INSURANCE EFFECTIVENESS FOR DRR AND CCA

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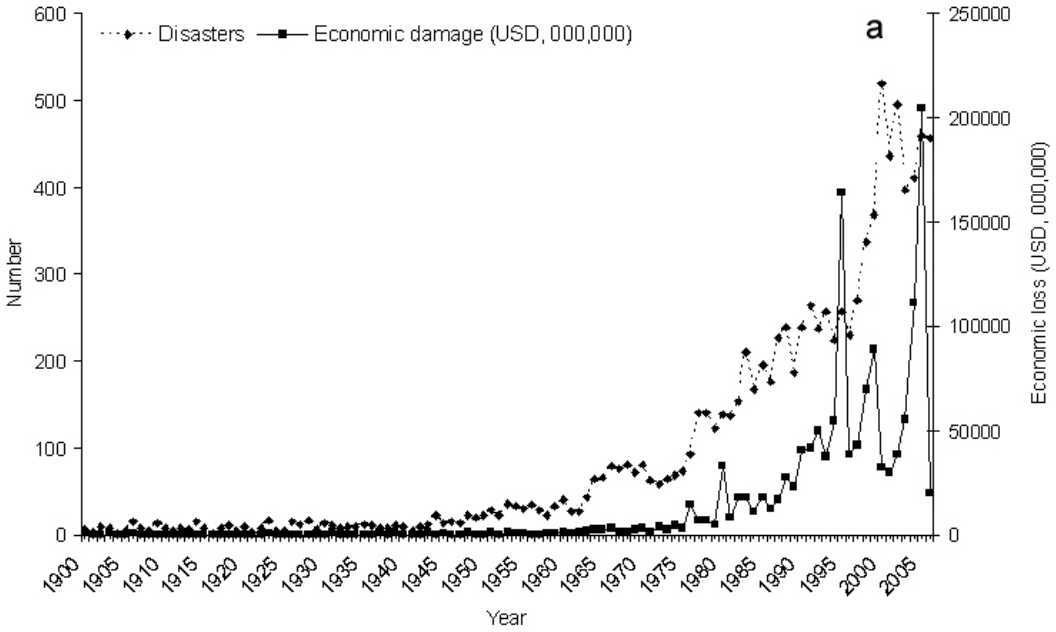
Today's Thought Plan

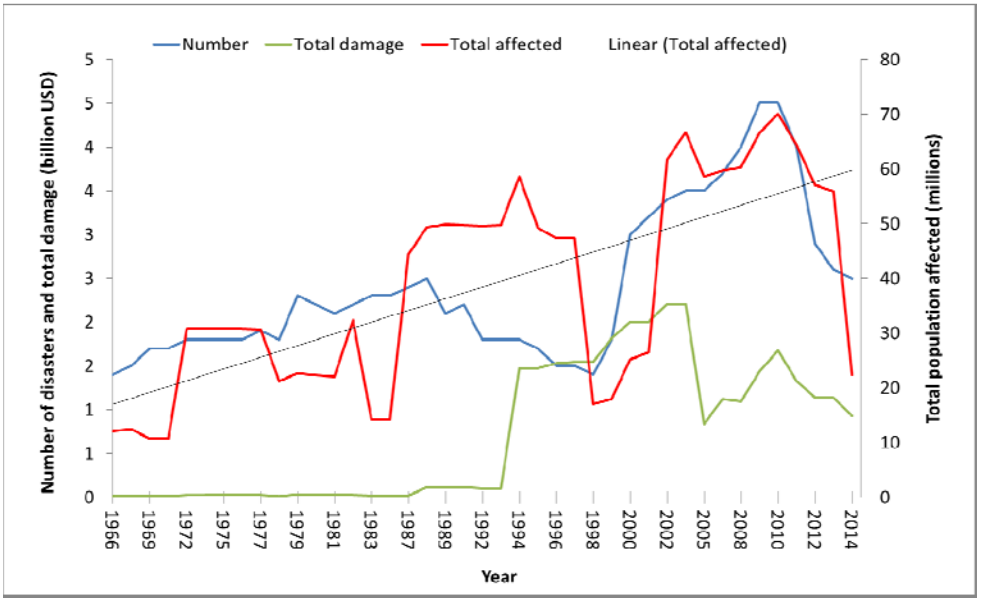
- Agricultural production risks are growing and buffering of resultant financial shocks is important
- Risk insurance can be promising but is facing important limitations in scaling up
- There are ways of addressing these limitations that could leapfrog adoption of insurance

Understanding Disaster Trends



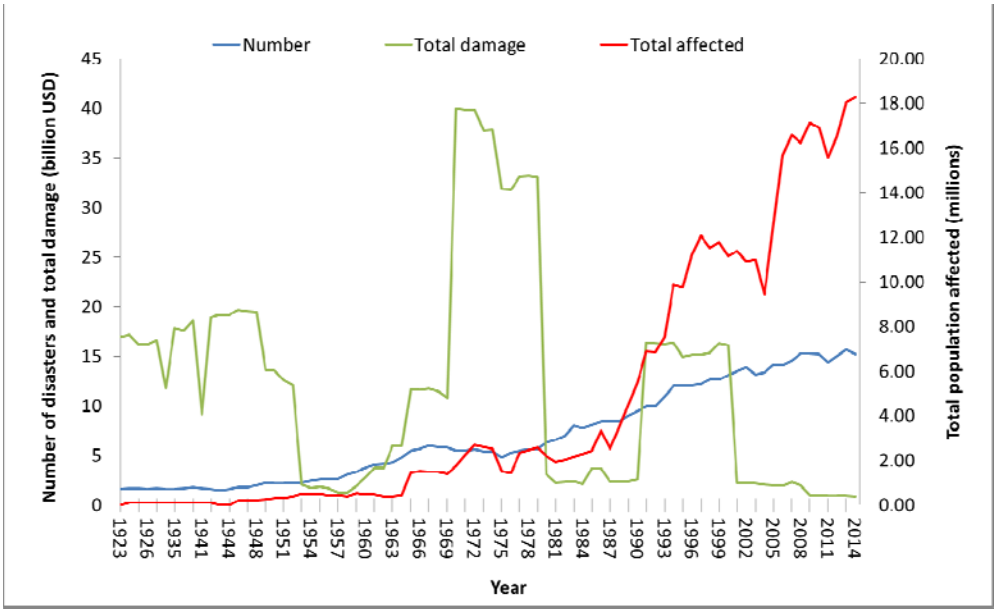
Global: Number of disasters and economic damage (Prabhakar et al., 2009)

Understanding Disaster Trends



Asia: 10-year moving average of number of droughts and related losses (data from EM-DAT, 2015)

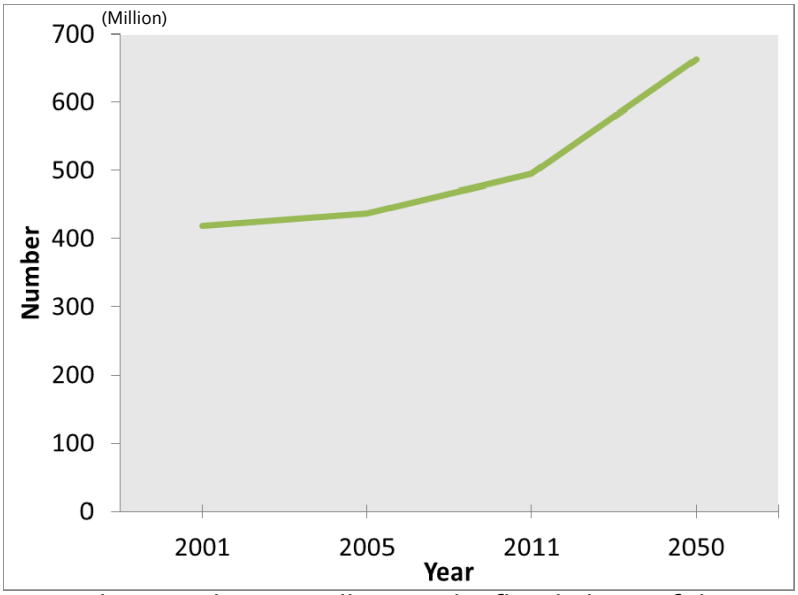
Understanding Disaster Trends



Asia: 10-year moving average of number of storms and related losses (data from EM-DAT, 2015)

Reasons behind increasing trends:

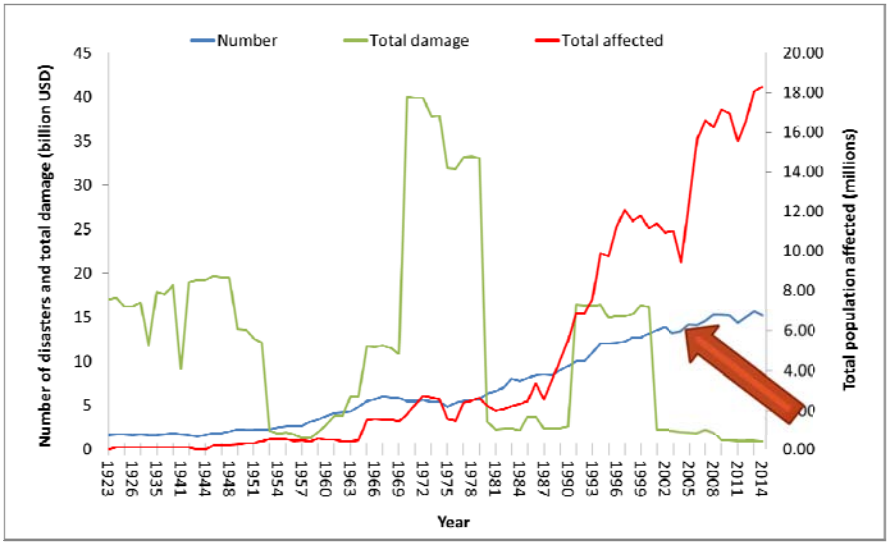
- Increasing population in vulnerable areas including in river flood plains



India: Population (million) in the flood plains of the Ganges basin (2050 figures are projections)

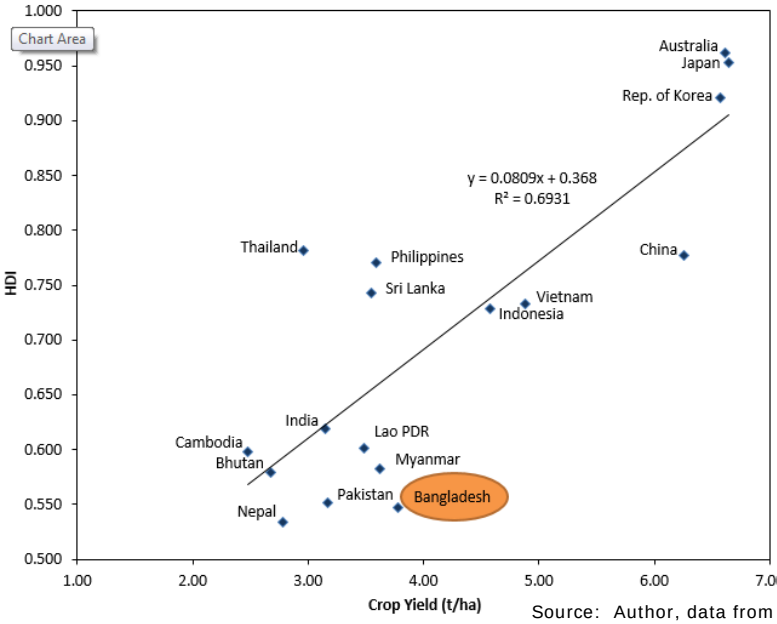
Reasons behind increasing trends:

- Increasing number of natural hazards (climate change?)
- Increased reporting of natural disasters
- A combination of all the above



Asia: Trend in the number of reported storms (EM-DAT, 2015)

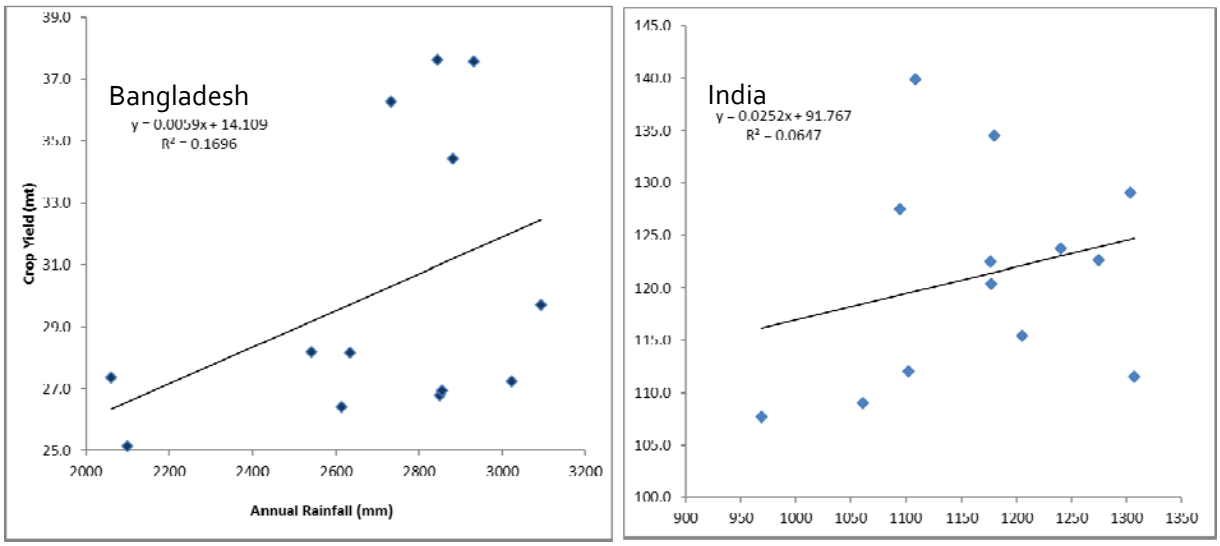
Agriculture Production and Human Development are Highly Related



- Agriculture can provide the most cost effective means of bringing people out of poverty (World Bank)
- This is more so in LDCs where the agriculture and development are strongly correlated than the developing and large economies

Source: Author, data from FAOSTAT and WB

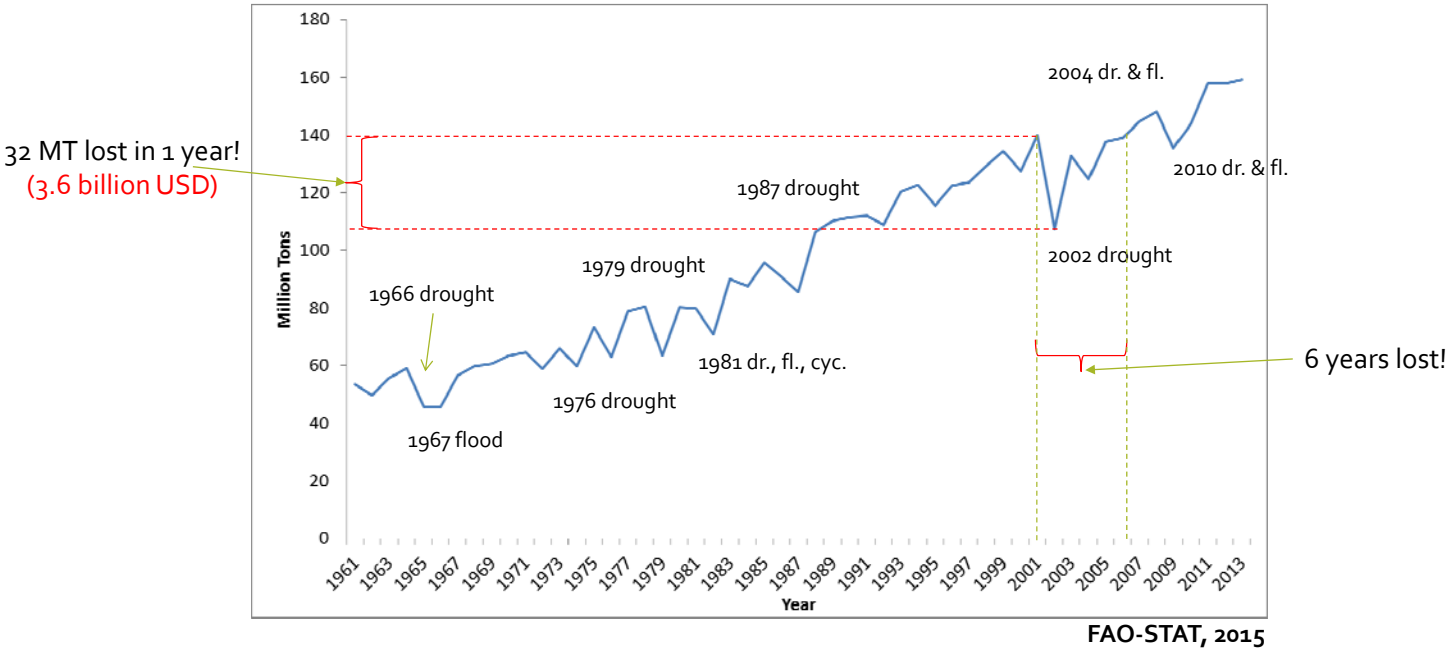
Weather and Wealth are Related?



The case of crop production and weather (annual rainfall) in Bangladesh and India

Source: Author, data from FAOSTAT

Climate Impacts Crop Production: Paddy in India



FAO-STAT, 2015

Agriculture being primary input provider, such a shock will have rippling effects on the entire economy!

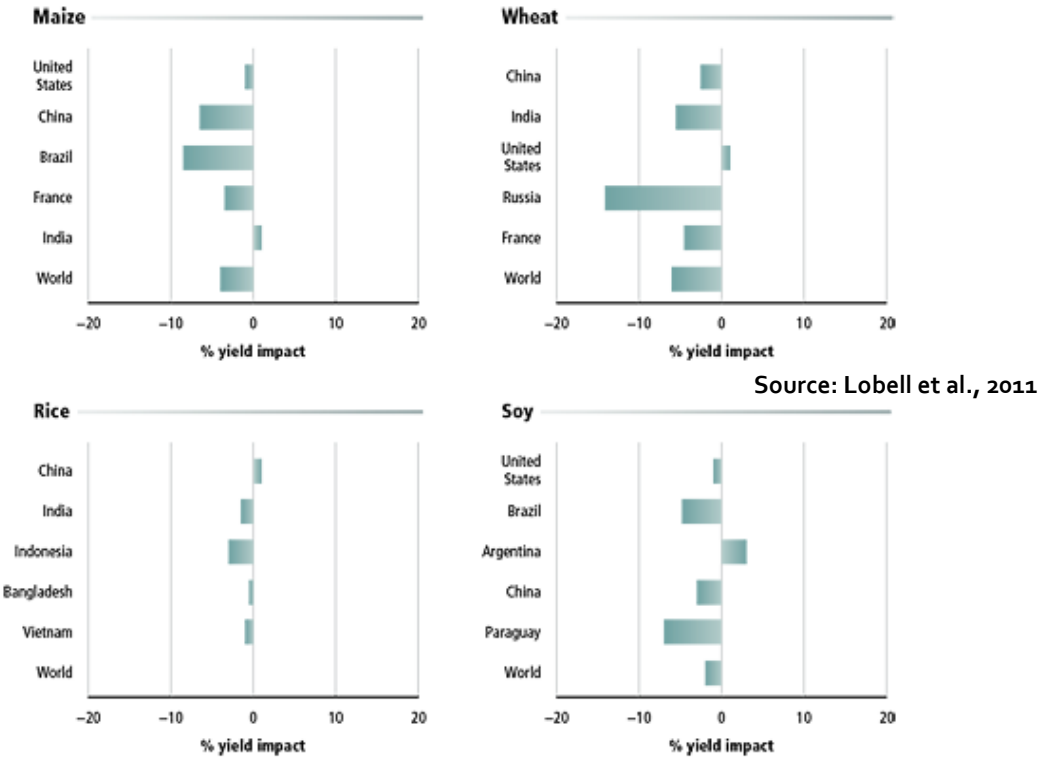
Impact on Farm Income: Impact of 2010 Drought on NPAs of Banks in India

- Increase in farm loan defaults (figure on the right).
- Increased burden on government: farm loan waivers to the tune of **14.4 billion US$ in 2008** by GOI, in comparison GOI spent only **~163 million USD on insurance in 2008**.

Agriculture NPAs in PSL, India

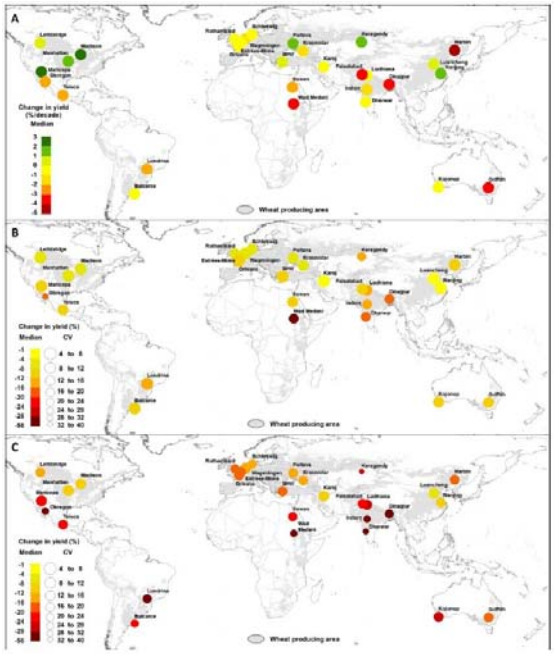
Source: RBI, 2014

Estimated net impact of climate trends for 1980–2008



Source: Lobell et al., 2011

Global Yield Trends and Climate



"…warming is already slowing yield gains at a majority of wheat-growing locations. Global wheat production is estimated to fall by 6% for each °C of further temperature increase and become more variable over space and time".

Source: Asseng et al., 2015

Shift towards Better Risk Management!

- There is a need for shift from ex-post relief oriented approaches to ex-ante risk mitigation and risk management approaches.

Types of Risks Faced by Farmers: Idiosyncratic Risks

- Shocks that are specific to individual farm contexts and vulnerabilities
- Can be mitigated by diversification of income sources
- Are easy to cover by insurance as they are not correlated with circumstances out of the control of the actors in question
- Risk of investing in such insurance is minimal for insurance companies

Covariate Risks

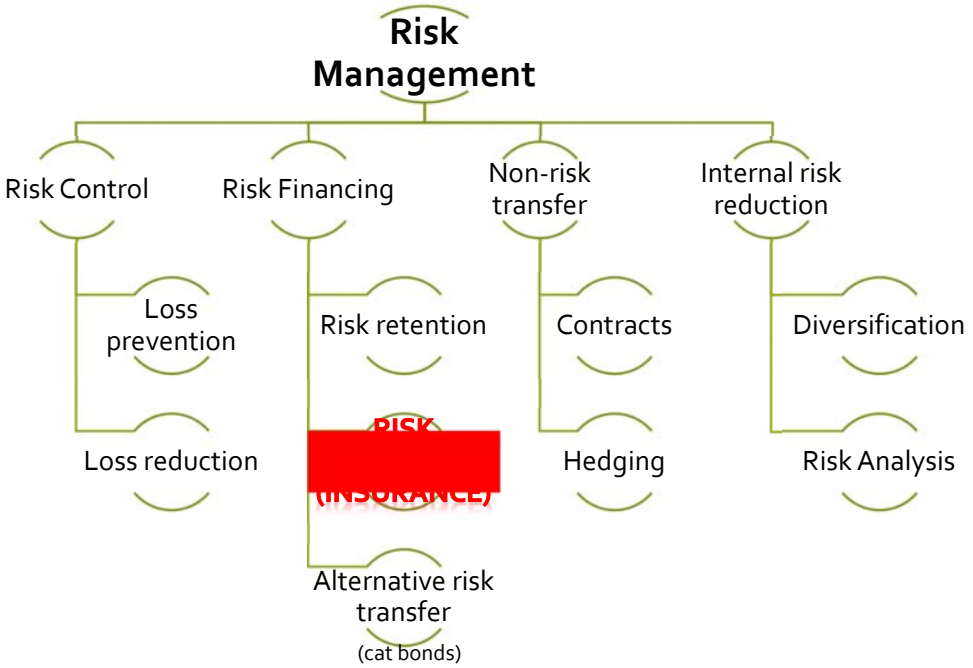
- Risks that have massive impact and are often out of the hands of the actors in question. E.g. constant natural disasters leading to erosion of mutual support systems in the society.
- Often covered by government safety nets.
- Difficult to insure and often associated with high insurance costs and losses

Examples of Risks

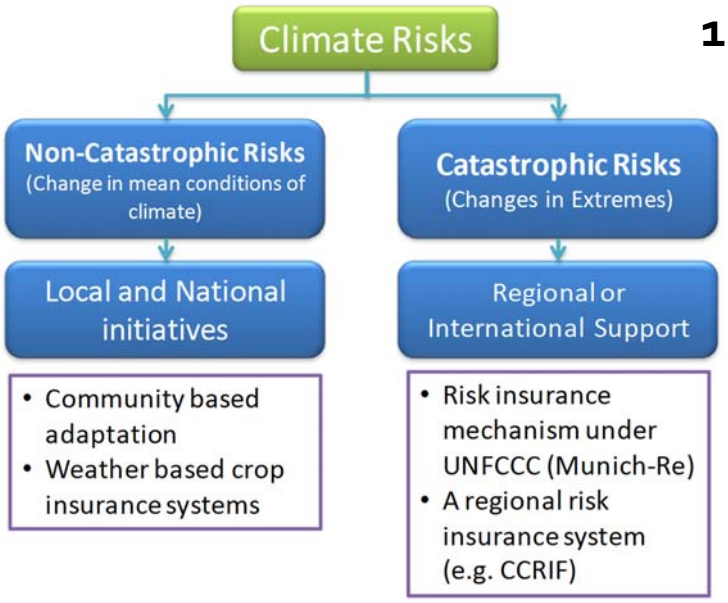
Idiosyncratic risks		Covariate risks
Income risks	High cost of inputs	Droughts
	Reduction of profits	Floods
	Loss of employment	High temperature shocks
Asset risks	Theft	Low temperature shocks
	Death of animals	Forest fires
	Breakdown of equipment	Disease and pest outbreak
	Fire outbreak	Labor shortage
Health risks	Ill health	Market fluctuations

Source: Adepoju et al., 2013

Risk Management Techniques

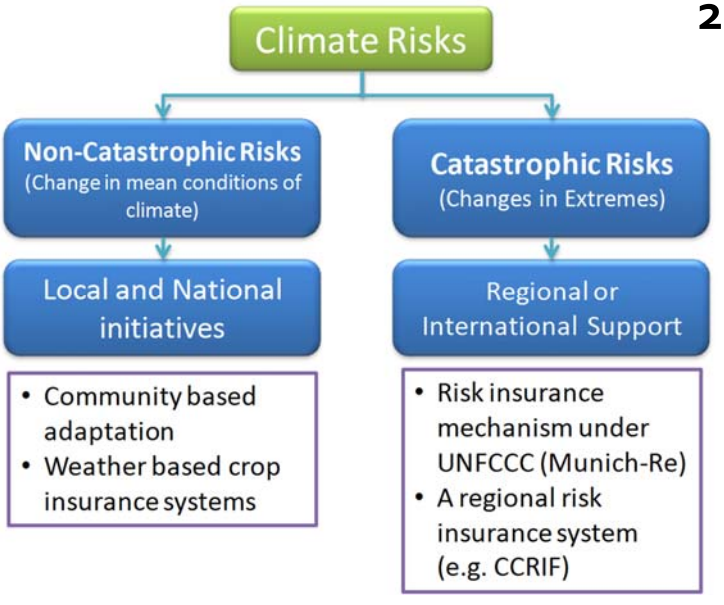


A two-pronged approach for covariate and idiosyncratic shocks



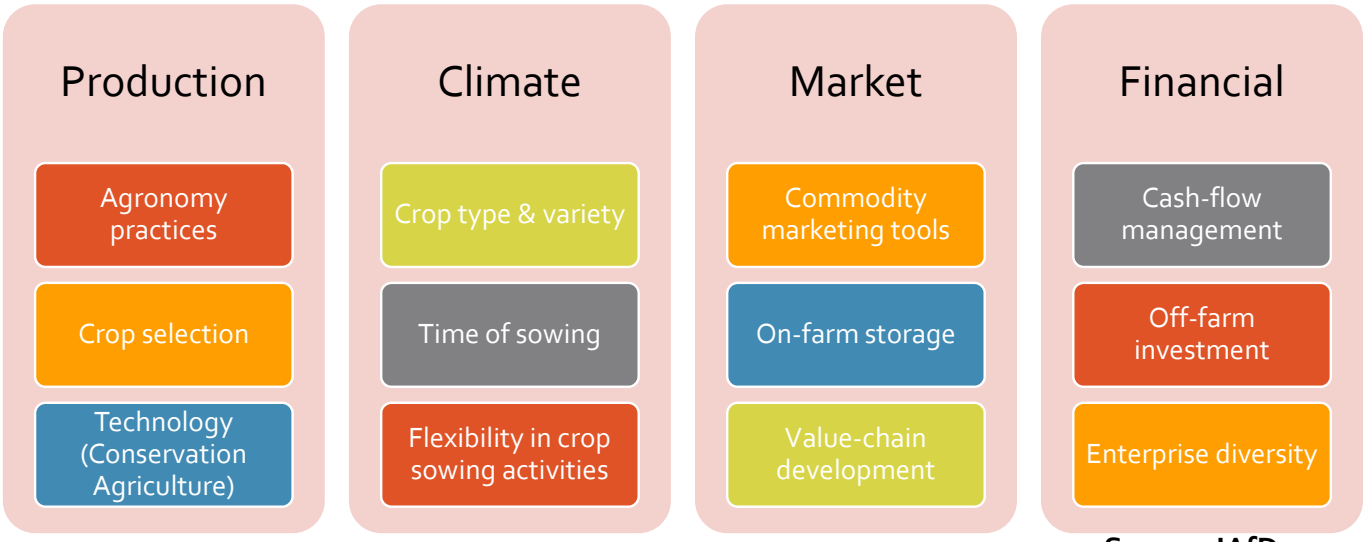
1. **Non-catastrophic risks: Risks from change of mean state of climate**
   a. Within the capacity of national systems
   b. Local knowledge is useful
      E.g. Community based adaptation, weather based crop insurance schemes etc.

A two-pronged approach for covariate and idiosyncratic shocks



2. **Catastrophic risks: Risks from changes in extremes**
   a. Need external assistance in terms of finances and experiences
   b. Local knowledge often fall short
   c. e.g. Global and regional catastrophic risk insurance schemes, adaptation networks

Risks and Management Strategies in Agriculture

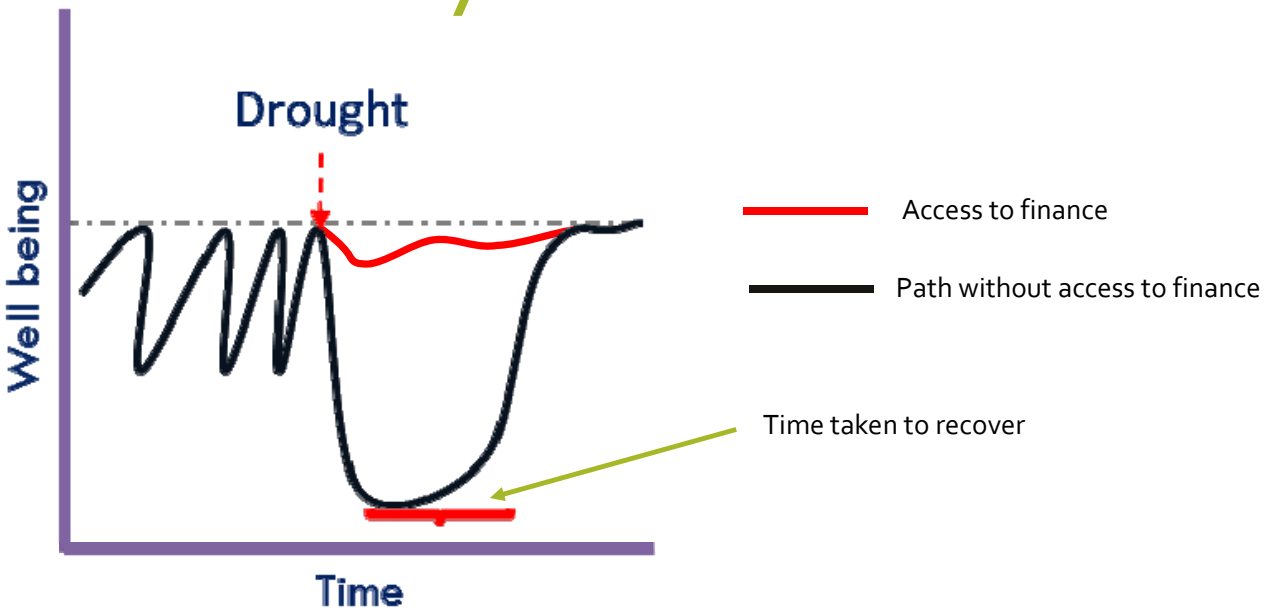


Source: IAfD, 2014

There are Buffers to Impacts but not Without Limitations

Means	Limitations
Better crop varieties	Often costly, spurious seeds, IPR and need to buy every year
Loan waivers	Costly on national budget, political influence, no-proper scrutiny of loss differentiation, mostly rich gets benefited and corruption
Expand irrigation facilities	High investment costs, declining rainfall and increasing rainfall variation may not buffer especially for the tail-end farmers
Livelihood diversification	Poor rural economy with low demand especially during drought and flood times; may promote migration
Input subsidies	Often rich gets benefited; high cost to the government; not useful when conditions are not congenial for cropping

Importance of Access to Finances Immediately After Natural Disasters



Risk Insurance: Several Expected Benefits

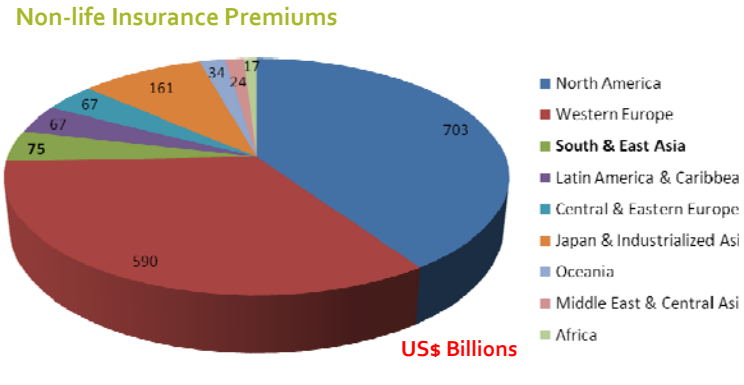
- **In agriculture sector, primarily introduced as a means of buffering economic shocks from natural hazards**
- If designed well, insurance can provide several benefits
  - Emphasis on **risk mitigation** compared to response
  - Provides a **cost-effective** way of coping financial impacts
  - Covers the **residual risks** uncovered by other risk mitigation mechanisms
  - Provides opportunities for **public-private partnerships**
  - Helps communities and individuals to **quickly renew and restore the livelihood** activity
  - Depending on the way the insurance is designed, the insurance mechanism can **address a variety of risks** of climatic and non-climatic nature
  - **Reduced burden on government**

Source: Arnold, 2008; Siamwalla and Valdes, 1986; Swiss Re, 2010

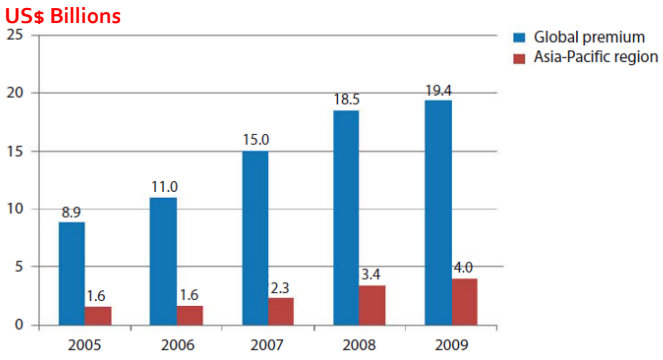
Insurance has been proposed as a means of adapting to climate change

- Cook Islands: 'International insurance mechanism'
  - Collective loss sharing mechanism
  - Payouts from internationally agreed triggers
  - Subsidy elements to maintain fund as a compensation for unavoidable impacts
  - To fund risk reduction initiatives
- Munich CII
  - Prevention pillar
    - Risk reduction through activities
  - Insurance pillar
    - Tier I (climate insurance pool): High level risk in non-Annex I countries
    - Tier II: Medium level risk through public safety nets and PP insurance solutions

Current Insurance Coverage



Source: Swiss Re, 2012



Source: Global Premiums Iturrioz,2010

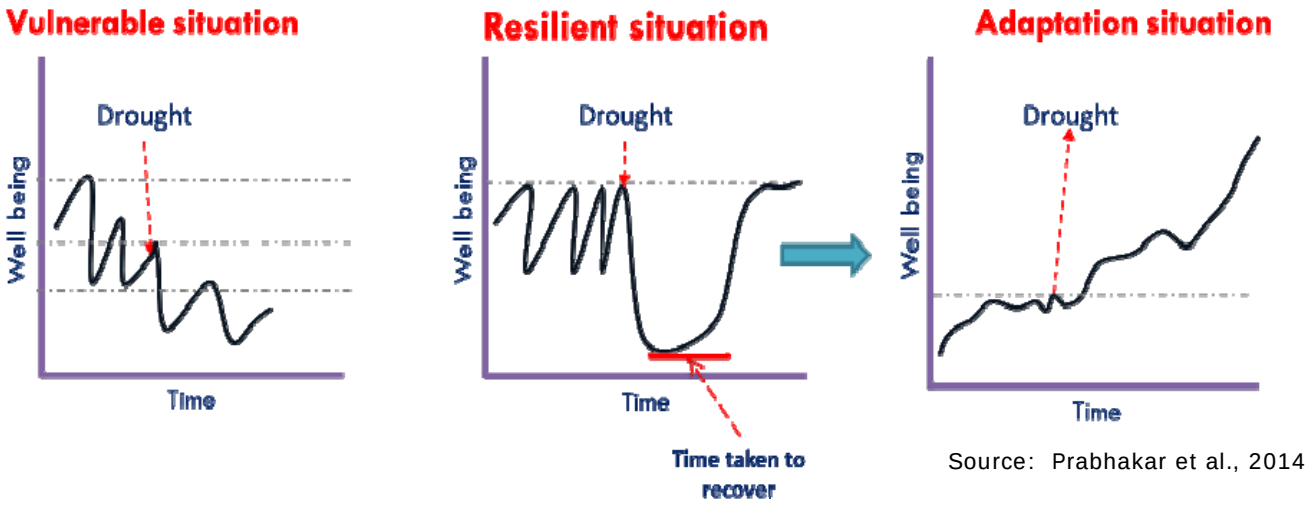
- In contrast, Asia and Africa have one of the highest agricultural populations in the world
- The rural areas in these regions with highest poverty and seasonal unemployment where buffering income fluctuations will have significant socio-economic impacts

Why Insurance has not Scaled Up?

- **High residual risks in agriculture**: Only 35-40% of agriculture is irrigated in Asia; low expansion of drought and flood-tolerant varieties; poor extension facilities
- Inefficiencies attributable to **adverse selection** and **moral hazard**
- **Poor availability of data** to assess risks for designing effective risk insurance systems (e.g. weather data and data on crop loss)
- **Willingness to pay**: Economic, cultural and perceptional issues with both people at risk and policy makers
- Lack of **trust** among the insured on insurance providers
- Poorly developed re-insurance industry
- And so on…
- **High insurance costs**: Costs to whom and compared to what alternative risk management strategy?

How to overcome these limitations?

Effectiveness of Insurance



Source: Prabhakar et al., 2014

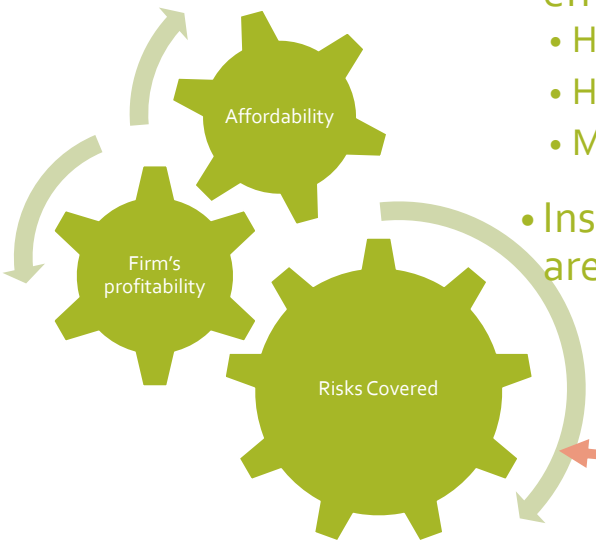
Insurance Effectiveness: Legal Perspective

- Understanding of insurance effectiveness by insurance delivery agencies:
  - Was the insurance able to deliver the contractual obligations i.e. payout as agreed in the contract.

Contractual obligations → Payout to the insured

Source: Prabhakar et al., 2015

Developmental Perspective



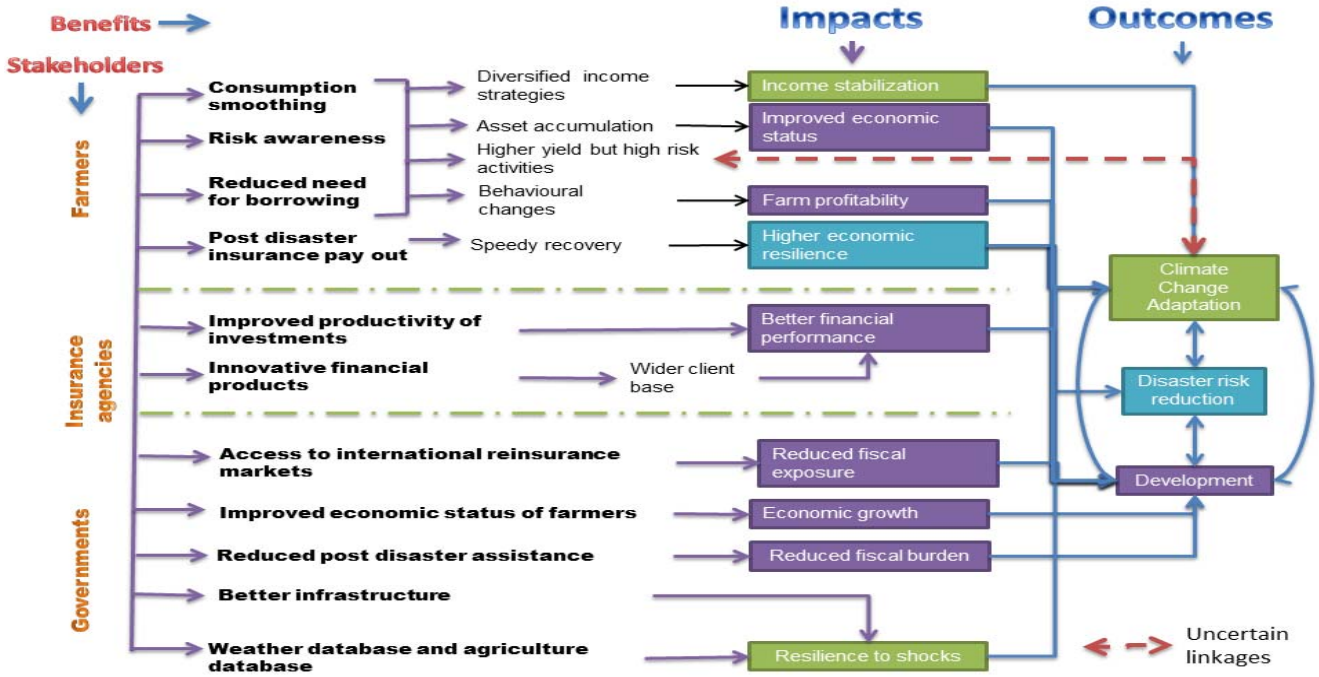
- Most literature and experiences talks insurance effectiveness in terms of
  - How many people are insured (Economies of scale),
  - How to avoid moral hazard and adverse selection,
  - Minimizing basis risk
- Insurance will be successful if the above factors are taken care of!

Payoff to the insured

Source: Prabhakar et al., 2015

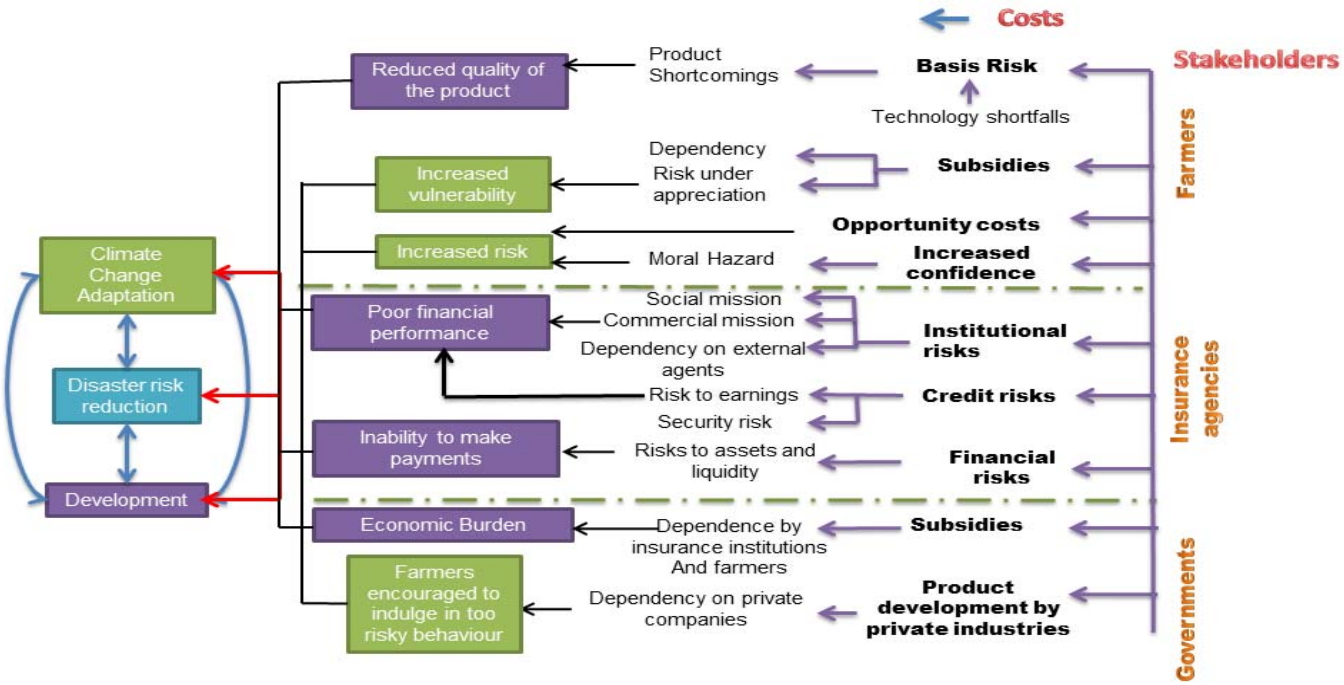
- **How the payoffs are spent?**
- **Has there been long term reduction in risks?**

Benefits of Insurance



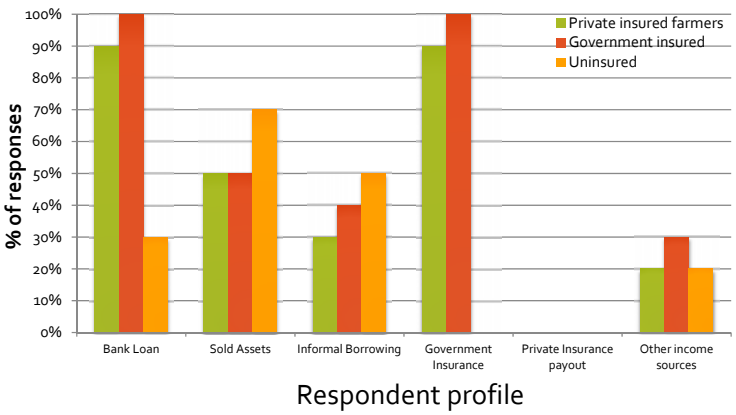
Source: Prabhakar et al., 2014

Costs of Insurance



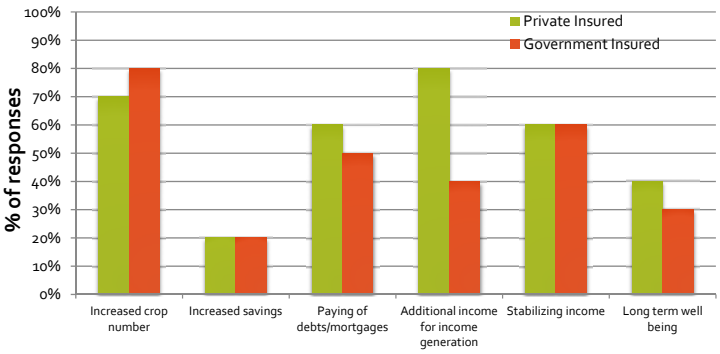
Source: Prabhakar et al., 2014

Survey Results on Insurance Effectiveness: India



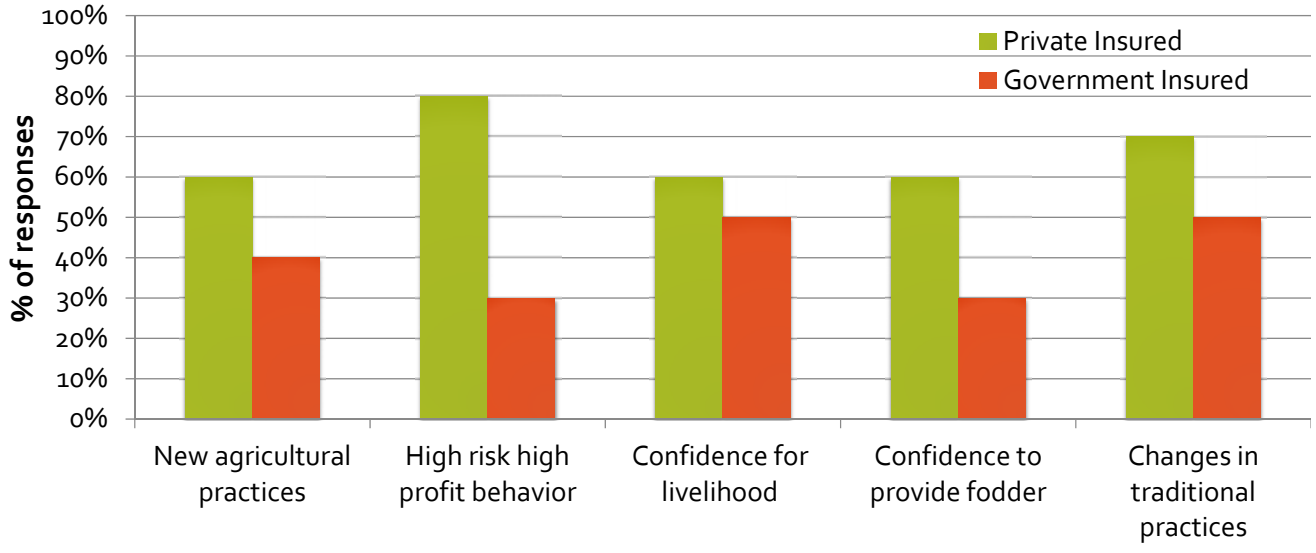
Impact of insurance on

- Borrowing after disaster
- Repayment of loans
- Long-term wellbeing

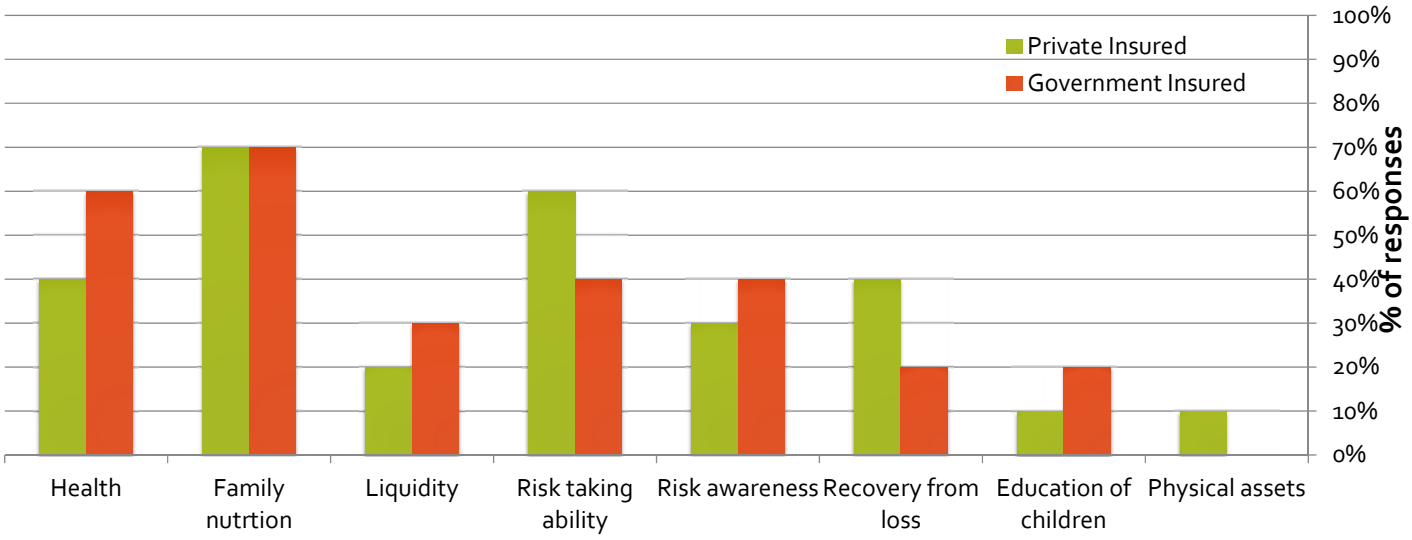


Based on pilot opinion surveys in Andhra Pradesh, India

Behavioural changes in insured farmers



Positive Impacts of Insurance



Insurance Survey Results from Japan

- 90% felt insurance is necessary for recovering from crop loss (highest among all the study countries) and the rest thought it is a good policy for the government to implement.
- 57% didn't find any loopholes in the system while 30% felt that the damage assessment was not up to their satisfaction.
- 57% received the compensation within 3 months of damage assessment while others received even sooner.
- Payment was timely for 83% and helped them to recover from the disaster. Majority felt that the damage assessment process was 'fair'.

Farmers Opinion on Insurance: Japan

- 43% felt that they recovered 'mostly' from the disaster with the help of insurance while the rest felt either recovered fully (30%) or didn't recover at all (10%).
- On the subsidy issue, most farmers felt the current level of subsidy is sufficient while 37% felt that it should be increased to 70%. None favored the removal of subsidy.

Sugarcane Insurance

- **Farmer 1:** Okinawa mainland, has <100 acres

  Premiums: ¥9,000 × 7 years=¥63,000

  Indemnities: ¥83,000 (last year)= **NET BENEFIT!**

- **Farmer 2:** Okinawa mainland, has area of 338a

  Premiums: ¥70,000 × 10years=¥700,000

  Indemnities: ¥1,470,000 (last year)= **NET BENEFIT!**

- **Farmer 3:** Irab island

  Premiums for 24 years= ¥3,000,000

  Indemnities: ¥5,000,000 (last year) = **NET BENEFIT!**

What are the DRR and CCA benefits of this payoff?

Conclusions from Japan study

- Farmers have reported the net benefit from crop insurance in questionnaire surveys (paddy) and in terms of indemnities received (Sugarcane)
- Subsidy played a major role in farmers finding the insurance profitable/useful (the net positive indemnities was after 55% insurance)
- Insurance helped in recovery from disaster according to 73% of respondents
- No major issues were reported in terms of moral hazard and hence both the insurance company and the farmers prefer indemnity based insurance (corroborated by the least I/P ratio)

There was a considerable resistance from farmers for changing from indemnity based insurance to index based insurance (why fix that is not broken)

Risk Insurance and Post-Disaster Recovery

- Typical view of disaster recovery:
  - Infrastructure
    - Health
    - Education
    - Transportation
  - Livelihoods
    - Agriculture
    - Fisheries
    - Manufacturing
  - Social capital
    - Community building

- Insurance?
  - Though insurance is purchased before disaster, its actual role is in post disaster recovery.
  - Insurance can be effective when it is combined with reconstruction.
  - However, insurance has largely been missing from the portfolio of post-disaster recovery approaches.

What is Limiting Risk Insurance Role in Long-Term Recovery?

- Can promote emphasis on risk mitigation especially when insurance is made mandatory and there is proper insurance price signal given: Insurance is largely subsidized in developing countries when present (especially in agriculture sector); In urban sector, insurance is either not mandatory or largely absent.

What is Limiting Risk Insurance Role in Long-term Recovery?

- Covers the residual risks not covered by the other risk reduction mechanisms. High basis risks could be a spoiler.
- Stabilizes rural incomes: reduce the adverse effects on income fluctuation and socio-economic development: Delayed payments, insufficient coverage of hazards.

What is Limiting Risk Insurance Role in Long-term Recovery?

- Reduced burden on government resources for post-disaster relief and reconstruction: Subsidization.
- Provides opportunities for public-private partnerships.

Non-Economic Loss and Damages

Economic L&Ds:

- "The loss of resources, goods and services that are commonly traded in markets" (UNFCCC, 2013).
- Economic damages can be "objectively verifiable monetary losses" (Fischer, J. M., 2010)

Non-economic L&Ds:

- The loss of "those that are not commonly traded in markets" (UNFCCC, 2013).
- Non-economic damages can be "subjective and non-verifiable losses" (Fischer, J. M., 2010)
- **L&Ds on human functions, and L&Ds of social, cultural and environmental assets which are often not valued by the existing markets**

Why non-economic L&Ds are Important?

Unreported non-economic L&Ds can constitute as much as 50% or more of the reported economic L&Ds.

Non-economic L&Ds can be more significant than economic L&Ds especially in developing countries.

Non-economic L&Ds have not been well considered in climatic & non-climatic assessments and in designing insurance and compensation mechanisms (UNISDR, n.d.; Hoffmaister, J. P., & Stabinsky, D., 2012).

Non-economic L&Ds has not been sufficiently reported in the most post-disaster reports and databases (Swiss Re, 2013).

NELD in the Reported Databases

Number of economic and non-economic L&D indicators reported at various international and national disaster reporting databases

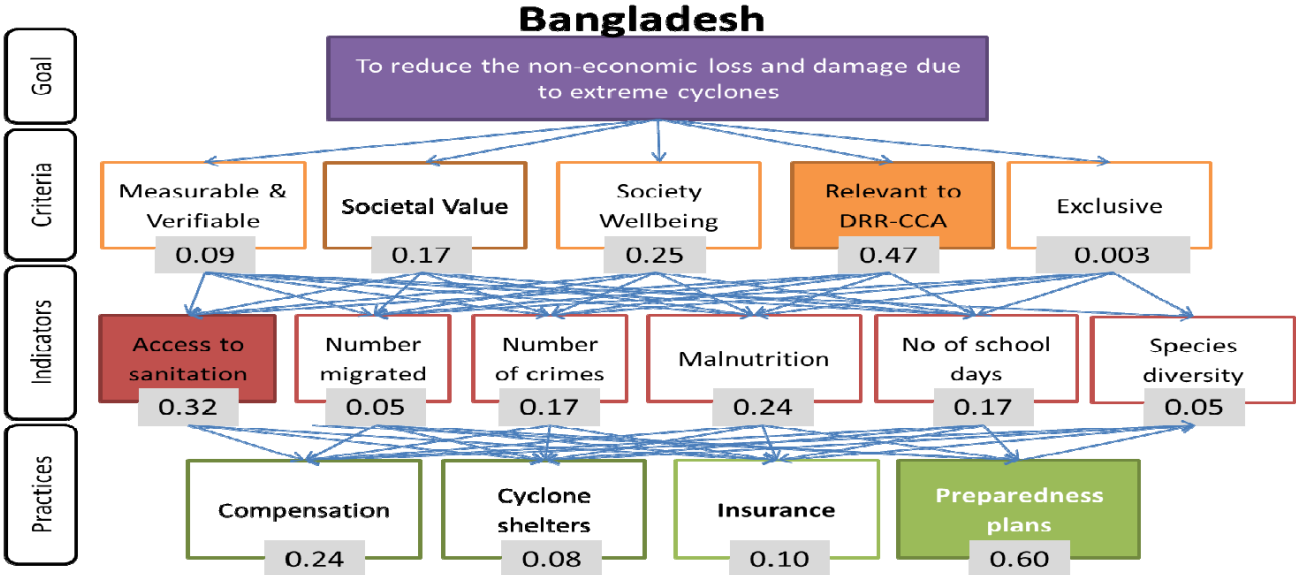
Database	Number of indicators reported	
	Economic	Non-economic
EM-DAT	1	5
Japan (Database covering natural disasters during 2003-2011)	10	5
Bangladesh (database covering floods, cyclones and landslides)	8	3

(Source: Compiled by author)

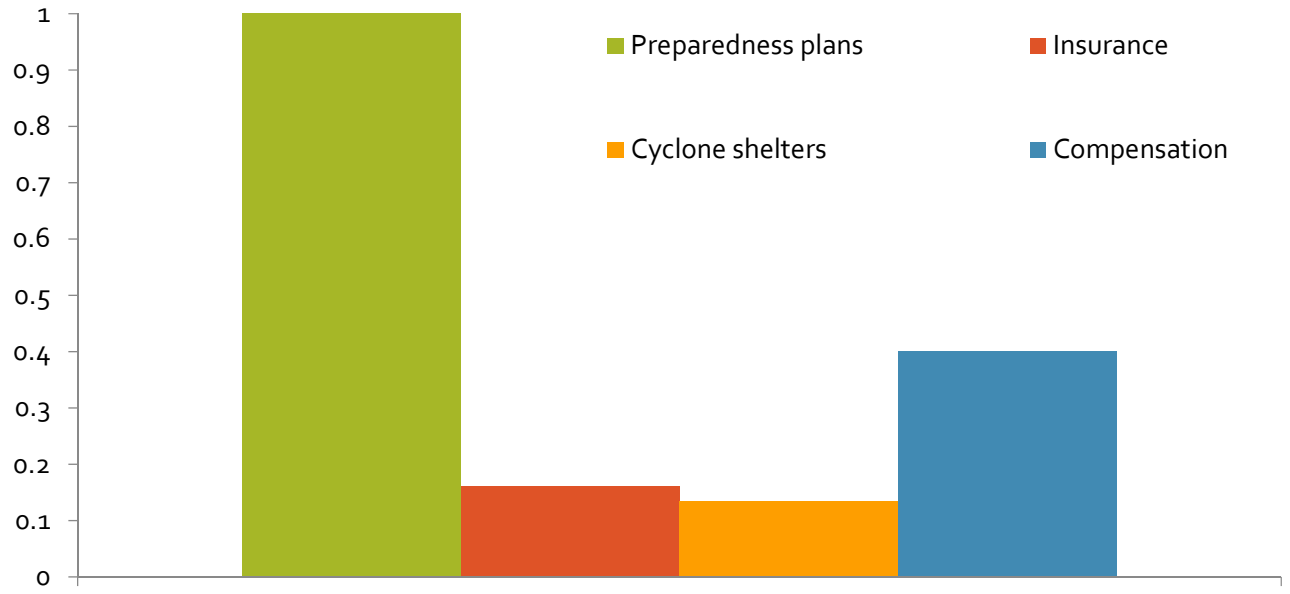
Understanding the NELD Efficacy: Bangladesh

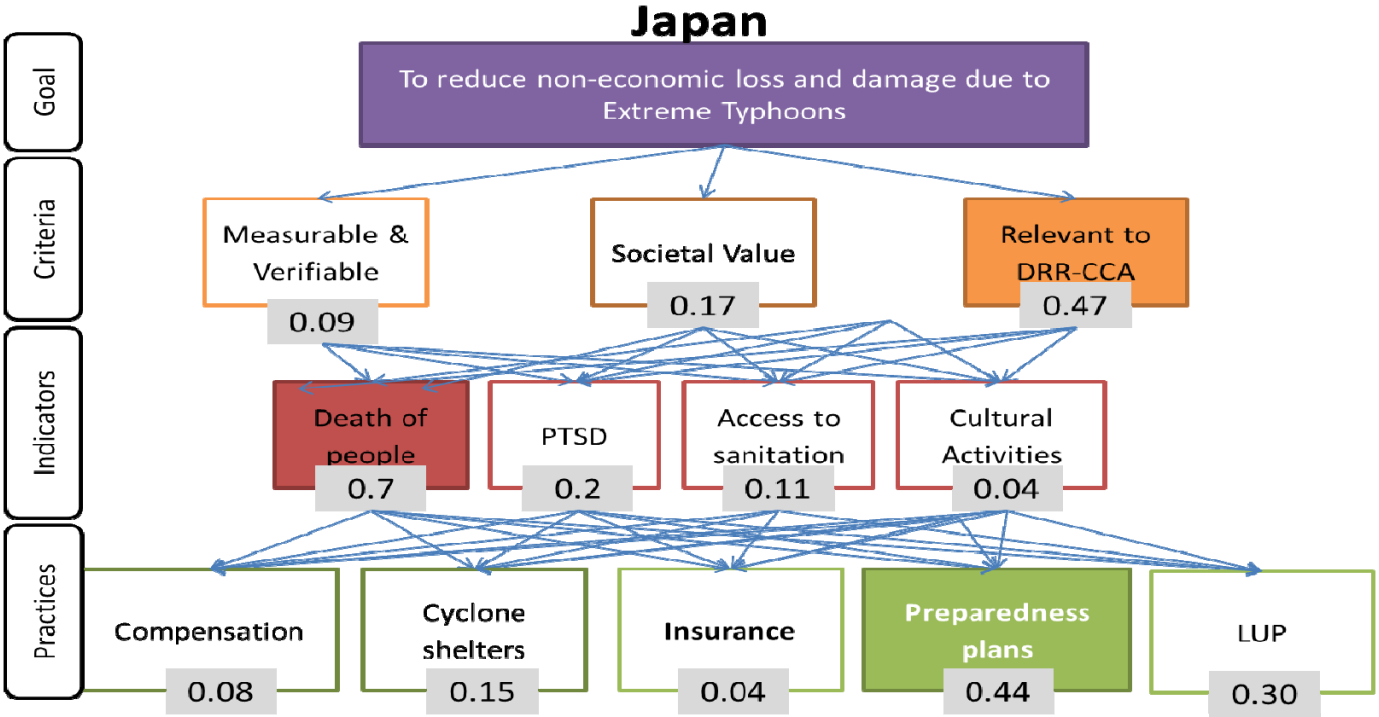
Japan Workshop

Not a Silver Bullet: Non-Economic Loss and Damages

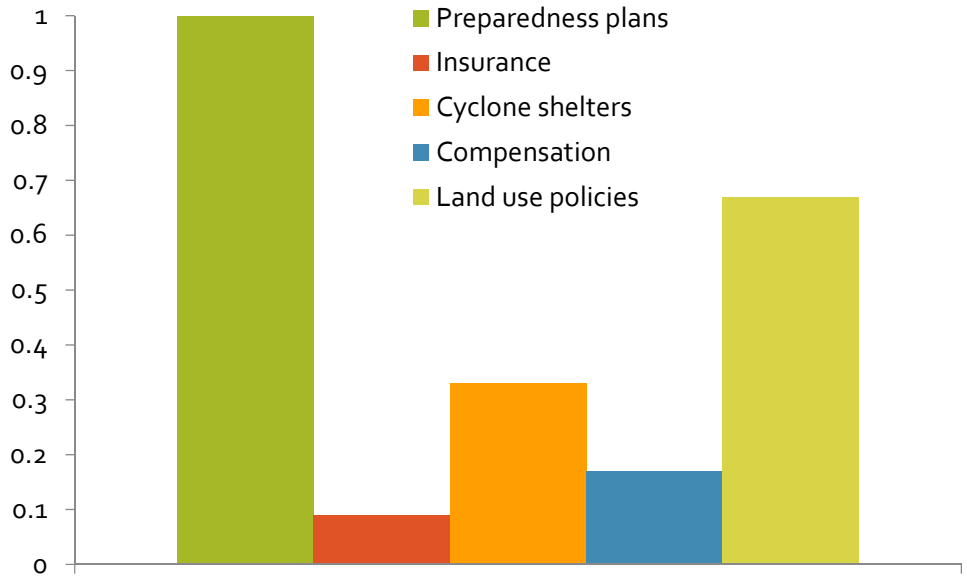


Efficacy of Practices Compared: Bangladesh





Efficacy of Practices Compared: Japan



Why Low Performance of Insurance in addressing NELD?

- Design elements: No guarantee of payouts invested in NELD-relevant areas
- Improved income stabilization doesn't necessarily lead to improvements in NELD
- Insurance vs compensation
- High opportunity and operational costs
  - for communities, industry and governments

- Will mere paying back of loss amount lead to CCA and DRR benefits?
  - Promoting high risk and profit seeking behavior (with implications for basis risk)
  - How the insurance pay offs are spent by farmers: in risk mitigation or business as usual crop management practices, resulting in no net risk reduction.
  - Subsidized premiums in most developing country contexts: Doesn't really convey the price signal to farmers leading to no change in crop production practices and no net reduction in cost of risk.

- Most of these issues are often linked to not just how the insurance is designed but also what kind of support services (e.g. education on risk management) goes to the insurance buyers so that they make informed choices.

What About Evidence?

- Our work has suggested that there is no sufficient evidence on how insurance is proving effective on the ground. What kind of social and economic benefits insurance is offering leading to disaster risk reduction and climate change adaptation outcomes?

Addressing High Insurance Costs

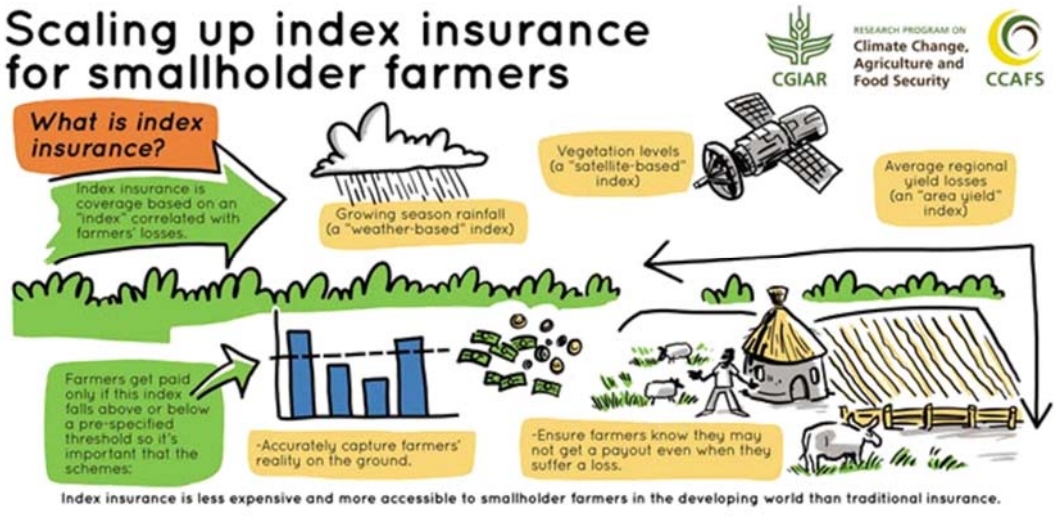
Subsidy on Premium

Country	% Premium Subsidy
China	60%
Japan	49%
India	30%
Pakistan	70%
Philippines	100%*
ROK	50%

*for subsistence farmers only
FAO 2011

- Most governments address the insurance costs through subsidy on premium. Premium subsidies **rose 250 percent** over 2007 subsidy levels in the Asia Pacific region.
- Advantages
  - Easy to implement
  - High political impact
- Disadvantages
  - The real cost of risk is not conveyed to farmer
  - Possibility of high risk seeking behaviour
  - Disproportionately benefits rich farmers
  - Overall insurance costs remain same or even higher

Index Insurance: Right Direction

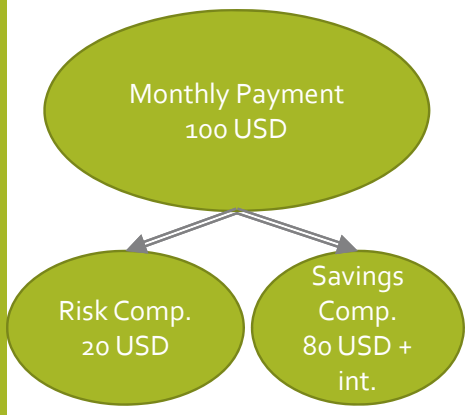


CCAFS 2015

- Reduction in transaction costs
- Greater reach to all size of farms (greater coverage)
- Reduces moral hazard and adverse selection problems
- Reduces distress sales due to quick insurance pay-outs

Willingness to Pay

Savings-Linked Insurance (Unit Linked Insurance Plan)



- Cheaper premium
- Poor households can have quick access to finances (overdraft with withdrawal on premium) and hence will not feel deprived of money for long periods of time
- Interest earned on savings can provide additional advantage: Promotes savings
- Help build assets in the long-term while protection against catastrophic risks
- Innovations in savings-linked insurance include designing insurance products based on interest earned on savings could substantially reduce the premium burden on insurance holders

Innovative Solutions

- **Combining Insurance with Payment of Ecosystem Services**
  - Payment of ecosystem services and carbon capture and sequestration proceeds could be linked to insurance premiums and or investments made on risk mitigation options that can generate substantial PES proceeds.
  - E.g. certain types of intensive row-cropping systems and ecological farm scapes can promote ecosystem services such as a clean and well-regulated water supply, biodiversity, natural habitats for conservation and recreation, climate stabilization, and aesthetic and cultural amenities such as vibrant farm scapes etc. (Robertson et al. 2014).
- **Combining insurance with social security programs**
  - 40% of global population is not protected and 75% are inadequately protected
  - Combining social security and insurance can help extend social protection to under-served populations and can reduce the overall costs of insurance for the vulnerable sections of the population while extending financial inclusion benefits

Mutual Insurance Performance: Indemnity/producer premium ratio (I/P)

COUNTRY	PERIOD	I/P (producer loss ratio)
Brazil (Proagro)	75-81	4.29
Costa Rica	70-89	2.26
India (CCIS)	85-89	5.11
Japan	47-77	1.48
	85-89	0.99
Mexico (Anagsa)	80-89	3.18
Philippines (PCIC)	81-89	3.94
United States of America (FCIC)	80-89	1.87

Source: FAO, 2011

Bundling Approaches

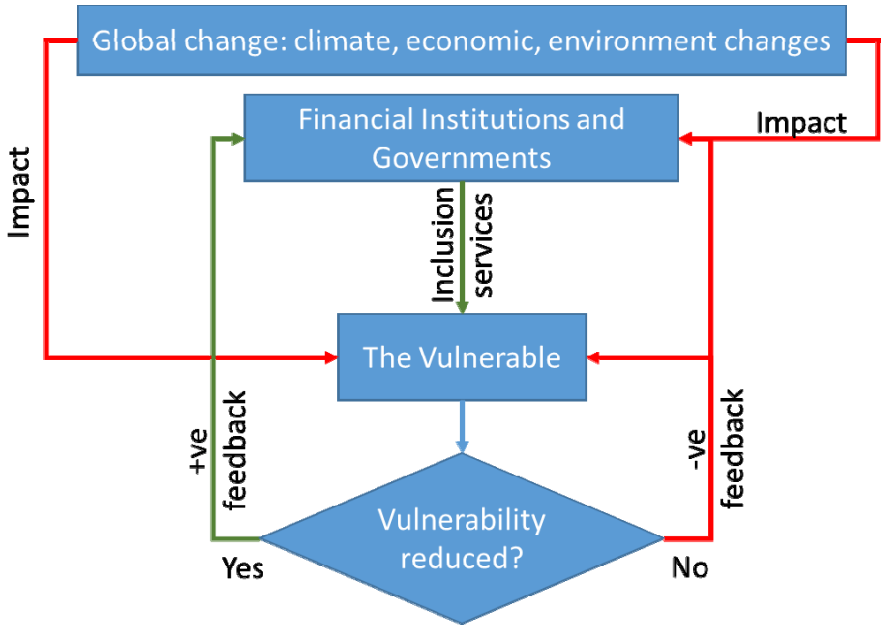
WFP 2016

- Bundling of risk management options can have synergistic impact on the overall insurance costs
- R4 Rural Resilience Initiative of Oxfam, WFP
  - Risk reduction through water harvesting and other activities through which farmers can earn vouchers to pay for their insurance
  - Risk transfer through insurance: Partly subsidized and partly paid by the participating farmers
  - Provide avenues for livelihood diversification for prudent risk taking
  - Promote savings which act as risk reserves

Scaling up: Issues to be addressed

- Investment in **risk mitigation** including providing efficient dependable irrigation facilities, better crop varieties, building the capacity of farmers and extension agencies etc.
- There is a need to promote **site-specific solutions** rather than one-fits all strategy in a top-down manner as is done in most government administered insurance programs
- Building **capacity** [and provide enabling environment]
  - of communities to understand risk insurance better
  - of the insurance supply chain to deliver diverse insurance products
  - of government to work with private agencies and
  - of private agencies to work with governments
- Building the **trust** among the communities and insurance delivery agencies is at most importance and this is where formulation of insurance regulation plays a major role. Mutual insurance model?
- **Data gaps** need to be addressed. Investment in remote sensing applications for developing better proxy index insurance in areas where rainfall data is not available

Financial Institutions Themselves are Vulnerable to Shocks too!



THANK YOU!

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