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Understanding vulnerability to poverty of rural agricultural households in Northeastern Thailand

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Abstract

Vulnerable households are not only those who are currently poor, but also those who are exposed to risks to become poor in the future. Rural agricultural households are perceived as being exceptionally vulnerable due to limited ability to cope with shocks and higher risks triggered by susceptible agricultural sector but it can also provide possibilities to cope with risks and shocks from other sectors. Understanding the characteristics of rural agricultural households provides a better insight to vulnerability to poverty and more efficient poverty reduction. To deal with this problem, 970 rural households were interviewed in 2007 in Ubon Ratchathani in Northeastern Thailand and found that 873 of them engage in some form of own-agricultural activity. Based on 873 (100%) rural agricultural households surveyed, about 7% depend on cropping and livestock production with support from remittances and public transfers, while the other 93% undertake more diversified occupation of on-farm activities simultaneously with off-farm, and/or non-farm activities to reduce the risk of income shortfall. However, roughly 30% of rural agricultural households are already caught in poverty whereas another one-third earn less than twice the provincial poverty line and thus can slip into poverty should an unexpected shock occur causing substantial income loss. Indeed, diverse types of shocks frequently occur in the area as 70% of rural agricultural households experienced at least one shock during the previous 5 years. These households were primarily affected by covariate shocks of flood and drought as well as idiosyncratic shocks of illness and death of household members. Regarding production system, half of the agricultural households engage primarily in cropping whereas the other half also raises livestock for commercial purposes. Approximately 60% of rural agricultural households report agriculture as main occupation of at least 60% of their active members. To construct a basis for modelling the rural agricultural households and their behaviour regarding effects of shocks and coping strategies, income, main production system and occupation are taken as major criteria and 8 typical farm types are identified. Statistical tests show significant differences in household size, allocation, yield and subsistence and commercial production.

Keywords: Agricultural households, Vulnerability to poverty, Typical farms

1. Introduction

With limited ability to mitigate shocks resulting from risk events of different characters inherited in agricultural sector, e.g. adverse weather conditions and pests, rural agricultural households can slip into the poverty trap or fall deeper into the poverty spell. But at the same time agricultural sector can provide protection against risks as well as possibilities to cope with shocks from other sectors. Depending on characteristics of rural agricultural households, the effects of and reactions to shock events may differ.

2. Objectives

As a part of the Impact of Shocks on the Vulnerability to Poverty: Consequences for Development of Emerging Southeast Asian Economies project of the DFG research group handles different aspects of vulnerability to poverty, this special project focuses on vulnerability to poverty of rural agricultural households in Northeastern Thailand. In particular, this study has the following aims:

- To classify characteristics of rural agricultural households in order to identify typical farms as a basis for understanding the effects and coping strategies of both agricultural and non-agricultural shocks.
- To examine the underlying factors of vulnerability to poverty within these typical farms with regards to demographic, economic and agricultural production aspects.

3. Data collection

Within the scope of the main DFG project, a total of 970 rural households were initially interviewed in 2007 in Ubon Ratchathani province in Northeastern Thailand. Since the focus of the special study is the agricultural sector, it is necessary to concentrate the analyses on vulnerable agricultural households. However, the main project survey covers a wide range of basic household data which requires an in-depth specific dataset to capture distinctive agricultural information. Hence, a sub-sample was selected and will be used to develop typical farm household models that allow behavioural analysis for a larger group of agricultural households with respect to vulnerability to poverty, particularly the extent of shock effects and the mitigation strategies. A typical farm is an empirically prevailing reference for an existing farm or group of farms in a specific region which is indicative of a substantial share of a farm household population with typical characteristics for the conditions of the rural households in the province, for example, specialized rice farms, specialized livestock farms, mixed crop farms or integrated crop livestock farms. The selection procedure of agricultural households from the panel set is described in the next section.

4. Selection procedure

The selection procedure for identifying typical farms among the rural agricultural households surveyed follows a two-step approach. First, the complete sample size of 970 households from the main project undergoes a filter-procedure to detect and remove households whose characteristics are not relevant for the study. Next the remaining households are regrouped according to their common characteristics and thus are used for additional data collection to develop models of typical farms.

4.1 Filter criteria

The following criteria concerning agricultural and vulnerability to poverty aspects including experiences with shocks had been selected to identify typical farms for the study.

On the agricultural aspect, the first criterion removes households with no residential member, i.e. member who resides more than six months in the same household during the past year to rule out migration for off-farm and non-farm self-employment. The second criterion selects households that perform income-generating economic activity such as agriculture, off-farm and non-farm self-employment to rule out absolute dependency on public transfers and remittances. The third criterion strictly requires engagement in own cropping and livestock farming to exclude non-agricultural households and complete off-farm agricultural employment. The fourth criterion limits income earning from remittances and public transfers to no more than 1,500 Baht (approximately 43 USD) per capita per month to verify that agriculture is a major income source of the selected households. The fifth criterion requires households to have a significant share of their total household income from agriculture. In this respect, an auxiliary variable of occupation is used such that at least 25% of household residential members must report own agriculture as primary or secondary occupation. Since very few households completely engage in agriculture and rely totally on agricultural income in Thailand, the threshold anticipates widespread (seasonal) off-farm and/or non-farm self-employment. Therefore, “agriculture” means very high share of agricultural income to allow for some “non-agricultural” income. The sixth criterion removes households with no cropping activity because such households usually have small subsistence livestock and/or aquaculture activities and these are very few.

On the vulnerability to poverty aspect, the seventh criterion draws an income ceiling of twice the provincial poverty line of 1,215 Baht (approximately 35 USD) per capita per month to include not only households who are already poor but also households at risk of falling below the poverty line. No income floor is set as households with extremely low income may have recently experienced a major shock event. Lastly, the eighth criterion selects households who reported having experienced at least one shock during the past five years with at least intermediate or high shock effect.

As a result, 641 households were filtered out during the procedure and 329 households remained suitable to deliver information on typical farms. Of all the total 970 rural households surveyed from the main project, this substantial portion of about one-third conforms to the characteristics of rural agricultural households exposed to vulnerability to poverty.

4.2 Regrouping of typical farms

To derive indicative typical farms for vulnerable agricultural households in Thailand, 329 remaining households from the previous step have been regrouped according to three dimensions: per capita income per month, occupation of household members and agricultural production system. Each dimension can be further classified into two levels as following.

For the first dimension of income, households are divided by the provincial poverty line: a) below and b) equal to and above. Hence, the first group represents the depth of current poverty and the second group signifies vulnerability to poverty, i.e. a considerable chance to fall below the poverty line when taking future uninsured risks into account. The second dimension of occupation is applied to indicate the level of agricultural intensity and share of agricultural income of the households. Due to the fact that (seasonal) off-farm and/or non-farm self-employment is very common among rural households in Thailand, agricultural households can therefore be categorized as being a) mainly agricultural if at least 60% of household members engage in own agriculture, or as having b) mixed occupation for the contrary. Regarding the last dimension, production system is an indicator for agricultural specialisation. In Thailand, most agricultural households either a) exclusively engage in cropping with some degree of small subsistence livestock husbandry and/or aquaculture farming; or b) operate a mixed production of cropping and livestock husbandry and/or aquaculture farming for commercial purpose.

The result of the combination of the two-levels of all three dimensions is a total of eight typical agricultural farms being vulnerable to poverty. The following section shows the results from the main project survey data and the distribution of the typical farms as a new dataset.

5. Results

5.1 Current situation of vulnerability to poverty of rural agricultural households

873 from 970 households surveyed engage in some form of agricultural activity. However, out of 873 (100%) rural agricultural households only 7% depend on cropping and livestock production with support from remittances and public transfers while the other 93% undertake on-farm activities simultaneously with off-farm, and/or non-farm activities. With more diversified source of income, the second group is bettered prepared to reduce the risk of income loss or consumption shortfall in times of shock occurrence.

Roughly 30% of all agricultural households are already below the provincial poverty line of 1,215 Baht (approximately 35 USD) per capita per month while another 30% earn less than twice the amount and can fall into poverty if an unexpected shock occur causing a substantial income or consumption loss. The survey also shows prevalence of shocks as 70% of agricultural households experienced at least one shock during the previous 5 years. Almost every household in the province was frequently affected by covariate shocks of flood and drought whereas illness and death of household members were reported as most common idiosyncratic, i.e. household-specific shocks. Regarding agricultural production system, half of the households engage primarily in cropping whereas the other half also raises livestock for commercial purposes. For almost two-third of all agricultural households, more than half of the household members report agriculture as main occupation.

5.2 Distribution of typical farms from the classification criteria

Assigning the total remaining 329 vulnerable agricultural households to poverty to the three dimensions reveal an almost even distribution in all levels. Exactly half of the households earn less than the provincial poverty line and the other half earns twice the amount at most. 60% of the households engage mainly in agriculture while another 40% also work off-farm and/or non-farm self-employed. Furthermore, almost half of the households concentrate on cropping and the rest operate a mixed system of cropping and livestock farming. Table 1 shows a more or less equal distribution of the selected vulnerable agricultural households from the survey into eight groups. Thus, the empirical classification seems to validate the proposed dimensions and indicates different typical farms being vulnerable to poverty.

Table 1: Distribution of typical farms by number of households

Group No.	Dimension			No. of households	Percentage
	Income	Occupation	Production System		
1	=> Z	Agriculture	Crop	36	10.9%
2	=> Z	Agriculture	Crop-Livestock	60	18.2%
3	=> Z	Mixed	Crop	31	9.4%
4	=> Z	Mixed	Crop-Livestock	38	11.6%
5	< Z	Agriculture	Crop	51	15.5%
6	< Z	Agriculture	Crop-Livestock	52	15.8%
7	< Z	Mixed	Crop	31	9.4%
8	< Z	Mixed	Crop-Livestock	30	9.1%
Total				329	100%

Source: DFG survey (2007)

Note: Z = provincial poverty line (1,215 Baht or 35 USD); => equal to or above; < below.

To demonstrate the differences of agricultural household characteristics between eight typical farms, t-test was applied and summarized in Table 2. On average, currently poor households

tend to be larger than households above the poverty line. Mixed occupation groups earn higher monthly income per capita as opposed to mainly agriculture groups (an average of 4,837 Baht and 4,540 Baht, respectively). Hence, income diversification tends to reduce the risk to fall into poverty. Nonetheless, agriculture makes up for a substantial share of household income from 48% to 83% for all households.

Although all households own approximately the same total land area of 1.2 Rai but land allocation is significantly different. Households with main occupation in agriculture are characterised by larger land for rice and field crops such as vegetable and cassava than households whose main occupation is outside agriculture. With an exception in group 8, crop-livestock systems have higher rice yield than households without animals which points out a complimentary role of livestock and aquaculture farming. Finally, subsistence rice production plays a minor role compared to commercial production and the amount of rice sale corresponds positively to household income.

During 2002-2007 all households were hit by almost 2 shocks with intermediate to high severity. Moreover, households above the poverty line suffered higher income loss from flood, draught and illness of household members than currently poor households. This empirical finding indicates the underlying agricultural-specific risk situation of natural adversity and the limited ability to prepare for unexpected hardship.

Table 2: T-test of household characteristics by eight typical farm groups

Characteristics	Unit	G1	G2	G3	G4	G5	G6	G7	G8	Total
Household size ^{***}	(persons)	3.6	4.2	4.5	5.1	4.4	4.8	4.4	4.8	4.5
Monthly per capita income ^{***}	(Thousand Baht)	1.7	1.8	1.8	1.7	0.5	0.5	0.6	0.6	1.2
Agricultural member ratio ^{***}	(Percentage)	83	83	49	48	78	83	49	50	69
Total land area	(Rai)	1.3	1.2	1.2	1.2	1.2	1.4	0.9	1.1	1.2
Land for rice and field crops ^{**}	(Rai)	2.0	1.7	1.5	1.3	1.9	2.1	1.5	1.6	1.7
Rice yield ^{***}	(Tonne/Rai)	1.6	1.9	2.0	2.1	1.5	1.7	1.6	1.3	1.7
Rice home consumption [*]	(Tonne)	1.1	1.2	1.0	1.3	0.9	1.2	0.9	1.0	1.1
Rice sale ^{**}	(Tonne)	2.3	2.7	1.9	2.0	1.6	2.3	1.4	1.5	2.1
Shocks	(number)	1.6	1.4	1.5	1.6	1.5	1.6	1.6	2.0	1.6
Income loss from flood	(Thousand Baht)	23.5	15.1	14.4	17.4	17.7	18.7	12.8	14.4	17.0
Income loss from draught	(Thousand Baht)	17.2	15.6	14.3	16.6	9.8	9.8	12.9	12.3	13.5
Income loss from illness	(Thousand Baht)	9.0	24.2	1.8	0.8	7.7	1.4	0.3	11.3	8.6

Source: Own survey (2007)

Note: 1) Standard deviations are in parentheses. 2) *** Significant at 0.01, ** Significant at 0.05, * Significant at 0.1.
3) 1 Baht = 0.3 USD as per 12th September 2008. 4) 1 Rai = 0.16 hectare.

6. Conclusion

The household survey data collected in Northeastern Thailand demonstrates that it is possible to identify groups of households that are to certain extent homogenous but also distinct from others. With respect to vulnerability to poverty among rural agricultural households, a total of eight typical farms is the result of the classification criteria of income, occupation and agricultural production system. Hence, a small sub-sample of empirically identified typical farms is sufficient for further modelling of rural agricultural household behaviours in response to shock events. Following this approach, a special survey was carried out to collect additional data necessary for model construction to represent such typical farms.