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

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AGRICULTURE AND RURAL DEVELOPMENT

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Market Development

- **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 2002-2005**
  - **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), Ukraine (2005), Malawi (2005), Ethiopia (2006)***

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Third Stage 2006-

- Dramatic increase in investments related to index based insurance programs from the international community:

World Bank	Inter American Development Bank
IFC	USAID
European Investment Bank	DFID
Asian Development Bank	European Commission
Caribbean Development Bank	European Donors (e.g. SECO, Dutch)
World Food Program	Japanese Investment Funds

- Investment focus on:
  - **New risks and countries**
  - **Innovative distribution channels**
  - **Use of new risk assessment technologies (e.g. remote sensing)**
  - **Capacity building**
  - **Design of new applications**
  - **Systematic project evaluation methodologies**
  - **Developmental impact**
- **Sustainable, scalable and standardized project deployment creating new risk markets**

- Current CRMG Activities in: Central America, Thailand, Vietnam, Bangladesh, Kenya, Tanzania, Malawi, Ethiopia

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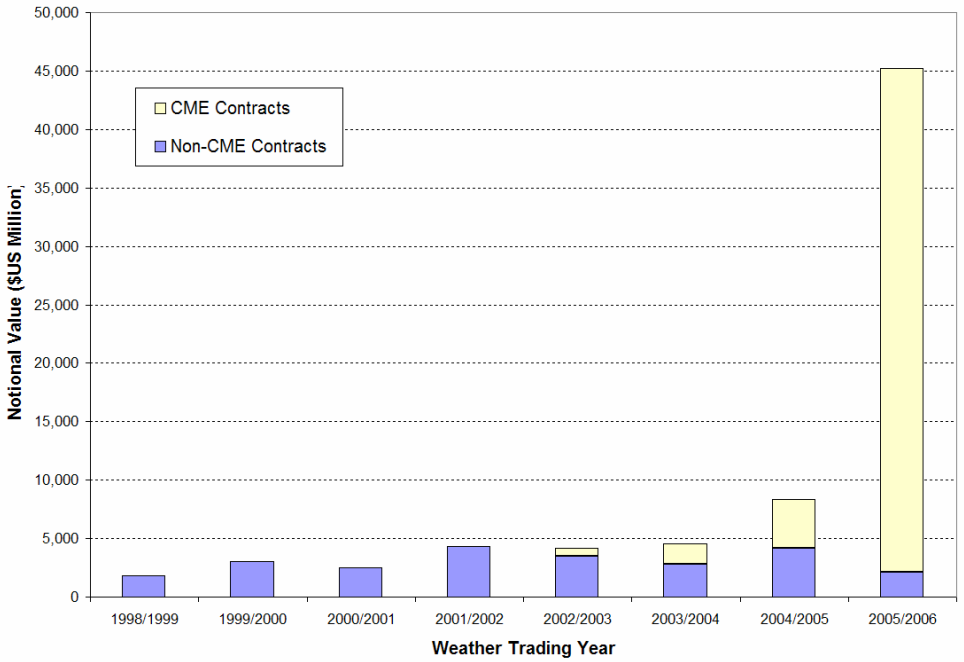
The Weather Market

- First weather derivative transaction in U.S. 1997
  - **Deregulation of the energy industry**
- Market has rapidly grown - Global estimated worth $45 billion (PWC Survey 2006)
  - **Non-energy applications**
  - **New participants**
  - **Global development**
  - **Broader product offering**
- Key Players:
  - **(Re)insurers**
  - **Investment Banks**
  - **Energy Companies**
  - **Hedge Funds**



CME = Chicago Mercantile Exchange

Over $100B Transacted to Date

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Scalable, Sustainable, Standardized

- CRMG experience shows:
  - **A "win-win" strategy for all stakeholders**
  - **Dense, high-quality weather network**
  - **Lead to successful farmer weather risk management pilots**

- Coupled with a standardized approach to pilot design and implementation:
  - **Synthesizes best practices**
  - **Efficient and easy to replicate and implement**
  - **Strong and enthusiastic local partners, local investment**
  - **Robust product delivery channels to farmers, linkages to finance or supply chain**
  - **Complemented with additional farmer products and services**
  - **Local ownership through capacity building and knowledge transfer**

- With the pre-requisite of:
  - **Favourable regulatory framework**

✓ **The key components to creating sustainable, scalable weather risk management programs for farmers**

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Experiences in Africa: Malawi

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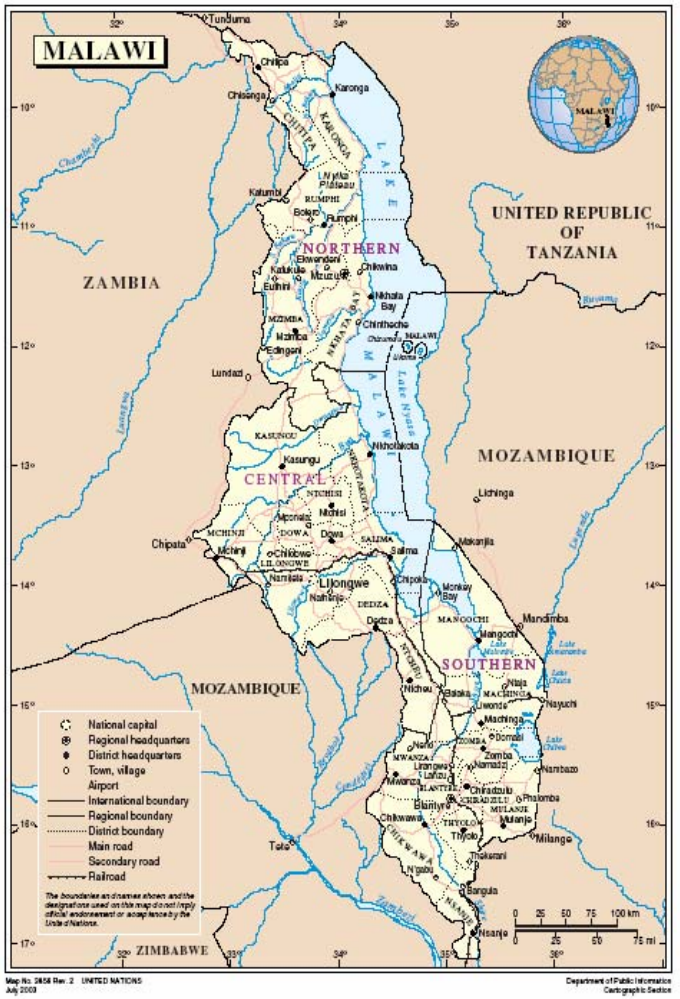
Example Malawi
Weather Insurance Pilots for Farmers

- **Malawi Facts:**
  - Population: 12 million
  - 165th Human Development Index
  - Agriculture-based economy
  - Maize staple crop food crop
  - Export: tobacco, tea, cotton, coffee, sugar
  - One rainy season in Malawi, November-April
- **CRMG Activities:**
  - Two weather index-based insurance pilots to help farmers access finance for cash crops (2005/6, 2006/7)
  - Mainstreaming product into ag. credit system 2007/8 onwards



Example Malawi
Why Weather Insurance?

- In 2004, the National Smallholder Farmers Association of Malawi (NASFAM) wanted to expand its operations and grow the Malawi groundnut market domestically and for export
- Farmers have higher value output potential through using higher cost but quality groundnut seed
- Greater profit; reliable yields; lower risk of disease; will receive training by NASFAM; access to high quality seed; export potential
- Farmers needed financing to purchase quality seed from NASFAM
- High risks from drought and high loan default rates deterring financing institutions from providing loans

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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 stopped lending to those farmers, about 1000 households affected
- Major government and donor lending program lost 50% of value over 5 years due to drought-blamed default: **program 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 Forex comes from agriculture**

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Example Malawi
The Objective of Insurance

- Gives farmers the ability to mitigate drought risk
  - **Secure access to finance and inputs for improved production**
  - **NASFAM training and higher quality seed will improve long-term production and revenues**
- Protects both producer and loan provider from weather-related production risks
  - **Allowing banks to expand their lending portfolios in a managed way**
- Gives insurers the opportunity to re-enter rural markets
  - **No regulatory impediment and reinsurance potential**
  - **Little (and bad!) experience with traditional agriculture insurance**
- Opportunity for NASFAM to expand its operations and grow the Malawi market domestically and for export

✓ **A win-win for all stakeholders**

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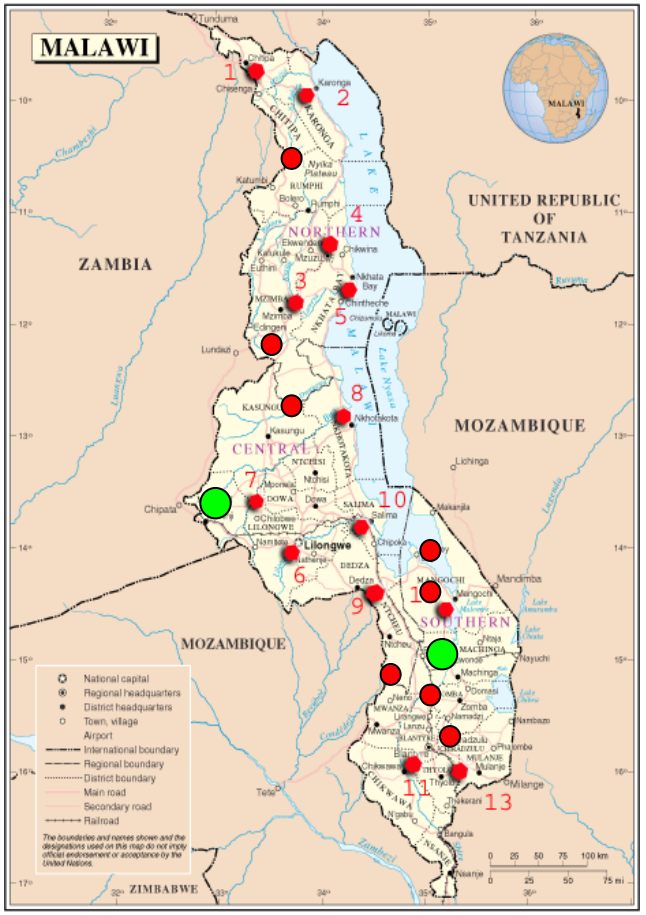
Example Malawi
Weather Infrastructure

- Malawi Met Office data **excellent**: over 30 years, few gaps, 21 primary synoptic stations (red)
- In addition over 200 rain gauges around the country which can be leveraged…
- CRMG/Met Office piloting the installation of new automatic weather stations (green) and creating historical synthetic data, opening new agricultural areas to weather insurance for this year
- Securing donor funds to scale-up infrastructure pilot significantly next year

✓ **Dense, high-quality network**



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Standardized Contract Design

- Balance simplicity that farmers and stakeholders can understand, with the complex dynamics that characterize water stress impact on crop yields:
  - **Easy to communicate to farmers and stakeholders**
  - **Performs well from agro-meteorological perspective**
  - **Provides required protection for all stakeholders at an affordable level**
  - **Captures local conditions and environment**
  - **Simple to replicate to other locations and crops so that programs are scalable**
  - **Local ownership, so programs are sustainable**

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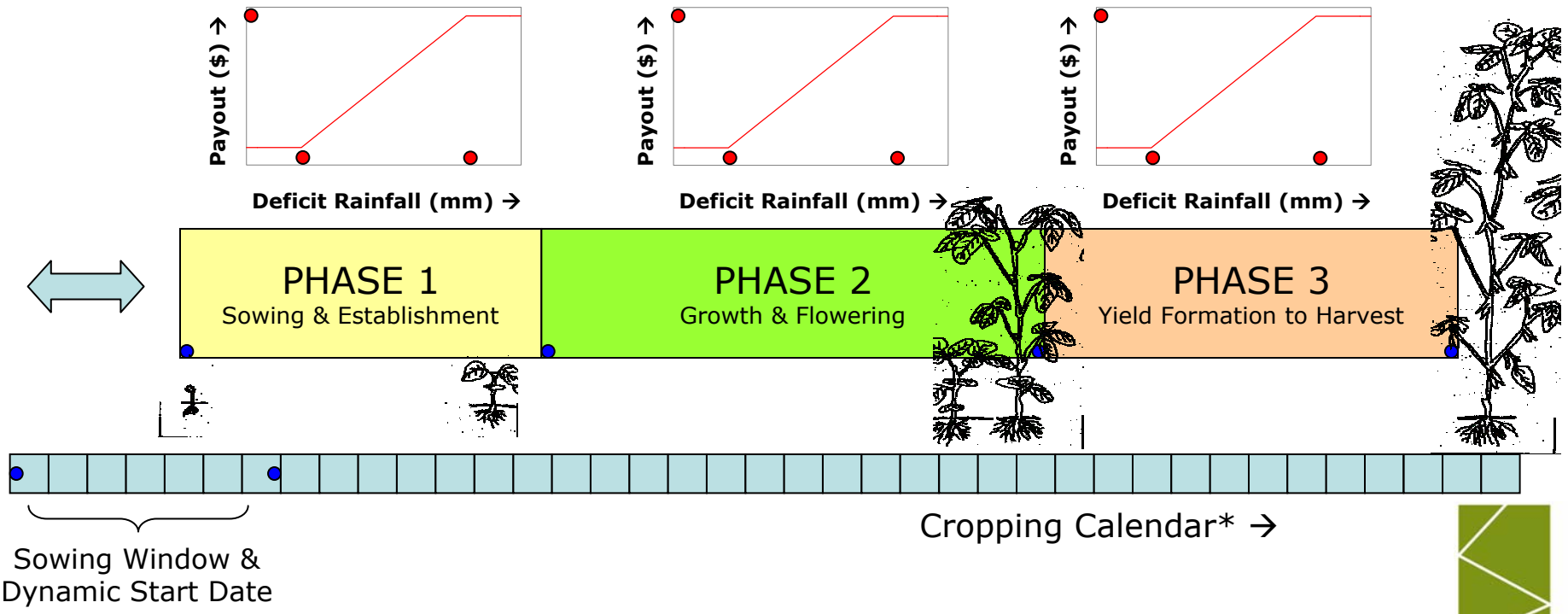
Standardized Contract Design

- Given a target **premium** and set pricing guidelines, and a required **maximum payout** per phase, red dots are calibrated to a simple crop water-balance model – **the FAO WRSI** – cross-checked against historical yields and local experts (blue dots) to minimize farmer income Value-at-Risk and maximize payout correlation to yields



* Cumulative 10-day rainfall is capped to prevent excessive rainfall impacting the phase-wise total

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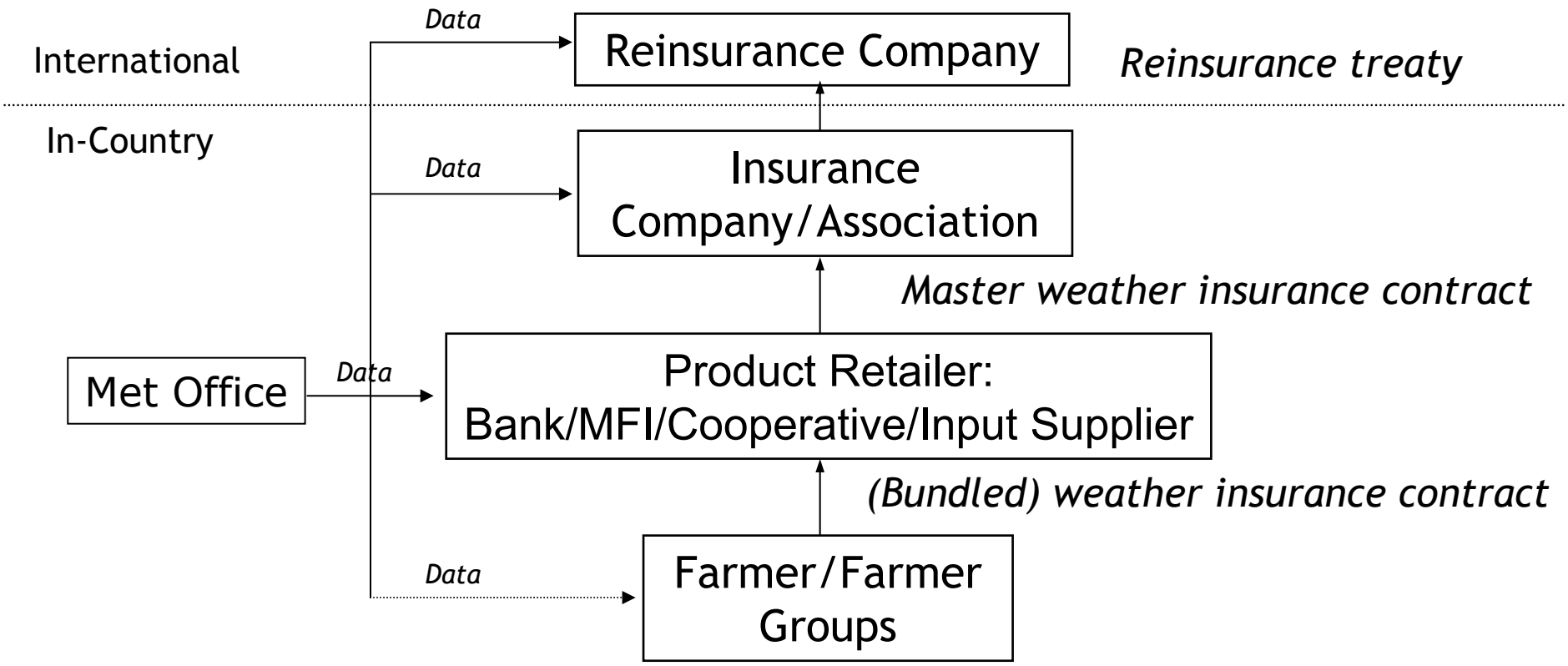
Standardized Program Implementation



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

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Example Malawi
Pilot Details

- Loans to cover seed, insurance premium and interest:
  - **Opportunity International Bank of Malawi**
  - **Malawi Rural Finance Corporation**
- Policies:
  - **Insurance Association of Malawi (seven companies pooled the risk)**
  - **Premium: 6-7%, Max Payout per farmer: Loan Size given by bank**
- 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: channeled from insurance company directly to the bank;**
  - **No Payout: farmers benefit from selling the higher value production**

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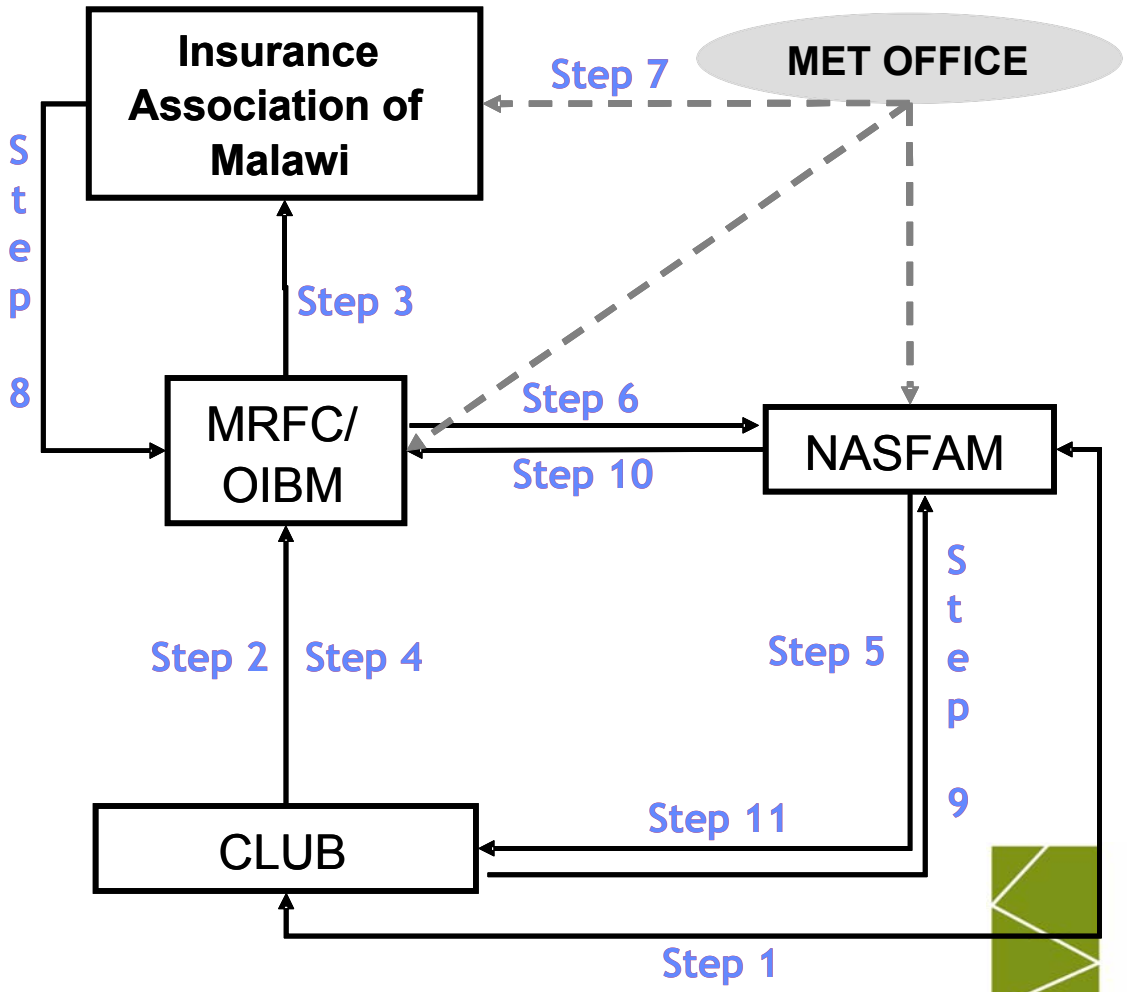
Example Malawi
Pilot Details

1	Club and NASFAM enter into sales agreement
2	Club enters into contract with bank for insurance & loan
3	Insurance purchased on behalf of clubs
4	Farmers authorize the bank to pay NASFAM for the seed
5	Seed distribution to clubs
6	Money paid to NASFAM for seed
7	Meteorological information distributed
8	Payout from insurers to banks
9	Farmers sell groundnut output to NASFAM
10	NASFAM pays off loan balance to the bank
11	Payment of any additional revenue from crop sale to club



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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 rural market.
- Quantifying exposure to weather risk

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Challenges Ahead for Malawi

- Willingness to pay by farmers
  - **Stand alone 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 50 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

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Malawi: 2007 and onwards

- Focus on established agricultural supply chains, e.g. tobacco
  - **70% of current loan portfolios**
  - **Tobacco loans also have a maize component that can also be insured**
  - **Economies of scale and critical diversification for insurers**
    - *Reduce premiums per policy*
    - *Increase volumes to attract reinsurers*
  - **Comfort for lenders when considering expanding their portfolio and reducing the risk (and therefore cost) of lending**
  - **Tie-in with emerging contract farming relationships in Malawi**

- Plus develop off-the-shelf products for other crops that have an established and working supply chain
  - ***E.g. Paprika, cotton, tea, other contract farming operations***
  - **Lenders can factor insurance into existing and new lending packages and farmer orientation programs**
  - **Support emerging contract farming relationships**
  - **Look at portfolio-level insurance opportunities, i.e. banks, processors etc.**

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Vision for Malawi: 5 Years

- The development of a vibrant weather insurance industry, participating in and transferring risk to the global market.
- Offering weather risk management products that are accessible to smallholders, larger producers, banks and MFIs, agri-businesses and Government
- Providing tools to remove weather risk as an impediment to agriculture planning, credit, investment and growth so that actors can focus on managing remaining risks
- Reduce credit costs and expand credit access to agricultural communities.

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Achieving the Vision

- Training and Capacity Building Programme:
  - **Technical training and knowledge transfer to the insurance industry**
  - **Training to other agriculture sector actors: lenders, contract farming companies, agri-business**
  - **Continued piloting and establish links with international market**
  - **Work with finance institutions to create better products for farmers and sustainable rural lending portfolios**

- Investment:
  - **More new weather stations and better data**
    - *Currently approximately 110,000 registered growers can be serviced by existing network*
    - *An investment of $1.2 million can increase this to 300,000, 13% of which are currently receiving financing*

- Creation of a risk management environment:
  - **Linkages to other institutional arrangements, e.g. biometrics, credit bureau, international price risk management**
  - **Government-level weather risk management**
  - **Work with regulator to provide comprehensive regulatory framework**

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Lessons Learnt from BASIX in India

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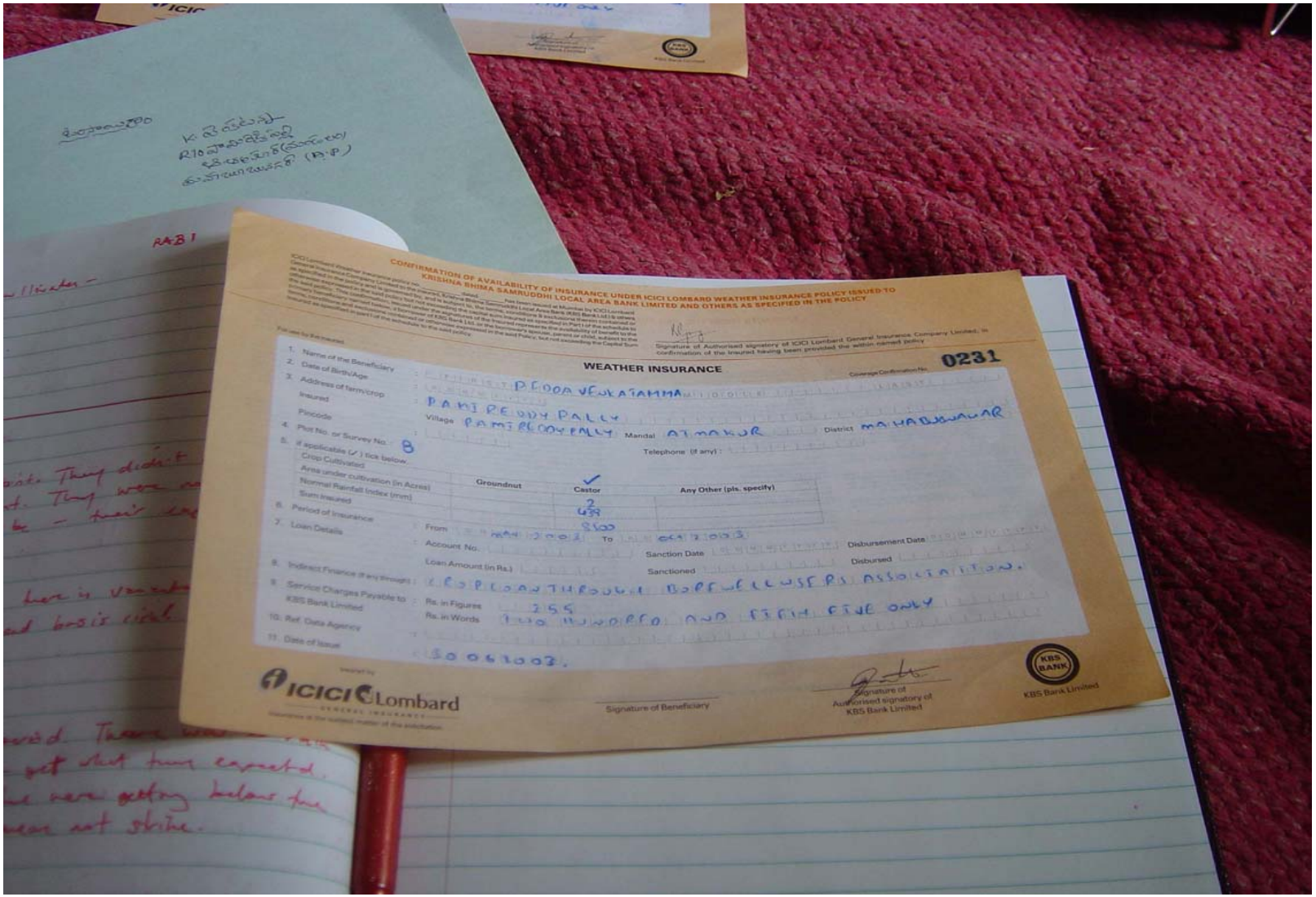
1st Farmer Weather Insurance Policy



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1st Pilot Farmers in Pamireddypally

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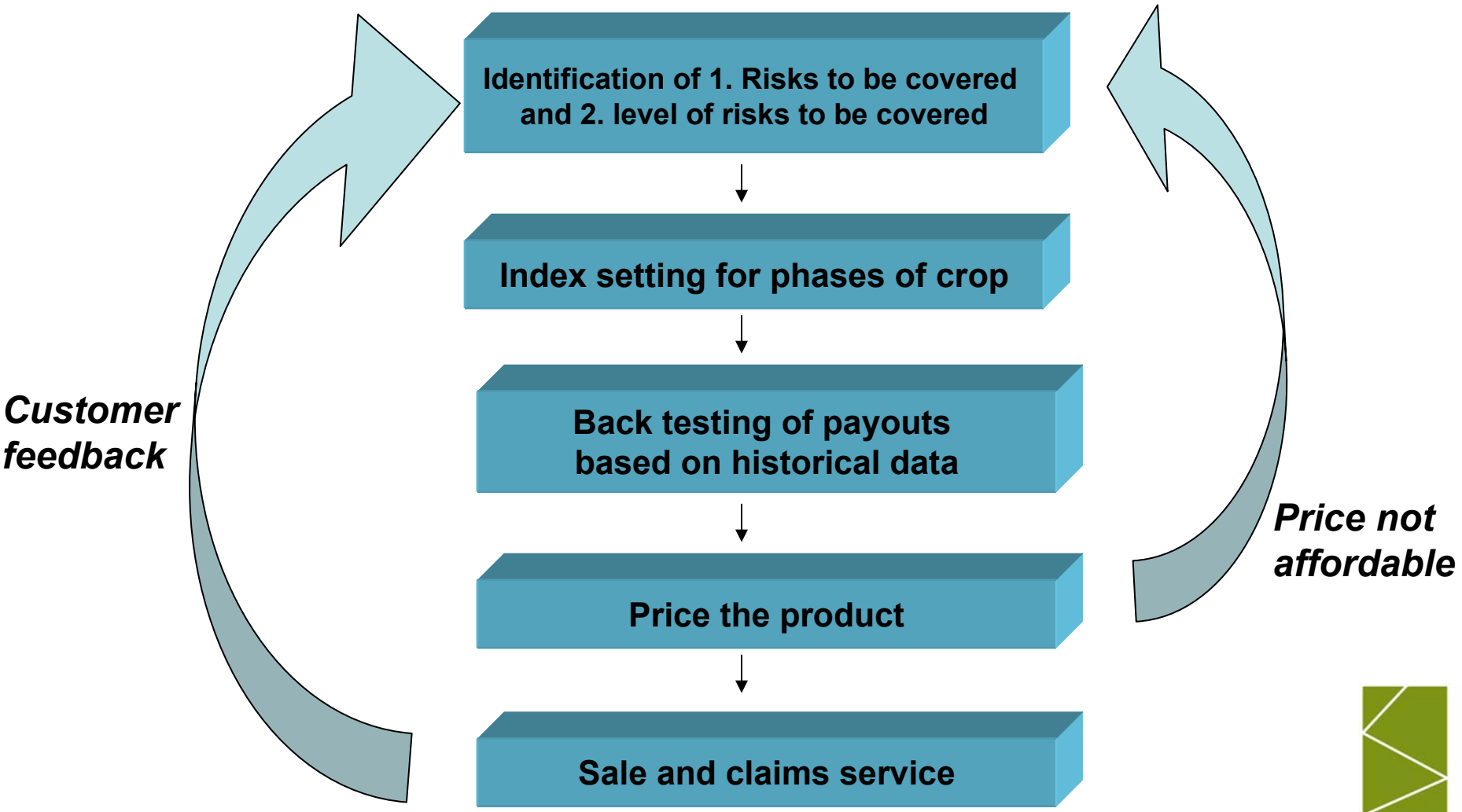
Product Design Process



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In BASIX's Words:
Simple Products and Procedures for Farmers

- Keep the fine print to minimal level
- It would be great to have all the product details conveyed in a one page document with a minimum 20 size font
- Product should speak the language that the farmer can understand
  - **Review and refine contracts each season**
- Benchmarking for simplicity
  - **Not only should it be simple enough for the farmer, but also to the field staff who interacts with farmer**
- Customer awareness and education through
  - **Village meetings**
  - **Various forms of print material and**
  - **Creative multimedia content**
  - **Communication in vernacular**
- Customer education programs may not translate into immediate uptake
- Need for investment from several stakeholders both private and public
- However BASIX worry for the setting in of path dependency: market chooses a product that may not be the best

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E.g. BASIX Contract Documentation

Up to 2006

2007

Term-sheet
(with product reference code)

Enrollment form

Product term sheet & enrollment form

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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.

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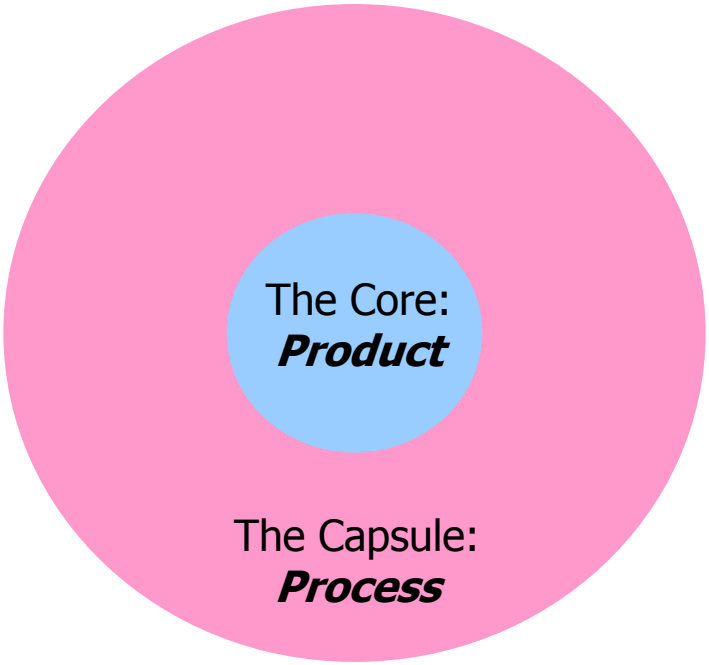
In BASIX's Words: Dissecting the Challenges in Delivering Micro Weather Insurance



- BASIX experience and initiatives have been largely to address the process bottlenecks and make fine refinements to products from time to time.

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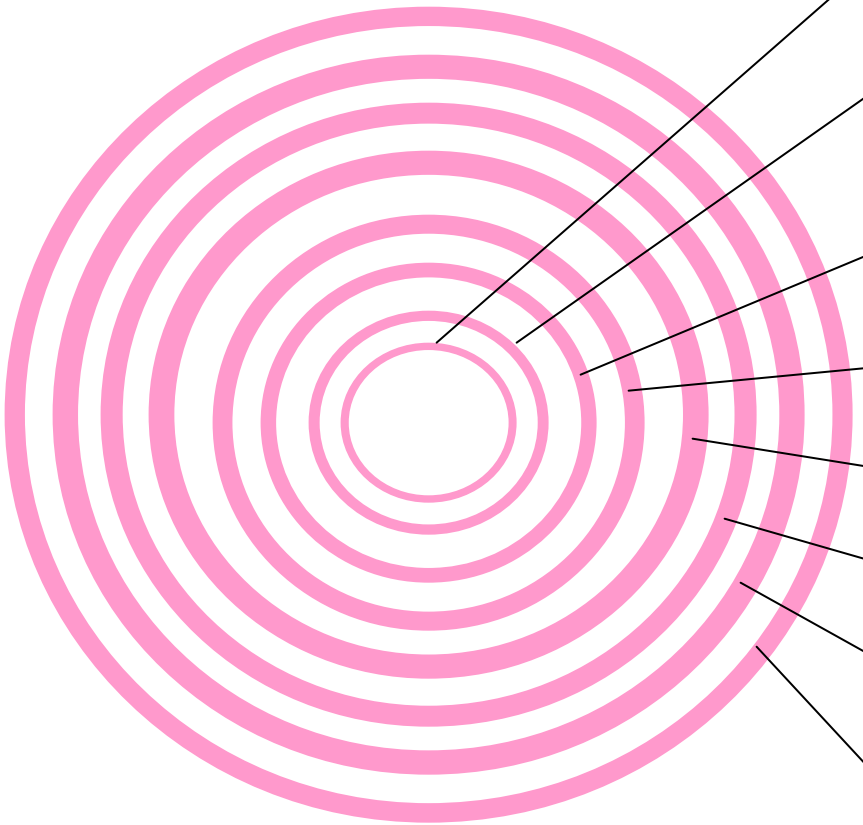
…and there are several layers to it



Partnerships and product development process

Simple Products and Procedures

Customer Education

Training and Capacity Building

Incentives

Documentation

Management Info. Systems & IT

Synergy with other products

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E.g. Synergy with other products and services

- Rural customers need various financial and non-financial services
- Distribution costs for intermediaries is high due to geographically scattered rural customers
- Distribution costs per product/service can be reduced by providing multiple services through a single window
- Making the products more affordable for rural customers
- BASIX offers Life, Health (Disease and Dismemberment), Livestock, Weather and Enterprise insurance to clients
- Plus Credit, Saving, Remittance and Agri-business development services

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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

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Conclusions

- CRMG 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.**

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