UNCCD United Nations Convention to Combat Desertification

Land Day 4

REDD+ and 'Cancùn agreements': what are the perspectives and hurdles for the land

Soil Carbon: at the crossroads of the conventions

Comité Scientifique Français de la Désertification

Martial Bernoux

ECO&SOLS

Functionnal Ecology & Biogeochemistry of Soils & Agro-ecosystems
A French Multi-institute Research group based in Montpellier

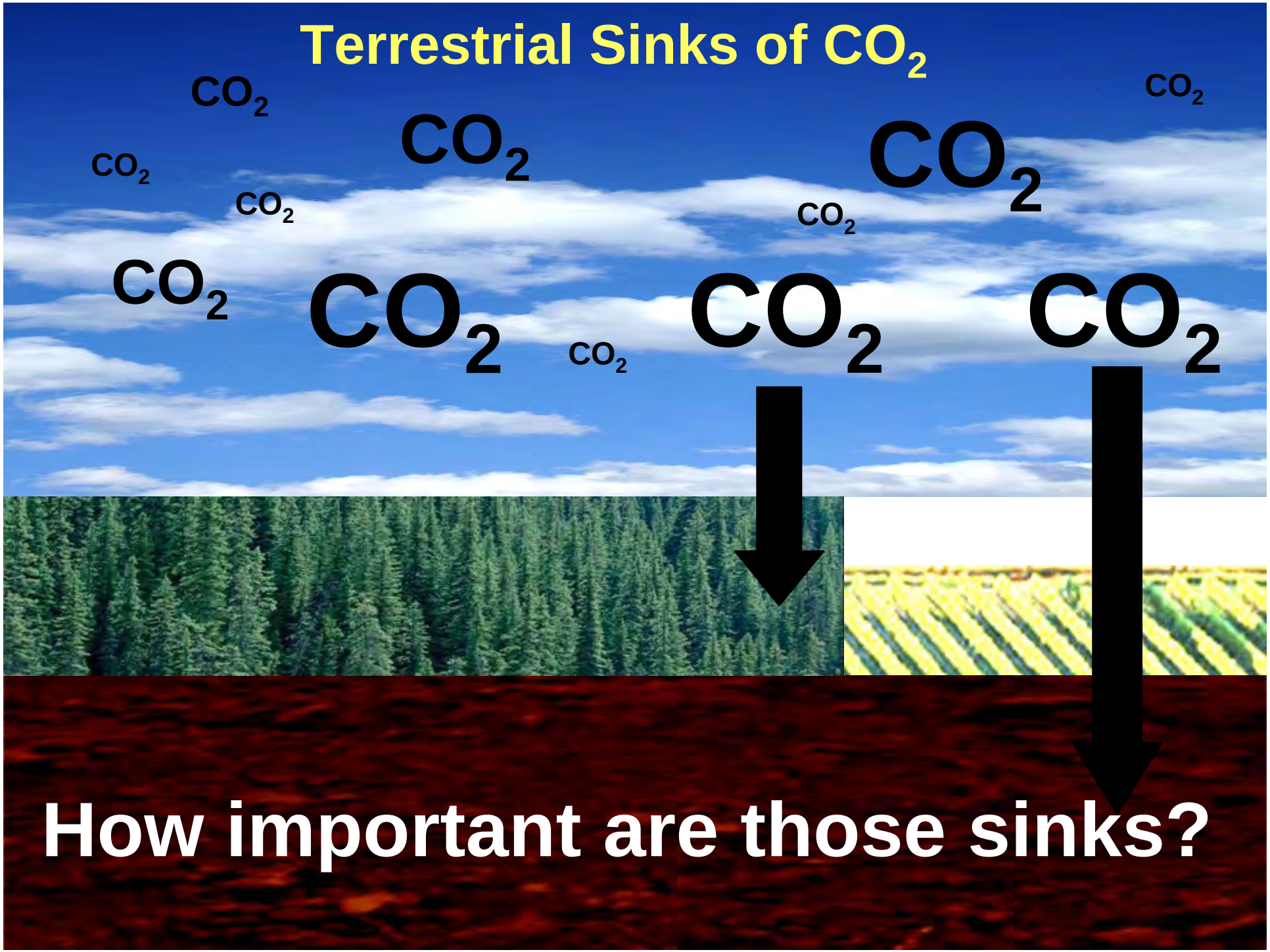
IRD Institut de recherche pour le développement

Saturday, 11 June 2011 – Gustav Stresemann Institut, Bonn, Germany

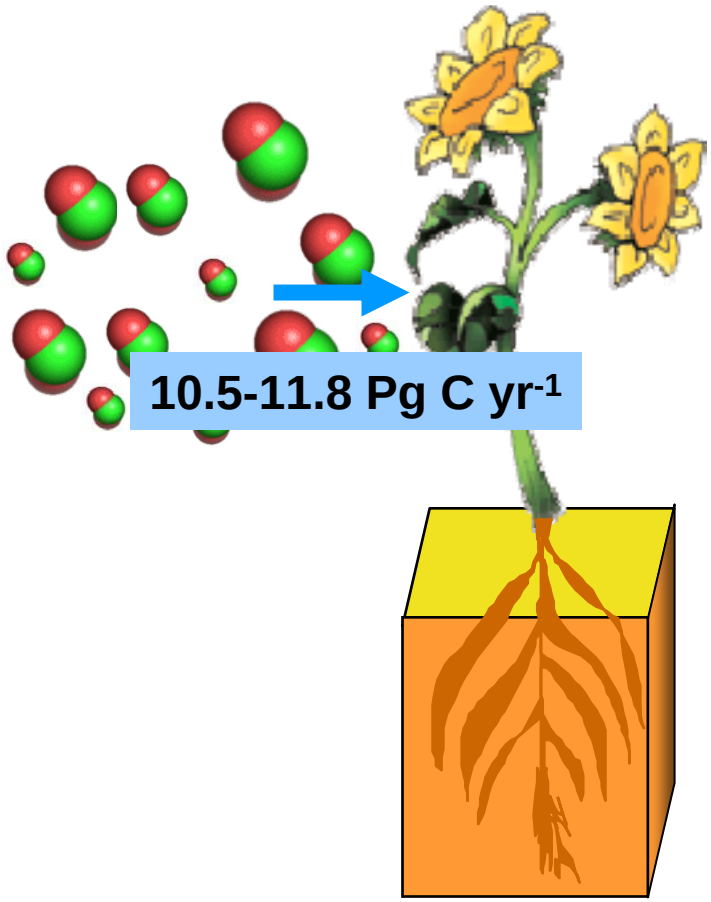
Agriculture and the UNFCCC

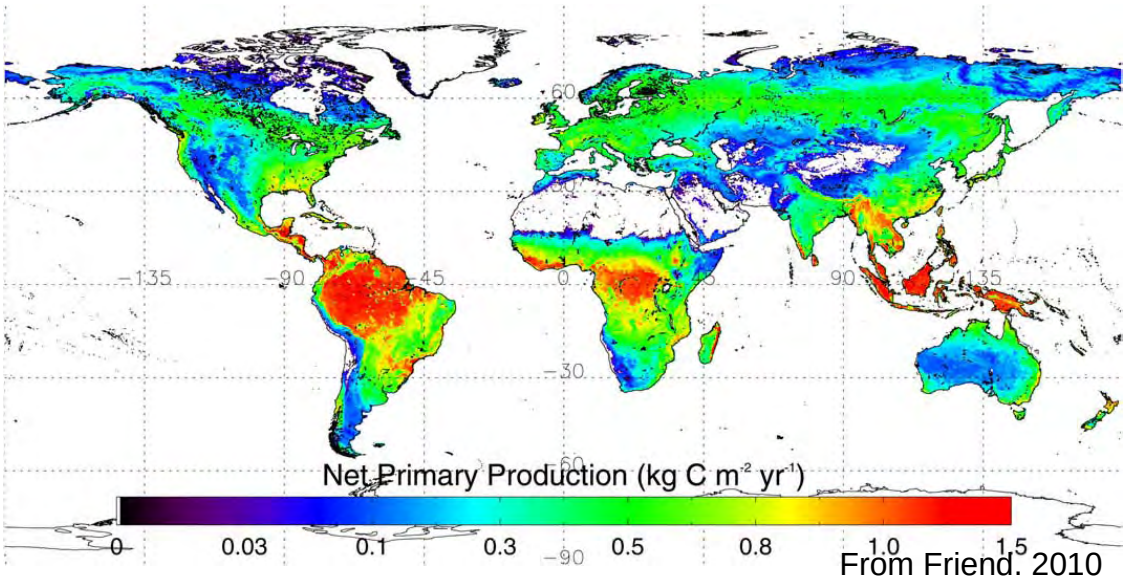
Sources

Sinks


Terrestrial Sinks of CO_2
CO_2
CO_2
CO_2
CO_2
CO_2
CO_2
CO_2
CO_2
CO_2
CO_2
CO_2
How important are those sinks?

How Soil Carbon sequestration Works



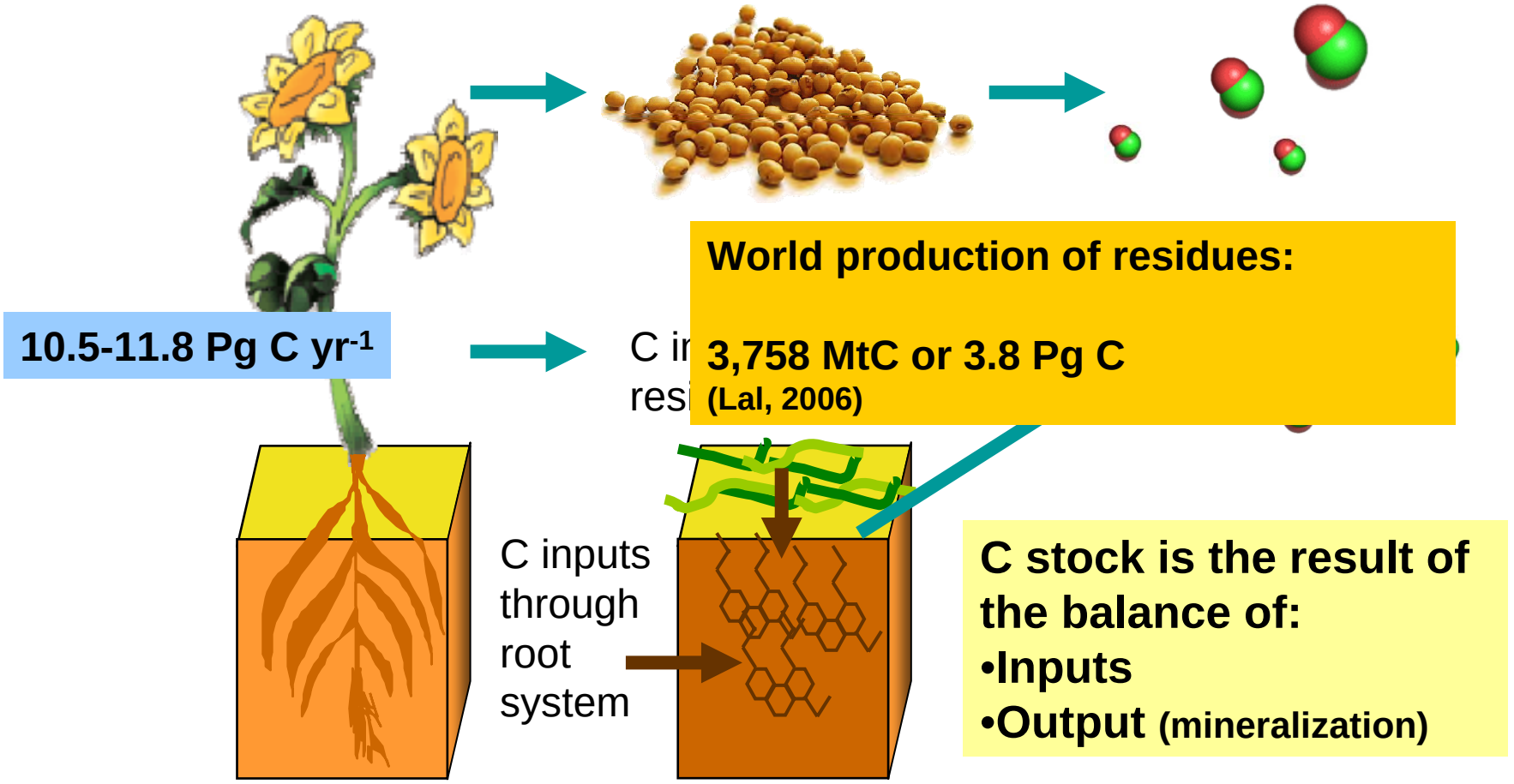


From Friend. 2010

Total Terrestrial NPP = 58.8 Pg C yr^{-1},

Cultivation ~ 14-15%
Perennial grasslands ~ 4-5%

How Soil Carbon sequestration Works



The humification efficiency or the efficiency of conversion of biomass C into humus C is about 5 to 15% in humid temperate climates and 2 to 5% in dry tropical regions (Lal, 2004)

Terrestrial Ecosystems are (still) a sink...

Atmosphere=760

Vegetation=600

~800 in top 0-30 cm

Soils = 1500-2000 (0-1m)

+4.1 ± 0.1

+0.5%

-0.3%

2.4

1.1±0.7

7.7±0.5

2.3±0.4

Very small Change!!

Averages for 2000-2009 (GCP, 2010)

It is thus necessary to implement best management practices in order to promote soil C sequestration

Values Billions tons of C, i.e. Pg C

Terrestrial Ecosystems are (still) a sink...

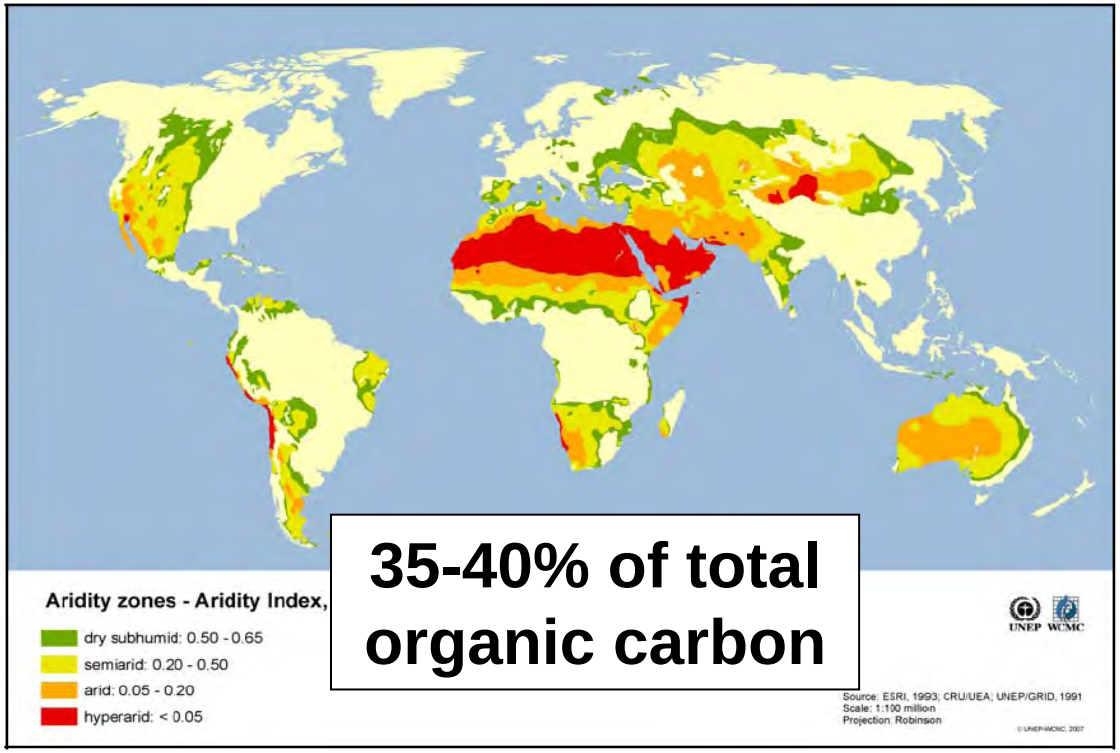
Atmosphere=760

Vegetation=600

~800 in top 0-30 cm

Soils = 1500-2000 (0-1m)

Dry subhumid, semiarid, arid and hyperarid regions



35-40% of total organic carbon

Drylands are part of the solution !

It is thus necessary to implement <u>best management practices</u> in order to promote soil C sequestration

Values Billions tons of C, i.e. Pg C

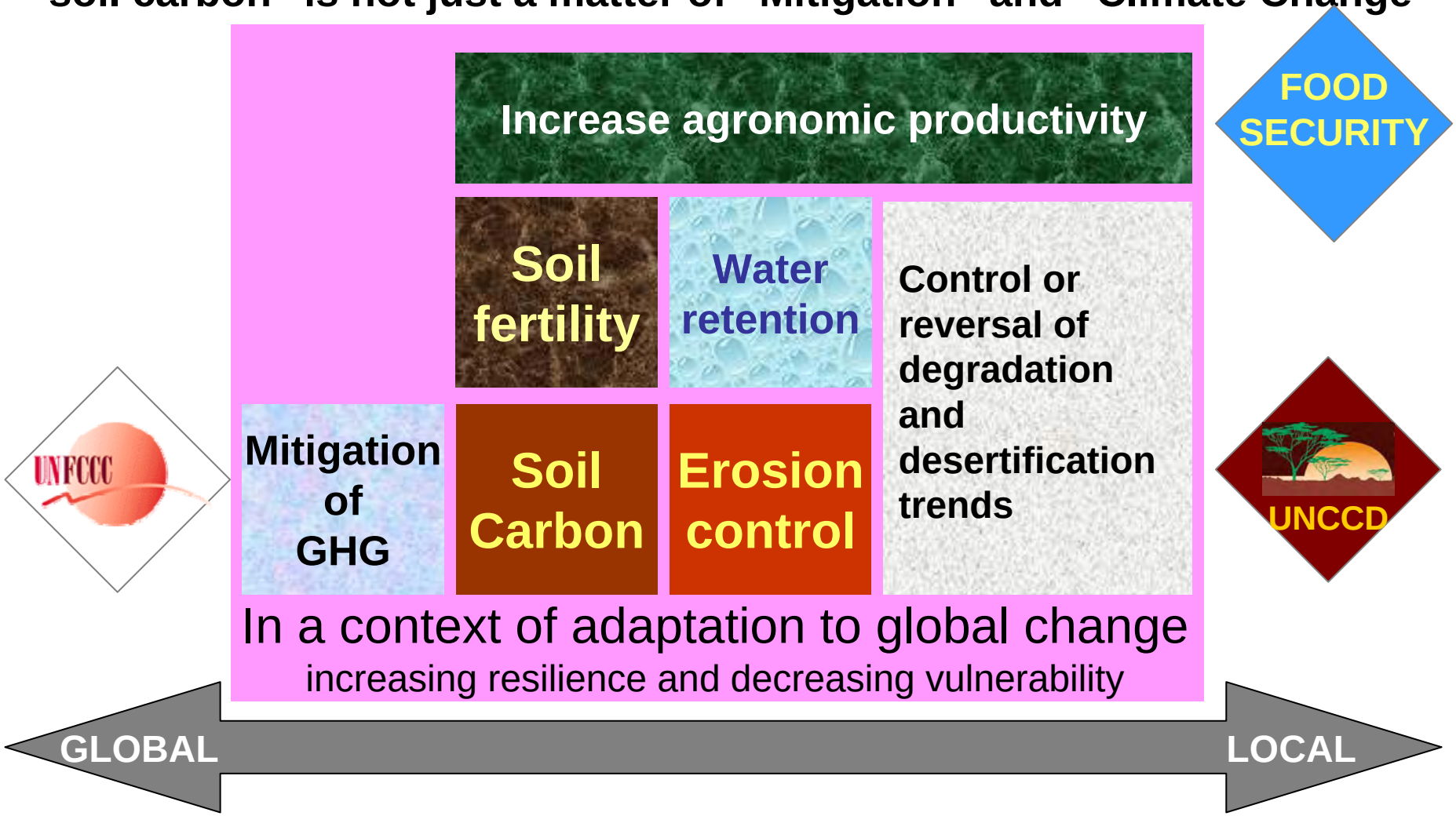
Agriculture, and thus carbon soil management, are essential in mitigation of GHG : need to be better recognized

The only sector answering directly to objective of the UNFCCC:

"The ultimate objective of this Convention […] is to achieve […] stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system […].
Such a level should be achieved within a time-frame sufficient to allow ecosystems to adapt naturally to climate change,
to ensure that food production is not threatened
and to enable economic development to proceed in a sustainable manner.

But "soil carbon" is not just a matter of "Mitigation" and "Climate Change"

soil carbon" is not just a matter of "Mitigation" and "Climate Change"



We need Agriculture that sustainably increases productivity, resilience (adaptation), reduces/removes greenhouse gases (mitigation), and enhances achievement of national food security and development goals.

Climate-Smart Agriculture

Part of the solution is already existing

Science and farmers have brought evidences…. …political decisions are also needed

How to overcome hurdles?

Ex-ante

Ex-post

Ex-ante

Mainstreaming climate smart agriculture in development projects/policies

There is a lack of tools to help project designers integrate climate response activities in agricultural development projects.

Investments in such activities would received due attention at project development stage if justified by reasonable carbon ex-ante appraisals

FAO developed EX-ACT (*Ex-Ante* Carbon-balance tool) to help Assessing potential mitigation benefits of agricultural investment projects

Set of linked Microsoft Excel sheets (19)

Based on land use and management practices

Using IPCC default values (Tier 1) and adhoc coefficients (Tier 2)

Measures C-balance with/without project

http://www.fao.org/tc/exact/ex-act-home/en/

Ex-post

Monitoring is not always the panacea

Result base approach (Soil C stock and ΔC measurements) is not the only solution and may not be possible (affordable) to be fully implemented with the existing technologies, even if technologies are rapidly changing (field and laboratory infrared spectroscopy for soil analysis)

My proposition is that it could be essential to consider a mixing of result based approach with practice-based verification/certification (as in the organic food sector) : For instance paying farmers/communities when they use or shift to climate-smart agriculture known (scientific validation) to protect or enhance soil C stocks: **Payment of Ecosystems Services**

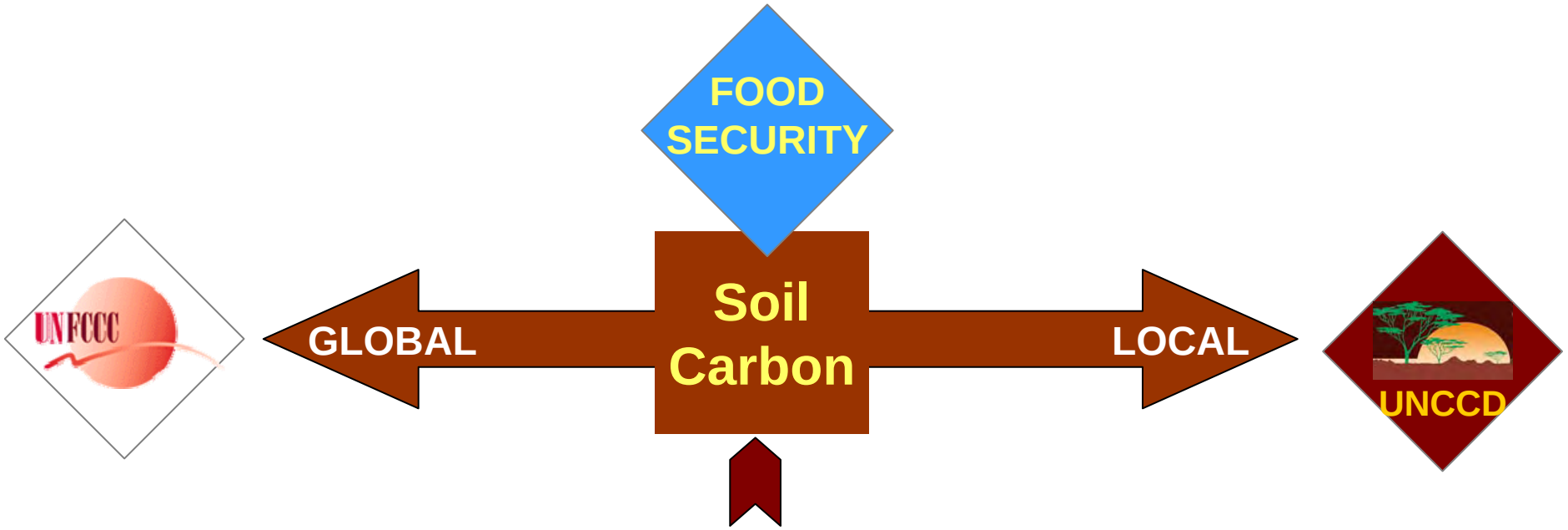
This is even more valid in drylands where the question is not so far to increase soil C stocks, but also to maintain soil carbon at an adequate level to secure all ecosystems services provided at local scales

UNCCD United Nations Convention to Combat Desertification

Land Day 4

REDD+ and 'Cancùn agreements': what are the perspectives and hurdles for the land

soil carbon" is not just a matter of "Mitigation" and "Climate Change"



Climate-Smart Agriculture

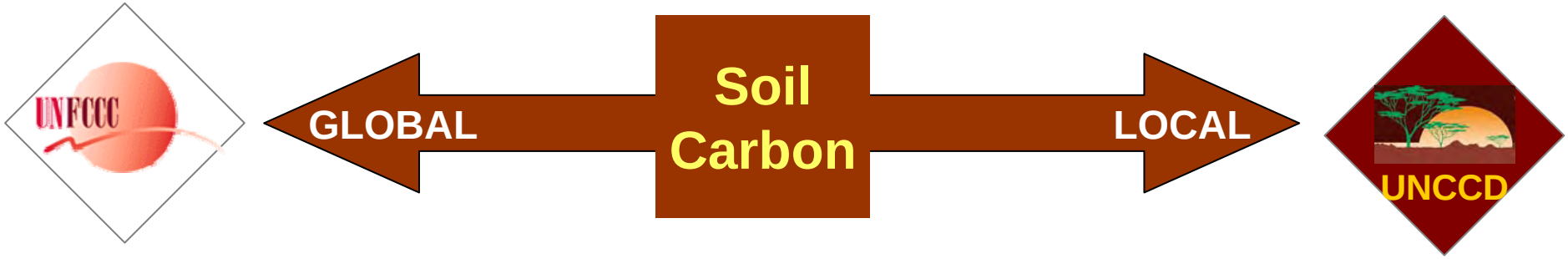
We need Agriculture that sustainably increases productivity, resilience (adaptation), reduces/removes greenhouse gases (mitigation), and enhances achievement of national food security and development goals…even more in drylands

UNCCD United Nations Convention to Combat Desertification

Land Day 4

REDD+ and 'Cancùn agreements': what are the perspectives and hurdles for the land

Soil Carbon is at the crossroads of the conventions



Thank you for your attention

Contact

www.csf-desertification.org

www.montpellier.inra.fr/ecosols

www.ird.fr

martial.bernoux@ird.fr