



Making Sense of CCA, DRR, and Loss and Damage Financing Conundrum in a Dynamic Risk Paradigm

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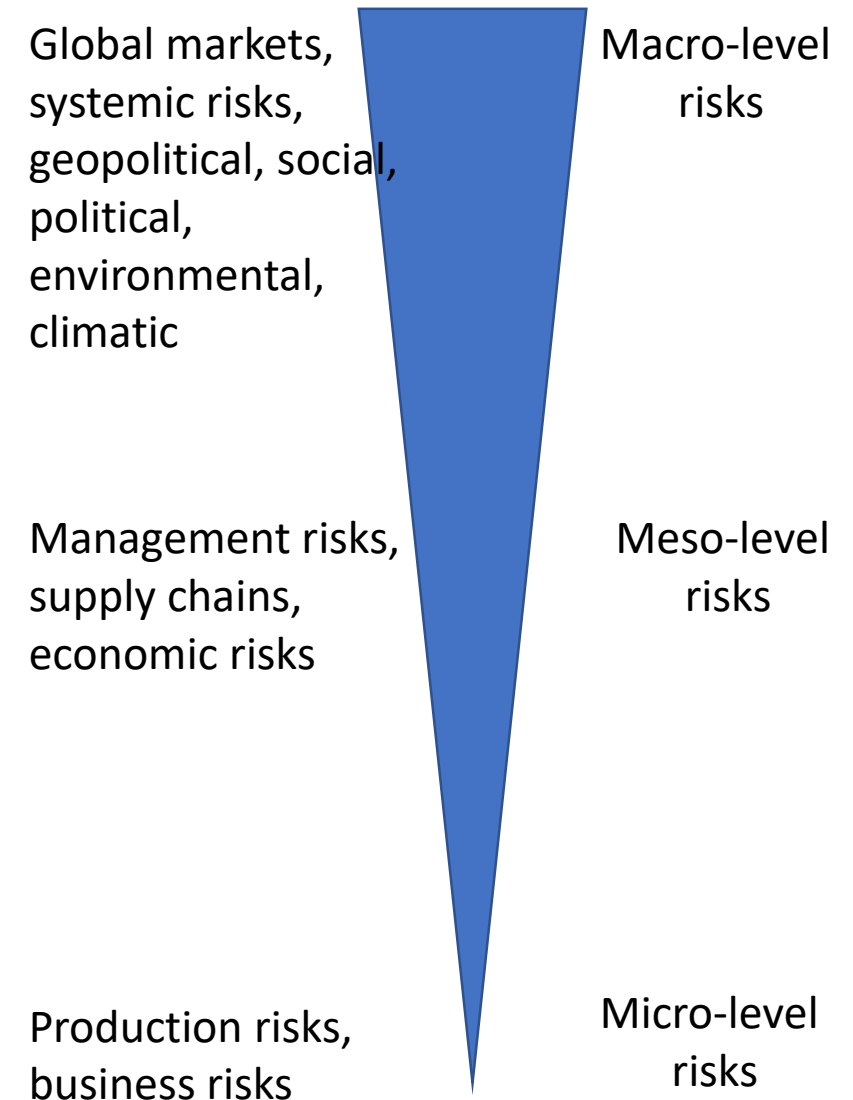
Contents

- The multi-dimensional risk paradigm
- The risk layering framework to address multi-dimensional risks
- Making risk insurance effective
- Making assistance effective
- Conclusions



The Multi-Dimensional Risk Paradigm

- We are experiencing a rapid increase in multi-dimensional risks. Risks that are highly interconnected across scales, sectors and regions.
- Unfortunately, the current risk financing regime is highly fragmented and lacks the perspective informed of the multi-dimension risk reduction.
- Often, financing is targeting the '**affected**' rather than '**effector**' addressing possibly only the half of the risk.
- Fragmented risk management approaches only increases the cost of risk management which works against limited finances available for DRR and CCA.
- **Follow the risk paths:** Addressing multi-dimensional risks needs greater coordination and cooperation across these levels.





Current Financing Conundrum for CCA, DRR & L&D

- Countries are faced with limited finances at the global to local level
- Financing these competing priorities at the international level are fraught with the challenges of additionality, climate justice, common but differentiated responsibility, polluter pays principle etc.
- While countries have agreed to these principles and funding in principle, meeting these financial commitments has not been easy for the developed countries.
- This leaves developing countries either waiting or to do something about it.
- Waiting is not an option as vulnerabilities and risks stack over the time.
- There is a growing recognition among developing and vulnerable countries on the need for self-financing to the extent their budgets can allow them.
- Integrated, least cost and high-efficiency approaches benefits all!

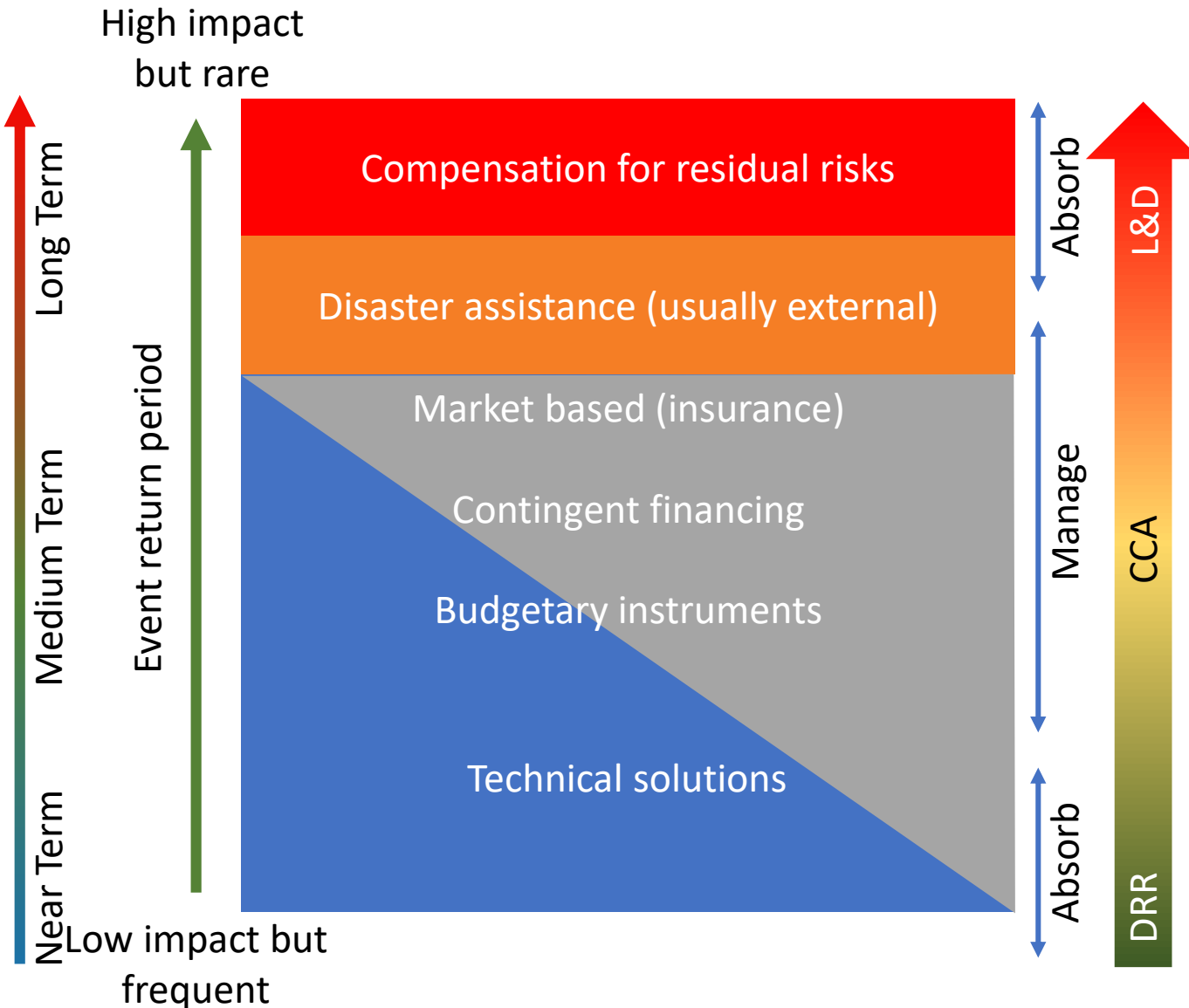


Efficiency and effectiveness: What countries need in the context of limited financing for CCA, DRR and L&D?

Category	Actions
Adaptation effectiveness	Effectiveness in approaches identified and implemented that address maladaptation in the long-run
Efficiency in program formulation and implementation	Tagging and taxonomy, governance efficiency, financial management
Integrated risk management frameworks	Risk layering frameworks , risk-based multi-hazard and transboundary CCA & DRR planning
Efficiency in risk financing	Risk layering frameworks that relies on cheap financing first and allocates expensive instruments later where risk insurance gained much attention
Efficient and effective response	Impact-based forecasting and warning, forecast-based financing, prepositioning of relief, and advanced contracts, critical thresholds for assistance , linking short-term responses with long-term risk reduction



Risk Layering Provides an Integrated Framework to Finance CCA, DRR & L&D



- Risk layering framework provides us with a wholistic and integrated picture of sources of risks.
- Helps build an integrated risk governance framework from local to national and international levels.
- It encourages an integrated assessment of risks at time and spatial scales, identify risks that need to be absorbed (both at the lower and very high risk levels), and risks that can be managed with given resources.
- Widely recognized by least applied in risk management policies of governments



Improving the Effectiveness of Risk Insurance

- Acts as a financial access tool
 - Provides access to loans when made conditional for borrowing as in the case of agricultural loan. Insurance has enabled millions of borrowers to obtain crop loans which they otherwise may not be able to
 - Soon after disaster when the communities need the finances the most
- The **Asia Pacific region ranks fifth in terms of insurance premiums** and the non-life insurance in particular rank after life and health insurance
- More and **more governments are emphasizing agriculture insurance** or are studying the possibility of putting in place agriculture insurance with subsidy on premium
- The role of insurance in risk reduction has largely been theorized but the reality may be different on the ground



The Potential of Risk Insurance

- 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**

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 perceptual issues with both people at risk and policy makers
- Lack of **trust** on the 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?

Addressing Willingness to Pay

Subsidy on Premium

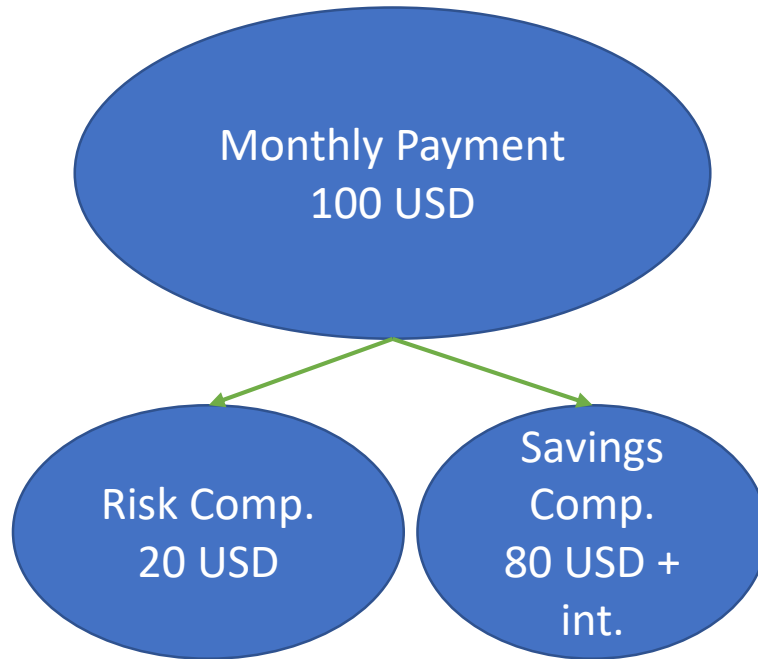
Country	% Premium Subsidy
China	60%
Japan	49%
India	30%
Pakistan	70%
Philippines	100%*
ROK	50%

*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

Addressing 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

Other Innovations in Insurance

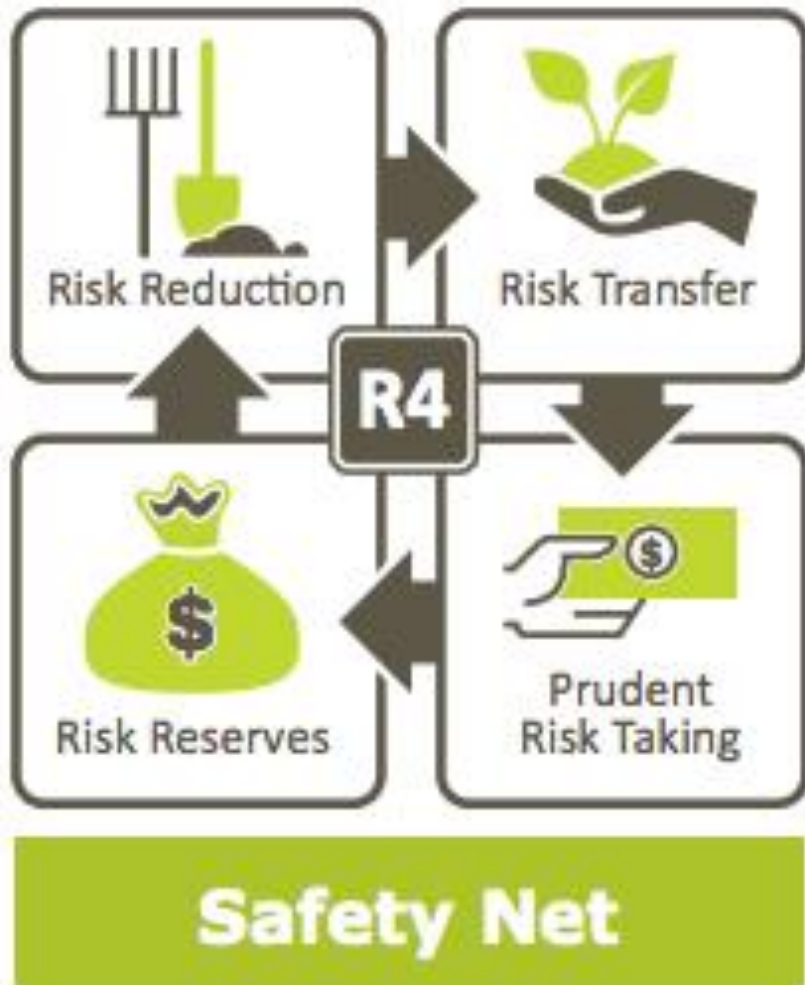
- **Combining Insurance with Payment of Ecosystem Services**

- 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 underserved populations and can reduce the overall costs of insurance for the vulnerable sections of the population while extending financial inclusion benefits

Bundling Approaches

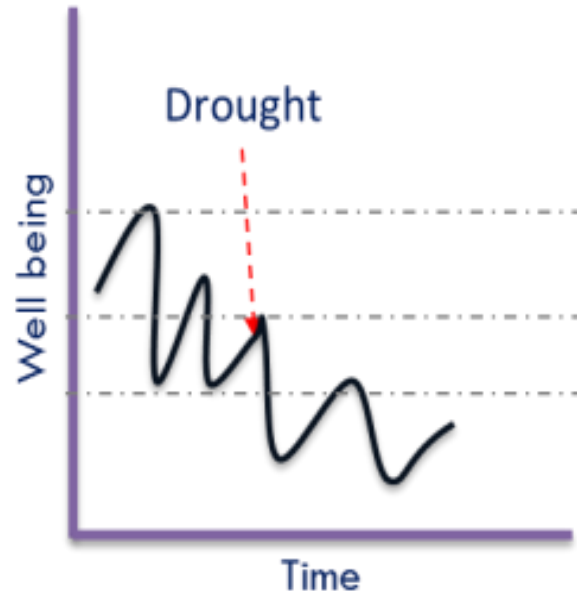


WFP 2016

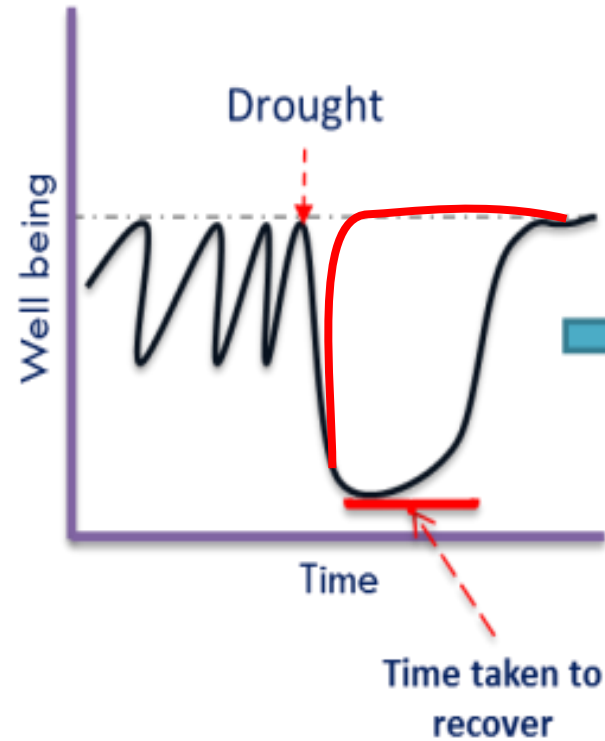
- Bundling of risk management options can have synergistic impact on the overall insurance costs.
- **Horn of Africa Risk Transfer for Adaptation (HARITA)** R4 Rural Resilience Initiative of Oxfam, WFP
 - Risk reduction through **water harvesting** and other activities through which farmers can earn 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

Effectiveness of Insurance

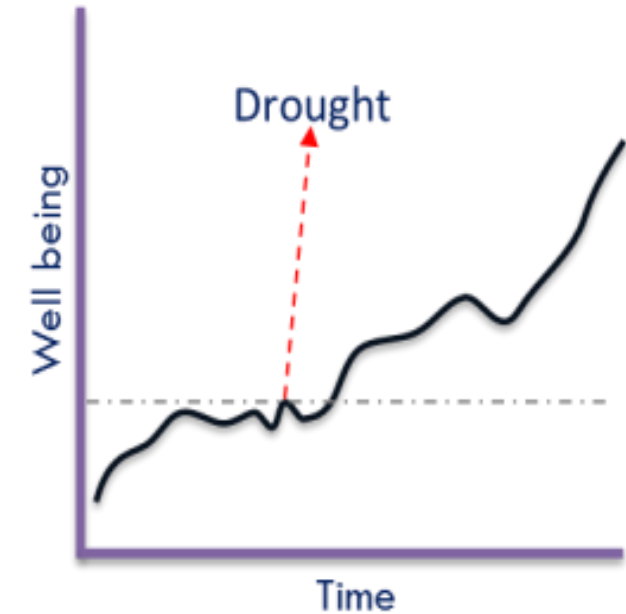
Vulnerable situation



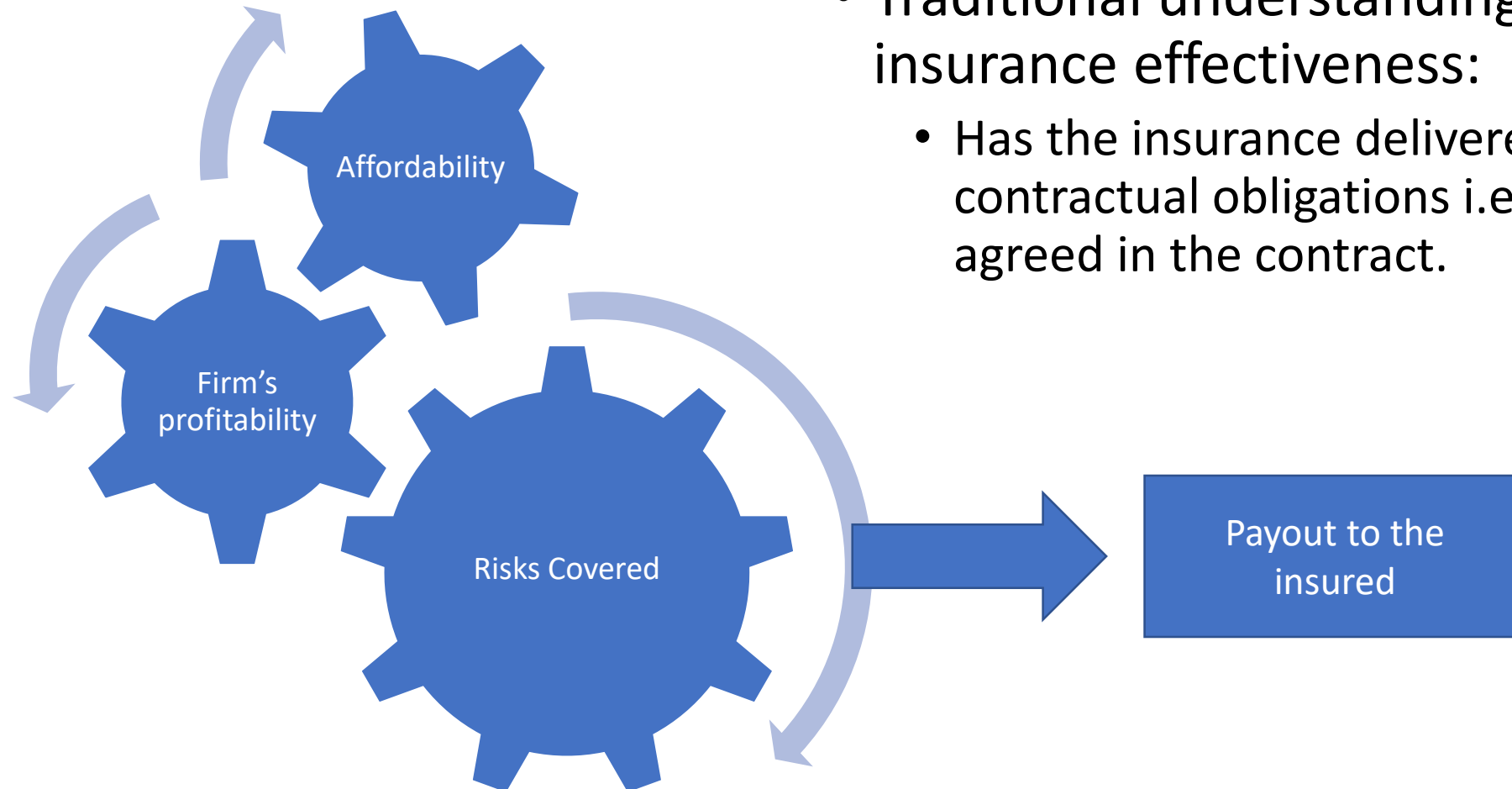
Resilient situation



Adaptation situation

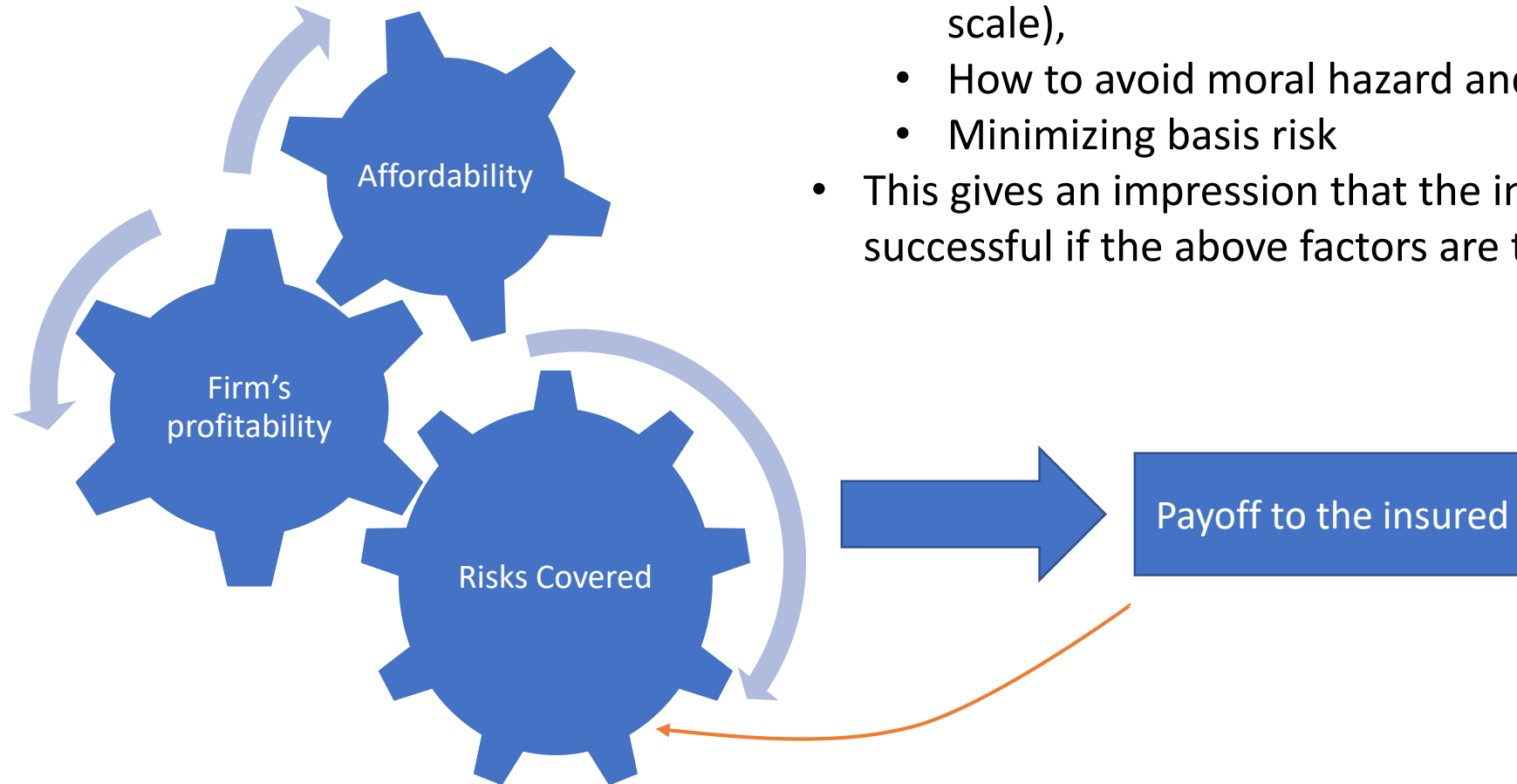


The Notion of Insurance Effectiveness



- Traditional understanding of insurance effectiveness:
 - Has the insurance delivered the contractual obligations i.e. payout as agreed in the contract.

Is this sufficient?

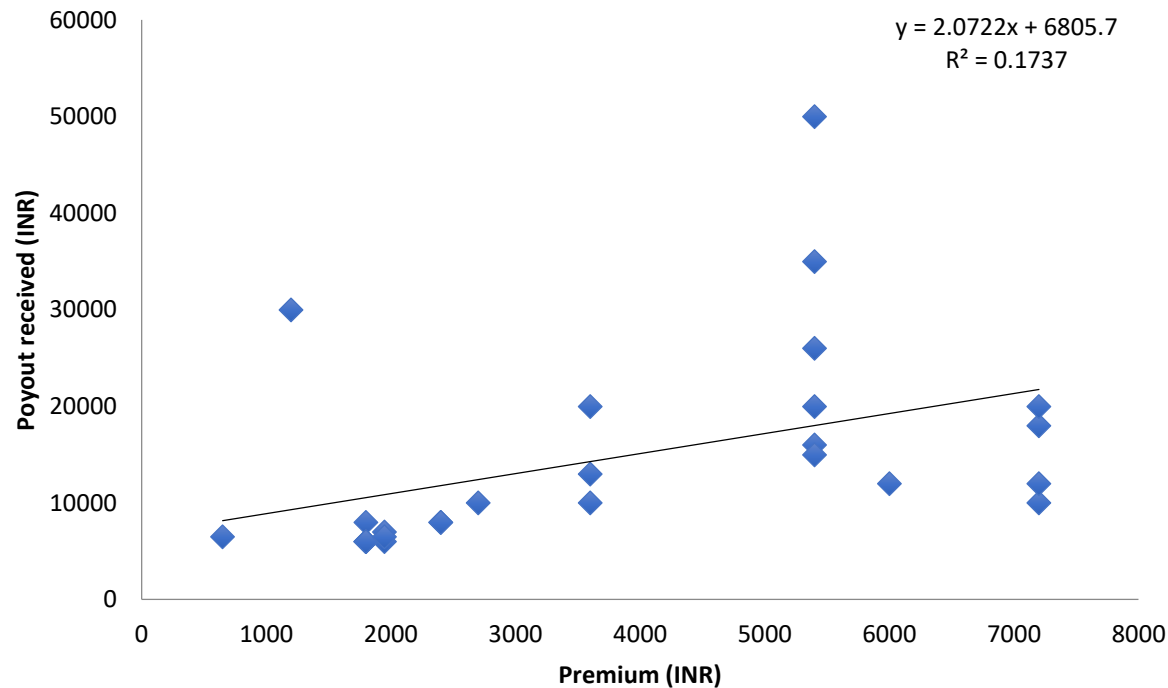


- Most literature and experiences talks insurance effectiveness in terms of
 - How many people are insured (Economies of scale),
 - How to avoid moral hazard and adverse selection,
 - Minimizing basis risk
- This gives an impression that the insurance will be successful if the above factors are taken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

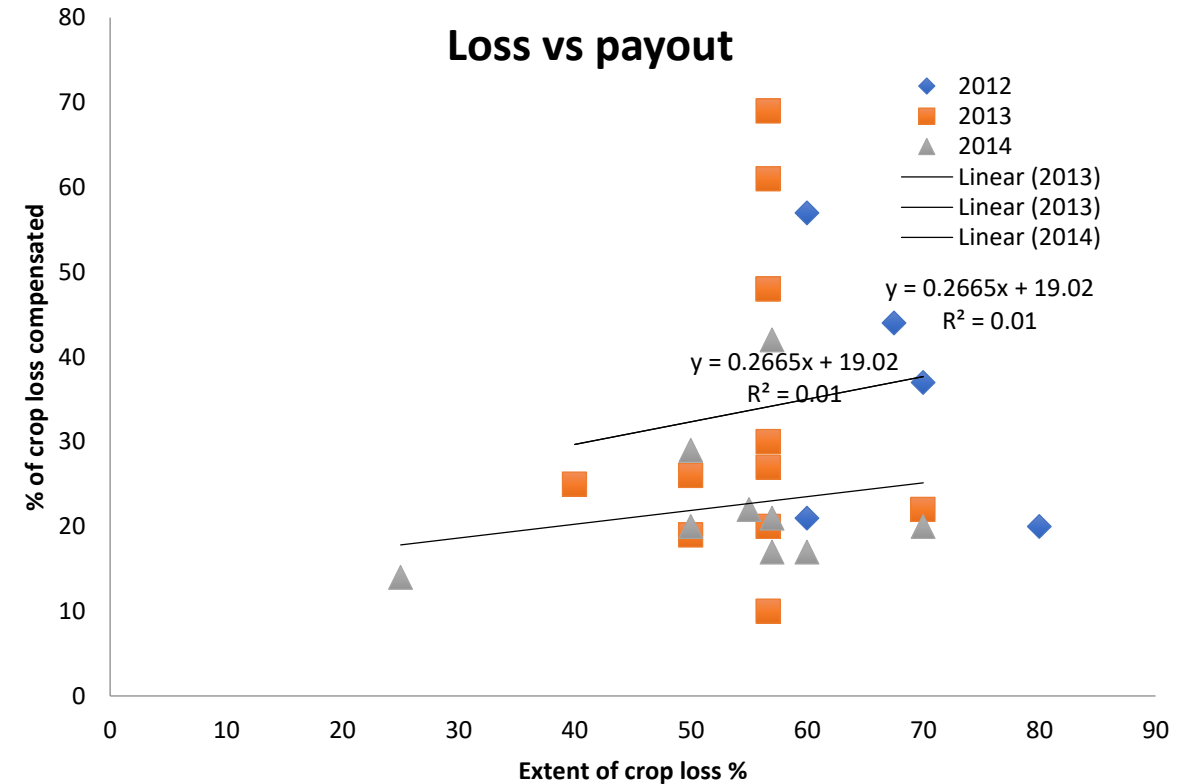
- **How the payoffs are spent? Have they spent on risk mitigation?**
- **Has there been long-term reduction in risks?**

Loss vs Payouts, Premium vs Payout Received: An example from India

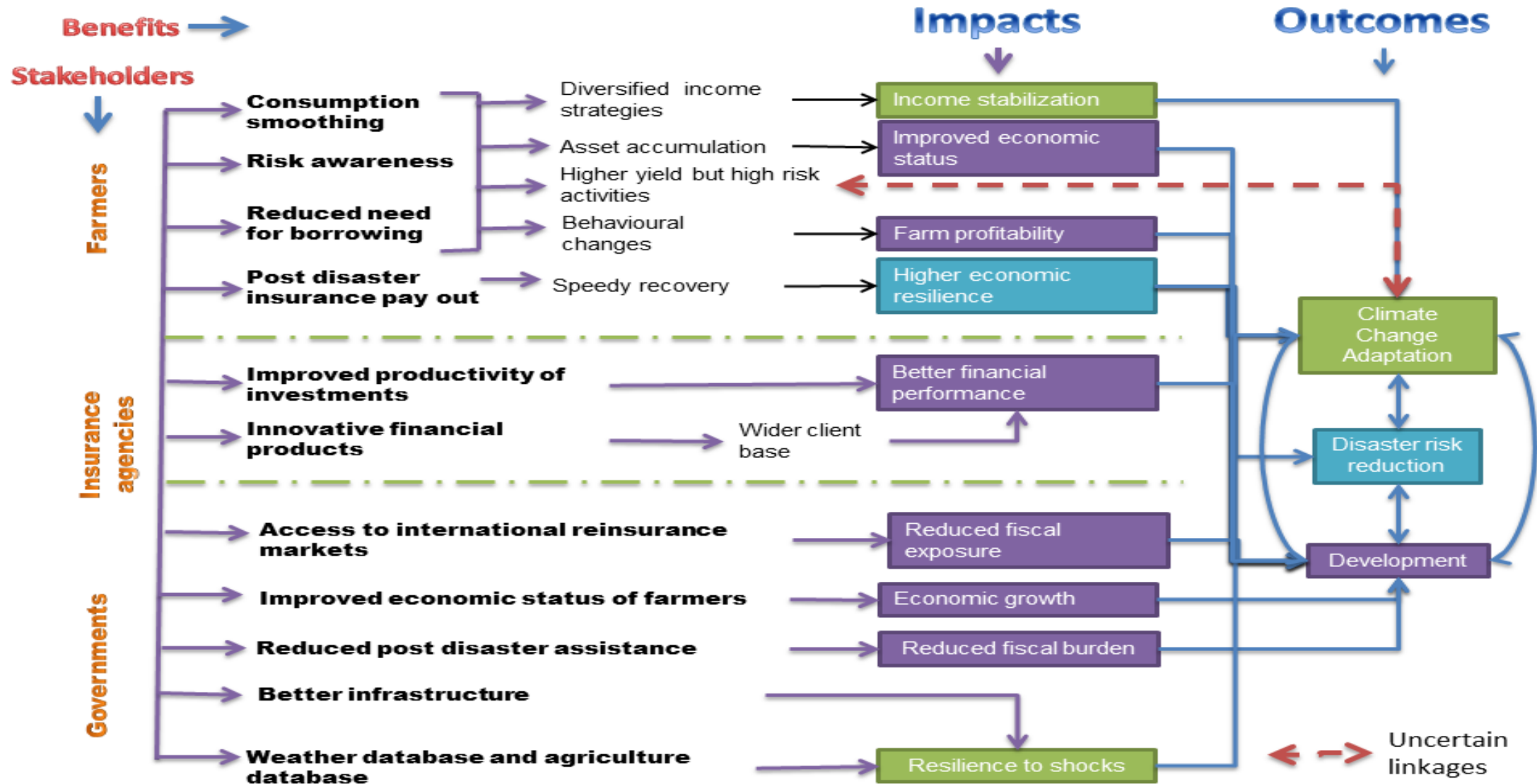
Premium vs Payout



Loss vs payout

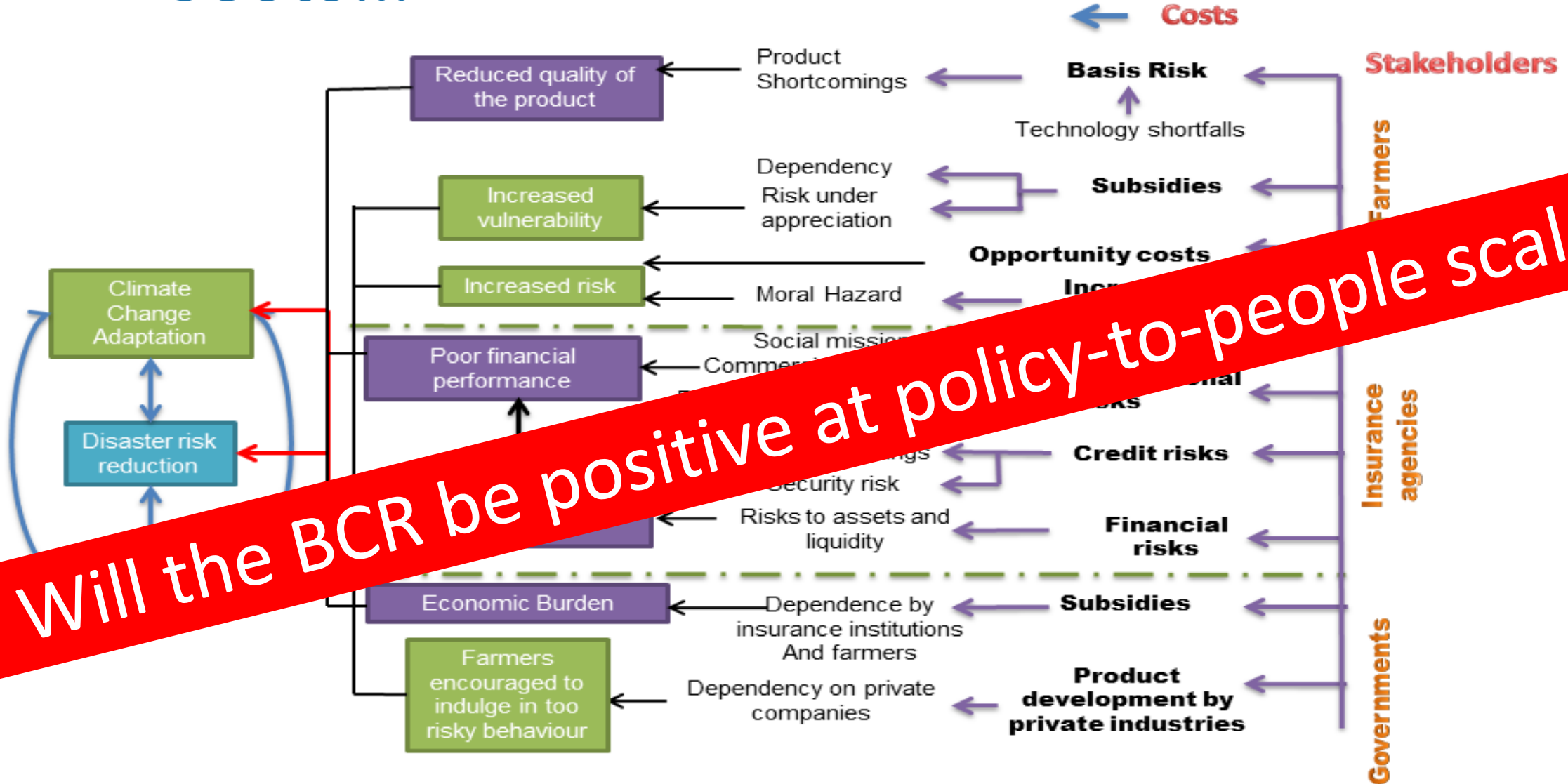


Comprehensive BCR of Insurance: Benefits

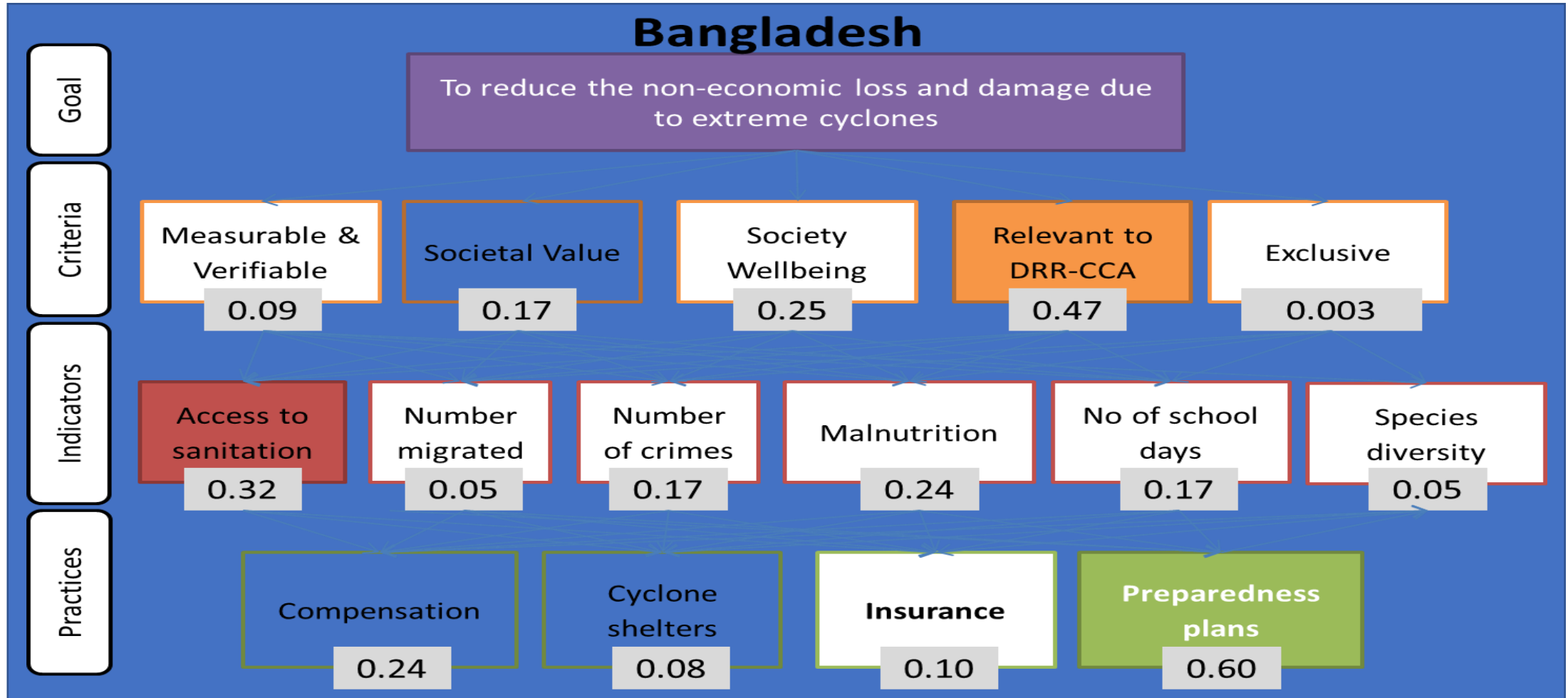


Source: Prabhakar et al., 2014

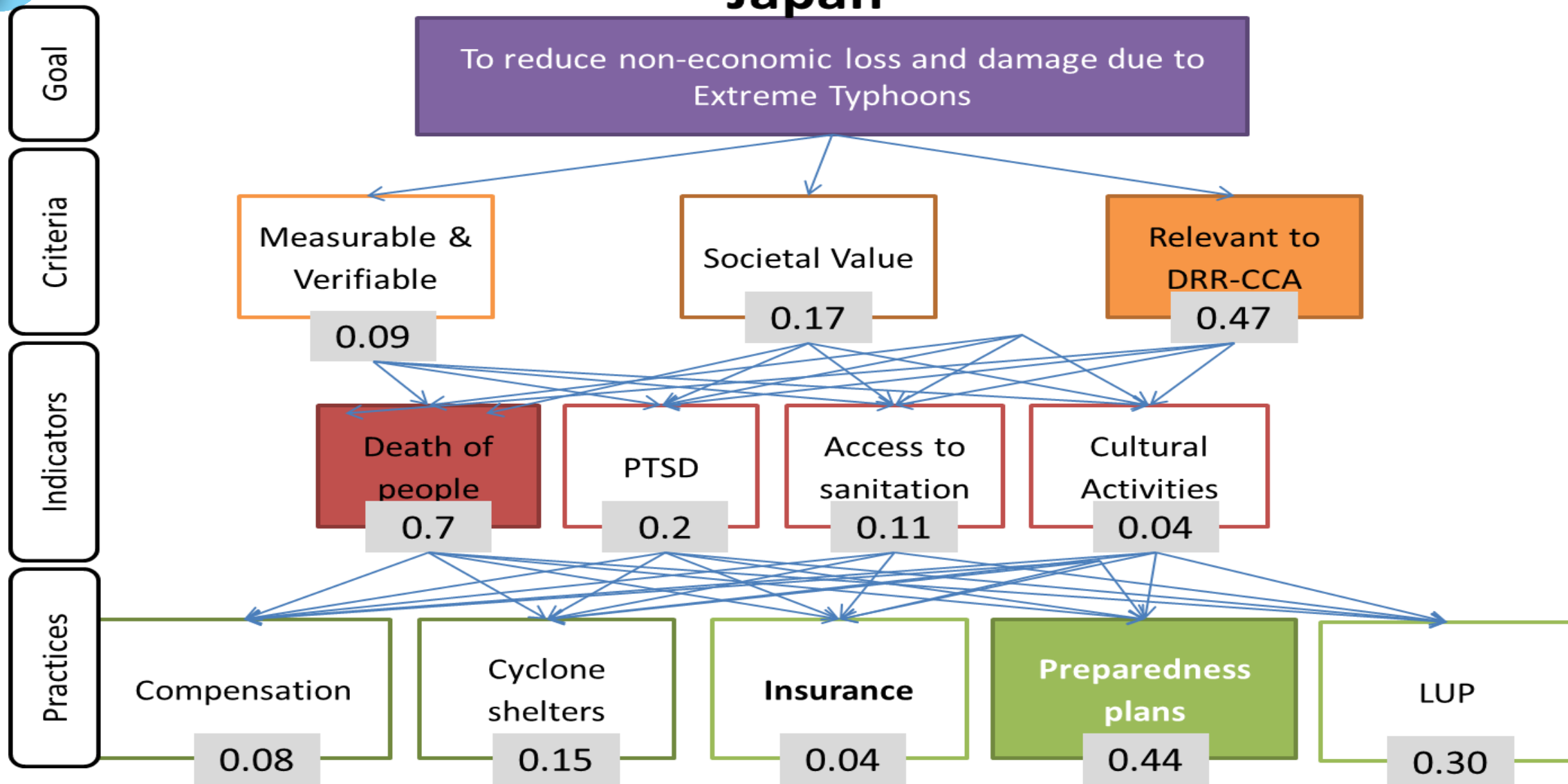
Costs...



Not suitable for non-economic loss and damages



Japan



2. Effectiveness of Assistance

Important Considerations to Ensure Effectiveness of Assistance

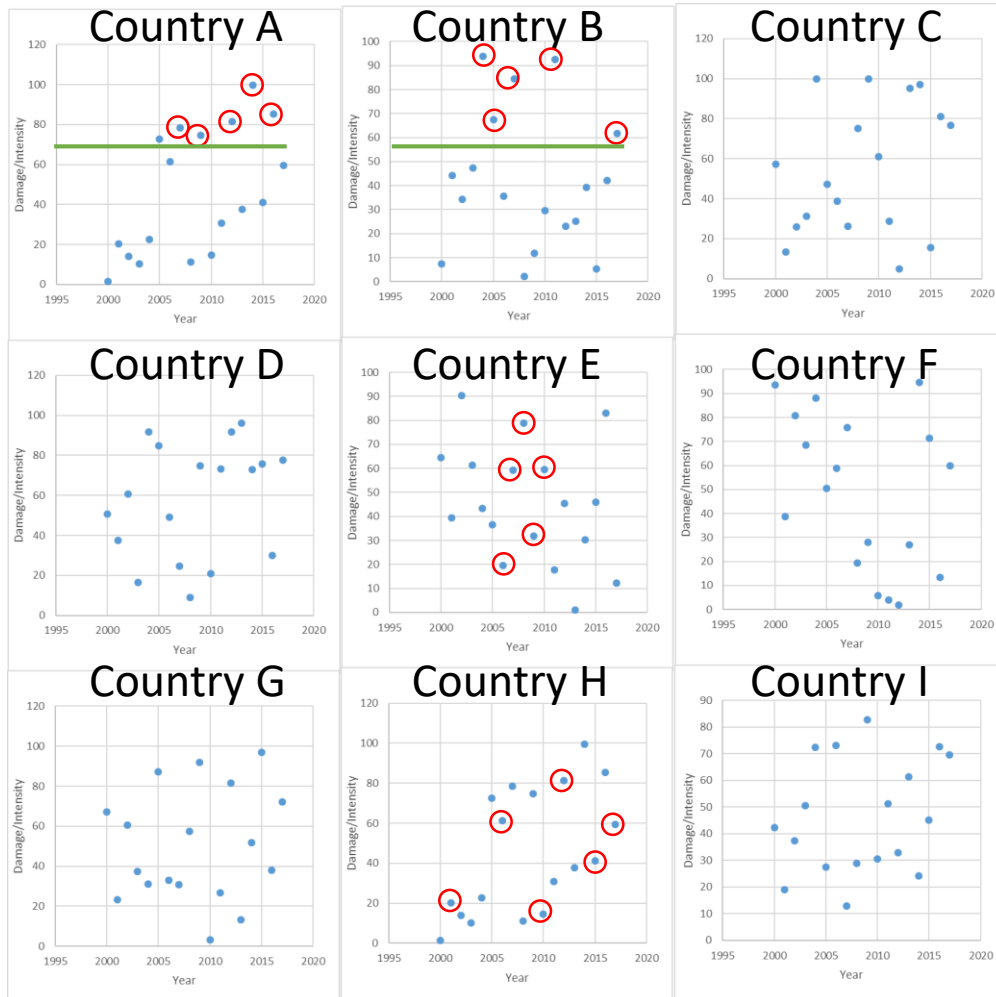
1. Increased efficiency of deployment of emergency assistance
 1. Quick assistance
 2. Appropriate assistance
 3. Strategic assistance
2. Increased overall benefits from external emergency assistance
 1. Prioritize assistance to countries and locations where a country's strategic interests are high (countries with significant FDI?) = **Not Humanitarian!**
 2. Connect short-term EEA engagements with long-term risk reduction investments in affected countries? **Currently there is no evidence**



Critical Thresholds Concept

- **What it is?** Critical thresholds refers to the level of hazard (either by intensity/duration/magnitude), or level of local capacities or a combination of both that result in a call for external assistance by a country.
- **What it can help achieve?**
 - Help better understand the nature of impending assistance needs
 - Help deliver appropriate assistance (amount, kind, duration etc.)
 - Better understand the assistance preparedness needed
 - Design assistance keeping in view the immediate and long-term needs for maximizing the climate security

Identifying the Critical Threshold of Assistance for Vulnerable Countries



- Country assistance requirement=f(damage threshold, current year GDP, disaster preparedness, ...)
- Some countries will have a reliable damage threshold-assistance relationships (e.g. Country A and B), where the concept of critical thresholds for Assistance work well.
- Countries where such function is not clear (e.g. Country E and H), due to varied capacities within the country, critical threshold should be further specialized to take into country circumstances.
- The research need to identify such circumstances for reliable estimation of assistance thresholds for these countries that also works for all other countries. One approach is to have a high resolution of the threshold i.e. to have sub-regional thresholds for these functions to work well.

Indicator Framework for Establishing Critical Thresholds

4 areas, 34 categories, & >100 indicators

Disaster impact characteristics

- a) Disaster characteristics
 - (1) Duration (Days)
 - (2) Area affected (km2)
 - (3) Magnitude
- b) Area characteristics
 - (1) Provinces affected (no)
 - (2) Villages affected (no)
- c) People affected (No) [Deaths, Disabled, Displaced, Total]
 - a) People affected (by economic class)
 - (1) Poor
 - (2) Middle class
 - (3) Rich
 - b) People affected by demographic class (Number)
 - (1) Male
 - (2) Female
 - (3) Children
 - (4) Elderly
 - c) Animals (cattle, poultry etc., number)
 - (i) Dead/lost
 - (ii) Injured
 - (iii) Total affected
- d) Damage to infrastructure
 - (1) Houses
 - (2) Bridges and roads
 - (3) Hospitals
 - (4) Critical infrastructure
- e) Damage to environment
 - (1) Soil erosion/degradation (ha)
 - (2) Forest degradation (ha)
 - (3) Loss of wild life (number)
- f) Economic damage
 - (1) Overall GDP Loss
 - (2) Household / livelihoods
 - (3) Household / assets
 - (4) Private sector
 - (5) Insured losses

National response capacity

- a) Time taken for initiating (Hr/Days)
 - i) Early warning
 - ii) Evacuation
 - iii) Rescue
 - iv) Relief
 - v) Rehabilitation
 - vi) Recovery
 - vii) For complete recovery
- b) Number of rescue & relief workers (no/1000 population)
 - i) Local government
 - ii) Prefecture
 - iii) National government
 - iv) Military
 - v) NGOs
 - vi) Private sector
 - vii) Voluntary civil workers
- c) Number of doctors/medical workers (no/1000)
 - i) Local government
 - ii) Prefecture
 - iii) National government
 - iv) Military
 - v) NGOs
 - vi) Private sector
 - vii) Voluntary civil workers
- d) Beneficiaries (No of people who received)
 - i) Evacuated
 - ii) Relief
 - iii) Recovery/compensation
 - iv) Medical support
 - v) Psychosocial support
- e) Total relief expenditure (Million USD)
- f) Immediate relief (million USD)
 - i) Local governments (Million USD)
 - ii) National govt.
 - iii) Non-governmental/voluntary contributions
 - iv) Private sector

- a) Financial compensation for damaged house reconstruction (Million USD, No)
 - i) Total National
 - ii) Local governments
 - iii) National govt.
 - iv) Non-governmental/voluntary contributions
 - v) Private sector
- b) Financial compensation for livelihood assets Million USD, No)
 - i) Local governments
 - ii) National govt.
 - iii) Non-governmental/voluntary contributions
 - iv) Private sector

International response capacity

- a) Time taken for initiating (Hr or Days)
 - i) Early warning
 - ii) Evacuation
 - iii) Relief
 - iv) Date relief request sent
 - v) The day relief landed in the country
 - vi) Rehabilitation
 - vii) Recovery
 - viii) For complete recovery
- b) Number of rescue & relief workers deployed (no/1000 population)
 - i) Japan
 - ii) All other foreign countries
 - iii) Name of countries
 - iv) Military
 - v) Non-governmental/voluntary contributions
 - vi) private sector
- c) Beneficiaries (No of people who received)
 - i) Evacuated
 - ii) Relief
 - iii) Recovery/compensation
 - iv) Medical support
 - v) Psychosocial support
- d) Total relief expenditure (Million USD)

- a) Immediate relief (million USD)
 - i) Total International Relief
 - ii) Japan
 - iii) All other foreign countries
 - iv) Non-governmental/voluntary contributions
 - v) Private sector
- b) Food (tons, total)
- c) Water (million liters)
- d) Medicines (tons or Million USD or Number of patients)
- e) Clothing (tons or Nos etc.)
- f) Electricity generators (Nos)
- g) Earth moving machines (no)
- h) Financial compensation for damaged houses including reconstruction (USD)
- i) Financial compensation for livelihood assets (cattle, ag fields, trucks etc.)
- j) Foreign technical assistance for long term risk reduction
- k) financial assistance for long term risk reduction

DRR capacity & vulnerability

- a) Population
 - i) Total
 - ii) Male
 - iii) Female
 - iv) Children
 - v) Elderly
- b) Economic category
 - i) Below poverty line
 - ii) Middle class
 - iii) Rich
- c) Health
 - i) No of hospital beds
 - ii) No of doctors
 - iii) No of Ambulances
 - iv) % of population with access to health facilities
- d) Disaster relief and response capacity
 - i) % people with access to evacuation shelters
 - ii) Total no of evacuation centers including schools etc. used
 - iii) No of trucks
 - iv) No of boats
 - v) No of Mass Communication equipment (satellite phones, radio communication etc.)
- e) Vulnerability
 - i) % population in Flood prone/typhoon prone areas
 - ii) % of agriculture area vulnerable to floods/typhoon
 - iii) % of area flood/cyclone prone
 - iv) % of non-permanent houses
 - v) % of houses in flood-prone/typhoon areas
 - vi) % of critical infrastructure in flood/typhoon areas
- f) No of water tankers/safe drinking water supply facilities
- g) % of people with access to safe water facilities
- h) No of staff trained in critical emergency operations
- i) No of fire brigade staff
- j) Civil defense forces (No)
- k) Military and other deployed for civil purposes (No)
- l) DRR funds (USD) Prior agreement with national and foreign entities for relief (No)
- m) Food stocks that can be mobilized on emergency (MMt)

What Determines Country's Dependency on External Assistance? Principal Component Analysis

- Dependent Variable: External Emergency Assistance (USD)
- Independent variables: Deaths, number of people affected, damage, GDP, Governance effectiveness, and poverty
- Principal component analysis design:
 - Rotation: Oblimin rotation (assumption: Principal components/factors are correlated)
 - Reduction of factor numbers: Eigenvalue < 1

PCA Analysis Results: E.g. Philippines

Pattern Matrix^a

	Component	
	1	2
Deaths	1.003	
Damage	.954	
Affected	.934	
Poverty		.996
GovEffect		-.946
GDP		-.928

Extraction Method: Principal Component Analysis.
Rotation Method: Oblimin with Kaiser Normalization.

a. Rotation converged in 6 iterations.

PC 1: Disaster Impact Indicators

PC 2: Macro Indicators

Total Variance Explained

Component	Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %
1	3.715	53.076	53.076
2	2.845	40.649	93.725

Extraction Method: Principal Component Analysis.

Component Transformation Matrix

Component	1	2
1	.832	.555
2	.555	-.832

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.

The correlation between two components is not very strong

Identifying the Critical Threshold Value for The Philippines: Regression Analysis

- The two principal components generated were used to develop a new variable. The Principal 1 is called Disaster Impact and PC 2 can be called Macro Economic

ANOVA ^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	4.511E+17	2	2.256E+17	31.592	.000 ^b
	Residual	1.214E+17	17	7.140E+15		
	Total	5.725E+17	19			

a. Dependent Variable: Assistance

b. Predictors: (Constant), Macro economic indicators, Impact of disaster

Only disaster impact indicators show significant regression

VIF <3, hence no multicollinearity problem

Coefficients ^a							
Model		Unstandardized Coefficients B	Std. Error	Standardized Coefficients Beta	t	Sig.	Collinearity Statistics Tolerance VIF
1	(Constant)	58522475.43	121285572.6		.483	.636	
	Impact of disaster	.948	.129	.930	7.359	.000	.780 1.282
	Macro economic indicators	-.002	.002	-.101	-.797	.437	.780 1.282

a. Dependent Variable: Assistance

Ext. Em. Assist.=0.948*PC1-
0.002*PC2+58522475

The Philippines tend to ask for Assistance when the PC1 reaches a value of **58522475**

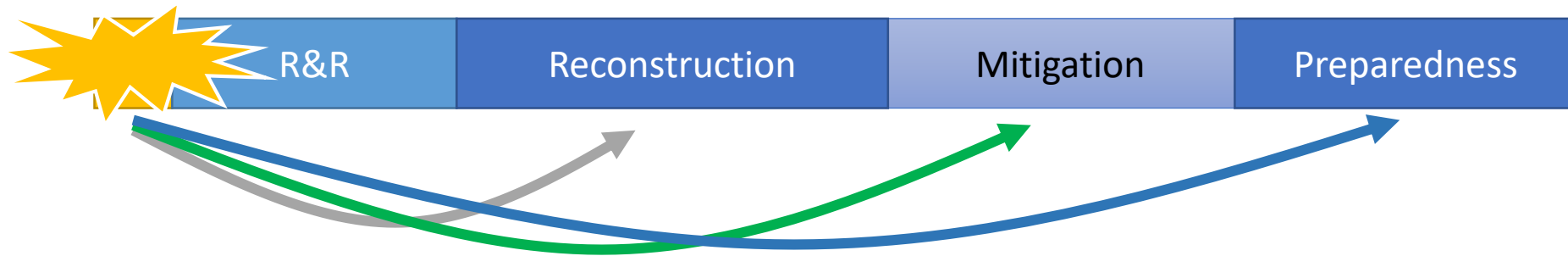
Critical thresholds for Major Asian Countries

- Afghanistan = $-0.007*PC1 - 25555*PC2 + 38020265$
- Bangladesh = $0.000*PC1 + 7.058*PC2 + 19520455$
- China = $0.008*PC1 - 2.50*PC2 + 20740127$
- India = $-8.55*PC1 + 0.000*PC2 + 38072756$
- Indonesia = $4.48*PC1 + 50.46*PC2 - 9700875$
- Pakistan = $0.04*PC1 + 112*PC2 - 1305814894$
- Sri Lanka = $0.001*PC1 + 57.2*PC2 - 19513408$
- Vietnam = $0.000*PC1 + 3.421*PC2 - 2977399$

Principal Components Vary for Each Country with Some Commonalities

Country	Principal Component 1	% σ^2	Principal Component 2	% σ^2
Afghanistan	GDP , poverty, affected	42	Dead , governance	29
Bangladesh	Poverty , GDP , governance	50	Affected , dead	23
China	Damage, dead, governance	47	Poverty, GDP, affected	26
India	Poverty, GDP, affected, dead	39	Damage, governance	21
Indonesia	GDP, poverty, governance	59	Affected, dead	28
Pakistan	Poverty, governance, GDP, affected	58	Dead	24
Philippines	Death, damage, affected	63	Poverty, governance, GDP	32
Sri Lanka	GDP, poverty	41	Dead, affected, governance	26
Vietnam	Governance, GDP, damage, poverty	58	Affected, dead	25

Connect Short-term EEA Engagements with Long-term Risk Reduction



- R&R is constituted of short period of time where large sums of resources will be spent.
- Much of these expenditures may not lead to long-term risk mitigation benefits.
- Linking experiences and lessons from engagements related to assistance and ploughing back into other phases of DRR could enhance the value of resources employed during the emergency phase.

Conclusions

- No one-fits-all strategy works.
 - According to the risk layering approach, risk management and risk financing tools needs to be deployed.
 - Insurance cannot address non-economic losses and damages. Hence, combining instruments such as PES with insurance can help cover a range of risks.
- Appropriate targeting is essential:
 - Ensures effectiveness and efficiency
 - It will contribute to reduced costs (including chances of maladaptation).

Thank You!



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