



Influences of Factors Affecting the Farmers' Network of Safe Vegetable Productions.

Vicharn Amarakul¹

Abstract

The influences of factors affecting the farmers' network of safe vegetable productions consisted of factor for motivation to build the network, factor for demand or consumers' preference, factor for related network supporting and the competition strategies. Totally 53 questionnaires were derived from the farmers who cultivated the safe vegetable in Muang and Bang Rakham districts, Phitsanulok Province and participated on safe vegetable production by using biopesticide for pest control during 9th - 10th June 2012 at Naresuan University. The structural equation model was analyzed by using PLS-Graph program including multiple regression analysis, factor analysis and causal influence analysis. It was found that the competition strategies, the related network supporting and the motivation to build the network were direct influences over the farmers' network of safe vegetable productions. Their path coefficients showed as 0.427, 0.373 and 0.235, respectively and their deviation was 81.4%. At the meantime, the consumers' preference and the motivation to build the network were indirect

¹Assistant Professor Dr. Program of Social Development, School of Political and Social Science : University of Phayao



influences over the farmers' network of safe vegetable productions at 0.419 and 0.215, respectively. The model were statistical significant at 95% levels of confidence.

Moreover, sustain in farmers' network of safe vegetable productions was depended on motivation of the network building. It means vegetable production leaders and members desire to provide the healthy and safety food to consumers. The promoting factors for carry out the network were consisted of related network supporting, business and demand condition or consumers' preference.

Keywords : Factor influence, Farmers' network Safe vegetable productions

บทคัดย่อ

อิทธิพลของปัจจัยที่ส่งผลต่อเครือข่ายเกษตรกรผลิตผักปลอดภัย ได้แก่ แรงจูงใจในการสร้างเครือข่าย ความต้องการของผู้บริโภค การเชื่อมโยงเครือข่ายที่ให้การสนับสนุนซึ่งกันและกัน และกลยุทธ์ในการแข่งขัน ที่ส่งผลต่อเครือข่ายเกษตรกรผลิตผักปลอดภัยจากการสอบถามข้อมูลกลุ่มเกษตรกรผู้ผลิตผักปลอดภัยต่าง ๆ อำเภอเมือง และ บางระกำ จังหวัดพิษณุโลก จำนวน 53 ตัวอย่าง จากผู้ที่เข้ารับการอบรมเชิงปฏิบัติการการผลิตพืชเพื่อให้ได้ผลผลิตที่ปลอดภัยด้วยการใช้จุลินทรีย์ควบคุมศัตรูพืช วันที่ 9 - 10 มิถุนายน 2555 ณ มหาวิทยาลัยนเรศวร โดยใช้โปรแกรม PLS-Graph วิเคราะห์แบบจำลองสมการโครงสร้างด้วยวิธีทางสถิติการวิเคราะห์ถดถอยพหุ วิเคราะห์องค์ประกอบ และวิเคราะห์อิทธิพลเชิงสาเหตุ ในคราวเดียวกัน พบว่า ปัจจัยการเชื่อมโยงให้การสนับสนุนซึ่งกันและกัน กลยุทธ์ในการแข่งขัน และแรงจูงใจในการสร้างเครือข่าย มีอิทธิพลทางตรงต่อเครือข่ายเกษตรกรผลิตผักปลอดภัย มีค่าสัมประสิทธิ์มาตรฐานเท่ากับ 0.427 0.373 และ 0.235 ตามลำดับ และมีค่าความแปรปรวนของปัจจัยเครือข่ายเกษตรกรผลิตผักปลอดภัย คิดเป็นร้อยละ 81.4 ส่วนปัจจัยความต้องการของผู้บริโภคและปัจจัยแรงจูงใจในการสร้างเครือข่าย มีอิทธิพลโดยอ้อมต่อเครือข่ายเกษตรกรผลิตผักปลอดภัย เท่ากับ 0.309 และ 0.419 ตามลำดับ การวิเคราะห์ข้อมูลมีนัยสำคัญทางสถิติที่ระดับความเชื่อมั่นร้อยละ 95



ดังนั้น เครือข่ายเพื่อผลผลิตปลอดภัยจะคงอยู่นั้น ย่อมขึ้นอยู่กับปัจจัยแรงจูงใจ การสร้างเครือข่าย หมายถึง ความปรารถนาของผู้นำและสมาชิกต้องการให้ผู้บริโภคมีอาหาร ในการบริโภคที่มีความปลอดภัยต่อสุขภาพ และปัจจัยที่ส่งเสริมให้เครือข่ายสามารถ ดำเนินการอยู่ ได้แก่ ปัจจัยการเชื่อมโยงที่ให้การสนับสนุนซึ่งกันและกัน ปัจจัยกลยุทธ์ ธุรกิจการแข่งขัน และปัจจัยความต้องการของผู้บริโภค

คำสำคัญ : อิทธิพลของปัจจัย เครือข่ายเกษตรกรผลิตผักปลอดภัย

Introduction

In the past, farmers mainly focused on increasing the agricultural products by means of expanding the area and application of fertilizers and pesticides. As a result, this way of agriculture has caused effects on health to the farmers as well as consumers. It also leads to the damage of natural resources and environment. If it is continuously practiced, it would definitely bring about the poor health throughout the country and effects on exporting the domestic products.

At present, some groups of farmers realize the effects and awareness on safety, health, food, natural resources and environment, and cooperate to produce the safe agricultural products for health and society. They allow the application of fertilizers and pesticides side by side with the natural and organic fertilizers. They integrate knowledge and innovation for controlling disease and pests by the organic way so that they can produce the toxin-free products according to the international standard. This prevents a consumer from an over-toxin product and empowers the ethics of farmers. This leads to quality of life for all and to the sustainable development in the natural resources, environment, economics and society. This trend has gradually become the main stream of agriculture.

The farmers who plant vegetables in Phitsanulok Province bear in minds about production of the safe vegetables as to meet the preference of



consumers who carefully concern with selecting a good food. The "Green Market" project carried out by the governor of Phitsanulok Province aims at being a network between the safe food producing farmers and the health-care concerned consumers without interference of a trader. It increases more incomes and meets preference of consumers. It is supported by various agents especially the Phitsanulok Municipality preparing the specific place for the toxin-free producing farmers to sale the safe food in Phitsanulok.

However, the specific place for sale of the green agricultural products is not only the key factor for success of the network of farmers, but it also depends on other factors relating to the network of farmers that lead to success in producing the safe vegetables. Therefore, the other factors influencing the production of safe vegetables should be investigated as to be a guideline for developing network of the safe food producing farmers.

Objectives

This study aims at analyzing the factors influencing success of network of the safe food producing farmers.

Hypothesis

H1: Factor for motivation to build network has influence on Factor for the success of the farmer's network for safe vegetable production.

H2: Factor for motivation to build network has influence on Factor for strategy, structure and rivalry.

H3: Factor for motivation to build network has influence on Factor for related network supporting.

H4: Factor for demand conditions (consumers' preference) has influence on Factor for related network supporting.

H5: Factor for demand conditions (consumers' preference) has influence on Factor for strategy, structure and rivalry.



H6: Factor for related supporting network has influence on Factor for the success of the farmer's network for safe vegetable production.

H7: Factor for strategy, structure and rivalry has influence on Factor for the success of the farmer's network for safe vegetable production.

Research Methodology

This study was conducted based on quantitative research approach on 'influences of factors affecting the success of farmer's network of safe vegetation production' of Phitsanulok province during the year 2010-2012.

Scope of the study, it mainly focuses on network of the safe food producing farmers in the area of Muang and Bangrakam Districts, Phitsanulok Province Thailand.

Literature Review and Related theories

Phitsanulok Province stands as the center for all lower northern provinces. Its area covers 10,816 square kilometers. It consists of 9 districts, 93 subdistricts, and 1,032 villages. According to the census in 2012, its populations are 854,372 people (General Register Office, Department of Provincial Administration, Ministry of Interior, 2012).

At Present, most people as well as tourists need a safe food for health. In Phitsanulok Province, there five groups of farmers and two different farmers are recognized as the producers who produce the toxin-free food by ways of the organic agriculture and alternative folk agriculture. They are: 1) the group of toxin-free farmers in Moo 4, Bungphra Sub-district, Muang District, 2) the group of toxin-free farmers in Moo 8, Bungphra Sub-district, Muang District, 3) the group of Tha-ngarm, Watboth District, 4) the group of organic fertilizers at Makhamsoong, Muang District, 5) the group of toxin-free farmers at Phansao Municipality, Bangrakam District, 6) Senthanghed Farm, Muang District, and 7) Rose Farm, Bangrakam District. The governor of



Phitsanulok declared the motto 'Phitsanulok, the Organic Agriculture City' and appointed the provincial committee for the green market as to run the green market in June 29, 2010 at the Municipality market 5 for the farmers distributing their organic products (77 Channel provinces, 2010).

The key factors of success for the farmers' network of safe vegetable productions consist of the following conditions: the network should have the shared objectives for corporation and intention to strengthen the network, the products should be of a premium quality, incomes of the members should be reasonable and sufficient for producing process, the products should meet the preference of consumers at present and in the future, the period of establishing the network should not take a long time, the network should be rapidly developed and accomplish the objectives, the leader or coordinator should have vision, sincerity, and experiences in administrating the network, and the members should have good wishes in distributing their safe food according to the specified purposes.

The farmers' network of safe vegetable productions [N_SAFEVEG] means a network for achieving a goal in carrying out business together with a desire for a secure and strong network having superior quality products over competitors' Income derived my members is worthwhile and stable for the production. The products must meet the present and future preference of the market. The duration of time for the network establishment should not be too long and the carried on work should grow toward the goal quickly. The leader or coordinator of the network possess far and wide vision with sincerity and experience in managing the network and members have the desire for successful operation in order for the consumers to have and to consume safe food based on the goal set. (Division of Network Promotion and Development, Office of Welfare Promotion, Protection and Empowerment of Vulnerable Groups, Ministry of Social Development and Human Security, 2012)



In order for the farmer's network for safe vegetable production to be successful, the farmer's network has to have the factor of motivation to build the network [MOTBUILD] by having reliable activities that can be put work to the full potential. Additionally, the leader has to have knowledge and ability to lead the network and to move forward to the success. The leader has to be self-motivated in order to motivate members to have self-motivation without having to be forced by others. The leader must lead by action not by verbal. The leader must be developing into hardworking habit, must determine to make the safe vegetable production a success for the leader as well as for the members. When the success has been materialized and accepted by the community, the member will become motivated and trust that the farmer's network of safe vegetable production can really be established.

Professor Michael Eugene Porter mentioned in the publication titled "The Competitive Advantage of Nations (1998)" that there are 4 factors for competitive advantage which are interrelated and comprise a single system called "Diamond Model" which include:

1) Factor Conditions: The important factors such as the skilled resources and technological base.

2) Demand Conditions: A more demand, strong, trend-setting local market lead to national advantage and help local market firms anticipate global trends.

3) Related and Supporting Industries: Local supporting industries are competitive, firms enjoy most cost effective and innovative input.

4) Firm Strategy, Structure, and Rivalry: Local conditions affect firm strategy Local rivalry forces firm to move beyond basic advantages that the home country may enjoy, such as low factor costs.

The "Diamond Model" had been applied to this study on the influences

The factors of this study will use as guideline for the network to produce safe vegetable in the future.



Population and Sample

Population for this study was drawn from farmer's network of safe vegetation production in Muang and Bang Rakham districts, Phitsanulok Province. Four sets of information (data) was collected regarding safe vegetation production from 53 samples of the farmers who participated in the training session on safe vegetable production by using bio-pesticides for pest control which was conducted at Neresuan University during 9th - 10th June 2011.

Research Tools

A set of questionnaire was established based on rating scale with 5 levels of scores, namely from 1 to 5 representing the least for 1, small for 2, medium for 3 , good for 4 and the best for 5. All data are accurate and reliability for the contents.

Data Collection

Data was collected by using the questionnaires. The factors in questionnaire had been arranged into 5 factors.

1. Factor for motivation to build network [MOTBUILD] which include factors for development of work of the group, the desire for network to be successful and to be accepted by the society,
2. Factor for demand conditions [DEMACON] which include consumers' preference, size and quantity of need and characteristics of the required safe production,
3. Factor for related network supporting [RELASUP] which consist of diversity of networks and products, diversity of activities in selling products and safe food and diversity of locations for product distribution,
4. Factor for strategy, structure and rivalry [STRARIV] which consists of defining standard for the product and services and production control to provide farmer's suitable quality for safe production,



5. Factor for the success of the farmer's network for safe vegetable production for health and society [N_SAFEVEG] which consists of factors for accomplishing the goal set by the leader and members, security and strength of the network, duration of time for establishment, quality products and members receive worthwhile returns.

The influences of factors affecting to the success of the farmers' network of safe vegetable productions had based on 2 main factors which consisted of factor for the motivation to build network [MOTBUILD] and factor for demand conditions [DEMACON]. Those factors were the initial factor to build the network. Other factors which are supportive factors to building the operation to the success which include networking factor that the related supporting factor [RELASUP] and the strategy(structure and rivalry) factor [STRARIV], shown in Figure 1.

Data Analysis

Analysis of mean value for descriptive purpose and analysis of structural equation model and analysis of reflective model for solution to causative relation by structural equation model (SEM) using method for partial least square analysis: PLS Graph (Chin, 2001; Bollen& Lennox, 1991; Edwards &Bagozzi, 2000) for the study of the influences of factors affecting the success of farmer's network of safe vegetation production.

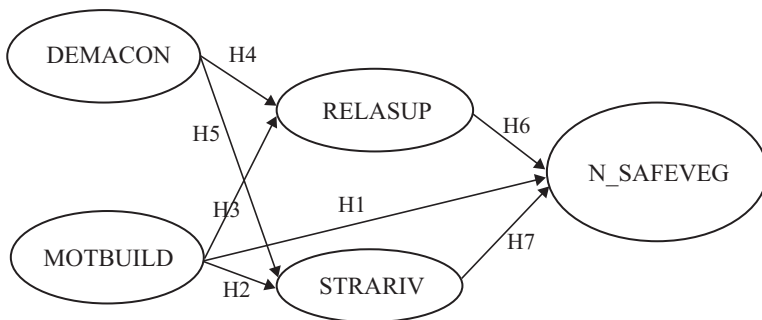


Figure 1 Success of Thai Farmers' Network model for safe vegetable production.



Conclusion

The following general information was obtained from the set of questionnaire on the influence of factors affecting the success of farmer's network of safe vegetable production of Muang and Bang Rakham Districts, Phitsanulok Province, conducted at the training workshop on the subject matter using biopesticides or microorganism for pest control at Naresuan University during 9th - 10th June 2012:

The 56.60% of the informants were women with average age of 49.2 years of age. It was also found that 64.15% were at the level of primary school education, 28.30% were at secondary school level, and 7.55% were at bachelor degree level.

The 90.60% of informants were farmers with the average experience of about 1.8 years in safe vegetable production and the rest were involved in safe vegetation production activities.

For farmers who responded to the questionnaire, the 32.08% of the informants were leaders of safe agriculture network, 56.60% were only the members of safe agriculture network and the rest were not members of the network.

From the table1, mean of all variables are moderate to good level.

The result of the analysis using PLS-Graph by the analysis of structural equation model and analysis of reflective model (Figure2 and Table2) can be summarized as follows:

Factor for motivation to build network and factor for demand conditions have direct influence on factor for related network supporting with standard coefficients of 0.577 and 0.366, respectively. The deviation in both factors supported each other and showed as 69.1%, significant at p - value < 0.05.



Factor for motivation to build network has direct influence on factors for strategy, structure and rivalry with standard coefficients of 0.478. But the factor for demand conditions has not influence on factors for strategy, structure and rivalry with standard coefficients of 0.184. The deviation of the factors for strategy, structure and rivalry showed as 35.5%, significant at p -value < 0.05 .

Factor for motivation to build network, factor for related network supporting and factor for strategy, structure and rivalry have direct influence on factors on the success of farmer's network of safe vegetable production with standard coefficients of 0.235, 0.373 and 0.427, respectively. The deviation of factors for the success of farmer's network of safe vegetable production showed as 81.4%, significant at p -value < 0.05 .

In addition, factor for motivation to build network and factor for demand conditions had indirect influence on the success of farmer's network of safe vegetable production with standard coefficients of 0.419 and 0.215, respectively at the level of confidence of 0.05.

Therefore, it could be concluded that the factor for motivation to build network which consists of factors for development of group working, the desire on successful of the network and the acceptance of the society had overall influence on the success of farmers' network of safe vegetable production and showed as 0.654, significant at p -value < 0.05 .



Table 1 The statistics of the variables in each factor from 53 samples

Construct (Latent variables)	Indicator (Manifest variables)	Mean	SD.
Factors of successful network of farmer's safe vegetable production	N1: Variables for fulfilling the goal of leaders and members	3.60	3.60
	N2: Variables for security and strength of the network	3.72	3.72
	N3: Variables for time of establishment	3.28	3.28
	N4: Variables for quality products	3.85	3.85
	N5: Variables for worthwhile return	3.72	3.72
Factor for motivation to build the network	M1: Variables for continue developing cultivation techniques	3.70	3.70
	M2: Variables for safe products and sufficient supply in local market	3.72	3.72
	M3: Variables for acceptable of consumer and market	3.81	3.81
Factor for demand or consumers' preference	D1: Variables for quantity of products	3.53	3.53
	D2: Variables for characteristic of the requirement	3.72	3.72
Factor for related network supporting	R1: Variables for diversity of products	3.60	3.60
	R2: Variables for diversity of selling activities	3.98	3.98
	R3: Variables for diversity of locations for products distribution	3.64	3.64
Factor for the competition strategies	S1: Variables for agricultural practices control by organization	3.55	3.55
	S2: Variables for quality control by organization	3.60	3.60

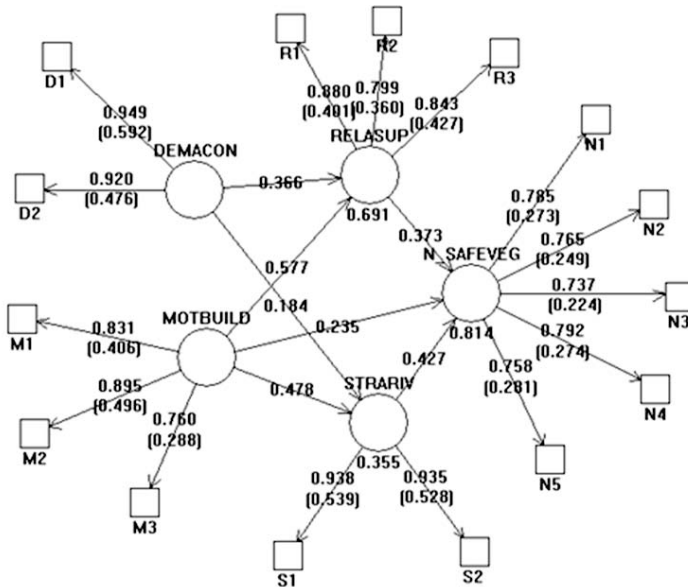


Figure 2 PLS path model of the success of farmer's network of safe vegetation production

The structural equation model as following :

$$N_SAFEVEG = 0.235 * MOTBUILD + 0.373 * RELASUP + 0.427 * STRARIV ;$$

$$R^2 = 0.814$$

$$RELASUP = 0.577 * MOTBUILD + 0.366 * DEMACON ; R^2 = 0.691$$

$$STRARIV = 0.478 * MOTBUILD + 0.184 * DEMACON ; R^2 = 0.355$$

Remark

MOTBUILD = Factor for motivation to build network

DEMACON = Factor for demand conditions (consumers' preference)

RELASUP = Factor for related network supporting

STRARIV = Factor for strategy, structure and rivalry

N_SAFEVEG = Factors of successful network of farmer's safe vegetable production



Table 2 Relationship between direct and indirect influences affecting the success of farmers' network of safe vegetable production.

Dependent variables	R ²	Effect	Independent variables			
			MOTBUILD	DEMACON	RELASUP	STRARIV
N_SAFEVEG	0.814	Direct Effect	0.235*	0.000	0.373**	0.427*
		Indirect Effect	0.419	0.215	0.000	0.000
		Total	0.654	0.215	0.373	0.427
RELASUP	0.691	Direct Effect	0.577**	0.366**	N/A	N/A
		Indirect Effect	0.000	0.000	N/A	N/A
		Total	0.577	0.366	N/A	N/A
STRARIV	0.355	irect Effect	0.478**	0.184	N/A	N/A
		Indirect Effect	0.000	0.000	N/A	N/A
		Total	0.478	0.184	N/A	N/A

* Significant at p -value <0.05 ** Significant at p -value < 0.01

Table 3 Results of hypothesis testing

Hypothesis	Path coef.	t-stat	p-value	result
H1: MOTBUILD → N_SAFEVEG	0.235*	1.998	0.050	support
H2: MOTBUILD → STRARIV	0.478**	3.388	0.001	support
H3: MOTBUILD → RELASUP	0.577**	5.785	0.000	support
H4: DEMACON → RELASUP	0.366**	3.900	0.000	support
H5: DEMACON → STRARIV	0.184	1.339	0.186	not support
H6: RELASUP → N_SAFEVEG	0.373**	2.688	0.010	support
H7: STRARIV → N_SAFEVEG	0.427*	2.232	0.030	support



Summary

The objective of this research was to analyze factors influencing the success of farmers' network of safe vegetable production over the study area of Muang and Bang Rakham Districts, Phitsanulok Province. It was found that factors for strategy, structure and rivalry, factors for related network supporting and factor for motivation to build network have direct influence on the success of farmers' network of safe vegetable production, with standard coefficients of 0.427, 0.373 and 0.235, respectively. And the deviation of factor for farmers' network of safe vegetable production showed as 81.4%. The factor for demand conditions and factor for motivation to build network had indirect influence on farmers' network of safe vegetable production showed as 0.419 and 0.215, respectively. The data analysis had statistical significant at 95%. Factors for motivation to builds for production network consisted of variables for the development of group working, the desire for the successful of the network and the acceptance of society have overall influence on the success of farmer's network of safe vegetable production with 0.654 which it was considered the highest influence. In addition, the factors for production had neither direct nor indirect influences on factors of the success of farmers' network of safe vegetable production, the statistical significant at 95%.

Discussion

The success factors of a network of safe, healthy and vegetable production depended on the procedure to achieving the goals of the leaders and members. Until now, the network of safe vegetables to consumers was built up to 22 months. The level of successful of this network had been evaluated in good level. Therefore, government and private sectors must provide the assistance for improve the strategic plan of safety vegetable production by doing the criteria and standards of vegetable products,



services and places for product distribution. The potential of the growers, who produced the safety vegetable, should be encouraged by build up their confident. The vegetable growers could sell the products and the consumers could trust in quality.

Suggestion

The results of this study for the consumers will have safe food for health. The factors to promote the continuation of the network consisted of factors for related network supporting, factors for business competition strategy and factor for consumer need. Those factors will use as guideline for the network to produce safe vegetable in the future. Government should extension and support to agriculture leader and members who working on safe vegetable production, built up the strengthening of farmers, promote on safe vegetables production and provide the place of product distribution.

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