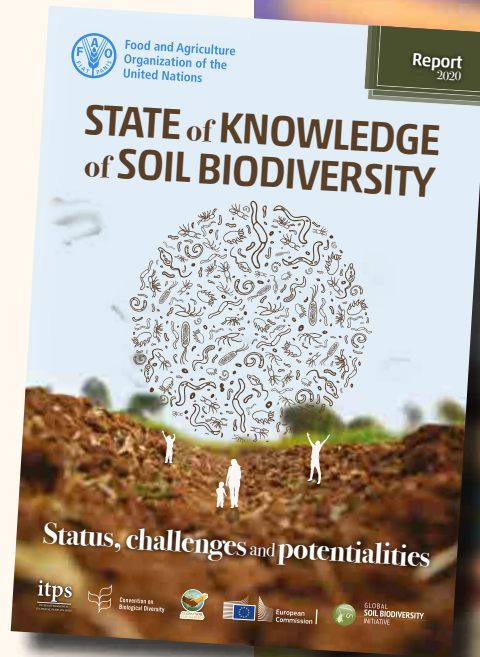


The **Global Assessment of Soil Pollution** exploring the nature and multiple sources of soil contaminants, their impact on soil health and functions, as well as on the environment and human health. The Assessment includes an overview of regional soil pollution and introduces some of the best available technologies to manage polluted soils.

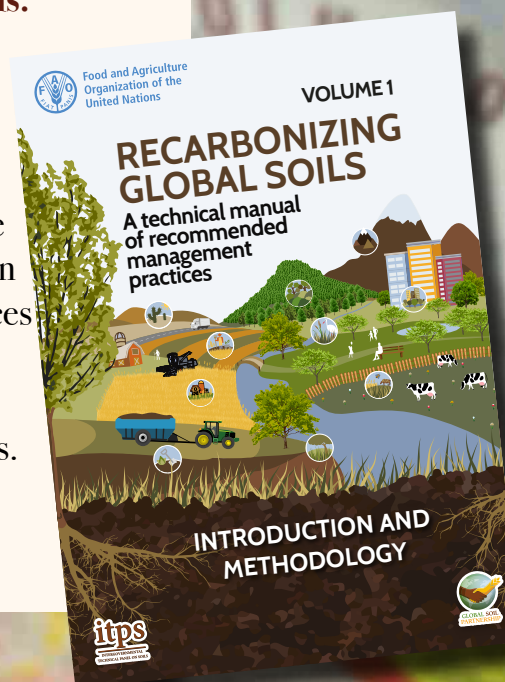


The **State of Knowledge of Soil Biodiversity**

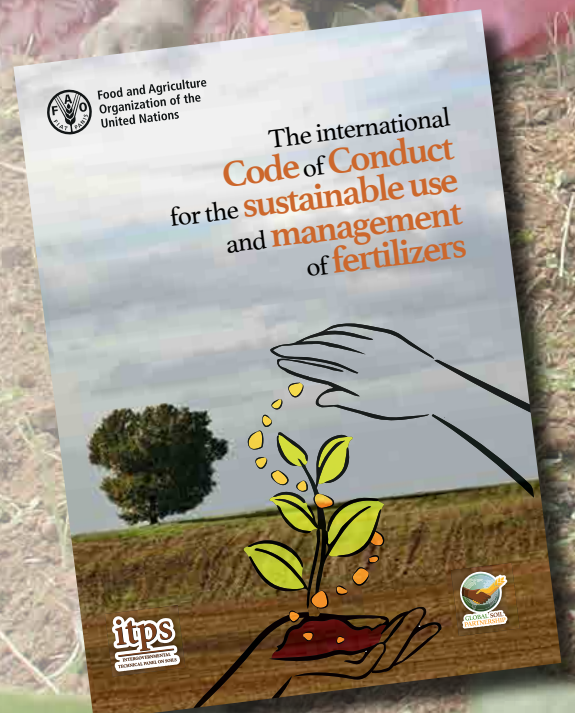
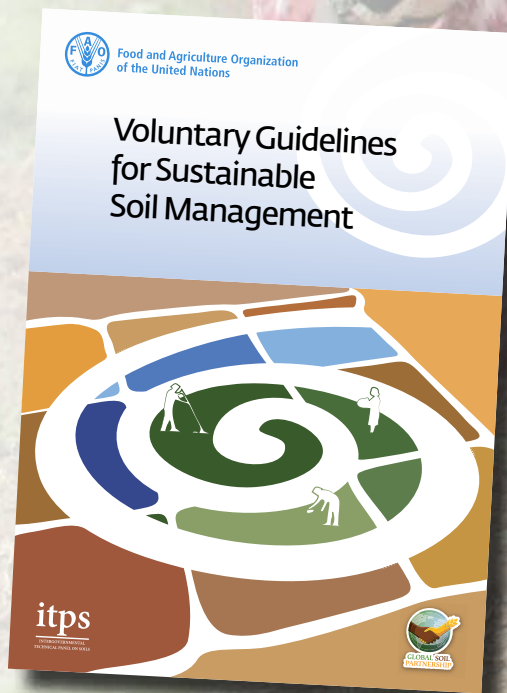
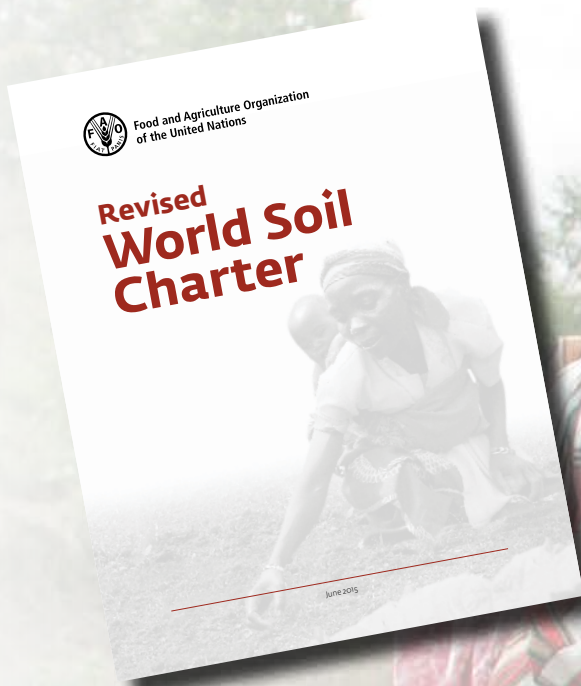
exposing the pivotal role played by soil biodiversity in providing ecosystem services that allow life on Earth, and how it can offer nature-based solutions to global challenges faced by the planet and people such as food insecurity, climate change and land degradation.



The **Recarbonizing global soils: a technical manual of recommended management practices** is a compilation of good practices and case studies illustrating how we can enhance and maintain soil organic carbon stocks through new best practices to help extend sustainable soil management to different countries, regions, and contexts.



The GSP also produces a series of non-binding normative documents to assist countries to mainstream soil health and sustainable soil management in national legislation, strategies, and programmes, via an inclusive process in which FAO Members reach a consensus.





What is a sustainable management of soils?



Provision of fiber



Provision of wood



Carbon storage and
greenhouse gas
regulation



Aesthetics



Provision of support
for animals



Cultural identity

Soil management is sustainable if the supporting, provisioning, regulating, and cultural services provided by soil are maintained or enhanced without significantly impairing either the soil functions that enable those services or biodiversity.



Provision of food



Provision of support for human



Detoxification and recycling of wastes



Regulation of pests and disease populations



Filtering of nutrients and contaminants



Flood mitigation



Provision of raw



Heritage values



Recreation

Positioning our programmes

The GSP is now ready to continue transforming theory into action through pioneering projects, which in the coming years will take expertise to farming communities around the world. If we preserve and protect our soils, we can safeguard food security while offsetting the impacts of climate change and improve human wellbeing from the roots upwards. Here is a sneak preview of our projects:

The **Global Soil Doctors Programme** is a farmer-to-farmer training initiative that builds the capacities of smallholders on the practice of sustainable soil management. It supports governmental agencies and organizations working on agricultural extension at the field. The Programme builds on the abilities of farmers by providing them with training so that they can restore healthy soil conditions and functions while raising awareness of soils globally.

RECISOIL: Recarbonization of Global Soils is a mechanism to scale-up sustainable soil management with a focus on soil organic carbon sequestration and maintenance. It backs national and regional farming incentives that restore degraded soils while preventing the release of greenhouse gases (GHG) into the atmosphere and contributing to carbon sequestration efforts.



SOILS4Nutrition sets up pilot sites to test and demonstrate the effects of sustainable soil management practices, such as intercropping and integrated fertility management, on micronutrient contents in crops. The goal of the project is to empower farmers so they can have a direct impact on the foods consumed by their communities, improving the nutritional content of local produce as well as addressing nutrient weaknesses in diets.

National Soil Information Systems in Asia covers all stages of developing soil information systems, including the collection of soil profile data and soil maps, the preparation of national soil databases, the establishment of a spatial data infrastructure and the development of a Soil Atlas of Asia.

Capacity development on sustainable fertility management operates in affiliation with the UN's South-South Cooperation and focuses on the implementation of the Fertilizer Code and the capacity building of sustainable soil fertility management conducted by the Global Soil Laboratory Network and EduSoils in Uganda and Rwanda.

The GSP is also involved in **FAO's technical cooperation projects** in more than thirty countries on soil data and information, soil laboratories, black soils, sustainable soil management practices, integrated soil-water management, and capacity development.



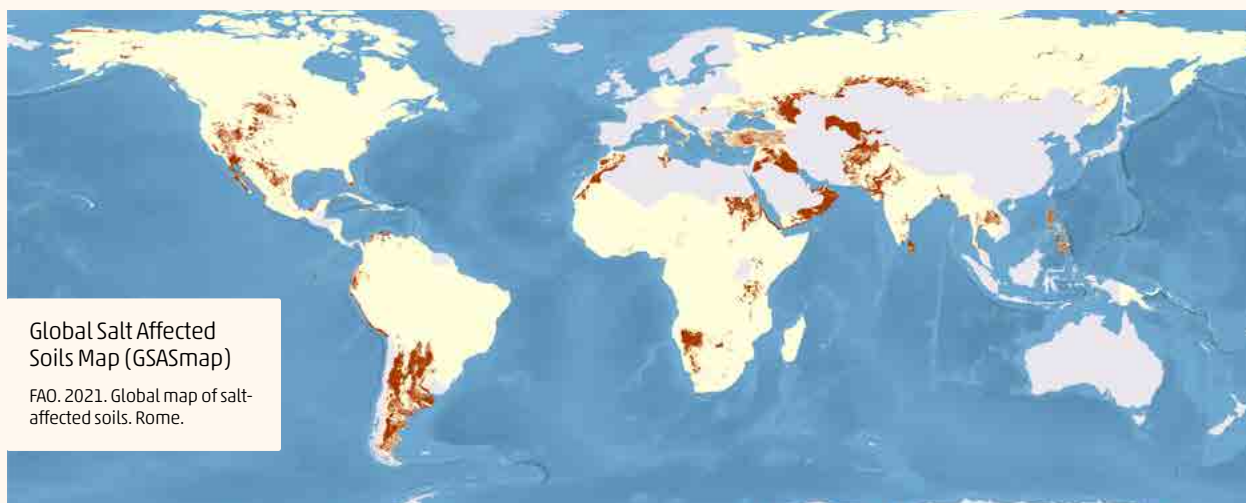
On a mission to map

Within the framework of the Global Soil Information System – a spatial data infrastructure that connects soil information from national institutions and bolsters their knowledge systems – the GSP has produced a series of soil maps:

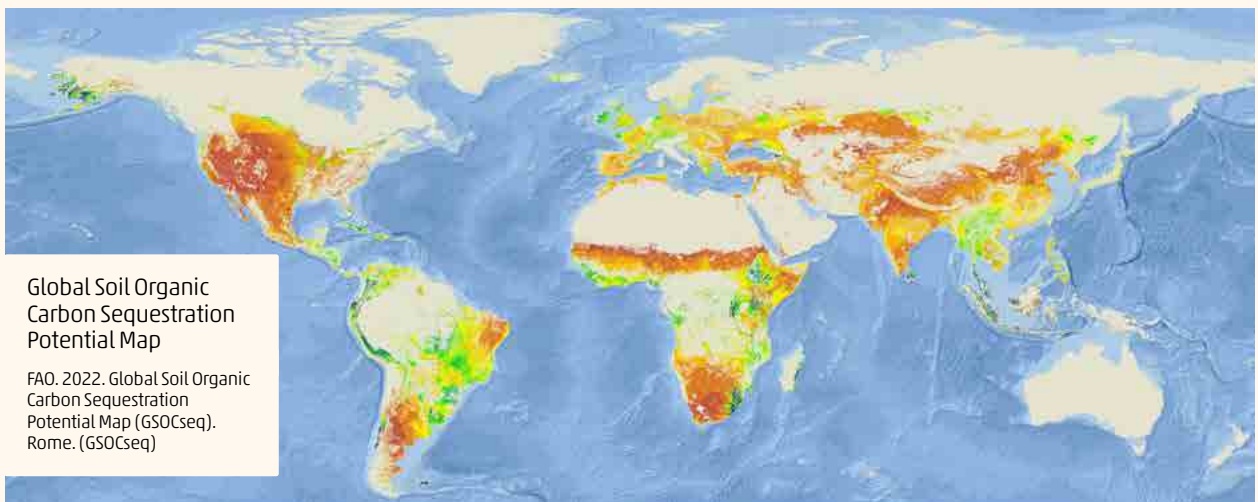
The **Global Soil Organic Carbon Map (GSOCmap)** – the first global map built through a country-driven process. It enables countries to draw conclusions on the distribution and status of their soil organic carbon stocks.



The **Global Salt-Affected Soils Map (GSASmap)** – is an innovative dataset prepared by countries partnering up. It depicts the spatial distribution of salt-affected soils and aims to become a monitoring framework to track soil salinization and enhance early detection systems and management.



The **Global Soil Organic Carbon Sequestration Potential Map (GSOCseq)** – they allow users with useful information to prioritize areas where sustainable soil management practices can be adopted to enhance soil organic carbon stocks and improve soil health. It allows individuals to identify the regions, soil types and farming systems with the greatest potential to offset GHG emissions.

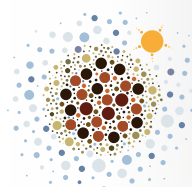


The **Global Black Soil Distribution Map (GBSmap - v1.0)** - was produced through national distribution maps of black soil submitted directly by 14 countries. This country-driven process was made possible thanks to training sessions held in 2021 to support members of the International Network of Black Soils in developing their national maps.



Shaping soil health, topic-by-topic

Every year since 2017, science-policy symposia debate the primary threats to soils: soil organic carbon loss, soil pollution, soil erosion, soil biodiversity loss, soil salinization and soil fertility reduction. The events unite research bodies, decision-makers, extension services, end-user communities, donors, and relevant UN agencies plus international organizations to turn theory into concrete implementation plans and actions.



GLOBAL SYMPOSIUM ON
SOIL ORGANIC CARBON
MARCH 2017



GLOBAL SYMPOSIUM
ON SOIL
POLLUTION
MAY 2018



GLOBAL SYMPOSIUM
ON SOIL EROSION
MAY 2019



GLOBAL SYMPOSIUM
ON SOIL BIODIVERSITY
APRIL 2021



GLOBAL SYMPOSIUM ON
SALT-AFFECTED SOILS
OCTOBER 2021



Global Symposium on
Soils for Nutrition
JULY 2022



Ours is a Partnership devoted to **creating a robust, diverse, and ever-growing network to promote sustainable soil management and soil governance globally.**

We are the **motor behind country-driven processes** because only by ramping up links with national partners can we achieve the SDGs. The GSP operates through regional soil partnerships that work with FAO offices and national soil entities.

This helps us to **produce cutting-edge products and services** illustrating the state of soil conditions so that countries and their national institutions can boost their own capacities and manage the threats they face.

We **inform and educate.** Since 2012, the GSP's capacity development programme has reached more than 7 000 national experts from over 170 countries.



How the GSP makes a difference

We act as an **agent for transformative change** and have a **track record of raising awareness of soils** as evidenced by the successful campaigns for the 2015 International Year of Soils and World Soil Day (WSD) - held annually on 5 December.

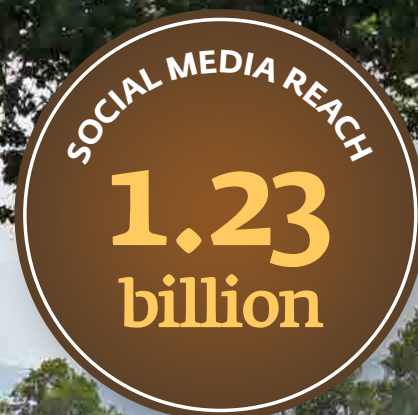
We **engage citizens by describing how soil relates to people's everyday lives** through activities, contests, and live performances. Advocacy campaigns all over the world now carry the GSP stamp, which has garnered the support of thousands of followers via social media, citizen contests and news coverage. Over the past ten years multilingual factsheets, infographics, posters, videos, press releases and more have been prepared and shared with different target groups.

By promoting responsible investment in soils, we build scientifically-sound evidence and practical guidelines, advocating for responsible investments and positive incentives aimed at bolstering sustainable soil management. In the long run, unsustainable soil management practices have higher social and private costs.

All our efforts culminate to **shape inclusive policies and improved soil governance**, which enhance the capacities of policymakers to implement sustainable soil management for future generations.



Global Soil Partnership in figures



TECHNICAL WEBINARS
+30 000
PEOPLE

NATIONAL EXPERTS
TRAINED
+7 000

IN
170
COUNTRIES

MEDIA OUTREACH
3.97
billion

For more information and to join our cause and re-imagine the future of soils...

See our website

<https://www.fao.org/global-soil-partnership/en/>

Check out our resource partners

<https://www.fao.org/global-soil-partnership/about/healthy-soils-facility/en/>

Become a GSP partner

<https://www.fao.org/global-soil-partnership/partners/en/>

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The Global Soil Partnership (GSP) is a globally recognized mechanism established in 2012. Our mission is to position soils in the Global Agenda through collective action. Our key objectives are to promote Sustainable Soil Management (SSM) and improve soil governance to guarantee healthy and productive soils, and support the provision of essential ecosystem services towards food security and improved nutrition, climate change adaptation and mitigation, and sustainable development.

Land and Water Division

GSP-secretariat@fao.org
www.fao.org/global-soil-partnership

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Commission



Ministry of Finance of the
Russian Federation



Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

Swiss Confederation



Land
Development
Department
of Thailand



International
Fertilizer Industry
Association



Ministry of Economic Affairs of the
Netherlands



PHOSAGRO®



Rural Development
Administration



AFACI
Asian Food & Agriculture
Cooperation Initiative



Federal Ministry
of Food
and Agriculture