

Technology Fact Sheet for Adaptation

C. Index Insuranceⁱ

Technology:	
Sector : Agriculture	
Subsector : all subsectors	
Technology characteristics	
Introduction	Originally insurance companies started a widespread use of multi-peril insurance. These peril aspect include: frost, hail, rainfall, flood, high temperatures, drought, snow, pest outbreak, etc. Farmers pay premiums which charge varies according to the peril type. However, the success of this type of insurance is variable and not always satisfactory. Payments issued by insurance companies to farmers in “Index Insurance” are based on weather or other indices that strongly affect farm production and farmer’s income. These indices retrieved from weather stations or satellite images are usually constructed through remote sensing and GIS techniques. Index insurance is therefore a type of insurance that addresses only one climatic peril factor that is particularly common in a region. Premiums to be paid by farmers are less costly and the indemnities paid by insurance companies are more efficient.
Technology characteristics/highlights	- Index insurance answers practical problems related to traditional production insurance or subvention including: adverse selection and moral hazard problems, and monitoring costs. - One index (i.e. cumulative rainfall, cumulative ETP...) can be strongly correlated to yield, and offer substantial value to farmers, if yield variability is a significant contributor to income variability. - Index insurance is a new growing “soft technology” that has not seen the light in Lebanon. However, some NGO and the public sector are discussing this topic with potential insurance companies.
Institutional and organizational requirements	Since Index insurance is to be introduced, all the necessary institutional and organizational arrangements are to be initiated from both legislative and financial aspects. The Ministry of Agriculture, Ministry of Finance, The Higher Relief Council and the Insurance companies are in charge of the implementation of this soft technology. Index insurance can be a tool that enhances agriculture credits; farmers who would apply for bank loans are obliged to buy index insurance. However, this might also hinder the farmers from seeking bank finance if they do not consider future climate impact as a threat.
Operation and maintenance	- Index insurance does not require field operation, but more GIS and remote sensing techniques. - Data on land cover/land use should be updated on a seasonal or annual basis. - Weather stations should be set up in all agro-climatic zones. Maintenance of these stations is essential.

	- In the local setting featuring a large number of farmers, small agriculture holdings and diversified crop production, it may be more effective to target financial or humanitarian intermediaries (i.e. NGOs, cooperatives) as the primary clientele for these index insurance products. Intermediaries with protection against extreme weather events should be more willing to provide services to producers who are directly vulnerable to these extreme events.
Endorsement by experts	Index insurance is endorsed and encouraged by most development organizations that are tackling adaptation measures in the agriculture sector. The deployment of this soft technology is recent and increasing worldwide.
Adequacy for current climate	Since Index insurance relies on weather indices and remote sensing it is an adequate technology for current and future climate. Nevertheless, the diversity of microclimatic conditions and crops in Lebanon helps in increasing the resilience of farmers, and reduces the risk factors, which makes the adoption of such technology under current climate limited to specific local contexts and hinders the adoption of a homogenous index all over Lebanon.
Scale/Size of beneficiaries group	Depending on the selected index, the scale of the beneficiaries may vary from a specific region or product to nationwide for the entire agriculture sector.
Disadvantages	- Getting Index insurance to smallholders (which are the most relevant in Lebanon) may be difficult and costly (administrative costs). - Demand for insurance among farmers may be weak if the insurance is not correlated to the main sources of risk. For instance, sometimes losses in yield due to climatic adverse are welcomed, as these losses are counterbalanced by higher prices and incomes are sustained. Index insurance should not be only correlated to yield, but also take income change into consideration. - Farmers are not willing to pay if they cannot foresee the coming risk, or if they assume that the frequency of the risk and the damage value are lower than the premium that they pay in a defined period of time. - Weather index insurance products in their current form seem to be most effective in relatively simple production environments that are heavily driven by a single weather outcome. Productivity in arid and semi-arid settings is often driven almost entirely by rainfall, which makes them especially well suited for index insurance products (i.e. rain fed crops). In more complex, diversified production settings, a much broader set of weather events matters to production outcomes, including cumulative rainfall, extreme temperature or rainfall events, wind events, etc. Furthermore, the impact of the timing of these events on production varies widely across crops, which is precisely the diversification benefit. Designing an index product that reflects a broad set of relevant weather events and the diversification of household productive activities is challenging, but also necessary if insurance is to help vulnerable smallholders to adapt to climate change.
Capital costs	

Cost to implement adaptation technology	The cost of implementation remains unclear. Weather index insurance should be a cost-effective business for insurance companies, and a mean to adapt to climate change for vulnerable farmers. The premium to be paid either by the farmers or the government is the key cost to be determined. The cost of this option relies mostly on the type of measuring the index (weather station, satellite image...), number of beneficiaries (farmers), the area covered by the insured crops, the type of crop and value of the eventual damages, the frequency of the climatic adverse occurrence (risk assessment)...etc.
<u>Additional</u> cost to implement adaptation technology, compared to “business as usual”	The cost of the premium to be paid is the only cost which is additional when compared to “business as usual”.
Long term cost (i.e. 10, 30, or 50 years) without adaptation	N/A
Long term cost (i.e. 10, 30, or 50 years) with adaptation	Cost of the premium.
Development impacts, direct and indirect benefits	
Direct benefits	The affected farmers will benefit from indemnities paid by insurance companies, which should enable them to sustain their activities (if the infrastructure is damaged) and livelihood (if only their income is affected). Indemnities will enable vulnerable farmers (namely small holders) to reduce the cost of restoration of physical damage to property and infrastructure and to cover the losses of economic output.
Reduction of vulnerability to climate change, indirect	Indemnities to farmers will decrease their vulnerability to climate change.
Economic benefits, indirect Employment Growth & Investment	Insurance companies will also profit from premium payments when climatic adverse does not occur, thus increasing job opportunities within insurance companies. The technology should guarantee a win-win state of affairs. Capital requirements from insurance and reinsurance companies are needed to pay the indemnities as well as from public and private sectors as well as donors to cover the insurance cost for small holders.
Social benefits, indirect-income Education	Insure a minimal income when the farmers’ income is totally affected by climate under the covered index. On the long term farmers will be aware of the need for insurance which will increase their willingness to pay.
Local context	
Opportunities and Barriers	- Index Insurance relies on other technologies like GIS and remote sensing and weather stations, enabling risk assessment. Mapping of risk assessment would also be useful to both public sector and farmers to adapt their programs and project investments according to the eventual risk occurrence. These technologies could be used also for early warning systems. - Index insurance is an opportunity to shift from relieve-programs and

	volatile indemnity distribution by the Higher Relieve Council and NGOs to a more business-oriented mechanism which spares these parties from the cost of assessing damages and the distorted mechanism for distributing indemnities. - Barriers are numerous, in terms of absence of institutional or organizational arrangements so far.
Market potential	Depending on the chosen index and the crops, the market potential is nationwide; furthermore, if one index is to be chosen, it is likely to have a restrain market which might not attract insurance or reinsurance companies.
Status	Not available, under study between an NGO and potential insurance companies. The policy of the Ministry of agriculture is to promote a “solidarity fund” for each type of crops that integrates farmers groups contributing in financing this fund along with the government. Furtherer, the fund will pay indemnities for the affected farmers. This preliminary concept is under development.
Timeframe	Medium to Long Term
Acceptability to local stakeholders	If the government, NGOs and insurance companies are studying index insurance, farmers are not ready to accept such technology as long as they receive relieve aids for free and do not estimate the future impact of climate change on their livelihood.

ⁱ This fact sheet has been extracted from TNA Report – Technology Needs Assessment Reports For Climate Change Adaptation – Lebanon. You can access the complete report from the TNA project website <http://tech-action.org/>