7-10 JULY 2015
PARIS, FRANCE

OUR COMMON FUTURE UNDER CLIMATE CHANGE

International Scientific Conference

Carbon sequestration in soils: a challenge for food security and climate action

Venue: INRA, 147, rue de l'Université, Paris. Amphitheater.

hr	duration	
		Introduction
04:00 pm	00:05	Welcome and introduction. *Dr. François Houllier, CEO of INRA.*
04:05	00:15	The 4‰ target. Why scale out carbon sequestration in soils? *Minister Stéphane Le Foll, MAAF*
04:20	00:15	Towards an international research program on soil carbon sequestration and food security *Dr. Jean-François Soussana,INRA*
		Soil carbon sequestration potential
04:35	00:20	Estimating the potential for soil carbon sequestration *Prof. Rattan Lal, Ohio State U and Prof. Pete Smith, Aberdeen U.*
		Practices and innovation: pathways for C sequestration & food security
04:55	00:20	Carbon sequestration in soils and food security in the context of small farmers *Dr. Deborah Bossio (CGIAR) and Prof. Paul Mapfumo (University of Zimbabwe)*
05:15	00:15	Soil carbon sequestration and food security in China *Prof. Mingsheng Fan, China Agricultural University, Beijing*

Liberté • Égalité • Fraternité
RÉPUBLIQUE FRANÇAISE
MINISTÈRE DE L'AGRICULTURE DE L'ALIMENTATION DE LA PÊCHE ET DE LA RURALITÉ

INRA SCIENCE & IMPACT

cirad AGRICULTURAL RESEARCH FOR DEVELOPMENT

IRD Institut de recherche pour le développement

Monitoring Reporting Verification and Carbon Funding

05:30 00:10 Monitoring, Reporting and Verifying soil carbon
Dr. Martial Bernoux, IRD

05:40 00:10 Verifying soil carbon through carbon flux balance: the ICOS infrastructure
Dr. Denis Loustau, INRA

05:50 00:10 Carbon funding and carbon markets
Claudine Foucherot, CDC Climat and Jean-Luc François, AFD

Links with other international initiatives

Chair Jean-François Soussana

06:00 01:00 Global Soil Forum, IASS, Germany (*Dr. Alexander Mueller, t.b.c.*)
Global Soil Partnership *(Rainer Baritz, FAO)*
UNEP networks *(Dr. Henry Neufeldt, ICRAF)*
Global Research Alliance *(Prof. Martin Scholten, WUR)*
AGMIP *(Prof Cynthia Rosenzweig)*
The Soil Carbon Network for Sustainable Agriculture in Africa" *(Prof Tantely Razafimbelo, Madagascar)*
CCAFS (*Dr. Sonja Vermeulen, CGIAR*)
FACCE-JPI (*Isabelle Albouy, Inra*)

Wrapping-up

07:00 00:40 Which aims for a new research program? Which links with other initiatives? Which first steps for 2015?
Moderators: JL Chotte (IRD), Hervé Saint Macary (CIRAD), JF Soussana (INRA)

07:40 00:20 Conclusions
Michel Eddi (CEO of CIRAD)
Jean-Paul Moatti (CEO of IRD)
Frank Rijsberman (CEO of CGIAR)

08:00 pm **COCKTAIL**

Towards an international research program on soil carbon sequestration and food security

The proposal, made by the French authorities ahead of COP21, to store annually four per mil of the soil organic carbon stock to offset current anthropogenic CO2 emissions is confronted to state-of-the art scientific understanding.

The adoption of best agronomic practices allows a significant carbon sequestration rate, reaching locally up to 4 per mil (4‰) of the soil organic carbon stock for some of the documented examples. However, these examples are unevenly distributed with, in particular, little data for tropical soils.

Assuming a global soil organic carbon stock of ca. 820 GtC (for the top soil), the 4‰ target would result in a carbon sequestration that could peak at 3.5 billion tons C per year (Gt C/ yr) when considering soils from all biomes.

Agricultural soils have a technical carbon sequestration potential between 0.7 and 1.2 GtC/yr, while the potential from all other land uses (including forests and integrated systems like agroforestry) could reach 2.5 GtC/ yr.

Such a rise in global soil carbon sequestration would double the current land carbon sink, through a large increase in global net primary productivity partly obtained by restoring degraded lands (ca. 24% of the total land area) that are widespread in all biomes and in most world regions. Further assuming that net CO2 emissions from land use change could be halted, the land carbon sink that could peak in the 2030-2040's thereby substantially offsetting the current growth in atmospheric CO2.

Positive impacts on food security and ecosystem services can be anticipated, including increased biomass production for bioenergy, as well as climate change adaptation, thereby contributing to sustainable development goals.

The additional soil organic carbon stock would need to be preserved until the end of the century - and as far as possible beyond - through a combination of soil conservation practices and of land adaptation to climate change. Research needs concern:

- Knowledge on the baseline of sequestration (or loss) of soil carbon and on current soil carbon stocks;
- The definition and co-construction of agronomic strategies and practices at various scales (individual to collective) targeting the '4 ‰' objective;
- The transfer and adoption of these strategies and the development of demonstration sites;
- The design, experimentation and assessment of institutional arrangements and public policies, including financial mechanisms that aim at promoting and rewarding relevant practices
- Metrics and methods for monitoring, reporting and verifying carbon sequestration, if possible on the basis of a net-net accounting.

An international research program would bridge these axes with contributions from a number of disciplines (soil science, carbon and nutrient cycling, agronomy, livestock, forestry, remote sensing, socio-economics) and would support the development of programs that could be funded, at least in part, by climate funds.

It could also be structured according to regions with different options (agroforestry, crop-livestock integration, land sparing, soil restoration, etc...) contributing to climate and food security policies. The launch of the research program could be announced at the time of COP21. A map of potential sequestration by region, soil type and farming system will be a first step, to argue the options and assess the barriers and the costs.