Constraints of organic vegetable production in Northeast Thailand

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ABSTRACT: The objective of the study was to assess the constraints affecting towards organic vegetable production (OVP) in Ban Swang and Ban Sam Hong villages, Sam Sung district, Khon Kaen province, Northeast Thailand. Simple random sampling technique was done in this experiment A survey method through face-to-face interview by using semi structured questionnaire which was used to collect data from 51 vegetable growers. The findings of the study showed that the percentage of respondents considering facing problems at different levels constraints were 61% low, 35% medium and 4% high level. The constraints of the respondents on organic farming faced according to rank order were insufficient understanding on the principle of OVP, insufficient training, lack of organic pesticides, difficulties on soil management, lack of co-operation, insufficient labor supply, required perception, time requirement for management for better yield, lack of monitoring & evaluation, and unsatisfactory price. Age, education, family size, farm size, annual family income, farming experience, training received and communication significantly negative correlated with constraints but no significant relation between input cost and constraints. So, adequate training on OVP, good co-operation, timely monitoring and evaluation were the most important remedies opined by the farmers.

Introduction

Organic vegetable is an important at the present and future time because of gaining popularity all over the world as it can diversify agricultural production system toward attaining improved productivity, farm income as well as food safety. And yield of organic agriculture are not less as compare to conventional agriculture (Ramesh et al., 2005). Since the 1990s, the global market for organic products has continuously and rapidly grown 20-25% per year, reaching an estimated US$ 33 billion in 2005 (Ellis et al., 2006). The reasons for increasing produce of organic vegetable are in the view of its friendly to environment, social and economic benefits. Recent research suggests that organic agriculture results in less leaching of nutrients, higher carbon storage and less erosion (Drinkwater et al., 1995). The great reason for converting conventional farm to organic farm is the impact of the heavy use of chemical pesticide and fertilizer in crop field. About one-third (2,838 million tons) of the agricultural products are produced by using pesticides (Liu et al., 2002).

Thailand is considered as an agricultural country, although its industrial sector is extending. In Thailand, an estimation indicates that certified organic production increased from 2,147 ha in 2001 to 22,550 ha in 2006, equivalent to 0.11% of the country's total agricultural area (21 million ha), representing an increase of over 950% over

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the 2001 hectares (Ratanawaraha et al., 2009). Thailand has adopted a policy that aims to promote organic agriculture in view of its environmental and economic benefits, since it evoke the 8th National Economic and Social Development Plan period (1997-2001). This policy gained prominence in 2005 when the government put forward a five years (2005-2009) organic agriculture promotion program. One of the main objectives in this program was to convert 13.6 million hectares of conventional agriculture areas into organic agriculture areas, where the use of organic fertilizers and bio-pesticides would be mainly promoted (Mingchai & Yossuck, 2008).

The Northeast region has the biggest area and population, but a moderately low supply of vegetable. Rattanasuteerakul and Thapa (2011) postulated that farmers' socioeconomic, social and farming characteristics were involved to practice good organic vegetable in Mahasarakham province, Thailand. Pattanapant and Shivakoti (2009) also studied and identified many constraints towards OVP in Chiang Mai province, Thailand. In Northeast Thailand, organic agriculture was developed in small scale business oriented mainly organic rice based, and extended to organic vegetable production (Pornpratansombat et al., 2011). In many cases, some farmers are not satisfied about their production and the concept of OVP are not yet understand by them. . In view of this context the objective was to assess the constraints affecting towards OVP in Northeast Thailand.

Materials and methods

Study area, population and sampling

The study was conducted in two villages namely, Ban Sam Hong and Ban Swang in Sam Sung district, Khonkaen province, Northeast Thailand. The total number of the farmers in the study area was 115 which were concentrated in same residential area, i.e., Sam Hong and Sawang villages. Due to language barrier and time constraint, interview with vegetable growers was done only 51 (44 percent) households. So, 43% percent of farmers were selected as sample from the population by using random numbers. A semi-structured interview schedule was used as the data collection tools, then the questionnaire was prepared for farms households' interview considering the objective of the study. Questionnaire contained measurement of constraints towards OVP; farmers' characteristics of age, education, farm size, family size, annual family income, input cost farming experience, training received, communication etc. Constraints facing index (CFI) was computed taking ten selected constraints by using following formula (Afrad, 2002). Constraints facing index (CFI) = $C_h \times 3 + C_m \times 2 + C_l \times 1 + C_n \times 0$; Where, C_h=Total number of respondents indicating high constraint facing; C_m= Total number of respondents indicating medium constraint facing; C_l= Total number of respondents indicating low constraint facing and C_n= Total number of respondents indicating no constraint facing. Constraint Facing Index (CFI) for any one of the selected constraint could range from 0 to 153, where 0 indicate no constraints facing and 153 indicating highest constraint facing. Simple co-relation

co-efficient (r) used to measure the relationship between constraints and farmers' characteristics by using SPSS (SPSS Inc., 1999) software for windows version 17.

Results and Discussion

Selected characteristics towards organic vegetables growers

The selected characteristics included age, education, farm size, family size, input cost, annual family income, training receive, farming experience and communication. The vegetable growers were categories into different characteristics and their distributions are presented in Table 1. The vegetables growers were 55 years of age the average and the overwhelming majority (74.5%) were above 50 years as compare to 25.5% below 50 years old farmers. The education up to primary (1-6) was 43.21%, up to high school (7-12) was 25.42%, and up to college/university (13-16) was 0% of the farmers. They had an average of 3 hectares of land and 9.8% were small farms compared to 35.3% medium and 54.9% were large farms. The organic vegetable growers had an average family size of 4 members and majority (64.7%) had small families where 33.3% were medium and 2% were large family. About farming experience 70.6% were low whereas medium farming experience was 29.4%. The proportion of the organic vegetable growers that had high annual income was 19.6% and 43.1% of the vegetables growers had low income of baht <60,000 compared to 37.3% of them having medium income. About input cost 51% were low, 43.1% were medium and 5.9% were high. In case of training receive 47% were no contact, 23% were very low contact and only 30% were medium contact. The proportion of 49.01 % towards organic vegetable growers had very low communication compared to 17.65 of them having high contact where 33.34% were medium contact.

Table 1 Salient features of the selected characteristics towards OVP farmers (n=51)

Characteristics	Categories	Percent	Mean	Standard dev.	Minimum	Maximum
Age (Years)	> or = 51	74.5	55	11.9	19	82
	<or=50	25.5				
Education (Year of schooling)	Can't read and write	31.37	5.27	4.27	0	11
	Primary (1-6)	43.21				
	High School (7-12)	25.42				
	College/University (13-16)	0				
Farm size (ha)	Small (0.1 to .99)	9.8	3	2	0	10
	Medium (1 to 2.99)	35.3				
	High (> 3)	54.9				
Family size (number)	Small (1-4)	64.7	4	2	1	8
	Medium (5-7)	33.3				
	Large (>7)	2.0				
Farming experience (Years)	Low	70.6	2	1	1	4
	Medium	29.4				
Annual income (baht)	Low (< 60000)	43.1	82,612	58335	6,000	232,800
	Medium (60001-120000)	37.3				
	High (> 120000)	19.6				
Input cost (baht)	Low (< 2000)	51.0	2,538	2,790	120	6,000
	Medium (2001 - 5000)	43.1				
	High (> 5000)	5.9				
Training receive (No. of times)	No training (0)	47	3.41	1.13	0	12
	Very low up to 5	23				
	Medium contact (>10)	30				
Communication (Score)	Low (1-20)	49.01	26.28	6.60	14	40
	Medium (21-30)	33.34				
	High (31-40)	17.65				

Constraints affecting organic vegetable production

Farmers' constraints towards OVP were ranked according to the order are presented in **Table 2**. Ten constraints were identified which hindered the farmers in cultivating organic vegetable.

First constraint was "insufficient understanding on the principle of organic vegetable cultivation". Farmers expressed in this section that it was very hard to understand about the principle of organic vegetable production, mostly farmers do not know the specific management is needed on soil, water, fertilizer, pesticide even timely harvesting.

Second ranking of the constraints was "insufficient training". Most of the farmers of Sam Sung revealed their expression on insufficient training which is obviously needed for organic vegetable cultivation. Farmers expressed that they need training especially, on soil management, soil test, crop cultivars, crop rotation, mix cropping, mulching, pest management system, procedure of making organic pesticides. Farmers also expressed that they did not have enough idea on organic agricultural regulations.

The third ranking of the constraint was "lack of organic pesticide". Farmers use only homemade pesticide for controlling aphids. Other pests like cabbage maggot, green ball shoot and fruit borer, nematode infestation and other fungal diseases are prominent in the area of Sam Sung.

Table 2 Ranked order of the constraints faced by the farmers' towards OVP

Constraints	CFI	Rank order
Insufficient understanding on the principle of OVP	130	1
Insufficient training	120	2
Lack of organic pesticides	115	3
Difficulties on soil management	112	4
Lack of co-operation	109	5
Insufficient labor supply	96	6
Required perception	83	7
Time requirement for management for better yield	76	8
Lack of monitoring and evaluation	74	9
Unsatisfactory price	72	10

The fourth ranking of the constraint was "difficulties on soil management". Most of the farmers expressed that they have the constraint on soil management due to lack of organic matter. Farmers in Sam Sung believe that organic matter is the solution for mitigating problem of soil. Most of them do not have idea on crop rotation, cropping pattern, legume crops that can enhance the fertility of the soil.

The fifth ranking of the constraint was "lack of cooperation". When farmers started at 2005, they had group but later the group abolished

automatically. The reasons behind abolishing of the group were: the farmers were busy of in their paddy fields and sugarcane fields and this was because farmers got more cash from those types of crops. Farmers expressed their opinion to make cooperation or group again because they were benefited from the group.

The sixth ranking of the constraint was "insufficient labor supply". Hasan (2005) did a research on the farming system in Northeast Thailand and ranked 11 constraints according to the order for sustainable farming. However, in Sam Sung the labor problem was the sixth ranking towards organic vegetable cultivation. Most of the farmers told that they have to be busy with their paddy and sugarcane fields.

The seventh ranking of the constraint was "required perception". According to the survey, organic farmers perceived that conventional farmers preferred uncomplicated agriculture practices that required shorter time in production and that had a quick turnover. Organic farmers also noted that in their view of conventional agriculture, farmers do not spend much time in the field, as their work consists mainly of spraying herbicides and pesticides in their crop fields after which they take up work in factories or perform other off-farm jobs. The eighth ranking of the constraint was "time requirement for management for better yield". With regard to organic production processes, the farmers noted that many constraints could occur, such as growth of weeds, especially in the rainy season. They stated that off-season vegetable could not be grown due to unfavorable environmental conditions.

The ninth ranking of the constraint was "lack of monitoring and evaluation". Farmers complained to the extension officers under this constraint. Farmers expressed that extension officer and sub-assistant extension officer visited their farm untimely. The farmers also told that even they have some time limitation due to engage in other crop field.

The last ranking was "unsatisfactory price". Farmers noted under this constraint that they do not get satisfactory price from consumers due to some barriers of marketing problem. Especially at peak harvest season of vegetable, they do not get higher price. In many cases they have to rely on local market, middleman and they do not get reasonable price from them.

Distribution of constraint level

The distribution of constraints of the respondents showed that 61% of respondents had low level of constraints, 35% respondents had medium level of constraints where 4% had high level of constraints are presented in **Table 3**.

Table 3 Distribution of constraints level towards organic vegetables production

Constraint level	Number (51)	Percentage
Low level (<60%)	31	61
Medium level (60% - 80%)	18	35
High level (> 80%)	2	4

It can be revealed, though low constraints level is 61% but some constraints like insufficient understanding on the principle of OVP, insufficient training, lack of organic pesticide, difficulties on soil management are important that are required for successfully OVP.

Table 4 Co-efficient of correlation (r) between selected characteristics towards vegetables growers and their constraints on OVP (n=51)

Independent variables	Computed values
Age	-0.382**
Education	-0.371*
Family size	-0.453**
Farm size	-0.340**
Annual family income	-0.277**
Input cost	0.101 NS
Farming experience	-0.365**
Training receive	-0.671**
Communication	-0.186**

*Significant at P≤0.05, ** Significant at P≤0. 01; NS = Non Significant

Relationship between characteristics and constraints towards OVP

Pearson's Product Moment Correlation Co-efficient (r) was computed in order to explore the relationships between the selected characteristics of organic vegetables growers and their constraints on OVP. The findings are presented in **Table 4**, which reveal that age, education, family size, farm size, annual family income, farming experience, training receive, and communication negatively significant correlated with farmers constraints for organic vegetable cultivation where input cost had no relationship with constraints. It implies that increasing age, and education, family size, annual family income, farming experience, training receive, communication of the farmers decrease their constraints for OVP. Since there is a limited scope to increase age, farm size and farming experience of the farmers by the external agencies, there is more than enough opportunities to help them increase their education, number of training and communication.

Conclusions

Around sixty percent of farmers towards OVP had low level of constraints on various aspects of OVP but some constraints like insufficient understanding on the principle of OVP, insufficient training, lack of organic pesticide, difficulties on soil management were prominent. Constraints significantly negative correlated with farmers' age, education, family size, annual family income,

farming experience, training received, and communication except input cost. It reveals that increasing age, education, family size, annual family income, farming experience, training receive, communication of the farmers decrease their constraints for OVP. Since there is limited scope to increase age, farm size and farming experience of the farmers by the external agencies, there is more than enough opportunities to help them increase their education, number of training and communication.

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