

Experiences in Index-Based Weather Insurance for Agriculture: Lessons Learnt from Malawi & India

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Motivation

- Traditional crop insurance for smallholder economies is **not viable**
 - **Main constraints for traditional products, based on individual loss assessments:**
 - *Poor rural insurance infrastructure and capacity*
 - *Operationally difficult for small farmer agriculture*
 - *Loss adjustment, availability of farm level data*
 - *Moral hazard*
 - *Adverse selection due to asymmetric information*
 - *High monitoring and administrative costs*
- Agricultural production risk needs reinsurance
 - **Covariant risks (e.g. drought) are an inherent characteristic**
- Risk management products are critical for **reducing cost** and **increasing access** to agricultural credit





The Challenge

Design an alternative, efficient and cost-effective crop insurance program that can be easily reinsured and distributed to both individual smallholder farmers and larger actors in the agricultural sector.

What is Index-based Weather Insurance?

- Financial protection based on the performance of a specified index in relation to a specified trigger
- Offers protection against uncertain costs or revenues that result from *volume* volatility
 - **Farmers are compensated against unfavourable weather fluctuations that impact physical volumes produced**
 - **Objective & timely**
- Can be at macro level for governments, e.g disaster insurance (hurricane, drought, floods, etc)
- Or retail for financial institutions as well as their customers

Market Development in Developing Countries

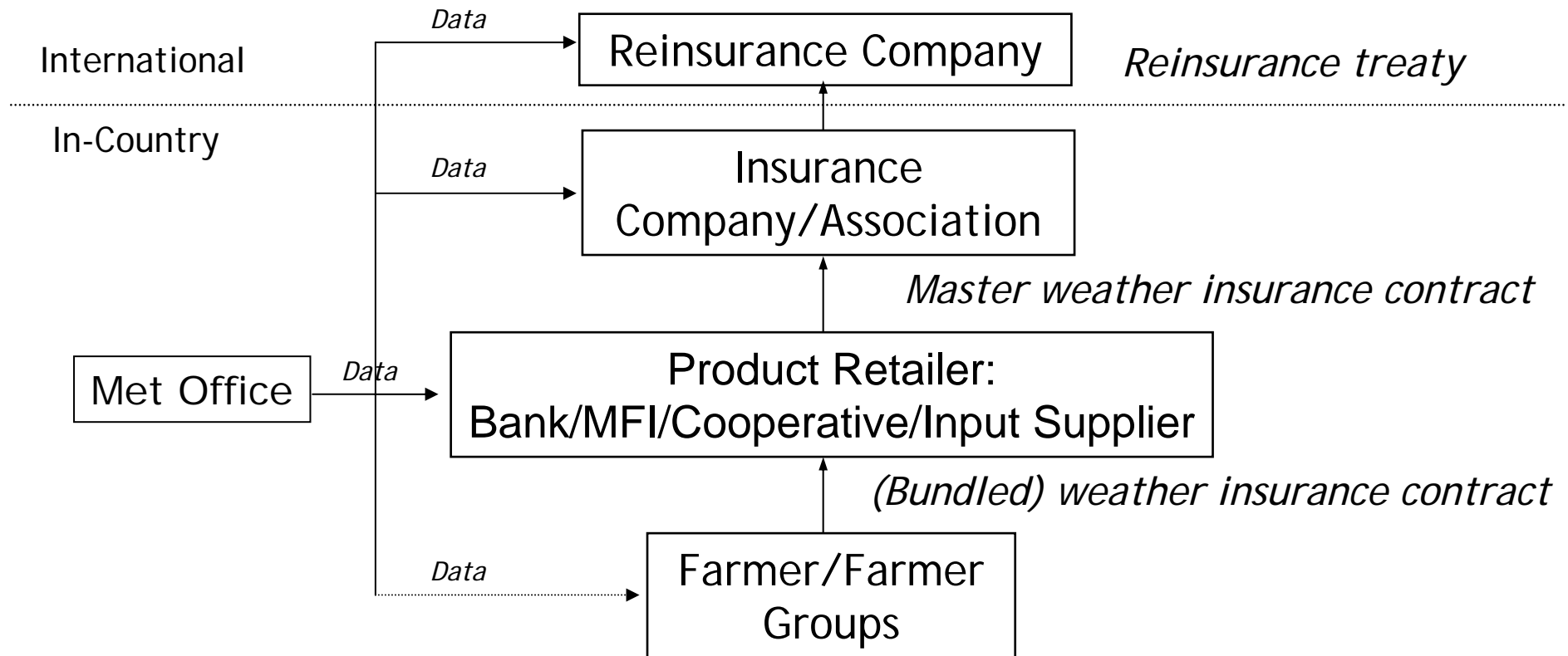
- First Stage 1997-2001
 - First weather derivative transaction in U.S. in 1997
 - Incorporated into research agenda of the World Bank in 1999
 - Academic focus: Design of generic applications to the rural sector economies in developing countries
- Second Stage 2002-2007
 - First involvement of diverse donors in financing project development costs
 - Focus on pilot weather-index insurance projects design and implementation (TA from Commodity Risk Management Group)
 - Interesting experiences at national and farmer level: *Mexico (2001), India (2003), Malawi (2005), Ethiopia (2006), Mongolia (2006), Thailand (2007)*
 - *Activities under preparation : Central America, Vietnam, Kenya and Tanzania*



Developing a pilot program

- I. Identify significant farmer exposure to weather
- II. Quantify the impact of adverse weather on their revenues
- III. Structure a contract that pays out when adverse weather occurs
- IV. Execute contract (with insurers and a delivery channel)
- V. Secure international reinsurance

Standardized Program Implementation



- Clear, well-defined responsibilities, product accounting practices and communication between all in-country stakeholders



Experiences in Africa: Malawi

Effects of 2004/5 Drought in Malawi

- Recovery rates for lenders in the range 50-70%
- One big bank lost \$110,000 to smallholders farmers in one area
- That bank has stop lending to those farmers, about 1000 households affected
- Major government and donor program lost 50% of value and was discontinued
- Two microfinance institutions stopped lending to agriculture
- **This is bad news because:**
 - **85% of Malawi is rural based.**
 - **45% of GDP comes from agriculture**
 - **87% of total employment is in agriculture**
 - **64% of rural income is from agriculture**
 - **90% of country foreign exchange comes from agriculture**



Example Malawi Weather Insurance Pilot Details

- Loans to cover crop seed, insurance premium and interest are provided by:
 - **Opportunity International Bank of Malawi**
 - **Malawi Rural Finance Corporation**
- Insurance policies (protecting groundnut against drought) issued by:
 - **Insurance Association of Malawi (seven companies pooled the risk)**
 - **Premium: 6-7% of max Payout per farmer(= Loan Size given by the banks)**
- Seed & Product Distributor:
 - **NASFAM: Groundnut in 2005, Groundnut & Hybrid Maize in 2006**
- Participants:
 - **Farmers all members of NASFAM clubs**
 - **2005: 900 farmers, 4 weather stations, sum insured \$35,000**
 - **2006: 2500 policies, 5 weather stations, sum insured \$110,000**
- Insurance Payout Payment details:
 - **Payout in case of drought: channeled from insurance company directly to the bank; farmers' debts are in turn alleviated**
 - **No Payout: farmers benefit from selling the higher value production**



Major Pilot Achievements

- Unlocking credit facilities for smallholder farmers.
 - **1800 farmers formerly excluded from financial markets.**
 - **Before pilot OIBM did not lend to agriculture, but now is using lessons learnt from project to expand lending book.**
 - **Four other banks promised to unlock more than USD 10 million of credit if weather risk is insured.**
 - **Weather insurance is becoming the norm in agricultural credit in Malawi.**
- Access to high yielding seeds and fertilizers.
 - **Farmers interviewed indicated that they got an average of SIXTY 50 kg bags (by using hybrid maize seed) as opposed the usual 20-25 bags.**
- Peace of mind for credit market:
 - **Can expand lending in a managed way**
 - **In case of another 2004/5 drought loans will be paid off**
- A chance for insurers (and reinsurers) to access and contribute to rural development.
- Quantifying exposure to weather risk



Challenges Ahead for Malawi

- Willingness to pay by farmers
 - **Stand alone product (as opposed to credit-bundled product) had no takers**
 - **Premiums will always have to be pre-financed through loans**
- Basis risk
 - **Need for more stations**
 - **Installing a new station in 2006/7 added 672 farmers**
 - **Upgrade of 75 other stations will capture 300,000 farmers**
- Marketing channels
 - **Groundnuts market prone to side-selling, nascent agricultural supply chain**
 - **Leading to non-weather related defaults**
 - **Focusing on new, additional crops in 2007**
- × **Robust product delivery channels to farmers**





The Experience of BASIX in India

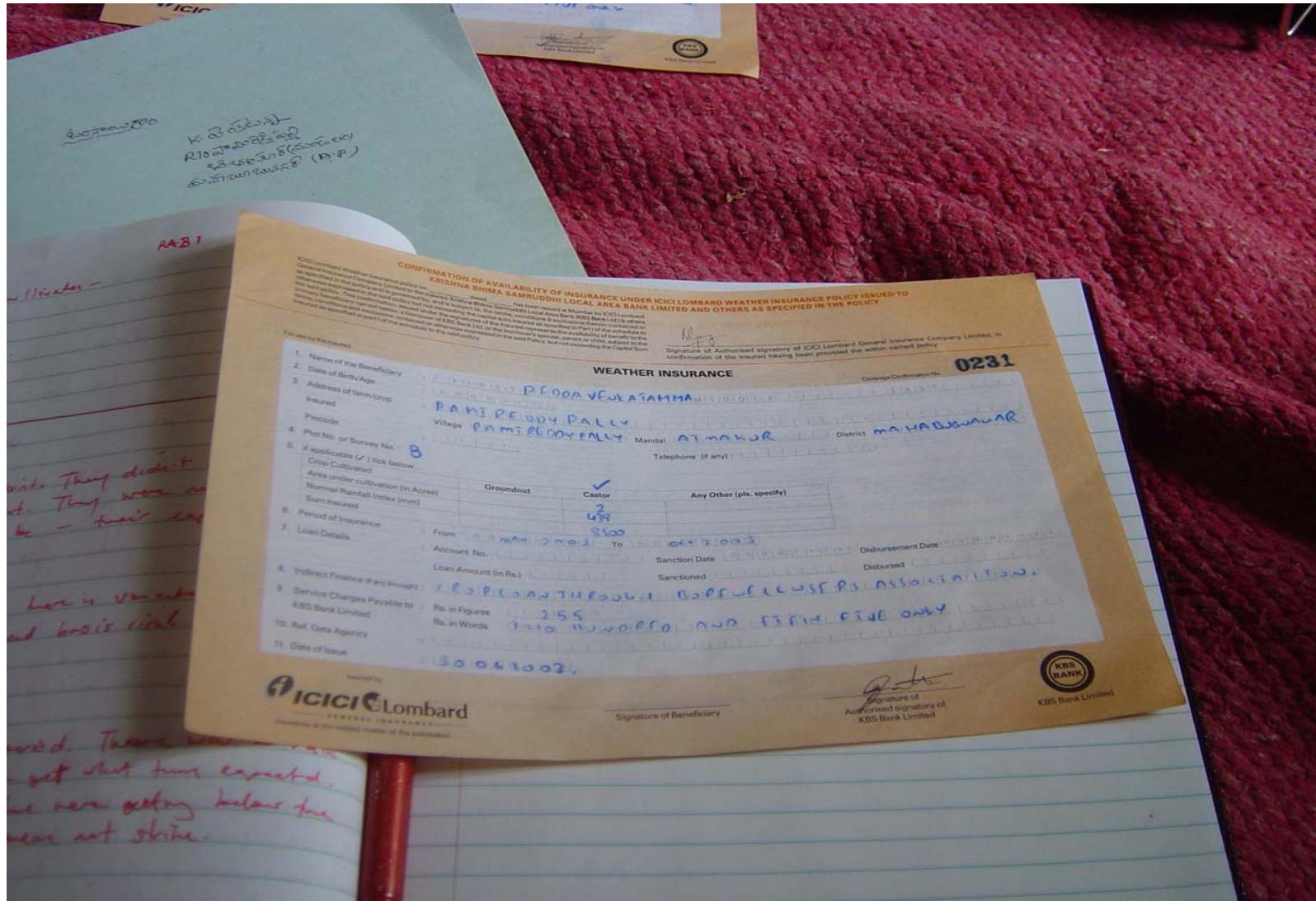
Example India

Why Weather Insurance? the Case of BASIX

- BASIX is a microfinance institution which operates in over 12,000 villages spread over 9 states in India, serving 0.5 million customers
- BASIX's customer contact and interactions in the initial years of operations showed that while credit is necessary, it is not sufficient for promoting livelihoods
 - **As of Sept 2006 BASIX made cumulative disbursements of Rs 7 Billion and had an outstanding credit portfolio of Rs 2 Billion**
- Risk management particularly for rain-fed agriculture was identified as an important credit plus service to be offered to its customers
- Between 1999-2001, BASIX carried out research and undertook small pilots in testing an in house crop insurance scheme
- Which culminated in the first weather insurance pilot in 2003, in collaboration with ICICI Lombard Insurance Co. and World Bank



1st Farmer Weather Insurance Policy

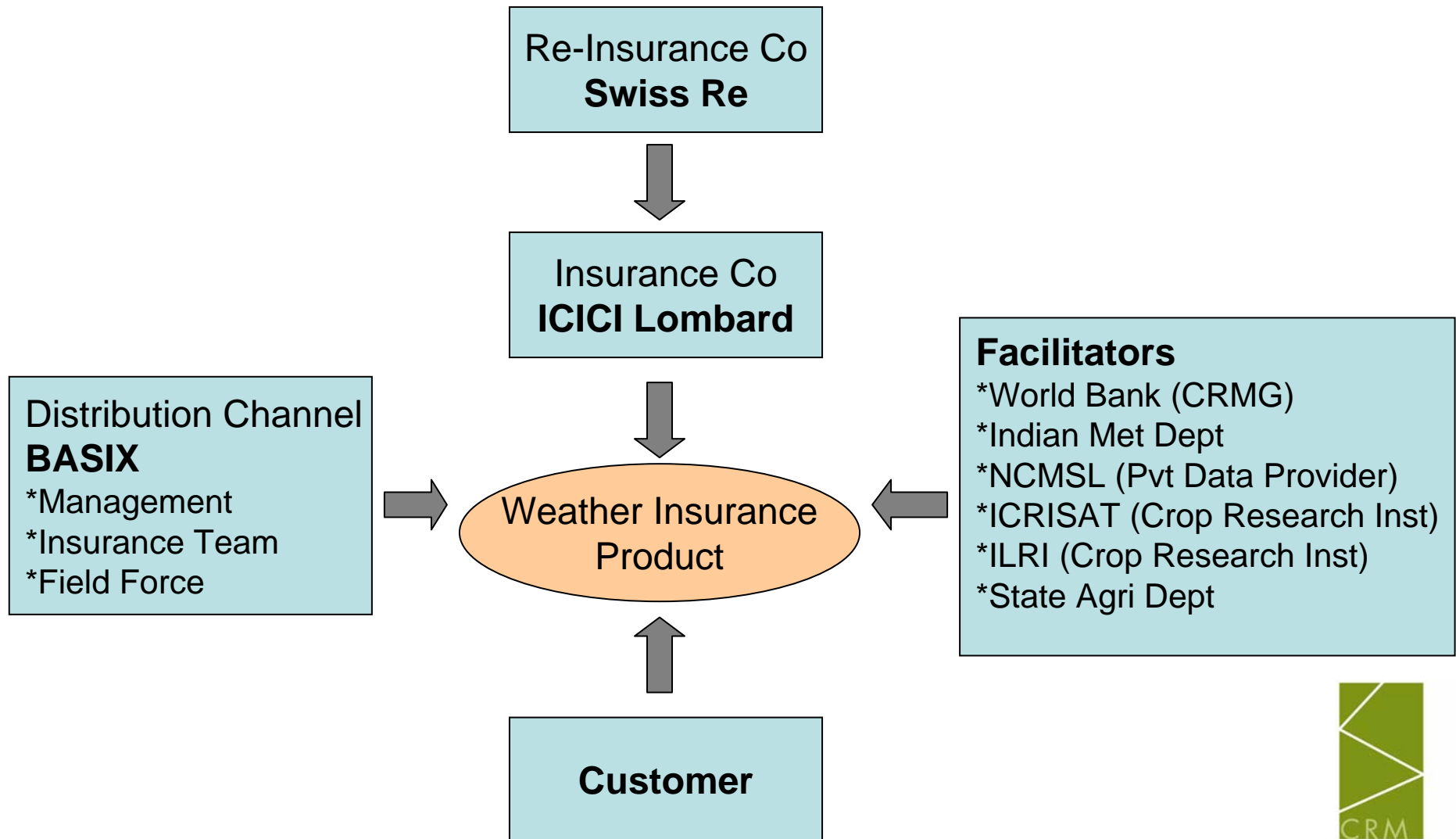


Farmers in Pamireddypally

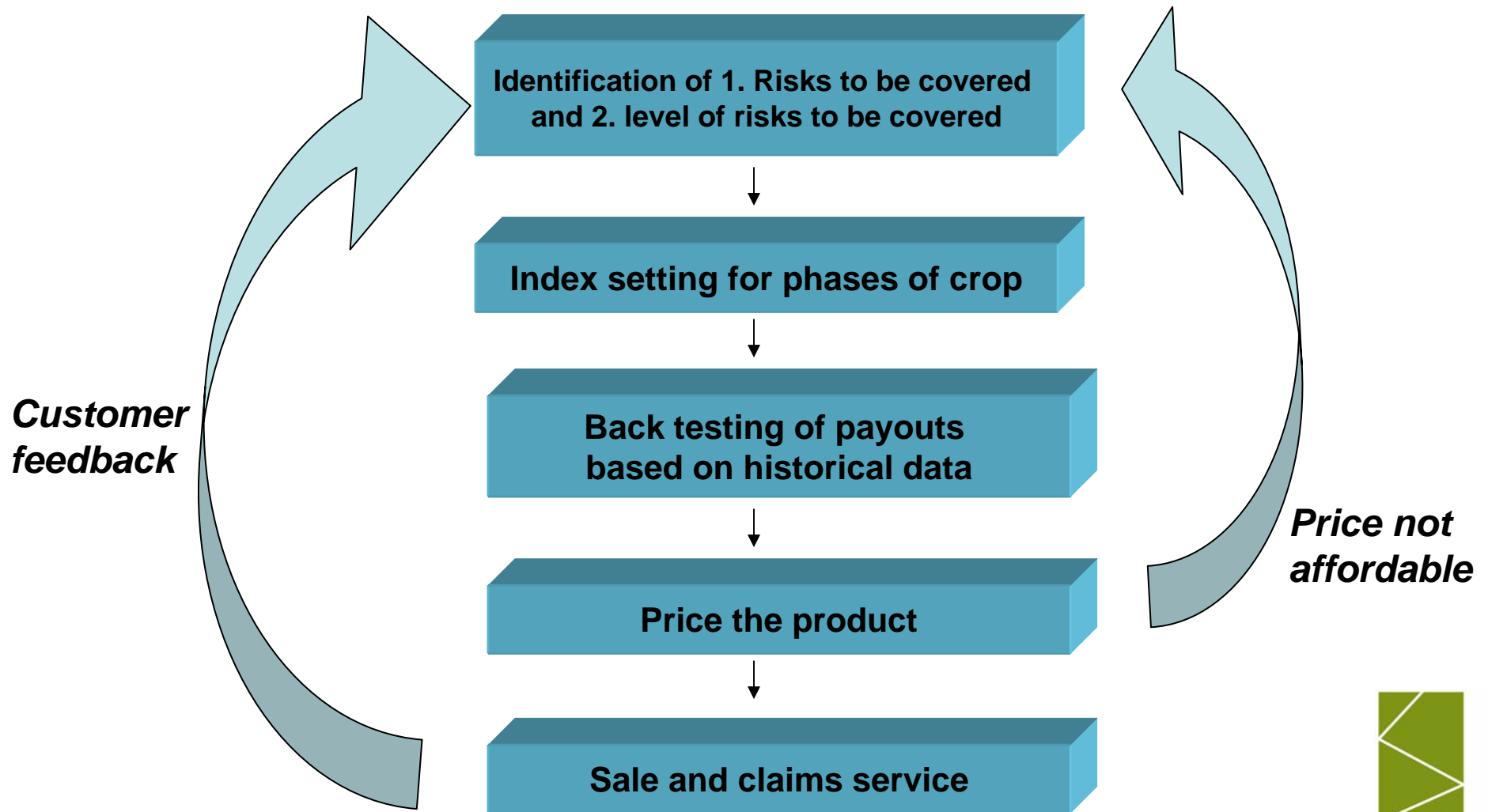


COMMODITY
RISK MANAGEMENT

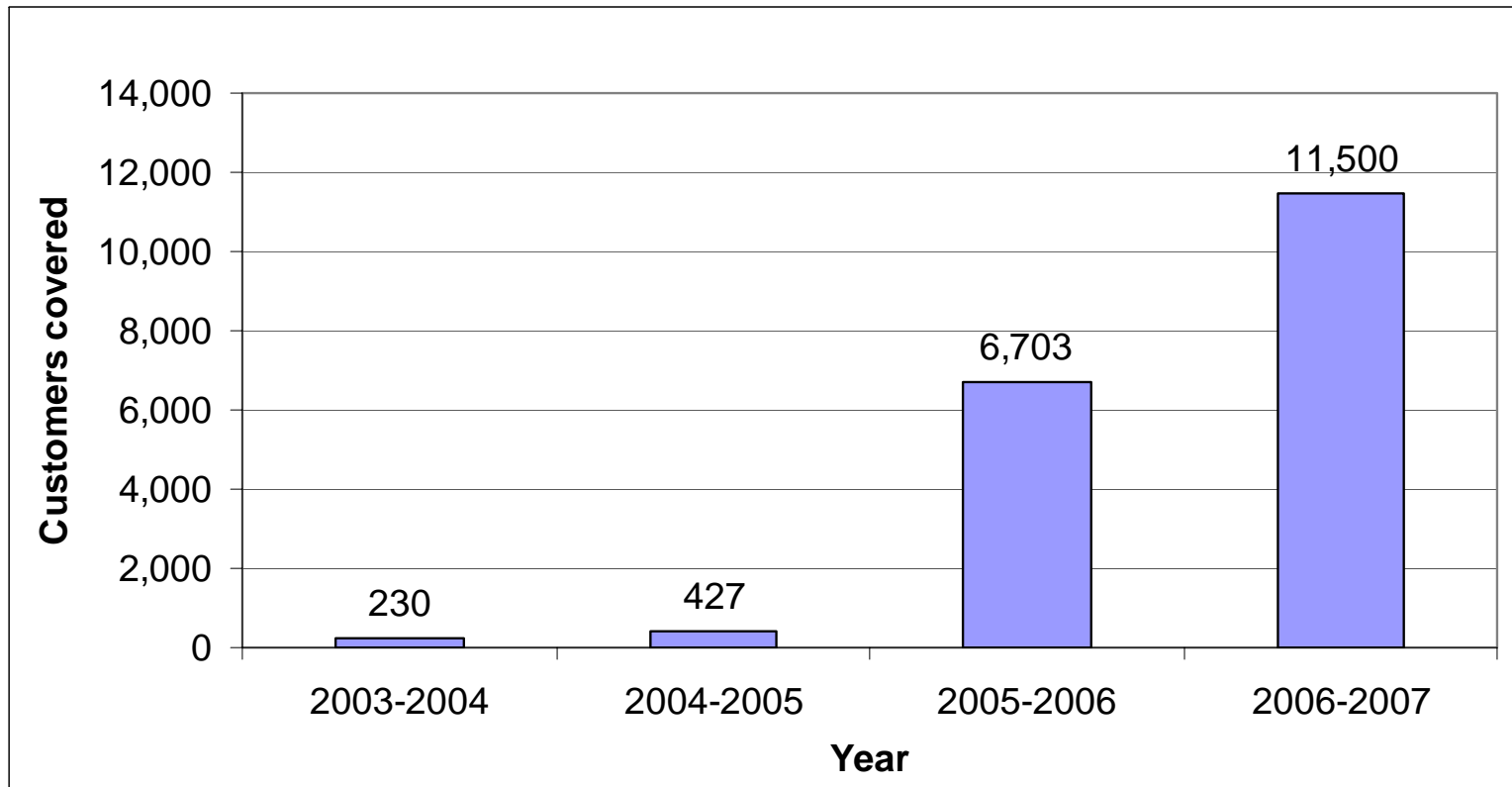
The System That Delivered



Product Design Process



Weather Insurance Growth At BASIX



Financial Performance

Year	2003	2004	2005	2006	Cumulative
Claim Payout/Premium Collected	<1	>1	<1	>1	<1 (70%)
Weather Stations	1	5	36	50	

- In its limited experience, the product sustainability has been enhanced through **temporal** and **spatial** diversification of risk

Performance History of Selected Crop Insurance Programs

Country	Program Period	A+I/P
Brazil	75-81	4.57
Costa Rica	70-89	2.80
Japan	85-89	2.60
Mexico	80-89	3.65
Phillipines	81-89	5.75
United States	80-89	2.42

In BASIX's Words: Challenges and Issues

- Need to reduce basis risk through
 1. **Deepening the network of weather stations to make the weather data more relevant to farms that are scattered over a wide geography**
 - *But is the investment to be private or public?*
 2. **Improved design of the product to increase the correlation of the indices to crop requirements**
 - *Yet simple enough for the easy comprehension of the majority of farmers, who are illiterate*
 3. **Integration of insurance with Business development services that focus on risk mitigation and productivity enhancement, so as to give a more complete solution to customers and to also reduce cost of transactions**
 - *In the absence of this, there are undue expectations from farmers on the risks that a weather insurance contract can cover*
- Greater investments to educate the target market on the concepts of insurance, its function and benefits.



In BASIX's Words: Critical Factors for BASIX Success

- Collaboration
- Piloting product concepts
- Channeling customer feedback into product design
- Continuous improvements in each product cycle
- Emphasis on product communication to customers who are illiterate
- Efficient policy distribution and claim servicing

Growth in Indian Weather Markets: Example of Products Currently Offered by ICICI Lombard

Crop	Risk Details	States	Number of farmers	Area covered (in acres)	Sum Insured (Rs mn)
Soybean	Deficit rainfall	RJ, MP	4,112	16,418	66
Oranges	- Deficit rainfall - Prolonged dry spell	RJ	453	1,223	6
Generic product for all field crops	- Deficit & Excess rainfall	Ap, MP, MH, Jharkhand, KK, Orissa, RJ and TN	19,100	22,000	66
Grapes	- Deficit & Excess rainfall, Temp	MH, AP	365	395	20
Paddy	- Prolonged dry spell - Excessive rainfall	Punjab	1,625	7,643	30
Cumin	- High relative humidity	RJ	686	688	6
Coriander	- Frost like temperature - Unseasonal rainfall	RJ	2,075	2,200	6
Fenugreek	- Excessively high temperature during days with high RH	RJ	70	260	2
Kinnu	- Excessively high temperature - Deficit rainfall	RJ	62	80	4
Wheat	- High temperature - Unseasonal rainfall	Punjab, Haryana	874	875	4
Cotton	- Deficit rainfall	MH	100,018	100,084	160
Total			150,000	180,000	



Conclusions

- Piloting has shown that weather insurance for farmers in developing countries is *feasible*
- *Sustainability* and *scalability* will not be achieved unless product development is own locally and data limitations can be overcome
- Successful weather risk markets can be created by:
 - **Strong local partners in local ownership**
 - **A “win-win” approach for all stakeholders**
 - **Robust product delivery channels to farmers, linkages to finance or supply chain**
 - **Complemented with additional farmer products and services**
 - **Favourable regulatory framework**
 - **Local ownership through capacity building and technology transfer**
 - **Investment in data and weather infrastructure**
- Weather insurance is not a panacea
 - **It can only enhance existing agricultural supply chains and businesses, not create them**
 - **It can help support expansion in rural finance and agriculture**
 - **But must go hand in hand with investment in extension services, irrigation, strengthening of input and output markets, other financial services and products etc.**



SUMMARY

Index Insurance: Advantages and Challenges

Advantages	Challenges
<i>Less moral hazard and adverse selection</i>	<i>Basis Risk</i>
<i>Timely payout</i>	<i>Sustainability of the index</i>
<i>Lower administrative costs</i>	<i>Precise actuarial modeling</i>
<i>Standardized and transparent structure</i>	<i>Education</i>
<i>Availability and negotiability</i>	<i>Market Size</i>
<i>Reinsurance acceptability</i>	<i>Forecast</i>
<i>Versatility</i>	<i>Micro climates</i>

