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Factors Affecting Farmers' Knowledge Towards the Extension of Organic Vegetable Production in Luangprabang Province, Laos People's Democratic Republic

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Abstract

This study aimed to: 1) investigate a level of knowledge about the extension of organic vegetable production of farmers in Luangprabang province, Laos People Democratic Republic and 2) analyze factors affecting the knowledge about the extension of organic vegetable production recommended by Department of Agriculture and Forestry, Luangprabang Province. A set of questionnaires was use for data collection administered with a sample group of 246 farmers. Obtained data were analyzed by using descriptive statistics and multiple regression. Finding showed that most of the respondents (93.5%) had a high level of knowledge about the promotion of organic vegetable production. Agricultural workers contact (organic farming system) and benefit gaining from organic farming were factors effecting the knowledge about organic farming system with a statistical significance level 0.01 and 0.05

Keywords: Farmers' knowledge, The Extension of organic farming

Introduction

The agricultural sector in Laos P.D.R has been changing rapidly since the previous two decades. Growth of commercial farming results in increased incomes of many agricultural household. In 2017, the value of exported agricultural products of Laos P.D.R reached one billion U.S. dollars per year while the farm land there covered and area of 1 million hectare. Nevertheless, too much use of chemicals and farm machinery had a negative impact on soil deterioration, water pollution and human health. Indeed, integrated agricultural extension shows that in the past ten years there was more than tenfold increase in pesticides imports (Ministry of Agriculture and Forestry. 2013). This was particularly in mountainous province where there was insecticide contamination in fruits and vegetables. One out of there students was found to have a high level of chemicals in the blood (Department of Agriculture. 2005). In order to be responsive to challenges arising from modernization in agriculture, the Laos P.D.R government has determined sustainable development and environmental protection and main target of the latest National Social and Economic Development Plan. The purpose of this

policy is "Leading to green economy and environmentally friendly practice". Executive of Department of Agriculture and Forestry bring the policy on "Sustainable development of clean and safe agriculture" to the strategic plan of the department up to the year 2025. The said strategic plan indicate practice guidelines on good agriculture practice (GAP) and organic agriculture (OA) as main methods employed to archive the goals. Normally, agricultural extension involved extended service in rural areas aiming to support sustainable agriculture. This is under the facilitation of the ecological and social learning process of farmers. In addition, green agriculture extension is not only a model of sustainability but also diverse methods employed for promoting farmers to adapt to various actual situations. Various guidelines for green agriculture extension aim to create sharing and apply local wisdoms as keys for operation. Besides, sustainable agriculture must be adapted to match local context having diversity and differences. Therefore, green agriculture extension is essential to practice. Various concerned public and private agencies can provide data on green agriculture and problem analyses to farmers for appropriate and effective organic vegetable or crop production. (Department of Policies & Law, 2019)

In 2003, Laos P.D.R launched organic agriculture under the international Federation Organic Agriculture Standards. This aims to increase quality and yields of organic agriculture. Presently, the provincial Agriculture and Forestry Department promotes farmers to participate in vegetable growing under the organic agriculture system for high nutritional value of food. Nonetheless, quality vegetable needed by consumers must pass the correct production process according to the principles so holistic agricultural management system that supports the ecosystem and biodiversity with an emphasis on the use of natural materials Avoid synthetic raw materials. And do not use plants, animals or microorganisms derived from genetic modification (GMO). Products are handled with emphasis on processing with care. To maintain the condition of organic farming and the important quality of the product in every step. This is particularly to correct and appropriate care taking practice. Hence, the researchers agree to investigate the promotion of organic vegetable production system and factors effecting knowledge about the promotion of organic vegetable production recommended by Department of Agricultural and Forestry, Luangprabang province. Results of this study is expected to be guidelines for planning promotion and development of organic vegetable production in Luangprabang and neighboring province.

Research Methodology

Population and sample group

The population in this study were farmers growing vegetables under the organic agriculture system of Luangprabang Agriculture and Forestry Department, Laos P.D.R. The sample group size was determined by using two-stages sampling (Suwatthi, 1998) with the following steps:

Step 1 the population in this study consisted of 639 organic vegetable farmers in 5 towns of Luangprabang province: Chiang Ngern, Nakhon Luangprabang, Chomphet, Pak-U, and Sala Phukhun (123 114 128 135 and 139 households, respectively). Taro Yamane's formula (1973) was use for the computation to get 246 representative of the farmers (95% reliability and 0.05 error).

Step 2 Farmers in each sample village were randomly selected. Then, the proportion of the total number of farmers in each sample village was compared with the calculated total sample size to find the sample size of each village. After

that, simple random sampling was conducted by using the table of random number according to the names of farmers in each village.

Research instruments and data collection

Questionnaire and knowledge test were used for data collection administered with the sample group. Data collection consisted of 2 part: socio-economic attributes of the farmers and knowledge about the promotion of vegetable production under the organic agriculture system. There were 20 question items and Cornbrash's alpha reliability coefficient was equivalent to 91.

Data analysis

This study employed quantitative data analysis by using the Statistical Package for the Social Sciences Program with the following details:

1) Data on socio-economic attributes of the farmers and their knowledge about the promotion of vegetable growing under the organic agriculture system proposed by Department of Agriculture and Forestry, Luangprabang province. Data were analyzed by using: percentage, mean and standard deviation.

2) An analysis of knowledge about the promotion of vegetable growing under the organic agriculture system. Each question was divided into two options: Correct, where the code in the analysis was 1 and incorrect, where the code in the analysis was 0. After that, collecting knowledge points of the individual farmers for grouping them based on classification of grades and levels of the knowledge of the farmers.

Score Range		Description (Knowledge)
13.5-20	=	High
6.67-13.4	=	Moderate
0-6.66	=	Low

3) An analysis for finding factors effecting knowledge about the promotion of vegetable growing under the organic agriculture system proposed by the Department of Agriculture and Forestry. Data analysis was done by using multiple regression of enter type (Wanitbancha, 2018). It was done to find a relationship between independent variables (2 and above) and the department variable with a statistical significance level at 0.05, 17 variables in formular form Y=a+bx1+x2 and name the variables: According to the investigation of factors effecting each pair of independent variables by using Pearson Correlation (Saipatthana and Piyapimonsit, 2004), it was found that neither pair of independent variables had on effect on (r) value greater than 0.80 that would cause problems between independent variables and themselves (Multicollinearity). This included the results in violation of the conditions of the multiple regression analysis (Prasitratsin, 2003).

Results and Discussion

Socio-economic attributes of the respondents

Results of the study revealed that most of the respondents were male, 47.8 years old on average, married, lower secondary school graduates and below. They had 5 household members on average and two of them were household workforce. Their annual incomes earned from the agricultural sector was 60,383 baht and from the non-agricultural sector for 42,685 baht on average. However, they had household expenses for 97,777 baht per year on average. Most of the respondents perceived news or information about vegetable production under the organic agriculture system 21.76 time per year and contracted the agricultural extension worker 0.68 time per year on average. Most of the respondents joined community traditions 10.72

times and attended a training or educational trip about organic vegetable production 2.05 time per year on average. Most of the respondents had 12.45 years of experience in vegetable growing under the organic agriculture system and their settlement time span was 49.05 years on average.

Level of knowledge about the promotion of vegetable production under the organic agriculture system of the respondents

It was found that most of the respondents (93.5%) had a high level of knowledge about the promotion of vegetable production under the organic agriculture system. Only 6.1 and 0.4% had a moderate and low level of the knowledge, respectively. (Table 1)

Table 1 A number and percentage of the respondents having different levels of knowledge about the promotion of vegetable production under the organic agriculture system

Level of the knowledge	N	%
High	230	93.5
Moderate	15	6.1
Low	1	0.4
$\bar{X}$=17.11 Min-Max=6-20 SD=2.28		

Factors effecting the knowledge of the respondents

According to an analysis of factors effecting the respondents knowledge about the promotion of vegetable production under the organic agriculture system, it was found that all of the 17 independent variables having an effect on variation that can be explained towards the dependent variable. That was, the knowledge about the promotion of vegetable production under the organic agriculture system was at 23.60% (R^2=.236). Considering the independent variables having an effect on the knowledge (statistical significance level at 0.01), two of them were agricultural extension worker contact and benefit gaining. This could be explained as below:

1) According to results of the study, it was found that agricultural extension worker contact of the respondents had an effect on their knowledge about vegetable production under the organic agriculture system with a statistical significance level. This implied that frequency of agricultural extension worker contact had on effect on the increased knowledge of the respondents. This conformed to a study of Kruekum *et al*. (2018) which found that agricultural extension worker contact had an effect on need for the promotion of organic fruit tree cultivation.

2) Results of the study revealed that benefit gaining from organic farming had an effect on knowledge about the promotion of vegetable production under the organic agriculture system. That was, the more benefit gaining from organic farming had an effect on increased knowledge and interest in organic farming with a statistical significance level. This also confirmed to study of Kaewlaima *et al*. (2017) which found that it farmers gain more benefits from organic farming this will make them learn more about organic farming. (Table 2)

Table 2 Factors effecting knowledge about the promotion of vegetable production under the organic agriculture system of the respondents

Independent Variables	Dependent Variables		
	Factors effecting knowledge about vegetable production of the respondents under the organic agriculture system		
	B	t	Sig.
Sex	-.019	-1.212	.227
Age	.002	1.972	.050*
Educational attainment	.016	1.582	.115
Marital Status	.019	1.151	.251
Household member	.007	1.002	.317
Household worker	.006	.454	.650
Household area	-.003	-1.561	.120
Organic farming area	-.007	-.887	.376
Agricultural incomes	-9.789 E-8	-780	.436
Perception of agricultural information	.001	1.785	.076
Agricultural extension worker contact	.053	3.444	.001**
Participation in vegetable production	.034	1.933	.055
Training and educational trip	0.21	1.245	.215
Experience in organic vegetable production	-.005	-1.689	.093
Participation in traditional activities	.033	1.971	.050*
Time span of Settlement	7.809 E-5	.245	.807
Benefits gained from organic farming	.046	2.757	.006**
R^2 = .236 (20.36%)	F = 2.838	Sig. F = 0.000**	

Remarks: Statistical significance level at 0.01 at 0.05

Conclusions

Results of the study indicated that the respondents had a high level of knowledge about the extension of vegetable production under the organic agriculture system. There were four independent variables having an effect on the respondents knowledge about the extension of vegetable production under the organic agriculture system: Age, agricultural extension worker contact, Participation in traditional activities and benefit gaining from organic farming with a statistical significance level (Sig.<.01 and Sig<.05).

Recommendations

1) According to results of the study, there was a age positive relationships between the knowledge about the promotion of vegetable extension under the organic agriculture system of the respondents. This implies that the farmer who often age, farmers have more knowledge and

experience in organic farming. Therefore, the researchers suggest that the developer should prepare a schedule to meet the farmers in the case of an area development project. He should allow farmers aged between 40 and 60 to participate in organic farming to make organic farming practices more successful.

2) According to results of the study, there was a positive relationships between the agricultural extension worker (vegetable production) and the knowledge about the extension of vegetable production under the organic agriculture system of the respondents. This implies that the farmer who often contacts the agricultural extension worker usually results in his increased knowledge about organic farming. Therefore, the researchers suggest that the developer should prepare a schedule to meet the farmers in the case of an area development project. He should provide data to the farmer clearly and be willing to coordinate with the farmer in an educational trip.

3) Results of the study revealed that there was a positive relationships between the benefit gaining from organic farming and the knowledge about the promotion of vegetable production under the organic agriculture system. This denotes that the farmer who gains benefit from organic farming such as based on household consumption and income generating normally wants to acquire knowledge more than even. Hence, the researchers suggest that it should have the extension of organic vegetable growing promotion to the group of farmers growing vegetables for increased incomes and safe food.

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