From Vulnerability to Coping Strategies Under Variable Climate – What Next?

Learning from the Traditional Water Management System in Pakistan

Humaira Daniel
United Nations University, Institute for Environment and Human Security, Bonn, Germany
Structure of the presentation

- Vulnerability to Climate Variability (Context)
  Global, Regional & Local (with special reference to Pakistan)
- About the Case Study Area
- Traditional Water Management System as Opportunity towards vulnerability to Climate Variability
- What Next?
CLIMATE VARIABILITY AND VULNERABILITY
Climate change is severely impacting the hydrological cycle and consequently, water management. This will in turn have significant effects on human development and security. (IPPC 2007).

Global water scarcity (a) now and (b) in 2050. Regions are coded according to their per capita annual renewable freshwater resource. Red: less than 1000m3 per person per year, orange: between 1000 and 2000m3 per person per year and blue : Greater than 2000m3 per person per year. (Data from Fischer and Heilig(1997)
Regional Context

Monsoon Dependency

Large parts of the Indian subcontinent depend on the monsoon rains. The summer monsoon accounts for as much as 90 per cent of annual precipitation in some regions (Lal et al., 2001)

M.Ashfaq. et al, 2009, Suppression of South Asian Summer Monsoon in the 21st Century....
Local Context- Pakistan

Most at Risk

- Exposure to climate-related hazards such as flooding and droughts,
- Human vulnerability in terms of the capacity of individuals, communities, and societies to effectively respond to such hazards based on a combination of natural, human, social, financial and physical factors. (A. Thomas 2010)
ABOUT THE STUDY AREA
Study Area: Dera Ismail Khan
Climate Change (Temp & Precipitation Variability) Trend in Dera Ismail Khan 1976-2009

Graph assimilated from the Climate data available at www.tutiempo.net
Typical village of the study area in the watershed
Rural Livelihoods
What makes it vulnerable to climate variability

- Arid- Semi Aridity
- Dependence of Monsoon Rainfall for Water
- Extreme Poverty & Remoteness
- Limited and restricted livelihood options
- Security Crisis
Traditional Water Management System As An Opportunity Towards Vulnerability to Climate Variability
Water Channels

In Dry Months

In Monsoon Months
How do they cope?
Water Management Under Tribal Rules
Perrnial Water Management
Challenges

- Strong Tribal Influence
- Decreased State Interest
- Large Dams Vs Local Water Management
- Less Funds
- Lack of Monitoring
- Rural - rural and rural –urban Migration
- Fading local institutions
Conclusions

- The Climate Variability, Social Vulnerability and their interaction is a complex research agenda. The ethnography pattern of research methodology can be a very useful methodology since it allows maximum interaction of researcher with the people and the environment.

- Difficult to conclude clear connection between extreme weather events with the climate change in the region.

- Monsoon variability have certainly made the livelihood choices of people at risk and combined with the water scarcity issues in the area have created vulnerable situation for the people.

- Traditional coping strategies to climate change are acquired through years of accumulated experience and indigenous knowledge. They are still of significant importance.
What Next?....................
Climate Change, Vulnerability, Adaptation, Sustainable Development Nexus

✓ Vulnerability is linked to access to resources (ecological, economical, social and human, governance, institutions)
✓ Climate change is expected to exacerbate current stresses ...(IPCC 2001, 2007)
✓ Adaptation is about tackling the effects of climate change, mainly through increasing the resilience and capacity to cope with its physical impact. (Prowse & Scott, 2008)
✓ Adjustment in natural & human systems in response to actual or expected climate stimuli or their effects, which moderates harms and exploits beneficial opportunities (IPCC 2001)
What Next?

- Not simple Adaptation rather **Pro-Poor Adaptation**

(Countries in South Asia and Africa are prone to physical impact of climate change even though their contribution in greenhouse gas emission is very less)

- If pro poor adaptation then should be **Community based adaptation** (Huq & Reid, 2007)
Community Based Adaptation

- Bottom Up
- Based on people’s knowledge and existing coping strategies
- Embedded in participatory approaches to development

Climate Change, Vulnerability and Adaptation research is not only about gathering information ......is about the way you do it....understanding people makes you understand their point of view...at the end its all about people.
Why not acknowledge that we, too are part of the public and that we have much to gain from treating our “subject” as the arbiters of knowledge rather than starting from the premise that people are ignorant.

Engendering local coping strategies to climate variability: Evidence from southern Cameroon

Olufunso Somorin
Center for International Forestry Research, Cameroon
Background

Increasing role of forest ecosystem goods and services (FEGS) in local livelihoods

- NTFPs as food sources
- Fuelwood to meet energy demands
- Herbs for medicinal purposes
- Additional income from NTFP trade
- Soil and water conservation
Background

• Impacts of climate variability and change on ecosystems including forests
  • Changing patterns of temperature and rainfall

• Resulting impact on forest-dependent communities
  • Because they depend on ecosystem goods and services

• In response, local communities have developed a range of coping strategies
  • Reducing vulnerability
  • Increasing adaptive capacity
Investigate gender differentiation in local responses to climate risks
Study context – southern Cameroon
Methodology

• Household survey
  - 120 households
  - 3 regions within southern Cameroon
    Central (n = 40)
    East (n = 35)
    West (n = 45)
  - 14 villages randomly selected in total
  - 10-12% of total HHs in the villages surveyed

• Data on:
  - Household socio-economic characteristics
  - Local perception of climate impacts
  - Dependency on forest resources
  - Local coping strategies
### Socio-economic characteristics

<table>
<thead>
<tr>
<th>Attributes</th>
<th>Female (n=47)</th>
<th>Male (n=73)</th>
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</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td>49.1 ± 11.8</td>
<td>55.4 ± 13.7</td>
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<tr>
<td>Educational level (%)</td>
<td></td>
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<tr>
<td>- None</td>
<td>23.4</td>
<td>8.2</td>
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<tr>
<td>- Primary</td>
<td>53.2</td>
<td>43.8</td>
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<tr>
<td>- Secondary</td>
<td>23.4</td>
<td>45.2</td>
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<tr>
<td>- Higher education</td>
<td>0</td>
<td>2.7</td>
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<tr>
<td>Household size (n)</td>
<td>10.2 ± 5.2</td>
<td>9.6 ± 5.3</td>
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<tr>
<td>Ethnicity (%)</td>
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<tr>
<td>- Native</td>
<td>48.9</td>
<td>93.2</td>
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<tr>
<td>- Migrant</td>
<td>51.1</td>
<td>6.8</td>
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<tr>
<td>Occupations (main livelihood activities)</td>
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<tr>
<td>- Primary</td>
<td>Agriculture (cash crops) NTFP Gathering, Petty trade</td>
<td>Agriculture (food crops) Hunting and Gathering, Paid labour,</td>
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<tr>
<td>- Secondary</td>
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</table>
Perception of climate variability

Temperature

- Male
- Female

Rainfall

- Male
- Female
Local coping strategies

Coping strategy

<table>
<thead>
<tr>
<th>Strategy</th>
<th>Male</th>
<th>Female</th>
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</thead>
<tbody>
<tr>
<td>Change in collection sites</td>
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<tr>
<td>Animal husbandry</td>
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<td>Shift in sowing time</td>
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<td>Mod. of treatment mtld.</td>
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<td>Income diversification</td>
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<td>Mod. Of use system</td>
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<tr>
<td>Multiple sowing</td>
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<td>Intro. Improved varieties</td>
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<td>Fallow</td>
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<td>Farm irrigation</td>
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<tr>
<td>Mod. Of cultivation tech.</td>
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Percentages
Local coping strategies

Coping strategy

Anticipatory C.S. | Reactive and anticipatory | Reactive

Percentage

Male | Female

10/04/10
Is there a role for forests?

- Food security – provision of food materials to meet household dietary needs
- Income sources – sales of NTFPs (e.g. *Gnetum africanum*)
Conclusion

• Forests offer additional coping strategies for both men and women-headed households

• Socio-economic characteristics determine perceptions of climate risks and coping capacity

• Gender differentiation in local coping strategies

• Livelihood systems- production vs. commercialization

• Gender differentiation in adaptation needs of local communities
Thank you!

www.cifor.cgiar.org
From coping to adapting: lessons from forest and livestock dependent communities in Northern Mali

Houria Djoudi and Maria Brockhaus
CIFOR

ICARUS-II, May, 2011 Ann Arbor
Introduction

1. Societies are undergoing fundamental economic, ecological, social and political change

2. Climate change adds a new dimension to the already existing vulnerabilities

3. Adaptation is a cross-level, cross-sectoral task to respond to CC

4. Challenges governance structures from local to global level to formulate and implement adaptation strategies
Key Question

Who, how and what shapes [or limits] the outcomes of adaptive decision making processes to support a shift from spontaneous, reactive and autonomous adaptation to strategic and sustainable adaptation?
Objectives, approaches and methods

To assess, with different actors at different levels, adaptive strategies in the context of livestock and forests depending communities.
Lake Faguibine

- Social, political and ecological conditions have drastically changed in the past 30 years:
  - Drying out of the lake
  - Rebellion
The adaptation arena in Mali: where are the local institutions

Diagram showing various institutions and actors involved in adaptation in Mali.
Different point of views and different levels (local, sub national, national)

Mobility = Adaptive strategy

Mobility = Factor of vulnerability
Adaptive measures and their importance for livelihoods, ranked by governmental representatives

<table>
<thead>
<tr>
<th></th>
<th>Sedentary</th>
<th>Transhumant</th>
<th>Nomadic</th>
<th>Mixed</th>
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<tr>
<td>Forest management</td>
<td><img src="icon1.png" alt="Icon" /></td>
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<tr>
<td>Water source management</td>
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<td>Livestock intensification</td>
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<td>Pasture management</td>
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<td>Pastures improvement</td>
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<td>Activity</td>
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<td>Natural and artificial reforestation</td>
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<td>Biological dunes stabilisation</td>
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<tr>
<td>Creation of protected forest areas for regeneration</td>
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<tr>
<td>Water source management</td>
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<tr>
<td>Rebuilding livestock herds</td>
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<td>Improving livestock husbandry system</td>
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<td>Improving animal health with regular treatments</td>
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<tr>
<td>Diversification of activities in addition to livestock</td>
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<tr>
<td>Creation of a conflict mediation local institution</td>
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<td>Pastures improvement by re-seeding high value species</td>
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<td>Creation of local comities for the regulation of natural resource use</td>
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Gender differences

Men in the farmer community (Tin Aicha)

- Forest
- Trade
- Handicraft
- Reflooding the Lake Faguibine (Agriculture)

Migration = Adaptive strategy

Women in the farmer community (Tin Aicha)

- Education (schooling of children)
- Livestock
- Charcoal production
- Agriculture
- Sedentary livestock

Migration = Factor of vulnerability
Conclusions

Observable autonomous adaptation, in eco-systems, at individual or community level, but political-administrative system is lagging behind:

• **Horizontal and vertical communication and coordination** of adaptation and development activities is needed

• **Institutional and political governance structure** across all levels needs to show willingness and flexibility to ensure strategic and planned adaptation from the local to the global level.

• **Feedback loops, reflective cycles, institutional learning mechanisms**, across institutions, sectors and across scales, are urgently needed

• **Capacity building**, and technical, financial, and scientific resources, to support the local adaptation are needed

• **Gender sensitive adaptation** analyses and planification are needed