

Effects of an organic vegetable production on on-farm and off-farm income: A case study of farmer group in Nong Saeng village, Northeastern Thailand

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ABSTRACT: Twenty six households in Nong Saeng village, Khon Kaen province in Northeast Thailand (NET) participated in an informal education program and formed a farmers' group in a project called Organic Vegetable Production for Self Reliance (OVPSR). Twenty out of the 26 households, 2 group leaders and an extension officer working in the village participated in semi-structured interviews (SSI) regarding project activities and its impact on the household incomes. On the average, 20 farmers received only 36.8% of their income from on-farm production, whereas off farm activities contributed 59.6% of their income. However, half of the households had greater on-farm income than off-farm income. The informal education program and the OVPSR project appeared to have increased the role of agriculture for the participant households. There was a positive impact on increasing their on-farm income especially through vegetable production. On the other hand, another half of the households with greater off-farm activities generate a higher household income and pursue non agriculture as the dominant income generating strategy. The rapid growth in non agricultural sectors provided better employment opportunities with higher returns for the rural households that seek employment in urban settings. In addition, the higher education among the younger people in the households appears to induce them to seek non agricultural employment. The households with greater on-farm income appeared to be older in average than the households with greater off-farm income.

Keywords: organic vegetable production for self reliance, informal education program, on and off-farm income, income generating strategies

Introduction

Nong Saeng is a traditionally farming village in Khon Kaen province, Northeastern Thailand. The majority of the populations in the village are resource poor, smallholder farmers with an average landholding size of 1.7 ha (11 rai) (Department of Agricultural Extension, 2010). The primary crop is rice grown under rainfed conditions for subsistence. Smallholder farmers in the village must also cope with a harsh environment of NET generally characterized by irregular rainfall and low soil fertility. Every year the smallholder farmers may experience flood or drought by which crop yields can be severely damaged (Limpinuntana et al., 1982). Agricultural modernization through

adoption of the green revolution and integration into the global economy has made smallholders like those in the village vulnerable to climate change, environment degradation and economic downturn (Chamala, 1990). Deteriorating soil fertility compels farmers to rely heavily on high cost external inputs like chemical fertilizers that increase the financial liability of farmers who purchase agricultural inputs on credits. About 60% of households in the village are in debt (Department of Agricultural Extension, 2010). It is nearly the same as the national figure at 61% (National Statistical Office, 2003). The smallholder farmers face the risk of food insecurity due to the low production yields while bearing the high production costs from external inputs such as farm

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machines, inorganic fertilizers and pesticides, irrigation systems, high yielding seed varieties, and fossil based energy (Edwards et al., 1990). For these reasons, many villagers take on non agricultural employment to supplement household income. It is well in line with the regional development geared toward non agricultural industry especially in manufacturing and service sectors. The manufacturing sector and other non agricultural industries are rapidly growing and creating jobs with better earnings and benefits for the rural poor in Northeastern Thailand (Ekasingh et al., 2008). The manufacturing sector has grown at 5.8%, which is faster than the agricultural sector at 3.9% during the 1998-2007 periods, according to the Office of the National Economic and Social Development Board (National Statistical Office, 2003). Therefore, the dwindling labor force in agriculture due to labor migration, and the tendency to avoid the drudgery of farming among the younger generation is a major concern for Thailand as a whole, because it depends on exports of agricultural products to earn foreign exchange.

The Royal New Theory initiated by the King of Thailand is an agricultural land management to cope with the constraints faced by smallholders in Thailand. It introduces the integrated farming system that features farm product diversification, utilization of locally available and renewable resources, and income generation through farmers' cooperative work (International Erosion Control Association, 1993). One of the government agencies that carried out the implementation is Office of the Non-Formal and Informal Education (ONIE) under the Ministry of Education. The ONIE has developed and implemented an informal

education program to train farmers in agricultural knowledge and skills, with the objectives of promoting sustainable agriculture and increasing farm incomes through product diversification on farm. Twenty-six farmers in Nong Saeng village voluntarily joined this informal education program and received financial aid to form a farmer group (FG) and initiate a project called Organic Vegetable Production for Self Reliance (OVPSR). The objective of this paper is to assess the impact of the organic vegetable production on income and income generating strategies of the participant households after formation of the FG. In particular, income from on-farm and off-farm activities will be examined since this is the main focus of the project. The findings will provide an assessment of the degree to which non agricultural employment remains the primary livelihood strategy of farmers when government programs are implemented to promote sustainable agriculture as a principal livelihood strategy for Isan farmers.

Material and Method

Site selection and characteristics

This study was carried out in Nong Saeng village, Ban Phue sub-district, Nong Rua district, Khon Kaen Province from June 2010 to August 2010. Nong Saeng village was selected because 26 households in the village had joined the Organic Vegetable Production for Self-Reliance project, participated in its informal education program, and formed a FG. Nong Saeng village is located at 16° 29' 36" N, 102° 26' 0" E and 38 km away to the west of Khon Kaen City as shown in **Figure 1**. It is adjacent to the Ubonrat dam

reservoir and the Nam Pong national park. The land around the Ubonrat dam reservoir is mostly flat and alluvial, although hilly along the Pan Mountain and the Nam Pong national park. Altitude ranges from 185 m in the west to 234 m in the east, forming a 2% slope from lowlands to uplands in the topography. Annual average rainfall ranges from 1143 mm to 1544 mm (Department of Agricultural Extension, 2010). The sub district has ample water resources and infrastructure, including one stream, several swamps, shallow and deep wells, weirs, and an irrigation system with an electronic pump and pipes managed by the sub district office. The texture of the topsoil is sandy loam, dark brown and gray in color. The texture of the subsoil is clay mixed with sand, brown in color. Top soil pH is 5.0-6.0 and subsoil pH is 6.0-7.0 (Department of Agricultural Extension, 2010). The soil is suitable for growing rice in the rainy season and short duration crops like vegetables and fruits in the dry season after rice harvest while the soil still contains high water content or if water resources are available near the plot. Poor drainage of the

soil makes it prone to flooding during the rainy season. Its low organic matter and plant nutrient content, especially phosphorous and potassium, result in poor soil fertility.

Data collection

Semi-structured interviews (SSI) were carried out with 20 of the 26 households, as well as two group leaders and an extension officer working in the village, to obtain information regarding project activities and its impact on household incomes. Each interview took approximately 30 to 60 minutes in the farmers' house. Interviews with the households and key informants provided a holistic view of the household's farming system with regards to household incomes, land use, crop and labor calendars, farm management, human and natural resources, and constraints and opportunities. Secondary data including the 2010 agricultural census and maps were obtained from the sub-district office regarding village land use, infrastructure, natural resources and socio-economic characteristics with relevance

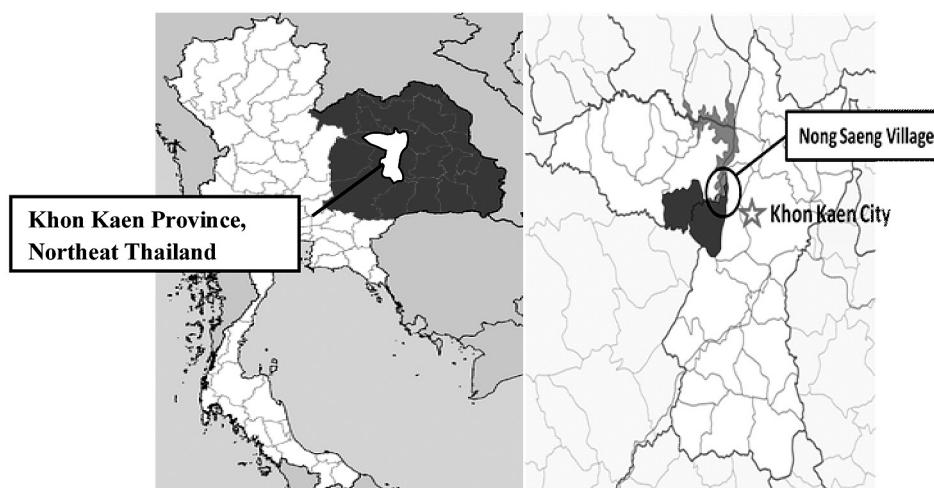


Figure 1 Location of Study Site

to the project. A limitation of this case study is an absence of information on change in income distribution of the participant households before and after the project. Therefore, a case study on Agroecosystem of Nong Saeng village conducted in 2005 by graduate students from the Program on System Approaches in Agriculture, Khon Kaen University was used as a reference that may compare and indicate the change on income level of the participant households in 2003. The small sample size confined into a single village makes the research findings inapplicable to other villages. However, it may provide a simplified picture of the way smallholder farmers in the areas make decisions on their income generating strategies.

Results and Discussion

Evolution of the OVPSR Project

The FG discussed and exchanged ideas on indigenous technical knowledge, farm management, marketing, problems and opportunities. Meetings were held twice or three times a month and the cooperative work started in 2003. The FG cultivated organic vegetables by applying the organic fertilizer EM (effective microorganism), which the farmers made with locally available and renewable resources in order to save costs on inputs. Chinese kale, Chinese cabbage, celery, eggplant, crucifer, tomato, green shallot, collard, alliums, chili, pumpkin, and corn were cultivated since 2003 until 2009. The income from selling organic vegetables in the local market was about 1,000 baht per month for each member according to the interviews with the farmers. However, in 2009, the project was terminated due to a lack of participation of

members of the farmers group. At the time of this study, only 2 households from the farmers group cultivated vegetables in their own farm land with a commercial objective, but they were not necessarily organic vegetables.

Household Income Sources

Table 1 show that the average off farm income of 20 households in the FG accounts for 59.6% of their total income, whereas the average on farm income accounts for 36.8%. Off farm income is 61.9% greater than on farm income on the average. However, the households in Group 1 actually have greater on farm income than off farm income. On farm income is generated from rice, cash crops (sugarcane and corn), vegetables and livestock. Off farm jobs include factory and construction workers, salesman, trucker drivers, and small business owners. In addition to on farm and off farm income, households also receive income from remittances of other family members who are migratory workers, accounting for 3.6% of the total household incomes.

Table 1 show that vegetable income was the greatest source among the on farm activities. However, off farm income is still the most important contributor of household income. From the comparison between Group 1 and 2, the vegetable income of Group 1 (23.3%) is almost two times higher than that of Group 2 (10.9%). It appears that households in Group 1 have successfully adopted the organic vegetable production as the primary source of household income. Thus, it may indicate that the informal education program and the OVPSR project had some positive impact on increasing the role of agriculture especially the vegetable activity.

However, the off-farm activity still provides 19.1% of the household income, which is slightly lower than the vegetable income for Group 1. Also, Group 2 is still better off than Group 1 to the extent in which Group 2 has a total household income that is 35% higher than the total household income of Group 1.

Table 1 Amounts of income from the 20 participant households in 2010 (currency in THB)

Group	On Farm					Off Farm	Remit.	Gross Income	
	Rice	Cash Crop	Vegetables	Livestock	Total				
Group 1									
26M2	100,000	300,000	0	0	400,000	252,000	0	652,000	
31M3	0	63,000	36,000	80,000	179,000	0	12,000	191,000	
89M2	30,000	150,000	0	4,000	184,000	82,000	2,000	268,000	
100M3	20,000	26,666	36,000	0	82,666	72,000	12,000	166,666	
162M3	30,000	3,000	0	12,000	45,000	24,000	84,000	153,000	
34M2	30,000	1,000	0	145,000	176,000	18,000	0	194,000	
1M2	25,000	10,000	355,100	40,380	430,480	44,400	30,000	504,880	
66M2	10,800	0	1,500	0	12,300	7,000	4,000	23,300	
65M2	15,000	3,000	2,400	0	20,400	3,500	5,000	28,900	
67M2	189,450	19,333	182,500	55,880	447,163	0	0	447,163	
Sub Total	450,250	575,999	613,500	337,260	1,977,009	502,900	149,000	2,628,909	
Average	45,025	57,600	61,350	33,726	197,701	50,290	14,900	262,891	
%	17.1%	21.9%	23.3%	12.8%	75.2%	19.1%	5.7%	100.0%	
Group 2									
412M3	0	15,000	0	0	15,000	718,800	0	733,800	
182M3	0	0	12,000	0	12,000	898,000	0	910,000	
101M3	0	0	0	120,000	120,000	384,000	0	504,000	
19M3	0	0	0	0	0	445,500	0	445,500	
35M3	30,000	0	0	15,000	45,000	206,500	0	251,500	
50M3	0	7,000	3,600	15,000	25,600	102,000	48,000	175,600	
50M2	0	4,000	36,000	0	40,000	132,000	0	172,000	
72M2	0	0	0	0	0	156,000	0	156,000	
33M2	0	30,000	0	0	30,000	44,400	24,000	98,400	
216M3	0	0	4,400	0	4,400	85,200	0	89,600	
Sub Total	30,000	56,000	56,000	150,000	292,000	3,172,400	72,000	3,536,400	
Average	3,000	5,600	5,600	15,000	29,200	317,240	7,200	353,640	
%	0.8%	1.6%	1.6%	4.2%	8.3%	89.7%	2.0%	100.0%	
Group 1 & 2									
Total	480,250	631,999	669,500	487,260	2,269,009	3,675,300	221,000	6,165,309	
Average	24,013	31,600	33,475	24,363	113,450	183,765	11,050	308,265	
%	7.8%	10.3%	10.9%	7.9%	36.8%	59.6%	3.6%	100.0%	

In addition, the t-test in **Table 2** shows that there is no significant difference between the vegetable incomes of Group 1 and Group 2. With regard to the off farm activity, there is a significant difference in off farm incomes between Group 1 and 2. Group 2 is highly dependent on off-farm activities, generating 89.7% of the household income, and able to generate significantly higher income than Group 1. The off farm income is currently the dominant income generating strategy for Group 2. It may indicate that the informal education program and the OVPSR project have failed to make on farm activities as the principle livelihood strategy for all the participant households in Nong Saeng village.

The average household income in Nong Saeng village, 2005 as shown in **Table 3** confirms

the finding that the vegetable income has substantially increased from zero income. Rice contributed the highest amount of household income in 2005, followed by the off farm income. However, by 2009 the off farm income has taken over rice as the most important income contributor. The informal education program and the OVPSR project appeared to have increased the role of agriculture especially the vegetable activity, but were unable to compete with the rapid growth of non agricultural sector. It is well in line with the fact that the manufacturing sector has grown at 5.8% as compared to the agricultural sector at 3.9% during the 1998-2007 periods, according to the Office of the National Economic and Social Development Board (National Statistical Office, 2003).

Table 2 Significant test of differences between incomes from each activity for Group 1 and 2

Activities	Group 1		Group 2		t-test ^{1/}	P	Significance
	Mean	Standard error	Mean	Standard error			
Rice	45,025	18,161	3,000	3,000	-2.25	0.0513	NS
Cash Crop	57,600	30,640	5,600	3,121	-1.71	0.1208	NS
Vegetables	61,350	37,173	5,600	3,588	-1.64	0.1362	NS
Livestock	33,726	15,262	15,000	11,832	-0.91	0.3885	NS
Off-farm	50,290	24,279	317,240	92,294	3.21	0.0106	*
Remittances	14,900	8,212	7,200	5,122	-0.72	0.4907	NS

^{1/} t-test of difference between values of each activity for two groups, level of significance at $P < 0.01$ (**), $P < 0.05$ (*), or Not Significant at $P > 0.05$ (NS)

Table 3 Average household income in Nong Saeng village, 2005

	Avg. HH income (THB/Year)	Proportion of each income
Rice	42,154.94	49%
Cash crop	1,076.71	1%
Vegetable	-	0%
Livestock	8,976.97	10%
Off farm	34,651.16	40%
Total	86,859.79	100%

Source: Agroecosystem of Nong Saeng village 2005, Khon Kaen University.

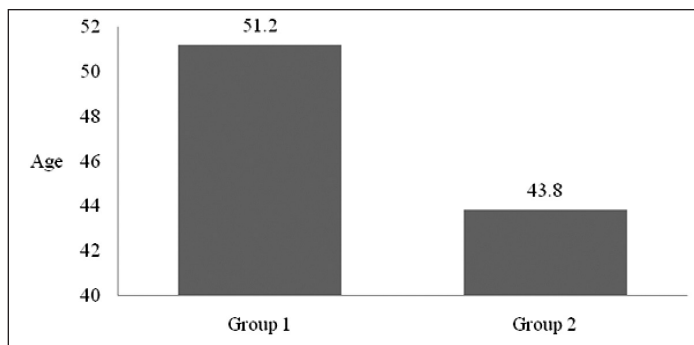


Figure 2 Average age of Group 1 and 2

It brings attention to the role of age and education with regards to the higher growth of non agricultural sector and its dominant position as the principal livelihood strategy. The younger generation which tends to have a higher education level than the older generation appears to prefer non agricultural employment. Most of the interviewees mentioned that the younger people in their households are more educated with a high school degree than most of the older people who received education up to only primary school. The younger people move to urban areas and big cities like Bangkok to seek employment. None of the farmers in the farmer group are under 40 years old. It appears that Group 1 that has higher on-farm activities is older in average than Group 2 that has higher off-farm activities as shown in **Figure 2**, although the t-test shows that there is no significant difference in age between Group 1 and Group 2. The 20 households responded during the interviews that even if the organic vegetable income increased, non agricultural employment would be more attractive because it provides quick cash income with reduced physical labor. The aspiration for an improved standard of living and higher education has apparently led all younger members of these households under the age of 40 to seek non agricultural employment in urban areas as migrant workers.

Constraints of adopting organic farming

Many studies on organic farming in developing countries point out the constraints faced by smallholders who find it difficult to capitalize on organic market due to a lack of economic incentive, inadequate knowledge and skills in production and marketing, and barriers in obtaining certification and labeling. The findings are consistent with this case study in Nong Saeng village. Households in Nong Saeng village are less likely to benefit from the organic vegetable production because the organic market is not yet well established in and around the village. Even if they have an access to organic market, there is no price premium for their fresh produce without organic certification from a recognized institution (Thapa and Rattanasuteerakul, 2011). The cost of obtaining the organic label is prohibitive for most of the smallholders. It is also very difficult to conform to various specifications and standard requirements of organic product in the market. None of the households in the FG were trained in how to meet the criteria required for certification. Knowledge and skills in marketing and postharvest practices are also inadequate to make their products competitive in the market (Roitner-Schobesberger et al. 2007). No household apparently indicated that it received significant economic returns from growing organic vegetables that are sold at the

same price as non organic vegetables. Also, none of the households in the farmers group indicated that they carried out any practices for conserving soil fertility, although this is the principle of organic farming and one of the project objectives.

Conclusion

The farmers' preferred income generation strategy differed from the strategy promoted by the Thai government through the informal education program. There appears to be a considerable gap between the thinking of farmers and the Thai government regarding the viability of sustainable agriculture as a livelihood system. The Thai government desires to protect the environment and conserve the depleting natural resource base by supporting organic farming, which is supposed to improve household incomes. However, the organic market is not yet established in and around Nong Saeng village. There are no significant economic returns to farmers who convert to organic farming. At the same time, the manufacturing sector and other non agricultural industries are rapidly growing and creating jobs with better earnings and benefits for the rural poor in Northeastern Thailand. Non agricultural employment thus appears to be a rational strategy to supplement low farm incomes and achieve economic sustainability of household income. In addition, higher education and industrialization appear to be leading the younger generation to favor non agricultural employment in urban settings, due to the better earnings and benefits in addition to less physical labor.

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