

RETERURALE
NAZIONALE
20142020

Uso efficiente delle risorse naturali:

priorità dello sviluppo rurale, sfida per i PSR

3 Maggio 2017

Sala conferenze 20 Maggio 2012

Regione Emilia-Romagna, 3^a Torre, Viale della Fiera n.8, BOLOGNA



USO EFFICIENTE DELLE RISORSE: IL RUOLO DI RICERCA & INNOVAZIONE

Come e perchè promuovere l'uso efficiente del suolo in agricoltura: *la Global Soil Partnership*



Soil is defined as the top layer of the earth's crust. It is formed by mineral particles, organic matter, water, air and living organisms.

It is in fact an extremely complex, variable and living medium. As soil formation is an extremely slow process, soil can be considered essentially as a non-renewable resource.

The interface between the earth, the air and the water soil performs many vital functions: food and other biomass production, storage, filtration and transformation of many substances including water, carbon, nitrogen.





SOIL DEFINITION IN THE ITALIAN LEGISLATION (D.lgs n. 152, 2006)

La definizione di suolo nella legislazione ambientale italiana compare nel Decreto Legislativo n. 152 del 3 aprile 2006, parte III Norme in materia di difesa del suolo e lotta alla desertificazione e recita:

1. **Ai fini della presente sezione si intende per** *(For the purposes of this Section, it is intended for):*

a) **suolo: il territorio, il suolo, il sottosuolo, gli abitati e le opere infrastrutturali**

a) **soil: land, soil, subsoil, habitats and infrastructure works**

More than a definition appears to be an equivocal meaning!

Since in the environmental text the soil is not an environmental component

SOIL SUITABILITY AND VULNERABILITY



Soil suitability

Attitude to accommodate a variable number of plants as a function of:

- its topographic and climatic location;
- its chemical-physical and biochemical composition;
- the availability of essential elements for plant nutrition.

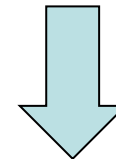


Soil vulnerability

Natural or anthropogenic causes of degradation in Function of:

- adverse climatic conditions
- the loss of the organic component;
- the impoverishment of the elements of fertility;
- contamination by EPT (Potentially Toxic Elements)

Non-respect for vocational suitability causes vulnerability in the soil

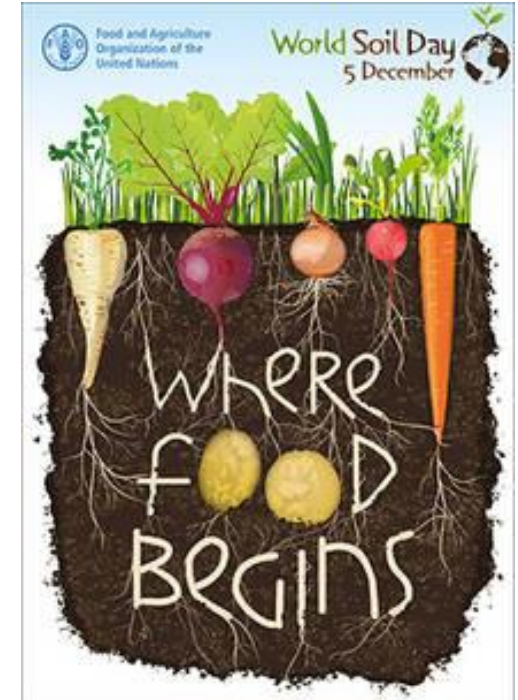
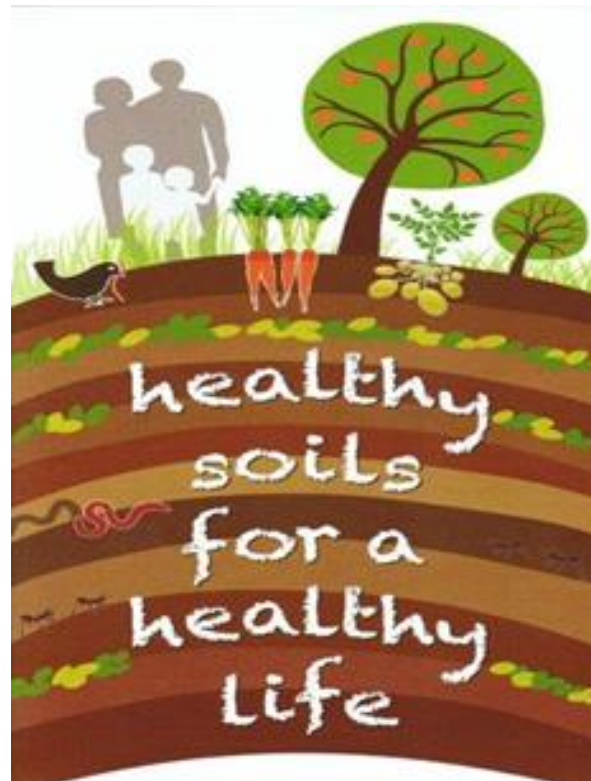
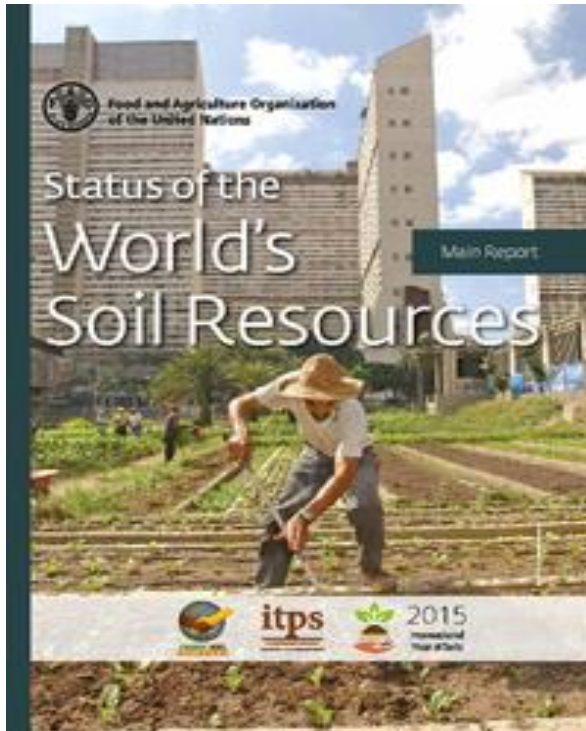


Excessive vulnerability leads to irreversible degradation

2015 International Year of Soils



The challenge of the third millennium is the contrast to poverty, hunger and food insecurity.



It has been estimated that 95% of food production directly or indirectly comes from the soil.

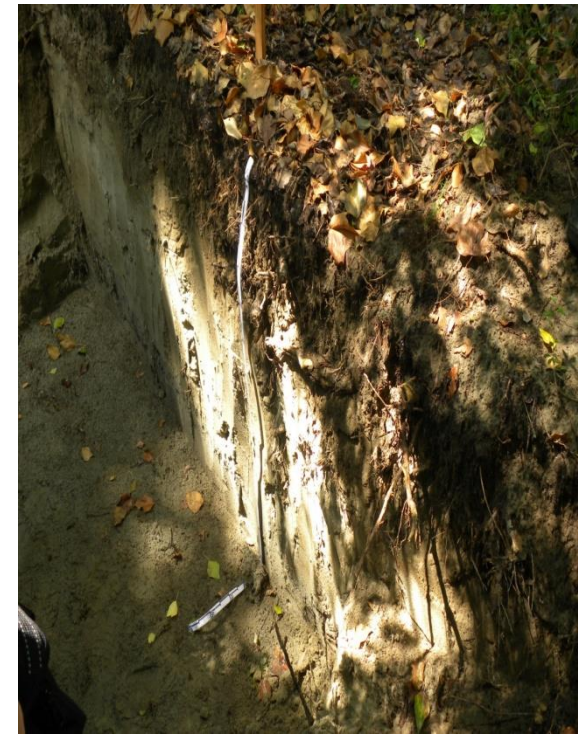
Status of the world's soil resources: key facts



In 2050 agricultural production will have to increase by 60% to globally feed the world population



33% of the soil is moderately to very degraded due to erosion, nutrient deficiency, acidification, salinisation, compaction and chemical pollution



For the formation of 1 cm of soil it may take up to 1000 years

Status of the world's soil resources: key facts

To ensure proper human nutrition, 15 different macro, meso and micro elements are required.

75% of the agricultural land has deficiencies in at least one of these elements

Soil the foundation of nutrition

Role of 18 nutrients necessary for plant growth and human health

Soil macronutrients: Nitrogen (N), Phosphorus (P), Potassium (K), Calcium (Ca), Magnesium (Mg), Sulfur (S)

Soil micronutrients: Zinc (Zn), Manganese (Mn), Copper (Cu), Iron (Fe), Boron (B), Molybdenum (Mo), Silicon (Si), Sodium (Na), Chlorine (Cl), Oxygen (O), Carbon (C), Hydrogen (H)

Human health benefits:

- Plays a key role in brain and muscle function
- Contributes to perception of taste
- Needed for immune system health
- Key component of protein
- Essential for muscle and nerve activity
- Important in immune system health, blood clotting and pressure regulation
- A component of proteins, DNA, RNA and blood
- Promotes digestive process
- Maintains acid-base balance
- Needed for proper fluid balance
- Essential for fetal development and functioning of reproductive system
- Key component of enzymes
- Helps deliver oxygen to the tissues
- Important for healthy bones
- A component of enzymes, DNA, RNA, proteins and promotes immune system health
- A component of enzymes and involved in iron metabolism

Soil degradation leads to the loss of soil micro and macronutrients

Nutrient-poor soils are unable to produce healthy food with all the necessary nutrients for a healthy person

Over 2 billion people suffer from micronutrient deficiencies

Sustainable soil management for healthy soils, healthy food and healthy people

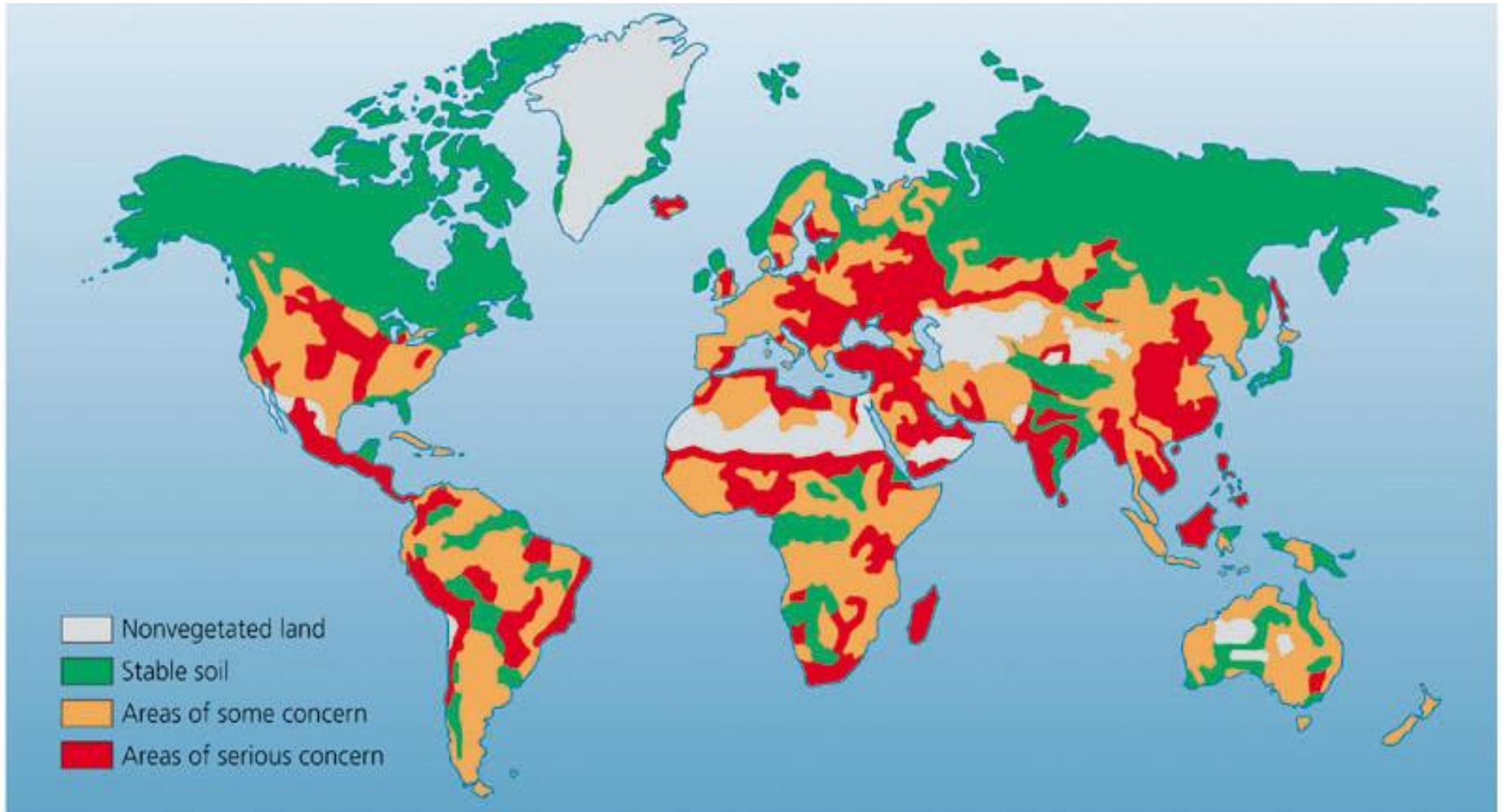
- Reduce erosion
- Ensure crop rotation
- Keep soil surface covered
- Minimize tillage
- Increase soil organic matter content

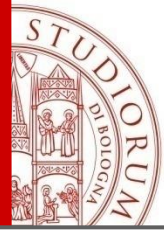
Food and Agriculture Organization of the United Nations

With the financial support of the Russian Federation

Healthy soils for a healthy life

Status of the world's soil resources: key facts





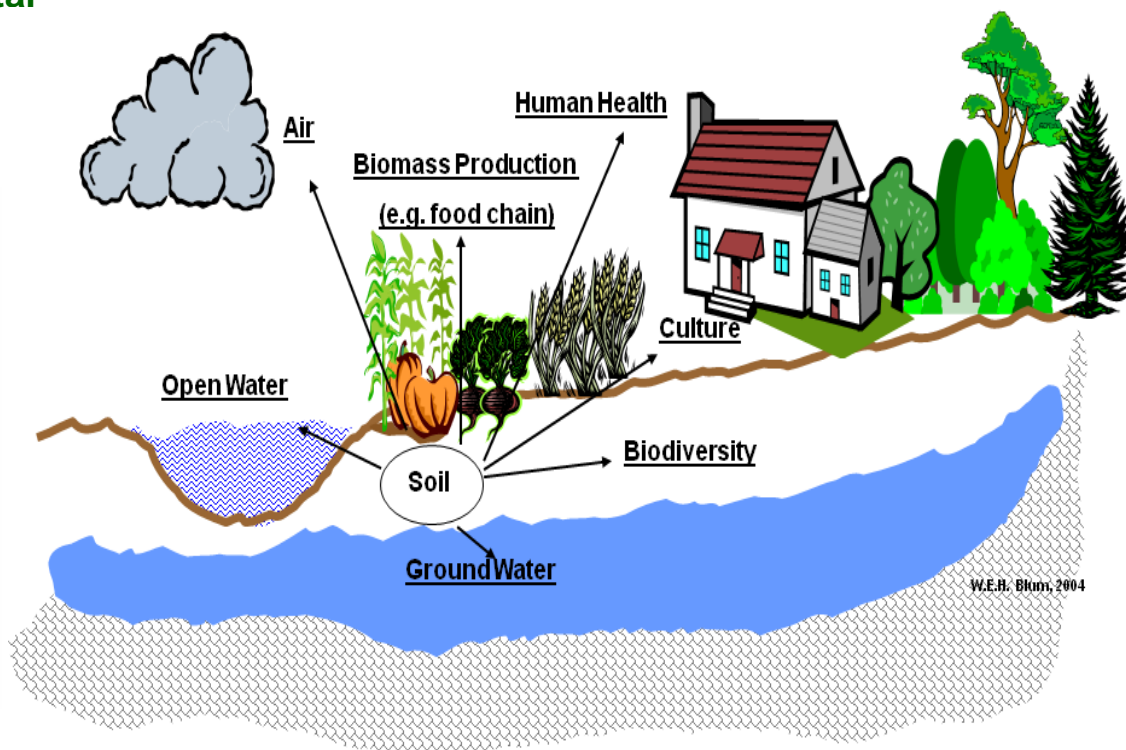
Status of the world's soil resources: key facts

Instead, correcting most of the low fertility limitations and sustainable soil management could ensure by 2050 an increase of 56% of agricultural products, satisfying the expected demand of 60%.



The thematic strategy for soil protection was adopted by the European Commission on 22 September 2006 recognizing the central role of soil in the environmental balance and interface between the lithosphere, the hydrosphere, the biosphere and the atmosphere

Goods and Services provided by Soil



W.E.B. Bkum, 2004

What are the current costs of soil degradation?

It is difficult to estimate those costs due to the lack of sufficient quantitative and qualitative data but several studies point to significant *annual* costs to society, in the ranges of:



erosion: €0.7 – 14.0 billion,
 organic matter decline: €3.4 – 5.6 billion,
 compaction: no estimate,
 salinisation: €158 – 321 million,
 landslides: up to €1.2 billion per event,
 contamination: €2.4 – 17.3 billion,
 sealing: no estimate possible,
 biodiversity decline: no estimate

Erosion, organic matter decline, salinisation, landslides and contamination might be costing the EU up to €38 billion annually.

As the costs of the other threats could not be assessed, the real costs of soil degradation are likely to exceed this estimate. The majority of these costs are borne by society

In October 2013 the Commission adopted the Communication on "Regulatory Fitness and Performance (REFIT): Results and Next Steps" ([COM\(2013\) 685](#) and its [Annex](#)) in which it noted that the proposal for a Soil Framework Directive had been pending for eight years during which time no effective action has resulted. The Commission would therefore examine carefully whether the objective of the proposal, to which the Commission remains committed, would be best served by maintaining the proposal or by withdrawing it, thus opening the way for an alternative initiative in the next mandate.



Aims of BusinessEurope

To unit the industrial federations to foster solidarity between them; encouraging a Europe wide competitive industrial policy; and acting as a spokes-person body to the European institutions”.

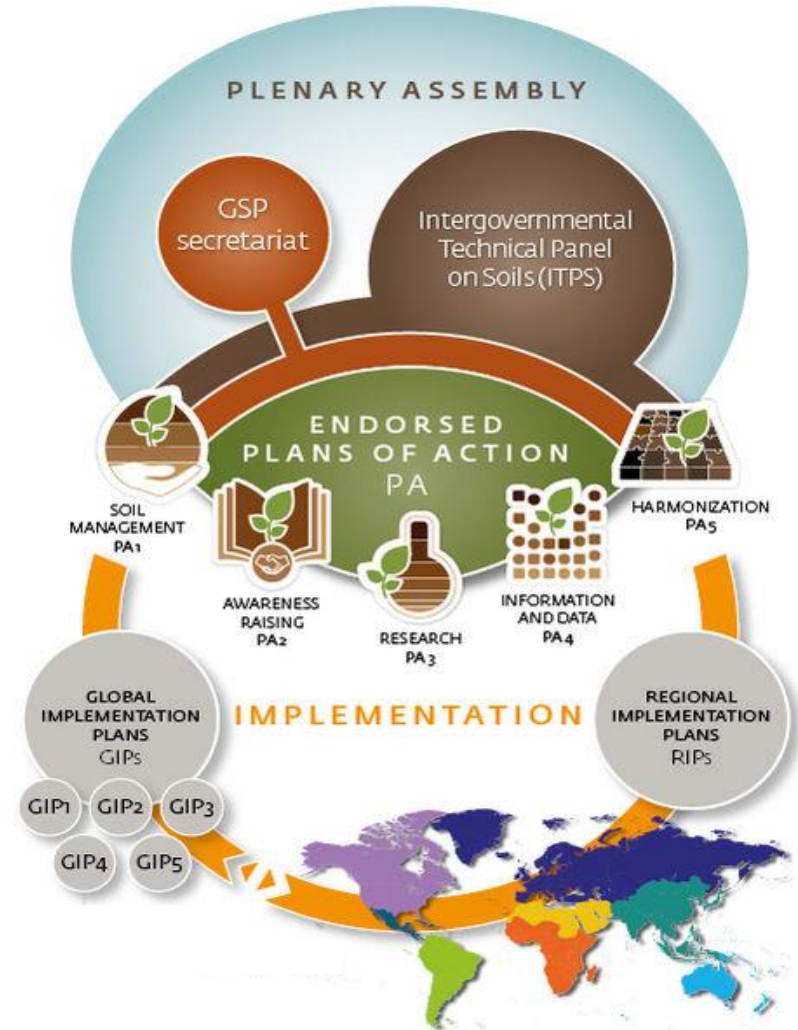
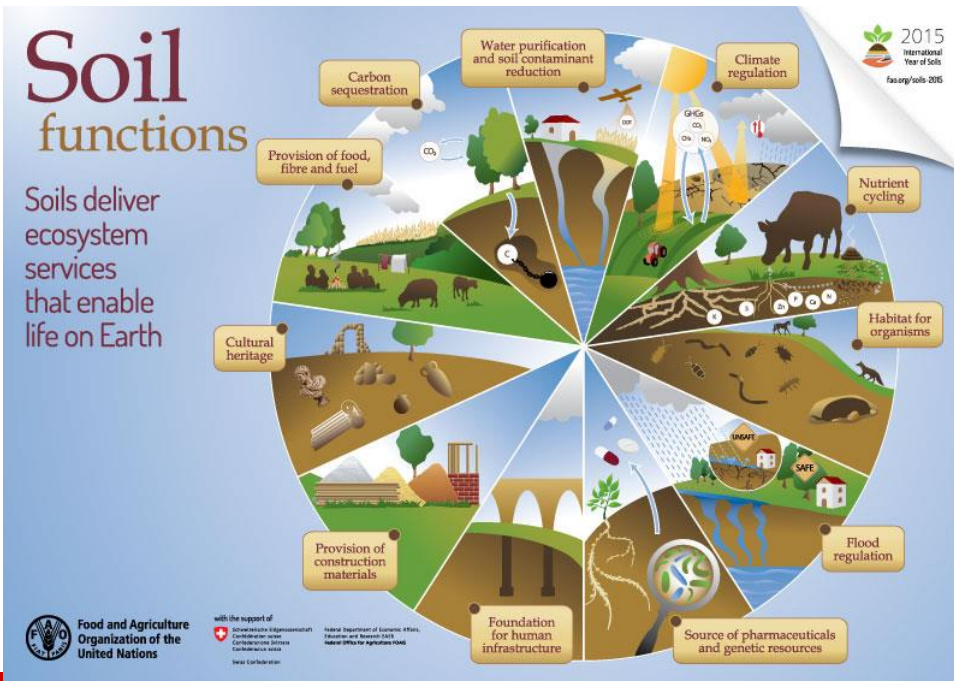
“The need for legislation on soil protection at European level is not obvious”



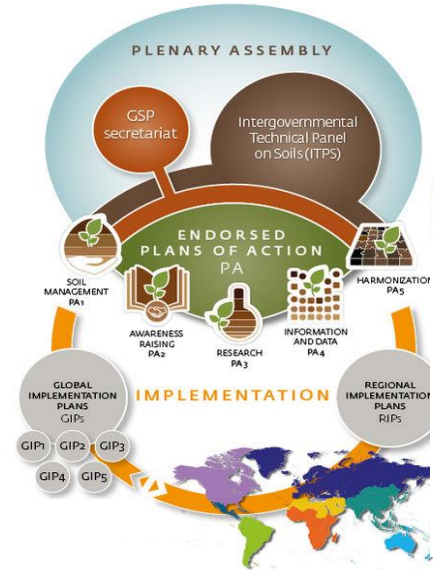
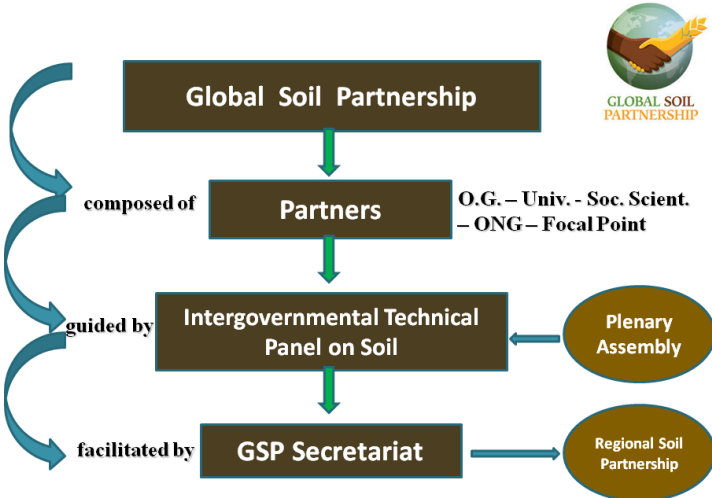
Global Soil Partnership



Soil is an essential resource and a vital part of the natural environment from which most of the global food is produced. At the same time, soil provides living space for humans, as well as essential ecosystem services which are important for water regulation and supply, climate regulation, biodiversity conservation, carbon sequestration and cultural services. But soils are under pressure from increases in population, higher demands for food and competing land uses.



Organizational structure of Global Soil Partnership



Regional Soil Partnership



Pillar 1 Soil management



Promote sustainable management of soil resources for soil protection, conservation and sustainable productivity

Pillar 2 Awareness raising



Encourage investment, technical cooperation, policy, education, awareness and extension in soil

Pillar 3 Research



Promote targeted soil research and development focusing on identified gaps, priorities and synergies with related productive, environmental and social development actions

Pillar 4 Information and data

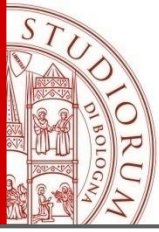


Enhance the quantity and quality of soil data and information: data collection (generation), analysis, reporting, monitoring and integration with other disciplines

Pillar 5 Harmonization



Harmonization of methods, measurements and indicator for the sustainable management and protection of soil resources



Organizational structure of Global Soil Partnership

EUROPEAN SOIL PARTNERSHIP



- Chair:** Elena Havlicek (Switzerland)
- Vice-chairs:** Hakki Erdogan (Turkey) and Carmelo Dazzi (Italy)

Working groups

- Pillar 1 Chair:** Violette Geissen (Wageningen University, The Netherlands)
- Pillar 2 Chair:** Arwyn Jones (European Commission)
- Pillar 3 Chair:** Coen Ritsema (Wageningen University, The Netherlands)
- Pillar 4 Chair:** Alan Lilly (The James Hutton Institute, Scotland)
- Pillar 5 Chair:** Hakki Erdogan (MAAF, Turkey)

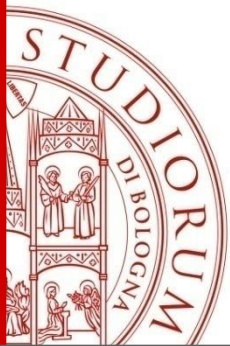
NATIONAL FOCAL POINT (ITALY) I-GSP



- Chair:** Anna Benedetti (CREA-ISPAN, Roma)
- National Coordination:** Carmelo Dazzi (Palermo University), Filiberto Altobelli (CREA-PBE), Elisabetta Lanzellotto (MiPAAF), Silvia Nicoli (MiPAAF).

Working groups

- Pillar 1 Chair:** Giuseppe Corti (Politecnico delle Marche University, SISS)
- Pillar 2 Chair:** Livia Vittori Antisari (Bologna University, SISS)
- Pillar 3 Chair:** Teodoro Miano (Bari University, SISS)
- Pillar 4 Chair:** Edoardo Costantini (CREA-ABP, SISS)
- Pillar 5 Chair:** Adele Muscolo (Reggio Calabria University, SICA)



Italian Focal Point activities in Global Soil Partnership SOIL SEALING



PRIORITY IMPROVEMENT

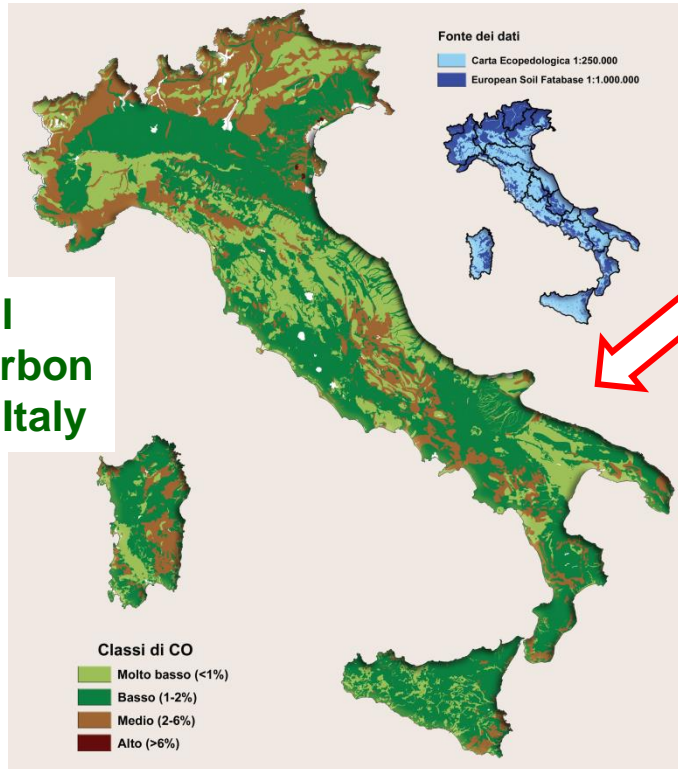
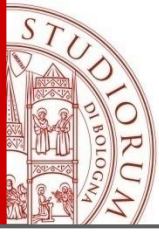
Urge the approval of a Law on Land Conservation.

Legislative proposals filed in the last two years remain between the Parliamentary Committees.

Rome, January 24, 2017. Hearing of prof. Fabio Terribile at the Joint Commissions 9a (Agriculture and Agro-Food Production) and 13a (Territory, Environment, Cultural heritage) of the Senate of the Republic, on draft laws nn. 2383, 769, 991, 1181 and 1734 (Soil Sealing).

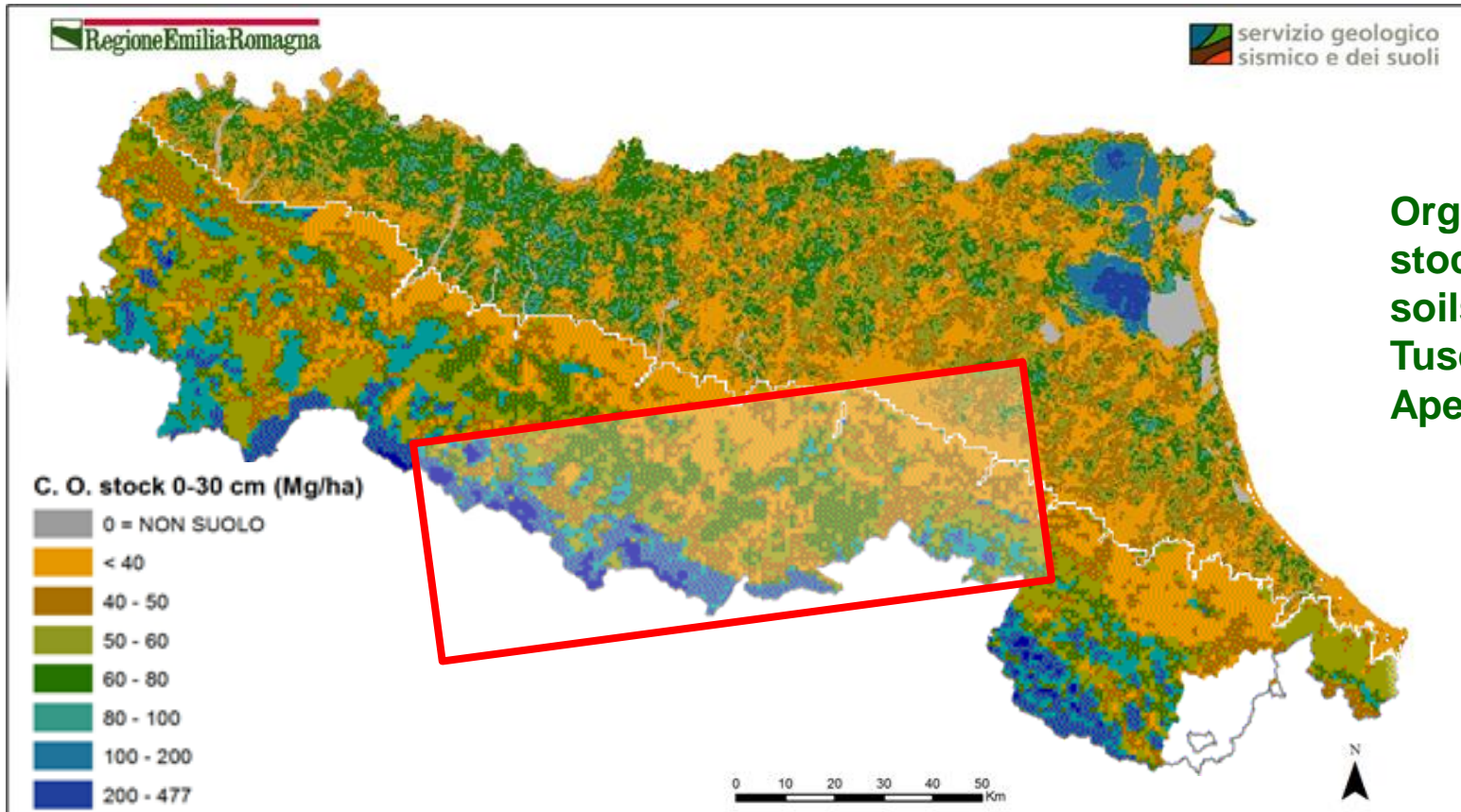
«La lotta contro la distruzione del suolo italiano sarà lunga e dura, forse secolare. Ma è il massimo compito di oggi, se si vuole salvare il suolo in cui vivono gli italiani»
"The struggle against the destruction of Italian soil will be long and lasting, perhaps secular. But it is the greatest commitment of today, if you want to save the soil in which the Italians live »
Luigi Einaudi, 1948

Italian Focal Point activities in Global Soil Partnership ORGANIC MATTER DECLINE

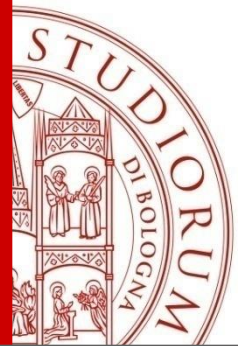


Map of Soil organic carbon content in Italy

Italian Focal Point activities in Global Soil Partnership ORGANIC MATTER DECLINE



Organic carbon
stocks in the
soils of the
Tuscan-Emilian
Apennines



Italian Focal Point activities in Global Soil Partnership EDUCATION





Thanks for the attention



***Caution!!!
This soil is
inhabited***

***So if you want
to open a soil
profile moved
at the proper
distance.***