

United Nations Economic and Social Commission for Asia and the Pacific

Weather Insurance for Adaptation to Climate Risk: Emerging Trends from Asia and the Pacific Region

In traditional agricultural insurance schemes, the insured receives an indemnity from the insurer when crops are damaged by drought, hail, or frost. Such insurance exists largely because of subsidies provided by governments and account for almost half of the premiums in some schemes. These include the schemes provided by the Federal Crop Insurance Corporation in USA, el FONdo de DEsastres Naturales de Mexico in Mexico, and Agricultural Insurance Company of India. However, maintaining high levels of subsidy may not be sustainable, especially for low-income countries. The experiments in promoting traditional indemnity based weather insurance have not been successful in Asia and the Pacific.

Index-based insurance can overcome some of the problems of traditional crop insurance schemes and has been piloted in several countries. Initial results of these pilots are encouraging where uptake of the insurance has been high. This case study looks at the experiences of index-based weather insurance and highlights the lessons from pilot schemes in China, India and Thailand that may be replicated elsewhere in the region.

China:

In 2008, the World Food Programme (WFP), International Fund for Agricultural Development (IFAD) and Ministry of Agriculture of China issued a joint index insurance pilot scheme in Anhui Province, China. The pilot index insurance covered around 500 households and 85 hectares of rice with a total insured value of USD 56,000 (IFAD 2010). Guoyuan Agricultural Insurance Company (GAIC), an insurance provider founded by state-owned enterprises, was selected to be the principle insurance provider. The pilot covered heat waves (above 35°C) and droughts and was intended to cover potential losses in production costs. A total of 91.7% of the premium was subsidized, the same level as the national Multiple Peril Crop Insurance (MPCI) (Balzer and Hess 2010). The pilot product of index insurance was found cheaper than MPCI. However, the demand for index insurance was limited by the availability other crop insurance schemes, bank credit guarantees, and relief programmes. Furthermore, most insurers were not prepared to develop an index insurance product, despite their strong interest in the sector (IFAD 2010). More needs to be done to promote, incentivize, and build capacity in developing a sustainable index insurance industry.

India:

In 2007, the Weather Based Crop Insurance Scheme (WBCIS) was introduced to provide protection to farmers against adverse weather events including rainfall deficits by basing insurance payouts not on damage, but on a given weather index. The insurance is linked to credit and farmers are requested to

obtain credit. Weather index data are generally taken from commercial weather stations approved by the insurance issuers. Feasible trigger and payout rates were developed using weather index models to make the insurance products sustainable and attractive to farmers. Private weather index insurance is also available in India through two main insurance providers: ICICI Lombard and Indian Farmers Fertiliser Cooperative (IFFCO) Tokio General Insurance Company (ITGI). Their products have been distributed through multiple channels including rural corporative banks, input suppliers, and contract farming companies. BASIX, a micro-insurance provider, also started selling insurance products in 2008 with 40–50% subsidy, after the government announced that it will start to offer private insurance companies the same subsidies as public companies in certain regions. As the basis of risk, the actual amount of insurance compensation, and the farmers' actual loss are largely influenced by the location of weather stations, WBCIS index insurance product is constrained by limited location of weather stations. The lack of weather data and real-time data transfer were also reported to be significant challenges to the accuracy and efficiency of the settling amount. In order to acquire accurate data and minimize basis risk, it is estimated that India would need an additional 10,000 weather stations, which is a significant financial commitment (IFAD 2010).

Thailand:

The Weather Index Insurance (WII) programme for rice crops was piloted in Khon Kaen Province in northeastern Thailand in 2008 (Jeerachaipaisarn 2012). The programme aims to protect insured farmers against droughts, which are common phenomena in northeastern Thailand. The province has 34 weather stations covering approximately 10,000 km² (Sinha 2014), which is a relatively high density. As of 2013, WII has been formally commercialized as an insurance option for farm loans, is available in 9 provinces and has insured more than 2,800 farmers (Sinha 2014). WII is based on a rainfall index designed by Sompo Japan Nipponkoa Insurance Inc (Sompo), which uses historical data of accumulated rainfall from weather stations. WII is the result of an international partnership of the Japanese insurance company, Sompo, which designed the weather index insurance product, and BAAC, which provided Sompo with local information and acted as a distribution channel. Thai Meteorological Department provides historical rainfall data and has set up the necessary weather stations. Private-public partnerships (PPPs) played critical roles in developing WII and set an encouraging precedent.

China, India, and Thailand are at different phases of adapting weather index insurance with varying levels of support from their respective governments. While these programmes have different modalities of operations, coverage and scale as they originated to address country specific concerns, the central common features are that they were all catered to smallholder farmers who are more often than not face severe hardships in agriculture and have limited access, if at all any, to formal financial markets, let alone insurance. Therefore the lessons learned from these pioneering pilots would be useful for other countries in the region in their efforts to address the adaptation needs of the agriculture sector to the vagaries of weather patterns.

Table 1: China, India and Thailand’s experiences with rainfall index insurance

Country	Year	Policyholder	Institutions involved	Scale (number insured)	Tied to credit
China	2008	Smallholder farmers	Guoyuan Agricultural Insurance Company, World Food Programme, International Fund for Agricultural Development	482	No
India	2003	Smallholder farmers	Agriculture Insurance Company	22,377,021	Yes
Thailand	2008	Smallholder farmers	Sompo Japan Nipponkoa Insurance Inc, Bank for Agriculture and Agricultural Co-operatives	2,800	Yes

Sources: IFAD 2010; Sinha et al 2014

Key Recommendations

The early experience with weather index insurance in China, India and Thailand provides some good insights into its effectiveness and sustainability as a climate risk management tool. While weather insurance programmes have demonstrated the potential to help farmers protect their investments against recurrent droughts, there are several prerequisites to the success of these programmes:

- **Raise the awareness of farmers:** In all of the cases studied, low awareness of farmers about the potential benefits of weather index based insurance products and their relatively low premiums was an obstacle. Proper marketing and awareness raising campaigns should accompany the introduction of index-based insurance programmes.
- **Invest in technological innovations:** Accurate and timely weather data hold the key to successful index insurance products. The densification of hydrometeorological networks in drought-prone areas, the development of crop-specific disaster loss databases, satellite-based products, and vegetation indexes are examples some of the technological innovations needed to operationalize weather insurance.
- **Reduction of basis risk:** The basis risk, as defined by the International Risk Management Institute, is the difference between an index and a specific portfolio of losses (relying upon that index) as the underlying basis for a hedge. For example, insurer A's loss portfolio will not be the same as the index used to calculate the price of the security purchased to hedge the loss portfolio. Basis risk results from an imperfect hedge¹. To deepen the market for index-based insurance, the basis risk must be reduced. Increasing the correlation of the index with actual yields will contribute to the development of the market. For example, precise co-relation of satellite derived crop specific vegetation index to the yield in a specific agro-ecological situation could be help in reducing basis risk.
- **Use risk-layered schemes:** A risk-layer based approach based on the severity levels protects farmers from the widest range of events ranked by severity. The highest risk is 100% loss of yields based on a

¹ <http://www.irmi.com/online/insurance-glossary/terms/b/basis-risk.aspx>

historical average for example. Layered programmes involve multiple insurance companies that take on part of a risk at various levels coverage, each one in excess of lower limits written by other insurers. Governments should heavily subsidize the insurance of the highest risk layer, while the lower ones would be dealt with by the private sector. Such a scheme would reassure farmers while at the same time guaranteeing a certain market size for insurance companies, thus allowing them to expand their range of index-based products.

- **Develop reinsurance markets:** Risk layering schemes can also come with the use of reinsurance schemes. Reinsurance was available in the cases studied, but with limited scope. Scaling up and the development of the reinsurance market is also essential to encourage the involvement of private insurance companies and to effectively transfer risk from domestic to international insurance markets.
- **Target institution level insurance:** Targeting institutions instead of individual households might also expand the use of index-based insurance. Institutions such as cooperatives operating on mutualised fixed costs, banks with outstanding loans, and international organizations committed to providing aid in times of crisis have reasons to subscribe to index-based insurance in order to insure their portfolios at risk. Once payment is triggered, these institutions can use their knowledge of the field to fine tune payments to the victims based on observable losses and lessening the basis risk, thus improving the overall quality of the index-based insurance product.

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