Pathways for Building Resilience: Some Lessons Based on Research in Natural Resources Management

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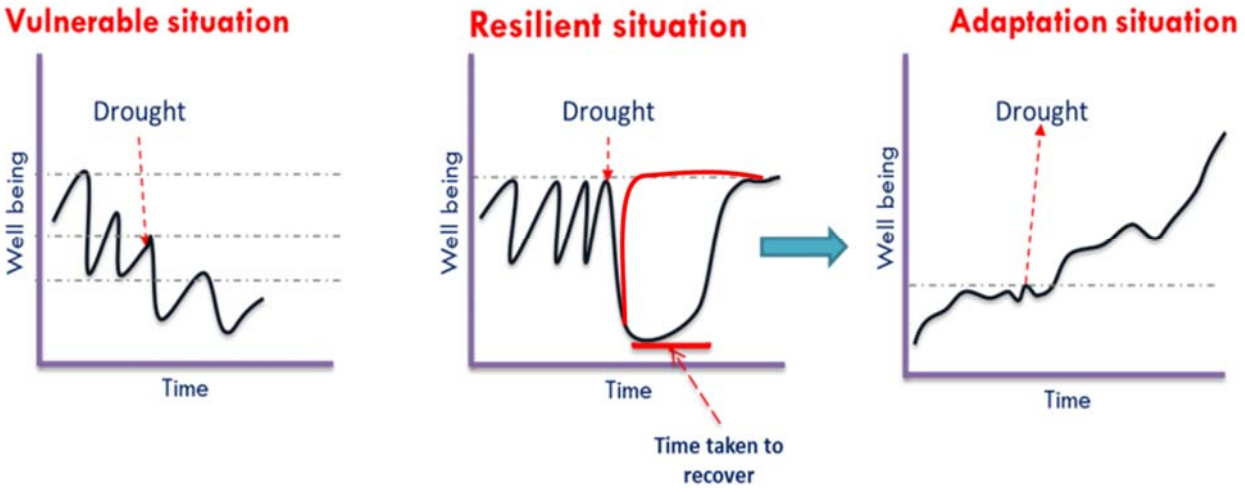
Outline

- Introduction: resilience for vulnerability and risk reduction
- Pathways to resilience
  - Integration of climate change concerns into DRR
  - Project planning based on vulnerability assessments
  - Integration of CC concerns into land use planning
  - Microfinance
  - Risk insurance
- Conclusions

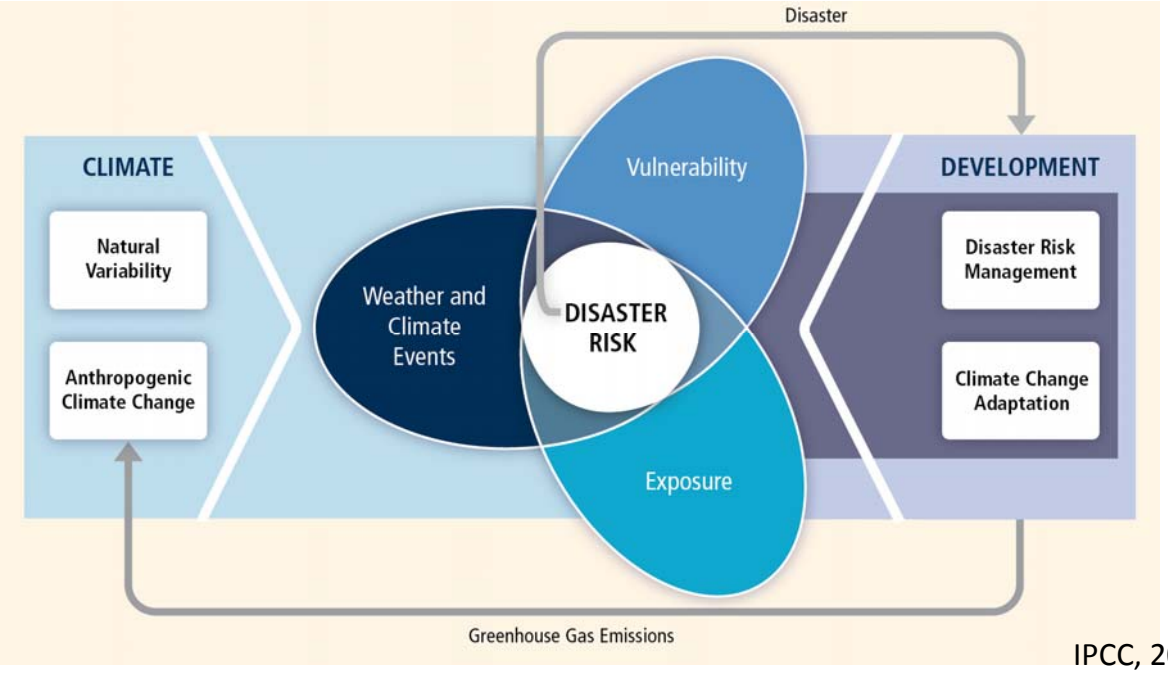
What is Resilience?



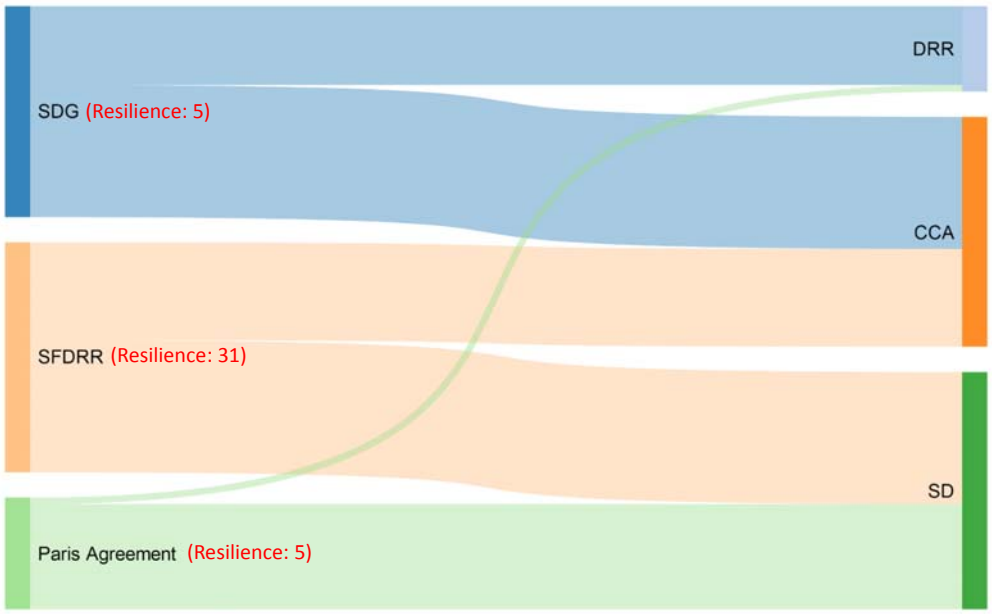
Resilience: Risk Reduction vs Vulnerability Reduction

- Reduced impacts at the same resilience level with emphasis on hazard
- Might lead to resilience building in the long-run
- Specific and works best when the risk is well quantified leaving little room for uncertainty

- Reduced impacts through possible net increase in resilience
- Immediate resilience building through addressing the underlying factors with emphasis on social and economic factors
- Broad based, robust and hence can address uncertainty better



IPCC, 2012



Synergies between SFDRR, SDGs and Paris Agreement

Pathways to Resilience

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Disaster Risk Reduction (DRR) and Climate Change Adaptation (CCA) Integration

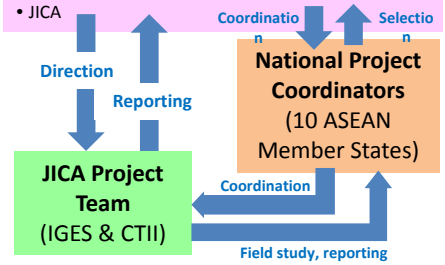
OBJECTIVES:
Foster the **integration of DRR and CCA at all levels** by sharing information, knowledge and good practices in ASEAN Member States.

Targeted Disasters:
- Storm and flood
- Rain induced landslide
- Drought




Management Arrangements

Project Steering Committee
- ACDM Working Group on Prevention and Mitigation, Co-chairs [Lao PDR & Thailand]
- Disaster Management and Humanitarian Assistance Division, ASEAN Secretariat
- ASEAN Coordinating Centre for Humanitarian Assistance (AHA Centre) *(observatory status)*
- JICA



Main Events and Reporting

2nd S/C	**27 July 2016, Bangkok**	**[Inception Report]**
1st Field Study	1-12 Aug, Thailand; 15-26 Aug, Lao PDR	
2nd Field Study	19-30 Sep, Myanmar; 3-14 Oct, Cambodia *(tentative; same below)*	
3rd Field Study	14-25 Nov, Vietnam; 28 Nov - 6 Dec, Malaysia; 7-9 Dec, Singapore	
4th Field Study	9-20 Jan, the Philippines; 23 Jan – 3 Feb, Indonesia; 6-8 Feb, Brunei	
3rd S/C	**1 March 2017, Bangkok**	**[Progress Report]**
National WS 1	May 2017, Nay Pyi Taw, Myanmar	
National WS 2	July 2017, Hanoi, Viet Nam	
National WS 3	July 2017, Manila, the Philippines	
Regional Forum	Sep 2017, Bangkok, Thailand (Preparatory meeting of SOLF)	
High-Level Forum	Nov 2017, Jakarta, Indonesia *(t.b.c.)*	
4th S/C	**Dec 2017, Jakarta?**	**[Draft Final Report]**

IGES

Framework of DRR and CCA integration

Category 4 | SFDRR* Priority 1

Disaster risk assessment

- Disaster data management (analysis of hazard characteristic)
- Assessment of exposure, capacity and vulnerability
- Hazard and risk mapping
- Data sharing and dissemination
- Disaster risk communication and early warning

Climate impact analysis

- Hydro-meteorological data monitoring and projection
- Downscaling from GCMs

Category 5 | SFDRR Priority 3&4

Planning and implementation

Incorporation of climate risk

- Guideline and standard (for structural and non-structural measures)
- Justification of investment (cost-benefit analysis; Build Back Better)
- Evaluation of ecosystem services and environmental functions (Eco-DRR)
- Revision of land-use and urban plans
- Water resources management and river basin management

Category 6: **Capacity Building**

Monitoring and evaluation

Integration with climate policies and funding

Category 1, 2 & 3 | SFDRR Priority 2

Institutional arrangement

- Laws, regulations and policies
- Institutional setup (inter-agency, inter-state/municipality and national-subnational coordination mechanism)
- Funding

Assessment Categories: 1-6 (JICA Project Team)

* SFDRR: Sendai Framework for Disaster Risk Reduction 2015-2030

Project Design Based on Vulnerability and Capacity Assessments

Overview

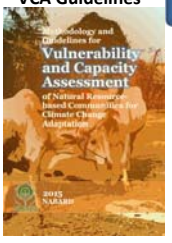
- NABARD is the National Implementation Entities (NIE) for Adaptation Fund Board-funded projects in India, the first NIA to be approved by AFB in Asia-Pacific region.
- NABARD has submitted several project proposals to AFB out of which 6 projects and 1 readiness grants were approved by AFB.
- Estimated total beneficiaries: 1.2 million

AFB funded projects in India

Vulnerability and Capacity Assessment

- AFB guidelines prerequisites assessing the vulnerabilities and capacities of communities for setting the baseline and for assessing the progress of the project implementation.
- IGES is helping NABARD to develop a vulnerability and capacity assessment methodology, in the form of an index called the **Vulnerability and Capacity Assessment Index** (VCAI) and related **Guidelines** for the executing entities to use before and during the implementation of adaptation projects in India.

VCA Guidelines



Approach

Consultation with NABARD on VCA requirements

Review of research and implementation literature for VCA methodologies

Consultations with communities, executing entities and NABARD

Development of methodological framework and set of VCA indicators

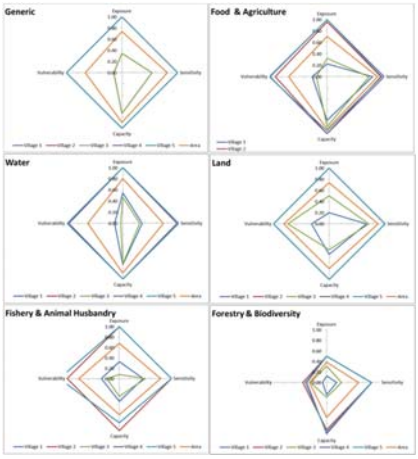
Consultation, review and finalization of methodology and guidelines

Vulnerability and Capacity Assessment Index

VCAI is a comprehensive Excel-based tool comprising of project management module, exposure module, sensitivity and capacity modules.

All are quantitative indicators with a function to normalize the data to generate an index.

Provides the EEs and NIEs to monitor project performance with quarterly and half-yearly reports.

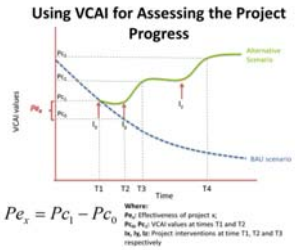


- The Excel tool generates easy-to-comprehend spider diagrams comparing different villages, sectors and overall condition.

Number of sectors and indicators

Sector/Category	Current No of Indicators in VCAI
Generic	64 (38)
Food and Agriculture	21
Water	24 (21)
Land	15 (13)
Fisheries and Animal Husbandry	15 (13)
Biodiversity and Ecosystem Services	26

- The project progress in achieving adaptive capacity is assessed by comparing the VCAI values against the base value.



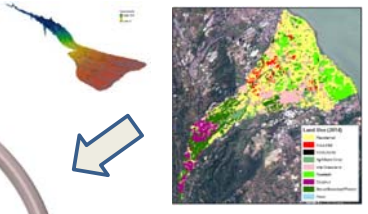
$$Pe_T = Pc_1 - Pc_0$$

Vulnerability Assessments Using Downscaled Climate Information

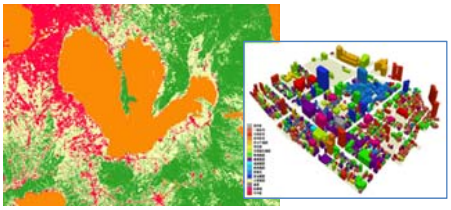
Project	Downscaled climate info needs	Purpose
Climate proofing of watershed development projects (Tamil Nadu and Rajasthan)	•Projected rainfall •Projected surface runoff •Projected temperature	•Water scarcity, crop planning •Crop insurance •Soil erosion, water table, soil water conservation practices •Impact on agro-forestry
Climate smart actions and strategies for sustainable livelihoods of agriculture (northwestern Himalayan)	•Projected extreme rainfall events •Change in rainfall patterns •Projected temperature	•Surface runoff •Impacts on fodder species •Impact on local biodiversity
Enhancing adaptive capacity and increasing resilience of small and marginal farmers (West Bengal)	•Projected rainfall •Projected surface runoff	•Implications of climate change on local weather forecast •Projected impacts on agro-forestry species
Conservation and management of coastal resources as a potential adaptation strategy for sea level rise (Andhra Pradesh)	•Projected sea level rise •Projected temperature •Projected rainfall	•Sea level rise impact on mangroves •Identify mitigation strategies for saline-water intrusion
Building adaptive capacities of small inland fishermen community (Madhya Pradesh)	•Projected rainfall •Projected temperature	•Impact on inland fisheries

Climate Sensitive Land Use Planning in the Philippines

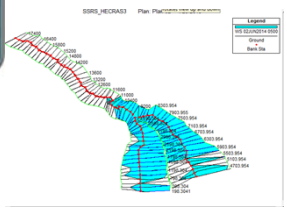
Participatory mapping



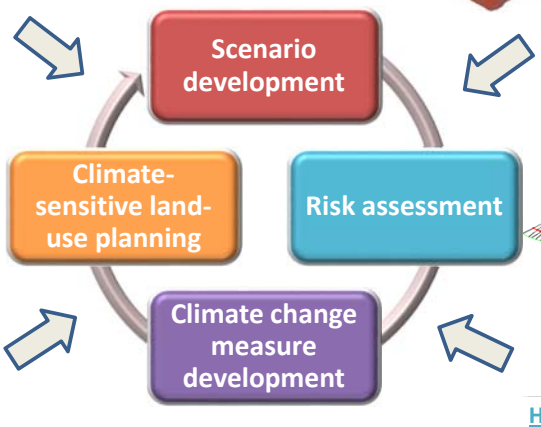
GIS / remote sensing



Land-use model & damage assessment

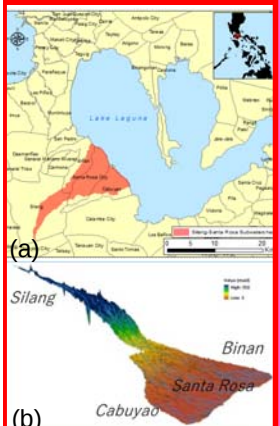


Hydrological modeling



Participatory management approach to improve land-use at watershed level to mitigate development and climate risks (e.g. floods, landslides)

SCENARIO & RISK ANALYSIS



Silang-Santa Rosa Subwatershed, Philippines
Area shaded in red (a), topography (b)

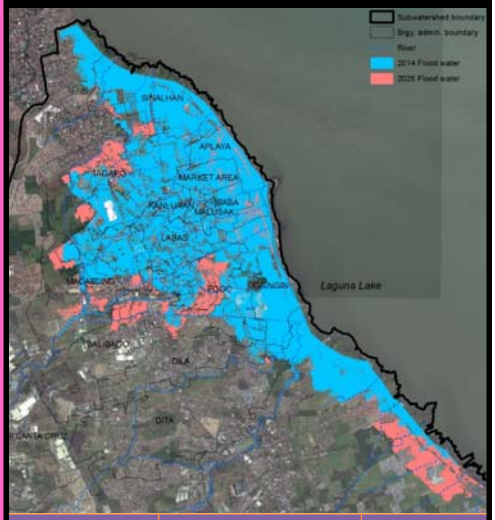
Study site

Future BAU scenario (2025)
Simulation using 10 min. time step

Rainfall: Typhoon Ofel
(Int. Name: Son-Tinh) Oct. 25, 2012
Duration: 12 hours
Amount: 224.4 mm
Intensity: 18.67 mm/hr
Collected using Tipping Bucket Rain Gauge installed in Silang, Cavite (Upstream)

10 year Rain Return Period *Based on Ambulong Station RIDF (Rainfall Intensity-Duration Frequency Curve) which has a 54 years record. Prepared by Hydrometeorological Data Application Section (HMDAS).*

Current vs Future



	Area (Hectares)	% increase
Current 2014	969.83	
Future 2025	1,180.12	21.68
Difference	210.29	

Climate change measures

1. Zoning enhancement To avoid and alleviate climate impact, and to sequestrate carbon dioxide	2. River rehabilitation To increase water retaining capacity
● Enforce development controls in areas highly susceptible to flooding. ● Strengthen building codes in high-risk areas (e.g. floodwalls, elevated flooring). ● Devise a relocation plan for informal settlers residing in flood-prone areas. ● Mandate runoff mitigation measures (e.g. tree planting, water-permeable paving) where development/land-conversion is made. ● Improve enforcement of zoning ordinances. ● Harmonize land-use among local governments to manage the river basin as a whole.	● All areas ➢ Regular river cleanup ● Upstream area ➢ Protection and improvement through replanting of endemic and indigenous plant species ● Midstream area ➢ Rehabilitation of easement and riverbanks ➢ Construction of slope protection along riverbanks ● Downstream area ➢ Dredging of sediments ➢ Solid and liquid waste management ➢ Planting of endemic and indigenous plant species ➢ Improvement of drainage
3. Capacity development **To build and strengthen the ability of local government to design and implement climate actions**	
● Needs assessments on climate change adaptation and mitigation and disaster preparedness and management ● Development of campaign materials and training modules ● Conduct of trainings and events to increase awareness and preparedness	

Microfinance for Resilience

What is financial inclusion?

- Financial services that are made accessible to poor households and tailored to their needs.

Why Financial Inclusion?

- Access to financial services can help poor households:
  - Manage their finances better, invest in more productive livelihood activities, and accumulate savings.
  - Prepare for and cope with risks associated with climate change, including extreme weather events

Livelihood activities supported with microfinance in Southwest Bangladesh

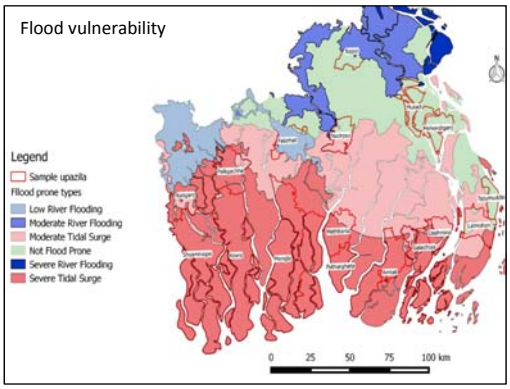
Resilience Evidence of Microfinance in RCTs

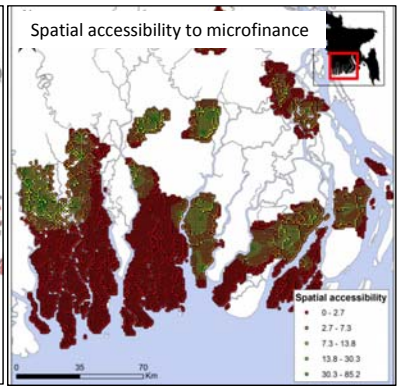
Microcredit cases	Impact of financial inclusion		
	Increased	Decreased	No evidence/impact
Savings and borrowings, Uganda	•Borrowing •Savings		
Microcredit program, India	•Borrowing •Investments in existing businesses •Profits of pre-existing businesses •Business expansion	•	•Consumption •Health •Education •Women's empowerment •Poverty •Business profits
Microcredit program, Mexico	•Borrowing •Investments in existing businesses •Business expansion •Trust •Female decision making	•Fire sales •Depression	•Micro-entrepreneurship, •Income •Labor supply •Expenditures •Social status •Subjective well-being
Seasonally adjusted microcredit, Bangladesh	•Food consumption during lean season	•	•Repayment frequency •Default •Food consumption (during intervention)

Physical Access to Microfinance Services is Crucial!

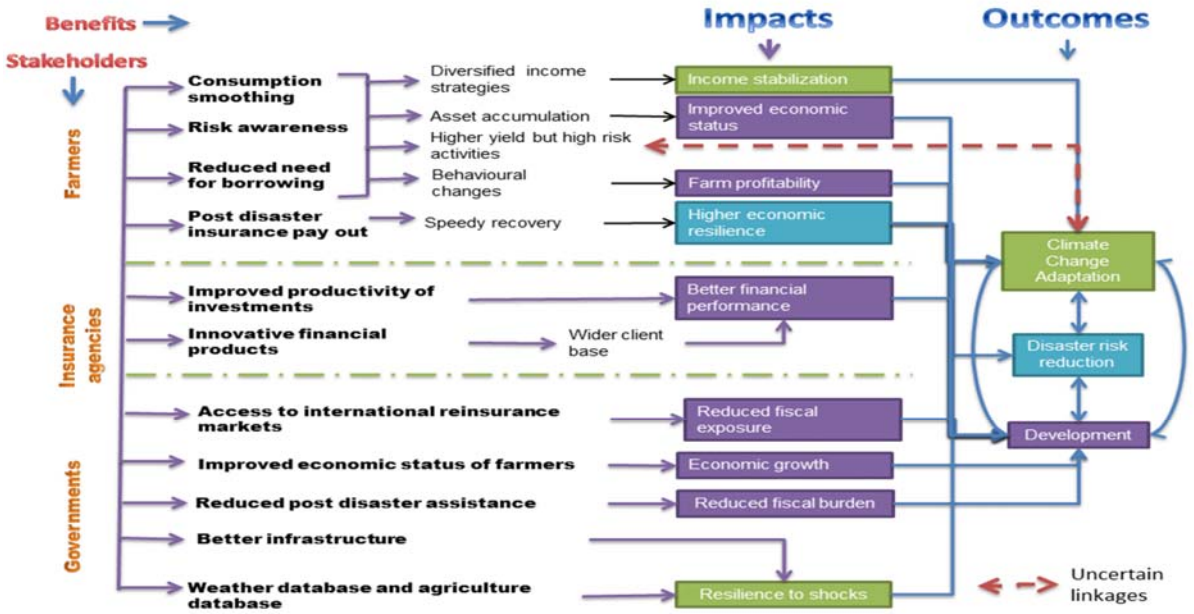
1. Assessing physical access to MF services

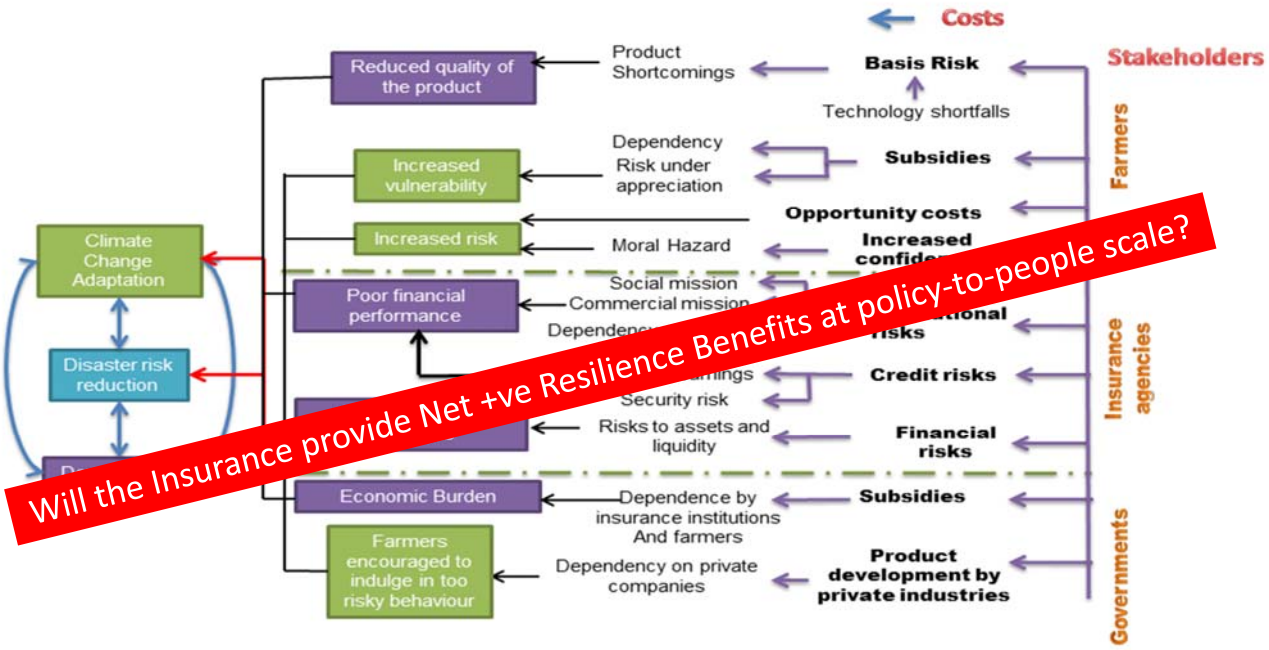
- Survey of 2,250 households in Southwestern region of Bangladesh using econometric techniques to understand importance of financial services for household resilience and wellbeing.
- Stocktaking analysis of financial health of 20 microfinance institutions operating in vulnerable areas
- GIS to investigate spatial accessibility of branches in Southwest region
  - **Lower accessibility to microfinance in areas with higher flood vulnerability**





Resilience Benefits of Risk Insurance





Conclusions

- There are several pathways to achieve resilience leading to vulnerability and or risk reduction
- Which resilience approach to be employed where depends on the location-specific conditions and the characteristics of the target communities
- There is a growing recognition for integrated approaches while their implementation on the ground is still a challenge
- User-friendly and practitioner-oriented decision support tools are necessary for efficiency and effectiveness

Thank You!

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