

Rural household characteristics and agricultural activities in relation to local non-farm employment: A comparative study of two wet-rice-growing villages in Northeast Thailand

Yuko Shirai¹, Stephen J. Leisz², Jefferson Fox³, and A. Terry Rambo^{1,3*}

ABSTRACT: This study examines the relations of local non-farm employment and out-migration with agriculture in two rural villages in Khon Kaen Province in Northeast Thailand. The villages have similar populations, topography, and agricultural systems, but differing in the number of residents employed in local non-farm regular wage jobs. The availability of local non-farm jobs was found to be related to the rate of out-migration, household structure, and agricultural activities. Households having members with local non-farm jobs have few out-migrants and are more likely to be extended and nuclear type households. These types of households can expand their agricultural activities by using family labor and investing in farm machinery. They are also able to transplant rice seedlings, which is more labor-intensive than broadcast seeding. In contrast, there are many out-migrants from households whose members lack local regular wage non-farm jobs. These households are more likely to be of the skipped generation and truncated types. Because their labor supply is small and they often lack sufficient cash income, they resort to broadcast rice seeding to save labor. Government promotion of rural industrialization may be an effective strategy to reduce rates of out-migration and develop more stable and prosperous agricultural communities in Northeast Thailand.

Keywords: rural industrialization, non-farm income, household structures, rural livelihoods

Introduction

Farm households in Thailand and other developing countries are becoming increasingly reliant on income from non-farm sources (Deichmann et al., 2009; van Leeuwen and Dekkers, 2013; The World Bank, 2014). Non-farm employment has many effects on agricultural activities and practices of farm households, including changes in technical efficiency, types of farming activities, the intensity of fertilizer application, and use of labor saving methods (Anseeuw and Laurent, 2007; Shi et al., 2011; Mishra and Moss, 2013). The local availability of non-farm employment has also been shown to

affect levels of out-migration from villages in Northeast Thailand (Shirai, 2016) which in turn affects the flow of remittances from the migrants back to their families there. Out-migration also changes the frequency of households with different types of structures (i.e., nuclear, extended, skipped generation and truncated households) which can affect household labor supply for agricultural activities (Shirai, 2016).

As part of the agrarian transformation of the region (Rambo, 2017) agricultural households in the Northeast have been undergoing major changes in their sources of income, including earning an increasing share of income from local non-farm employment (Fukui, 1993; Grandstaff

¹ Program on System Approaches in Agriculture, Faculty of Agriculture, Khon Kaen University, Khon Kaen 40002, Thailand.

² Anthropology Department, Colorado State University, Fort Collins 80523, USA.

³ The East-West Center, Honolulu, Hawaii 96848-1601, USA.

* Corresponding author: trryrambo@yahoo.com

et al., 2008; Keyes, 2010; Rigg et al., 2014). Nevertheless, the total number of local non-farm jobs remains small in the Northeast so out-migration of villagers is still common. Previous studies have reported apparent changes in the agriculture practices of farm households in the Northeast (Rigg et al., 2012; Malanson, 2014). However, we have been unable to identify any published studies on the effects of local non-farm employment on agricultural activities in rural villages there. Understand changing agricultural practices in rural space is needed to effectively manage natural ecosystems and the services they supply and to improve the effectiveness of rural development policies. Therefore, in this study we make use of a “natural experiment” involving comparison of the agricultural activities of households in two villages that differ greatly in the number of their residents with local non-farm employment. One of the villages has many local regular non-farm workers but few out-migrants while the other village has few local regular non-farm workers but many out-migrants. By making this kind of controlled comparison we seek to isolate the effects of local non-farm employment on the agricultural activities of rural households. We also examine if households with different types of structure in these villages display differences in the character of their agricultural activities.

Methods

Using information from an initial investigation of 44 villages in Khon Kaen Province (Shirai, 2016), we selected two villages that are similar in terms of population size, land area, topography,

and agricultural systems, but that differ in the number of residents employed as workers in local non-farm regular wage jobs. These workers, who are often employed in large factories, receive regular weekly or monthly wages, enjoy more job security than casual hire wage workers on construction sites. One village (which we call High Employment Village or HEV) was chosen that had many local industrial workers (23.7% of the labor force); and one village (which we call Low Employment Village or LEV) was chosen that had few local industrial workers (2.0% of the labor force). Detailed information on each household, including the age, sex, marital status, occupation and relationship of all household members, number of out-migrants (defined as people who left their village to find employment in other places on either a permanent or temporary basis), agricultural engagement and types of agricultural activities, were obtained from the village health volunteers.

Based on information from the above survey, the households in HEV were classified into 2 groups: Group 1 was made up of the 47 households having one or more members employed in local industries. Group 2 included 24 households that did not have any members employed in local non-farm jobs. Households in LEV were also classified into 2 groups: Group 3 included the 99 households having one or more out-migrants and Group 4 included the 23 households having no out-migrants. Initially it had been planned to interview 20 households randomly selected from each group. This was done for groups 3 and 4 but only 16 households classified as belonging to Group 2 were available for interviewing, one of which was found to belong

to Group 1. Consequently, the final sample sizes for these groups were 21 households from Group 1 and 15 households from Group 2.

All data were entered in an Excel database and SPSS version 21 was used for statistical analysis of the data.

Results and discussion

In this section, we first present some a descriptive statistics about the economic and social characteristics of the two study villages, followed by a description of agricultural activities in each village. We then examine differences in agricultural activities of different groups of households (households with and without members having local regular wage employment and with and without out-migrants). Finally, we describe differences in agricultural activities of households with different types of structures.

Characteristics of the study villages

The two villages have similar histories, having been established about a century ago by people from nearby villages who moved there in search of new land. Rain-fed rice is the main crop, occupying 77.7% of the agricultural land in HEV and 80.1% in LEV. Cassava, sugarcane and rubber are planted on upland fields in both villages. HEV has a somewhat larger resident population (490 people and 121 households) than LEV (408 people and 122 households). HEV has a smaller land area (371 ha) and total area of agricultural land (288 ha) than LEV (524 ha and 400 ha, respectively). It also has a higher population density (132 persons/km²) than LEV (77 persons/km²)

The most important difference between the two villages relates to their locations relative to sources of local non-farm employment. HEV is much closer to Khon Kaen city (25 kms) and the nearest major source of non-farm employment (1 km) than LEV, which is 75 kms from the city and 34 kms by road from the nearest source of non-farm employment. These differences are clearly reflected in the number of residents with local non-farm employment. HEV, which has easy access to 10 industrial sites and 28 other sources of non-farm employment, has 66 factory workers and 79 persons working for other non-farm employers, e.g., a hospital, hotel and supermarket that are located outside the village. Altogether 65% of households have members either employed in local industries or having other local non-farm employment. In contrast, LEV has only four local industrial workers and 35 persons with other local non-farm employment. Only 23% of its households have members with such employment.

Four types of household structures occur in the study villages: Nuclear family household (parents and children), extended family household (both vertically and horizontally related family members), skipped generation family household (elderly grandparents, and one or more of their own or someone else's grandchildren and/or great grandchildren), and truncated family household (a widow or widower or an elderly couple living alone with no children present). Henceforth, these types are referred to as "nuclear household", "extended household", "skipped generation household" and "truncated household" respectively. Extended households are the most common type in both villages, representing 40.5% of all households in HEV and

30.3% in LEV. The share of nuclear households is much higher (33.9%) in HEV than in LEV (19.7%). Truncated (26.2%) and skipped generation (23.8%) households are much more common in LEV than in HEV where they are 16.5% and 9.1% respectively.

Agricultural systems of the study villages

The two villages have quite similar agricultural systems although there are some relatively minor differences between them. LEV has a larger area of agricultural land and somewhat lower number of people supported per hectare than HEV. Rain-fed paddy fields cover more than three-quarters of the agricultural land in both villages. Upland areas are used for growing cash crops including cassava, sugarcane, and rubber trees. Most households engage in agriculture but the share of households that own the land they farm is considerably higher (82.8%) in LEV than in HEV (66.9%). The number of households that keep buffalo or cattle does not differ greatly between the villages, but LEV has a much larger number of large livestock (113 head) than HEV (33 head).

Comparison of the agricultural activities of the different groups of sample households in the study villages

In this section, we compare the agricultural activities of four different groups of sample households. Group 1 in HEV includes households that have one or more members with local non-farm regular wage employment and Group 2, also in the HEV, consists of households having no members with such employment. Group 3 in LEV includes households with one or more out-

migrant members while Group 4 households, in the same village, have no out-migrant members.

Table 1 presents the agricultural characteristics of households in each group. On average, households in Group 4 (have no out-migrants) own and cultivate the largest mean area of agricultural land, whereas households in Group 1 (have one or more members with local non-farm employment) cultivate the smallest mean areas. Households in Groups 1 and 2 use larger shares of their land for growing rice whereas households in Groups 3 and 4 use more of their land for upland cash crops with the differences in the mean areas of sugarcane grown by the groups statistically significant ($p < 0.01$). Only 76.2% of households in Group 1 grow rice, whereas 93.3% of households in Group 2 do so. A smaller share (85.0%) of Group 3 households, which often receive remittances from out-migrant members, grow rice than do Group 4 households (90.0%) that have no out-migrants members. A majority of households in Group 3 (64.7%) and half (50.0%) of Group 4 households broadcast rice seeds while most of Group 1 households (71.4%) and all Group 2 households transplant rice seedlings. These differences are statistically ($p < 0.01$).

Cattle and buffalo are raised by one-third of Group 2 households and one-quarter of Group 4 households, but only 15% of Group 3 households and no Group 1 households. Group 2 has many truncated households which are mostly composed of retired people who are still active and like to keep livestock for their assets and also have time for raising livestock. Group 3 also has many truncated households but they said that they were too old to care for livestock. Group 1 has many nuclear and extended households whose

members are employed in non-farm work and have no time for raising livestock. These differences are statistically significant at a $p < 0.01$ level.

Group 4 households (no out-migrant members) cultivate a much larger mean area, devote a great share of their land to cash crops, especially sugarcane, and own the largest

number of 4-wheeled tractors. In contrast Group 3 households which have out-migrants cultivate a smaller mean area, use a smaller share of their land for sugarcane, and do not own any 4-wheeled tractors. The difference in the ownership of 4-wheeled tractors among the groups is statistically significant ($p < 0.05$).

Table 1 Agricultural characteristics of sample households in different groups

	High Employment Village (HEV)		Low Employment Village (LEV)	
	Group 1 (n=21)	Group 2 (n=15)	Group 3 (n=20)	Group 4 (n=20)
Mean agricultural area owned per household (hectares)	2.2	2.8	3.1	5.5
Mean agricultural area cultivated per household (hectares)	2.2	2.9	2.5	4.5
Agricultural land use (% of cultivated land)				
Rain-fed rice:	67.3	53.9	42.6	29.8
Cassava:	13.9	24.2	37.1	22.8
Sugarcane: a**	13.9	19.2	18.8	44.9
Eucalyptus:	2.3	0	0	0
Rubber:	2.3	1.0	1.5	2.4
Vegetables:	0	1.0	0	0
Other crops:	0.3	0.7	0	0.1
No. of large livestock (head)	0	14	9	83
No. of households raising large livestock b*	0	5 (33.3%)	3 (15.0%)	5 (25.0%)
No. of households raising swine	1	1	0	1
No. of households raising fighting cocks	6 (28.5%)	3 (20%)	0	0
No. of households owning 4-wheeled tractors b*	1 (4.7%)	0	0	4 (20%)
No. of households grow rice	16 (76.2%)	14 (93.3%)	17 (85.0%)	18 (90.0%)
Rice planting method (no. of households) b**				
Broadcasting:	4 (28.6%)	0	11 (64.7%)	9 (50.0%)
Transplanting:	10 (71.4%)	14 (100.0%)	6 (35.3%)	9 (50.0%)
No. of household with different types of household structure b**				
Nuclear:	6 (28.7%)	4 (26.6%)	2 (10.0%)	14 (70.0%)
Extended:	13 (61.9%)	3 (20.2%)	5 (25.0%)	5 (25.0%)
Skipped generation:	1 (4.7%)	4 (26.6%)	5 (25.0%)	0
Truncated:	1 (4.7%)	4 (26.6%)	8 (40.0%)	1 (5.0%)

In Group 1, two households that grow rice are missing value for their rice planting method.

a= One-Way ANOVA; b= Chi-square test: significant difference at *($p < 0.05$), **($p < 0.01$).

Source: Interviews with sample households, 2015

Differences in agricultural activities of households with different types of structure

To analyze the relationship between household structure and agricultural activities we

combined data on all the sample households with the same type of structure from both villages (Table 2).

Table 2 Agricultural characteristics of households with different types of structure

	Household Types			
	Nuclear (n=26)	Extended (n=26)	Skipped generation (n=10)	Truncated (14)
Mean area of agricultural land owned per household (hectares)	4.5	2.9	3.6	2.4
Mean area cultivated per household (hectares)	3.5	3.2	3.4	1.7
Agricultural land used for different crops (% of cultivated agricultural land)				
Rain-fed rice:	32.4	52.9	48.5	56.5
Cassava:	22.6	23.6	33.0	21.5
Sugarcane:	42.0	20.9	17.2	16.9
Eucalyptus:	0	1.3	0	0
Rubber:	2.4	1.3	1.3	3.2
Vegetables:	0	0	0	1.9
Other crops:	0.6	0	0	0
No. of large livestock (head)	43	20	6	37
No. of households raising large livestock	3 (11.5%)	5 (19.2%)	1 (20.0%)	4 (28.6%)
No. of households owning 4- wheeled tractor	4 (15.3%)	1 (3.8%)	0	0
No. of households grow rice	21 (80.8%)	22 (84.6%)	8 (80.0%)	14 (100.0%)
Rice planting method (no. of households)				
Broadcasting:	6 (28.6%)	9 (45.0%)	3 (37.5%)	6 (42.9%)
Transplanting:	15 (71.4%)	11 (55.0%)	5 (62.5%)	8 (57.1%)

In extended household type, two households that grow rice are missing value for their rice planting method.

Source: Interviews with sample households, 2015

Nuclear, skipped generation and extended households cultivate similar mean areas (3.5, 3.4, and 3.2 ha respectively) but truncated households cultivate a much smaller mean area (1.7 ha), but these differences are not statistically significant. Truncated, extended, and skipped generation households use half or more of their cultivated land for growing rice whereas nuclear households

plant a larger share (64.6%) of their land with cassava and sugarcane and also owned the largest number of the 4-wheeled tractors. Rice is grown by about four-fifths of households of all types except truncated households which all plant this crop. Most nuclear households (71.4%) transplant whereas one-third or more of rice the other types of households use broadcast seeding.

The share of households practicing large animal husbandry is the highest (28.6%) for truncated households, followed by skipped generation households (20.0%), and extended households (19.2%). Only a small share of nuclear households (11.5%) raise livestock.

Relationship of local non-farm employment and out-migration with agriculture

Households with no local non-farm workers and no out-migrants cultivate a larger mean area of agricultural land than households have local non-farm workers or out-migrants. Households in Group 1 that have local non-farm workers use the largest share of their agricultural land for growing rice but the share of households grow rice is the lowest, possibly because they have a reliable flow of cash income from local non-farm jobs which allows them to buy rice.

Most households that use broadcasting seeding said that they wanted to transplant rice but lacked enough farm labor and cash to do so. Households having out-migrants lack enough labor so mostly use broadcast seeding while households having local non-farm workers have enough labor to transplant rice seedlings. Households that have local non-farm workers lack both the time and the economic incentive to engage in animal husbandry.

Overall, households which have no out-migrant members to send back remittances and only a few members receiving wages from local non-farm employment engage in more agricultural activity than households with out-migrants. They own the largest number of 4-wheeled tractors so can cultivate a much

larger mean area, and devote a great share of their land to growing cash crops. This emphasis on agricultural activities may reflect the their much greater dependence on farming to earn cash for their living.

Some difference in the agricultural activities of households with different types of structure were also found. Truncated households own and cultivate the smallest mean agricultural area. This is probably because their mostly elderly members have already transferred some of their land holdings to their adult children as well as because of their limited working ability due to their advanced age. Nuclear households can transplant rice because they have a larger labor supply and use a smaller share of their land for rice than other types of households. Other difference among the different types of households (ownership of 4-wheeled tractors and practicing large animal husbandry) are not statistically significant. However, there is a negative correlation ($r = -.270$, $p < 0.01$) between the owned agricultural area and raising large livestock, which reflects the finding that it is truncated type households which own and cultivate the smallest mean agricultural area that are most frequently engaged in raising large livestock.

Conclusions

This study has examined the relationships of local non-farm employment and out-migration on agriculture in rural villages in Khon Kaen Province in Northeast Thailand. The results show that the availability of local regular non-farm job

opportunities exerts a strong influence on out-migration, household structure, and agricultural activities (Figure 1). High Employment Village, where many households have members with local non-farm employment, has fewer out-migrants and a larger share of nuclear and extended type households than Low Employment Village, where few households have members with local non-farm employment. Having abundant

local non-farm employment opportunities allows rural people to remain in their natal villages, thus maintaining more extended and nuclear households. These households have a larger labor force than the skipped generation and truncated households that occur with greater frequency in villages with many out-migrants. Consequently, they can use more labor-intensive rice cultivation methods.

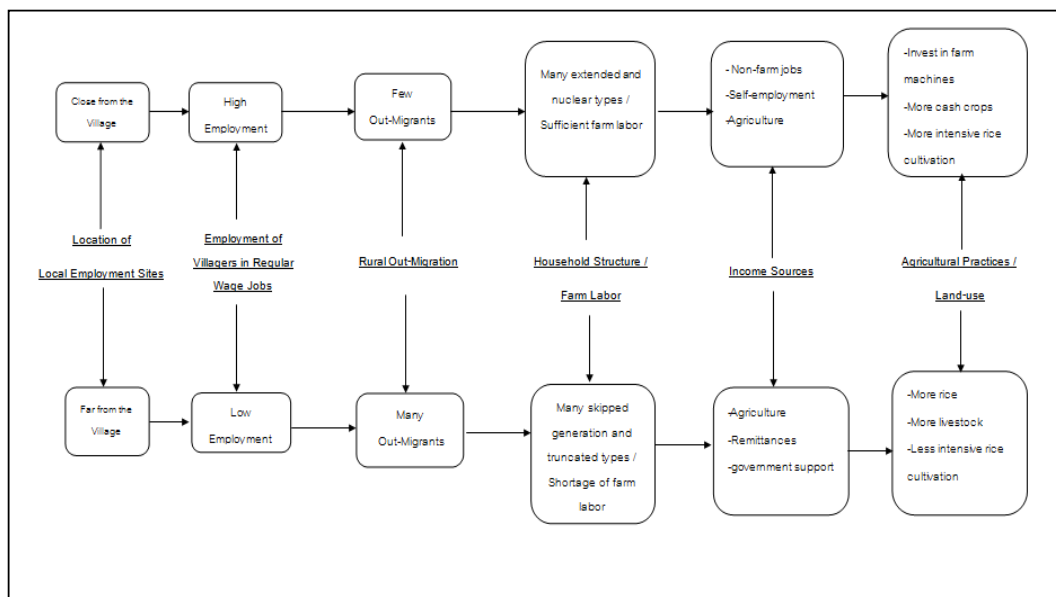


Figure 1 Effects of local non-farm employment on out-migration, household structure and agricultural activities in rural villages in Northeast Thailand

The availability of local non-farm employment opportunities also allows households to diversify their income sources, including expanding agricultural activities by using family labor and investing in farm machinery. A large share of households that enjoy a reliable cash income provided by members with local regular non-farm employment continue to grow rice. This provides a safety net against unpredictable economic

fluctuations. The value of such a safety net was shown by Subhadira et al. (2004) who found that Isan rural households that were self-sufficient in rice could cope successfully with the economic crises in Thailand in 1997-98.

It may seem counter-intuitive but it appears that government promotion of rural industrialization may be an effective strategy for maintaining and developing prosperous agricultural communities

in the Northeast. If they can obtain good paying stable local non-farm employment, young rural people are more likely to remain in the villages rather than migrating to the cities in search of work. Their non-farm income raises the standard of living of their families and allows them to purchase agricultural inputs. And because they remain with their families, they can provide them with extra labor at peak times in the agricultural cycle. However, because the number of factories in the Northeast is still small, and they are concentrated in only a few localities, most villages are not yet able to benefit from rural industrialization and, consequently, its impact on agricultural activities is still quite limited.

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