

CC DARE

Climate Change and Development
Adapting by Reducing Vulnerability

Agriculture and Forestry



Tanzania CC DARE Mission 13 -16 October 2008



CC DARE

Climate Change and Development
Adapting by Reducing Vulnerability

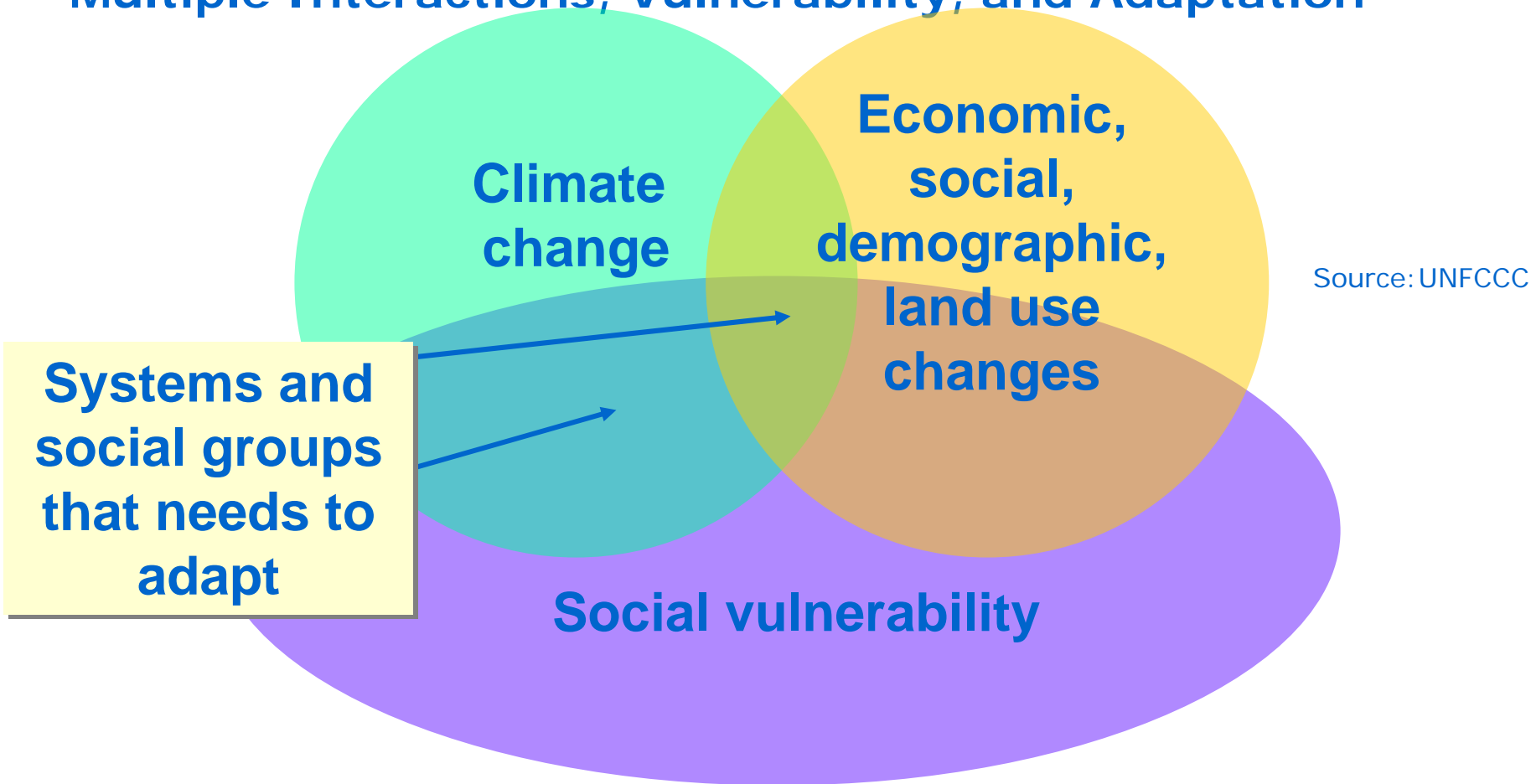
Recap of the nature of CC DARE

- CC: DARE approach to climate change challenges: provide **demand driven** financial and technical support to sub-Saharan Africa that is **targeted, flexible** and **rapid**. The support will be made available to assist countries to remove barriers for the integration of climate change issues into development planning and decision-making frameworks.
- Application Requirements
 - Summary of needed assistance(half a page)
 - Background and rationale(1 page)
 - Expected outcome(s) (1-2 pages)
 - Design and implementation procedure –partners & stakeholders (1-2 pages)
 - Budget for national activities – staff, local consultants, travel, secretarial services etc (1-2 pages)
- N.B –Maximise CC DARE benefits through X-sectoral approach e.g.
- Agriculture  Water  Health

CC DARE

Climate Change and Development
Adapting by Reducing Vulnerability

Multiple Interactions, Vulnerability, and Adaptation



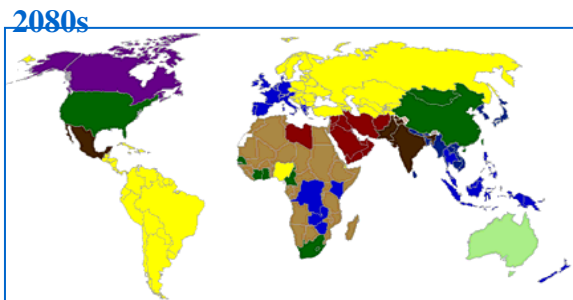
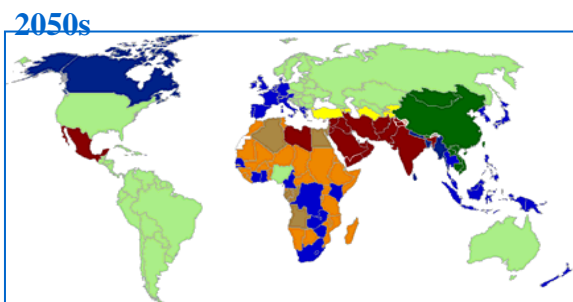
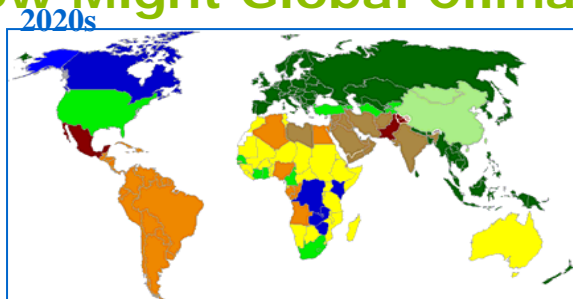
Multiple Interactions

- Climate change is one stress among many now affecting agriculture and the population that depends on it
 - Integration of results is essential to formulate assessments relevant to policy
- Potential future consequences depend on:
 - The region and the agricultural system
 - The magnitude
 - The socioeconomic response

CC DARE

Climate Change and Development
Adapting by Reducing Vulnerability

How Might Global Climate Change Affect Food Production?



Yield Change (%)



Percentage change in average crop yields for the Hadley Center global climate change scenario (HadCM2). Direct physiological effects of CO₂ and crop adaptation are taken into account. Crops modeled are wheat, maize, and rice.

*Source: NASA/GISS;
Rosenzweig and Iglesias,
1994.*

CC DARE

Climate Change and Development
Adapting by Reducing Vulnerability

Climate change and agricultural production

Climate Factor	Direction of change	Consequences and factors
Precipitation intensity/run-off	Intensified hydrological cycle with regional variations	Changed patterns of erosion, storm damage, water logging
Heat stress	Increases in heat waves	Damage to grain formation, increase in some pests
Droughts	Decreased rainfall amounts; temporal and spatial variability	Crop failure, competition for water

Approaches to adaptation in Agriculture

- Crop Models
 - Models need calibration and validation to represent reality
 - Models need data and technical expertise
- Agroclimatic zonation to minimize risk of crop failure
 - Agroclimatic indices often provide the necessary information on how crops respond to varying rainfall and temperature in wide geographical areas
- Social Sciences Tools- Surveys and interviews
 - Allow direct input of stakeholders (demand-driven science), provide expert judgment

Importance of Data

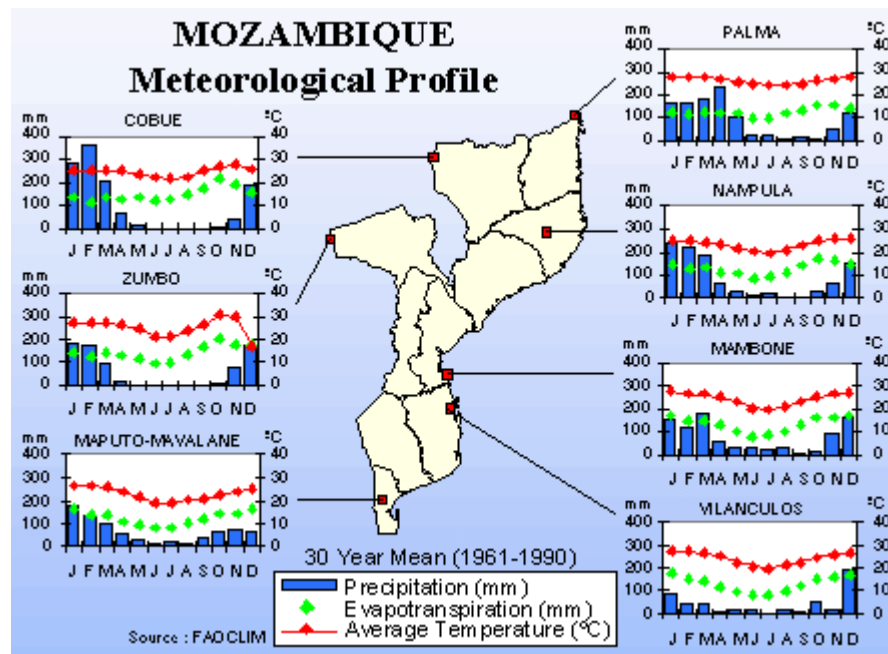
- Data are required to define climatic, non-climatic environmental, and socioeconomic baselines and scenarios
- Crop simulation models (generic and crop-specific)
- Crop-specific models are used to test alternative management that analyses regional vulnerability
- Key variables for agronomic and socioeconomic studies: crop production, land suitability, water availability, farm income

CC DARE

Climate Change and Development
Adapting by Reducing Vulnerability

Example of climate application

- Does the start/and distribution of the rainy season affect crop yield in Tanzania?



Source: UNFCCC

Social Sciences Tools

- Surveys and interviews - Development of adaptation options with stakeholders
- Allow the direct input of stakeholders (demand-driven science), provide expert judgment in a rigorous way



Source: UNFCCC

Suggestions for CC DARE assistance

Is it feasible that the following could be done at district /provincial scales as a starting point?

On-farm adaptation: *Use of alternative existing varieties and optimization of the timing of planting may improve yield levels or water use*

Essential changes in resource management *(crops, water and land) leading not only to adaptation to climate change but also to the overall improvement of the agricultural systems (no regret options).*

Explicit guidance to farmers *regarding optimal crop selection, irrigation, and fertilization. Should enhance strong incentives to avoid excessive water use.*

Suggestions for CC DARE assistance(cont'd)

Is it feasible that the following could be done at provincial/district levels as a starting point?

- **Agroclimatic zonation** - *Identification of climate impacts, vulnerabilities and coping measures in relation to different agricultural production strategies (crops, livestock and agro forestry) across Uganda*
- **Seasonal forecasts** - *Assessment of the availability of tools for seasonal forecasts that can be used in Uganda, including regional efforts and practices, dissemination of information, distribution, and advice to farmers.*
- **Sustainable afforestation techniques**
- **Socio-economic data collection** in as far it relates to agriculture
- *this can be used to facilitate adaptive responses*

CC DARE

Climate Change and Development
Adapting by Reducing Vulnerability

What can we conclude from these considerations?

- Regional differences in crop production are likely to grow stronger through time, leading to a significant polarization of effects
- Substantial increases in prices and risk of hunger amongst the poorer nations
- Most serious impacts are at the vulnerable regions and groups

THEREFORE ADAPTATION IS IMPERATIVE. WE CAN NOT AFFORD TO DO OTHERWISE!!!

Thank you- todd.ngara@risoe.dk