

Market Based Agricultural Risk Management for the Coffee Industry

World Bank
Non-Lending Technical Assistance
Agriculture Risk Management in the Caribbean

Kingston, Jamaica
June 18, 2009



ALL ACP AGRICULTURAL COMMODITIES PROGRAMME



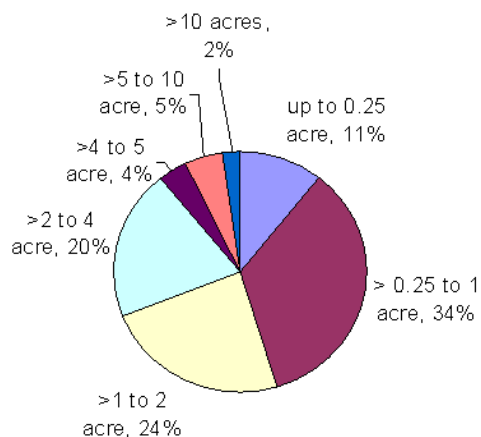
Agenda

- Coffee industry
- History of coffee insurance
- Index-based Insurance for Coffee farmers
 - Objective
 - Scope of technical assistance
 - Technical Challenges
- Possible Options.
 - Index weather insurance for individual farmers (Option 3)

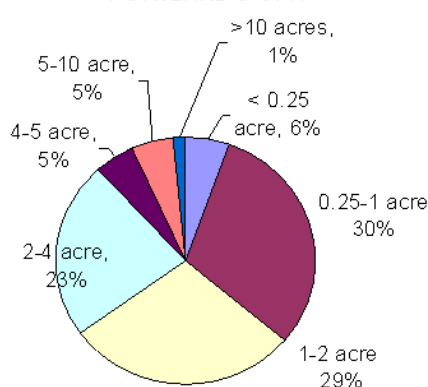
Structure of the Coffee Industry.

GPA	Total Farmers	Farmers with production & acreage	%	Total coffee area	%	Average production 2000/01 - 03/04 (Boxes)	%
St. Andrew	2,916	2,454	84%	5,822	44%	120,540	53%
Portland	2,238	1,710	76%	4,121	31%	58,226	26%
St. Thomas	1,878	1,632	87%	3,347	25%	47,567	21%
TOTAL	7,032	5,796	82%	13,290	100%	226,333	100%

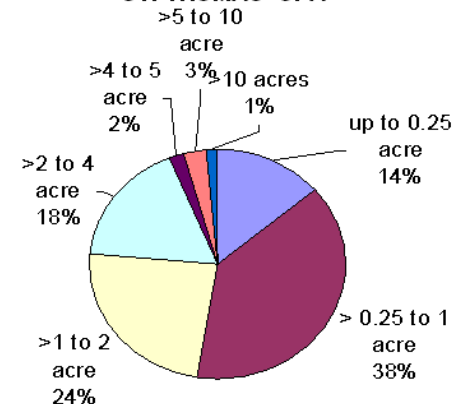
FARM SIZE DISTRIBUTION
ST. ANDREW'S GPA



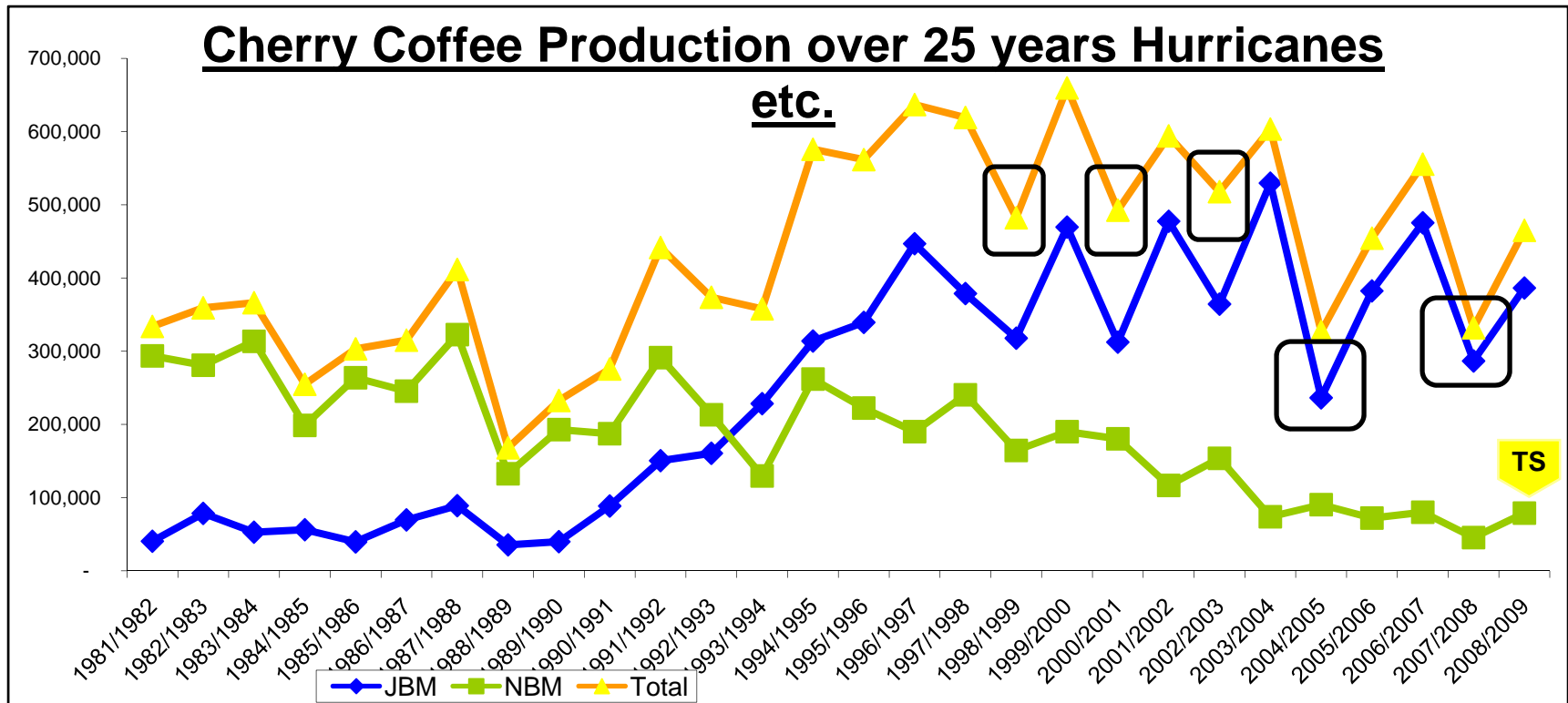
FARM SIZE DISTRIBUTION
PORTLAND'S GPA



FARM SIZE DISTRIBUTION
ST. THOMAS' GPA



Main causes of Coffee yield Losses



Main causes of Coffee yield Losses

Cherry Coffee Reaped.

Crop Season	Climate Event	Bmountain (Boxes)	% Change/year	NBMountain (Boxes)	% Change/year	Total Boxes	% Change/year
1998-1999	Unusual heavy rainfall	317,843	-16%	164,404	-32%	482,247	-22%
1999-2000		438,036	38%	167,642	2%	605,678	26%
2000-2001	Drought, wind storm damages, flood rains.	312,403	-29%	180,253	8%	492,656	-19%
2001-2002	H. Michelle (Cat 4)	477,575	53%	116,491	-35%	594,066	21%
2002-2003	H. Isidoro and Lily	364,356	-24%	153,528	32%	517,884	-13%
2003-2004		529,704	45%	73,809	-52%	603,513	17%
2004-2005	H. Ivan	236,405	-55%	90,318	22%	326,723	-46%
2005-2006	TS Dennis, Emily and Wilma	382,421	62%	71,950	-20%	454,371	39%
2006-2007		475,416	24%	80,032	11%	555,447	22%
2007-2008	H. Dean	286,636	-40%	45,313	-43%	331,949	-40%
2008-2009	TS Gustav	386,425	35%	78,691	74%	465,115	40%

History of Coffee Insurance.

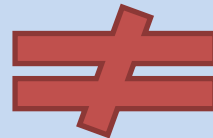
**CIB
Insurance
Program**

- Administered by trustees for CIB:
 - ✓ Purchased Commercial Reinsurance.
 - ✓ Managed the Program (Aggregated shortfall policy).

Claims response
was not properly
defined

Farmers did not
understand the bases
of the insurance
provided.

Total Individual
Coverage



Comercial Policy

There was a Generalized Unhappiness with the CIBIP.

Take the past experience and restructure/modify what is needed.

Individual Contracts vs Collective contracts.

Updating and Administering Farmer Registration and Activity Tracking System (FRAT)

Solving financial lack of liquidity at the moment of paying the premium.

Secure premiums to insurers and reinsurers.

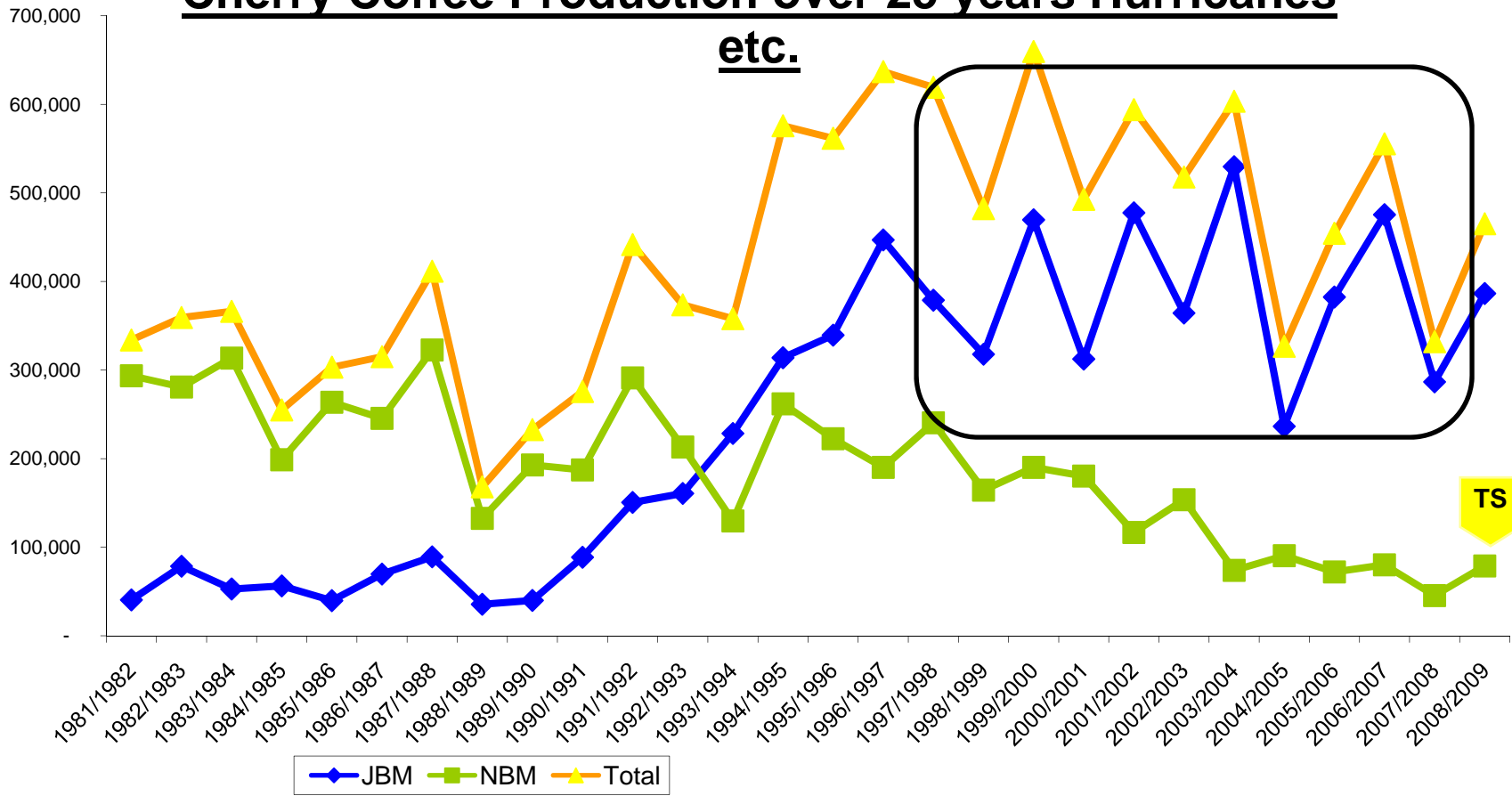
Simplify channels to collect premiums and distributing payments (minimize/eliminate field survey).

Improve the institutional structure and capacity that already exists for reaching farmers.

Index Based Insurance for Coffee Farmers

- Objective:
 - Assist the CIB in designing and implementing a financial market-based mechanism for transferring weather risks to the international market.
- Scope in providing technical assistance:
 - Layering weather risks,
 - Designing a delivery channels for premium collection and payouts.
 - Risks quantification,
 - Structuring a weather insurance product,
 - Reinsurance negotiations.

Cherry Coffee Production over 25 years Hurricanes etc.



Technical Challenges

- Lack of data or inadequate infrastructure.
 - There are no wind gauges in the BM, for pricing and monitoring contracts.
 - There will be a need to install new wind and rain gauges in the coffee regions.
 - Statistical base (production, losses, risks).
 - Farmers deliver berries to different dealers and factories.
- Lack capacity or willingness to pay premiums.
 - Need to find a financial arrangement to overcome the financing gap problem that farmers lack liquidity at the moment premiums are due.
- Presence of huge basis risk.
 - Extreme topography in the BM area, and its impact on localized wind and rain patterns.
 - Design a mechanism to compensate genuine losses incurred by farmers, but not triggered parametrically.
 - Agronomic cycle of coffee trees varies in relation to altitude and coffee areas.

Options Considered



1. Traditional crop insurance;



2. An aggregate parametric trigger for the industry as a whole;



3. Parametric insurance with individual contracts to farmers;



4. Same as 3, but with creating a fund to deal with basis risk;
and



5. Doing nothing

Possible Options.

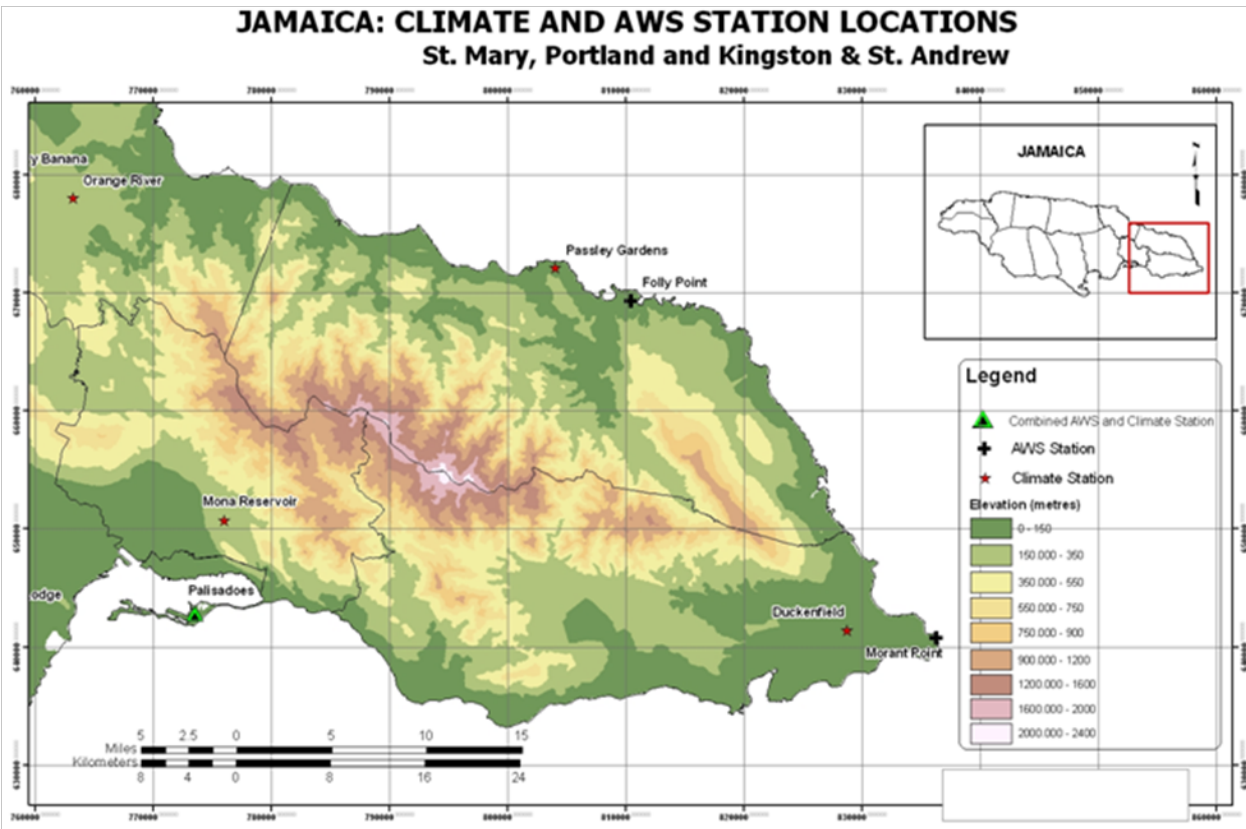
Possible Options	Advantages	Disadvantages	Observations
<p>1. Traditional Crop Insurance.</p>	<ul style="list-style-type: none"> ▪ Indemnity according to individual farmer loss 	<ul style="list-style-type: none"> ▪ Loss assessment highly problematic, and costly ▪ Need of an insurance and claims management unit. ▪ High moral hazard ▪ <i>Reinsurers will not provide support</i> 	<ul style="list-style-type: none"> ▪ This option has been tried and is highly challenging. ▪ There are almost insurmountable operational difficulties
<p>2. Aggregate Parametric Trigger (either (a) index based on hurricane track parameters or (b) based on triggers at a series of weather stations)</p>	<ul style="list-style-type: none"> • Likely to be acceptable to reinsurers • Payouts based on independent and transparent parameters • (a) would be easy to implement 	<ul style="list-style-type: none"> • Cannot operate without setting up scheme to distribute aggregate payout to individual farmers • Does not solve loss assessment needs at individual farmer level • Trigger type (a) gives high basis risk even at whole-industry level and cannot capture excess rainfall • Trigger type (b) requires new local station network in coffee areas as in (3) 	<ul style="list-style-type: none"> • This option would make aggregate payment to CIB. • Does not address how to distribute claims to farmers • Neither hurricane track or weather-based option addresses underlying difficulty of previous scheme

Possible Options.

Possible Options	Advantages	Disadvantages	Observations
<p>3. Parametric Trigger with individual contract to farmers (Based on weather stations)</p>	<ul style="list-style-type: none"> • Transparent index • Rapid claims payment • No field loss assessment • Simple product allowing insurance contract to farm level • Likely to be acceptable to insurers and reinsurers • CIB act as distributor and not as insurer 	<ul style="list-style-type: none"> • High Basis Risk • Few existing rain stations and no wind stations in coffee areas • Setting premium rates and triggers, and defining sub-zones, is technically challenging, and needs risk modeling • New automatic weather stations needed • Needs careful extension to farmers. • Premium rates and affordability unknown – increase in frequency of recent events 	<ul style="list-style-type: none"> • High basis risk means that this option needs to be considered as “income supplement” and not “crop insurance”.
<p>4. As (3) but with additional Basis Risk Fund</p>	<ul style="list-style-type: none"> • Basis Risk Fund targets farmers who are genuinely affected by loss when trigger not hit 	<ul style="list-style-type: none"> • Individual farm assessment required for localized damages to be compensated under the Basis Risk Fund • Difficult to define coverage and to limit the circumstances which the Fund is required to compensate. This depends on extent of basis risk and on the triggers levels of the parametric product as in (3) 	<ul style="list-style-type: none"> • This Fund would still need conventional individual farmer loss assessment (as per previous scheme). • It would be essential to clearly define and limit situations in which Fund responds to claims, to be operationally and financially feasible • It is recognized that the Basis Risk Fund would carry operational challenges.
<p>5. Nothing</p>	<ul style="list-style-type: none"> • Decision that insurance solutions are highly challenging or “too difficult” 	<ul style="list-style-type: none"> • Financial protection against major events is extremely highly demanded by the industry and ranked as a top priority 	<ul style="list-style-type: none"> • Insurance is just one of many measures needed by the industry,

Option 3. Parametric Insurance: Individual Contracts for Farmers.

JAMAICA: CLIMATE AND AWS STATION LOCATIONS St. Mary, Portland and Kingston & St. Andrew



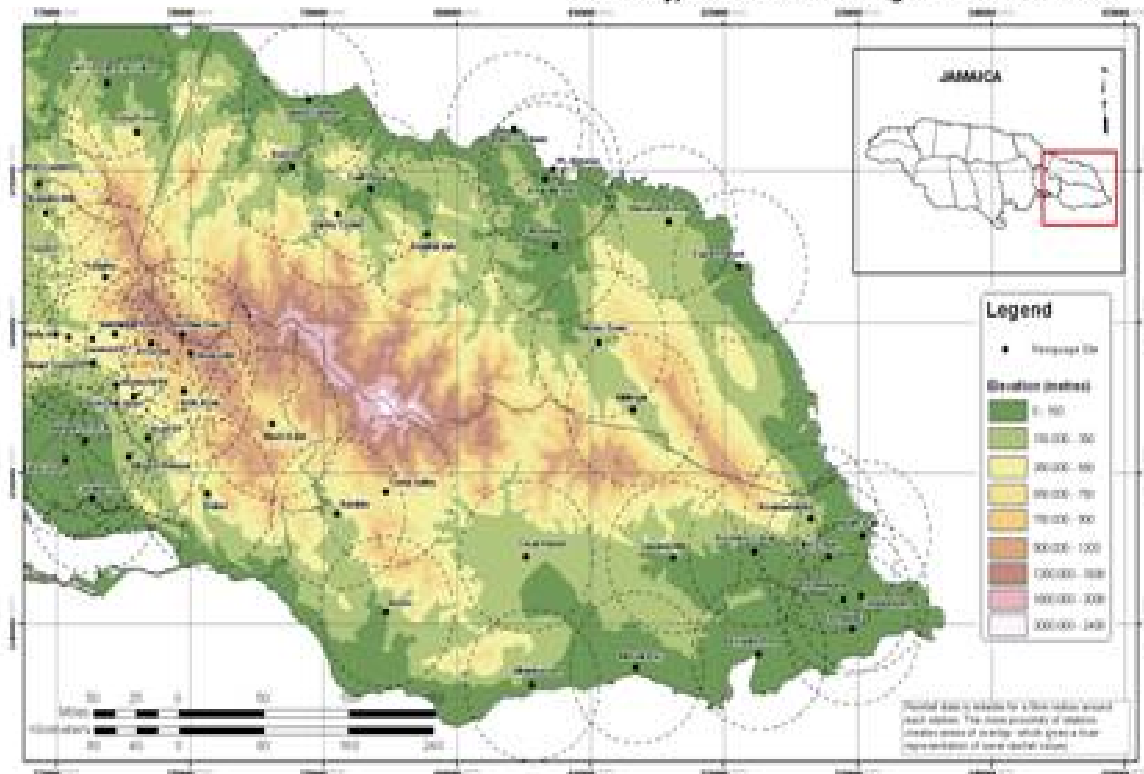
- Automatic weather Stations:
 - 10 ws (US\$12,000.00/ws)
- Calibration of WS and triggers.
- Product Design:
 - Period of coverage.
 - Insured entity.
 - Sum insured.
 - Scale of sum insured by date.
 - Trigger definition.

Source: National Meteorological Service

Option 3. Parametric Insurance: Individual Contracts for Farmers.

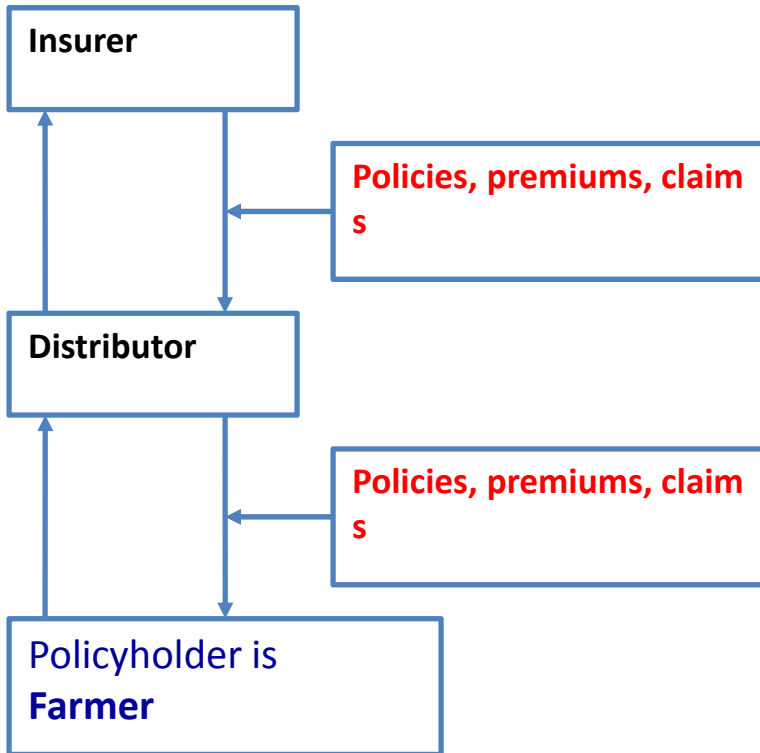
- Adm and contractual arrangements:
 - Who will underwrite?.
 - Voluntary or automatic.
 - Distribution and Enrolment.
 - Premium and Claim Payments.
 - Farmer extension.
 - Pilot implementation.
- Financial Arrangements.
 - Development costs.
 - Capital funding and maintenance budget for AWS.

**JAMAICA: AREAL REPRESENTATION OF POINT RAINFALL DATA-
St. Mary, Portland and Kingston & St. Andrew**

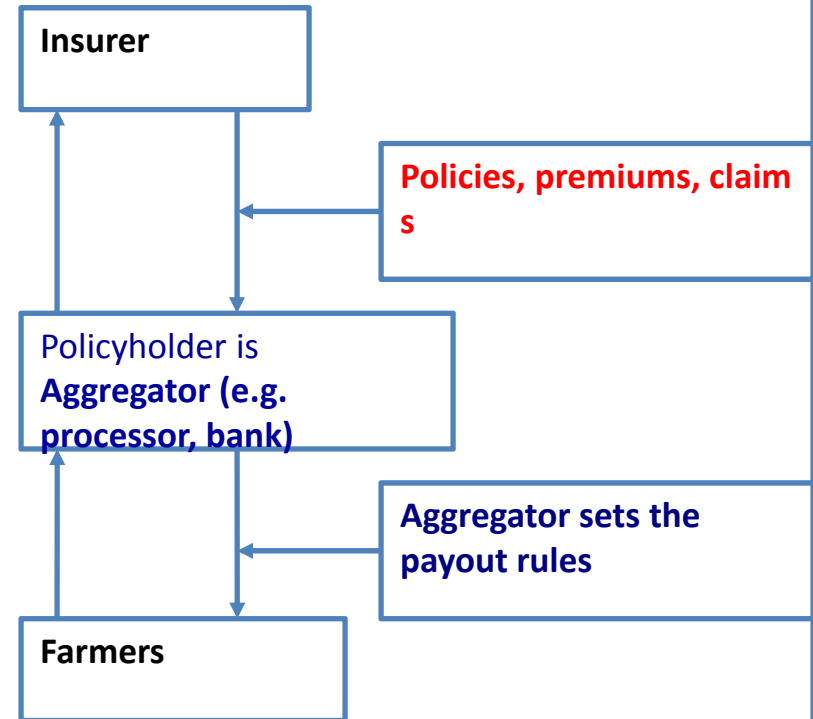


Insurance Structures.

Micro level insurance program



Meso/Macro insurance program



Coffee Industry Board Jamaica Index Insurance Project Overview Planning - Feasibility Study and Pilot Design

Activities - commencing November 2007 2 week period	2009												2010																												
	Apr 1-2	Apr 3-4	May 1-2	May 3-4	Jun 1-2	Jun 3-4	Jul 1-2	Jul 3-4	Aug 1-2	Aug 3-4	Sep 1-2	Sep 3-4	Oct 1-2	Oct 3-4	Nov 1-2	Nov 3-4	Dec 1-2	Dec 3-4	Jan 1-2	Jan 3-4	Feb 1-2	Feb 3-4	Mar 1-2	Mar 3-4	Apr 1-2	Apr 3-4	May 1-2	May 3-4	Jun 1-2	Jun 3-4	Jul 1-2	Jul 3-4	Aug 1-2	Aug 3-4	Sep 1-2	Sep 3-4	Oct 1-2	Oct 3-4	Nov 1-2	Nov 3-4	Dec 1-2
PHASE 1: PILOT WEATHER INDEX INSURANCE PREPARATION Target completion December 2009												RESPONSIBILITY Note: refers to WB staff, consultants or contracted firms																													
Mission 1 - technical support and preparation Agree project with CIB/Govt AGREE OUTLINE PARAMETERS FOR INDEX PRODUCT Draft consultant TOR including modeling contract Identify local organisations and potential stakeholders Formulate pilot project preparation and implementation plan Appoint/selection procedure local PMU or consultant	Timing is approximate: detailed timetable to be refined												TTL and mission team																												
Technical and modeling Risk Modeling - wind Risk Modeling - rainfall Specification and location options for weather stations Assemble all hazard data and loss data Develop vulnerability assessments with local experts Mapping of Blue Mountain geographical zones Develop example pricing for sample station locations	Timing is approximate: detailed timetable to be refined												Technical/Modeling Consultant contract and agronomist consultant																												
(Note: interim supervisory missions may be necessary by TTL)	Timing is approximate: detailed timetable to be refined												TTL and mission team																												
Mission 2 - product design and stakeholder formation AGREE FINAL DESIGN FEATURES OF INDEX PRODUCT Farmer concept testing in selected pilot areas Identify insurer and pilot project organisation Form stakeholder group and hold workshop Finalise number and location of weather stations Legal and regulatory clearance	Timing is approximate: detailed timetable to be refined												Insurance International consultant/local consultant																												
Analysis and insurance preparation Organisational structure and operational plan Contract wording, documentation Operational procedures and manual, training materials	Timing is approximate: detailed timetable to be refined												TTL/consultant																												
Budgeting Revise budget and funding for implementation phase Costings for weather stations, procurement needs	Timing is approximate: detailed timetable to be refined												TTL/consultant																												

PHASE 2: IMPLEMENTATION OF PILOT WEATHER INDEX Pre-policy sales and pilot operation January - November 2010												SALES WINDOW																							
ORGANISING THE PROJECT AND TECHNICAL SUPPORT Procure weather stations Confirm the insurer(s) who will operate the insurance for 2008 season Formalisation of Steering Committee attached to the CIB Formalisation of the Technical Support for Insurer Appoint Project Co-ordinator (local consultant) Agree the target clients / farmer groups eligible												Timing is approximate: detailed timetable to be refined												SALES WINDOW											
FINALISE PRODUCT DESIGN AND INSURANCE DETAILS Finalise the product design/phases/triggers/sums insured etc Propose options for 2010 product parameters and pricing to Insurer Finalise insurance pricing Finalise policy wording/certificates Set limits for policy sales volume per district Agree the process for policy sales and premium payments Provide draft operational manual for policy sales and claims payment Construct flow chart and write operational manual for pilot												Timing is approximate: detailed timetable to be refined																							
LEGAL AND REGULATORY Confirm clearance for index policy for pilot testing												Timing is approximate: detailed timetable to be refined																							
DISTRIBUTION AND FARMER INFORMATION Organise farmer information meetings Train CIB and Insurer officers in product Prepare product explanation leaflets Prepare presentation and "Q&A" materials Test product premium/cover options with Farmers Specify responsibility and reporting channel for sales agents												Timing is approximate: detailed timetable to be refined																							
RAINFALL RECORDING Installation of automatic stations												Timing is approximate: detailed timetable to be refined																							