

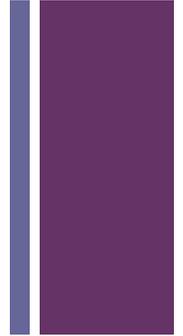


Agricultural Development and Adaptation to Climate Change: Issues and Challenges

Capacity Development Workshop on Improving Agricultural Productivity, Water Use Efficiency and Strengthening Rural Livelihoods
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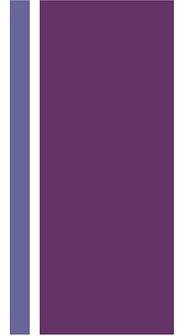
+ Overview



- Concepts
- Agriculture and climate change: Why it matters for development
- Adaptation options in agriculture: Where to start looking
- Key questions: Impacts, tipping points, development trends
- Key questions for decision making
- Take away messages

Farmers have always had to deal with risk – how does climate change pose a new type of problem?

+ Concepts



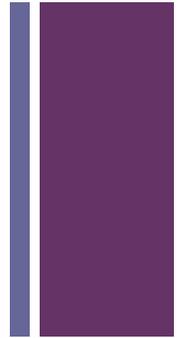
■ Adaptation

- A process of adjusting to changes in variables that influence e.g. human wellbeing & survival, ecosystems
- Takes place at different levels, with different actors, different levels of consciousness, purpose and timing

■ Vulnerability

- How sensitive and exposed an individual or system is to a specific natural hazard (flood, drought, hurricane, etc.)
- Determined by geographical location, gender, age, political affiliation, livelihood, religion, access to resources and wealth (entitlements) as well as exposure
- $\text{Vulnerability} + \text{Hazard} = \text{Risk}$

+ Concepts (2)

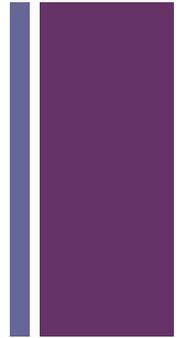


- Climate is the pattern of weather, meaning averages, extremes, timing, spatial distribution of temperature, humidity, and extreme weather events, ie. hurricanes, cyclones, typhoons...

Climate change means changed patterns ([Australia drought example](#))

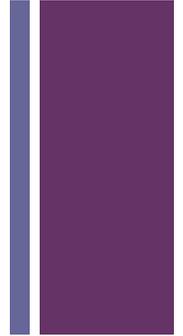
Perception of Climate Change	Reality of Climate Change
Uniform across planet	Non-uniform
Gradual	Rapid
Mainly about temperature	Not just about temperature
Not necessarily harmful	Mostly harmful

+ Agriculture and climate change: Why it matters for development



- One of the most sensitive sectors to impacts of climate change
- Remains the major source of livelihoods of majority of world's rural poor
- Productive agriculture is necessary for food security (but not sufficient)
- **Major overlapping issue for addressing both climate change and poverty**

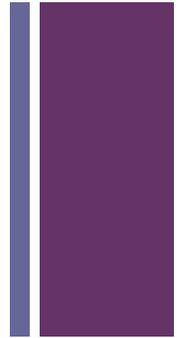
+ Agriculture and climate change: Focus on food security



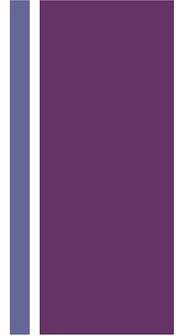
- Food security has four main dimensions:
 - Access to food
 - Safe and healthy use of food
 - **Food availability** (production constraints due to climate change; use of land for bioenergy crops)
 - **Stability of supply** (extreme weather events, global insecurity)
(from Cohen et al, 2008, 'Impact of climate change and bioenergy on nutrition' IFPRI)
- Climate change is an important factor influencing food security, but not the only one
- None of the factors affecting food security will ever exist in isolation, thus all need to be taken into account, thus **climate change needs to be considered seriously in the food security debate**

+ Adaptation options: Where to start looking

- Baseline
 - Existing climate variability vs. future climate change
 - Existing poverty vs. future poverty (other changes)
- Impacts
 - Immediate, secondary, tertiary
 - Predicted *with* preparedness/response and *without* preparedness/response
- Responding
 - Reducing greenhouse gas emissions (*mitigation*)
 - Adjusting to the changes (*adaptation*)



+ Adaptation options in agriculture



- **More irrigation and water storage** [implications for downstream water users, vector-borne diseases]
- **Different crops** [implications for diet, market success, seed access, knowledge and experience in planting]
- **GMOs** [sensitive topic, uncertainties about consequences]
- **Bioenergy crops** [new opportunity, overlap with greenhouse gas mitigation, valid criticisms]
- **Urban migration, i.e. get out of agriculture** [no guarantee of improved wellbeing, urban risks]

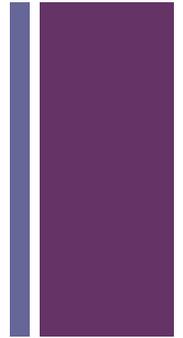
+ Adaptation options: The Agriculture dilemma

- More reliable water source (eg. through irrigation) = higher productivity
- Same responses to adjust to drier climate as to reduce poverty
- BUT - less rainfall, less water, irrigation not viable, agriculture not viable!
- Higher productivity not guaranteed to result in reduced poverty
- Finally not enough water available – farmers are **maladapted** to the new climate: still rely on same crops, same activities
- Climate change only one of many pressures on the rural poor & agriculture

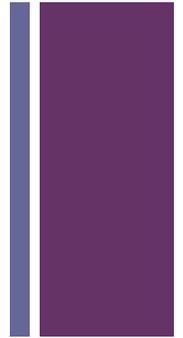


+ Adaptation options: Where to start looking

- Responding to the impacts of climate change will not necessarily address underlying factors of vulnerability...
 - So should adaptation focus on the impacts of climate change, or on underlying issues such as differentiated entitlements, equality, power...? Major debate in adaptation discussions.
- Technical fixes, infrastructure cannot address socio-cultural issues, larger issues of the chosen development approach
- Changes necessary in institutions, attitudes, priorities
- Development activities often at odds with reducing vulnerability to climate change or hazards

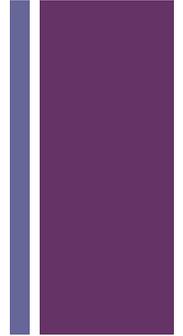


+ Key questions for decision making



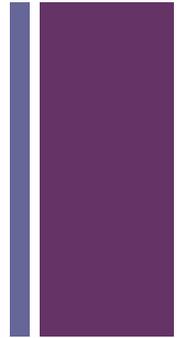
- How much climate change can a given crop take?
- Given limited funds, what are the best investments:
 - Different or modified crops?
 - More irrigation? More water storage? [infrastructure]
- How will rural-urban and cross-border migration as a consequence of climate change affect rural livelihoods and food needs?
- How will price changes affect agriculture (rural) sector?
- How to make a decision about planting crops for bioenergy?

+ Key questions and knowledge needs



- **Impacts** – changes in climate
 - Will it get hotter?
 - Will it get dryer?
 - Will it get wetter?
 - What about extreme events – frequency, magnitude, location?
- **Tipping points** – state change, collapse
 - How can we know when a system will collapse?
- **Development trends** – compatible or incompatible
 - How will other responses to climate change affect the agriculture sector and/or rural livelihoods?
 - How do trends in rural development influence vulnerability to climate change?
 - What trends have the greatest influence on food security?

+ Take away messages



- There are limits to adaptation
 - *There are limits to how much we can prepare for and how much we can respond to*
 - Physical limits (what are the ecological tipping points)
 - Social limits (how much is acceptable)
 - Economic limits (how much can we afford)
- Not all development will reduce vulnerability to climate change
 - *Getting rural development 'right' means that vulnerability to climate change must be reduced*
 - *Agricultural development must think about long-term change and be flexible*



Thank You

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