Impacts of climate change on farming and food security

Bruce Campbell
Program Director
Article 2 of the Treaty
“stabilization of GHG concentrations […] should be achieved within a time frame sufficient […] to ensure that food production is not threatened” (emphasis added).

Proposed agriculture text was dropped in Cancun (only calling for a SBSTA work program)

Now it remains as “agriculture as a driver of deforestation” in REDD+
In order to meet global demands, we will need 60-70% more food by 2050.
Long term impacts on production
Crop suitability will fall in many areas

Andrew Jarvis, CIAT/CCAFS

% change
-95 to -31
-30 to -11
-10 to -1
0
1 to 29
30 to 47
48 to 98

50 crops, to 2050
Irrigation will be impacted

Zhu and Ringler, IFPRI
Impacts on prices and food security
Food price rises

2050 price –
Climate change
(two different models)

Current price
2050 price –
No climate change
“Unchecked climate change will result in a 20% increase in malnourished children by 2050,”

Gerald Nelson, IFPRI/CCAFS
Impacts already measurable
• Many causes, climate not main driver but contributory
• Poor Australian wheat harvests in 2006 and 2007
• Poor European wheat harvest 2007
Historical impacts on wheat


% Yield impact for wheat

Lobell et al (2011)
Farmer’s are adapting..... Zai in Burkina
Climate change adaptation will sometimes drive increases in emissions

- No rice planting before 15th June
- Harvest rice in October; reincorporate residues
- Plant wheat in November
- But high temperatures in March dictate an earlier planting time for wheat
• 2 million hectares now being burnt
• CO2 and haze
Incremental Adjustments

Transformative Adaptation

Costly, risky and complex

Incremental:
- early harvesting
- manipulation of the crop canopy
- selection of drought-tolerant root stock
- use of water efficient technologies and practices

Transformative
- Relocation of grape production or wineries to cooler regions
- Shifts to other crops
- Diversify into additional on and off-farm income-generating activities

*Parks et al CSIRO*
Message 1: Recognise the multiple roles of agriculture

- Food Security
- Mitigation
- Adaptation
Message 2:
Get agriculture as a work program
Message 3:
It is feasible to incentivize agriculture and reduce deforestation.
CCA FS/FAO/ZEF: Incentives to Agriculture, halting deforestation. 8th June, 3.15 pm

CCA FS/FAO: Climate-Smart Agriculture 10th June, 6 pm

Meridian Institute: Addressing Agriculture in Climate Change Negotiations: A Scoping Paper  Saturday 11th June, 6pm

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Thank you