

Webinar on "The role of governments in scaling up agriculture (index) insurance"

We are developing an NDVI index insurance on crop loss incorporating climate change into the model. However, we are having difficulties collecting NDVI data (numerical values). Is there a database (data source) available that we can access NDVI data for our research purposes? It would also be good to get the panellists' view on NDVI vs. weather index, and some success stories.

Peter Wrede, World Bank Group - The best known sources of NDVI data include NOAA and MODIS, and data can be downloaded from the corresponding websites or from research institutions like the International Research Institute for Climate and Society. However, data formats may have changed in the past, e.g. in respect of resolution, and discontinued satellites may have been replaced with new ones. So achieving consistency of past data may require help from specialists, and it is advisable to seek assistance (or at least some dialogue) with local experts like geographic departments of universities. Given that some ground truthing will be necessary (e.g. concerning soil use, to distinguish farms from football fields), this analysis needs to be done on a national or sub-national level anyway.

NDVI-based index insurance is more similar to yield insurance than to weather index insurance in that insurance payments are agnostic to the reason for the reduction in biomass; in theory, they could therefore provide more comprehensive protection than weather index insurance, also covering pests for example. However, given that there is not so much experience with NDVI-based index insurance in developing countries, pilot testing there is limited so far to straightforward weather-related hazards, typically the impact of rainfall deficit on extensive pasturage (which has the additional advantage of largely homogeneous "crops", unlike the predominant intercropping on small parcels by small-scale farmers). NDVI seems superior in these cases where weather station density is low and high resolution is not required. Where higher resolution is important – e.g. to reduce basis risk – the advantage of NDVI based insurance is not so obvious. Michael Carter of UC Davis for example has written on this.

Lena Heron, USAID - While no index will perfectly correlate to losses on the ground, using rainfall as an index for insurance contracts is increasingly seen as having too high basis risk. The problem is both with the dearth of weather stations, but also the complex relationship between rainfall and plant growth/yields--too many other factors come into play--temperature, timing of moisture, soil fertility, etc. The thing is, NDVI isn't a silver bullet index either. There is no one index that is better than others for all situations. For some things (like the quality of available pasture forage in northern Kenya), NDVI is far superior to rainfall as a predictor of livestock mortality at higher rates of mortality. But for other crops in other places, NDVI will be not be a very good predictor of yields. (NDVI would miss so-called green famines, in which the biomass of plants is great, but the grain never sets because of temperature variations at the wrong time during the growing season.) Our point is that you use the best index for the situation--that is, that one that correlates most closely to the losses that are the objective of the insurance contract.

Aside from the choice of index, there is really interesting work now on how to use hybrid contract design, audit mechanisms and other design features as a way to minimize or protect against the basis risk inherent in index insurance contracts.

Is there any study on the availability of data across different countries to implement index insurance?

Peter Wrede, World Bank Group - If the question is about the implementation of cross-border index insurance schemes: the only cases of multi-country index insurance schemes are on the sovereign level, e.g. the CCRIF and the ARC. All cases of retail index insurance that I can think of are confined to one country. One reason is the usual national sovereignty in respect of weather data with the resulting differences in formats, frequencies, quality and public availability of data. Using satellite data instead of ground based weather stations might have the potential to overcome this, but satellite data would need to be calibrated using ground based weather stations (if only to convince the insured populations that the highly intangible satellite data does reflect the weather they experience, which of course also needs to be correlated to local crop losses).

If the question is about the availability of global data for implementation of local index insurance schemes, it comes back to satellite data given the nationality of ground based weather stations and crop yield statistics.

Could you please share with us some experiences about government helping farmers to increase their investment in productive technologies? This is really interesting, but it implies the integration of counterparties which are not really in the scope of the insurance industry. Thus it may be difficult to implement.

Peter Wrede, World Bank Group - The World Bank supported West Africa Agricultural Productivity Program (WAAPP) is a beautiful recent example. More traditional approaches include free / subsidized fertilizers and subsidized access to credit through (partly-) state owned agriculture banks or interest-compensation government funds. The challenge is to convince governments that insurance can be an important component in any effort to improve farmers' / herders' productivity and lives if included in the technology / finance / access to markets package. Like households, governments have different tools to address risk, for example using savings instead of insurance, which in the case of governments means setting up some disaster / emergency fund for example to reimburse lenders for loan defaults due to massive crop losses. The example of Kenya provides a beautiful case study of how the public and the private sector can come together, explore the advantages and disadvantages of the different available instruments, and make better choices for the future, for example by making better use of risk transfer provided by (re)insurance.

Difficult, yes, but not impossible; and worthwhile.

Lena Heron, USAID - There is increasing empirical evidence that when farmers are better able to manage their risk, they are more likely to invest in improved inputs such as seeds, fertilizer, and veterinarian services, etc. (See work of Karlan and Udry in Ghana; Barrett and Mude in Kenya; Carter and Gurkinger in Mali). If this is case, it is possible that by supporting access to insurance, governments may be able to more cost effectively increase the use of these inputs (than they do by directly supplying or subsidizing them). Of course, other things also have to be in place--financial and input supply markets have to be working, farmers have to have a market for their production, etc. So insurance doesn't solve all problems--and doesn't necessarily work in isolation, but it can be a powerful tool. This is the theory of change behind the crop insurance program that Kenya is developing. It will certainly be interesting to watch what happens there.