# Evidence in Agriculture in Ghana

In Ghana, as in other parts of sub-Saharan Africa, investment in agricultural inputs such as fertilizer, high-yield seeds, and farm equipment is low among smallholder farmers. Researchers working with IPA have performed several evaluations in an attempt to better understand the causes of low investment and programs which may change investment patterns and ultimately improve yields, profits, and welfare for smallholder farmers.

## Examining Underinvestment in Agriculture: Returns to Capital and Insurance Among Farmers in Ghana (EUI)

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**Partners:** Agricultural Technology Adoption Initiative (ATAI), BASIS Research Program on Poverty Inequality and Development, Consortium on Financial Systems and Poverty (CFSP), Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ), Ghana Agricultural Insurance Programme (GAIP), Government of Ghana Ministry of Food and Agriculture, International Initiative for Impact Evaluation (3ie), Presbyterian Agricultural Services (PAS), Swiss Re, International Growth Centre (IGC)

**Timeline:** 2009-2012

Farmers in sub-Saharan Africa tend to underinvest in inputs such as fertilizer hybrid seeds, and labor, though such investments could increase their agricultural yields and profits. The reason why farmers underinvest are not clear: it may be due to a lack of cash, or it could be due to the risks of farming: if you invest all your money into your farm, you might be sorry if a crisis like a drought occurs. In northern Ghana, researchers conducted a randomized evaluation to evaluate whether access to capital or risk was driving farmers' investment decisions by comparing farmers who received access to rainfall insurance to those who received cash grants. The study found that farmers who were offered weather insurance spent more on inputs such as chemicals, land preparation, and labor than those who received cash grants—suggesting that risk, rather than money, was the major constraint on investment.

## Disseminating Innovative Resources and Technologies to Smallholders (DIRTS)

**Researchers:** Mathias Fosu, Savanna Agricultural Research Institute (SARI); Dean Karlan; Shashidhara Kolavalli, International Food Policy Research Institute (IFPRI); Christopher Udry

**Partners:** GAIP, Government of Ghana Ministry of Food and Agriculture, IFPRI, SARI

**Timeline**: 2014-2017

In this project, which built on the learnings of the EUI project, researchers tested whether access to two different payout levels of rainfall insurance—tested individually and in combination with improved-yield agricultural inputs, agricultural extension advice, access to input markets and delivery, and weather forecast alerts—led to more intensive land cultivation and increased earnings among farmers in northern Ghana. Preliminary results suggest that community extension agents helped to increase farmers' knowledge and adoption of improved practices and spurred increased investment in certain inputs, but did not lead to improvements in farmer welfare. Similarly, farmers who received access to the higher payout level of rainfall insurance spent more on inputs for their farms, but these investments did not lead to higher yields or profits for farmers.

## Testing Agricultural Technologies (TAT)

**Researchers:** Dean Karlan, Shashidhara Kolavalli, Christopher Udry

**Timeline**: 2015-2016

**Partners:** SARI, IFPRI

Using improved hybrid seed varieties may generate higher yields for maize farmers in sub-Saharan Africa—where agricultural productivity is low relative to other regions—but many farmers have not adopted these seeds. In conjunction with the DIRTS project, researchers investigated the performance of several different kinds of seeds. This project, which was not a randomized evaluation, studied the comparative yields of several seed varieties and farmer purchasing decisions in an effort to understand the performance and adoption of seed varieties in northern Ghana. Researchers found that there was a wide variety in yields between seeds, with farmers who grew a foreign hybrid seed on average yielding more than double what those who used a local hybrid, and the local hybrid did not perform as well as the more common local seed.

# Key Takeaways

**Extension agents can be effective in spurring behavior change.** Community extension agents helped to increase farmers' knowledge and adoption of improved practices and spurred increased investment in certain inputs.

**But farmers who learned best practices from extension agents did not see higher agricultural outputs.** More research is needed to determine how the promising extension agent model can best help farmers increase yields and profits.

**Weather insurance can increase smallholders' investment in their farms.** Evidence from EUI and DIRTS suggests that farmers who received the highest payout level of insurance invested more in their farms, spending significantly more on seeds and chemicals.

**However, there is not yet any evidence that the increase in investment from having weather insurance leads to improved yields or profits for smallholders.** The changes in investment and adoption of practices observed in this research were not of a sufficient magnitude to generate observable improvements in outcomes. Further research is needed to determine a path by which insurance can improve outcomes for farmers.

**Timing the delivery of information about a practice to when it is most useful may be an important component of a successful program.** Effects of extension agents' knowledge sharing were stronger on practice adoption than on knowledge: a possible reason is that while messages were delivered at the time of the adoption decision, knowledge about practice was tested several months later.

**Weather forecasting alerts via SMS can help farmers plan their activities more effectively.** Evidence suggests that these effects are not limited to farmers who receive the messages themselves, but spread quickly—often within hours—to others in their communities.

**Inputs subsidies programs are often characterized by unreliability and delays in the distribution of inputs.** This may make input marketing and delivery interventions a logistical challenge as well as negatively influence farmers' uptake: the possibility of buying inputs at market price right after harvesting, and having them delivered at their doorstep did not increase farmers' adoption. Affordability rather than accessibility seems not to be the main issue at least in the Northern Region of Ghana.

**Foreign hybrid seeds appear to be worth their higher cost for farmers, but local seeds may not be.** In the comparison of seed yields, the most common local open-pollinated seed variety outperformed two recently released local seeds (which performed similarly to one another). The foreign hybrid seed yielded almost double that of the local hybrid.

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