

Drought and Informal Insurance Groups: A Randomised Intervention of Index-based Rainfall Insurance in Rural Ethiopia

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Introduction

- ❑ Weather risk remains a major challenge to farming in the developing world;
- ❑ Thin insurance possibilities. Informal insurance hampered by risk covariance;
- ❑ Classical information asymmetry problems and high implementation costs limit viability of **traditional insurance**;
- ❑ **Index-based weather insurance** offers new possibilities;
- ❑ However, demand remains invariably low – **basis-risk** – a key challenge;



Introduction

- ❑ Steps taken to **mitigate** basis risk still limited;
- ❑ **Study Question** – is it possible to design better ways of providing weather risk;
- ❑ **Study approach** - **randomized field experiment** with an index product - a group contract, an MFI, and Iddirs (local traditional risk-sharing institutions – **Iddirs** in Ethiopia) .
- ❑ **Study objective** - explore possibilities that such **risk-sharing institutions**:
 - can be **harnessed** to mitigate basis risk; and
 - can, at the same time, become **resilient** to the ever changing climatic and environmental challenges.



Observations

- ❑ Combining features of informal and formal insurance is a potential way forward!
- ❑ Specific questions:
 1. Can group contracts mitigate basis risk by increasing **side-payments** in the event of individual-specific bad outcomes? - *possible*
 2. Do group contracts require **ex-ante rules** to effectively mitigate basis risk? – *they help*
 3. What are the mechanisms through which these processes work and what determines the direction of the outcome? – *mandated rules, access to funds*
 4. What are the overall welfare effects? – *some gains*

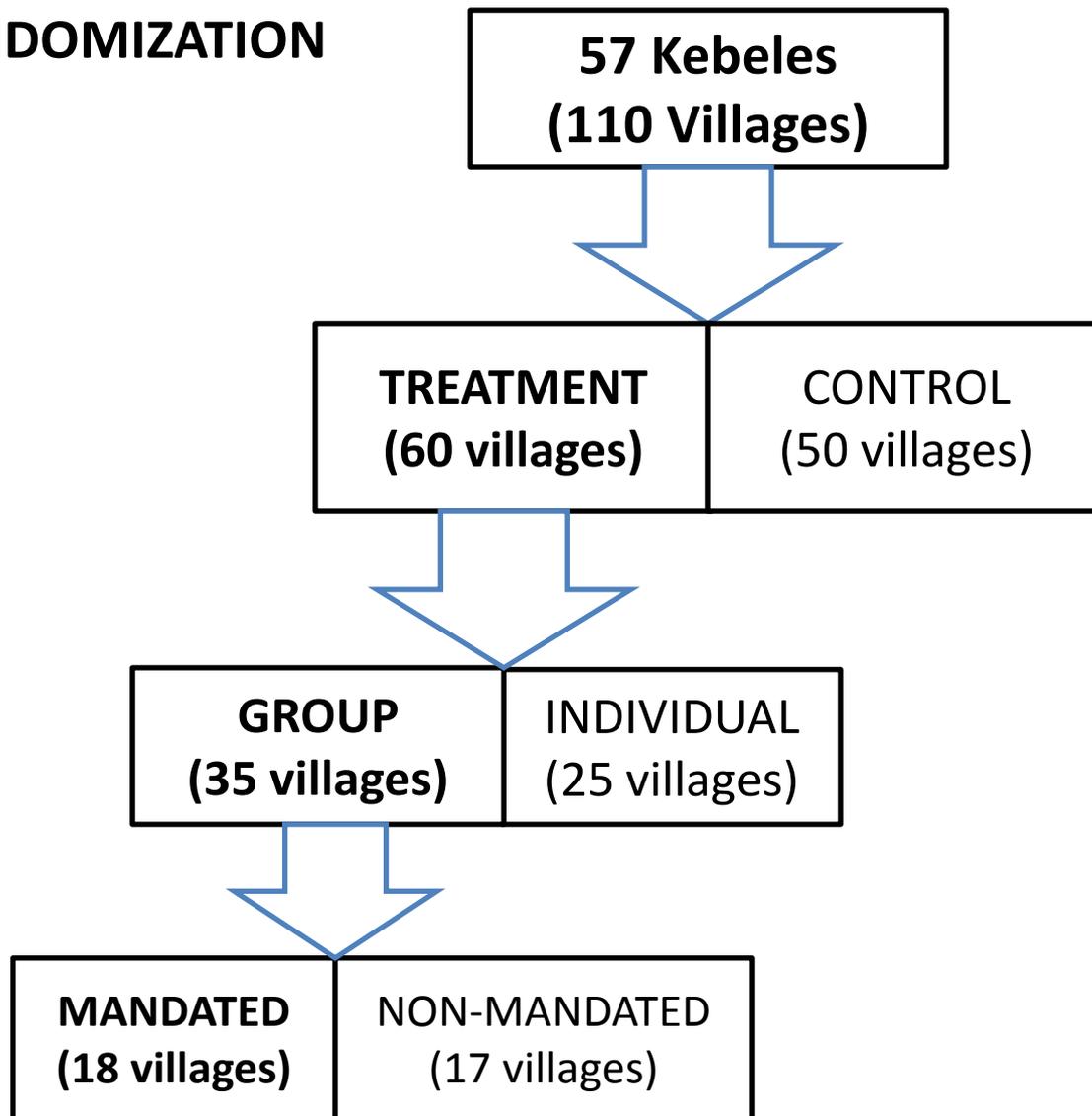


Weather index pilot in Ethiopia

- ❑ Long run pilot—looking at group institutions takes time
 - first year in 2011, second year piloting now, ...!
- ❑ 57 Kebeles (3-4 villages) selected around 3 weather stations in Oromia region of Ethiopia – Shashemene, Dodota and Tibe (long-term panel data available via the ERHS)
- ❑ **Primary interest** is to target risk-sharing group
 - conducted a **network mapping exercise** to ensure selection of villages with low probability of network overlap between “**treatment**” and “**control**” villages.



RANDOMIZATION



Mandated sharing-rules

□ *What did we mandate?*

- The group establishes regular savings to a **common pot**;
- 10% of any insurance payout in this group goes to this pot;
- This pool is disbursed to members that experience **idiosyncratic basis risk**, as a zero-interest loan;
- Disbursement criteria is discussed and set by the group at the beginning of the year;
- Members apply for the loan, group follows disbursement rules!
- Repayment is enforced as per the rules;



Provision of savings

- ❑ Money was contributed by project as “savings”
 - Research goal: examine how money is disbursed – need to see **disbursements** – and also show we keep our word - **trust!**
 - Discussing and agreeing on bylaws is a time-consuming **process**, it helped to have a reason to do this;
- ❑ Disbursement procedures
 - **Iddir villages:** In July/August Iddirs received a **promise** of 800 Birr in October on completion of bylaws discussion;
 - **Mandated:** 800 Birr on completion of mandated form agreeing to how payment would be spent;
 - **Non-mandated:** 800 Birr on completion of discussion, form could state that a discussion would be held in the future on how to split payment;
 - **Individual villages:** In July/August 16 individuals were randomly selected in a public meeting to receive 50 Birr each in October;
- ❑ Total flow of money into the village is the same, but who receives it is different;



Insurance Marketing, Sales, and Take-up

- ❑ Village-level meetings and training:
 - iddir leaders and influential people;
 - everyone in the village – organized through iddir leaders and village elders;
- ❑ Very few **early** season (May, June and July) policies were sold;
- ❑ Discounts offered for **late** season policies (September/Meskerem):
 - **Free insurance** in Dodota and Bako Tibe;
 - **Price discounts** in Shashemene: 40%, 60%, and 80% discounts randomly allocated across villages;
- ❑ 296 policies were sold in Shashemene (134 individuals and 435 Iddir members), about 13% of households;



Payouts

- ❑ September rains were poor in Shashemene – index triggered a payout!
- ❑ Insurance payout was made at the end of October in Shashemene.
- ❑ “Savings” payouts were also made at the end of October in all three sites.



Summary of experiment

	Control	Individual	Iddir, mandated	Iddir, not mandated
Common		<ul style="list-style-type: none"> Insurance to individuals; all season (mobilization through iddir) 	<ul style="list-style-type: none"> Insurance to iddirs; all season; iddir had to define rules 	<ul style="list-style-type: none"> Insurance to iddirs; all season; iddir had to have a discussion
		<ul style="list-style-type: none"> 50 Birr (paid in Oct) to 16 randomly selected individuals 	<ul style="list-style-type: none"> 800 Birr (paid in Oct) to iddir to distribute 	<ul style="list-style-type: none"> 800 Birr (paid in Oct) to iddir to distribute
Shashemene		<ul style="list-style-type: none"> Meskerem insurance <i>sold</i> and <i>prices varied across villages</i> 	<ul style="list-style-type: none"> Meskerem insurance was <i>sold</i> and <i>prices varied across villages</i> 	<ul style="list-style-type: none"> Meskerem insurance was <i>sold</i> and <i>prices varied across villages</i>
		<ul style="list-style-type: none"> October <i>payout</i> to those who bought 	<ul style="list-style-type: none"> October <i>payout</i> to those who bought 	<ul style="list-style-type: none"> October <i>payout</i> to those who bought
Dodota and Bako Tibe		<ul style="list-style-type: none"> Meskerem insurance <i>given</i> to 16 randomly selected individuals 	<ul style="list-style-type: none"> 16 Meskerem insurance policies <i>given</i> to iddir 	<ul style="list-style-type: none"> 16 Meskerem insurance policies <i>given</i> to iddir
		<ul style="list-style-type: none"> No payouts 	<ul style="list-style-type: none"> No payouts 	<ul style="list-style-type: none"> No payouts

Data

- ❑ Baseline survey: February –March 2011:
 - 1760 households in 110 villages (16 households per village);
- ❑ Follow up survey I: December 2011, some weeks after payouts were made:
 - 1734 households in 110 village re-visited (very little attrition, 1.5%);
 - 138 iddirs in 110 villages;
- ❑ Follow up survey II: February-March 2012;
- ❑ Follow up survey III: February-March 2013;

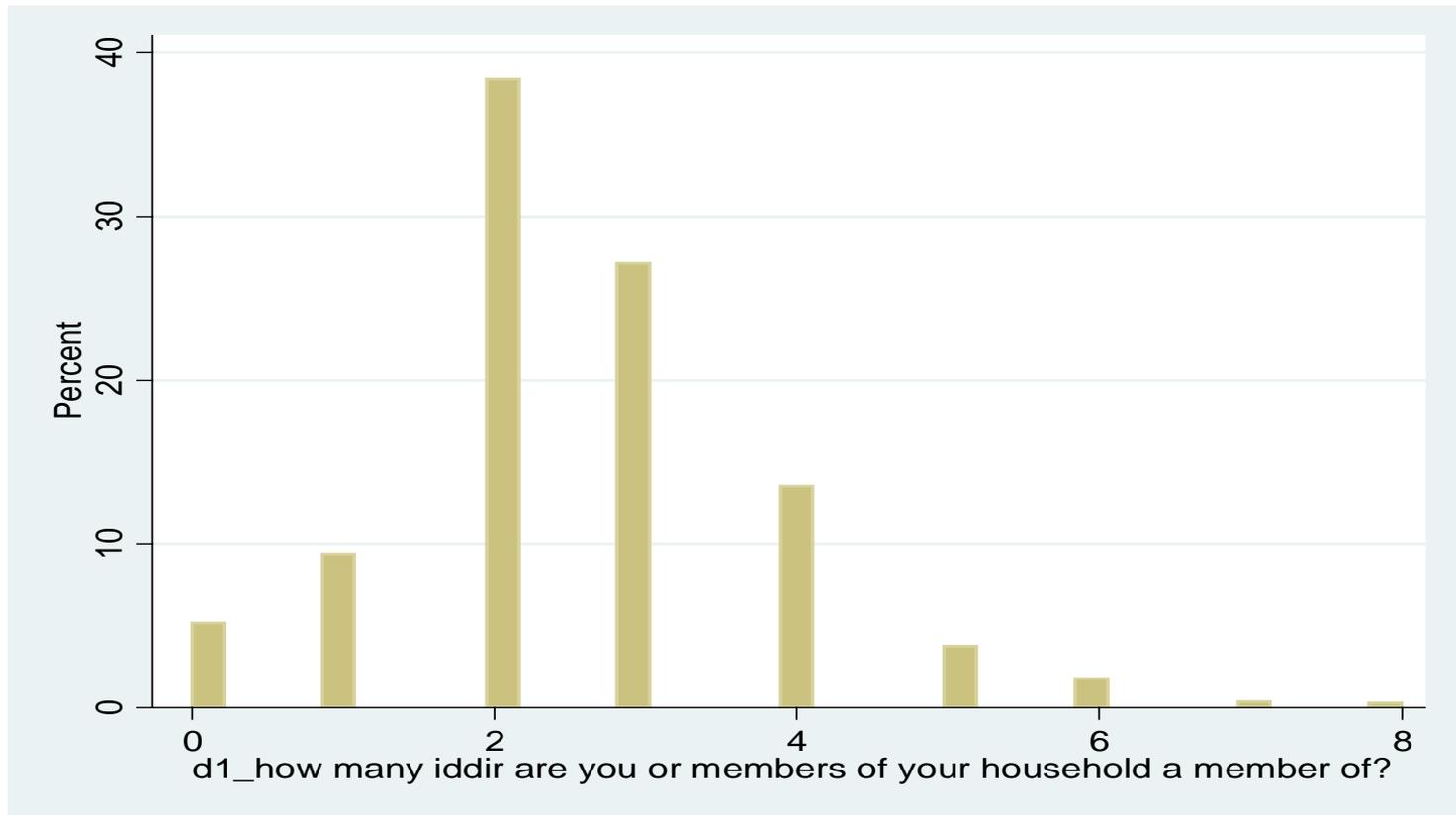


Baseline characteristics

- ❑ High incidence of drought: 51% experienced drought shock in the last three years;
- ❑ Formal insurance an almost unknown concept:
 - 10% had heard about traditional indemnity (car, life or health) insurance;
 - No-one had heard of weather or crop insurance before;
- ❑ Also:
 - Only 21% have heard of what a **millimeter** is;
 - Only 7% had a **bank account**;
- ❑ Initial interest in index-type insurance:
 - 87% were interested in a weather indexed insurance policy described to them in the survey;
- ❑ Indications of huge **basis risk**:
 - only 32% thought rainfall measured at the nearest weather station accurately measured rainfall on their plots;

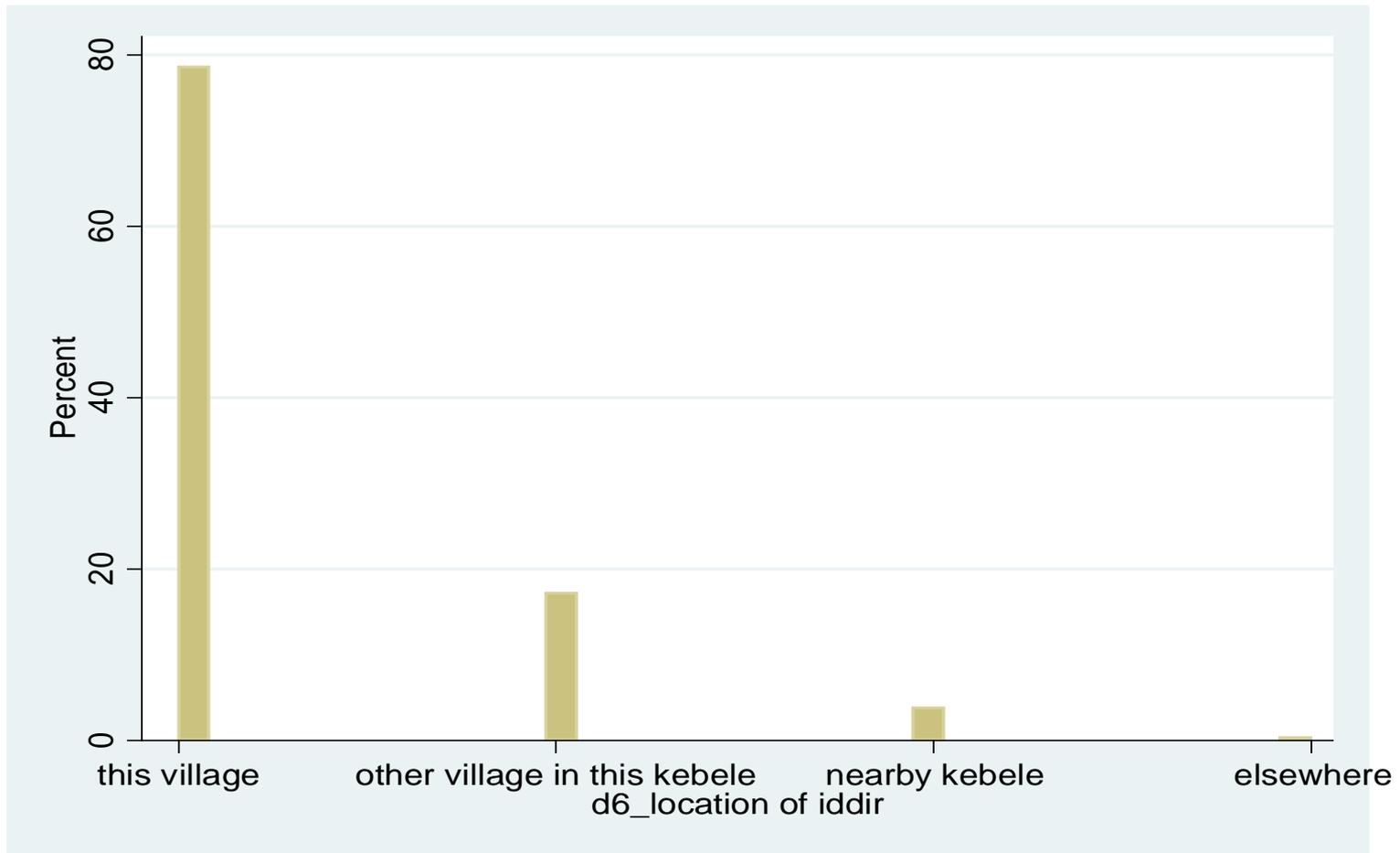


Baseline characteristics



Informal insurance very prevalent: only 5% did not belong to an iddir; 92% belonged to 1-5 iddirs

Baseline characteristics



Close to 80% of iddirs' *span* within the village



Econometric analysis

- ❑ compare outcomes between the **control** and the following treatment groups:
 - Individual and iddir
 - Mandated and non-mandated iddirs
- ❑ estimate the ANCOVA for outcome variables of interest with baseline data:

$$y_{it} = \beta_0 + \beta_{yt-1}y_{i,t-1} + \beta_T T_i + \varepsilon_i$$

- ❑ estimate a difference in outcome equation for outcome variables of interest without baseline data:

$$y_{it} = \beta_0 + \beta_T T_i + \varepsilon_i$$

- ❑ Stratification at **location** (weather station-level) so **dummies** are included for this in all regressions
- ❑ Randomization at village level, so standard errors are clustered at the village level

Results: insurance uptake

iddir_mandate	0.108**
	0.053
individual	0.077*
	0.039
cons	0.023
	0.014
Observations	387
R-squared	0.019

- Results for all individuals in treated villages in Shashemene - the omitted treatment is iddir_nomandate.
 - individuals in both iddir_mandate and individual villages purchased **more insurance**.
 - no statistical difference between iddir_mandate and individual villages in the **amount of insurance purchased**, although the point estimate for iddir mandate is higher.

Results: change in iddir rules

	Does your iddir provide	
	loans	loans for crop loss
Iddir	0.061 (0.046)	0.066 (0.041)
Individual	0.071 (0.044)	0.042 (0.031)
Estimation method	ANCOVA	ANCOVA
Observations	3629	3850
R-squared	0.198	0.013

District dummies included to account for stratification. Robust standard errors in parentheses

□ Change in iddir rules:

- No clear difference between iddirs in “iddir” treatment and “individual” treatment villages;
- Reason - because we are combining **mandated** and **non-mandated** iddirs (see below);

Results : access to loans and transfers

	(5)	(6)	(7)	(8)
	Grant or loan for crop loss	Grant or loan for crop loss	Loan for crop loss	Loan for crop loss
Iddir	0.051** (0.022)		0.066*** (0.022)	
Iddir (not mandated)		0.010 (0.027)		0.024 (0.026)
Iddir (mandated)		0.087*** (0.029)		0.102*** (0.029)
Individual	0.024 (0.023)	0.024 (0.023)	0.042* (0.022)	0.042* (0.022)
Constant	0.199*** (0.017)	0.199*** (0.017)	0.177*** (0.017)	0.177*** (0.017)
Observations	3,850	3,850	3,850	3,850
R-squared	0.010	0.013	0.013	0.016

- Insurance improved access to grants/loans to cover crop loss (crowding in of risk-sharing);

Results 2: access to loans and transfers

	1	2	3	4	5	6
	If your household needed 4,000 Birr for a medical emergency could the household obtain it within a week?			If your household needed 1,000 Birr for a medical emergency could the household obtain it within a week?		
insurance	0.066* 0.034			0.110*** 0.037		
Iddir		0.101** 0.038			0.159*** 0.041	
Individual		0.036	0.036		0.057	0.057
savings		0.042	0.042		0.039	0.039
		-0.107	-0.107		0.019	0.018
		-0.088	-0.088		0.132	0.132
iddir_nomandate			0.055			0.136** 0.053
			0.051			
iddir_mandate			0.139*** 0.037			0.178*** 0.043
Constant	0.258*** 0.036	0.257*** 0.036	0.256*** 0.036	0.548*** 0.038	0.543*** 0.038	0.543*** 0.038
Observations	1,107	1,107	1,107	1,107	1,107	1,107
R-squared	0.018	0.023	0.026	0.036	0.045	0.046

- Insurance increased perceived ability to finance emergencies, but not business ventures – (4-6 apply to self and friends;
- Result is driven by changes in the iddir villages, particularly changes in the mandated ones

Results 3: Impact on welfare

- ❑ Question - Did these (insurance purchases, iddir discussions and changes in sharing rules within village) result in differences in welfare across study villages?
- ❑ Where there were payouts (Shashemene):
 - no effect on food consumption;
 - those in **mandated** villages more likely to purchase clothing, footwear and mobile phones in the 4-5 months following payouts than those in control villages.
 - livestock ownership increased in mandated villages
 - no such differences between the individual and control villages, or the non-mandated iddirs and control villages.
- ❑ Where there were no payouts (non-Shashemene sites):
 - no effect on food consumption;
 - no impact on durable purchases;

Observations

❑ Specific questions:

1. Can group contracts mitigate basis risk by increasing **side-payments** in the event of individual-specific bad outcomes? - *possible*
2. Do group contracts require **ex-ante rules** to effectively mitigate basis risk? – *they help*
3. What are the mechanisms through which these processes work and what determines the direction of the outcome? – *mandated rules, access to funds*
4. What are the overall welfare effects? – *some gains*

❑ Next steps, this season:

- Continue with sharing rules and observe an additional season of insurance.
- Included a feature to the index – i.e., **gap insurance**. A carefully designed crop-cutting experiment is added to the index.
- A lot of optimism this year – many policies already sold, particularly in area where payouts made last year

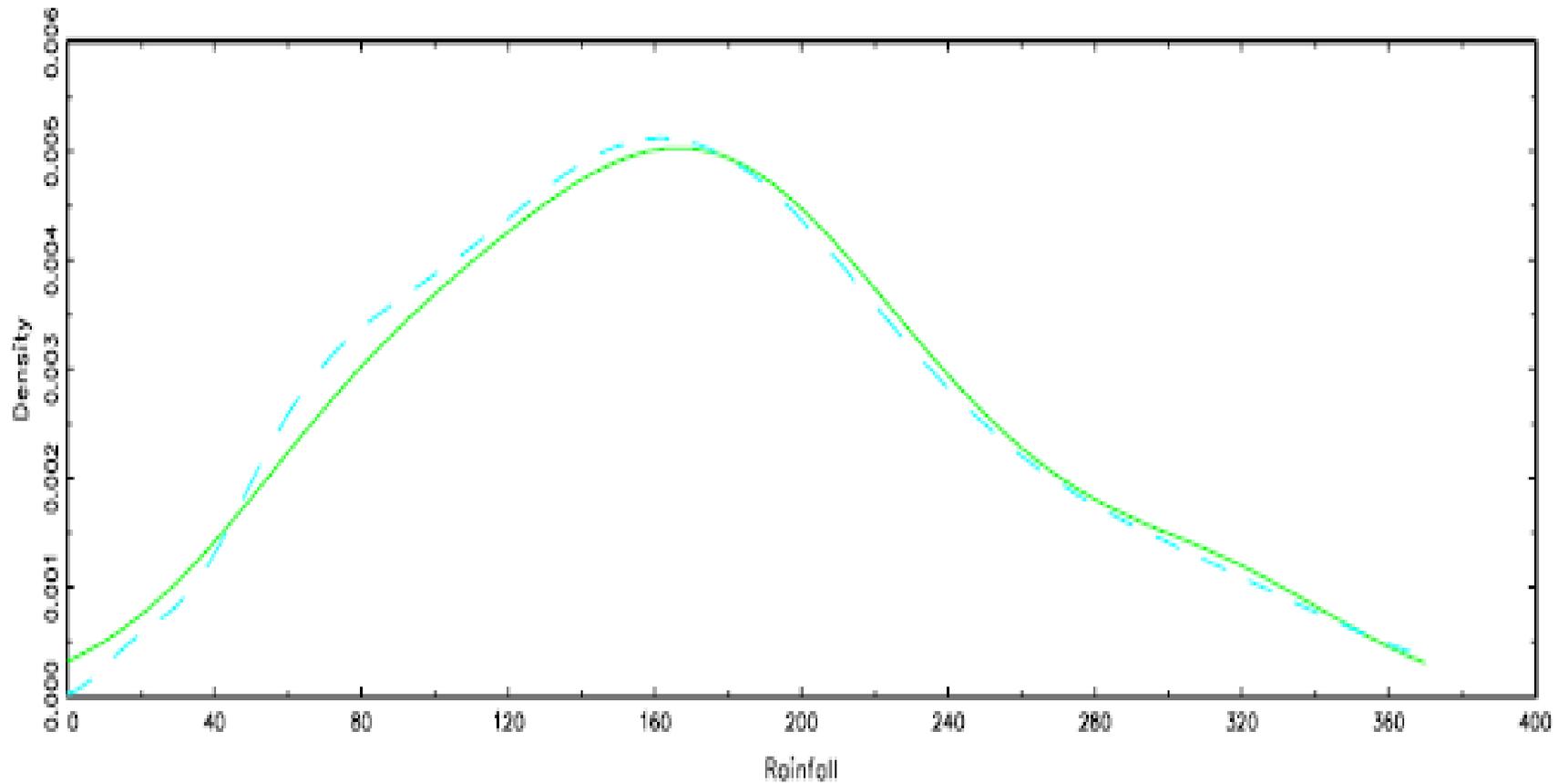


Thank You



Tibe weather station - Ginbot

Chen and Rosenblatt density estimates



Research questions

Specific questions:

Can we design better ways of providing weather risk

Group contracts – additional mechanism

1. Can group contracts mitigate basis risk by increasing **side-payments** in the event of individual-specific bad outcomes?
2. Do group contracts require **ex-ante rules** to effectively mitigate basis risk?
3. What are the **mechanisms** through which these processes work and what determines the direction of the outcome?
4. What are the overall **welfare effects**?

Summary: access to loans and transfers

- ❑ Source of finance for small emergencies (Birr1000 with in a week)
 - Those in mandated iddir villages reported increases in possible financing from iddirs, friends and own assets.
 - Those in non-mandated iddir villages reported increases in financing from friends and own assets only.
 - Those in individual villages also reported increases in financing from iddirs (not sure why this would be).

- ❑ Comparing the Shashemene and non-Shashemene - in the non Shashemene sites:
 - insurance did not increase a household's ability to finance emergencies - if anything there was a lower ability of those in individual villages to rely on each other;
 - And perhaps a lower ability of those in mandated iddir villages to rely on friends;
 - Since the story is different in the non-Shashemene sites, the results thus suggests that it was the **payout plus the mechanism that mattered**;

