GLOBAL SOIL PARTNERSHIP

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GLOBAL SOIL PARTNERSHIP

Outline

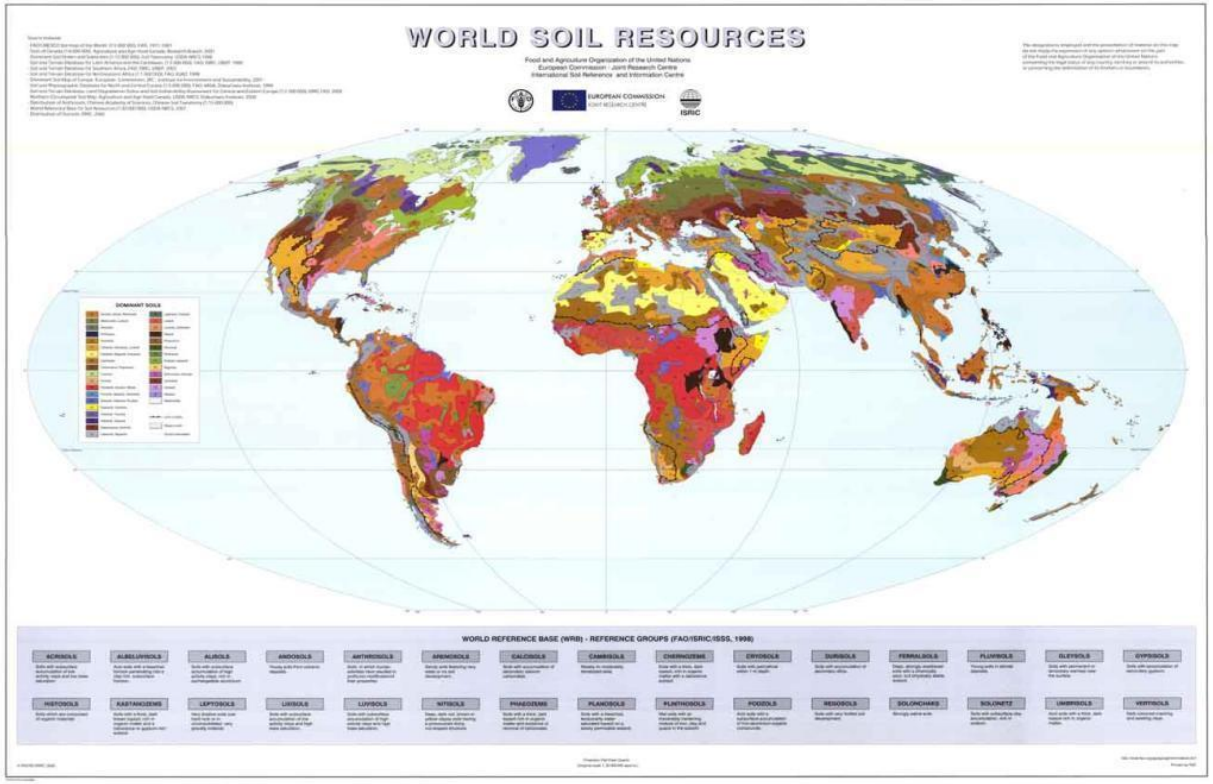
- Why Soils? Why they are important?
- Challenges: past, present and future
- Global Soil Partnership
    - Why?
    - Vision and mission
    - Pillars of action
    - Governance
    - Status of its establishment
- Regional Soil Partnerships
- This workshop

Why Soils?

Why they are important?

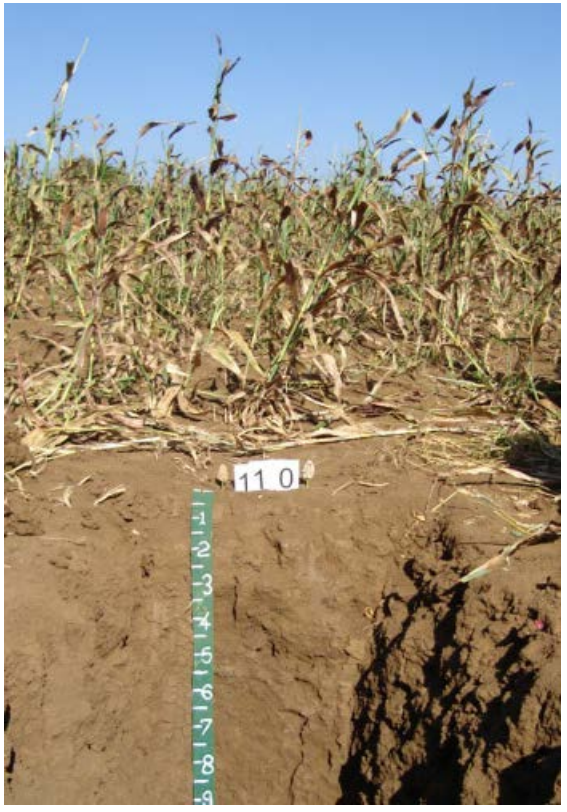
Why soils?

- **Soils are complex, finite and strategic resource**: **many soil classes (mineral and biological complex, ecosystem specific).**



Why Soils?

- Soil erosion in Somalia: an average of 100 tons/ha of topsoil per year is lost (SWALIM, 2009).
- At the same time, in order for nature to **form 2-2.5 cm of soils, requires approx. 1000 years**.



Why soils are important?

Ecosystem Functions of Soils

Supporting services
Nutrient cycling, water release/retention, soil formation, habitat for biodiversity, exchange of gases with the atmosphere, degradation of complex materials

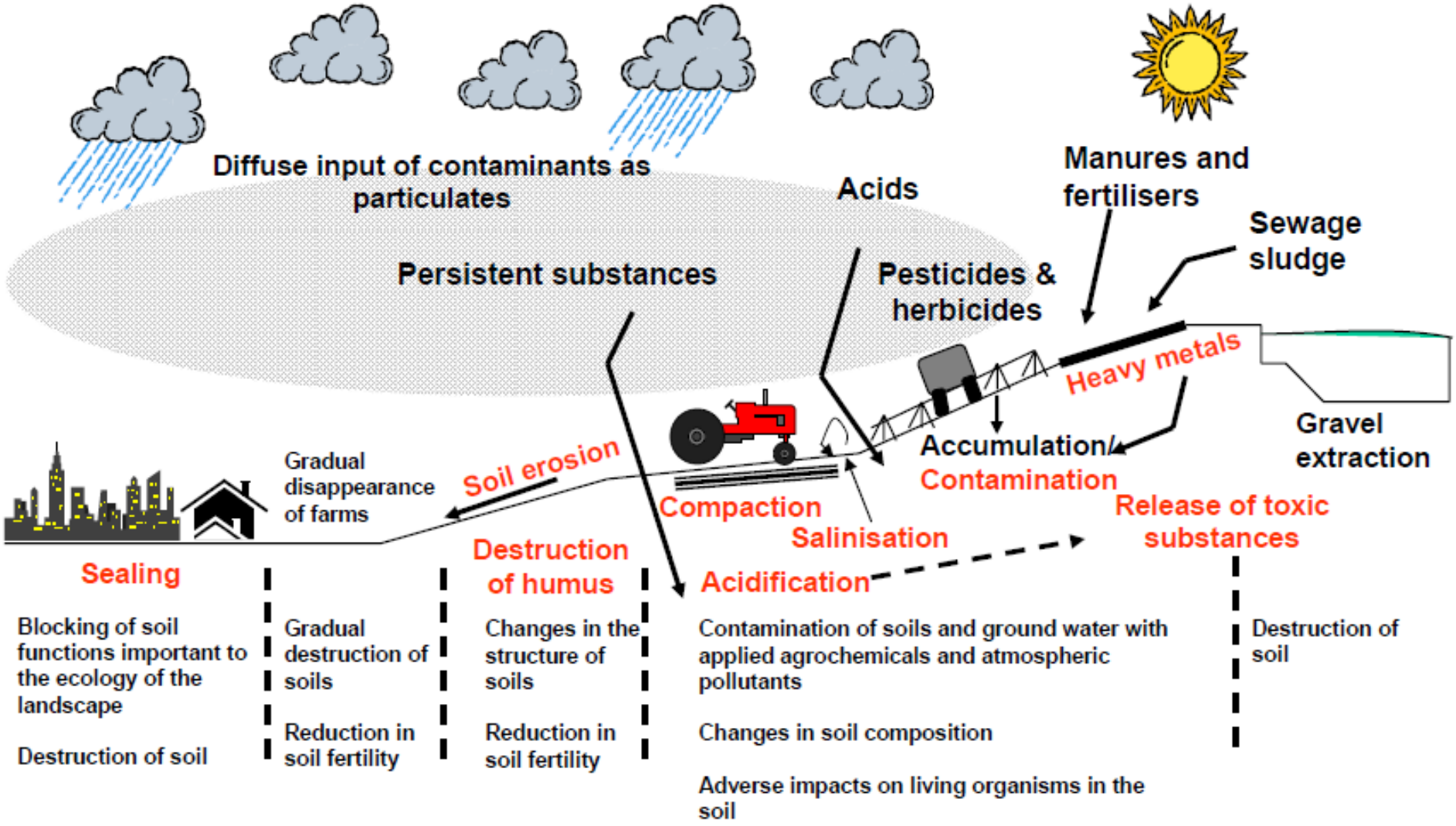
Provisioning services:
food and fibre production, water availability, platform for construction

Regulating services:
carbon sequestration, greenhouse gas emissions, water purification, natural attenuation of pollutants

Cultural services:
protection of archaeological remains, outdoor recreational pursuits, landscapes, supporting habitats

(Source: Black,2011)

The impact of human activities on soil

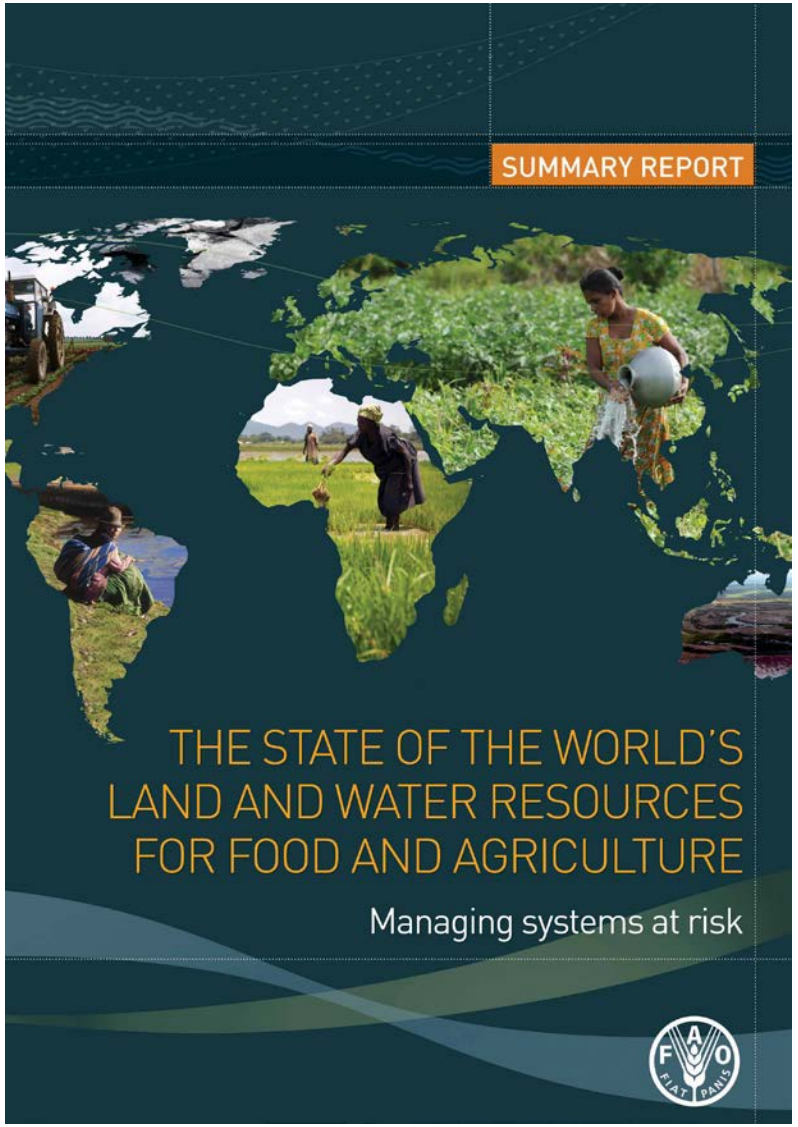


Challenges: past, present and future

Soils and The Green Revolution

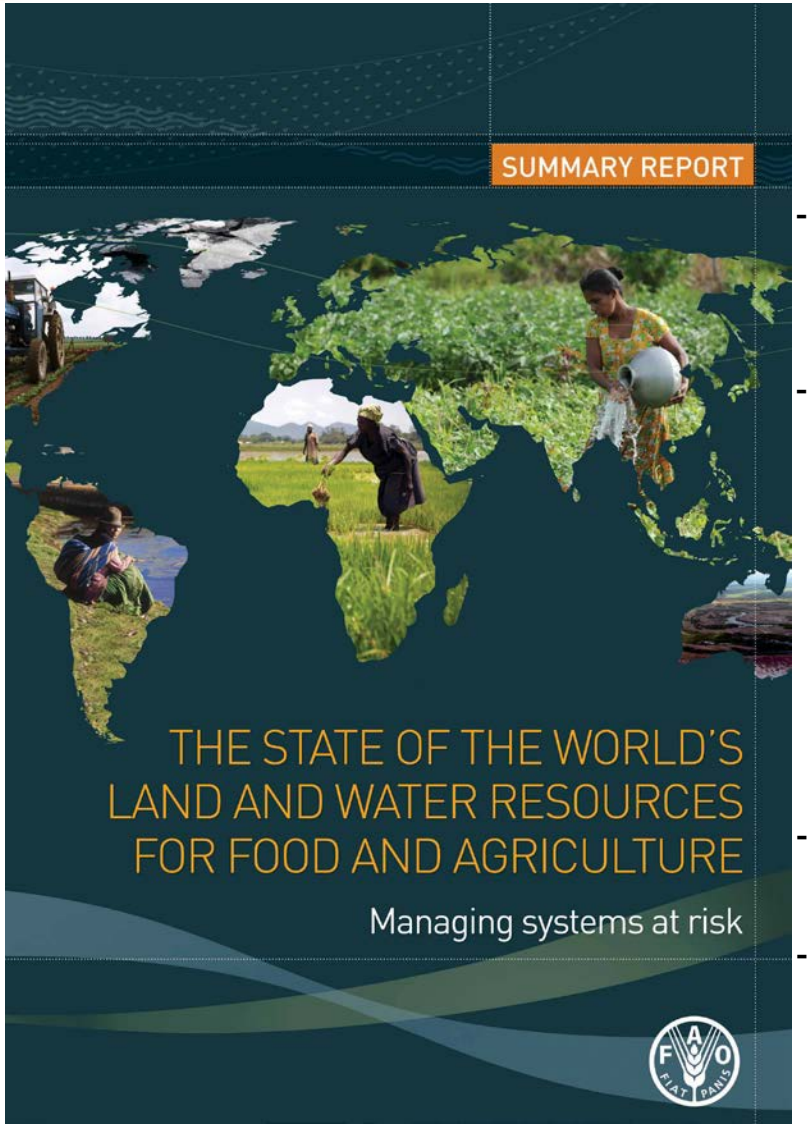
- Over the past half-century, since the advent of the Green Revolution, **world annual production** of **cereals coarse grains, roots and tubers, pulses and oil crops has grown from 1.8 million tonnes to 4.6 billion tones**. It is now recognized that those enormous gains in agricultural production and productivity were often accompanied by **negative effects on agriculture's natural resource base**, so serious that they jeopardize its productive potential in the future. Negative externalities of intensification include **land degradation**, salinization of irrigated areas, over-extraction of groundwater, the builtup of pest resistance and the erosion of biodiversity.
- The **declining quality of land and water resources** available for crop production has major implications for the future.
- **Soil is fundamental to crop production and rural developemnt**. Without soil, no food could be produced on a large scale, nor would livestock be fed. Because it is **finite and fragile**, soil is a precious resources that requires special care from its users. Many of today's soil and crop management systems are unsustainable. At one extreme **overuse of fertilizer has led, in the EU, to Nitrogen (N) deposition that threatens the sustainability of an estimated 70% of nature** (Hettelingh, J.P. et al, 2008). At the other extreme, in **most parts of sub-Saharan Africa, the under-use of fertilizer means that soil nutrients exported with crops are note being replenished**, leading to soil degradation and declining yields.

CURRENT AND FUTURE CHALLENGES FOR MANAGING SOILS



- The world's cultivated area has grown by 12 percent over the last 50 years.
- Meanwhile, agricultural production has grown between 2.5 and 3 times, thanks to significant increase in the yield of major crops.
- However, global achievements in production in some regions have been associated with degradation of land and water resources, and the deterioration of related ecosystem goods and services.
- Toward 2050, rising population and incomes are expected to call for 70 percent more food production globally, and up to 100 percent more in developing countries, relative to 2009 levels. Yet, the distribution of land and water resources does not favour those countries that need to produce more in the future.
- The largest contribution to increases in agricultural output will most likely come from intensification of production on existing agricultural land. This will require widespread adoption of sustainable land management practices

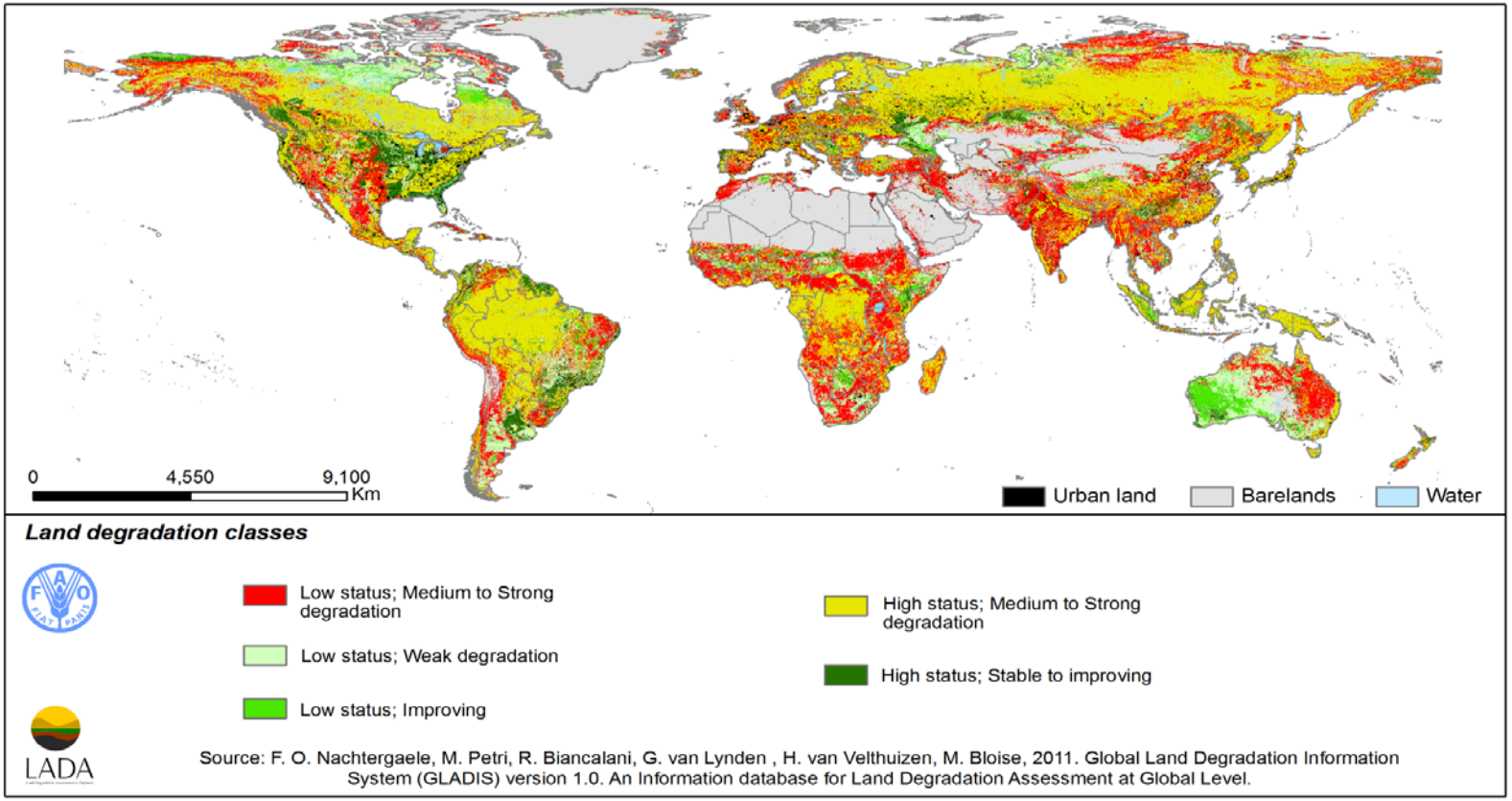
CURRENT AND FUTURE CHALLENGES FOR MANAGING SOILS



- A series of land and water systems now face the risk of progressive breakdown of their productive capacity under a combination of excessive demographic pressure and unsustainable agricultural practices.
- The potential exists to expand production efficiently to address food security and poverty while limiting impacts on other ecosystem values.
- Actions include not just technical options to promote sustainable intensification and reduce production risks, they also comprise a set of conditions to remove constraints and build flexibility. These include (1) the removal of distortions in the incentives framework, (2) improvement of land tenure and access to resources, (3) strengthened and more collaborative land and water institutions, (4) efficient support services including knowledge exchange, adaptive research, and rural finance, and (5) better and more secured access to markets.
- The negative trend in national budgets and official development assistance allocated to land and water needs to be reversed.
- Finally, there is a need for much more effective integration of international policies and initiatives dealing with land and water management.

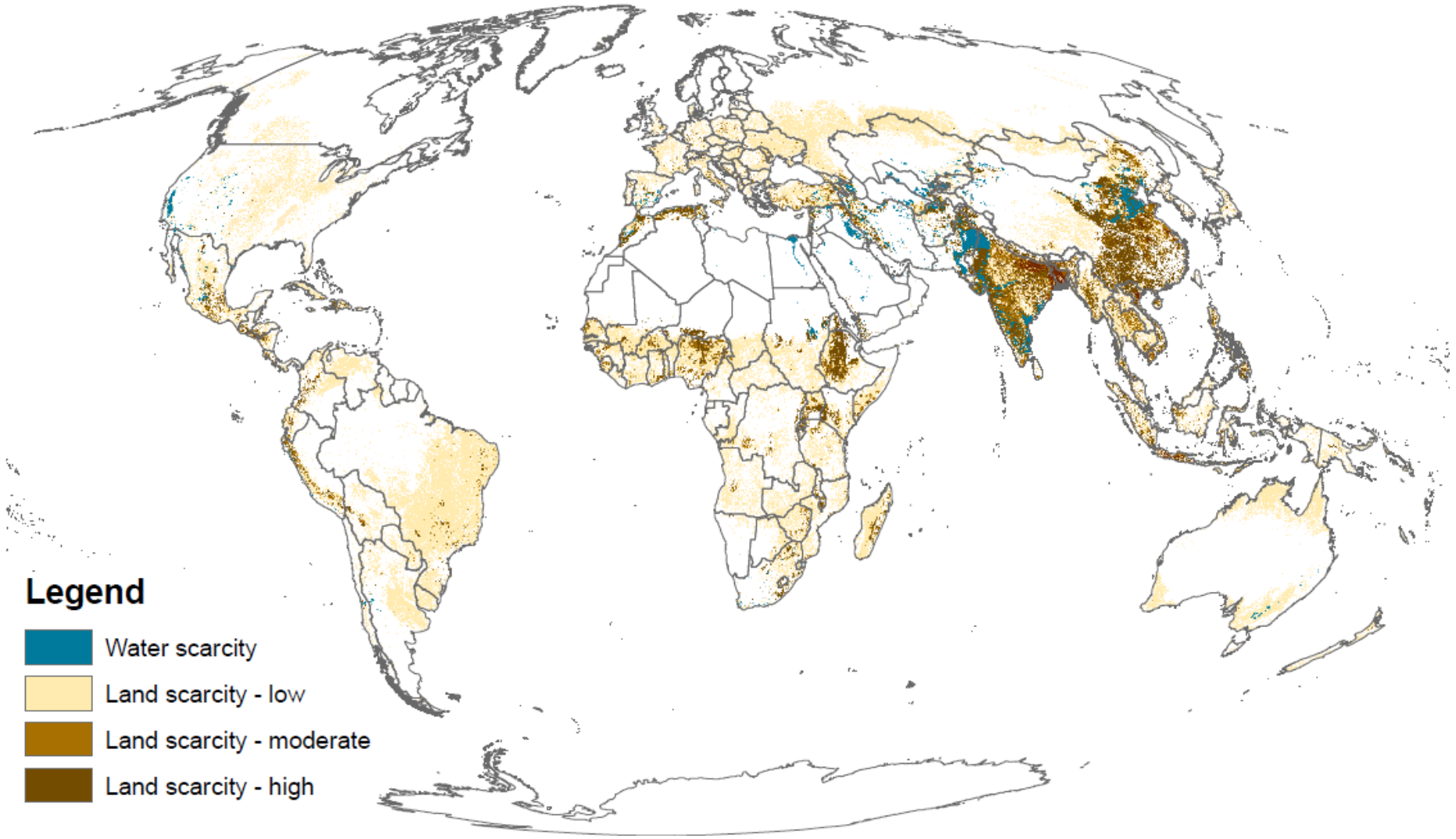
What are the problems with Soils?

- **Soils are fragile and under a high and increasing degradation:**

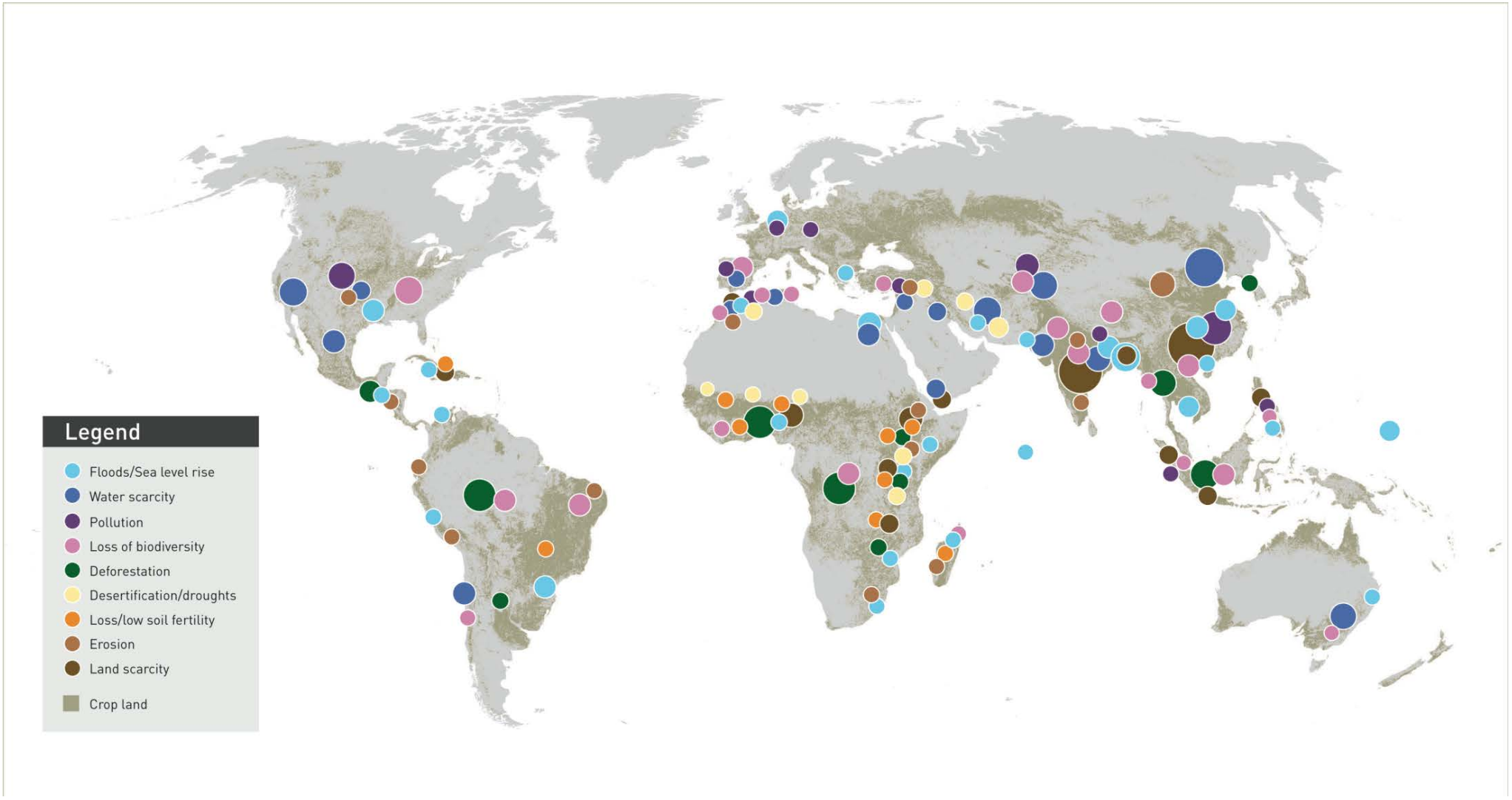


- **Water and wind erosion**
- **Nutrient depletion (OM)**
- **Salinisation**
- **Contamination**
- **Acidification**
- **Compaction**

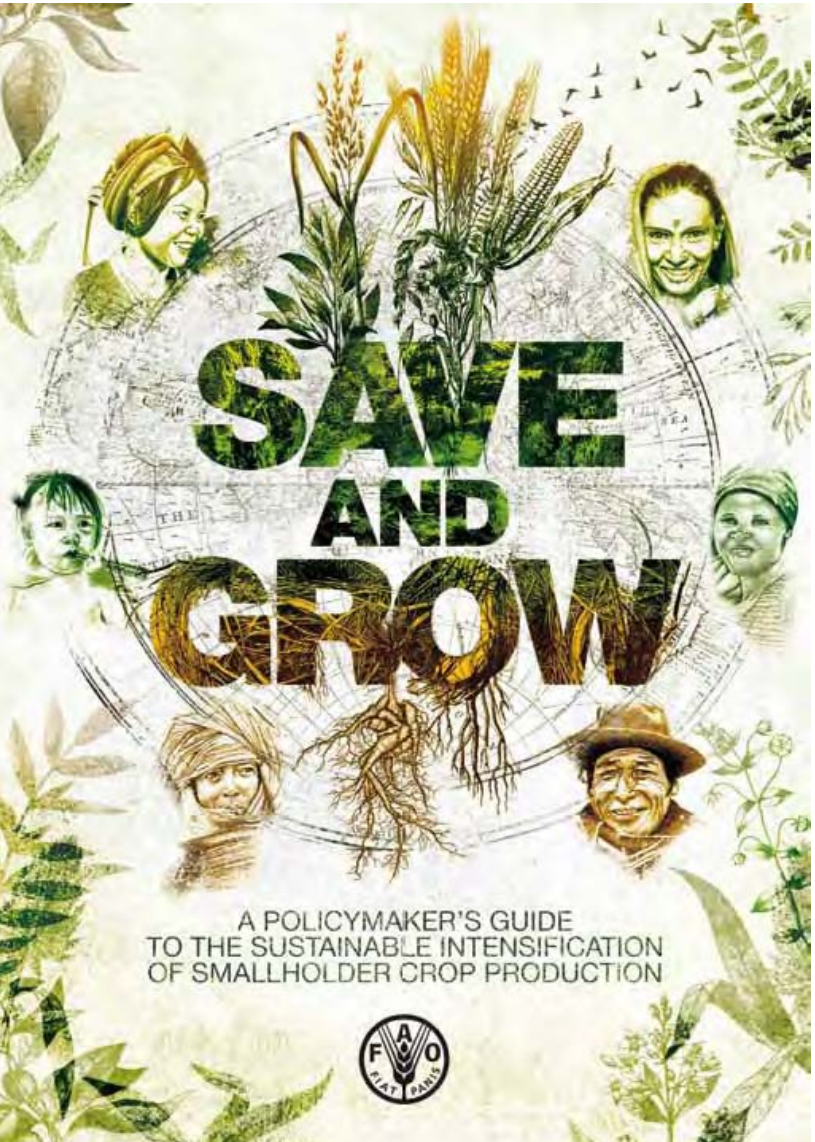
SYSTEMS AT RISK



SYSTEMS AT RISK



NEW FAO PARADIGM FOR AGRICULTURE

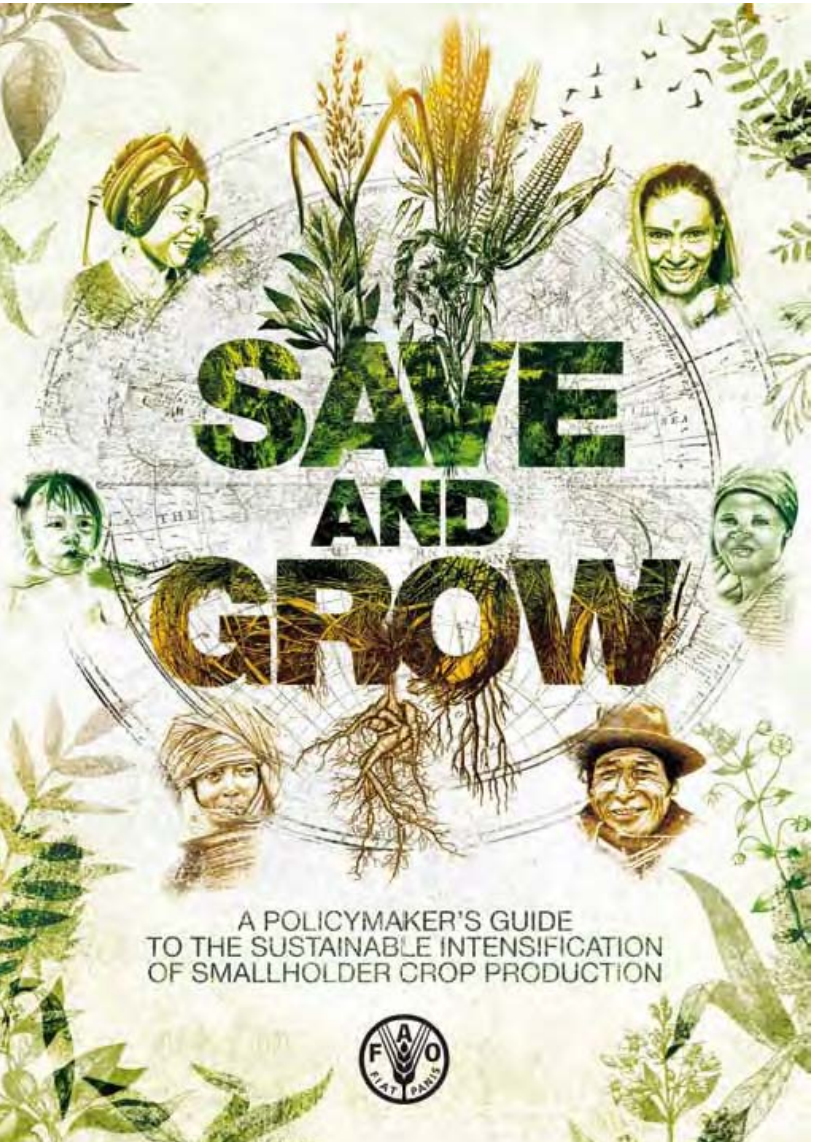


The challenge

To feed a growing world population, we have no option but to intensify crop production. But farmers face unprecedented constraints. In order to grow, agriculture must learn to save.

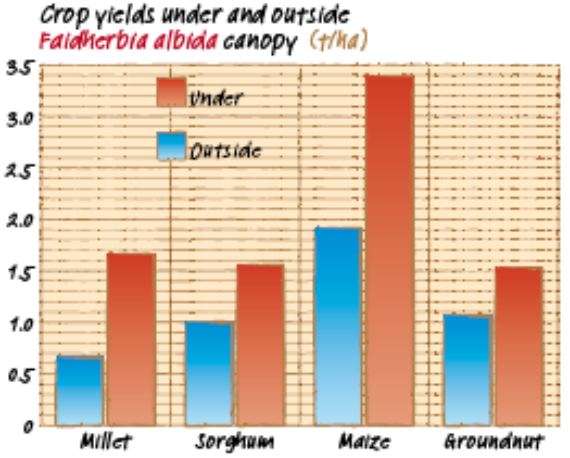
The Green Revolution led to a quantum leap in food production and bolstered world food security. In many countries, however, intensive crop production has depleted agriculture's natural resource base, jeopardizing future productivity. In order to meet projected demand over the next 40 years, farmers in the developing world must double food production, a challenge made even more daunting by the combined effects of climate change and growing competition for land, water and energy. This book presents a new paradigm: sustainable crop production intensification (SCPI), which produces more from the same area of land while conserving resources, reducing negative impacts on the environment and enhancing natural capital and the flow of ecosystem services. While none of the options presented is etched in stone, all are based on sound scientific principles and have helped farmers around the world to "save and grow".

NEW FAO PARADIGM FOR AGRICULTURE



Soil health

Agriculture must, literally, return to its roots by rediscovering the importance of healthy soil, drawing on natural sources of plant nutrition, and using mineral fertilizer wisely.



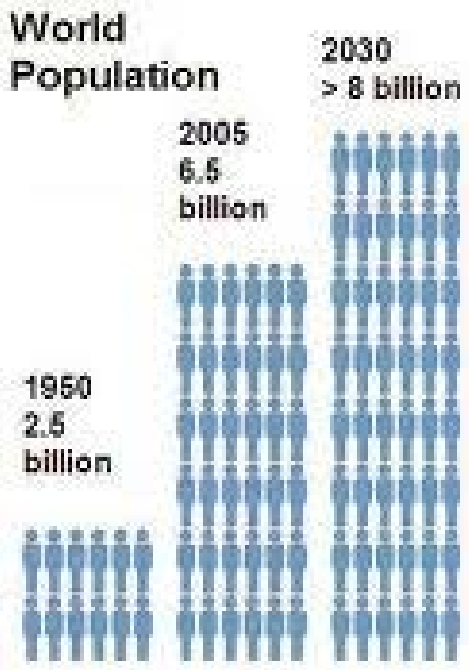
Soils rich in biota and organic matter are the foundation of increased crop productivity. The best yields are achieved when nutrients come from a mix of mineral fertilizers and natural sources, such as manure and nitrogen-fixing crops and trees. Judicious use of mineral fertilizers saves money and ensures that nutrients reach the plant and do not pollute air, soil and waterways. Policies to promote soil health should encourage conservation agriculture and mixed crop-livestock and agro-forestry systems that enhance soil fertility. They should remove incentives that encourage mechanical tillage and the wasteful use of fertilizers, and transfer to farmers precision approaches such as urea deep placement and site-specific nutrient management.

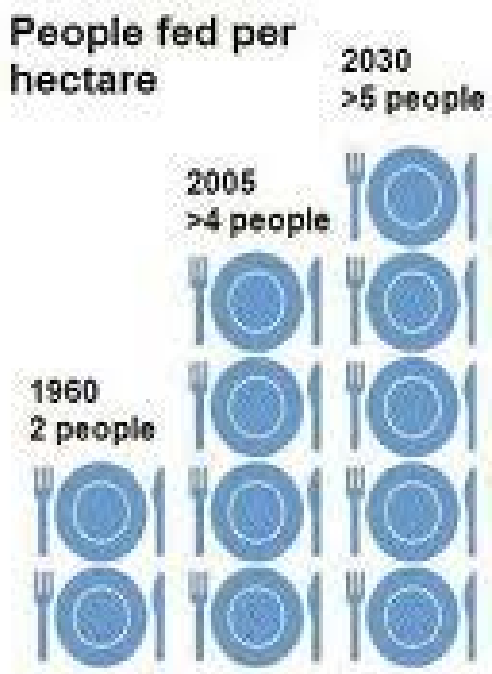
Why Soils are important again?

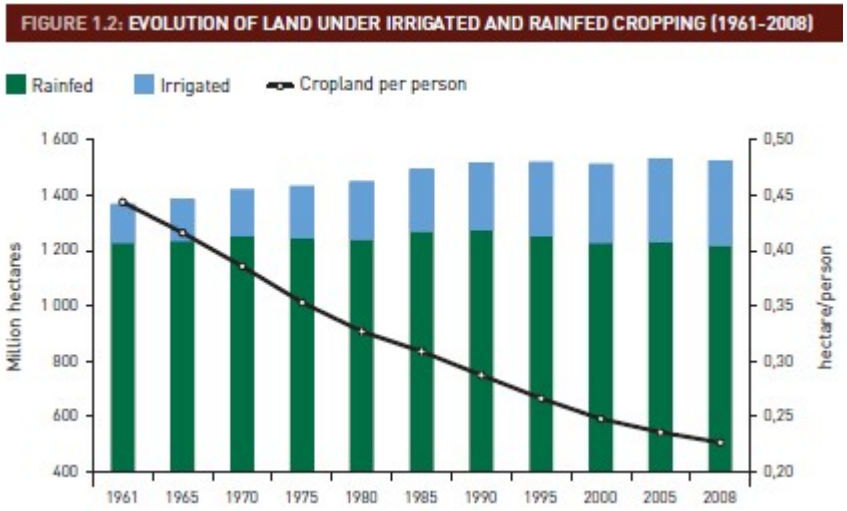
- Growing population demands more ecosystem services provision, especially healthy soils for ensuring **food security** and mainly to reduce **poverty** and allow **rural development**.

UPCOMING CHALLENGES

Food security: population growth, change on diets, food waste, increasing of productivity and production.

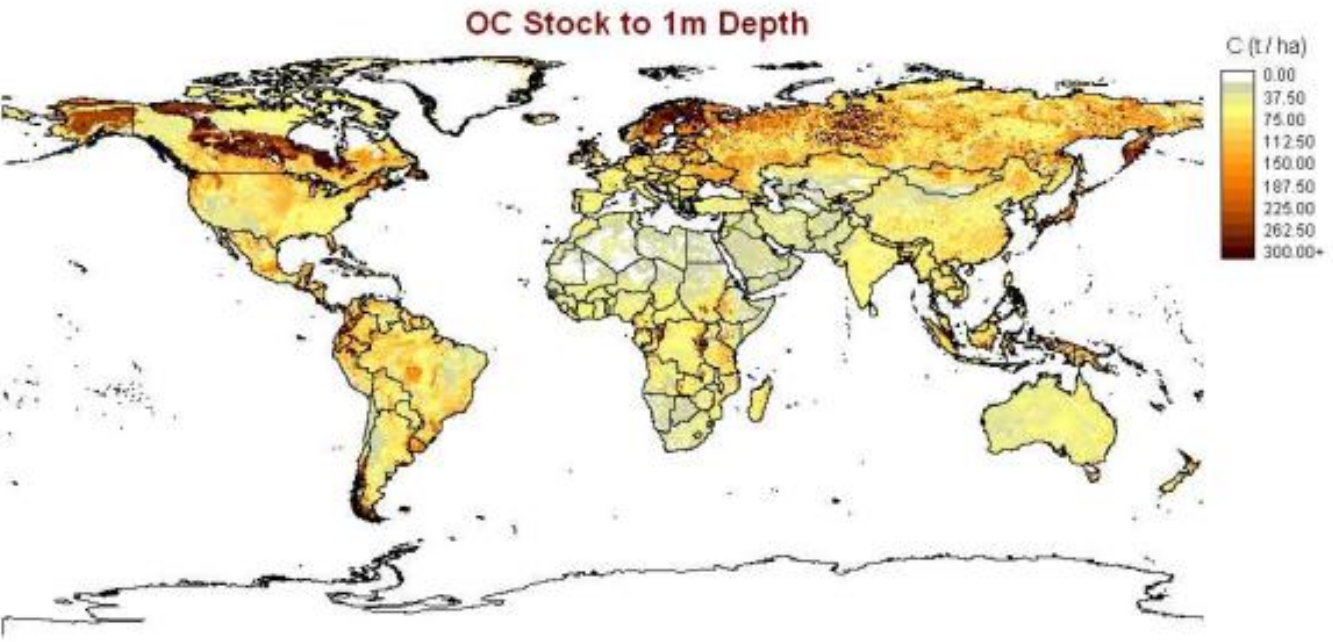






UPCOMING CHALLENGES

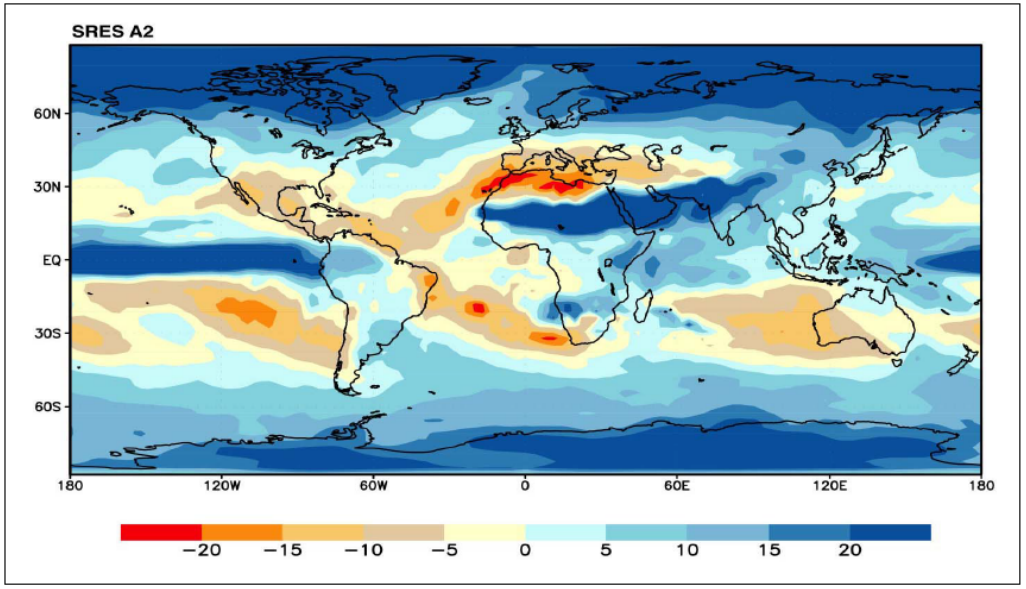
- **Climate change adaptation and mitigation**: provision of environmental systems for the growing population under climate change remains a challenge and soils play a key role on.



UPCOMING CHALLENGES

Water scarcity: climate change scenarios predicts reduction of rainfall in some semi-arid regions. Is soil ready to receive water?

Annual mean precipitation change: 2071 to 2100 relative to 1990 (Hadley Center)



Source: IPCC, 2001.

UPCOMING CHALLENGES

Bioenergy: biofuels and biomass production for fuel. Soil results the key for its production.

Urban growing: best soils occupied by urban settlements.

Regulating services: hidden role of soils

SOILS UNDER PRESSURE

Soil biodiversity

Climate change adaptation and mitigation

Food security

Bioenergy production

Urban expansion

Water scarcity-storage

Further ecosystem services

Help!

Global Soil Partnership

Soils response so far..

Worrying issues:

- Soil data heterogeneous, fragmented, partly outdated (soil fertility, carbon content) difficult to compare, not easy accessible and not responding to users demands;
- Soil capacities are constantly becoming scarce (loosing soil expertise);
- Soil Knowledge too technical for specialists, and not translated and used for decision making and not tailored to development agendas of today's issues;
- Investments in soil management are far too low compared to the needs;
- Need of compatible soil policies for: UNCCD, UNCBD, UNFCC, Food security, disaster and drought management, land conflicts and grabbing , rural poverty , rural/urban planning.

Soils response so far….

- Because it's everywhere, we tend to overlook the fact that soil is a limited natural resource. On top of that, the world's limited area of *fertile soils* are increasingly under pressure from competing land uses. Soil degradation threatens this vital resource, weakening efforts to increase food production for a growing population.

- Soils are often perceived as a second-tier priority and no international governance body to support coordinated global action on their management exists. A unified and authoritative voice for soil management is needed to better coordinate efforts and pool limited resources.

Why a Global soil Partnership ?

A Global soil Partnership (complementing the Global water partnership) can bring due **recognition and concerted action** with stakeholders at international, national and local levels to protect and sustain soil and water resources as the basis for sustainable agriculture and food security.

It will provide a **platform and intergovernmental mechanism** for **updating and sharing knowledge** on soils, for **developing capacities** of users and technical institutions and providing information and evidence for **strengthened policies and investment programmes.**

Why a Global Soil Partnership?

- Improve **global coordination through an intergovernmental mechanism**;
- Put **national and regional needs** in the centre.
- Involve **local institutions** and communities to create ownership.
- Catalyse effective and coordinated **soils policies and investments,** for food security and other ecosystem services.

Soils response today

For these reasons, FAO and a group of partners have launched the Global Soil Partnership (GSP) to improve global governance of the world's soil resources in order to guarantee healthy, productive soils for a food secure world -- and to work together to sustain other essential ecosystem services on which our livelihoods and societies depend.

Launch of the GSP Initiative at Rome 2011

With the support of **EC-JRC**, GSP started its establishment.

200 participants from different type of organizations (120) and countries (100):

- Country representatives to FAO;
- International Organizations
- Research Institutions
- National Institutions
- NGOs
- Universities
- Farmers associations
- Soil science networks and associations.

GSP Vision and Mission

- **The Vision of the GSP** is the improvement of the global governance of the limited soil resources of the planet in order to guarantee healthy and productive soils for a food secure world, as well as sustain other ecosystem services on which our livelihoods and societies depend including water regulation and supply, climate regulation, biodiversity conservation and other cultural services.

- **The Mission of the GSP** is to develop capacities, build on best available science, and facilitate the exchange of knowledge and technologies between stakeholders, for sustainable management of soil resources at all levels with a view to enhancing food security, protecting ecosystem services, and contributing to poverty alleviation in an era of increasing human demands and climate change.

GSP Proposed Pillars of Action

1. Promoting sustainable management of soil resources and improved global governance for soil protection and sustainable productivity;
2. Encouraging investment, technical cooperation, policy, education awareness and extension in soils;
3. Promoting targeted soil research and development focusing on identified gaps and priorities and synergies with related productive, environmental and social development actions;
4. Enhancing the quantity and quality of soil data and information: data collection, analysis, validation, reporting, monitoring and integration of data with other disciplines;
5. Harmonization and establishment of voluntary guidelines of methods, measurements and indicators for the sustainable management and protection of soil resources;

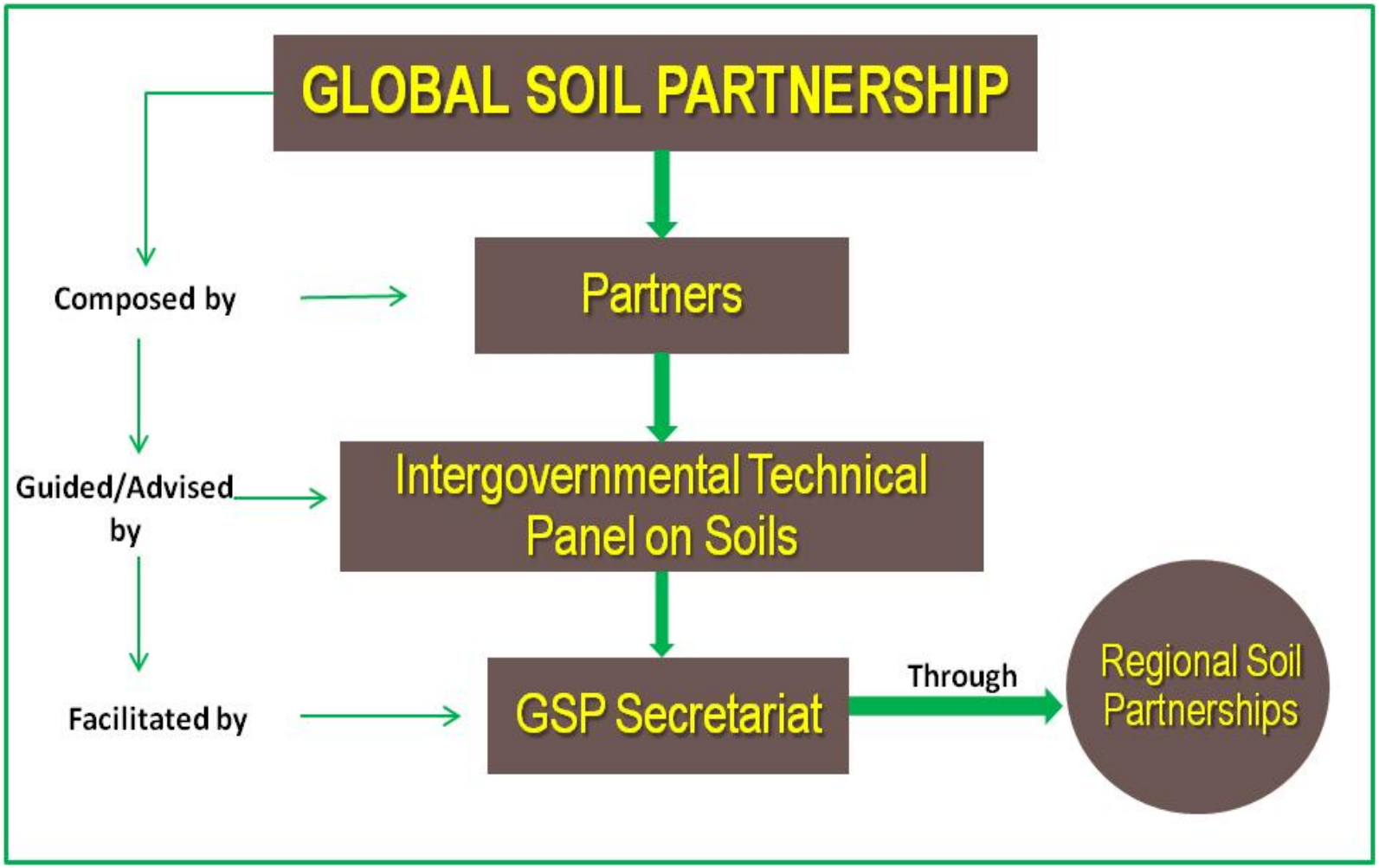
Proposal of the main elements of the GSP

- A **Partnership** open to all governments and all relevant stakeholders and organizations. Regional partnerships are fundamental (composed by any type of regional and national institutions/organizations working in soils);

- A **Secretariat** who will implement the vision and mission of the GSP through Regional Partnerships. The Secretariat will be hosted at FAO and part of its funding will come from FAO's regular programme;

- **An Intergovernmental Technical Panel on Soils** of 25 high-level scientists providing scientific and technical advice to the Global Soil Partnership and FAO. This Panel will be selected and appointed by the country representatives to FAO.

The Global Soil Partnership



AGREED WAY FORWARD BY THE GSP MEETING PARTICIPANTS

TECHNICAL WORKING GROUP Soil Scientists from all type of organizations (voluntary basis)	**December 2011-january 2012**
Open-Ended Working Group Country Representatives to FAO	**February-April 2012**
FAO PROGRAMME COMMITTEE	**May 2012**
FAO COMMITTEE ON AGRICULTURE (COAG)	**May 2012**
RIO+20 Conference	**June 2012**

Where are we with the GSP establishment?

a) A **Technical Working Group (TWG)** was established on 17th October 2011 to prepare the draft of the Terms of Reference for the establishment of the GSP. The 76 voluntary members worldwide were invited to review the working version of the ToR on three rounds. A consolidated Zero version has been prepared by end of February.

GLOBAL SOIL PARTNERSHIP

Zero Version of the Terms of Reference of the Global Soil Partnership

Contents

Where are we with the GSP establishment?

b) Discussion with the **Regional Chairs of the Permanent Representations to FAO**. Full agreement about the establishment of GSP. Request to shorten the current Zero Version ToR, then review it again by countries for final endorsement. Composition of the Open-Ended Working Group will be discussed as most likely not needed.

c) Preparations towards RIO+20 (Unified Soils side event).

GSP is part of the first draft of the Final RIO+20 document as supported by partners.

Two unified Soil Side events will be implemented at Rio+20 to position soils at the highest level agenda.

Additionally, under the GSP framework we are starting the process for:

- Recognition by the UN system of the World Soil Day
- Implementation of the Global Soil Week 2012.
- Recognition of the International Year of Soils 2015.

Where are we with the GSP establishment?

d) **Actions in the field:** while GSP is being formally established, problems in the field cannot be left, so FAO started funding the establishment of institutional networks in the different regions in order to set the basis of the Regional Soil Partnerships and start a process of developing soil information systems in which Capacity Development is the top priority. This is done through Letters of Agreements with leading institutions in the region (South-South cooperation) in Africa, Asia, MENA and Latin America.

Where are we with the GSP establishment?

- GSP Workshop **"Towards Global Soil Information: activities within the GEO Task Global Soil Data"** 20-23 March 2012, FAO HQ Rome.

The objective of the workshop was to review the state of the art of tools and techniques for mapping soils at global and regional scales as an input for defining future activities under the implementation of the Global Soil Partnership. Soil data/information user demands were also reviewed.

Regional Soil Partnerships

Regional Soil Partnerships

The Partnership aims to address the soil issues from the field using the best science possible. Regional partnerships will implement the actions of the GSP, while addressing local needs with local experts and fostering south-south cooperation .

Nanjing Communiqué on Asian Soil Partnership

Nanjing, China, February 11, 2012

We, the soil scientists from 16 Asian countries/regions along with international/national institutes and others with an interest in advancing the science and technology of soil information in Asia have assembled in Nanjing，China， from February 8th to 11th, 2012, to explore opportunities and applications of the emerging Global Soil Partnership(GSP). The meeting was hosted by the Institute of Soil Science, Chinese Academy of Sciences, and sponsored by FAO and Chinese governmental institutions.

We have unique and diverse knowledge of the soil and land use of Asia that we share. We recognize the benefits to be gained from further sharing our information and data on soil survey, soil mapping and capacity development. During the four days of discussions, the participants highlighted the importance of sharing soil information regionally and globally, and with succeeding generations, to achieve food security, carbon sequestration, combating land degradation and to promote climate smart agriculture – the key components of sustainable development and poverty reduction.

Across the region, there is substantial variation in information, capacity, investment and environmental challenges. By working together, individual countries and Asia as a whole will improve soil security and benefit from this new regional cooperation.

We consider the priorities of this partnership should be:

a) sharing and transferring soil knowledge and new technology within and beyond the region.
b) providing soil information to all those with an interest in the sustainable use of soil and land resources.
c) building consistent and updated Asian soil information systems and starting to contribute to the global soil information system through initiatives such as GSM.
d) training new generations of experts in soil science and land management.

To achieve these goals, the participants agreed to establish the "Asian Soil Partnership" and support the vision and mission of Global Soil Partnership (GSP).

The Asian Soil Partnership will be initially operationalised by the setting up of a provisional secretariat and a steering committee to determine the rules of governance. The provisional secretariat will be located at the Institute of Soil Science, CAS, Nanjing, China.

ASIAN SOIL PARTNERSHIP

LAC Regional Soil Partnership

16-20 April will be the workshop for the establishment of the Regional Soil Partnership in Latin-American.

This Workshop

Why addressing soils in the region?

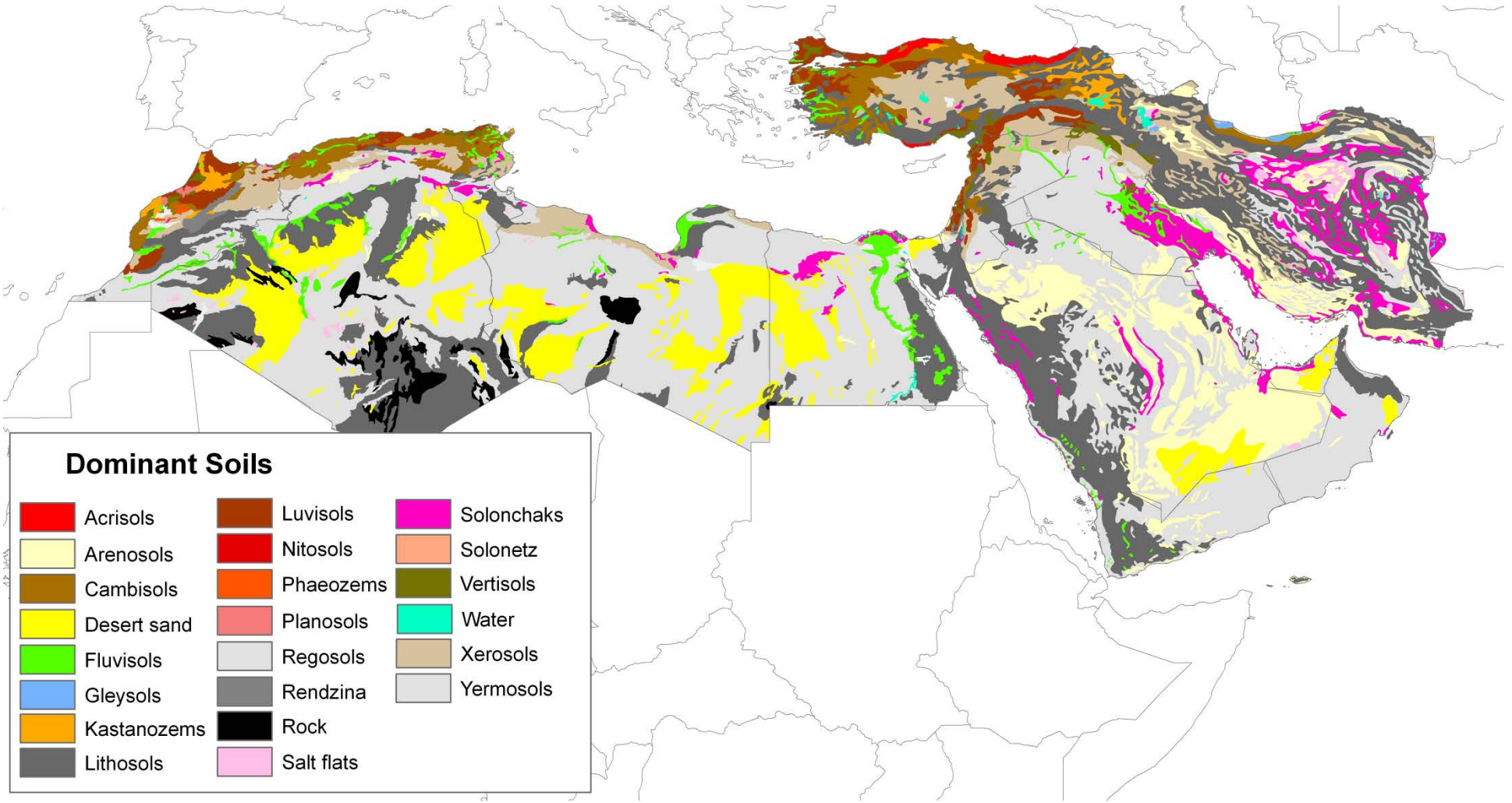
This workshop has the following objectives:

- To present the Global Soil Partnership;
- To present the aim and components of the project in the MENA region;
- To discuss about the status and challenges of soil information in the region and how to establish a joint regional information system;
- To establish the MENA Regional Soil Partnership.

Why addressing soils in the region?

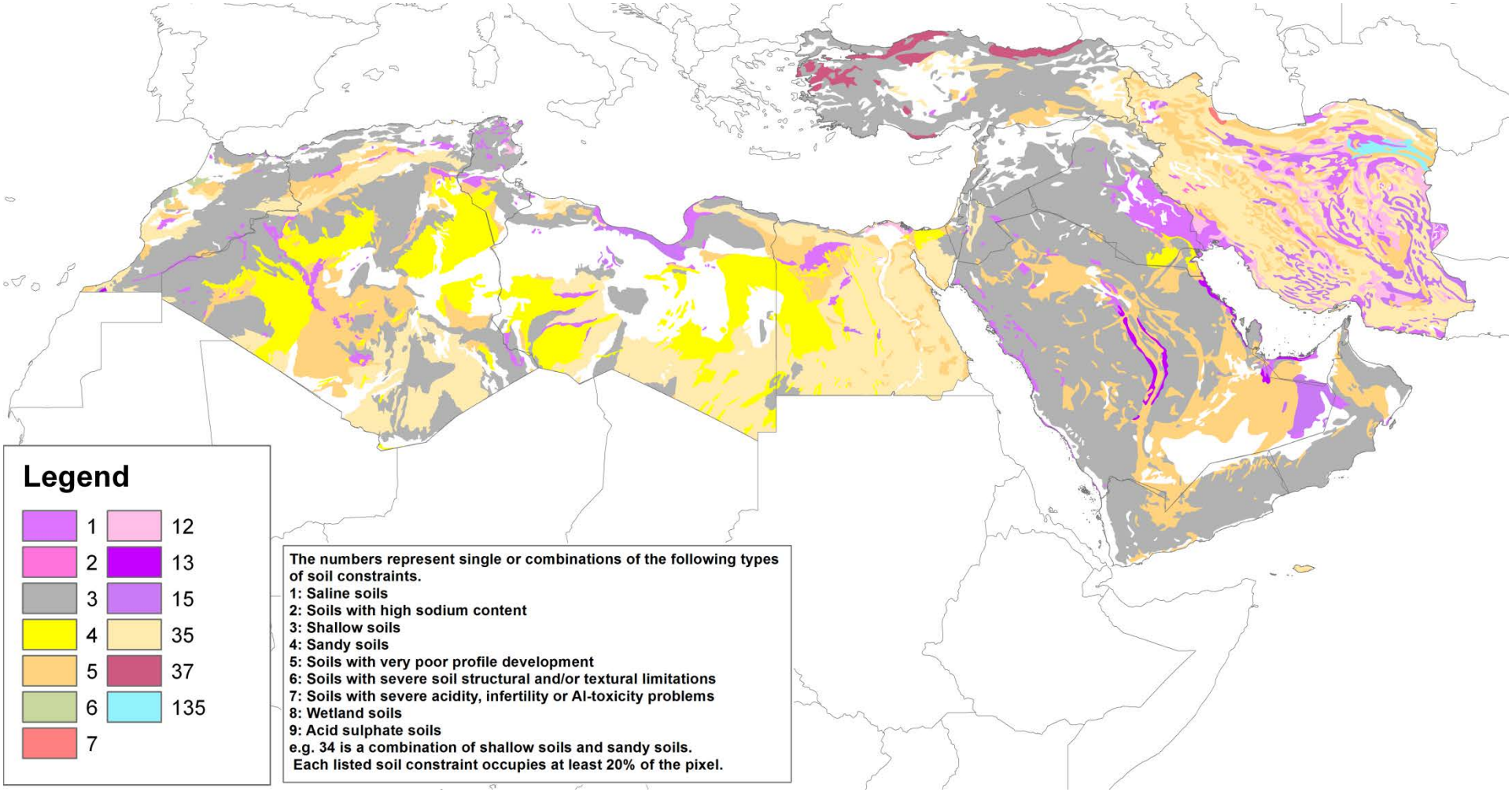
- Dryland covering approximately 7 M km2;
- Although water results the main challenge in the region, yet its diversity allow different land uses that depend on the status of soils;
- Limited area of fertile soils that requires a sustainable soil management strategy;
- Proper soil information could contribute to deal with the challenges, specially linked to climate change.

Why addressing soils in the region?



Source: FAO, presented by E. De Pauw

Why addressing soils in the region?



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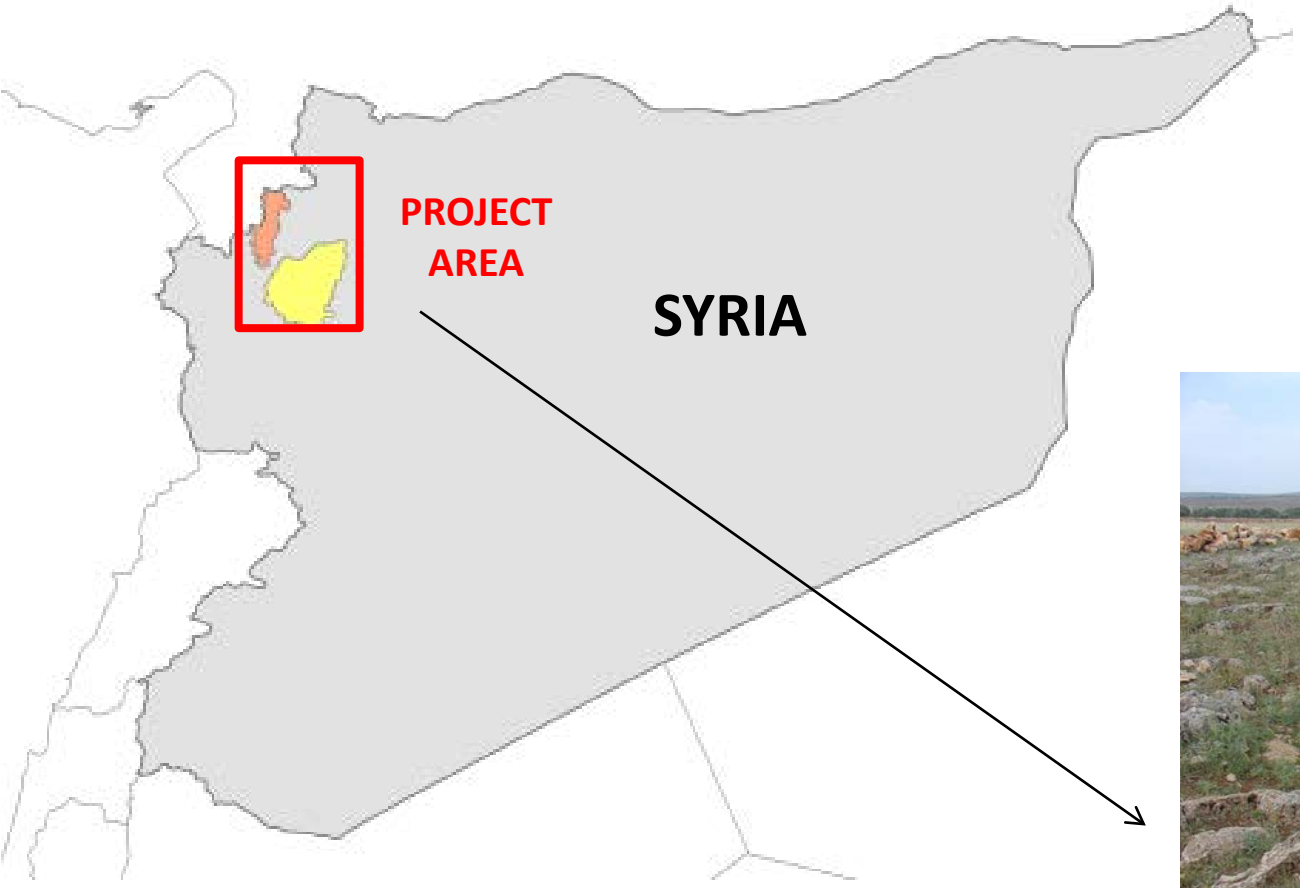
Is soil needed?



Source: E. De Pauw , ICARDA 2012

De-rocking process
(as used in IFAD* projects in Syria)

Source: E. De Pauw , ICARDA 2012

(3) raking rocks of over 30 cm diameter from the field, piling up the rocks at the field

(2) ripping to a depth of usually 90 cm to bring rocks to the surface, normally using a three-shanked ripper mounted on the rear of the bulldozer

(1) initial clearing of the surface rocks using a front-mounted bulldozer blade

Outcome after de-rocking

Source: E. De Pauw , ICARDA 2012

After de-rocking, although still rough and stone-covered, fields can be planted to various crops

With time, manual stone removal and ploughing create an even seedbed

Status of soil resource information in West Asia -North Africa

Source: E. De Pauw , ICARDA 2012

- **A lot more available than inspired by conventional wisdom**

BUT

- Major differences in geographical scope, quality and scale (from 1:25,000 to 1:1,000,000 for country maps)
- Some of the information may be out of date
  - due to changes in state of degradation (e.g. salinization in irrigated areas, wind and water erosion, changes in flooding patterns)
  - major land improvements (e.g. terracing, de-rocking, new irrigation infrastructure)
  - urban encroachment
- Different classification systems
  - Soil Taxonomy, French classification, FAO, Russian classification, local systems
- **A MAJOR PROBLEM: Accessibility**
  - varies greatly between countries
  - access can be restricted to either maps, profile data or both

Some questions?

- **What are the needs and priorities on soil information and management that need to be addressed?**

- **How to positively contribute to deal with the challenges in the region?**

Towards a…….

GLOBAL SOIL PARTNERSHIP