



GECHS

GLOBAL ENVIRONMENTAL CHANGE
AND HUMAN SECURITY

Bioenergy and adaptation to climate change

Increased vulnerability or increased adaptive capacity for poor people? ?

Presentation at the internal COMPETE Work Package 3 Meeting in Arusha, Tanzania, Wednesday 18 June 2008

Kirsten Ulsrud
GECHS – Global Environmental Change and Human Security Project
Department of Sociology and Human Geography
University of Oslo
Kirsten.ulsrud@sgeo.uio.no

Content:

1. The urgent need for climate adaptation in all aspects of economic and social development
2. How are people actually affected by climate change, and how can bioenergy make a difference?
3. How can climate adaptation be integrated in sustainability analysis of bioenergy cases?
4. Some guiding principles for climate adaptation and poverty reduction and their relevance for bioenergy activities

1. The urgent need for climate adaptation (and emission reductions...)

- Changes are already observed (IPCC 2007) and are experienced by people on the ground
- Significant changes are expected in the future
 - 95% probability of more extreme heat, heatwaves, droughts and intense rainfall
 - Likely that tropical hurricanes and typhones become more intense
 - Global sea level is expected to rise by 19-58 cm within 2100 (probably low estimate)

Expected changes in Africa

- Expected changes in Africa are such as longer drought periods, more extreme heat, more intense episodes of rainfall, sea level rise
- Increased drought is likely in most of Sub-Saharan Africa, but probably increased rainfall in parts of East Africa
- *Increased unpredictability, more irregular rainy seasons*



Examples of impacts

- Reduced food production in many parts of Africa (as pointed out by prof. Ravindranath)
- Also several other potential impacts:
 - Destruction of infrastructure and settlements
 - Problems in water supply
 - Spread of vector-borne diseases
 - Increased flooding and landslides in slums and along rivers
 - Coastal erosion, saltwater intrusion in groundwater
 - Migration
 - Conflicts?
- Positive impacts are expected to occur in some regions, but the challenges are enormous



Adaptation to current and future climate conditions

- People are influenced by both climate variability and change
 - Climate variability and climate change are difficult to separate at the local level
 - The important thing is how people are affected
 - Many societies are not well adapted even to current climates
- Climatic shocks and stresses and unpredictability will increase
- It is therefore important to increase the flexibility and resilience of households and communities



”All the water comes at the same time”



2. How are people and communities actually affected?

- Social and environmental factors decide the situation people are in – and thus decide vulnerability and capacity to adapt
- Vulnerability varies between countries, groups and individuals, also between poor people
- Some groups or individuals may experience large consequences by small climatic stresses while others may experience small consequences by extreme climate events

Why should bioenergy activities consider climate adaptation?

- Climate adaptation should be an integrated part of *all* efforts for economic and social development, including bioenergy activities
- Without such integration:
 - climate stress may undermine the efforts
 - the activities may increase people's vulnerability to climate change
 - the activities may fail to increase flexibility, resilience and adaptive capacity, which is urgently needed



BUT, bioenergy activities must go further than considering climate risks to crops:

The impacts of bioenergy activities on people's vulnerability and adaptive capacity should be considered



3. A comprehensive approach to climate adaptation:

- Three types of factors that need to be taken into account
 - Direct climate risks
 - Vulnerability, influencing how people are affected
 - Adaptive capacity and adaptation options
- The point is not to be able to put factors in correct categories, but to see important types of factors and structure the thinking on climate adaptation
- The approach can be used as a method for doing case studies for planning, monitoring and search for good practice examples



Climate risk

- *Climate risk* can be defined as the direct, physical impacts of climatic conditions on human health, lives, activities, crops and physical assets in the built or natural environment.
- Climate risks are created by a range of different climate conditions and weather events.



Examples of climate risks

- Examples from Development Fund case studies:
 - Damages on crops, soil, roads and houses in intense rainfall (partially due to degraded environment)
 - Serious losses of farm animals
 - Increasing drought problems
 - Lowered ground water levels, dried up springs, longer walking distances to collect water
 - Changed planting and harvesting times, reduced food security
- Main question for data collection: What are the most important climate elements (weather conditions) that influence individuals/households/communities in a given geographical context?

Bioenergy and climate risk

- Climate risks in communities could potentially be influenced by bioenergy projects by
 - Reduced water availability for other purposes
 - Land use change leading to increased risk of soil erosion
 - Possibly making the population dependent on incomes or energy supply at risk from climate change
 - Improved soil management techniques
 - More efficient irrigation, like introduction of drip irrigation
- Several bioenergy activities may be less at risk than other agricultural activities, for instance if involving perennial instead of annual plants, or trees and bushes instead of cereal crops.



Vulnerability to climatic stressors

- *Vulnerability* to climate stress is created by societal processes influencing the social, economic and environmental context under which people live.
- Processes influencing vulnerability include globalization, urbanization, the spread of infectious diseases, import competition, and pollution of air and water. (Important north-south issues – political)
- Individuals, households, groups and communities are unevenly influenced by these processes (Eriksen et al. 2007).



Examples of vulnerability factors

- Examples from Development Fund cases:
 - Environmental degradation – lost vegetation cover
 - Reduced availability of firewood around settlements
 - Health problems, lack of public services and infrastructure
 - Lack of transport opportunities to markets
 - Dependence on seasonal migration, splitting up of families
 - Irrelevant school curricula to local livelihood opportunities
 - Local power relations, marginalisation of some groups
 - Gender inequality, high workload on women and girls
 - Ongoing and recent violent conflicts
- Main question for data collection: What are the most important underlying causes of vulnerability in this area? (And how does vulnerability differ among groups and individuals?)

Bioenergy and vulnerability to climate stress

- Bioenergy activities might influence the environmental and social context, thus influencing the vulnerability of the population to climate change
- The vulnerability might increase if bioenergy activities influence environmental surroundings on which people depend for livelihoods
- Bioenergy activities can reduce vulnerability by reducing burden on females, improving their rights and incomes, providing energy for improved health, education, and information services, etc.

Vulnerability among pastoralists or nomades – especially important in COMPETE considerations?

- Pasture land is not exempted from the land described as available in WP 1
- Pasture seems already to be threatened by biofuel projects
- Those factors may add to the vulnerability of pastoralists created by other factors such as:
 - Insecurity towards raiding and theft of animals
 - Lack of public services
 - Lack of relevant modernisation (veterinary services, value adding, transport of products, growing of fodder plants, etc.)
 - Lack of support for this kind of agriculture – although adapted to local climate and nature
 - Privatisation of land for large scale meat production



People's adaptation strategies and adaptive capacity

- *Adaptive capacity* can be defined as the ability of people and communities to adapt to stressors such as climate variability and change.
- Adaptive capacity is influenced by factors such as relevant education and information, support services and technologies, access to natural resources, access and transportation to markets, governmental regulations, etc.



Examples of adaptation strategies and adaptive capacity

- Local adaptation strategies
 - Diverse strategies to try to secure food and income
 - Charcoal production for income in periods of drought
 - Migration for work
 - Use of social networks for coping
- Examples of strengths and capacities of poor people:
 - Skills and interest in livestock rearing and growing of food
 - The universal ability to learn and be creative
 - Aspirations for childrens education and health
 - Pride in improving their own situation
- Main research question: What are the strategies that people use in order to cope and adapt to climatic stressors, and what are their strengths and capacities?



Bioenergy and adaptive capacity

- Bioenergy activities can increase the capacity of people and communities to live with climatic challenges, for example by
 - Improving household energy supply, employment opportunities and incomes in climate resilient and sustainable ways
 - Influencing school curricula for better information access, education opportunities and skills for the sustainable use of local natural resources
 - Facilitating learning across local communities
 - Addressing political, institutional and economic barriers for social and technological change

4. A few general suggestions for guidance on climate adaptation

- Promote adaptation to increased unpredictability by fostering resilience, adaptive capacity and flexibility
- Remember: we have only seen the beginning of c.c.
- Climate adaptation must be based on a good understanding of local contexts, developed with involvement of local actors
- Think diversity in livelihoods, technology and knowledge (bioenergy can contribute to the diversity of available choices)
- Address poor social conditions creating vulnerability



Suggestions for guiding principles (cont.)

- Provide knowledge about organic growing techniques for maintenance and increase of soil organic matter to reduce erosion risk and increase water absorbing capacity
- Encourage innovativeness among farmers
- By understanding the opportunities and barriers at the local level, the relevant factors at other levels can be addressed in fruitful ways
- Develop methods for systematic knowledge transfer across contexts
- Don't give up to address national and global political issues influencing poverty and vulnerability to climate change



Bioenergy for local energy supply is one of several alternatives – think diversity and combinations



GECHS

Relevance for COMPETE case studies

- Climate risk, vulnerability and adaptive capacity should be taken into account in any sustainability analysis, to shed light on relevant factors
- Qualitative studies are important in order to understand how people are affected the local level, and how bioenergy activities can make a difference
- Useful and simple interview guides can be made from this comprehensive approach
- Locally based partners can do interviews and share data with others for analysis, as in Development Fund cases (Draft report)

Conclusions

- Bioenergy activities can be made more useful for economic and social development and poverty reduction if they consciously aim to reduce climate risk, reduce vulnerability and increase adaptive capacity of people and communities
- Most of the climate adaptation issues may be difficult to include in sustainability criteria, but can be included in guidance and recommendations



Draft report on climate adaptation:

The Development Fund climate Change
Documentation Project: Poverty reduction and climate
adaptation – lessons learned and future directions

kirsten.ulsrud@sgeo.uio.no

