

## IFPRI Podcast Series Episode 5: Picturing a Better Crop Insurance

**Sivan:** Hi and welcome to “Research Talks”, a podcast series that explores how research is making an impact on people and policies, with a focus on the ‘how,’ brought to you by the International Food Policy Research Institute, IFPRI. I am your host, Sivan Yosef, and today, we’ll be talking about insurance. Now, not just any regular insurance, but agricultural insurance. And not just any regular agricultural insurance, but picture-based insurance. Here is a preview from Berber Kramer, a senior researcher with IFPRI, doing work in India.

**Berber:** Insurance is just a means to an end. Ultimately, the goal is to improve resilience, to improve incomes, to reduce poverty.

**Sivan:** So before we talk about picture-based insurance, we need to really understand what agricultural insurance is, and why farmers even need it.

**Berber:** I’m Berber Kramer, I’m a research fellow with IFPRI’s Markets, Trade and Institutions Division. I’ve been with IFPRI now for almost 7 years and am currently based in Nairobi. Together with colleagues from different parts of the world - DC, Europe, Kenya, India, I’m studying how to improve agricultural risk management. When we’re looking at smallholder farmers, they have very limited access to financial instruments: there’s limited savings, they have limited access to credit, and so when there’s a drought or another natural disaster destroying their crops....it pushes them down the ladder.

**Sivan:** When poor farmers’ livelihoods are wiped out, they might have to sell their land, or take their kids out of school, or cut down on healthy foods like vegetables from their diets. In really bad situations, they and their families might start skipping meals. Enter insurance.

**Berber:** When I joined IFPRI, the work on crop insurance was led by my colleague Miguel Robles. IFPRI’s work in this area, that was started under his leadership, has always been motivated by the idea that crop insurance does not only improve welfare once farming households receive an insurance payout, so once they have actually lost their crops, but also that the feeling of having insurance for their farms gives farmers confidence to invest more, which can improve agricultural productivity, profitability and, ultimately, incomes.

**Sivan:** IFPRI’s early trials around insurance were focused on index-based insurance. This type of insurance depends on, for example, a weather station that measures temperature or rainfall. When the weather becomes too extreme, there’s too much or too little rain or very high or low temperatures, farmers receive insurance payouts. The weather index insurance trials were done in Bangladesh, Uruguay, Ethiopia, and Egypt.

**Berber:** IFPRI has tested these products for a period of time. And in several trials, our colleagues have found encouraging results. Insured farmers were changing their production practices, for example, they invested more in riskier crops, most likely because they were facing less risk. But at the same time, farmers often got disappointed with their insurance policies. Some farmers would suffer damage while the index didn't trigger a payout; sometimes this was because the farmer was too far away from the weather station, so there was no accurate weather record for that farmer; in other cases, it was because the damage was not caused by extreme weather, but by something else, for instance, a pest or a disease that wasn't covered under the insurance policy.

And also, we noticed that farmers found index insurance rather abstract. And I think that makes sense; it seems difficult to imagine that there is a satellite up there in space measuring rainfall on my specific plot. So we started thinking, ok, what can we do to make these insurance products closer to farmers' actual experience? And we would almost want to see what's happening in farmer's fields real time.

**Sivan:** In late 2014 Berber's team started thinking of innovative ways to tackle the problem. Their first idea was using drones to take images of crop damage and using those images for claim settlement. Farmers could actually see a drone flying above their heads, which would make the whole thing tangible. But the idea ran into roadblocks pretty quickly.

**Berber:** It seems like the idea wasn't ripe enough back at that time. There wasn't enough regulation in place yet, and things like that. The other thing with drones is that, you know, we were very excited about drones because they were not expensive at all. And we thought, "okay with this, you can cover quite a large portion of land with the cost of a drone." The only problem was who is going to operate that drone? Who is going to take that drone where it needs to be flying? And that actually costs a lot of money.

**Sivan:** How did the people, other people working on drones solve that issue?

**Berber:** So what we're seeing drones being used for now, for instance in the US, you have these large farms, and so there's enough surface that a farmer would like to have a drone fly over that it actually becomes economically viable. For a small farmer with just an acre of land, this wouldn't be economically viable.

**Sivan:** In 2015, Berber was talking to a colleague at the IFPRI offices about what their next move should be.

**Berber:** We see so many more smartphones these days in farmers' hands. So, what if we could actually use those smartphone cameras that farmers have to get that better picture that we need of farmers' fields to settle claims? And that's how picture-based insurance, how the idea started.

One of the first things that I remember is a conversation with Miguel Robles in the coffee room on the eighth floor of the old IFPRI building where Miguel kept saying, "I wanna go from pictures to numbers. I want to go from pictures to an indication of a farmer's yield or losses."... And it was Miguel saying, "you know, maybe we can use smartphones that farmers have." So we started implementing this idea with Miguel, myself and our colleague, Francisco Ceballos.

**Sivan:** The team envisioned that farmers themselves would use their smartphones to send in pictures of their fields and of their crops to an insurance company. The insurance company could then look at the photo evidence and say, "yes, there's damage", or "nope, in this case we don't see any damage. So, we don't see any reason for a pay-out." They worked with a developer to create an app for this very purpose, and roll it out in August of 2016. It was ... a rocky process.

**Berber:** We were two weeks before we really had to start rolling out the app and installing the app on farmers' phones so that they could start sending in images and the app just kept crashing. This was quite a problem. But I

mean in the end we had a developer work until very late at night, a day before we were to go to the fields. But it's just a whole different ball game. Like as a researcher, it's difficult to imagine what it means developing an app. There are so many things that can go wrong.

And in that first year that we were testing it, I felt a little bit like we were kind of cowboys out in the Wild West doing something that had never been done before. And people saying like, "but does it work?" And I thought, well, we're right now testing whether it works. Ummm... We don't know it yet. You know, that's part of the research. That's why we're doing this.

The first thing that people bring up is, "Oh, people will start tampering with the photos. You know, they'll apply an Instagram filter to their photos, and they'll cheat on you. So, this model is not sustainable." That was a little bit of the initial skepticism that we got. So, we said, "okay, let's actually test it." And so, we had our app, the smartphone app through which farmers are sending in images. The photos are taken within the app and farmers can't do any photo editing on it before it goes out. So that's one thing in which we said, "okay, let's, you know, prevent the tampering." But then people said, "okay, but there's moral hazard"

**Sivan:** Moral hazard is the possibility that since farmers might think, "okay, I might get a pay out if I have damage," they might have less of an incentive to prevent any damage from happening to their crops. So, they might not apply pesticides or do other things to prevent a pest attack, in order to qualify for a payout.

**Berber:** We said, okay, let's test if that happens.

**Sivan:** They tested it on 750 farmers in India.

**Berber:** So, we told half a group of farmers that they would be receiving picture-based insurance in which if there was visible damage due to natural disasters, visible in their pictures, they would receive a pay-out. And we told farmers in another group, "you're receiving weather index-based insurance." And so here the payouts depended only on the weather measured at a weather station, nearby weather station. And overall what we found was that there was very little difference in yields between the farmers in the picture-based insurance group versus those that had been offered weather index-based insurance. Also, when it came to visible damage that was, you know, showing up in the images that we had been receiving. We didn't see significantly more instances of damage for farmers in the picture-based insurance group.

**Sivan:** These findings suggested to Berber's team that maybe moral hazard wasn't actually a big issue. One possible reason could be how they had designed the product. Farmers had to send in their pictures every single week, regardless of whether they were making an insurance claim or not. This may have given them the feeling that the insurance company was keeping an eye on them.

Were you working with an actual insurance company during this experiment or were the payouts coming from the project funds?

**Berber:** No, we are working with an actual insurance company still. This is an Indian-based insurance company. We reached out to them, it was a matter of one phone call. They loved the idea. They priced the insurance product. So, they said, okay, we have our weather index-based insurance product for this region for Punjab and Haryana for this crop. We were working on wheat initially and then we added a small mark-up. So, they priced the picture-based insurance product in that way. And then we purchased insurance coverage on behalf of the farmers. So that's where the payouts were coming from. They were actually coming from an actual insurance company.

**Sivan:** The researchers found that the insurance company viewed picture-based insurance as a marketing tool. The company could say to farmers “Hey, here’s some weather-based index insurance. And it comes with this extra backup product—picture-based insurance—just in case your index insurance doesn’t trigger a payout.” So now the next big question for Berber’s team was whether farmers were actually willing to *pay* for picture-based insurance. Could it be a real life product?

**Berber:** We went to farmers and we elicited their demand for these products at different price points. What we found in this research was that farmers were willing to pay much more for weather index insurance when we added the picture-based cover for visible damage.

Now at the same time we do have to keep into account that it's very difficult at this stage with limited data to really price that picture-based insurance cover. And so, this is something that just requires a lot more data, a lot more research. And so that's what we are also really focusing on in our work for more crops and for more years trying to collect this type of data as a way of providing this as more like a public good. So we're not so much ourselves, you know, trying to promote this solution or trying to sell insurance, but we're really trying to generate the data that is going to help the insurance companies and governments with insurance schemes take better decisions on whether this is an appropriate solution for them.

**Sivan:** The project also gave some unexpected insights on gender roles.

**Berber:** This project is not only about taking pictures, but it's really about the impacts that improved insurance coverage can have on households. And that means that we should interview not only the men, but it's also the women who are actually the ones who might be affected the most when there's a shortfall in income in the household.

But this was really difficult in the beginning as I started working on this project. Enumerators, they were sort of, of the opinion that, you know, why would we interview women? They don't know anything about agriculture. It's a waste of our time. It's a waste of their time. And then I said, “Listen, it's a pilot. Let's just try it. See how it goes.” And so, they did it. They interviewed the women, and at the end of the day, they came back to me and they said, “You know, we never realized that women actually know so much about agriculture and that they are also taking on so much of the burden and that they should be part of this project.” And so that was sort of a personal victory, I feel. That on a very small scale, we changed something in those gender norms in a way or the ways that people think about the roles that men and women play in agriculture.

**Berber:** We are working with a couple of larger insurance initiatives now, that really have thousands of farmers and in some cases even millions of farmers insured. And so, for instance, we're working with the government of India currently to test whether this methodology can be used in their national crop insurance scheme.

**Sivan:** Has this project changed the way you engage with insurance in your own life?

**Berber:** Yes. So, at some point I had an accident. I fell and I had an open knee, a cut in my knee. And so right away I took a picture of it. So, I've been starting to document everything with pictures so that I have proof. And then the insurance companies, actually that's quite funny too. Like when I'm talking to them on the phone, I actually sometimes tell them; I tell the service agents from the insurance company or the call center people, I tell them why I'm sending those pictures because of our project on picture-based insurance. And I think they normally find it quite amusing.

**Berber:** Insurance is just a means to an end. Ultimately, the goal is to improve resilience, to improve incomes, to reduce poverty. That's ultimately the end goal. Now, insurance is only one instrument in achieving that goal. We have a lot of different instruments, both financial services. So, savings, credits, we can look at mobile money.

And then there's a lot of technologies in agriculture that also are helping to improve resilience and productivity. And so, all these different pieces, they need to be put together in a comprehensive way and in such a way that they're not competing with one another. So, insurance needs to be designed in such a way that it covers the risks that farmers wouldn't be able to manage with their production technologies. If farmers have access to credit, then insurance shouldn't be covering the risks for which farmers could easily cope by taking out an extra loan at reasonable interest rates. So that's how to look at insurance. It really just plays a role in this bigger picture of different instruments that farmers have to manage risk.

**Sivan:** A big thank you to Berber Kramer for her time. For our listeners, you can read up more by googling IFPRI and Picture Based Insurance. And don't forget to subscribe to our podcasts so you don't miss a single episode of Research Talks from IFPRI. Til Next Time!