JAMAICA

Agricultural Insurance: Scope and Limitations for Weather Risk Management

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Agenda

- The global market
- Products
- Organisation of agricultural insurance
- Government intervention
- Public-Private sector partnerships
- Lessons learned
Global agricultural insurance market

Agricultural Production
Direct Insurance Premium
€ 16,5 Billion Worldwide estimated Volume

Source: Paris Re, 2008
Rural insurance constraints in developing countries

- Highly challenging environment for insurers
  - 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
Risk assessment - analysis of yield volatility

Arachide: Rendements Moyens, 1986/87-2006/07 (Kg/Ha)

Senegal – groundnut département level yields

drought
Risk assessment

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

Rainfed Crops: Causes of Crop Losses

- Drought: 29%
- Flood: 5%
- Locusts: 5%
- Other: 4%
- Theft: 2%
- Wind: 1%
- Fire: 1%
- Bird attack: 6%
- Unseasonal rainfall: 9%
- Animals: 9%
- Disease: 13%
- Insects (excl. locusts): 16%

Irrigated Crops: Causes of Crop Loss

- Drought: 29%
- Flood: 13%
- Locusts: 3%
- Commercial risks: 4%
- Theft: 5%
- Unseasonal rainfall: 16%
- Disease: 15%
- Animals: 12%
- Irrigation equipment breakdown: 10%
- Bird attack: 7%
- Insects (excl. locusts): 7%
Philippines - Rice Crop Insured Causes of Loss
1981 to 2006 (26 years) (P.Pesos ’000)

Typhoon & Flood 1,046,097 55%
Drought 255,869 13%
Pest 365,004 19%
Diseases 241,642 12%
Others 28,738 1%

Total: P1,937,350

Source: Philippines Crop Insurance Corporation
### Traditional Indemnity Crop Insurance

**NAMED PERIL**
- Assess loss from specific perils
- Requires loss adjustment (percentage damage assessment)
- Suitable for perils causing measurable, sudden-impact damage to crops.
  - Not drought, pest, and disease.
- Hail is the most common because:
  - Damage is easily identifiable
  - Field assessments can be accurately carried out
  - Losses are typically localized rather than widespread

**MULTIPLE PERIL**
- Assess loss as deviation from historical yield
- Requires loss adjustment (yield loss assessment)
- Contributing causes to yield loss are not differentiated
  - Difficult differentiate weather event vs poor management practices
- Suffers from:
  - Adverse selection
  - Moral hazard and high costs of loss assessment
- Base product for the subsidized federal crop insurance program in the USA and most of Canada, and China
What are index insurance contracts?

- An index insurance contract pays out based on the value of an “index”, not on losses measured in the field.

- An index is a variable that is highly correlated with losses and that cannot be influenced by the insured.

- Example indexes - rainfall, temperature, regional yield, river levels etc.

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

- Constraints
  - 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
Index Based Products

**AREA YIELD**
- Assess loss based on estimates of the area yield.
  - Threshold is established less than the expected county yield
  - Indemnities paid when area average yield is < than threshold.
- Products date to the 1950s (Sweden) and have been offered in Canada (since 1977) and the US (since 1992).
- India’s national crop insurance program is area yield
  - Mixed social and market goals
  - Actuarial performance is quite poor
  - Average loss ratios exceed 400 percent

**WEATHER INSURANCE**
- Assess loss based on the changes in a weather index over a pre-specified period of time at a particular weather station.
- Appropriate for highly correlated weather risks
  - excess and deficit rainfall
  - excess and deficit temperature.
- Strong, quantifiable relationship, must exist between weather risk and yield loss in order to establish the index on which the contract will be based.
- Relatively low administrative costs and does not face moral hazard issues.
# Stakeholders in rural insurance

<table>
<thead>
<tr>
<th>Category</th>
<th>Potential stakeholders</th>
<th>Role</th>
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</thead>
<tbody>
<tr>
<td>Insurers</td>
<td>Insurance companies</td>
<td>Underwriting of the risk</td>
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<td>Insurance association</td>
<td></td>
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<tr>
<td>Reinsurers</td>
<td>Reinsurance companies</td>
<td>Acceptance of transferred risks</td>
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<td>Delivery Channels</td>
<td>Agricultural banks</td>
<td>Distribution channel of insurance to farmers</td>
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<td>Rural Service organizations</td>
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<td>NGO’s</td>
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<td>MFI ‘s</td>
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<td></td>
<td>Input suppliers</td>
<td></td>
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<tr>
<td>Farmers</td>
<td>Farmer Association</td>
<td>Representing farmers, as buyers and beneficiaries</td>
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<td></td>
<td>Co-operatives</td>
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<tr>
<td>Government Departments</td>
<td>Meteorological Service</td>
<td>Representation of government organizations at policy, research or operational level. Possible subsidy and/or ongoing support to the program.</td>
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<td></td>
<td>Regulator of Insurance</td>
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<td>Ministry of Finance</td>
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<td>Ministry of Agriculture</td>
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<td>Planning Ministries</td>
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<tr>
<td>Donors</td>
<td>Technical assistance</td>
<td>Support (financial and/or consultancy) mainly during design and implementation phases</td>
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Insurance structures

**Micro level insurance program**

- **Insurer**
- **Distributor**
- **Policyholder is Farmer**

- Policies, premiums, claims

**Meso/Macro insurance program**

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

- Aggregator sets the payout rules

- Policies, premiums, claims
Some public sector interventions in agricultural insurance

- Premium subsidy
- Administrative subsidy
- Reinsurance
- Legal and regulatory
- Loss assessment resources
- Data collection, weather services
- Government compensation systems or safety nets often operate in parallel with agricultural insurance

- Public-private partnerships are needed to engage the private insurance sector
- Insurance is supportive to, but not a substitute for, investments in rural finance and services, supply chains, infrastructure...
Layered risk transfer structure

**Return Period**
- 20-30 years: Catastrophe government reinsurance
- 5-7 years: Commercial reinsurance
- 3-5 years: Insurance
- Independent risks
  - Intermediate risks
  - Catastrophic risks
Country Agricultural Risk Management Model

Institutional capacity building
- Data management
- Regulatory/supervisory framework
- Information and education
- Technical expertise
- Program administration and monitoring

Agri-business segmentation
- Social vs commercial insurance
- Traditional farming sector
- Emerging farming sector
- Commercial farming sector

Agricultural risk financing
- Risk layering
- Insurance index
- Insurance pool
- Insurance and rural finance

Agricultural risk assessment
- Risk identification
- Risk quantification
- Probabilistic agricultural risk model
Scope, limitations and lessons

- Opportunity to embed weather insurance into larger development projects and lending
  - An integrated approach is needed linked to other rural services
  - Natural linkage to improved availability of agricultural credit

- Climate adaptation and role of insurance
  - Insurance plays a supportive but not a leading role
  - Insurance is not a substitute for climate adaptation measures
  - Increased risk from climate change is a challenge to insurers

- Lessons learned in agricultural insurance
  - Technically demanding and sometimes infeasible or costly
  - There is no universal insurance product
  - Public-private partnerships are needed for agricultural insurance
  - Devil is in the detail
  - Insurance is only one component of risk management
  - Insurance is not a panacea
  - Practice may differ from theory