

Crop insurance in Bangladesh: protecting poor farmers against natural disasters?

Overview

Bangladesh is a highly flood prone country, being situated on deltas of large rivers flowing from the Himalayas: the Ganges, the Brahmaputra, the Jamuna and the Meghna. These rivers fill up with melted snow from the Himalayas, while heavy rainfall during the monsoon season (June to October) combines to bring extensive floods. Serious flood damage can mean a total loss of livelihoods: families are made homeless, crops are destroyed, there is no fodder for livestock, and poultry drown.

Nearly 35 million people in Bangladesh are affected by flooding (25% of the total population). Agriculture is the source of employment for more than eighty percent of the rural population, many of whom live below the poverty line. A key challenge for poor farmers living in the river and coastal floodplains of Bangladesh is the management of crop damage risk when floods strike. Traditionally, this risk has been managed by building protective embankments, or by providing external help after flooding such as access to credit. Can farmers be more proactive when it comes to protecting their crops? One potential strategy for coping with the devastating effects of flooding is to introduce a crop insurance scheme. Such a scheme would require farmers to pay a fixed amount of money for the next five years (an insurance premium) on a regular basis. In the case of an officially recognized disaster, farmers would be compensated for any losses they had suffered as a result. But are poor floodplain farmers interested in buying crop insurance schemes? If so, how much of a premium are they willing and able to pay? Can crop insurance schemes be financially sustainable in areas where natural disasters are a regular event?

This study aims to 1) assess the demand for crop insurance, and 2) test the commercial viability of a crop insurance scheme in areas of Bangladesh exposed to four different types of natural disaster risk. The results show that only certain groups of farmers would be willing to pay an insurance premium. Farmers' ability to pay is more important in determining the willingness to pay than the type of natural disaster risk they face. Crop insurance is only a marginally commercially viable option in riverine floodplain areas. It is not a viable option in the haor basin and coastal areas.



Issues facing policy-makers:

- Is there enough demand from farmers for crop insurance in Bangladesh?
- Which groups of farmers are the potential buyers?
- Is there a difference in demand for crop insurance from farmers living in areas exposed to different types of natural disaster?
- Given the demand for crop insurance and the value of premium farmers are willing to pay, are crop insurance schemes commercially viable?



Study Area

Bangladesh is situated in Southern Asia, bordering the Bay of Bengal. Crop damage in Bangladesh occurs mainly due to four major types of natural disasters: 1) riverine flood, 2) water logging, 3) flash flood and 4) coastal cyclone. These different types of natural disaster vary in terms of their frequency, timing, duration and extent of damage.

Seven districts were selected: two river districts without embankment protection located near or at the two major rivers in Bangladesh (the Meghna and the Jamuna) were selected on the basis of flood damage intensity observed during the 2004 disaster flood. One district was selected inside the Ganges-Kobadak project (one of the biggest and oldest Flood Control and Irrigation (FCDI) projects in Bangladesh) to cover damage from water logging. One coastal district surrounded by the Bay of Bengal and lower Meghna and one district in north east Bangladesh covering the flash flood-prone hoar basin were also selected. From these main districts, seven sub-districts called upazilla were selected that lie closest to the main rivers and sea. Households were interviewed within each upazilla (3600 in total).

The approach

We conducted a large scale household survey at the end of 2006. Using the contingent valuation method, 3600 riverine and coastal households were asked whether they would be willing to participate in a hypothetical insurance scheme to reduce the risk of damage caused by natural disasters (flooding and coastal cyclones). The households were divided into four different groups, each of which is exposed to a different type of natural disaster risk:

- River flood with no embankment protection
- River flood with embankment protection
- Flash flood
- Coastal cyclone

Such a scheme would provide financial compensation in the event of a future natural disaster such as flooding. Those respondents who declined to buy the insurance scheme were subsequently asked why they did not want to buy crop protection insurance. We used a statistical model to estimate the average willingness to pay for crop insurance schemes in the different risk areas. Using the information collected through the household survey, we investigated the commercial viability of crop protection insurance schemes. We used a simple analytical model to compare the future value of expected premium received by the insurer with the expected indemnity (money paid out to farmers in the event of a flood). Our model assumes zero administrative cost for insurance delivery and a market interest rate of 10% per annum. Expected indemnity payments were calculated based on the average crop damage costs incurred by households. Using the estimated willingness to pay for crop insurance scheme in different risk area, we also calculated the future value of the total insurance premium payable by the farmer.





These are the key results:

1. The demand for crop insurance is not very high.

Just over half of the respondents said they were willing to buy the insurance scheme in principle. Nearly half (42%) of those who were not interested stated that they didn't have enough household income to be able to participate in such a scheme. One third of these respondents refused to buy crop insurance because they disliked the stated terms and conditions of the hypothetical insurance scheme. The two least popular features of the scheme were that:

- i) insured farmers would not be paid any money if there was no disaster within 5 years and
- ii) insured farmers would be compensated only if the disaster was officially acknowledged.

2. Rich farmers are the potential buyers.

The following groups of farmers are significantly more willing to buy crop insurance schemes:

- Households who depend primarily on crop farming for their livelihoods.
- Land owners (as opposed to landless farmers).
- Land owners who own large parcels of land (around one and a half hectares or more).

3. Willingness to pay between farmers living in different areas varies widely because of difference in ability to pay.

Frequency of flooding from natural disasters varies between the different areas. Households living within an embanked area suffer damages once every six years. Those living without flood

protection suffer damages once every five years. Coastal households experience damages from coastal cyclones at least once a year. Crop damage varies depending upon the nature of the natural disaster (see Figure 1).

We estimated that farmers on average are willing to pay between Tk. 26 (US\$ 0.41) and Tk. 45 (US\$ 0.71) per household per week across the four different risk areas. Interestingly, farmers living in the areas protected from some flooding by embankments are willing to pay the highest premium for crop protection. Farmers in the flash flood region suffer the most crop damage from flooding. Conversely, they are willing to pay the least amount to protect their crops from future damage. The variation in willingness to pay can be explained by differences in livelihood opportunities and income in the four risk areas. Annual household income for farmers located in the flash flood area is significantly lower than any of the other risk areas included in this study. There are few opportunities to earn money outside of farming and households experience destruction from natural disaster on a regular basis. Farmers living in the protected areas have higher household incomes due to year-round availability of irrigation water as well as protection from seasonal and annual flooding.

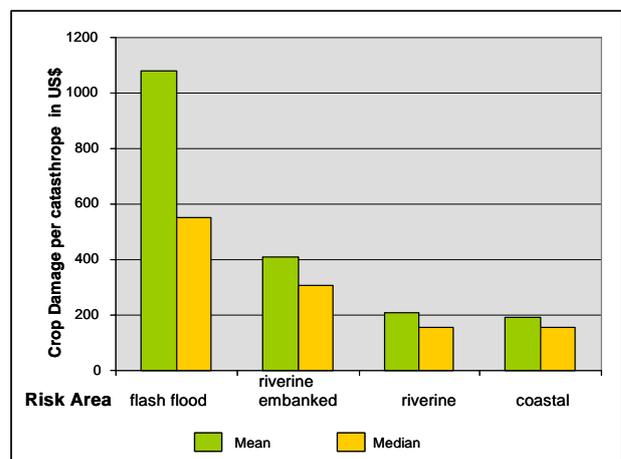


Figure 1: Comparison of crop damage in the four different risk areas

4. Crop insurance schemes are not always commercially viable

In nearly all of the risk areas, the expected average insurance premium that farmers are willing to pay is too low to cover the expected indemnity payouts (see Figure 2). This means that crop insurance schemes are not viable in the flashflood and coastal cyclone areas.

The least feasible option is in the flashflood areas, since the amount farmers are willing to pay is very

low, while the crop damage cost per disaster is the highest in this study area. Although the crop damage cost in coastal areas is the lowest of all the risk areas, natural disasters happen almost every year. This means that the expected indemnity payouts will be more than the insurance premiums paid by the farmers. Crop insurance schemes are only marginally viable in the embanked and unembanked river floodplain areas.

Risk Type	Viability Score
Riverine_unembanked	0.9
Riverine_embanked	1.0
Coastal	4.6
Flash flood	7.3

Viability score =1 implies insurance scheme is commercially viable.

Figure 2: Financial viability of crop insurance contracts

Solutions for policy makers

Our research indicates that a uniform structure for a crop insurance market does not exist in Bangladesh. If policy makers are seriously considering setting up a crop insurance market, we recommend that the following key factors be considered:

- Crop damage varies depending on the nature of the disaster (e.g. coastal cyclone or riverine flooding). Farmers' willingness to pay also varies depending on the socio-economics of the area. Therefore any crop insurance scheme needs to be developed in a case-by-case manner.
- The sustainability of an insurance scheme depends upon the widespread participation of

floodplain residents. Households who are familiar with the concept of insurance are more likely to purchase a crop insurance scheme. It is essential to enhance people's understanding by using targeted TV and radio programmes.

- Crop insurance is not commercially viable in the haor basin and coastal floodplain areas of Bangladesh. It breaks even in the river floodplain areas where a moderate amount of government subsidy may be useful for the start up period. However, depending on the institutional set up for a crop protection insurance scheme, a high administrative cost may render it impractical.



PREM: In brief

This policy brief is based on the PREM report, 'Demand assessment and test of commercial viability of crop insurance in Bangladesh'. The full papers are available online at: www.prem-online.nl

By: Authors: Sonia Akter, Roy Brouwer, Luke Brander

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The full paper is available online at: www.prem-online.org

For further information about PREM, contact:

Pieter van Beukering
Institute for Environmental Studies (IVM)
Vrije Universiteit
De Boelelaan 1087
1081HV Amsterdam The Netherlands
Tel. +31(20)5989555/Fax. +31(20)5989553

beukering@ivm.vu.nl
www.prem-online.org - www.vu.nl/ivm