Ex Ante Financing for Disaster Risk Management and Adaptation

A Public Policy Perspective

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- **Mission**
  - *Improve access to financial services for the rural poor through innovative approaches for transferring weather risk*

- **Activities**
  - Research and development
  - Technical capacity building
  - Educational outreach

- **Supported by**
  - Multinational donors
  - Governments
  - Nongovernment organizations

- **Select Country Work**
  - Peru – El Niño
  - Mongolia – Livestock
  - Vietnam – Flood/Drought
  - India – Drought
  - Morocco – Drought
  - Mexico – Drought
  - Romania – Drought
  - Ethiopia – Drought
Economic Impact of Natural Disasters

Muestra de Pérdidas Totales Asociadas a Desastres Naturales

<table>
<thead>
<tr>
<th>País</th>
<th>Año</th>
<th>Desastre</th>
<th>Pérdida Total/PIB*</th>
<th>Emergencia/PIB**</th>
</tr>
</thead>
<tbody>
<tr>
<td>Honduras</td>
<td>1998</td>
<td>Huracán</td>
<td>38.4%</td>
<td>6.1%</td>
</tr>
<tr>
<td>República Dominicana</td>
<td>1998</td>
<td>Huracán</td>
<td>13.7%</td>
<td>2.2%</td>
</tr>
<tr>
<td>Ecuador</td>
<td>1998</td>
<td>Inundación</td>
<td>12.3%</td>
<td>2.0%</td>
</tr>
<tr>
<td>México</td>
<td>1985</td>
<td>Terremoto</td>
<td>2.1%</td>
<td>0.3%</td>
</tr>
<tr>
<td>Argentina</td>
<td>1985</td>
<td>Inundación</td>
<td>1.5%</td>
<td>0.2%</td>
</tr>
</tbody>
</table>

* Fuente: EM-DAT  
** Fuente: estimaciones propias

Fuente: Cardenas, 2009
GDP Growth Rate
One Year Before and in the Year of Natural Disaster

Source: Adapted from Cardenas, 2009
The Shock of the Natural Disaster Has a Longer-Term Effect as Well

Somebody Always Pays for Catastrophic Risk

Who? How?

Society needs to understand the cost of natural disaster risk
Someone always pays:

- The poor pay through direct losses and long term economic impacts
- Financial institutions restrict services as they learn that the correlated losses of many of their borrowers and savers create significant banking problems
- Governments—disaster relief and recovery expenses, infrastructure investments, subsidized agricultural insurance
- Donors forgive debt and divert funds for recovery

Need incentives for proper risk management and mitigation
The Poor Pay
Poverty Traps Created by Severe Events

- Rapid onset shocks can knock households below a minimum asset threshold, locking them into a poverty trap
- Households sell assets to maintain minimum levels of consumption — This in turn reduces future streams of income
- Households reduce consumption to protect assets — This can impact the human capital needed to generate future income streams
- Slow onset shocks can also result in poverty traps depending on the coping strategies available to and chosen by households
Lenders Pay


With this event every 1 in 15 years, 300 basis points must be added.
Governments Pay

- Disaster relief
- Infrastructure repairs
- Debt forgiveness
- Lost revenues
- Hinders economic growth
- Social programs for those thrust into poverty by the disaster
- Opportunity costs of diverted budget resources
Problems with *Ad Hoc* Responses to Natural Disasters

- Responses that are not planned are also not targeted to the proper groups
- Acting without a plan and under political pressure will also mean the response is done with little oversight; increasing the opportunity for corruption
- Working to deploy resources after a disaster without a plan generally involves higher administrative costs
- Putting public money into the sectors without a plan also means that there is a lower economic return from the public expenditure
More Problems with *Ad Hoc* Responses to Natural Disasters

• **Ineffective**
  • It takes too long to deliver and results in extended waiting periods for disaster victims

• **Inequitable**
  • The poorest segments of population most affected by disasters generally receive only a small fraction of the assistance

• **Insufficient**
  • Governments rarely have enough resources to help everyone in need, meaning resources are allocated on first-come-first-served basis
Why Governments Need Risk Management Strategies

- The benefits from catastrophe risk management at the country level, regionally and local can be significant
- Public financing can be improved with catastrophe risk management that uses capital and reinsurance markets
- It is possible to create strategies in the short, medium and long term that will give results in the short run
Risk Management Policy Framework

A Systematic Approach to Risk Management

1. Identify goals and priorities
2. Perform a risk assessment
3. Design a risk management strategy
4. Implement risk reduction and risk transfer
Step One
Identify Goals and Priorities

1. Identify Goals

- Who are the target beneficiaries?
- What is the intended outcome?
- What are the potential benefits of risk management?
- Identify roles for public and private sector in creating markets to aid in risk management
- Consider how to spur development
- Consider how to keep those on the margin from falling into poverty traps
Step Two
Understand the Risk Profile

1. Identify Goals

2. Perform a Risk Assessment

- Identify risks that impact livelihoods and assets
- Distinguish between micro- and macro-level risks
- Consider seasonal and geographical variations
- Model the risk with historic data and existing infrastructure to understand how the same event will impact various segments of the population
- Consider current risk-coping strategies
Step Three
Design a Risk Management Strategy

1. Identify Goals
2. Perform a Risk Assessment
3. Design a Strategy

- Plan with careful attention to needs and constraints
- Emphasize *ex ante* approaches that enhance existing risk-coping systems
- Invest in risk mitigation to lesson the impacts
- Clearly delineate public and private roles for risk mitigation, risk financing, and emergency response
- Design risk management solutions that support the financial sector and the market
- Encourage incentives for good management practices
- Decrease opportunities for fraud and abuse
Step Four
Implement the Risk Management Strategy

When implementing the use of market-based risk transfer instruments the following questions must be addressed:

- Who will use the instruments?
- Who will deliver the instruments?
- Who will underwrite the risk — who pays?
- Who will provide the expertise and expense to develop and maintain the instruments?
- Who will pay for education of potential users?
- Who will develop needed laws and regulations?
Advantages of Risk Transfer via Capital and/or Global Reinsurance Markets
(Ex Ante Risk Financing)

- Financial risk transfer provides access to global capital markets that can absorb the financial exposure of catastrophic events
- Better planning and resilience to economic impact of catastrophe: Smoothing of budgets
- Faster response to disaster
- More structured rules: reducing corruption
- Better planning for more effective, efficient and equitable responses
- Potentially better targeting
- Improved incentives for risk reduction systems
More on Advantages of *Ex Ante* Financing of Catastrophic Risk

- Financing corresponds to magnitude of loss—opportunity for better allocation of resources
- *Ex ante* financing can help households, communities, governments mitigate the financial impacts of risk and longer term impacts on development
- Can strengthen rural financial services—removes some of the risk of providing services to vulnerable populations
- Can facilitate disaster planning, risk mitigation, and strategies for adaptation
Public Policy Recommendations for *Ex Ante* Risk Financing

- National/regional budgets should plan for the contingent liabilities associated with natural disasters
- Develop plans and linkages for efficient public expenditures that flow from central government to appropriate public agencies and local and regional governments
- Promote development of insurance markets to transfer catastrophic risk and to develop new financial products
- Have professionals *inside* government who understand risk management from the public and *private* perspective
Types of Risk Financing

- **Reserves / Savings**
  - Covers low severity, high frequency events
  - Viability depends on opportunity cost of capital

- **Contingent credit**
  - Stand-by line of credit drawn down immediately after a pre-defined disaster
  - Annual commitment fee

- **Indemnity-based insurance**
  - Loss specific
  - High deductible/high administrative costs

- **Index-based insurance / Catastrophe Bonds**
  - Payments based on an index (e.g., rainfall level, hurricane intensity, area yield losses)
  - Quick disbursement
  - Lower transaction costs
  - Imperfect coverage (basis risk)

Source: Mahul, 2005
Layering the Risk
Public & Private Sector Roles

<table>
<thead>
<tr>
<th>Probability of Occurrence</th>
<th>Government Assistance</th>
</tr>
</thead>
<tbody>
<tr>
<td>100 years</td>
<td>Reinsurance/Capital Markets</td>
</tr>
<tr>
<td>20-30 years</td>
<td>Insurance</td>
</tr>
<tr>
<td>5-7 years</td>
<td>Contingent Credit</td>
</tr>
<tr>
<td>3-5 years</td>
<td>Self-retention</td>
</tr>
</tbody>
</table>

Source: Mahul, 2005
Possible Risk Financing Channels

- Int’l capital and reinsurance markets
  - Gov’t Disaster Aid
  - Domestic Insurance Companies
    - NGOs
    - Rural Banks/MFIs
  - Gov’t Reinsurance (Last resort)

Adapted from Mahul, 2005
Mexico: Natural Disaster Financing

Mexican government created a natural disaster fund “FONDEN” in 1996 to set aside designated disaster financing

However, contributions to disaster funds can be unreliable

Source: Cardenas, 2006
Mexican Experience with *Ex Ante* Financing of Natural Disaster Risk

2006: Mexican government applied blend of CAT bond and Index Insurance to finance earthquake risk

- The goal is to enhance the capacity of FONDEN, a disaster relief fund, without tying up capital
- Underwritten by Global Reinsurers
- Payments based on earthquake of 8.0 or greater on Richter scale
  - US$160 million in contingent disaster financing from CAT Bonds in one zone of Mexico
  - US$290 million in financing from index insurance in 2 other zones of Mexico

Mexico also has a FONDOS program where states (regional governments) purchase drought insurance to fund assistance for small farmers
Comprehensive Approach to Risk Management

**Risk Assessment**
*Identify risks, vulnerabilities, strategies*

**Capacity Building & Education**
*Technical and institutional capacity, risk education*

**Ex Ante Risk Management**
*Risk Financing (Insurance, Risk Transfer), Adaptation, Disaster Planning, Risk Mitigation*

**Ex Post Risk Management**
*Coping strategies, disaster relief, recovery, reconstruction*
Linking Insurance and Risk Adaptation

Combining insurance with adaptation strategies can reduce risk exposure and protect livelihoods against severe events

- Encourage risk management and appropriate adaptation
- Smooth cash flow following a disaster
- Targeted, timely payments
- Build on existing network for education and access to reduce cognitive failure and reduce transaction costs
- Stakeholders may use payouts to finance adaptation investments (e.g., infrastructure, livelihoods transitions, etc.)

*Insurance is not a solution to climate change*

- Insurance can protect against weather extremes, but adaptation is necessary to adjust to changing climate trends
Consider the Widespread Effects of El Niño in Piura

- Disruptions in major markets
  - Financial services (about 3 percentage points of interest rates tied to El Niño
  - Agricultural value chain — fertilizer sales down 27% in 1998
- Damaged infrastructure
  - Transportation sector — accounted for 59% of losses in 1998
  - Poechos Reservoir – capacity was reduced by ½ in last El Niño
- Disruptions in small trade
- Significant declines in exports
- Loss of GDP and tax base of government
- Destruction of homes and other private property
- Significant declines in the anchovy catch
- Disruptions in the livelihoods of smallholder households
Our Work in Peru

ENSO Insurance: a new Catastrophe Insurance Product that is designed to transfer extreme catastrophe risk associated with strong El Niño rainfall and flooding

- Early payments could be used to mitigate losses, encourage adaptation

- Research and feasibility work to identify how advance payments from ENSO insurance can support risk management and mitigation activities for:
  - Government agencies (disaster management & relief)
  - NGOs (household adaptation to climate change)
  - Infrastructure (mitigation measures & repairs)
  - Improve markets (value chain, micro finance, lending to agriculture, products for farmer associations and households exposed to this risk)
Thank You!

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