

Increasing Financial Capacity in Disaster Risk Management of the Rural-Low Income through an Innovative Trinity Financial Instrument: A Case Study of Ayutthaya Province, Thailand

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Abstract. The purpose of this study is to increase Thai rural low-income households' financial capacity to handle with the house restoration cost caused by flood damage through providing affordable proactive finances. The study aims to introduce the Trinity Financial Instrument (TFI): micro-insurance, micro-credit and micro-savings, to Thai policy-makers. The study considers the government's cash compensation for house restoration as reactive finances for the flood-affected households. This compensation potentially results in increasing long-term financial vulnerability of the households. To analyse the financial vulnerability, an Asset-Based Approach aiming to measure vulnerability was used for formulating independent variables, and a financing gap regarded as a dependent variable was adapted from the CATSIM model (Catastrophe Simulation Model) for indicating a funding proportion of reactive finances to the total house restoration cost. In addition, a comparison of household preferences in financial instruments between the previous financial statement and the future financial plan of individual households could explain how they change their preference after introducing TFI. In this study, Tambon Phukaothong, Ayutthaya Province, Thailand, was selected to be a case study. Based on the quantitative methodology, 197 households were surveyed by a questionnaire distribution. The result found that more than half of the respondents were categorized as a high financially vulnerable group in 2006 flood event, because the compensation of the government potentially made respondents rely more on reactive finances rather than seeking for proactive finances. Consequently, an average funding proportion of proactive finances to the total house restoration cost was about 44% during the 2006 flood event. Nevertheless, the use of proactive finances for funding house restoration among Thai rural low-income households would increase to 82%, based on the assumption that the government replaces the compensation for house restoration with TFI. With regard to the results, the study proposes that the Thai government is a key factor in assisting Thai rural low-income households in funding house restoration activities associated with floods. However, instead of providing the reactive compensation, the government should provide the households with access to affordable TFI in order to guard them against future flood damage.

Keywords: Rural-low income households, Financial vulnerability, the Trinity financial instruments; microinsurance, micro-credit, and micro-savings

1. Rural Low-Income Households Suffering from the Overwhelming Cost of House Restoration Caused by Flood Damage

Natural disasters happened in the past indicate that an annual flood is a major disaster in Thailand, and it tends to be more severe than the past of centuries in terms of increases on its frequency and intensity. Therefore, a flood can be interpreted as an extreme situation when it is compared with daily-life conditions as it makes disaster victims, especially rural low-income households, suffer in both diminished mental health and physical losses of their property.

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Individuals' resilience to flood insecurity appears to be the most important predictor of why different households decide to deal with a flood in different ways and suffer the consequences of flood impacts dissimilarly, even if they live in the same area. The resilience to flood insecurity not only refers to households' capacity to deal with flood impacts in order to recover their living conditions and infrastructure that supports them, but also implies that how households are vulnerable to floods. Based on literature reviews towards households' vulnerability to disasters, a number of reasons given by scholars obviously indicate that the most vulnerable group in disasters is supposed to be low-income households who live in the rural area. Cunny (1983) [1] argued that low-income victims are made more vulnerable to disasters due to lack of financial capacity to handle with any risks, especially unexpected risk. The statistical data of in Peru provide evidence of dropped consumption phenomenon of different household income groups caused by natural disasters during 2000 to 2006 that different the income groups suffered disaster impacts in different levels. Due to those disasters, the first quarter of poorest group dropped their consumption by 3.8 percent, while the least poor group in the top quarter had consumption dropped only 1.2 percent (UNISDR, 2009) [2]. Seemingly, a natural disaster does not only impact on vulnerable households during it is occurring, but also disaster victims had been suffering from financial losses after disaster occurred, especially the low-income households. It can be seen clearly that the financial situation of households and time spent in the disaster recovery process depends on their assets and socio-economic characteristic. For Thai rural low-income households, their financial options are narrower and more climate-sensitive than the other income class. Therefore, rising flood risks and the rural low-income's low capability to pay for the house restoration lead to financial vulnerability to deviations from average climate conditions, particularly vest floods.

As a viewpoint of emergency response, a disaster emergency should be brought under control. Thai government, therefore, provides disaster reliefs to assist disaster victims after a disaster strikes such as distributing survival kits, building shelter-in-places, and compensating house restoration costs. With those government's reliefs, it may potentially reduce the disaster victims' vulnerability in short-term, but it does not ensure that long-term financial vulnerability and financial deficiency in the house restoration, will be decreased. Moreover, the reactive reliefs give an incentive to affected households to rely more on the government rather than seek for proactive finances in order to manage disaster risks.

Instead of providing reactive reliefs based on tax income, the government should look for other instruments of risk financing approaches. Increased attention in risk financing approaches has recently been given to the possible role of financial services in disaster risk management (Koko and Colleagues, 2007) [3]. Table 1 shows a number of innovative risk financing instruments for helping affected households to have better financial liquidity in order to restore their property after disaster events. Based on risk financing theories, risk financing approaches can be categorized into four categories, which are non-market risk sharing, market risk transfer, inter-temporal risk spreading and the other self-financing.

Table 1: Risk financing approaches and instruments

Approaches	Examples of instruments
1. Non-market risk sharing	Disaster relief provided by government, NGO and donors
2. Market risk transfer	Insurance and reinsurance, Micro-insurance and Catastrophe bond
3. Inter-temporal risk spreading	Contingent credit (financial market instrument), Reserve fund, and Microfinance in term of Microcredit services
4. Self-financing	Four financial options facing low-income households in a crisis - Reducing household consumption - Making distress sales of physical assets, including livestock - Sending family members to search for work in less-affected areas - Drawing upon their savings

Sources: Adapted from Hochrainer and colleague (2007)[4], Parker and Nagarajan (2000)[5]

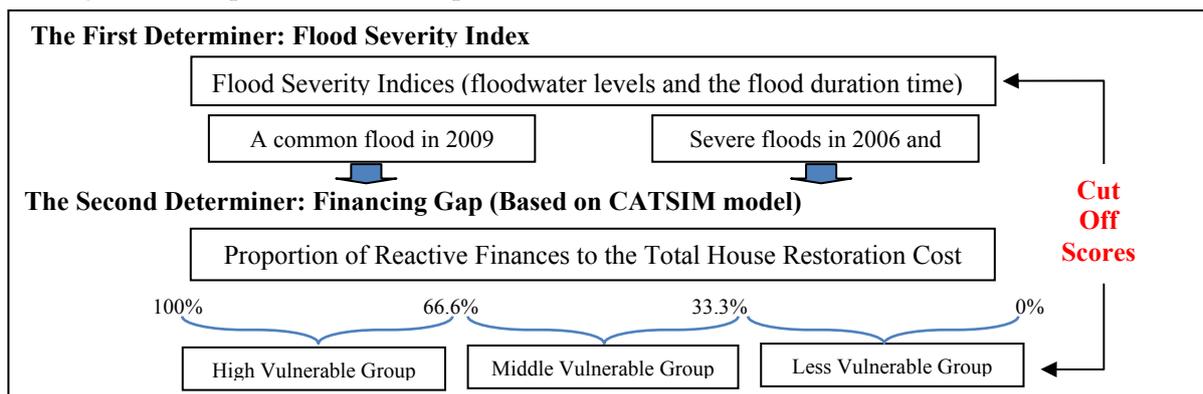
However, each of disaster risk financing approaches has its strengths and weaknesses. Using only one instrument may not be effective at increasing financial capacity for flood risk management. Therefore, the study focuses on a combination of Trinity Financial Instrument (TFI); micro-savings, micro-credit, and micro-insurance, in order to enhance financial capacity in disaster risk management of the rural-low income. The expected outcome of this study is to introduce Thai policy makers the TFI for enhancing households'

financial capacity to cope with the overwhelming cost of house restoration and improvement associated with floods. The study was conducted with regard to two research core questions, which are “How do Thai rural low-income households handle with house repair cost associated with flood damage?” and “Can TFI motivate the households to take proactive finances in funding house restoration?”. Consequently, two objectives of this study correlated with the research questions were to indicate of Thai rural-low income households’ the status quo in financing house restoration and to examine household preferences in financial instruments for funding future house restoration caused by floods, based on an assumption that if the government will replace cash compensation for the house restoration with TFI.

2. Assessing the Financial Vulnerability of Thai Rural Low-income Households to Flood Hazards

In this study, Tambon Phukaothong, Ayutthaya Province, Thailand, was selected as a case study. The quantitative research methodology was utilized through a questionnaire survey distributed to 197 rural households. Those households are residents in four villages, which are Chong-Rom, Phu-Kao-Thong, Hua-Pua and Had-Sai. For the households, there are plenty of ways of adsorbing the financial burdens of house restoration such as relying on savings or taking loans from moneylenders. The study differentiated a variety of financial instruments through dividing it into two groups; proactive and reactive finances. Namely, savings, cash in hand, and house insurance are considered as proactive finances. Whereas, loaning services and disaster reliefs provided by the government are defined as reactive finances.

Financial vulnerability can be evaluated by using the information on direct risks to the financial statement and resilience of households in funding house restoration cost caused by floods. A concept of financing gap in CATSIM model, Catastrophe Simulation Model (Hochrainer and Mechler, 2009) [6], was adapted for financial vulnerability assessment in this study. Focusing on the term resource gap or financing gap, it has been heavily used in the economic growth modeling literatures in order to explain a difference between required investments in economy and the actual available resources. In this case, the study used the financing gap to indicate a ratio of fund based reactive finances to the total house restoration cost. With utilizing financing gap, the financial vulnerability can be defined as the use of reactive finances for paying the house restoration. Based on a cross-section analysis, the study selected three flood events during 2000-2010 for assessing the financial vulnerability. Those three events are floods in 2006, 2009, and 2010. The 2009 flood was regarded as a common flood, while floods in 2006 and 2010 were defined as severe floods in which the government provided cash compensation for house restoration to flood-affected households.



Source: by authors

Fig. 1: Flood severity index and a financing gap designated as dependent variables

In the financial vulnerability assessment, the study considers that households are financially vulnerable to floods if they are unable to take proactive finances to fund house restoration costs in a timely manner. The study operates this concept by using financing gap analysis, which it can define the net loss associated with a disaster event after exhausting proactive finances. The repercussions of the financing gap can be substantial when the inability of households to self-finance house restoration cost leads to adverse long-term socio-economic impacts. In this case, the more financing gap that an individual household had could make the household more vulnerable. To use the financing gap index for making comparisons, the sampling was

sorted in ascending order according to financing-gap ratio. Figure 1 illustrates the use of cut-off score to create three financial vulnerable groups. The cut-off score of 33.33% and 66.66% were set for defining the limits of each vulnerable group. The high vulnerable group was defined as households with a financing-gap ratio higher than two-third (66.66%), and households with financing-gap ratio less than one-third (33.33%) were categorized into the less vulnerable group. Other households who had the financing-gap ratio between 33.33% - 66.66% was regarded as the middle vulnerable group.

3. Conceptual Framework

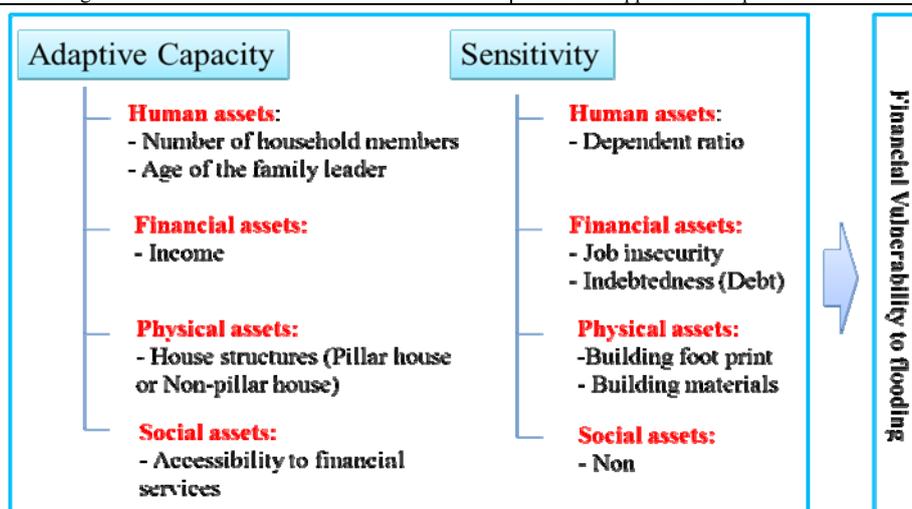
The conception of vulnerability has been amended and adapted for various approaches. Recent concerns at poverty measurement have also appended the importance of vulnerability factors. It implies that factors of vulnerability could be indicated as a complex characteristics produced by a combination of the socio-economic and political systems. There are many ways to categorize factors of vulnerability such classifications based on particular criteria, for instant, 1) productive vs. non-productive assets or 2) tangible and intangible assets 3) and the ease focusing on how assets can be liquidated. However, an Asset-Based Approach proposed by Seigel and Alwang (1999) [7] is utilized for assessing vulnerability of households extensively. This asset-based approach to vulnerability uses a broad definition of assets covering household-owned assets, community and extra-community assets. All of vulnerability factors can be inserted within seven types of assets, which are related to natural asset, human, finances, social, location and infrastructure, and politic and Institution. It describes relationships between household asset position and the usefulness of different assets in risk management, which result in household responses to risky events and outcomes in a number of ways. On the other hand, wealth and asset position can also affect households' perceptions of how they behave for coping with risks, and attitudes towards risk. However, these perceptions likewise depend on external factors such as individual accessibility to markets and the impacts of policies. Vatsa (2004) [8] explained further that each category of assets has been correlated to vulnerability reduction in different ways (see Table 2). Natural assets can help households reduce environmental stress, and provide the necessary wherewithal. Financial assets can be used to smooth consumption, recover damaged houses, or invested in mitigation measures. Physical assets can be pawned, mortgaged, or turned into productive assets to increase household income. Human assets in the form of the basis for labour mobilization, is a key strategy for coping with shocks from disasters. Whereas, social assets are a potential source of financial and non-financial support in emergency events, therefore, people keep building and maintaining these assets.

Based on the Asset-Based Approach, the conceptual framework of assessing household financial vulnerability to flooding could be invented by describing the potential of exposure elements, which can indicate their adaptive capacity and flood sensitivity. For this study, a scheme of asset classification is created by dividing the assists into four categories: financial assets, human assets, physical assets, and social assets. Nevertheless, natural, location and political assets are not taken into consideration because those assets emphasize on differences in terms of individual power in politic, physical location and agricultural products, which is out of the study's concern. Because the target group of the study is non-agricultural households who live in a same geography area and have characteristics of the rural low-income household. In order to identify the potential of four assets, those assets are analyzed in terms of positive factors influencing on their adaptive capacity and negative factors imposing on their sensitivity (see Figure 2).

Table 2: Indicators and Its Impacts on Vulnerability

Asset types	Indicators of increasing vulnerability	Indicators of decreasing vulnerability
Human	<ul style="list-style-type: none"> - Illnesses and loss of health - Deaths and disability - Withdrawal from schools - Primary concern with coping 	<ul style="list-style-type: none"> - Good health - Physical capacity to work - Educational opportunities for children - Education opportunities
Physical	<ul style="list-style-type: none"> - Crop failure - Damaged and destroyed house - Disruption or closure of business - Distress sale of household consumer durables 	<ul style="list-style-type: none"> - Diversified cropping - Structural reinforcement of houses - Business continuity plans - An increase of security for house, business and household goods
Financial	<ul style="list-style-type: none"> - Withdrawal of savings - Rise in indebtedness - Loans for consumption - Dependence or remittances - lack of insurance 	<ul style="list-style-type: none"> - Sustained level of savings - Diversified financial investments - Loan repayment on schedule - Availability of insurance - Availability of a wide array of financial instruments

Asset types	Indicators of increasing vulnerability	Indicators of decreasing vulnerability
Social	<ul style="list-style-type: none"> - Discrimination based on race, sex, caste or ethnicity - Social exclusion and lack of trust - Lack of participation in community organization - Dependence on charity - Looting and criminal activities 	<ul style="list-style-type: none"> - Relief and assistance based on equity and special needs of different social groups - Participation in community initiatives and volunteerism - Self-help and mobilization of community resources - Mutual support and cooperation



Source: Vatsa, 2004 Source: by authors

Fig. 2: A model of expected factors influencing on households' financial vulnerability to floods

Source: by authors

4. Financial Vulnerability of Thai Rural Low-income Households in Funding House Restoration and Their Preferences in the Trinity Financial Instrument

4.1. House Restoration Costs of Each Vulnerable Group

Table 2 compares the number and percentage of respondents in each vulnerable group regarding to three flood events in 2006, 2009 and 2010. It can be clearly seen that the proportion of less vulnerable households in severe floods was currently increasing throughout the econometric analysis of cross sectional data. Therefore, the study area reached a disproportionately high number of very vulnerable households relative to the general population. In case of the previous floods in 2006 and 2009, a majority of respondents was the less vulnerable households. However, a recent flood in 2010 made almost 48% of respondents more financial vulnerable to a flood, which results in changing a majority position of respondents from the less vulnerable group to the high vulnerable group. For the severe floods of 2006 and 2010, more than one fifth of respondents could not bring money from proactive finances to cover house restoration expenses greater than one third of the total house repair cost. As a result, 20.51% of the respondents were identified as highly vulnerable households, and it was getting worst when a percentage of high vulnerable households rose rapidly to 47.96% by 2010, as well as a significant drop in a percentage of less vulnerable households from 66.15% in 2006 to 30.10% in 2010. However, the percentage of less vulnerable households went up to 87.76% in 2009 (a common flood event).

Table 2: House repair costs of three vulnerable groups of respondents categorized by ratio of fund based on proactive finances to total house repair cost in each year

Vulnerable groups/ years of flooding	2006		2009		2010	
	Respondents (Valid Percent)	House Repair Cost (Std. Dev.)	Respondents (Valid Percent)	House Repair Cost (Std. Dev.)	Respondents (Valid Percent)	House Repair Cost (Std. Dev.)
1) High vulnerable households	40 (20.51%)	14,200 (11,959)	23 (11.73%)	8,130 (7,263)	94 (47.96%)	10,531 (13,608)
2) Middle vulnerable Households	26 (13.33%)	15,808 (9,645)	1 (0.51%)	60,000 (-)	43 (21.94%)	11,623 (11,901)
3) Less vulnerable households	129 (66.15%)	6,031 (9,455)	172 (87.76%)	1,262 (2,913)	59 (30.10%)	12,398 (11,272)
Sub total	195 (100%)	9,010(10,834)	196 (100%)	2,367(5,952)	196 (100%)	11,332 (12,541)
Missing	2		1		1	

Vulnerable groups/ years of flooding	2006		2009		2010	
	Respondents (Valid Percent)	House Repair Cost (Std. Dev.)	Respondents (Valid Percent)	House Repair Cost (Std. Dev.)	Respondents (Valid Percent)	House Repair Cost (Std. Dev.)
Total	197		197		197	

Note: An average house repair cost is in Baht currency.

Source: Questionnaire survey, 2011

4.2. Influences of Assets and Experience of Households on Their Financial Capacity to Cope with Floods

In order to investigate correlations between households' assets and their financial capacity in using proactive finances for house restoration expenses, the Spearman's rho correlation coefficient was computed under the hypothesis that the each household's asset has correlations with the level of households' financial capacity. With an alpha level of 0.05 for all statistical tests, the results proved that there were at least four households' assets influencing on their ability to fund house restoration costs caused by floods, depending on the flood severity. Some of those assets are positively correlated factors of households' financial ability (a direct variation), and some assets are negatively correlated factors (a reverse variation) (see Table 3). Focusing on 2006 severe flood event, the top three factors positively correlated with households' financial capacity levels were the area of building footprint ($r_s = 0.235$, $p < 0.01$), levels of income security ($r_s = 0.229$, $p < 0.01$), and income per capita ($r_s = 0.178$, $p = 0.02$). While, the crucial negative factor limiting the financial capacity of households was social assets in the form of the total score of accessibility to loaning services ($r_s = -0.228$, $p < 0.01$).

Table 3: The correlation between assets of households and their financial capacity in funding house restorations

Assets and flood experience of households		Statistic Values	Levels of Financial capacity	
			2006 (severe flood)	2009 (common flood)
Human assets	Numbers of Household member	Correlation Coefficient	-0.085	0.094
		Sig. (2-tailed)	0.241	0.47
	Age of Family leader	Correlation Coefficient	.149**	0.126
		Sig. (2-tailed)	0.039	0.327
	Total Dependency Ratio	Correlation Coefficient	-0.009	0.071
		Sig. (2-tailed)	0.907	0.594
- Child Dependency Ratio	Correlation Coefficient	-0.012	0.062	
	Sig. (2-tailed)	0.872	0.643	
- Aged Dependency Ratio	Correlation Coefficient	-0.008	0.023	
	Sig. (2-tailed)	0.909	0.865	
Flood experience	Levels of difficulty in funding house repair costs	Correlation Coefficient	.161**	0.229*
		Sig. (2-tailed)	0.025	0.074
	How long have you stay in this house?	Correlation Coefficient	0.002	0.159
		Sig. (2-tailed)	0.975	0.216
Financial Assets	Household income	Correlation Coefficient	.152**	.437***
		Sig. (2-tailed)	0.036	0.001
	Income per capita	Correlation Coefficient	.178**	.270**
		Sig. (2-tailed)	0.014	0.035
	Income security	Correlation Coefficient	.229***	0.171
		Sig. (2-tailed)	0.001	0.181
Physical assets	Building footprint (For lifted-up houses) Or Usage space of the first floor (For Pillar-houses)	Correlation Coefficient	.235***	.400***
		Sig. (2-tailed)	0.001	0.002
Social assets	Total score of accessibility to saving services	Correlation Coefficient	0.105	.578***
		Sig. (2-tailed)	0.142	0
	Total score of accessibility to loaning services	Correlation Coefficient	-.228***	-.337***
		Sig. (2-tailed)	0.001	0.007
	Total score of accessibility to compensation	Correlation Coefficient	0.023	0.136
		Sig. (2-tailed)	0.752	0.288

Note: - N= 197 households

- A financial capacity was classified as follows; 1 = high vulnerable group, 2 = middle vulnerable group, and 3 = less vulnerable group.

- Levels of household income were indicated as follows; 1 = less than 6,000 Baht/ month (less than 16,000 Yen/ month), 2 = 6,001-12,000 Baht/month (16,001-32,000 Yen/ month), 3 = 12,001-18,000 Baht/ month (32,001-48,000 Yen/ month), and 4 = Over 18,000 Baht/month (Over 48,000 Yen/ month)

- Income security indicating flood impact on income was classified as follows; 1 = totally lost income and earnings, 2 = significantly diminished income, and 3 = Household income unaffected by flood

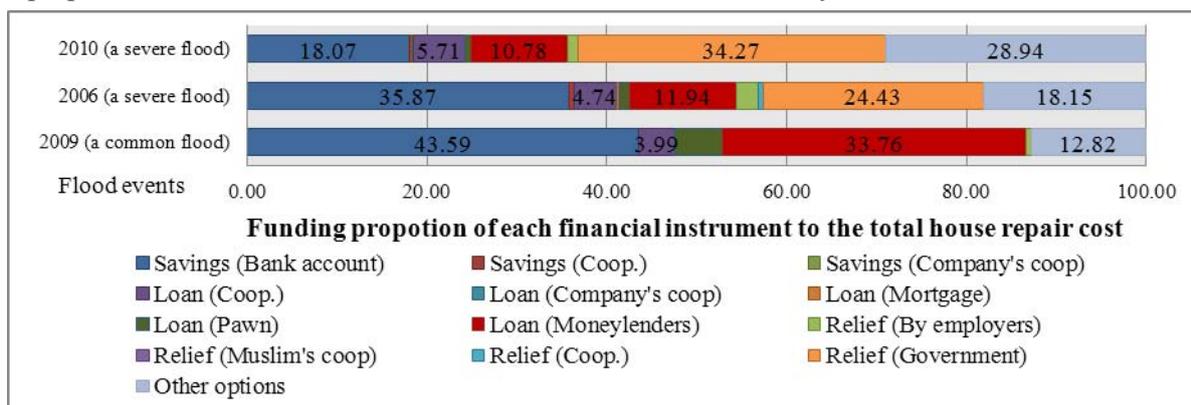
- The score of accessibility to 14 financial services was divided into 3 levels; 0 = never use, 1= ever used, and 2 = still use.

- *** Correlation is significant at the 0.01 level, ** Correlation is significant at the 0.05 level, * Correlation is significant at the 0.10 level

Source: Questionnaire survey, 2011

4.3. Sources of Fund for House Restoration

Figure 3 provides an overall trend of the respondents' behavior in taking financial instruments in each flood event. The major distributions of financial instrument between three flood events were noticeably different. In 2006 and 2009 flood events, for individual households, the majority of source of fund for house restoration was saving bank accounts. After the government provided cash compensation in 2006 and 2010, the compensation became the major source of fund for the respondents in 2010 flood. Noticeably, the government's compensation is not enough for funding the house restoration activities. Respondents still had to take other financial instruments for achieving those activities. When comparing taken financial instruments in 2006 and in 2010, the results found that respondents tended to rely more on the government's compensation and other options (cash-in-hand and family/relatives remittance); meanwhile, loaning services such as pawning and borrowing money from moneylenders were considered as minor sources of fund. The funding proportion of the government's compensation to total house restoration cost rose rapidly from 24.43% in 2006 to 34.27% in 2010. On the other hand, there was a slump for funding proportions of savings as its proportion, which stood at 35.87% in 2006, went down dramatically to 18.07% in 2010.



Source: Questionnaire survey, 2011

Fig. 3: An overview of respondents' behaviours in taking financial instrument for funding house restoration costs caused by three flood events (2006, 2009 and 2011)

4.4. Household Preferences in the Trinity Financial Instrument (TFI)

The results indicated that micro-insurance is the most preferred financial instrument, which is under consideration of over half of the respondents, however, different vulnerable groups of respondents were interested in the benefits of TFI differently (see Table 3).

Figure 4 shows overall household preferences in 16 different financial instruments in terms of funding the house restoration cost. After introducing the TFI, respondents were interested in all of three financial services of TFI. In overall financing system for house restoration, cash in hand and family remittance were regarded as the most preferred option as its coverage percentage on to the total house restoration cost was about 33.10%. The secondary preferred source of fund for respondents was placed to a micro-insurance program: it would be used to cover 22.93% of the house restoration cost. Meanwhile, micro-savings and micro-credit were ranked in the fourth and the fifth financial instruments with the coverage percentage at 7.29% and 6.93% respectively. In addition, the concentration on the TFI and other financial instruments could decrease respondents' dependency on loans provided by moneylenders and cooperatives. Funding proportions of loans from moneylenders decreased from 8.69% in the 2006 flood to mere 0.99% in the

financial plan, and cooperative loans' funding proportions declined from 4.74% in the 2006 flood to 2.46% in the financial plan.

Table 3: The Preference of Thai Rural Household in the Trinity Financial Instrument categorized by the 2006 vulnerability group

	Number of Households (Percentage)		
	Micro-Savings	Micro-Credit	Micro-insurance
High Vulnerable Households	16 (8.12%)	20 (10.15%)	23 (11.68%)
Middle Vulnerable Households	9 (4.57%)	4 (2.03%)	38 (19.29%)
Less Vulnerable Households	28 (14.21%)	28 (14.21%)	50 (25.38%)
Total	53 (26.90%)	52 (26.40%)	111 (56.36%)

Note: Total number of respondents = 197 households

Source: Questionnaire survey, 2011

Sources of fund

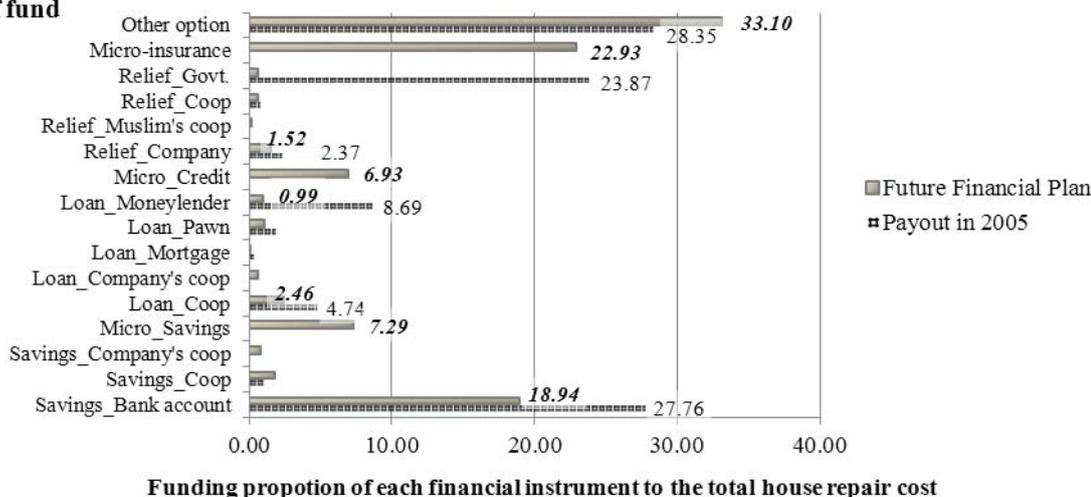


Fig. 4: Changing and shifting in the preferred financial options of respondents' preferences for the future floods

Source: Questionnaire survey, 2011

In order to identify the change of household preferences in financial instruments, the study indicates that cash in hand, micro-insurance, micro-savings, and another savings services are proactive finances, and other financial services are reactive finances. The change could be examined by a comparison of funding proportion based on proactive finances between a financial statement in 2006 and the future financial plan. As a result, 24% of 197 respondents did not change their attention in proactive finances, and not many respondents changed negatively in funding proportion of proactive finances (16% of respondents). Nevertheless, a significant number of respondents (nearly 60%) paid more attention to proactive finances. To indicate the changes of household preferences in proactive finances more specifically, the study computed Paired Samples T-Test based on hypothesis that after introducing the TFI, households would be more interested in proactive finances.

The statistical analyses were based on two scenarios; proactive finances included cash-in-hand and proactive finances excluded cash-in-hand. As a result, the study found that a total coverage percentage of proactive finances increased from 44% in the 2006 flood to 82% in the future financial plan. It can imply that respondents were more willing to use proactive finances for future house restoration expenses.

Table 4: The funding proportion of proactive finances between the payout in 2006 and a financial plan

	Mean		Paired correlations		Paired Sample Test			
	Mean	SD.	Correlation	P value	MD.	SD.	t	P value
Scenario1: Proactive finances included cash-in-hand								0.000
- A financial plan	81.80	30.10	-.097	.175	37.97	56.48	9.435	(1.17E-17)
- Payouts in 2006	43.84	44.96						

	Mean		Paired correlations		Paired Sample Test			
	Mean	SD.	Correlation	P value	MD.	SD.	t	P value
Scenario 2: Proactive finances excluded cash-in-hand								0.000 (5.41E-20)
- A financial plan	60.74	39.92	.224	.002	35.96	49.26		
- The payout in 2006	24.78	39.17						

Note: N= 197, df = 196, MD = Mean Difference,
Source: Questionnaire survey, 2011

5. Conclusions

The study found that the Thai rural low-income households confronted with financial liquidity to fulfill the financing gap for maintaining their living condition and restoring their houses. The nature and vulnerable characteristics of the rural-low income make them more vulnerable to handle flood loss and its recovery activities, which cause the rural low-income to rely more on convenient reactive finances, especially the government's cash compensation for house restoration considered as reactive policy in flood risk management. In order to assist the rural low-income to be financially better off in funding house restoration costs than the previous situations, the study proposes that the government should change from providing the compensation to affordable proactive financial services. The study focuses on implications for disaster risk financing approaches, which comprise of non-market risk sharing, market risk transfer inter-temporal risk spreading and a self-finance approach. In regard to a questionnaire survey, it is evident that respondents would be more interested in proactive finances after introducing TFI. A total funding proportion of proactive finances to the total house restoration cost might increase up to 82%, comparing with a threshold at approximately 44% in the 2006 flood.

6. Acknowledgements

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