



## CONFERENCE/WORKSHOP ORGANISER'S REPORT

### *“Global Soil Security Symposium”*

The opinions expressed and arguments employed in this report are the sole responsibility of the authors and do not necessarily reflect those of the OECD or of the governments of its Member countries.

#### **Brief Description of what the conference/workshop was about**

Soil security requires maintenance and improvement of the soil resource to produce food, fiber, and fresh water, to contribute to sustainable energy production, adapt to climate changes, and to maintain biodiversity, human health, and function in ecosystems. Those concerned with achieving soil security recognize that attainment involves scientific, economic, industry and political engagement to effectively and credibly inform policy and legal frameworks and implement appropriate actions. Soil security, like food security, has a number of dimensions that interact with environmental, social, and economic components. The discussion at the Global Soil Security Symposium was organized around the five dimensions of soil security, which include (1) capability, (2) condition, (3) capital, (4) connectivity and (5) codification.

To work toward achieving soil security in the next two decades, participants identified goals to secure soil so that it can contribute to solving other global issues. Specific goals for each dimension were designed to achieve the overall goal of soil security, catalyse research and practice, and contribute to soil policy.

#### **Participation – details of total number of participants, countries they came from, backgrounds (academia, industry, etc.)**

Approximately 85 people from 14 countries and 40 institutions met to discuss the topic of soil security.

Countries include: France, Italy, Australia, Mexico, Canada, Brazil, United States, New Zealand, Republic of Korea, United Kingdom, The Netherlands, Thailand, Russia, Lebanon

Backgrounds of participants included academia, government research, agriculture industry, government policy, citizen organizations, non-profit organisations.

#### **Major highlights from the presentations**

##### *Capability*

It is well recognized that not all soils share a similar ability to provide the seven soil functions that are distinguished by the Soil Protection Strategy of the European Union (biomass production, filtering nutrients, source of biodiversity, cultural environment, raw materials, carbon pool, heritage). When soil is not managed to its identified capability, negative impacts on soil conditions can occur that negatively affect its contributions towards general ecosystem services. Soil capability needs to be evaluated according to the seven functions.

For each function, there are indicators that evaluate capability. The USDA NRCS Soil Survey Division has developed many (hundreds) soil interpretations as indicators of soil capability and are linked to soil series descriptions. The USDA's empirical estimates can be quantified by process-oriented computer simulations that also allow risk assessments based on soil limitations. Aside from defining soil capability it is also desirable to explore ways in which potentials can be reached using management support systems, with precision agriculture as an important component.



### *Condition*

The dimension of soil condition refers to the current state of a soil, reflects human management of soil, and how state and management alters or enhances the seven soil functions. Other concepts of valuing and caring for soil through management include soil health, quality, change, and, resilience. Much of the focus on soil condition is associated with agriculture, but functions of soil not linked to agriculture (e.g. – urbanization, mining, and nature preserves) are equally important. The assessment of soil condition is commonly associated with measurement of soil organic carbon as an indicator of improved soil condition; however, improvements in soil condition or function may not always be reflected by changes in soil organic carbon.

### *Capital*

The dimension of soil capital refers to the economic and natural capital value of the soil resource. Placing a monetary value on an asset enables a society to value or secure the asset. Therefore a societal focus in soil security can be economically driven. Monetary value also provides a way for capital and risk markets to engage with valuation of soil as an asset for economic flows. Financial incentives that clarify and define natural capital and ecosystem services are ways to value soil. Other indices that describe soil value can exist, but might be more difficult to assess. Examples include soil rarity, soil diversity, or where soil directly provides food for consumption (subsistence agriculture). The economic value of soil can develop “top-down” through government, market and institutional frameworks or bottom-up through standards, labelling and social licensing of soil products.

### *Connectivity*

Connectivity refers to the connection of individual land managers/farmers with the soil they manage and the broader connection of soil to society and with society to soil. Connectivity also encompasses issues of knowledge, education, training, and awareness. The group identified many ways to know, understand, and value soil. Aesthetic consideration can drive the general population to appreciate and understand the relevance of soil. Participatory learning by managers and experiential learning at schools have the potential to change mindsets on soil value and management. Inter-generational equity is a strong human driver of soil security. The soil health concept provides an effective means of connecting the importance of sustainable soil management by soil managers with the broader community and the means to help build recognition by society of the important role that soil managers play in maintaining soil function for the production of food, fibre, and other ecosystem services.

### *Codification*

Codification refers to the policies, regulations and governance arrangements, in both the public and private sectors that enable soil security. Many countries have formulated soil policy and regulations. Both carrot (incentive programs) and stick (regulatory penalties) approaches are used. The U.S. has many financed incentive programs that implicitly embed soil security policies. Australia has a free market economy and relies less heavily on government programs; however an issue is that government programs for soil tend to be weighted towards natural resource management programs, rather than treatment of soil security for agricultural productivity. Soil security is an internally focused goal for countries that grow and export much of their food and fibre production and an externally focused goal for those that rely on the soil of other nations for food and fibre through imports. While there are national arrangements, international policy around soil security so far has been missing; possibly due to its importance in different domains, e.g., desertification, food security - causing a degree of ownership conflict. The European Union has made the biggest attempt, so far, through the



European Soil Thematic Strategy. Sustainable development goals and similar instruments may offer a way forward.

### **Major outcomes/conclusions in terms of policy relevance**

Goals for Global Soil Security organized around the 5 dimension are the following:

1. *50% of soil is used according to its capability by 2030.*
2. *Soil condition is optimally managed according to the inherent capability in 50% of managed soil systems by 2030.*
3. *Increase annual capital value of soil ecosystem services by 5% per annum by 2030*
4. *Commercial land values based on full economic value of soil capability and condition, by 2020*
5. *90% awareness and understanding of soil security amongst the general public by 2030*
6. *50% of national governments recognize soil security in their laws by 2025*

### **Relevance to CRP theme(s)**

The Global Soil Security Symposium addressed many of the goals and topic areas suggested in the theme on Natural Resources Challenge. Soil is a natural resource that humans rely on for health, nutrition, clean water, biodiversity. Soil Security is about ensuring the ability of soil to function in many of the roles that provide vital ecosystem services. The approach to this conference emphasized 1) valuation of soil as natural capital, 2) communication of knowledge between soil users and soil science, and 3) policy design that links society, science, economy, and governance. Traditional soil science issues on understanding the capability of soil to function in natural and managed ecosystems and anthropogenic impacts on soil function will be woven into this economic, social, and political structure. The approach of this conference was holistic, encompassed many disciplines, and maintained a broad vision of how to deal with scientific knowledge of our natural resources among complex societal, economic, and political issues.

### **Website for further details – please also indicate if the presentations are/will be available on the website**

Soil Science Society of America Website

<https://dl.sciencesocieties.org/publications/meetings/browse/ssa/2015GS>

United States Studies Centre Website

<http://ussc.edu.au/events/past/global-soil-security>