Tailoring Agricultural Insurance Products for Developing Countries

William Dick

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Agricultural Risk Management Team
Agriculture and Rural Development
The World Bank
Agenda

- Context for agricultural insurance in developing countries
- Product options
- Tailoring products
- Weather Index insurance
- Area yield index insurance
- Knowledge transfer and capacity building
Risk in agriculture

- **Risks** are uncertain events which cause loss
- Examples: weather, natural hazards, health, accident, strikes....

Constraints in agriculture

- **Constraints** are predictable conditions and lead to low productivity and low income
- Examples: ineffective supply chains, access to finance and market, poor prices, lack of reliable input supply, low technology, rural roads, infrastructure, ....

Why is the distinction important?

- **Risks** *may* be insurable
- **Constraints** are not insurable but increase farmer vulnerability to losses
- **Constraints are normally extremely high for agriculture in developing countries**

*there is a requirement for appropriate insurance products and innovative distribution linkages*

*insurance may supplement existing informal or formal risk coping at family or community levels, especially for serious and correlated risks*
Context: a challenging environment

- Agricultural insurers faces barriers
  - Insurers lack rural networks, expertise, data
  - Technically complex to insure crops and livestock
  - Catastrophe risk exposures
  - High transaction and loss assessment costs
  - More profitable opportunities exist in commercial and urban areas

- Clients
  - Small size, geographically spread
  - Lack insurance awareness
  - Lack capacity or willingness to pay premiums
  - Lack incentives to insure if there is government disaster assistance

- Inadequate data and infrastructure
  - Poor statistical base (crop production, risks, losses)
  - Poor rural services including credit
  - Difficult to establish distribution channels and linkages
Agricultural insurance – product range

- Traditional crop and livestock indemnity products
  - Named peril crop insurance (e.g. hail)
  - Multiple peril crop insurance (yield guarantee)
  - Revenue insurance (yield and some price protection)
  - Livestock mortality insurance

- Index-based products
  - Weather index products
  - Area yield index products
  - Livestock index products

- Rural insurance products
  - Health, life, property, motor...
  - Microinsurance a growing sector enabling rural households to access simplified policies
If traditional insurance is not feasible, can index insurance fill the gap?

- An index insurance contract pays out based on the value of an “index” that is highly correlated with yields, and not on losses measured in the field.

- Example indexes: rainfall, temperature, regional yield, river levels, NDVI.

**Key advantages**
- Index insurance overcome most of the supply side problems of MPCI.
- Objective and transparent.
- Provides timely payout.
- Reduce administrative costs.
- Facilitates international reinsurance.

**Disadvantages**
- **Basis risk** – the potential mismatch between losses and payouts.
- Provides single-risk protection.
- High inputs required during development phase.
- Requires local adaptation – slows the scaling up.
Simple Weather Index Insurance Contract

- Three-phase deficit rainfall weather insurance contract, indexed to a weather station

- Pioneered by Indian insurance company ICICI Lombard in 2004 and subsequently in many pilots around the world (Malawi, Central America, Thailand)

\[
\text{Indemnités} = \min (\text{Max Paiement}, \text{Phase 1} + \text{Phase 2} + \text{Phase 3})
\]
WII is appropriate if risk is correlated to yield and an index can be designed.
Tailoring index insurance for different client levels...

<table>
<thead>
<tr>
<th>Level</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>Micro level clients</td>
<td>Weather index insurance retailed directly to farmers - intermediated through institutions with rural outreach</td>
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<tr>
<td>Meso level clients</td>
<td>Weather indexed portfolio insurance for rural financial institutions (incl. MFIs) that lend to poor farmers; or for processing companies which contract with farmers</td>
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<tr>
<td>Macro level clients</td>
<td>Weather insurance or weather-indexed contingent credit line for governments or international organizations that provide safety nets for the poor.</td>
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-> Assessment of risks and players in each supply chain can enable:
  - Identification of entry points for product distribution and management
  - Finding linkages which can allow “bundling” of insurance with other services
Organisational linkages for micro and meso index insurance

Micro-level insurance program

- Insurer
- Distributor
- Policyholder is Farmer

Meso-level insurance program

- Insurer
- Policyholder is Aggregator (e.g. processor, bank)

- Aggregator sets the payout rules

➢ Aggregator/Distributor is a critical link
Tailoring: 1/5. Type of climate and extent of weather risk?

- The primary interest in index insurance is for drought risk.
- There should be a strong relationship between crop yield and rainfall (e.g. where seasonal rainfall is between 400mm and 800mm).

Risk Zoning for return periods for given rainfall deficits helps in analysing suitability for index insurance.
Tailoring: 2/5. Type of crop and production system?

- Most suited for rainfed **annual crops**
  - Cash crops (e.g. cotton, groundnut)
  - Food crops principally grown for market (e.g. maize, sorghum....)

- Other potential for index insurance
  - Pasture index for livestock herding

- Mixed cropping (inter-cropping)
  - As farmers may grow several crops on a single plot of land, there is interest in creating index insurance not linked to specific crop types ("income supplement index insurance")

- Irrigated agriculture
  - Irrigated crops are less suited to weather index insurance

Inter-cropped coffee plantation with maize, beans, banana and palm oil
Tailoring: 3/5. Type of farmer and livelihood?

- Index insurance has potential to reach lower income farmers compared to traditional agricultural insurance.
- Farmer groups and co-operatives can act as focal local points for insurance education and distribution.
- Ability to pay premium, insurance awareness, and demand are key issues.
- The farmers most likely to benefit from index insurance are the emergent and commercial rather than subsistence.
- Relationship of Index Insurance to government safety nets and food security systems?

Livelihood zones, Mali

Tailoring: 4/5. Organisational linkages and stakeholders for index insurance?

Example: a proposed structure for a pilot project for groundnuts in Senegal for rainfall index insurance.
Tailoring: 5/5. Data availability and quality?

Parametric insurance needs

- Historical weather data (min 20-30 years)
  - Missing daily data less than 1%
- Currently operating weather stations
  - Guideline radius for farmers <20 km distance from station
- Investment in low cost automatic stations is likely to be needed to improve network
- Most meteorological services are under-resourced

Area yield insurance

- Long term yield data series at department level (min 20-30 years)
- Production/Area/Yield statistics are often of poor quality
- Many factors affect yield (weather; effectiveness of pest control; technology; profit margin and incentives....)
Malawi – feedback from an index insurance stakeholder

- Perspective of Opportunity Bank Malawi (micro-finance provider and product distributor):
  - "Weather index insurance is an incentive to the farmers borrowing from Opportunity Bank and also it gives a safety net to both the farmer and the bank"
  - The weather insurance is offered within the credit package and not as a stand alone product
  - Weather index insurance provide a win-win situation to all the players:
  - With Weather index Insurance Opportunity Bank is able to:
    - Reach out and sell its products to many farmers.
    - Get exposure to different crops and diversify its portfolio”

Source: MANAGING RISK IN FINANCING AGRICULTURE Expert Meeting Convened and co-sponsored by AFRACA, FAO, the Land Bank of South Africa, and the World Bank April 1-3, 2009
Some lessons learnt on weather index insurance

- ARMT piloting has shown that weather insurance for farmers in developing countries is *feasible*.

- Weather insurance is not a panacea
  - Can only enhance existing agricultural supply chains and businesses, not create them
  - It can help support expansion in rural finance and agriculture
  - It must go hand in hand with other investments in extension services, irrigation, strengthening of input and output markets, other financial services and products etc.

- *Sustainability* and *scalability* will not be achieved unless *operational* hurdles can be overcome:
  - Robust product delivery channels to farmers, linkages to finance or supply chain with additional farmer products and services
  - Local ownership through capacity building and technology transfer for all actors
  - Strong local partners and incentives

- Just as important for scalability (if not more) than *technical* hurdles:
  - Investment in data and weather infrastructure
  - Synthesizing best practices for contract design, insurance and reinsurance
  - Favourable regulatory framework
Area yield index insurance – an option to weather index insurance

- Historical
  - Sweden, 1950’s
  - India, 1980’s (National Agricultural Insurance System, NAIS) – 20 million farmers
  - USA 1990’s (Group Risk Plan, GRP)
  - Brasil since 2000.

- An insurance policy based on loss of yield aggregated over a specified district

- Unit of insurance = Geographical unit (e.g. county, district, département)

- Level of coverage = percentage of the historical average yield aggregated for the unit area of insurance
  - Levels of cover between 50% and 90%
  - Sum insured: In the USA, GRP allows farmers to chose up to insure up to 150% of the value of their production
  - Premium rate is calculated based on the variability of the yield at an aggregated level

- Indemnity = difference, if positive, between the reference insured yield at the aggregated level and the actual aggregate yield measured in the period of insurance
Area yield index is still in a development stage in Africa. A key pre-requisite is the availability and quality of disaggregated yield data.

Risk assessment

Senegal: Causes of Loss in Rain-fed and Irrigated Crops

Rainfed Crops: Causes of Crop Losses
- Drought: 29%
- Locusts: 5%
- Theft: 2%
- Other: 4%
- Wind: 1%
- Fire: 1%
- Flood: 5%
- Unseasonal rainfall: 9%
- Animals: 9%
- Disease: 13%
- Insects (excl. locusts): 16%

Irrigated Crops: Causes of Crop Loss
- Drought: 13%
- Locusts: 3%
- Theft: 5%
- Commercial risks: 4%
- Wind: 1%
- Unseasonal rainfall: 16%
- Animals: 12%
- Flood: 13%
- Insects (excl. locusts): 7%
- Irrigation equipment breakdown: 10%
- Disease: 15%
- Lack irrigation water: 7%
Area yield index insurance: advantages and disadvantages

- **ADVANTAGES**
  - Individual loss adjustment is not needed
  - Moral hazard and antiselection are minimised
  - Data is available: statistics at an aggregated level (e.g. region) are collected in most countries
  - Covers multiple risks affecting crops
  - Relevant particularly for correlated risks (e.g. drought)
  - Low costs in underwriting/distribution
  - Low costs of loss assessment

- **DISADVANTAGES**
  - Does not cover the losses of an individual farmer
  - Payments do not reflect fully the loss suffered by an individual (Basis risk)
  - Does not capture very localised losses (e.g. hail)
  - Requires uniform production systems within the unit area of insurance
  - May lack historical yield data
  - Difficulties in measurement of yields within the unit area of insurance
  - Possible late payment of claims, pending yield results
How can developing countries benefit from global agricultural insurance experience?

- Capacity building: are there synergies in traditional agri insurance which are transferable to insurers of index products?
  - Strong synergies:
    - Underwriting and insurance management
    - Claims management/internal systems
    - Pricing
    - Financial management and reinsurance
  - Lesser synergies
    - Product design
    - Loss adjustment
    - Rural extension and education?

- Who can actually transfer know-how?
  - Reinsurers
  - Global insurance groups
  - Consultants and practitioners
  - Rural/micro-insurance/micro-finance associations/networks

- Identify missing links for capacity transfer: especially technical and rural development practitioners
Training and capacity building

- Agricultural insurance design and implementation requires a mix of skills: insurance, agronomy, rural development...

- Training courses in parametric index insurance have developed by the Agricultural Risk Management Team, (ARD, World Bank)

- Written by practitioners, and built on the experience of pilot testing of weather index insurance in Africa, Asia and Central America

- Existing materials have been combined with additional resources, exercises, assignments, glossaries and supporting background materials to create a comprehensive price risk management training package suitable for:
  - Self-directed learning; In person training; Distance learning

- www.AgriskTraining.org
Thank you!

William Dick
Agricultural Risk Management Team
Agriculture and Rural Development Department
wdick@worldbank.org