

# CREATING A REGIONAL PLATFORM FOR RISK MANAGEMENT IN LAC

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Risk Management in Agricultural Finance: Building More Inclusive  
and Secure Markets

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# GlobalAgRisk, Inc.



## ● Mission

*Improve access to market services for the poor through innovative approaches for transferring natural disaster risk*

### Activities

- Research and development
- Technical capacity building
- Educational outreach
- Supported by
- Multinational donors
- Governments
- Nongovernment organizations
  
- Linked to the University of Kentucky

### Select Country Work

- Peru – El Niño/Flood
- Mongolia – Livestock
- Indonesia – Earthquakes
- Vietnam – Flood/Drought
- Ghana – Area Yield
- Mali – Drought
- Morocco – Drought
- Mexico – Drought
- Romania – Drought
- Ethiopia – Drought

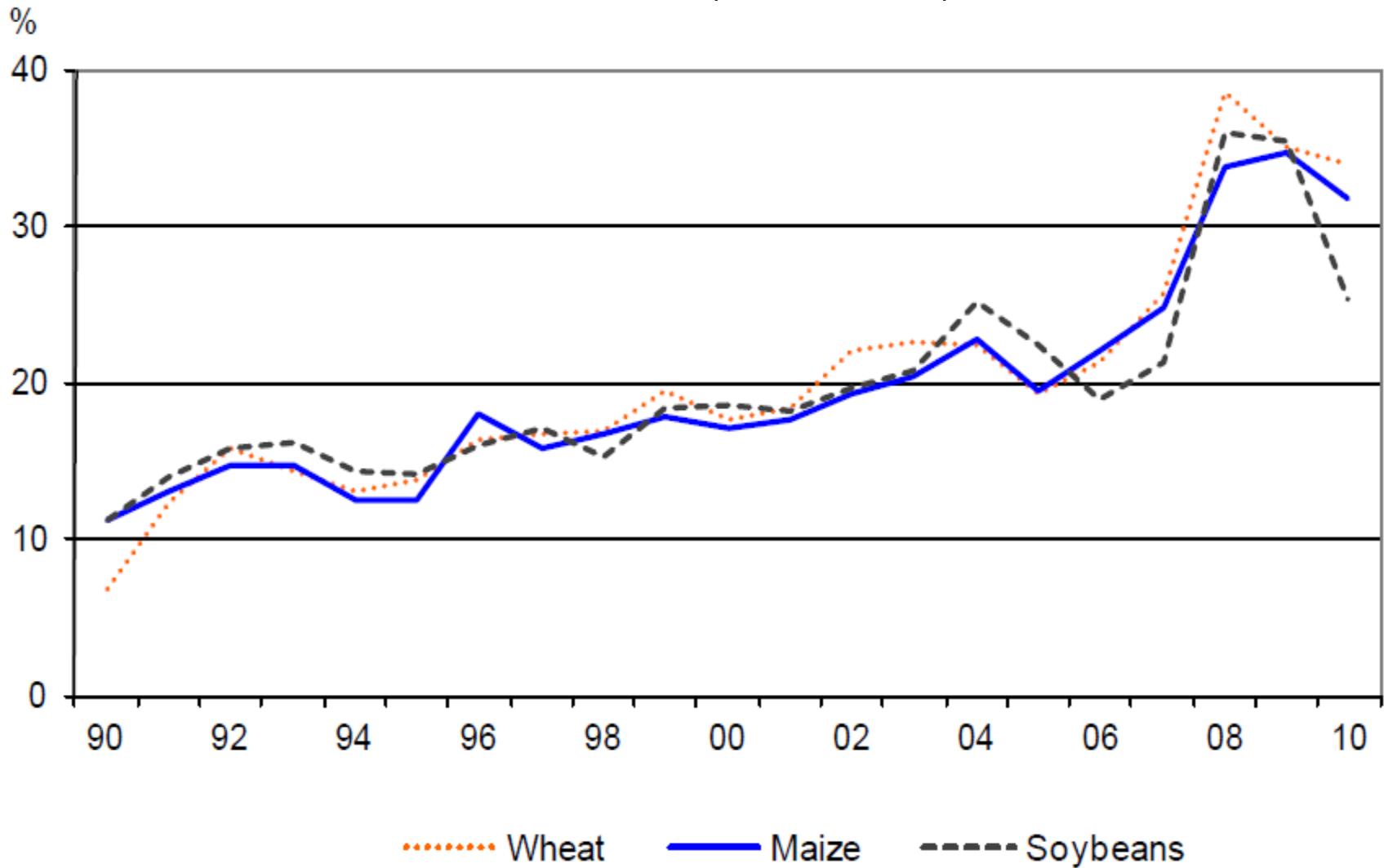
# Price Volatility in Food and Agricultural Markets: Policy Responses

“Variations in prices become problematic when they are large and cannot be anticipated and, as a result, create a level of uncertainty which increases risks for producers, traders, consumers and governments and may lead to sub-optimal decisions. Variations in prices that do not reflect market fundamentals are also problematic as they can lead to incorrect decisions.”

Interagency Document – 2 June, 2011

# Annual Implied Volatility from 1990 to 2010

Source FAO Food Outlook (Nov 2010)



# Insuring poor management!

- Banks that take loan guarantees are poor banker?
- Agricultural insurance has the same challenges
  - Moral hazard
  - Adverse selection
- Core asymmetric information issues remain an important explanation for why there are limits to agricultural loans and agricultural insurance

# Some core market concepts

- Issue:
  - Price volatility and natural disaster risks leads to more risk adverse behaviors from a wide range of decision makers
    - Agricultural lenders
    - Value Chain firms
    - Households
- Consequence
  - Lower investments in agriculture within the country
- Policy alternatives?
  - Don't repeat the same mistakes
  - Challenge → how to use market-based solutions?

# Food Price Volatility Hurts Poor People the Most

- People in developing countries spend as much as 75% of their income on food
- Price spikes can lead to undernourishment in children with life-long developmental consequences
- Price crises lead to coping strategies of changing diets, selling productive assets, withdrawing children from school, early marriage, migration, etc.
- Vulnerability to price shocks also affects smallholders, most of whom are net food consumers. They also typically lack access to credit to expand production when prices are high, while also lacking hedging mechanisms to protect them from future collapse in prices

# A big picture view Drivers of Price Volatility

- Sources of price volatility
  - Global drivers
    - Production from major exporters
    - Energy links with bio-fuels
  - Regional climate anomalies
  - Government policy
    - Both macro and agricultural policy



# Consequences of Weather-Induced Price Volatility

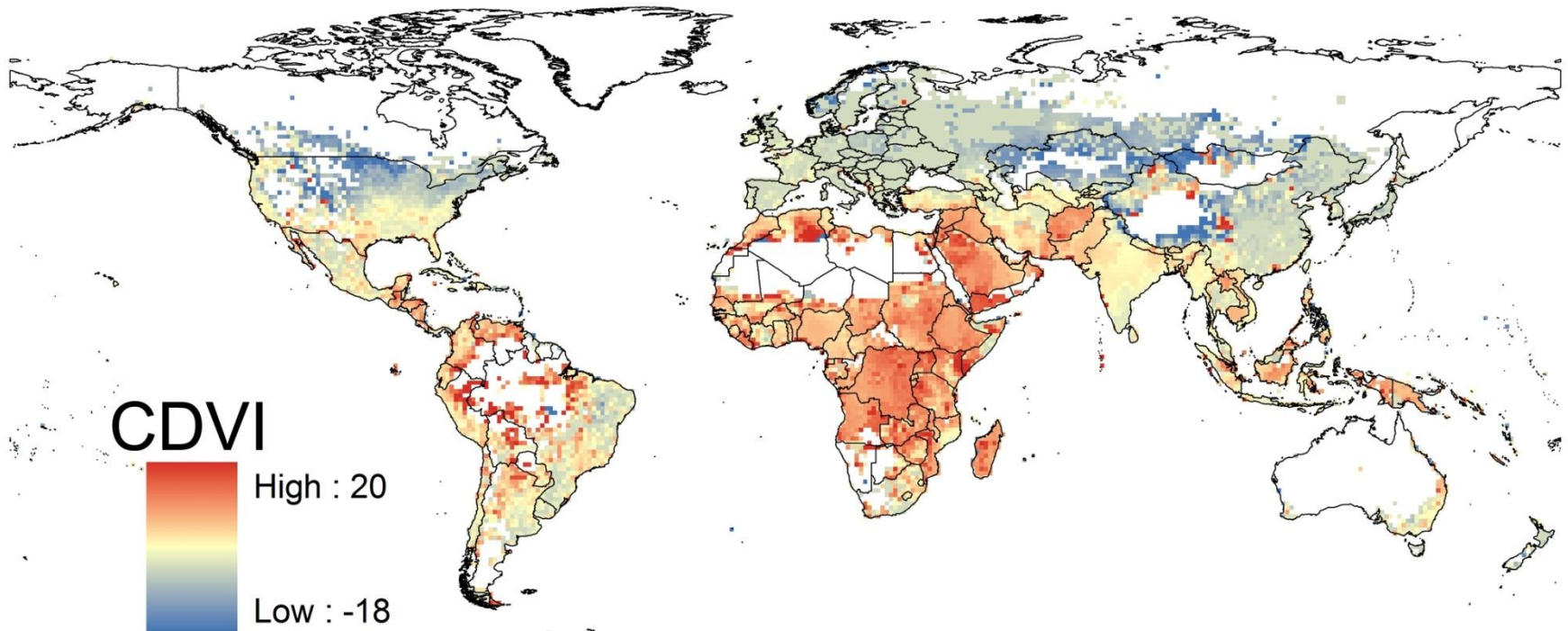
- Crop losses in exporting countries can trigger responses among producer and consumer countries, which escalate prices further
  - Export ban in the case of the Russian drought in 2010
- Sharp rises in the price of staple crops threaten food security
  - 2007/08 crisis contributed to an eight per cent rise in the number of undernourished people in Africa
- The adverse effect of price spikes on the global food system have escalated political instability and social strife in many parts of the world in recent years

# The Impact of Climate Change on Food Production and Price Volatility

- Average global yields are declining due to slow-onset changes in mean temperatures and precipitation patterns
- Crop losses are worsening due to more frequent and intense extreme weather events
- The rising uncertainty and instability of food production is expected to worsen, especially in lower-latitude, tropical regions

# Future regional vulnerability of human populations to climate change

## *Climate-Demography Vulnerability Index (CDVI)*



Regions with a high CDVI are expected to be most negatively impacted by climate change.

© McGill University

Source: Samson, J. et al. (2011) Geographic disparities and moral hazards in the predicted impacts of climate change on human populations. *Global Ecology and Biogeography*.

# Using Markets to Manage Price Volatility

- Global drivers of price and supply conditions are difficult to hedge at the country level
  - A direct use of global exchange markets has met with limited success
- Local weather and regional climate drivers are different
  - A local or regional weather shock can drive prices up even if world prices are low
    - In 2010, better than average harvests in Africa stabilized food prices in the region, staving off a repeat of the 2007/08 food crisis despite a similar spike in world food prices
  - Advances in financial innovation are increasingly facilitating transfer and financing of weather and natural disaster shocks at the local and regional level

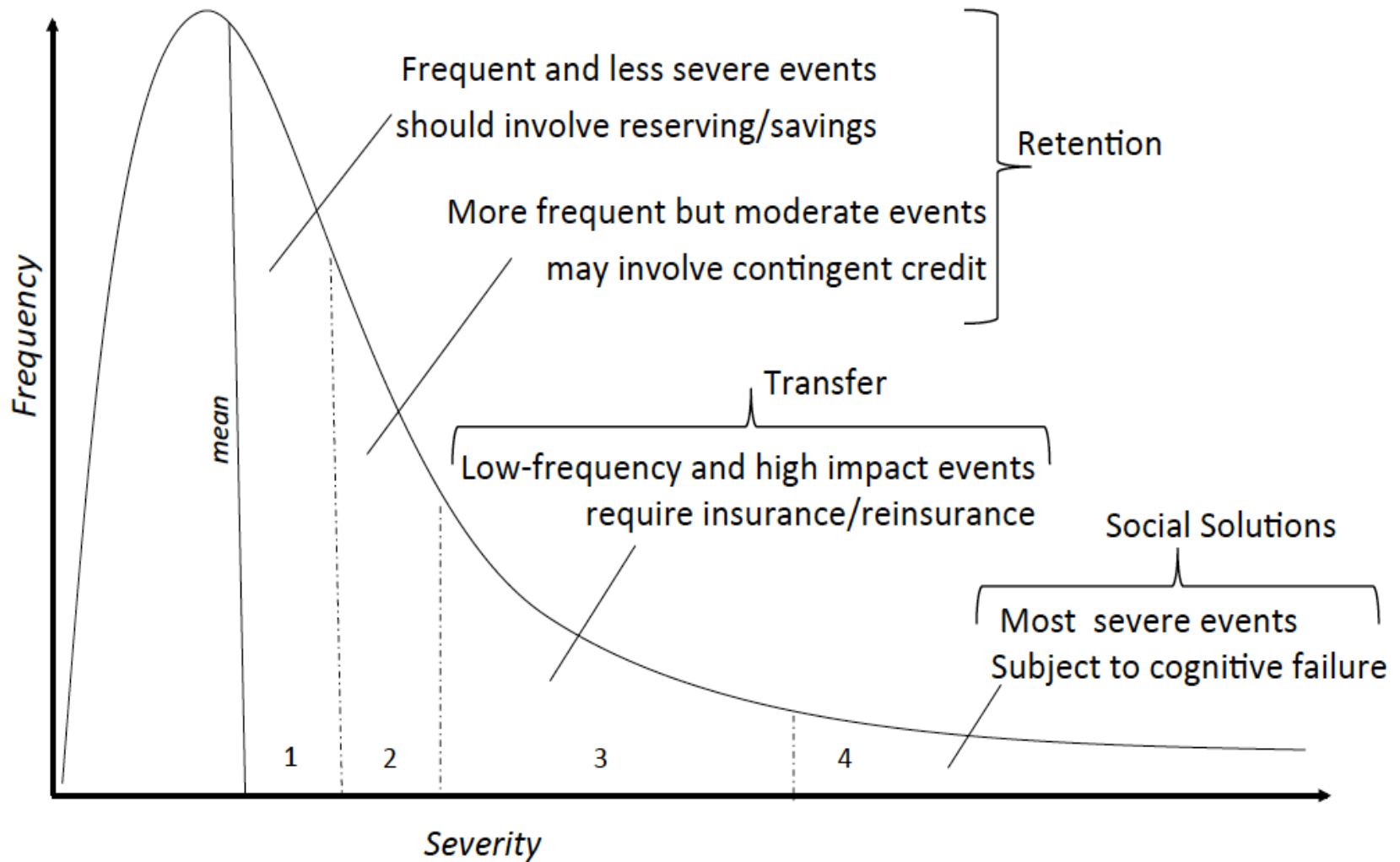
# Domain of Risk Financing for Extreme Weather in Developing Countries

| <b>Who is Vulnerable?</b>  | <b>Sample Instruments</b>  | <b>Sample of Innovative Projects</b>   |
|--|--|--|
| <b>Governments</b><br>National<br>Regional<br>Communities            | Reserve Funds<br>CAT Bonds<br>Weather Derivatives<br>Index Insurance | Mexican FONDEN<br>Caribbean Cat Risk Insurance<br>Facility (CCRIF – World Bank)<br>Pacific / Africa Food Security<br>El Niño Insurance (GIZ) |
| <b>Households</b><br>Especially the Poor                             | Traditional Insurance<br>Index Insurance                             | Malawi / Haiti Fonkoze / Ethiopia<br>HARITA/ Mongolia IBLIP / Kenya /<br>Indonesia   |
| <b>Private Companies</b><br>Agriculture, Energy,<br>Transport        | Traditional Insurance<br>Index Insurance                             | Peru Extreme El Niño Insurance<br>Private weather derivatives (BMGF,<br>GIZ)   |
| <b>Financial Institutions</b><br>MFIs, Banks, Insurance<br>Companies | Traditional Insurance<br>Index Insurance<br>Reinsurance              | Peru Extreme El Niño Insurance<br>Philippines Tropical Storm (GIZ)<br>Ghana Index Insurance (GIZ)  |

# Future innovations: Forecast Insurance

- Risk assessment that uses forecast of extreme events and more sophisticated approaches to understand risk
- The science of forecasting extreme events is improving
- Oceanic oscillations provide advanced warnings of extreme events
  - ENSO – El Niño-Southern Oscillation
  - IOD – Indian Ocean Dipole
  - NAO – North Atlantic Oscillation
  - PDO -- Pacific Decadal Oscillation
- Matching extreme events to loss and vulnerability is improving

# Basic Principles for Risk Management



## Too much focus on little risk

- Summary points
  - Far too often decision makers forget the big risk!
  - Managing smaller risk should be done with savings and credit
  - Insurance-like solutions should targeted at the BIG risk



# Innovations in Sovereign Risk Financing

- Risk pooling
- Risk layering
- Insurance and Alternative Risk Transfer solutions are being used
  - Insurance/reinsurance
  - Catastrophe bonds
  - Derivatives
- Science and parametric or index solutions are being used
  - Reduces moral hazard and adverse selection
  - Can get the liquidity into the system much faster
- Common problems
  - Capacity building
  - Proper consideration of how to use the financing
  - Basis risk
  - Legal and Regulatory System
  - Risk Aversion in the Insurance Sector

# Back to Price and Weather Volatility

- New paradigm: how to combine asset risk with asset funds that integrate a portfolio approach to manage risks of both price and extreme natural disasters and regional climate anomalies
- Drawing on regional innovations: CCRIF and ARC
  - To think how to combine risk transfer products for regional climate anomalies with strategies for either lower than expected or higher than expected prices
- Higher than expected prices are of value to producers
- Lower than expected prices are of value to consumer

# Country Level Solutions are Important but Have Limitations...

- Country-focused lending plays an important role in public good investments:
  - Financial technology transfer, links between credit organizations, market development support for different types of risk management products, etc.
  - Investments and Technical Assistance at the Country Level – Responding to Price and Weather Shocks
  - Short term solutions: ex post coping and ex ante financing are needed to manage the immediate impacts
  - Long term solutions: strategies that incorporate risk reduction and ex ante financing mechanisms to facilitate greater economic stability, resilience and adaptation.

# Caribbean Catastrophe Risk Insurance Facility

## A Regional Insurance Company Focused on Sovereign Risk

- **Type of Instrument:** Index insurance
- **Risk(s) Covered:** Earthquake and damaging wind from hurricanes
- **Beneficiaries:** Sixteen participating Caribbean nations
- **Structure:**
  - Functions as a mutual insurance company
  - Initially capitalized by the participating countries, with support from donor partners.
  - Helps Caribbean countries lower the cost of insurance by pooling their risk exposure.
  - Portion of the pooled risks is retained through reserves, which reduces the cost of insurance premiums.
  - Transfers the risks it cannot retain by purchasing reinsurance and catastrophe swaps.

# African Risk Capacity (ARC) Project

## A Regional Insurance Company Focused on Food Security

- **Type of Instrument:** Risk pooling and risk transfer through a contingency financing facility, using a layered approach
- **Risk(s) Covered:** Drought (to lower the costs of disaster response, address food insecurity, and obviate humanitarian crises)
- **Beneficiaries:** Food-insecure populations and governments via African Union (AU) member states and regional bodies
- **Structure:**
  - Envisaged as a African, stand-alone insurance company that will pool weather risk across the continent and, through aggregation, significantly reduce risk transfer and risk management costs for participants
  - Payouts will be based on transparent and objective criteria identified through a software platform, Africa RiskView (ARV), which uses satellite rainfall information to produce near real-time response cost estimates
  - The capital in the pool will be based on initial contributions from member countries and donors. Participating countries will pay an annual fee (coverage), based on their risk exposure as calculated by ARV

# Lessons Learned for a Market Oriented Pooling Facility for Markets Operating in LAC

- Is there a role for IDB to address the impact of price and natural disaster risks that threaten market stability and vulnerable populations?
- Can we draw from the Sovereign Risk Motives of the CRRIF, the social motivates of ARC, and the needs for better risk management of agriculture to create a unique insurance entity that is backed by IDB capital?
- A Multi-Country Approach – Supporting a LAC Regional Asset Management Platform (RAMP)

# Seeking Integrated Solutions that Favor Multi-Country Approaches

- A novel, integrated approach that draws on recent innovations for multilateral risk financing and risk pooling is needed
- With advances in technology and financial engineering, new opportunities are presenting themselves for IDB to contribute to, and expand, the range of financial products and services available to the developing economies of the LAC region

# Opportunities for IDB

- Create an efficient, market-based facility that manages regional risk through a variety of financial instruments
  - Using reserving for lower levels of risk
  - Access to 2<sup>nd</sup> tier contingent credit for intermediate risk
  - Opportunity for hedging global price movements
  - Risk pooling and transfer of regional climate anomalies
  - Integrate central stakeholders and develop pricing and measurement tools for extreme weather risk management and price volatility hedging
- Take advantage of opportunities for offsetting risks that affect different stakeholders in a different fashions



# Creating a Regional Asset Management Platform (RAMP)

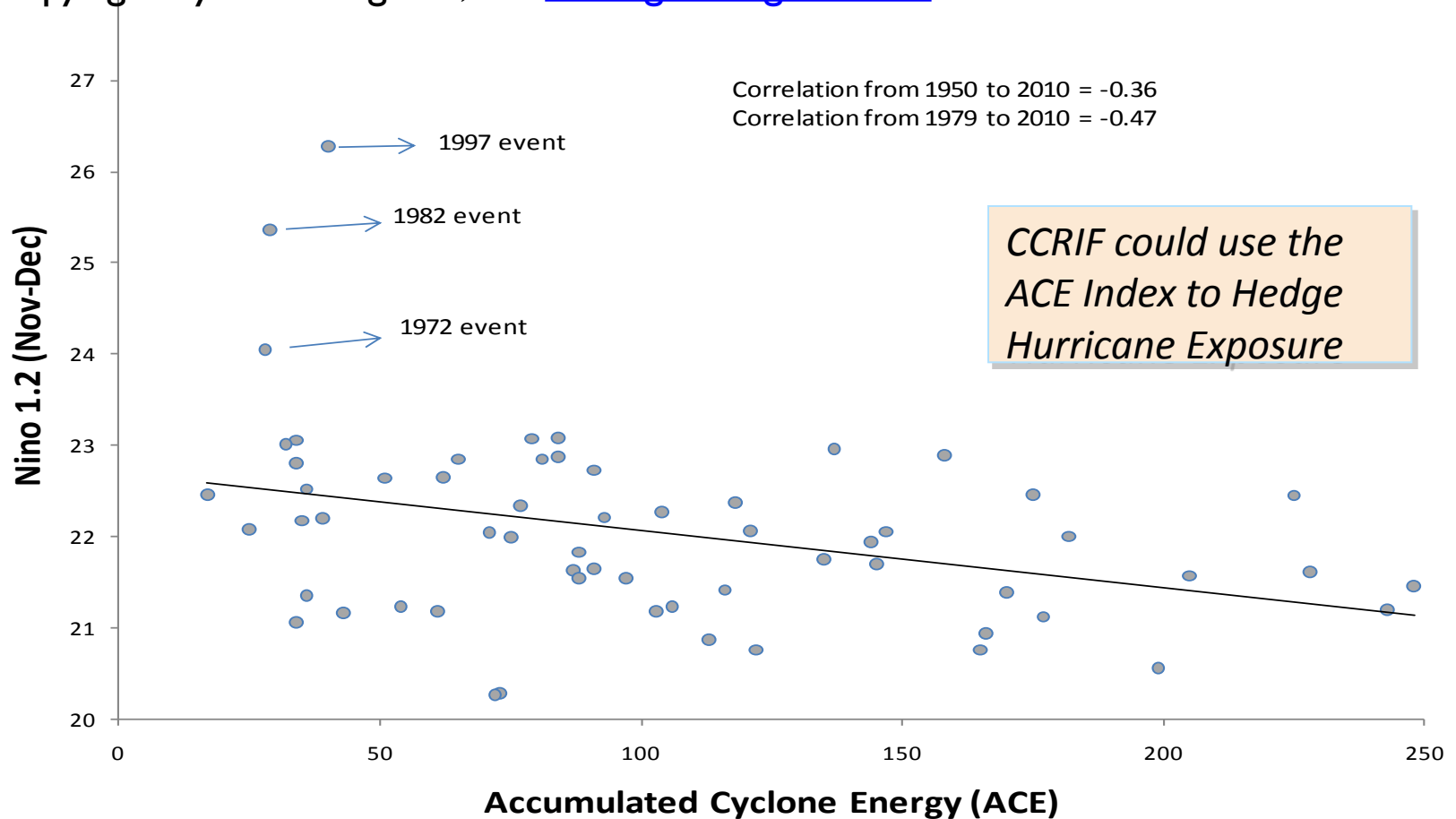
- *The importance of risk aggregation and pooling combined with the comparative advantage of IDB to mobilize capital and work in a regional context suggests a strategy to develop a multi-country approach to risk management*
- RAMP Scale Must be Sufficient to:
  - Have resources and capacity to manage a diverse portfolio of risks
  - Operate well beyond existing contingency lines or facilities like the CCRIF and ARC
  - Key instruments like loan guarantees can be leveraged more as they can be options for contingent credit rather than complete use of funds

# Example of How the IDB-RAMP May Operate

| Ramp  | Instruments  | Clients  |
|---|--|--|
| <ul style="list-style-type: none"><li>• Regional Insurance Facility</li><li>• With backing from IDB</li><li>• Linkages to Global Reinsurance</li><li>• Advanced Scientific Capabilities</li></ul> | <ul style="list-style-type: none"><li>• Derivatives</li><li>• Put and Call options</li><li>• Revenue products</li><li>• Index insurance for regional climate anomalies</li></ul> | <ul style="list-style-type: none"><li>• Commercial Banks</li><li>• Agri Lenders</li><li>• Value chain firms</li><li>• Food importers</li><li>• Food exporters</li><li>• Sovereigns for food security</li></ul> |

# Extreme El Nino Events are Negatively Correlated with Hurricanes in the Atlantic Region and the Gulf of Mexico

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NOAA develops the ACE Index to reflect the "total seasonal activity" which measures the collective intensity and duration of Atlantic named storms and hurricanes occurring during a given season. The ACE index is a wind energy index, defined as the sum of the squares of the maximum sustained surface wind speed (knots)

# Taking Advantage of Offsetting Interests to Organize, Pool, and Transfer Risk

- Potentials for natural swaps to offer greater efficiencies for protecting the positions of the key stakeholders in the region
- Example: Extreme El Niño events and extreme La Niña events are 100 percent negatively correlated. Yet, both have regional effects on crop production that create regional food security problems. Having regional forecast insurance creates more opportunities to find market solutions that work on both the price and yield risk problems in the region
- Having experts in global exchange markets work alongside climate experts to create a suite of parametric forecast-based risk transfer solutions will enhance both the price risk management and the weather risk management solutions in the region

# Challenges in Starting an IDB-RAMP

- Strong asset base to access financial markets
- Institutional structure to operate within the region and still operate within varying legal and regulatory environments in the region
- Origination professionals with strong relationships in the global capital markets and with stakeholders in the LAC countries
- Highly technical professional staff that understand global financial exchange markets and climate relationships to regional outcomes.

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