




Adaptation to climate variability

The role of past experience and institutions in Ethiopia, Mali and Yemen

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Context



Poor, rural households are facing most of the climate change related hazards.

Adaptation is more than techniques, also involving socio-economic aspects

Understanding local adaptation processes is important for formulating macro-policies

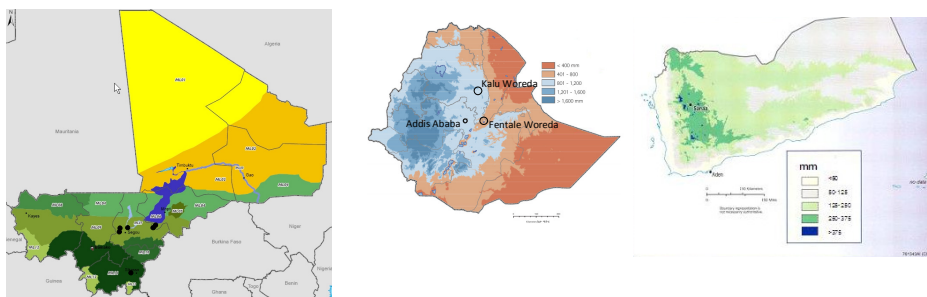
For prioritizing future adaptation, it is crucial to analyze historical adaptation strategies.

Objectives



<p><u>Household level:</u></p> <ul style="list-style-type: none">▪ Which adaptation strategies are adopted by rural households in Yemen, Mali and Ethiopia?▪ Which factors explain (non)adoption of a strategy?	<ul style="list-style-type: none">▪ What type of adaptation cost do households and institutions incur?
<p><u>Institutional level:</u></p> <ul style="list-style-type: none">▪ Which institutions support households to adapt to climate variability▪ How do institutions facilitate adaptation to climate variability?	
<p>What can donors do to prepare rural households to climate change?</p>	

Mali – Ethiopia – Yemen

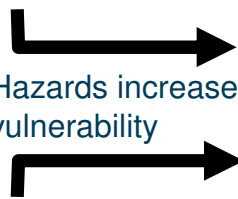


CALI - Methodology



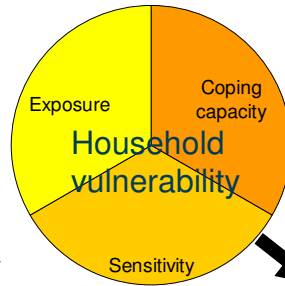
- droughts
- floods
- extreme rainfall
- extreme temperatures

Climate hazards



Other hazards

- high food prices
- diseases
- market problems
- land accessibility



Assistance from formal and informal institutions

- Food
- Labour
- Training
- Inputs
- Cash

Adaptation Strategies

- Agricultural techniques
- Water management techniques
- Diversification techniques
- Communal pooling techniques

Main conclusions



1. Vulnerability is mostly explained by sensitivity and coping capacity. Exposure is less important. ▶
2. Strong institutions are important for implementing new adaptation strategies. ▶
3. Monetary costs are only one constraint for adopting adaptation strategies. Investments in terms of time, training and social relations are equally important. ▶



Vulnerability



Exposure

- Droughts
- Floods
- Extreme rainfall

Sensitivity

- Low land holdings
- No use of water management
- Low cash income
- Low input use

Coping capacity

- Low income diversity
- Low education level
- High dependency ratio
- Female headed / dominated
- Remote areas

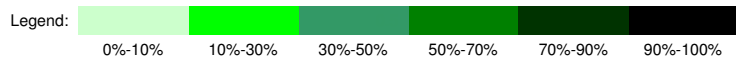


CALI – Institutions

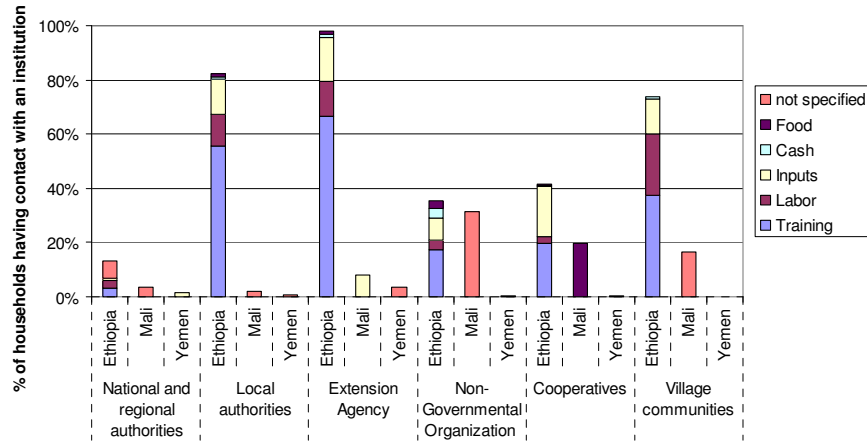


Percentage of households having contact with institutions

	Local authority	Extension Agency	NGO	Cooperatives	Village comm.	Religious comm.	Women groups	Micro-finance inst.
Ethiopia	90%-100%	90%-100%	30%-50%	30%-50%	90%-100%	90%-100%	30%-50%	10%-30%
Mali	0%-10%	0%-10%	30%-50%	10%-30%	10%-30%	0%-10%	0%-10%	0%-10%
Yemen	0%-10%	0%-10%	0%-10%	0%-10%	0%-10%	0%-10%	0%-10%	0%-10%



CALI - Institutions



Percentage of households having contact with an institution. The subdivision of the bars shows the allocation of the types of assistance households receive.

Coping capacity increasing

Country	Individual strategy	Communal strategy
Ethiopia	7. Home garden agriculture (47%)	
Mali	4. Temporal migration to urban centres (24%) 7. Reduce livestock/savings (16%) 9. Temporal migration to other rural areas (14%)	5. Communal cereal bank (21%)
Yemen	1. Temporal migration to other rural areas (15%)	
Ethiopia	1. Crop selection (78%) 5. Adapt planting dates (51%) 6. Adapt feed techniques (zero grazing) (48%) 8. Adapt cropping densities (43%) 10. Adapt fertilizer/pesticide application (41%)	2. Improve, construct or rehabilitate terraces (72%) 3. Soil erosion prevention (69%) 4. Restore and preserve forests (69%) 9. Rangeland preservation / management (42%)
Mali	1. Improved seeds (79%) 2. Use of manure of family herd on the fields (70%) 3. Adapt fertilizer/pesticide application (41%) 6. Change production practices (20%)	8. Use irrigation (16%)
Yemen	1. Use irrigation (26%) 2. Adapt fertilizer/pesticide application (22%) 6. Adapt tillage practices (10%) 7. Use water harvesting techniques: roof water collection, tanks (10%)	3. Improve, construct or rehabilitate terraces (18%) 5. Communal irrigation (12%)

Sensitivity reducing

Main adaptation strategies (only those adopted by at least 10% of the households are shown)

Costing



Costs of adaptation strategies

- Monetary costs
- Labour
- Skills (training)
- **Commitment**

Costing



Strategy	Household				Community institutions				Governmental or non-governmental institutions			
	M	L	T	C	M	L	T	C	M	L	T	C
Individual strategies												
Adapt fertilizer/pesticide application												
Awareness creation												
Implementation												
Communal strategies												
Improve or rehabilitate terraces: rehabilitate existing or create new terraces along slopes of hills												
Awareness creation												
Implementation	?				?				?			
Maintenance												

■ = low
 ■ = medium
 ■ = high



Costing: individual strategies

Strategy	Household				Community institutions				Governmental or non-governmental institutions			
	M	L	T	C	M	L	T	C	M	L	T	C
Individual strategies												
Crop Selection and selection of improved seeds												
Awareness creation												
Purchase and application												
Adapt planting dates: adapt planting dates according to the most up-to-date meteorological information												
Awareness about improved cropping calendar												
Application of improved cropping calendar												
Use manure of family herd on the field												
Awareness creation												
Collection and application	?											
Adapt fertilizer/pesticide application												
Awareness creation												
Implementation												
Irrigation (wells or pumps)												
Awareness creation												
Construction and implementation												
Operation and maintenance												
Use water harvesting techniques: roof water collection, tanks												
Awareness creation												
Installation of water harvesting equipment												
Operation and maintenance of equipment												
Temporal migration												
Implementation												
Home garden agriculture: promote vegetable and fruit cultivation on home gardens												
Awareness creation												
Apply home garden agriculture												

■ = low ■ = medium ■ = high

Costing: communal strategies

Strategy	Household				Community institutions				Governmental or non-governmental institutions			
	M	L	T	C	M	L	T	C	M	L	T	C
Communal strategies												
Improve or rehabilitate terraces: rehabilitate existing or create new terraces along slopes of hills												
Awareness creation												
Implementation	?				?				?			
Maintenance												
Soil erosion prevention: programmes focussing on improved tillage techniques (e.g. improved ploughing and instal												
Awareness creation												
Implementation												
Maintenance												
Restore or preserve forests: prevent deforestation and (re)plant homestead or mountaines forests to prevent soil er												
Awareness creation												
Implementation									?			
Maintenance												
Cereal bank												
Awareness creation												
Install infrastructure												
Create management organisation												
Maintain infrastructure and management system												
Use irrigation: installation and management of communal irrigation systems												
Awareness creation												
Install irrigation systems												
Operate irrigation systems												
Maintain irrigation systems												

■ = low ■ = medium ■ = high

Recommendations



- Integrate climate variability into development programmes, not as a separate theme.
- Focus on a programmatic approach, not single theme projects.
- Assure long term presence of institutions in rural areas.
- Do not only concentrate on technical interventions but also strengthen social cohesion.

CALI



For the documents of the CALI-project, see:

<http://go.worldbank.org/MAECAN0IF0>