VUNA

changing farming for a changing climate

Adam Smith International

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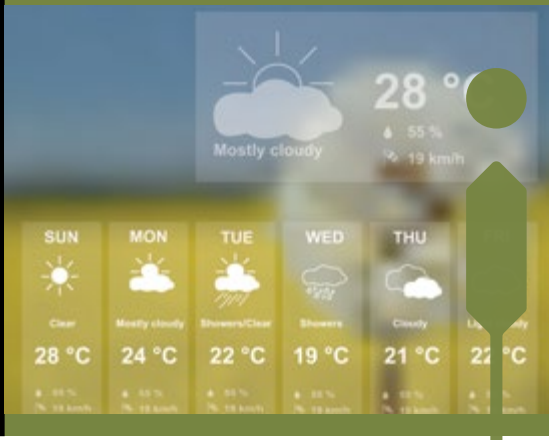
Vuna is a DFID-funded climate smart agriculture programme working in Eastern and Southern Africa. The programme is implemented by Adam Smith International with a consortium of local partners.

INFORMATION BRIEF:

Agricultural Weather Index Insurance in Sub-Saharan Africa

Based on the Vuna report "Comparative Assessment of Selected Agricultural Weather Index Insurance Strategies in Sub-Saharan Africa," by Carlos E. Arce (August 2016). Pretoria: Vuna. Online: http://www.vuna-africa.com



Key Points

- Weather index insurance (WII) has been promoted as a way to mitigate climate risks undermining the production of smallholder farmers.
- International donors have generously funded WII pilot projects, partly as a way to promote climate-smart agriculture.
- None of these projects have proven commercially self-sustaining. Most pilots have failed because farmers have shown little interest or because insurers have suffered large financial losses.
- WII appears to hold little promise for improving the resilience of smallholder farming in the face of climate change.

The Promise of Weather Index Insurance

Agricultural production is inherently risky in Eastern and Southern Africa due to variable rainfall, and frequent drought is common. Climate change is increasing these risks. As a result, farmers are less willing to invest in new technologies. Traders and agro-processors face lower incentives to expand supply chains into these risky environments.

Traditional agricultural insurance, mostly sold in developed countries, is ill-suited to meet these challenges. Such insurance, which bases indemnity payments on verifiable losses, does not work for smallholder farmers in developing countries, largely because of the high transaction costs involved in selling contracts and assessing losses among dispersed smallholders in rural areas.

Weather index insurance was created to address such problems. With WII, indemnity payments are not dependent upon measured losses. Instead, they are linked to an index, which is based on estimates of the weather required for crops (or livestock) to develop satisfactorily. Models are designed to predict, for example, how many tonnes per hectare of a crop are lost for every millimetre of rainfall excess or deficit in a specified location. The insurance company needs to monitor not the farmer's crop, but rather the weather near that crop. Indemnities can be paid on the basis of remote observations of key weather conditions. WII promises to overcome the shortcomings of traditional agricultural insurance, which include moral hazard, high adverse selection, and the high cost of field assessments.

There have been many pilot projects testing various models of WII. A number of these have already failed. But new investments in WII pilots are still occurring. Vuna, therefore, conducted a literature review and visited pilot projects in four countries in Eastern and Southern Africa to determine whether the promise of WII is finally being achieved.

Global experience

Since 2005, international funders – most prominently the World Bank, the European Union, and USAID – have committed more than $40 million to WII programmes in developing nations, including at least eight countries in Eastern and Southern Africa.

The projects have proven expensive, in part because designing an index is data-intensive, and the data required are often unreliable or simply unavailable. Donors have funded the hiring of weather experts and modellers, the capturing and cleaning of data on weather and crop yields, and the installation of weather stations. WII contracts cannot be easily replicated across locations or from one crop to another: new crop models and yield data are required for each new policy, and these must be tested anew in each environment in order to estimate the model's accuracy and to set policy prices. Experts also must analyse the weather observations on a regular basis to declare potential payouts. All of these factors increase costs.

Despite these investments, the models continue to face technical challenges, the largest of which is basis risk—the difference between the level of losses predicted by the model and the actual level of losses experienced by farmers. The model may call for a payment when none is needed. Worse, weather damage may occur to an insured crop, but the model fails to predict this and the insurance contract does not trigger a payment.

Basis risk has been a large factor in another significant problem for WII: low demand. Despite more than a decade of testing many models of WII, uptake has been far below expectations (Giné and Yang, 2008; Binswanger-Mkhize, 2012; Cole et al., 2013). Such policies have been widely accepted only in few situations where they were either free or heavily subsidised. According to Clarke (2011), the low demand for WII by poor farmers is a rational response to basis risk. For higher uptake, WII must be cheaper and/or more effective than the current risk management practices of smallholders, such as reliance on social networks and self-insurance mechanisms (Binswanger-Mkhize, 2012).

Overall, insurers do not regard WII as a profitable line of business, and have not made sustained investments in it. Most of those involved in early pilot projects have dropped out. Most of the projects initiated with donor funding have failed, and the development and testing of pilot WII programmes continues to require substantial donor funding at every level—from building weather infrastructure to marketing and monitoring contracts.

Table 1: Recent weather index insurance pilots in Sub-Saharan Africa

Type of Policy	Recent pilots	Issues arising
Seed protection	Kenya, Rwanda, Tanzania, Zimbabwe	Low demand; low payouts; model implementation constraints
Input credit protection	Malawi, Mozambique, Tanzania, Zambia	Variable demand, insurance losses, high basis risk, model development constraints
Yield protection	Kenya	Low demand, high basis risk, model development constraints

One motivation underlying the promotion of WII has been to increase the incentives of farmers to invest in new, potentially riskier technologies, including climate-smart technologies that may improve the resilience of local farming systems in the face of climate change. The evidence shows there is some degree of correlation between the introduction of subsidised insurance and higher risk-taking by insured farmers (McIntosh, 2016; Mobarak and Rosenzweig, 2012; Giné et al., 2016). Although experimental findings suggest insured farmers tend to undertake riskier agricultural activities than those uninsured under the same circumstances, the cost effectiveness of this public investment remains questionable.

Case Studies in Sub-Saharan Africa

In June 2016 Vuna conducted field visits to four countries in Sub-Saharan Africa—Kenya, Tanzania, Zambia, and Zimbabwe—to collect data on active WII programmes, including numbers of farmers covered, insurance value, evidence of technological change, levels of continuing subsidy, and the prospect for commercial sustainability. The field visit involved seven case studies in the four countries. The results were consistent with that of the global literature, suggesting grave challenges to the success of WII.

The case studies included seed and yield protection programmes for maize farmers, input credit protection for cotton and maize farmers, and yield protection for livestock keepers. Overall, the programs faced problems including low uptake among farmers, lack of reliable weather data, inaccurate models, technical complexities in marketing and delivery platforms (some of which involved registration via mobile phone), and high loss ratios for insurers. Table 2 shows results for three of the programs.

Table 2: Three WII case studies in Sub-Saharan Africa

	Tanzania: input credit protection for cotton farmers (2014)	Zambia: input credit protection for cotton farmers (2014-15)	Zimbabwe: input credit protection for maize farmers (2014-5)
# of insured farmers	337	3,092	3,700
Total sum insured	$6,411	$84,948	$5,000,000
Total premiums	$385	$6,796	$300,000
Premium rate	5.8%	8.0%	6.0%
Payouts to farmers	$494	$5,684	$3,300,000
Loss ratio	128%	84%	1,100%

Sources: Gatsby Foundation, Focus insurance, ZimNat

A shifting array of insurance companies seems to be willing to keep investing in WII pilots if donor support continues to fund many basic operational costs. However, there is no indication that insurers will make these investments on their own. Nor is there evidence of commercial sustainability.

Conclusions

Despite substantial financial support from donors and extensive testing of various models, the commercial development of WII has largely failed. Insurance companies do not see it as a profitable line of business. Despite subsidies, relatively few farmers have shown interest in WII policies. Although farmers who received subsidised insurance tended to undertake riskier agricultural activities than those who were uninsured, there is no evidence that WII can support expanding investment in more climate-smart agricultural technologies. Efforts continue to find a better model. Ultimately, however, the largest contribution of WII may be in the development and refinement of models for providing early warning of national and sub-regional production loss, rather than as a basis for insuring individual farmers.

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