Food security and climate change

A report by the High Level Panel of Experts on Food Security and Nutrition (HLPE)

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Request from CFS

- Review existing assessments and initiatives on the effects of climate change on food security and nutrition
- Focus on
  - the most affected and vulnerable regions and populations
  - the interface between climate change and agricultural productivity,
  - the challenges and opportunities of adaptation and mitigation policies and actions for food security and nutrition.
Report organization: five chapters

1. Assessing vulnerability to climate change today
2. Assessing vulnerability tomorrow
   - Plausible scenarios of the future
3. Adaptation
   - Options to address food security challenges from climate change
4. Mitigation
   - Options to reduce GHG concentrations while supporting sustainable food security and poverty reduction
5. The need for coordination and coherence of food security and climate change policies and actions
Dimensions of vulnerability to climate change

- Vulnerability depends on risk...
  - Exposure
  - Magnitude
  - Sensitivity
  - Ability to respond and adapt

- Vulnerability components
  - Biophysical and social

- Vulnerability affects individuals, household, communities, and agricultural systems

- The poor are especially vulnerable
Examples of vulnerable livelihoods

- Sensitive cropping systems
  - Potato-based systems are sensitive to high nighttime temperature
  - Rice-based systems are sensitive to high daytime temperature
- Women who haul water are sensitive to increased variability in precipitation
- Key staples and sources of diet diversity susceptible in some regions (e.g., wild foods, fruits and vegetables)
- Low-income, rural communities
Most vulnerable regions?

- Arid and semi arid regions of the tropics
  - Sahel of sub-Saharan Africa, South and West Asia, North Africa, India and parts of the dry Andes in Latin America.
- Coastal areas, at risk from flooding and sea level rise.
  - Countries with agriculture in river deltas
  - Small Island States.
Most vulnerable systems?

- Pastoralists and smallholder farmers in dry areas, particularly in South Asia and Africa
- Marine fishery production among tropical nations
- Small farms with limited access to input and output markets and off-farm opportunities
- Regions where conflicts for land and water are already pending
Integrating biophysical and socioeconomic futures essential for understanding vulnerability

- With high population growth and low income growth, average kilocalorie availability declines in all regions by 2050.
- Climate change increases the number of malnourished children substantially.
- Trade flows adjust if trade policies don’t constrain
Adaptation to increase the general resilience of food systems

- Adaptation to climate change is embedded in the broader need to
  - Produce more food
  - Build more resilient food systems
  - Consider the needs and rights of farmers
  - Support vulnerable groups and communities
  - Address sustainability
GHG emissions linked to agriculture

- Sources of agricultural GHGs
  - 13% of total GHG emissions result directly from agricultural activities
  - 2% indirect (energy and other inputs used in ag)
  - 11% to 17% from land use change, most associated with agricultural practices
- Total: 26 to 32% (2005)
Assess mitigation and food security jointly

- Reduce emissions at the lowest food security cost and improve food security at the lowest emissions cost
- Undertake full-cost assessment of mitigation options
  - upfront, transaction, transition, opportunity
- Need appropriate metrics to assess emissions reductions in a food security perspective
Mitigation options that also enhance food security: examples

- **Direct**
  - Farming practices that increase soil carbon in degraded soils
  - Fertilizer management that reduces fertilizer application by increasing plant uptake
  - Livestock and manure management that reduce GHG emissions and lower farmer cost per unit of output
  - Water management that saves water and reduces GHG emissions
  - Crop residue management that increases soil health and reduces GHG emissions

- **Indirect**
  - Manage food consumption for lower emissions and more efficient food systems
  - Reduce emissions from land use change for agriculture by increasing agricultural productivity
RECOMMENDATIONS FOR COORDINATION AND COHERENCE OF FOOD SECURITY AND CLIMATE CHANGE POLICIES AND ACTIONS
Four principles for policies and action

- Integrate food security and climate change actions
- Increase the base of evidence for policy-making
- Involve all stakeholders in decision-making
- Focus on the needs and contributions of the disadvantaged
Five sets of recommendations for national governments and international organizations

- Pursue synergies in food security and climate change actions
- Increase resilience of food systems to climate change
- Develop low-emissions agricultural strategies that contribute to food security
- Collect information locally and share knowledge globally
- Facilitate participation of all stakeholders in decision making and implementation
Integrate food security and climate change concerns

- Increase immediately investments for food security and resilience to climate change
- Refocus agricultural research to address a more complex set of objectives, including adaptation and mitigation
- Modernize extension services
- Build human, physical, and institutional capacity
Increase resilience of food systems to climate change

- Facilitate
  - Exchange of information on farmer practices
  - Improved farmer access to weather information
  - Greater diversity in the field and broader access to genetic resources
- Promote an international trading regime that supports food security and contributes to the resilience of food systems
- Invest to increase resilience to climate-change driven water availability risk
- Support special management challenges of coastal areas
Develop low-emissions agricultural strategies that contribute to food security 1/2

- Adopt policies and develop programs that discourage land use change for agriculture
- Promote crop, livestock, manure, and water management practices that
  - Prevent loss of soil carbon
  - Build carbon soil carbon banks
  - Prevent land degradation
  - Reduce greenhouse gas emissions
Develop low-emissions agricultural strategies that contribute to food security 2/2

- Manage food consumption for lower emissions in food systems
- Assess the contribution of various types of biofuels to mitigation and food security
Collect information locally and share knowledge globally

- Collect more spatially explicit biophysical data
- Monitor and share information on existing practices and performance
- Improve information about vulnerable communities/populations and regions
- Improve models that facilitate understanding of climate change effects on agriculture
- Organize regional sharing of experience and knowledge
Facilitate participation of all stakeholders in decision making and implementation

- Promote debate on the roles of the public and private sectors in safeguarding food security in the context of climate change
- Encourage public-public information- and technology-sharing partnerships to share the value of public goods developed and knowledge gained locally
- Increase transparency and civil society participation to improve efficiency and equity
Recommendations for the CFS

- Include climate change recommendations in the Global Strategic Framework (GSF) for Food Security and Nutrition
- Encourage more explicit recognition of food security in negotiations on climate change and international trade
- Enhance the role of civil society
- Support efforts to improve data collection and a collection sharing mechanism on international data gathering for climate change and food security
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