

# Examining Underinvestment in Agriculture



## In brief

- Smallholder farmers in Northern Ghana often fail to invest in their farms, even when it may be profitable to do so. A randomized controlled trial was launched in 2009 to explore whether underinvestment was due to capital constraints or risk aversion.
- The project was implemented in 74 communities and 1,350 farmers were randomly selected to receive “treatments” of capital, rainfall index insurance, both, or neither.
- Results of the study show that:
  - Insurance provision creates a sense of security, leading to more investment.
  - Capital grants did little to change investment behaviour.
  - Demand for rainfall index insurance products is high.
  - Rigorous testing of an intervention can lead to national scale-up partnerships.
  - Further marketing tests are needed to assess profitability, scalability and associated basis risk of private, commercial rainfall index insurance products.
  - Further research is needed on combining rainfall index insurance with other agricultural interventions.
- Policy implications for implementers:
  - Assess the risk environment beyond unpredictable rainfall
  - Assess the regulatory environment to ensure investigators and policymakers work together from the beginning with regulators
  - Product designers and farmers should collaborate on product design.
  - Communicate with local institutions to develop scalable, sustainable and locally-directed interventions
  - Assess and partner with local distribution channels
  - Carefully design impact evaluation

## Background and Motivation

In the Northern Region of Ghana, smallholder farmers often fail to invest in their farms, even when doing so could be profitable. Innovations for Poverty Action (IPA) designed a randomized controlled trial (RCT), launched in 2009 and continuing into 2012, to explore this phenomenon, with a specific focus on whether capital constraints or risk aversion explain farmers' decisions to underinvest. The "Examining Underinvestment in Agriculture" (EUI) project was implemented in 74 communities across the Northern Region, and 1,350 smallholder farmers living in these communities were randomly selected to receive "treatments" of capital, rainfall index insurance, both capital and insurance, or neither. The study's design as a randomized controlled trial allows investigators to determine the impact of each treatment on populations statistically identical to each other.

## Policy Impact

*"Smallholder farmers often fail to invest in their farms, even when doing so could be profitable"*

Preliminary analysis shows that while the provision of capital alone did little to change investment behavior, the provision of insurance led farmers to invest more in their farms. The evidence from these interventions suggests that imperfect insurance in a risky environment is a strong deterrent to agricultural investment. Demand for rainfall index insurance was sufficiently high to encourage private insurers and national stakeholders to launch a scale-up initiative.

## Audience

The target audience includes agricultural and financial policymakers, insurance and microinsurance regulators and companies, private agricultural input suppliers and other institutions on agricultural value chains, not-for-profits, civil society organizations, and researchers.

## Policy Implications

The study has wide-ranging policy implications, detailed below.

**Preliminary analysis shows that the provision of insurance creates a sense of security for farmers that led them to invest more in their farms.**

Farmers with capital and insurance increased their total farm investment by over 30 percent, compared to the control group; the investment came in the form of increased cultivation, land preparation, chemical input purchases and household labor. However, there was no evidence of corresponding technological transformation, intensification or high returns to these investments. In other words, the increased investments did not lead to higher farm profits.

### **Preliminary analysis shows that capital grants did little to change investment behavior.**

Farmers who received a capital grant purchased more inorganic fertilizer, but made no other significant changes to their activities. While it is important that farmers have access to liquid capital, especially to purchase inputs ahead of the farming season, preliminary findings indicate that operating in an environment of reduced risk is more likely to encourage increased farm investment than is access to cash. The financial industry in particular may be interested in providing smallholder farmers with access to combination loan and insurance products.

### **Demand for rainfall index insurance products is high.**

IPA has found each year that half to two-thirds of farmers demand the rainfall index insurance product when offered at an actuarially fair price. In three years of insurance marketing, the demand curve has been continually refined based on demand levels. See Appendix for pricing details.

*“Farmers who received a capital grant purchased more inorganic fertilizer, but made no other significant changes to their activities”*

### **Rigorous testing of an intervention can lead to national scale-up partnerships.**

Since 2009, IPA has been granted exclusive permission to market rainfall index insurance to individual farmers in Ghana, and has served as an incubator for the nascent rainfall insurance industry in Ghana. In 2009 and 2010, IPA marketed its own non-commercial product to farmers in the EUI sample, and disseminated findings to national stakeholders. Consequently, in 2011 and 2012, IPA partnered with the newly established Ghana Agricultural Insurance Programme (GAIP), as well as the Ghana Insurers Association, Swiss Re and GIZ, to market GAIP's commercial drought index insurance product to EUI farmers, while GAIP marketed the product to banks to cover aggregate loan portfolios. IPA has also influenced insurance industry regulations by sharing EUI's research on product performance, basis risk, farmer investment behavior, and demand for both non-commercial and commercial products.

### **Further marketing tests are needed to assess profitability, scalability and the associated basis risk of private, commercial rainfall index insurance products**

Through its position as an incubator for rainfall insurance products, IPA has been able to make recommendations on farmer preferences for product design; to perform basic cost-benefit analysis of different insurance designs; and to recommend tests of new, potentially cost-effective and privatized scale-up strategies. Currently, IPA, GAIP, GIA and GIZ intend to test marketing through new distribution channels such as input suppliers, financial institutions, farm-based organizations, and mobile money services, in order to reduce distribution costs and to extend the product's reach. Ultimately, IPA and partners hope that continued tests of marketing strategies will lead to nation-wide availability of a rainfall index insurance product, offered through an effective delivery channel, so that private insurance companies can make a reasonable profit while farmers are adequately protected from catastrophic rainfall events.

*“IPA has found each year that half to two-thirds of farmers demand the rainfall index insurance product when offered at an actuarially fair price”*

## **Further research is needed on combining access to rainfall index insurance with other agricultural interventions**

EUI’s critical finding that increased investment did not improve farm profitability has led study investigators, partners and stakeholders to explore a new research question: can farmers with rainfall insurance improve productivity and profitability levels when they are provided access to improved extension services and inputs, such as fertilizer and seeds? In response to this question, IPA has designed two pilot studies—one on the costs and benefits of organic fertilizer application (2011), and another on the scalability of a mobile extension program (2012)—and a largescale RCT in partnership with the Ghana Ministry of Food and Agriculture (MoFA). The pilots will inform design of this larger RCT, scheduled to begin in 2013. The proposed RCT will test the hypothesis that access to inputs and extension services will have an effect on smallholder farm investment and profitability, and has the potential to improve MoFA’s local capacity, modernize extension delivery channels, and test the profitability of improved-yield input packages in real farming systems.

## **Action points for Implementers**

The results of this study should be especially interesting to those interested in testing or scaling up commercial rainfall index insurance products in developing countries.

### **Assess Risk Environment**

Farmers face a number of risks beyond unpredictable rainfall, such as disease, pests, lack of access to inputs and finance, more dependable returns to non-farm activities, and so on. Extensive focus group discussions with farmers and expert practitioners should be conducted before launching a rainfall index insurance product.

### **Assess regulatory environment**

Investigators and policymakers should work from the beginning with regulators, such as insurance commissions, to ensure that the study is legal.

### **Collaborate on product design**

Product designers should continually gather feedback from farmers on any insurance product, and should perform analysis on any available historical rainfall data, crop yield data and crop price data, in order to determine historical losses and appropriate payout amounts.

*“Product designers should continually gather feedback from farmers on any insurance product”*

## **Communicate with local institutions in order to develop scalable, sustainable and locally-directed interventions**

IPA has taken an iterative, collaborative approach to design of the EUI project, continually reflecting on and sharing research findings, disseminating results with local, crosssector stakeholders, and adjusting research and intervention design accordingly. Sharing preliminary research findings and operational test experiences through both informal and formal channels has encouraged local input on intervention design, led to scale-up initiatives, and generally driven support for evidence-based agricultural policy-making in Ghana.

*“Investigators and policymakers should work from the beginning with regulators, such as insurance commissions, to ensure that the study is legal.”*

### **Assess and partner with local distribution channels**

Investigators and policymakers should work with local institutions to determine whether these institutions can cost-effectively market and deliver insurance products to local populations. An expensive, unsustainable marketing campaign driven by a research organization or NGO with high distribution costs is unlikely to be replicated.

### **Carefully design impact evaluation**

Careful consideration should be given to any evaluation that will be used to measure the impact of insurance. Such a study should be piloted until study investigators or policymakers are certain it accurately captures information about outcomes of interest.

## **Dissemination**

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## Further Readings

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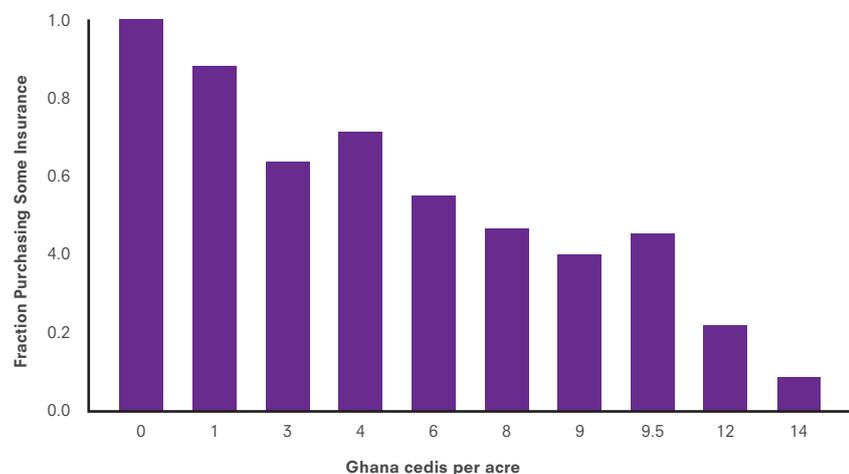
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### Appendix: Insurance Takeup by Price, 2009-11



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