



*Strengthening local capacity
in the economic analysis
of environmental issues*

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Flood insurance market for farmers affected by climate change: A study from Vietnam

As in many developing countries, floods are increasingly becoming a problem in Vietnam. This issue will become even more significant in the future as the impact of climate change becomes more pronounced. One way in which farmers can guard against the negative impacts of floods is to take out insurance. However, little research has been done on this issue in Vietnam.

To provide much needed information to policymakers, a new EEPSEA report has looked at the demand for flood insurance amongst farmers in the Vietnam Mekong Delta.

The study is the work of a team led by Phung Thanh Binh from the University of Economics, Ho Chi Minh City. It finds that, although farmers are willing to pay a significant amount of money for flood insurance, a large proportion do not currently favor taking out a flood insurance scheme. The study highlights the reasons why this might be the case. It also suggests ways in which farmers can be encouraged to invest in flood insurance and highlights opportunities for insurance providers in Vietnam.



A summary of EEPSEA Research Report No. 2017-RR10 'The Flood Insurance Market in Vietnam: Challenging but Potentially Profitable' by Phung Thanh Binh, Xueqin Zhu, Rolf Groeneveld, and Ekko van Ierland. Comments should be sent to: Mr. Phung Thanh Binh, Department of Environmental, Agricultural and Resource Economics, University of Economics Ho Chi Minh City, 1A Hoang Dieu Street, Phu Nhuan District, Ho Chi Minh City, Vietnam. Tel: +84 8.3844.8222. Fax: +84 8.3847.7948. Email: ptbinh@ueh.edu.vn



A typical farm home for a family growing rice in the Vietnam Mekong Delta. This photo was taken about a week before the planting of the next rice crop, so the paddy is flooded but fairly low. Photo by Colin Dawson, sourced from flickr.com.

The flood insurance challenge

Flood insurance helps many households minimize the losses they experience following floods and helps them repair any damage floods cause. Well-designed insurance packages also motivate people to adopt certain flood mitigation measures.

There have been many studies on the demand for flood insurance in various developed countries. However, studies in developing countries have been rare and have often been compromised in terms of their experimental design and the techniques they have used. By implementing a carefully designed and innovative research approach, Phung Thanh Binh and his team aimed to provide useful information on the demand for flood insurance in Vietnam and to assess the opportunities and challenges that exist for insurance companies.

Vietnam's Mekong Delta

The study team worked in five districts in Vietnam's Mekong Delta, namely: (i) Tan Chau, which has a high risk of flooding from the Hau River; (ii) Tan Hong, which has a high risk of flooding the Tien River; (iii) Cao Lanh, a medium-risk

district near protected wetland areas; (iv) Cho Moi, a medium-risk district protected by a modern Vam Nao dike system; and (v) Vi Thuy, a low-risk district near the Xang Xa No canal. These districts are located on either the Tien River or the Hau River and were recommended by flood risk experts from Can Tho University.

One representative commune was selected in each district. Information was collected using a questionnaire from a random sample of 374 households drawn from the five districts. This was done during the 2015 flood season. The questionnaire asked for general information about the respondents and their families, their economic activities, their perceptions of flood risk, and the flood control management in their districts. It also assessed the respondents' attitudes to risk and included a choice experiment, which was designed to highlight the factors that would encourage farmers to take out flood insurance.

Assessing if farmers will take out flood insurance

To design the choice experiment, the research team worked with insurance experts to identify the key attributes of a typical

flood insurance product. With five key attributes chosen, the team used focus groups to check the feasibility of the proposed attributes and to determine appropriate 'levels' for each one (listed in Table 1).

Choice sets were generated from the chosen five attributes using orthogonal main effects design. Each of these described a range of insurance products with different characteristics. Respondents were then asked to choose the one they most preferred.

The study also found that effects coding (an approach in which qualitative attributes are coded as -1 and +1) is better than conventional dummy coding (an approach in which qualitative attributes are coded as 0 and 1) in terms of model specification, and thus results in better estimation of willingness to pay (WTP) values for flood insurance products.

Do farmers favor flood insurance?

The study found that a very high proportion (64%) of farmers in the study areas did not favor taking out flood insurance. Specifically, people in higher-risk regions were less interested in taking out a

flood insurance plan compared to those who live in low-risk regions. This can be explained by the fact that, after catastrophic floods in 2000, the Vietnamese government made huge investments in the construction of large-scale full-dike systems and residential clusters. The existence of this 'levee effect' implies that many people in the study areas believe that these defences will protect them from future floods.

In addition, households in Cao Lanh district felt that they were relatively safe from flooding because of the protection provided by local wetlands and because they live relatively far away from large rivers. What's more, a number of respondents from all areas felt that floods will never happen again in their area. Due to this 'wishful thinking' they were therefore not interested in buying flood insurance.

The study also found that the more a household depends on agricultural activities, the more likely it is that they will refuse to buy flood insurance. This may be because such purely farming households are more loss averse than risk averse. This finding implies that the Vietnamese government may find it challenging to design a popular insurance programme for farmers.

The impact of age

People over 40 years old were more interested in a flood insurance programme than those younger. This can be explained in two ways. Risk aversion rises as age increases, so demand for flood insurance will also increase with age. In addition, the older a person is, the more flood disasters they are likely to have experienced and the more likely they are to think that insurance is important.

Members of agricultural cooperatives were less in favor of insurance than those not in such organizations. This may be because agricultural cooperatives provide common adaptation measures such as pump stations, early weather warning systems, and special loan policies for their members. Therefore, members of agricultural cooperatives have less reason to buy flood insurance. This poses a potential challenge for insurance companies as governments in the Mekong River Delta want to expand the agricultural cooperative development programme (to realize economies of scale).

In addition, households with farms and farming properties not protected by August dikes (i.e., semi-dikes made of clay and trees which also serve as irrigation

canals that connect to rivers) are more likely to buy flood insurance. Moreover, those who have experienced recent flooding are also more likely to favor insurance because their recent memories of flooding heightens the perceived probability of a future flood.

The impact of income

Not surprisingly, the richer a household, the more likely it will be to join a flood insurance program and the more willing it will be to pay more for flood insurance. Moreover, obviously, respondents are more likely to favor lower levels of deductible and cheaper premiums. This indicates that respondents are willing to adopt self-protection measures so that they can pay a lower level of premium.

Overall, flood-prone households prefer 'triple disaster' insurance to 'double disaster' insurance, and prefer 'double disaster' insurance to 'single disaster' insurance. This is explained by the fact that they often face various natural disasters during the rainy season; it therefore makes sense for them to choose insurance that will cope with all disasters at once.

Insurance schemes are more popular the higher the cover they provide. This implies that

Table 1. Description of attributes and their levels

Attributes	Description	Labels
Insurance policy	Single flood insurance policy or combined insurance policy.	Policy 1: Flood insurance Policy 2: Flood + waterlog insurance Policy 3: Flood + whirlwind insurance Policy 4: Flood + waterlog, & whirlwind insurance
Insurance cover	The loss paid directly to the insured by the insurer for first-party coverage. It is measured in terms of VND million per 1000 m ² .	VND 2 million per 1000 m ² VND 3 million per 1000 m ² VND 4 million per 1000 m ²
Insurance provider	The insurance providers.	Joint-stock insurance company Private insurance company International insurance company
Deductible	Part of the damage due to flood hazard is initially borne by the insured.	Low deductible level: 10% High deductible level: 25%
Insurance premium	The cost per 1000 m ² paid by the insured to the insurer at a given time before the flood season.	VND 15.000 per 1000 m ² VND 50.000 per 1000 m ² VND 30.000 per 1000 m ² VND 65.000 per 1000 m ² VND 40.000 per 1000 m ²

farmers are risk averse. However, it should be noted that it is not only risk-averse farmers who want higher insurance cover. It is also clear that post-flood disaster relief from the government is not a significant factor in the choices farmers make. This is probably due to the low level of relief provided. For example, after the catastrophic flood of 2011, affected farmers only received a subsidy of about VND 0.5 million per 1000 m².

It was also found that respondents prefer joint-stock companies over private companies, and private companies over international companies. A possible explanation is that international insurance companies operate mostly in urban areas. Therefore, rural households are not familiar with their services. However, as not all respondents favor joint-stock companies, international insurance companies will have an opportunity to offer flood insurance services if the market is developed.

Farmers' willingness to pay for flood insurance

For a triple-disaster insurance and high deductible package, the mean WTP for flood insurance ranged from VND 45,000 to VND 163,000 per 1000 m², depending on the type of insurance provider (Figure 1). The break-even point for insurance companies is about VND 20,000 per 1000 m².

It is clear that flood-prone households do have the ability to pay for flood insurance packages because their WTP is only equivalent to a small percentage of their income from agricultural cultivation. For example, if farmers choose triple-disaster insurance packages, the WTP per 1000 m² is equivalent to just 1.3% (for low cover, from an international company) to 4.8% (for high cover,

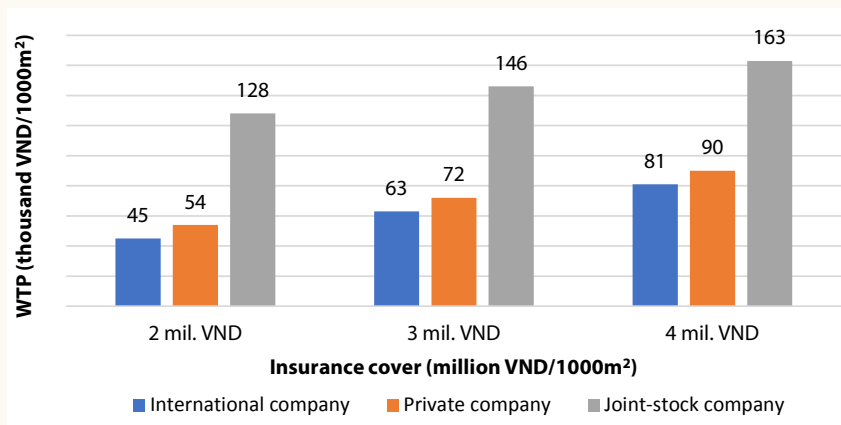


Figure 1. Estimated WTP for a 'triple-disaster' insurance package and a high deductible per type of insurance company

from a joint-stock company) of their total income per 1000 m².

Policy implications

It is clear that there is a potential market for combined insurance policies (i.e., flood with other disasters insurance) in Vietnam. Indeed, farmers' WTP for insurance is much higher than the estimated amount insurance companies would have to charge to break-even. This means that both private and international insurance companies could make a profit by providing triple-disaster insurance products.

To develop the market for this type of insurance, the study recommends that it will be important to enhance the understanding and awareness of agricultural communities, especially their younger members, about the role and operation of insurance schemes and to show them how such schemes reduce damages.

It also recommends that the government provide information through various communication programmes. Any communication programme should clearly define the responsibility of each stakeholder in integrated flood

management, because some households in high-risk areas still blindly trust in the effectiveness of large-scale dikes and collective adaptation measures. In order to reduce wishful thinking among flood-prone farming households, awareness campaigns should highlight how climate change will affect the strength and frequency of floods, especially in the Greater Mekong sub-region countries. Communication efforts should also provide immediate reminders of flood risk.

Finally, it is recommended that the government should not provide a generous subsidy for flood insurance because the average WTP for risk reduction is relatively high.

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