



# Climate change, agriculture, and food security...

Should Africa move  
towards low-carbon green  
agriculture?



By Louis Bockel

## Diagnosis

### Climate change

Length of growing seasons

More frequent and severe droughts, floods and weather extremes , rising of water temperatures

Affect local food supplies

Compound the constraints on crop and livestock production systems

compromises

### Agriculture production and productivity

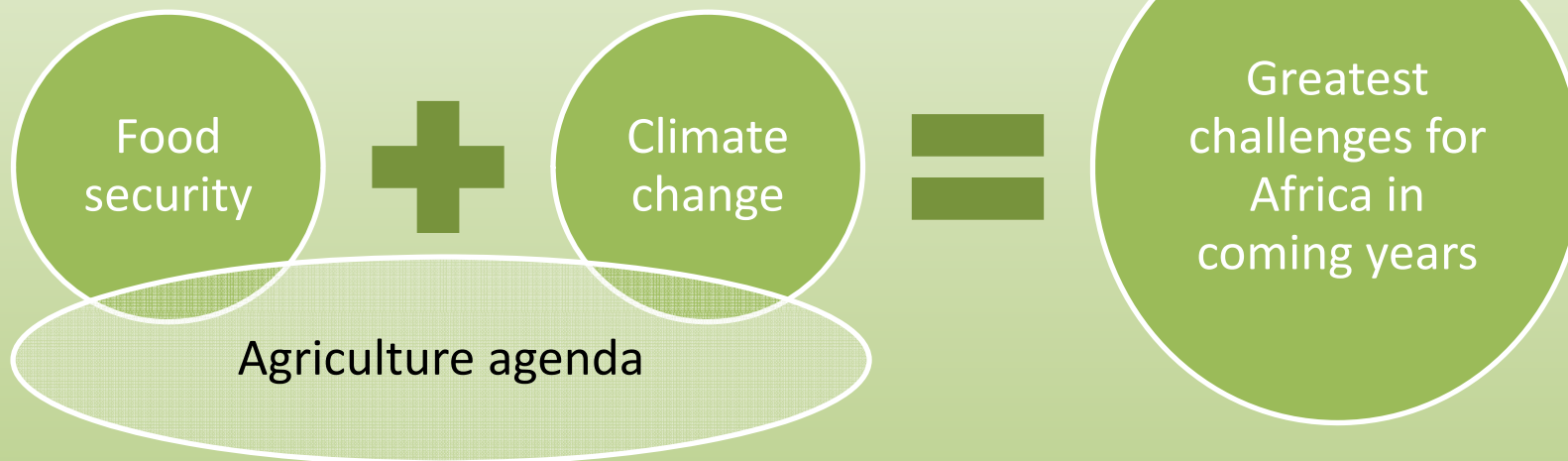
Backbone of most african economies

Threaten the livelihoods of large proportions of the African population

consequently

**Exacerbate poverty and food insecurity**





adapt agriculture to the new climate reality

Appropriate policy  
and incentives

Adapted  
Technics/inputs

Engagements from  
stakeholders

All actors involved



# Potential synergies and trade offs between food security and mitigation (FAO 2009)

Food  
Security  
Potential

Food Security Potential: High  
Carbon Sequestration Potential: Low

- Expand cropping on marginal lands
- Expand energy-intensive irrigation
- Expand energy-intensive mechanized systems

Food Security Potential: High  
Carbon Sequestration Potential: High

- Restore degraded land
- Expand low energy-intensive irrigation
- Change from bare to improved fallow
- Agro-forestry options that increase food or incomes
- Conservation tillage and residue management, limited trade-offs with livestock
- Improved soil nutrient management

Food Security Potential: Low  
Carbon Sequestration Potential: Low

- Bare fallow
- Continuous cropping without use of organic or inorganic fertilization
- Slope ploughing
- Over grazing

Food Security Potential: Low  
Carbon Sequestration Potential: High

- Reforestation/afforestation
- Restore/maintain organic soils
- Expand biofuel production
- Agro-forestry options that yield limited food or income benefits
- Conservation tillage and residue management, large trade-offs with livestock

Carbon  
Sequestration  
Potential

# Building Synergy between climate adaptation and mitigation in agriculture

## Agriculture Adaptation Targets

cropping systems resilient to drought and water stress

reduce flood recurrence and improve resilience to natural disasters

diversify rural income and strengthen HH economic resilience

Increase protection against disaster (Disaster risk management, insurance)

## double-target actions

new cropping technics

adequ. irrigation

land use management

PES to farmers

labour-intensive public works

## Agriculture Mitigation Targets

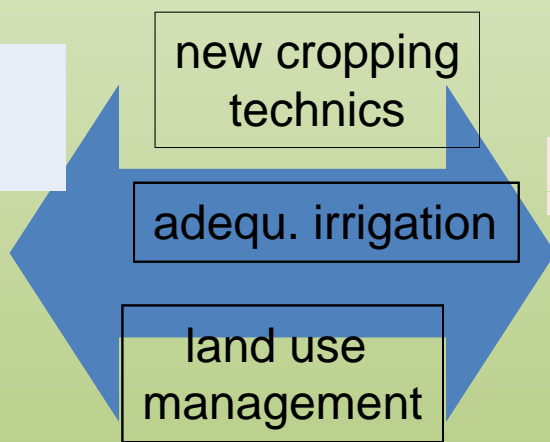
enriched carbon soils

reduced CH<sub>4</sub> emissions

rehabilitated land in watersheds

reduced deforestation and slash and burn pract.

Reforested areas improved pasture management



## How low carbon options contribute to agriculture productivity and food security ?

### Climate change

Increased carbon in  
soils

Decrease GHG  
emissions

Mitigation

### Agriculture production and productivity

More biomass,  
more residue,  
more production

Better land  
management

Adaptation

How carbon helps?

### Reduce poverty and food security

Value to farmers,  
communities,  
society

More employment





# Core Principles that guide FAO's work on Climate Change

Integrating climate change concerns into food security and development planning

Build synergies in mitigation, adaptation and sustainable food production

Mainstream appraisal of GHG impact - carbon balance in projects, programmes and policies

Addressing adaptation and mitigation as an ongoing social learning processes

sustained internalization of agriculture mitigation practices in farming systems



# Towards green agriculture?

- A consensus is progressively building around the “development of a new paradigm for sustainable agricultural intensification—more food with less land, more efficient water use, less fossil fuel inputs and reduced greenhouse gas emissions”
- There is the potential to combine different sources of finance for the development of agricultural and rural economies, and to support climate resilience, low carbon and agricultural productivity/food security objectives together.



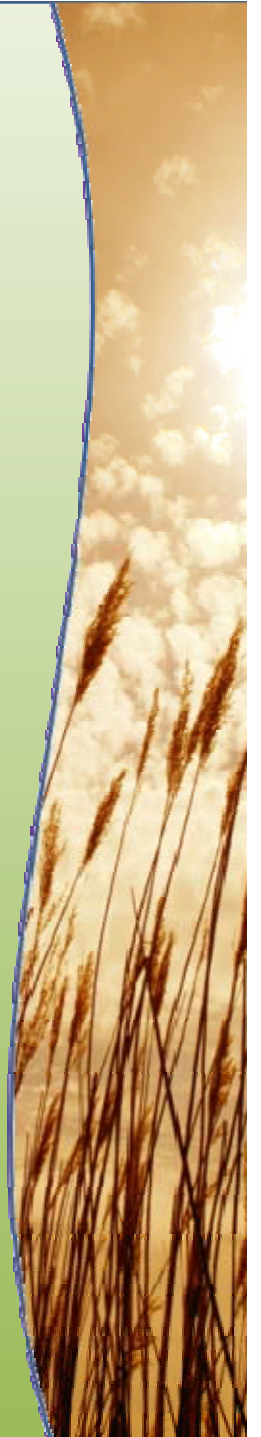


# Conclusion

- Africa's ability and means for mitigating climate change lies in agricultural and terrestrial carbon.
- This contribution would concurrently bolster African food security, through increased investments in sustainable land management practices that are carbon-friendly.
- Agricultural carbon activities also offer significant co-benefits through rehabilitating degraded soils, increasing productivity of agricultural landscapes, and expanding capacity of communities to cope with climate accidents (flood, drought)



Thanks



## Moving toward green agriculture

A Green Economy could be of great benefit to much of African agriculture, but need to work on the following areas:

Need to strengthen institutions to manage the demands for 'greening' agriculture

Develop agriculture infrastructure and investment

Capacity building to allow research/extension services to enable farmers to cope with climate variability

Develop modern risk-management tools such as index insurance and other formal insurance schemes

New finances to conduct the necessary changes (carbon fund?)



## Moving toward green agriculture

With what kinds of options?



Suppression of the  
burning  
(harvest  
residues...)



Improve soil fertility  
and plant biomass  
production



Improve management:  
Reduce/no tillage  
and/or cover  
crop/mulch





# References

- **Seventh African Development Forum. *Acting on Climate Change for Sustainable Development in Africa*. Climate Change, Agriculture and Food Security *Issues Paper #2* ADF VII • 10 - 15 October 2010 • United Nations Conference Centre • Addis Ababa, Ethiopia. Available at:**  
**<http://www.uneca.org/adfvii/documents/IssuePaper2ClimateChangeAgricultureandFoodSecurity.pdf>**
- **TWENTY-SIXTH REGIONAL CONFERENCE FOR AFRICA. Luanda, Angola, 03 – 07 May 2010. CLIMATE CHANGE IMPLICATIONS FOR FOOD SECURITY AND NATURAL RESOURCES MANAGEMENT IN AFRICA.**
- **Climate change and food security: a framework document. FAO.2008**
- **Food security and agricultural mitigation in Developing countries: options for capturing synergies.fao.2010.**

