




# 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

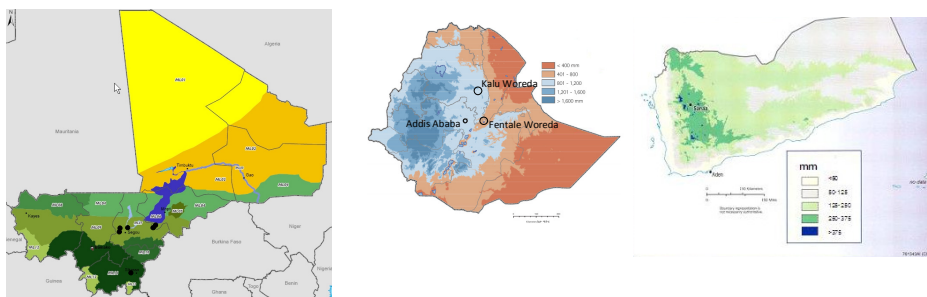
For prioritizing future adaptation, it is crucial to analyze historical adaptation strategies.

# Objectives



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

# Mali – Ethiopia – Yemen

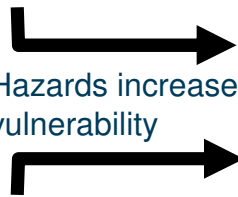


## CALI - Methodology



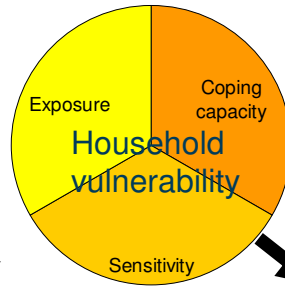
- droughts
- floods
- extreme rainfall
- extreme temperatures

### 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



<p><b>Exposure</b></p> <ul style="list-style-type: none"> <li>▪ Droughts</li> <li>▪ Floods</li> <li>▪ Extreme rainfall</li> </ul>	<p><b>Sensitivity</b></p> <ul style="list-style-type: none"> <li>▪ Low land holdings</li> <li>▪ No use of water management</li> <li>▪ Low cash income</li> <li>▪ Low input use</li> </ul>	<p><b>Coping capacity</b></p> <ul style="list-style-type: none"> <li>▪ Low income diversity</li> <li>▪ Low education level</li> <li>▪ High dependency ratio</li> <li>▪ Female headed / dominated</li> <li>▪ Remote areas</li> </ul>
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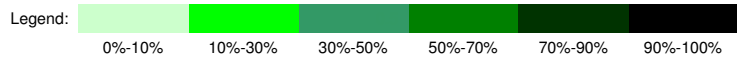


# CALI – Institutions

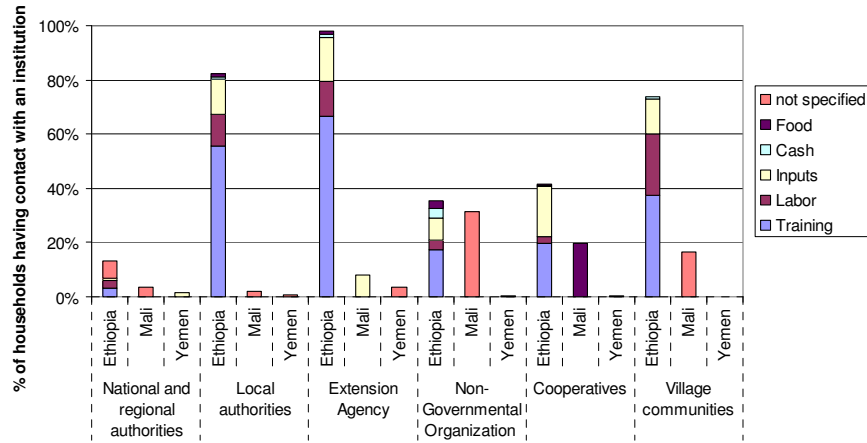


Percentage of households having contact with institutions

	Local authority	Extension Agency	NGO	Cooperatives	Village comm.	Religious comm.	Women groups	Micro-finance inst.
Ethiopia								
Mali								
Yemen								



# 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
<b>Ethiopia</b>	7. Home garden agriculture (47%)	
<b>Mali</b>	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%)
<b>Yemen</b>	1. Temporal migration to other rural areas (15%)	
<b>Ethiopia</b>	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%)
<b>Mali</b>	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%)
<b>Yemen</b>	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
<b>Individual strategies</b>												
<b>Adapt fertilizer/pesticide application</b>												
Awareness creation												
Implementation												
<b>Communal strategies</b>												
<b>Improve or rehabilitate terraces: rehabilitate existing or create new terraces along slopes of hills</b>												
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
<b>Individual strategies</b>												
<b>Crop Selection and selection of improved seeds</b>												
Awareness creation												
Purchase and application												
<b>Adapt planting dates: adapt planting dates according to the most up-to-date meteorological information</b>												
Awareness about improved cropping calendar												
Application of improved cropping calendar												
<b>Use manure of family herd on the field</b>												
Awareness creation												
Collection and application	?											
<b>Adapt fertilizer/pesticide application</b>												
Awareness creation												
Implementation												
<b>Irrigation (wells or pumps)</b>												
Awareness creation												
Construction and implementation												
Operation and maintenance												
<b>Use water harvesting techniques: roof water collection, tanks</b>												
Awareness creation												
Installation of water harvesting equipment												
Operation and maintenance of equipment												
<b>Temporal migration</b>												
Implementation												
<b>Home garden agriculture: promote vegetable and fruit cultivation on home gardens</b>												
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
<b>Communal strategies</b>												
<b>Improve or rehabilitate terraces: rehabilitate existing or create new terraces along slopes of hills</b>												
Awareness creation												
Implementation	?				?				?			
Maintenance												
<b>Soil erosion prevention: programmes focussing on improved tillage techniques (e.g. improved ploughing and instal</b>												
Awareness creation												
Implementation												
Maintenance												
<b>Restore or preserve forests: prevent deforestation and (re)plant homestead or mountaines forests to prevent soil er</b>												
Awareness creation												
Implementation									?			
Maintenance												
<b>Cereal bank</b>												
Awareness creation												
Install infrastructure												
Create management organisation												
Maintain infrastructure and management system												
<b>Use irrigation: installation and management of communal irrigation systems</b>												
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>