

Instruments to protect farmers from exposure to climatic disasters

Alain de Janvry, University of California at Berkeley and FERDI

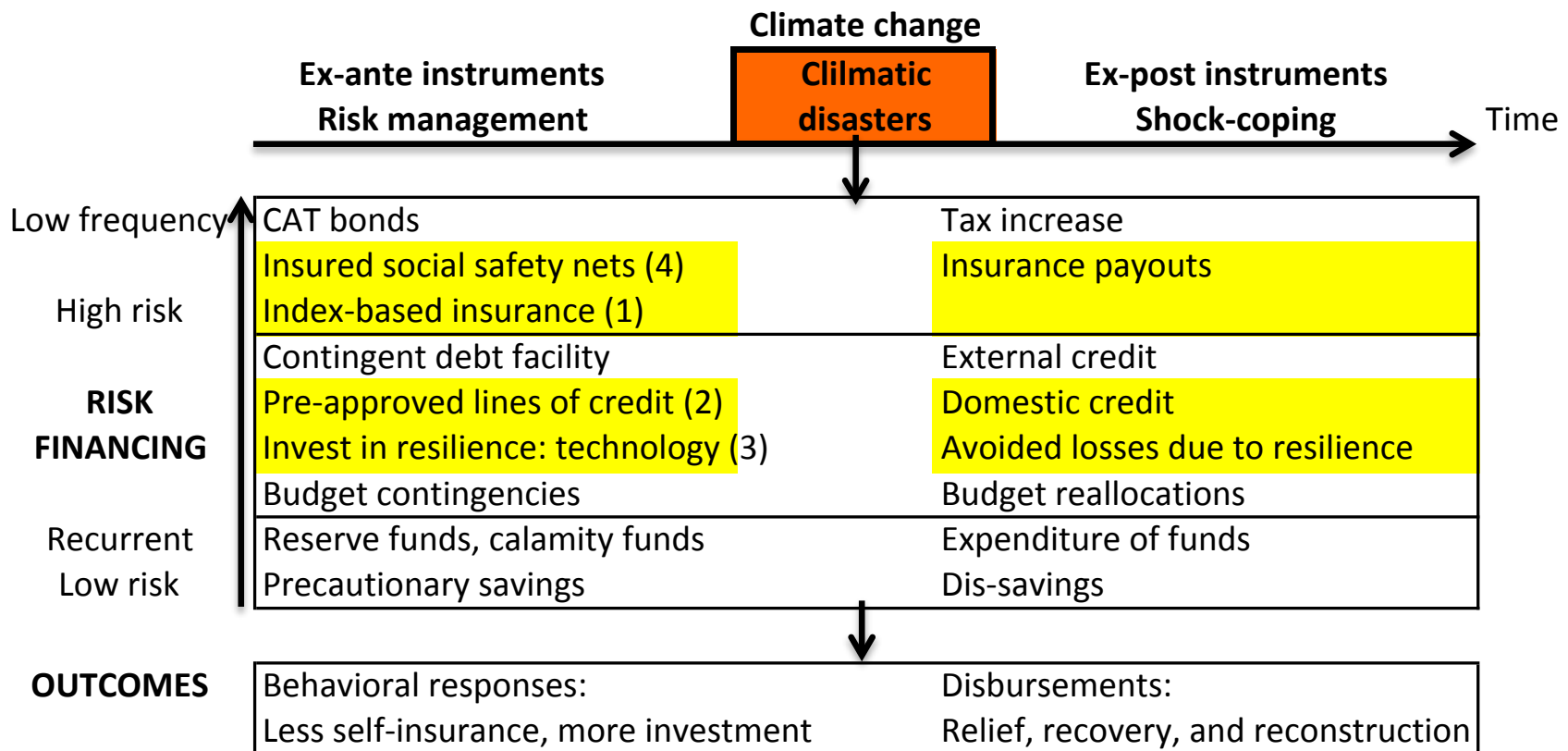


Farmer inspecting his flooded rice field in Odisha, India

Climate change adaptation: Disaster Risk Financing and Insurance

Importance of reducing exposure to weather risks for the world poor

- Exposure to uninsured **climatic disasters** has very high costs in terms of:
 - Poverty and welfare: ex-post losses and irreversibilities
 - Reduced investment and growth: ex-ante disincentives and costly self-insurance
- **Climate change** is increasing exposure to disasters, with lesser-known probabilistic regularities, and will likely get exponentially worse
- Weather risks cannot be reduced through local risk pooling arrangements due to covariate nature: need broader **instruments**
- Wide array of risk-reducing instruments exist: use as a **portfolio** of options



How to protect farmers from exposure to risk? Four instruments:

- (1) Index-based weather insurance (China)
- (2) Flexible financial products: pre-approved credit (Bangladesh)
- (3) Risk-reducing technology: resilient crops (India)
- (4) Insured social safety nets: triggered transfers (Mexico)

1. Progress with index insurance

What it is: payouts triggered by indicator (e.g., rainfall or area yield) crossing a pre-established observable threshold for a pre-determined area.

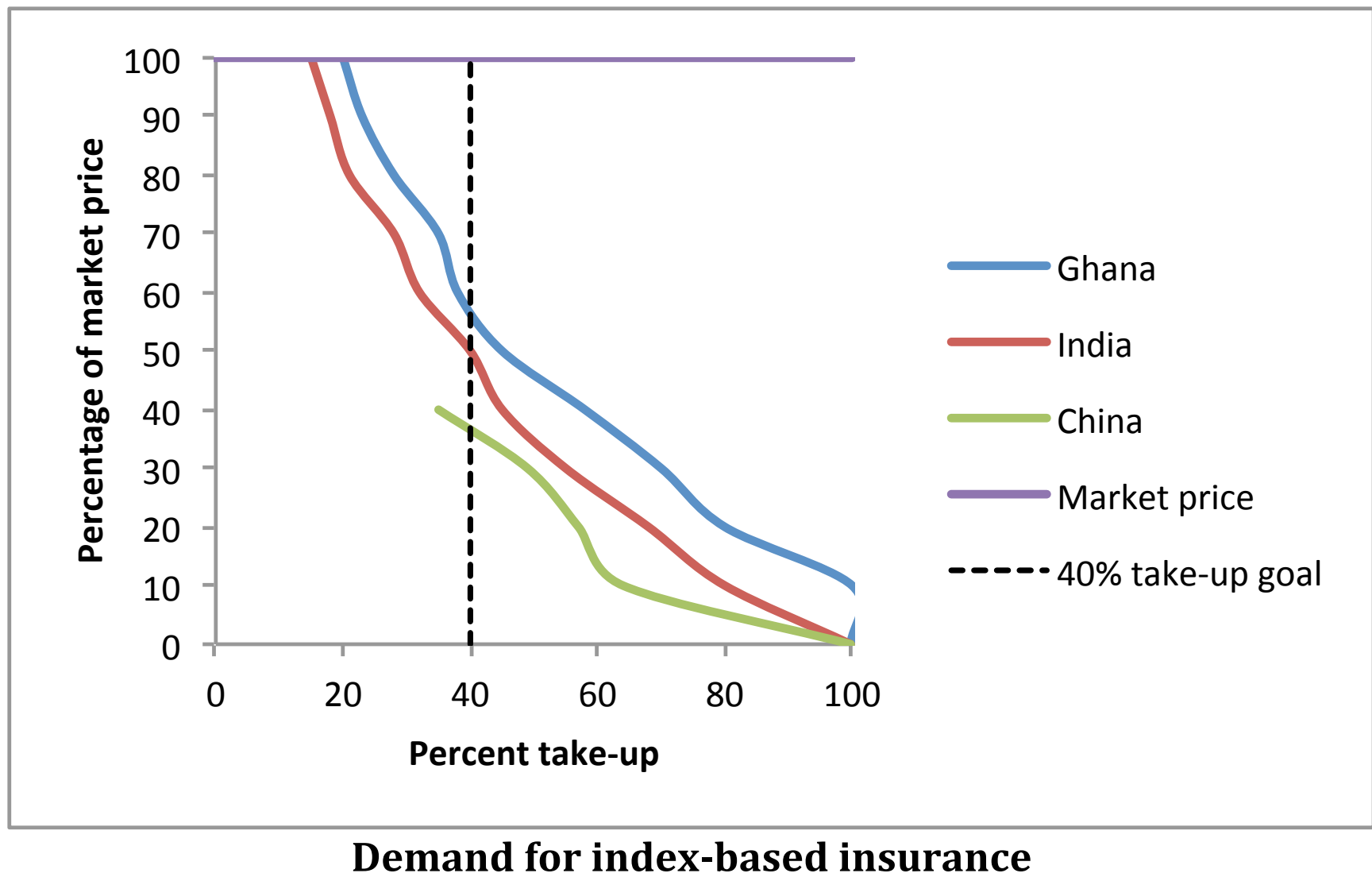
Potential for millions of small farmers/entrepreneurs shut out of the insurance market

Presumed advantages: no AS, no MH, low TC, no delays, cheap

It works where applied: better coping (less reduction of consumption, sale of assets), more investment (fertilizer Ghana), more high-value activities (Pakistan, India, China)

Private sector providers or semi-public

But low uptake at market price and need for high subsidies



How to solve this problem? Solutions

1. Improved design: reduce basis risk

Better weather measurements

Area yield triggers, satellite observations

2. Training in financial literacy: role of social networks (China experience)

3. Smart subsidies: effective but expensive. Define optimum subsidies for learning based on past subsidies and past payouts (China experience)

4. Trust in provider: witness payouts to oneself and to others

5. Use with other financial products as an element of a comprehensive risk layering strategy (DRFI): credit, technology, social safety nets

Conclude: subsidies needed for current uptake. Role for foreign aid for design, learning, re-insurance, and 40% target take-up.

2. Flexible financial products: Emergency indexed credit lines

- BRAC example (NGO Bangladesh): microfinance credit declines after shocks (floods), savings are depleted, and missed payments and defaults rise
- Microfinance typically very rigid and concerned with repayment due to lack of collateral
- Innovation: Introduce **pre-approved** additional credit line for **good clients** (high credit score) **triggered** by climatic events (like index insurance) to preserve option to borrow
- Observe uptake of new financial product
- Can have **ex-post** coping value (welfare) and **ex-ante** risk management (behavior) effect
- Other case: Emergency loans by **Vision Fund International** following hurricanes in the Philippines, but slow disbursement

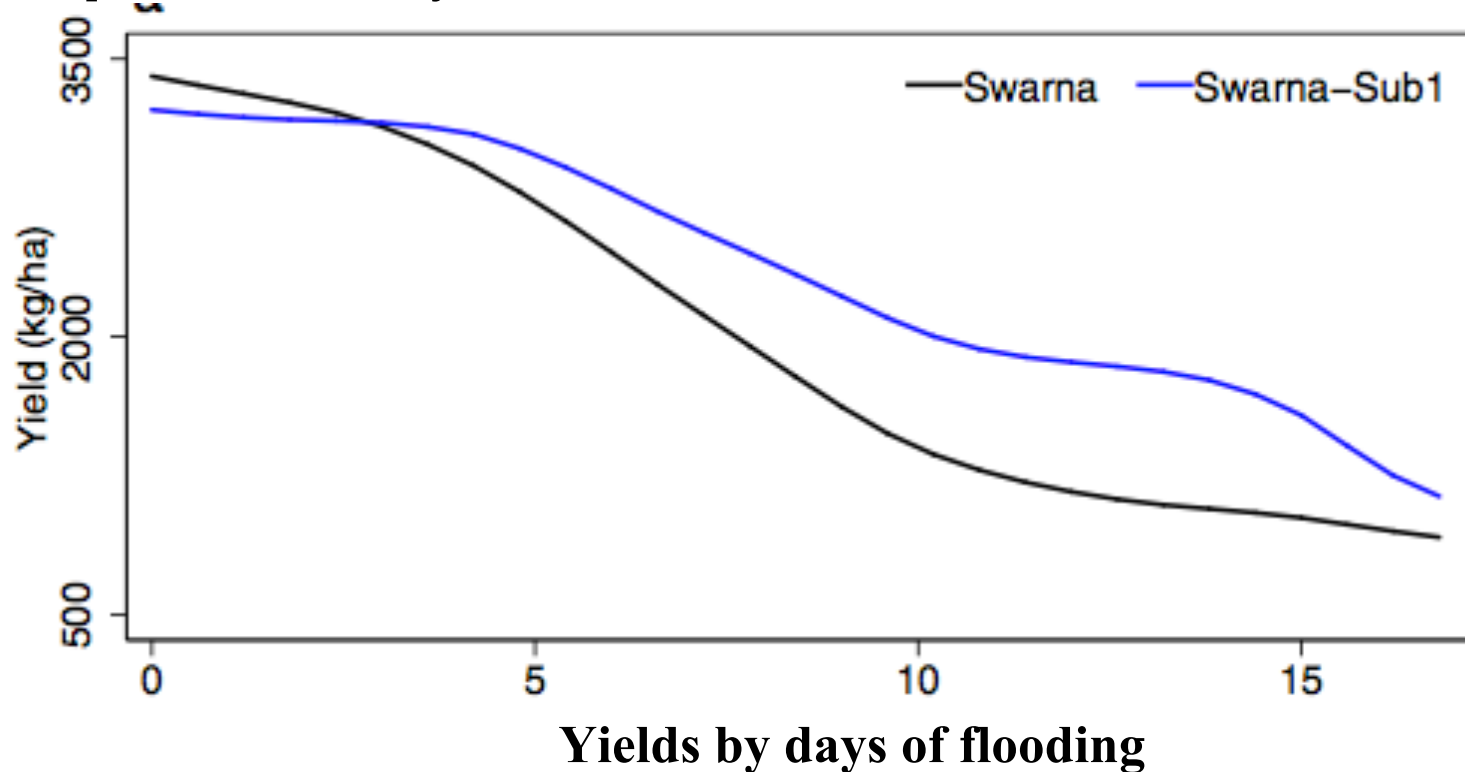
Conclusion: Emergency credit can be privately provided. Role of foreign aid in design and experimentation

Huge opportunity to introduce a new microfinance product in context of climate change

3. Risk-reducing technology

Rice crops increasingly exposed to weather shocks: floods, droughts, high temperatures

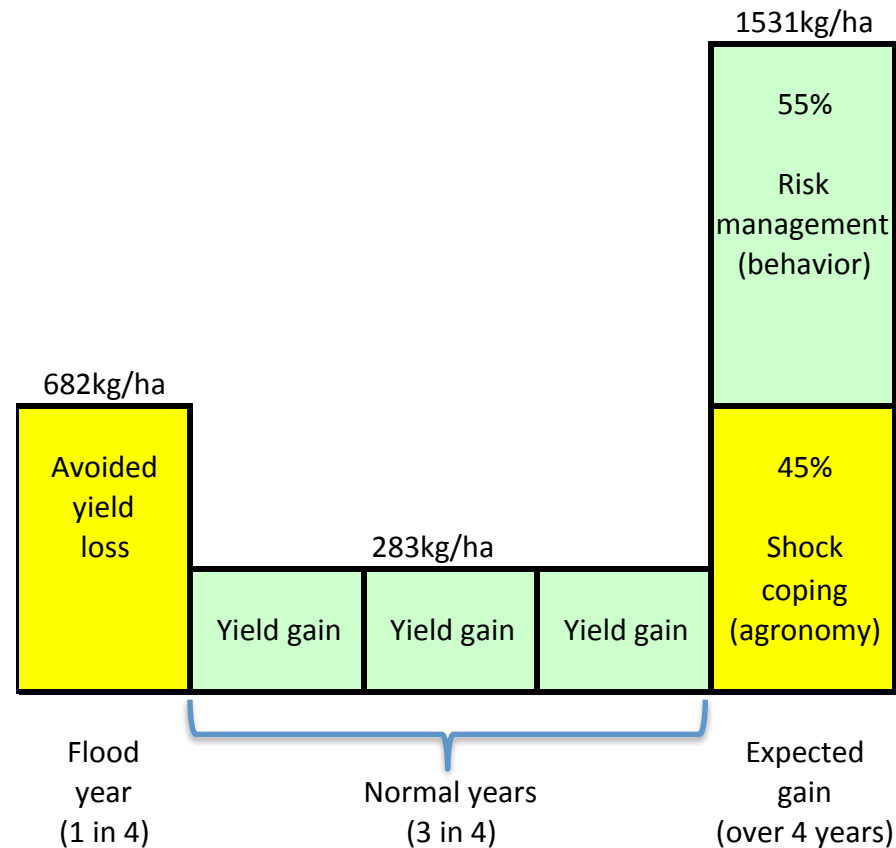
SwarnaSub1, a new rice variety developed for South Asia by IRRI and national partners, with capacity to survive up to 14 days of submergence, compared to 4-5 days for normal rice.





Yield advantage of SwarnaSub1 after flooding, Odisha, India

Story told:



Conclusions: Shows that risk reduction can have high payoffs not only for relief but also for growth.

Role for foreign aid: invest in international public goods such as risk reducing agricultural technology.

4. Insured social safety nets

Publicly provided social safety nets

Provider can use insurance to reduce potentially huge weather-based fiscal risks

Case of Cadena, Mexico

- State governments need put into place social safety nets to respond to catastrophic weather events, such as drought for smallholder farmers
- But social safety nets are highly destabilizing of public finances, periodically starving planned expenditures in health, education, infrastructure
- Response: introduce weather insurance indexed on indicators of extreme weather events
- Offer free insurance to targeted populations: Smallholders with less than 20ha of rainfed land

- Find that insurance payouts are effective in helping beneficiaries **cope with shocks**:
 - Plant more insured crops relative to non-beneficiaries the year after a payout
 - Plant more of all crops
 - Have higher post-shock income and expenditures than non-beneficiaries
 - Reduce dependence on remittances (private transfers crowded out by public)
- Can also be effective in inducing higher yields through **risk management** (Fuchs)

Conclusion: Insured social safety nets can work, and create additional benefits through behavioral responses

5. Conclusion: A major research agenda, with a huge potential for poverty and growth in adaptation to climate change

1. Current solutions still very **incomplete**, yet increasingly urgent.
2. **Index insurance** not commercially viable at farmer level and subsidies are expensive, but can be improved
3. **Flexible financial products** generally not available and un-tested, but can be designed and implemented
4. **Resilient agricultural technology** not available for many places (supply gaps) and partially adopted (need improve extension/demonstration), but large potential gains in both shock coping and risk management
5. **Insured social safety nets** barely explored, but can be effective
6. Countries need develop **comprehensive ex-ante DRFI strategies** that combine these various instruments in terms of finance, investment, and implementation
7. Requires more **design, experimentation, evaluation, and implementation**

End