Index insurance for agriculture in Ethiopia
Addis Ababa, Ethiopia, 9 December 2010

Issues to Consider in the Design Index Insurance Products:
Index-Based Livestock Insurance

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The Case for Index Insurance

- **Sustainable insurance can:**
  - Prevent downward slide of vulnerable populations
  - Stabilize expectations & crowd-in investment and accumulation by poor populations
  - Induce financial deepening by crowding-in credit supply and demand

- **But can insurance be sustainably offered in remote infrastructure deficient areas and to smallholders?**

- **Conventional (individual) insurance unlikely to work, especially among pastoralists:**
  - Transactions costs
  - Moral hazard/adverse selection
The Case for Index Insurance

- Index insurance avoids problems that make individual insurance unprofitable for small, remote clients:
  - No transactions costs of measuring individual losses
  - Preserves effort incentives (no moral hazard) as no single individual can influence index.
  - Adverse selection does not matter as payouts do not depend on the riskiness of those who buy the insurance.
  - Available on near real-time basis: faster response than conventional humanitarian relief.

- Index insurance can, in principle, be used to create an effective safety net to alter poverty dynamics and help address broad-scale shocks.
Perquisites and Challenges of Sustainable Index Insurance:

1. DEFINING THE RISK
   - Area-based product ➔ the risk must be covariate in nature
   - Risk must be quantifiable and predictable
   - Risk must be ‘indexable’

2. IDENTIFYING THE INDEX
   - Index is a single-valued, specific measure associated with insured-risk upon which payment decisions are made
   - Must be: i) Easy to Measure, ii) Precise Indicator of Insurable Risk, iii) Cannot be Easily Manipulated, iv) Consistently Available
3. DESIGNING THE INDEX

- Need to model a relationship between the risk to be insured and the index \( \rightarrow \) The Response Function

- The challenge of data availability

**DATA**
- Livestock Mortality
- NDVI

**Response Function**

**Index**
- Predicted Livestock Mortality

\[
M_{ls} = M_{g}(ndvi) + \varepsilon_{gl}\] if good climate regime \((C_{ndvi_{pos_{ls}} \geq 0})\)

\[
M_{ls} = M_{b}(ndvi) + \varepsilon_{bl}\] if bad climate regime \((C_{ndvi_{pos_{ls}} < 0})\)
4. TESTING INDEX PERFORMANCE

- Minimizing “BASIS Risk”:
- How well does the index correspond to the outcome it is measuring?
- How well does the index correspond to individual outcomes?
5. CONTRACT FEATURES: SPATIAL COVERAGE

- How wide a geographic area can a single index-cover?
  - What is the spatial precision range of the response function?
  - At what level of resolution is the necessary data available?
  - Administrative considerations

**Figure A1. Chalbi and Laisamis contract coverage clusters**

- **Two Separate NDVI-Livestock Mortality Response Functions**
- **Five Separate Index Coverage Regions**
5. CONTRACT FEATURES: TEMPORAL COVERAGE

- Over what time span should an index cover?
  - Function of the production system/risk profile being modelled
  - Administrational considerations
5. CONTRACT FEATURES: RISK COVERAGE AND PRICING

- Need to select an index strike point to trigger indemnity?
  - Trade off: Higher Strike → Lower Risk Coverage → Lower Cost
  - Conditional or Unconditional?
  - Payoff structure: Linear, Segmented, All or nothing, No claims bonus?

### Data

<table>
<thead>
<tr>
<th>Contract Cluster</th>
<th>Consumer Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upper Marsabit</td>
<td>5.5%</td>
</tr>
<tr>
<td>Lower Marsabit</td>
<td>3.25%</td>
</tr>
</tbody>
</table>
6. INNOVATIONS INCENTIVES

• Catalyzing the Market
• Enabling Regulation
• Engaging Re-Insurance/Co-Insurance
• Private vs. Public, or Partnership?
7. ESTABLISH INFORMED EFFECTIVE DEMAND

- Insurance is a difficult product to sell
- Insurance is a foreign concept to relatively uninformed target
- Initial significant investment in extension and marketing
- Simulation games with real information and incentives
From Theory to Practice

8. LOW COST DELIVERY
   • Identify mechanism to deliver product to client
   • What sales delivery platform?
   • What information delivery platform?

9. IMPACT ASSESSMENT
   • Does Index-Insurance deliver the social and economic benefits it promises?
   • Need a rigorous research design to allow quantification and attribution of impacts?
   • M&E to guide scale-up
Thank you

For more information please visit:

www.ilri.org/ibli/
The Way Forward

- Integrated long-term survey design for impact evaluation to inform program and policy formation
  - HH survey in pilot and control locations
  - Comparative assessment with unconditional cash transfer program (the Hunger Safety Nets Program: HSNP)
  - Discount coupons randomly allocated to eligible subpopulations

- Scaling up across ASAL regions in Kenya

- Investigating feasibility of IBLI in the region – recently launched a Southern Ethiopia program
Research and Policy Questions

- Investigate Alternative Contract Structures
  - Group-based insurance marketing
  - Linked credit and insurance
  - Risk layering
  - Conditional insurance transfers

- IBLI impact on livestock holdings, spatial distribution and condition of the rangelands
Research and Policy Questions

- Determinants of demand and adoption?

- Developing processes to establish rules of implementation amidst challenging public/private relationships

- Data availability and collection coupled with improved response function modelling for better scale-up
The Marsabit Pilot

- Premiums for contract with trigger level 15%, providing annual coverage with two potential payout periods

<table>
<thead>
<tr>
<th>Contract Cluster</th>
<th>Actuarially Fair Price</th>
<th>Target Consumer Price</th>
<th>Net to Reinsurer</th>
<th>Total Market Price</th>
<th>GIFF Subsidy Request</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upper Marsabit</td>
<td>4.75%</td>
<td>5.5%</td>
<td>7.3%</td>
<td>9.2%</td>
<td>3.7%</td>
</tr>
<tr>
<td>Lower Marsabit</td>
<td>2.2%</td>
<td>3.25%</td>
<td>4.3%</td>
<td>5.4%</td>
<td>2.15%</td>
</tr>
</tbody>
</table>

- To insure 15TLU valued at Ksh 225,000
  - Upper Marsabit: Ksh 12,375
  - Lower Marsabit: Ksh 7,312.50
## The Marsabit Pilot

### Contract Sales Jan/Feb 2010

<table>
<thead>
<tr>
<th>Premium Rate</th>
<th>Contracts Sold</th>
<th>Cattle No. Insured</th>
<th>Sheep/Goats No. Insured</th>
<th>Camels No. Insured</th>
<th>Total Value of Insured Livestock (USD)</th>
<th>To Value of Collected Premiums (USD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upper</td>
<td>5.5%</td>
<td>556</td>
<td>371</td>
<td>11,081</td>
<td>347,620</td>
<td>19,119</td>
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<tr>
<td>Lower</td>
<td>3.25%</td>
<td>1,423</td>
<td>3537</td>
<td>4,745</td>
<td>845,460</td>
<td>27,477</td>
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<tr>
<td>Total</td>
<td>1,979</td>
<td>3908</td>
<td>15,826</td>
<td>339</td>
<td>1,193,080</td>
<td>46,597</td>
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</tbody>
</table>
(i) Teach how IBLI works and how IBLI can affect herd dynamics
(iii) Used lessons from Game to design extension training program
Establishing Informed, Effective Demand

Willingness to pay (WTP) experiments using contingent valuation methods