Climate Change and Financial Inclusion

Climate change-induced natural disasters affect an estimated 230 million people worldwide.[1] Droughts, flooding, pollution, and other weather events are especially threatening in developing countries, which have limited capacity to cope. Within those countries, the poor and marginalized are the most vulnerable, since climate change makes food more expensive, poses health risks through waterborne disease and extreme weather (particularly in areas with poor infrastructure and sanitation), and limits farmers' ability to create and maintain sustainable livelihoods.

The poor are inadequately equipped to cope with income shocks that accompany extreme weather conditions. A study in India found that while farmers adjusted to weather fluctuations (in this case monsoons) by changing irrigation and crop choices, they only recovered 15% of profits lost.[2] Substantial financial barriers may prevent farmers from adapting effectively to harmful impacts of climate change. For example, farmers may not have capital or credit available to invest in more resilient seeds or technology like irrigation. Additionally, they might not have access to affordable insurance products that can mitigate losses caused by extreme weather patterns.

As the effects of climate change intensify, it is critical to help the poor adapt to climate-induced challenges and empower them to reduce their impact on the environment. **At IPA's Financial Inclusion Program (FIP), we are discovering new ways that financial services and products can address the risks that climate change poses for the poor.**

There are two ways in which financial services can be linked to climate change:

1. **Financial services as a tool to build *resilience* in the face of shocks related to climate change.**

   One reason why the poor are most at risk is that they lack the tools to help them cope with the challenges to their health and livelihoods that accompany climate change. Rigorous evidence demonstrates that providing access to formal financial services, such as insurance, savings, or loans, can help the poor smooth consumption when they face unexpected setbacks.

2. **Financial services as a mechanism to *increase the accessibility, affordability, and usage of cleaner technology* that reduces contributions to climate change.**

   Specially designed financial services may allow the poor to be able to make affordable investments in environmentally friendly practices, lessening environmental damage.

This brief summarizes existing evidence from rigorous randomized control trials that suggest ways in which financial services can help the poor build their resilience and mitigate the risks associated with climate change, as well as reduce contributions to climate change. The brief also highlights several opportunities for innovative research to discover solutions to these formidable challenges.

Financial services as a tool to build *resilience*

Rigorous research demonstrates that improved access to formal financial services can help the poor deal with income shocks, whether they are weather-related (such as drought or floods), threats to health and wellbeing, or other unexpected challenges. Further research is needed to discover how we can: (1) design effective financial products and services to meet the specific needs of farmers and others facing climate-induced disruptions to their livelihoods; (2) make these products more accessible to the poor; and (3) increase usage of these products and services.

Insurance

Increasing access to various types of insurance can protect the poor against a variety of climate-related threats, including recurrent droughts, rising water levels, the spread of disease, and the increase of pests that endanger crops and carry diseases. Weather index insurance, for example, which makes payouts based on an easily observed variable such as rainfall, is an innovative financial product designed to make insurance accessible to poor smallholder farmers. Rigorous research demonstrates that when farmers are given subsidized insurance, the protection leads them to make investments to increase farm productivity.[3]

In some cases, insurance products may be more appropriate than cash or credit as a financial tool to support growth. For example, a study in northern Ghana found that the offer of rainfall index insurance led farmers to make larger investments and riskier production choices than providing farmers with cash.[4] Smallholder farmers are especially sensitive to the risk surrounding their investments, and, in the absence of appropriate insurance products, will make decisions to limit risk—which may simultaneously limit profitability. Providing capital either through credit or cash can facilitate investments, but such investments may enhance risk (since they are not guaranteed to pay off). They also cannot guarantee protection against weather-related risk in the same way that insurance can.

Low demand has prevented the growth of commercial markets for weather index insurance, suggesting that insurance is unlikely to reach a market-priced solution.[5] Yet, the study in Ghana suggests that insurance may be an effective policy tool for governments that want to encourage productive investments in agriculture.

Savings

Savings are another financial tool which can help the poor smooth consumption in times of unexpected setbacks or facilitate investments in climate-resilient technology.[6] Formal savings accounts also provide a safer way to store money than saving informally in livestock or other goods that may be negatively affected by climate change.

Allocating resources for specific purchases using labeling (in which a client labels funds as they set them aside for a certain purpose) or commitment devices (in which a saver chooses to restrict access to own his or her own funds to save towards a goal) can help people save more. These tools can also help users direct investment towards agriculture, the activity most vulnerable to the effects of climate change. In Malawi, for example, farmers who were offered savings accounts (which included a commitment feature) increased investment in agricultural inputs by 13 percent and increased production by 21 percent.[7]

Credit

Rigorous research has shown that climate-resistant inputs such as hybrid seeds can increase resilience among smallholder farmers in the face of climate related shocks. Such research demonstrates that increasing access to credit helps farmers invest in these technologies—like improved seeds, irrigation, fertilizer, and insecticides—that increase crop yields and improve productivity. In Kenya, for example, researchers found that asset-collateralized loans increased the take-up of rainwater harvesting tanks, which helped provide dairy farmers reliable and convenient access to water and improved their productivity.[8]

Moreover, matching the disbursement and repayment of loan products to farmers' harvest and planting cycles can increase their impact. Allowing farmers to delay repayment of a loan until after the harvest and helping farmers save between harvest and planting can increase farmers' investment in agricultural inputs. In Mali, providing farmers with an innovative loan product adapted for farmers' seasonal cash flow led to a significant increase in farm investments and expenditures (fertilizer, insecticides, and herbicides).[9] In another example from Kenya, researchers found that offering farmers the option to buy fertilizer at the time they received their harvest income increased fertilizer usage by 14 percentage points (on a base of 23 percentage points).[10] These effects were comparable to those obtained from a 50% price subsidy.

Increasing access to credit during the lean season can also help farming households allocate labor more efficiently, leading to improvements in productivity and well-being. In Zambia, farming households with access to loans that were offered during the start of the lean season (to be repaid after harvest) produced 5.6 percent more on average relative to comparison households. They were also almost 40 percent less likely to experience food insecurity during the lean season.[11]

Credit products that provide flexible repayment schedules can help clients who face natural disasters or other unexpected events. While bundling credit products with insurance could also potentially help clients who face climate induced risk, the results of studies evaluating this approach are mixed. In Ghana, Mumuadu Rural Bank offered randomly selected farmers a loan that incorporated crop price insurance. Specifically, the loan specified that if crop prices at harvest dropped below a certain threshold, the bank agreed to forgive

50 percent of the loan and interest payments. Farmers who were offered the loan spent significantly more on inputs (mainly fertilizer) than those who had not been offered a loan without the crop price insurance.[12] Yet, the insurance component did not appear to alter other kinds of investments by farmers, and separate research conducted in Malawi showed that bundling insurance with a credit product meant to increase technology adoption reduced demand for the product.[13]

What We Need to Know

- What role can digital finance play in increasing access to and take up of credit and savings products?
- Can subsidized insurance be an effective social safety net program? How does it compare in effectiveness to other potential programs like subsidized inputs or credit or cash transfers?
- How can we design financial products so that they better fit the specific cash flow needs of a farmer and the climate-induced risks that they face?
- How best can we quantify the business case for providers to mitigate customer risks? What kind of small, low-cost tweaks to existing models can have a large impact?

Financial services as a mechanism to increase the *accessibility, affordability, and usage* of cleaner technology which reduces contributions to climate change

Financial services can also allow the poor to make affordable investments in alternative, cleaner technology and encourage the adoption of better environmental practices which reduce contributions to climate change and are potentially welfare enhancing at the individual level. Ongoing research into these creative solutions suggests that there is demand, but further research is necessary to understand how best to design and market products which encourage the take-up and use of cleaner technologies and the adoption of better environmental practices.

Payments for ecosystem services, where payments are provided to individuals or firms to perform environmentally protective services, is one way that financial products can help increase the usage of better environmental practices. A study in Uganda showed that incentivizing landowners to not cut trees resulted in slower tree cover loss in villages that received the incentive.[14] The program was an effective and cost-effective way of averting carbon dioxide release and resulted in significantly less deforestation in the targeted villages. While there is evidence that, given the right incentives, farmers can be encouraged to invest in environmentally friendly practices, there is a need for additional innovation in how to incorporate these incentives into existing financial products and services. "Green loans," for example, provide clients with access to credit to use for environmentally friendly products, such as solar technology, better insulated houses, and eco-friendly seeds and fertilizers. Because these loans are fairly new, however, they need to be rigorously evaluated to assess whether they can encourage uptake of environmentally friendly practices and reduce the population's carbon footprint.

Solar energy microgrids are an example of a clean energy technology that can be linked to financial services in ways that are potentially beneficial to clients, service providers, and the environment. These grids are meant to be cost-effective for consumers, and may increase poor communities' resilience to power loss in weather events while also reducing carbon emissions by burning fewer fossil fuels.

Pay as you go (PAYGO) services can give customers access to environmentally friendly technologies such as these solar microgrids and other alternative power sources. A client can take a small loan to buy power from an off-grid solar panel, and then pay it off in installments via mobile money accounts that clients can easily manage. If clients miss a payment, the devices can be switched off as a reminder. These platforms are not only convenient for customers who can buy as much power as they need, but are also less risky for providers, who can cancel the service if they do not receive payment. Observational research suggests that consumers in South Africa utilize the flexibility that prepaid electricity meters provide when this technology is available.[15] Preliminary results from an IPA study conducted in Kenya suggests that providing retailers in Nairobi with PAYGO solar lamps led to lower use of kerosene.[16]

What We Need to Know

- What kind of financial products and services can encourage people to adopt environmentally friendly practices?
- Do PAYGO and digital payment technology increase the take up of clean energy?
- Do PAYGO services increase welfare for users, in addition to boosting efficiency for suppliers?
- How do PAYGO services work at scale, and how can they reach scale? How do we guide the market towards improved outcome for the planet as well as the poor?
- Can PAYGO services help build trust in the financial system? Does switching to PAYGO create measurable impacts on security?

Project Development

The Financial Inclusion Program at IPA is looking to work with interested policy makers, donors and researchers to delve further into these questions. FIP at IPA is on the cutting edge of connecting financial products and services with the reality of climate change. Innovative research can find solutions to today's most pressing environmental challenges while protecting those most vulnerable to climate-induced dangers.

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