
Knowledge and attitudes towards marketing innovation of organic rice farmers in Sanam Chai Khet organic agriculture group, Chachoengsao province, Thailand

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Abstract The socio-economic, knowledge, and attitudes towards marketing innovation of organic rice farmers in Chachoengsao Province, Thailand was investigated. The research findings revealed that most farmers are female (65%), aged between 51-60 years old (35%), graduated from primary school (80%). Experienced in organic rice production was 11-20 years (55%). The area of organic rice production was less than 15 Rai (50%), the most of which were their own areas (95%). The most commonly used rice was Jasmine Rice (Red How Mali Rice) (85%). The farmers produced rice products in accordance with the IFOAM, EU, and Canada Standard Organic Farming Procedures (90%). The main distribution channel of organic rice product was farmers' group shop (70%). There was no bargain with buyers (70%) and no marketing promotions for customers (90%). The result of participant on farmer knowledge of marketing innovation was a knowledgeable about organic rice marketing innovative at a moderate level (55%). They had a high knowledge of price (91.70%), and promotion (81.65%), while knowledge of place and product were at moderately levels (70% and 68.75%, respectively). Considering the attitudes, the farmers had high level of attitudes towards marketing innovation (80%). Interestingly, they strongly agreed on price ($\bar{x} = 4.37$), but they agreed on product ($\bar{x} = 3.98$), and on promotion ($\bar{x} = 3.64$). However, the farmer's attitudes towards place was undecided ($\bar{x} = 3.47$).

Keywords: organic rice, marketing innovation, farmer's knowledge, farmer attitudes

Introduction

In recent years, an important trend in sustainable food consumption is represented by organic consumers (Annunziata and Vecchio, 2016). Research Institute of Organic Agriculture (FiBL) and International Federation of Organic Agriculture Movements (IFOAM) (2018) indicated that the global organic food market growth reaches \$ 89.7 billion in 2016. In Thailand, the market of organic agriculture currently has been expanding increasingly (Panmanee and Kongtanajaruanun, 2012; Ueasangkomsate and Santiteerakul, 2016). In 2017, the organic food market in Thailand was valued 2,700 million Thai baht with an average annual growth of 20%

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(Department of Internal Trade, 2018). Considering supply side, the government policy pays more attention to increase organic farming from 300,000 to 600,000 rai in 2021 as announced by the National Strategic Plan for Organic Agriculture, 2017-2021. As a result, Thai farmers turn to grow organic rice. The organic production area increased from 219,391 rai in 2011 to 284,918 rai in 2015 or 29.87 percent increase. The organic rice growing area increased from 140,712 rai in 2011 to 168,310 rai in the year 2015 (19.61 percent increase) (Panyakul, 2016).

Organic rice farmers utilize a variety of marketing channels including selling products to the middlemen, to retail stores, to modern trade (farmer-to-middlemen), or selling directly to the customer (farmer-to-consumer). Farmers consider direct marketing as an alternative market outlet to increase their income (Nayga *et al.*, 1994; Onianwa *et al.*, 2005). Farmer-to-consumer marketing is of growing importance, not only in providing many farmers with greater net returns but also in retaining food traditions (Kambara and Shelley, 2002; Spiller *et al.*, 2007). Direct marketing outlets include community-supported agriculture (CSA), farmers markets, u-pick farms, farm stands, restaurants, farm-to-schools and institutions programs, agritourism, and online marketing (Timothy, 2009). Online marketing can serve farmers as an alternative marketing channel (Hoffman and Novak, 1996); it is also able to cut the middlemen in many aspects of the selling process (Woun, 2007; Alavioun *et al.*, 2012; Arayesh, 2015) and enables the businesses to sell directly to the final buyers through cut out the traditional intermediaries (Kotler and Armstrong, 2010). Online marketing and online social network have become increasingly significant, because “we are in the era of social marketing” (Reed, 2012; Ilić *et al.*, 2014).

Johne (1999) pointed out that there are three types of innovation which contribute to organic business development: product innovation, process innovation, and market innovation. This study focused on marketing innovation, since it is consistency with Thai government policy. Since 2017, the government agencies have promoted the use of online marketing for organic rice farmer. This is a mission launched by the Ministry of Commerce by the Department of Internal Trade (DIT), which responsible for organizing the promotion and development of trade, marketing, and domestic markets. The DIT has issued a strategy for the period of 2060-2021 to develop markets and trade systems for agricultural products. Currently, the DIT disseminates knowledge including new marketing advice, such as selling rice online through various marketing channels, making rice packaging to attract customers, and adding value to the product by disseminating knowledge and advice through social media, for instance Facebook Fanpage and Youtube Channel. The new marketing of rice is a marketing of farmers which is consistency with the Thailand 4.0 strategy

focusing on the use of technology and innovation to create the value added for agricultural products.

In regard to online marketing channels, the innovation involving changing the way a product is delivered to customers. Online marketing as a sales and marketing techniques is an innovation of creating and implementing new ideas (Gautam, 2012). Online marketing has a potential to transform the marketing channel for a farmer; however, the adoption of the online marketing by rice farmers is limited. According to the 15 year-old long statistics surveyed by the National Bureau of Statistics Ministry of Information and Communication Technology (2015) revealed that skilled workers in agriculture and fishery was using only 9.6% of the internet. It is interesting to study about the acceptance of marketing innovation by selling via social media in accordance with government policy. In addition, currently, many organic niche marketers still use traditional method. In some cases, there is a delay, and sellers cannot communicate directly with consumers. They do not know exact product requirements, or how to delivery from manufacturers to consumers through multiple intermediaries.

Knowledge, attitudes, and practice studies looking at the uptake of innovations have been carried out since the 1980s (Seline *et al.*, 2015). Knowledge and attitudes are key factors in accepting marketing innovation. Knowledge is the result of the attitudes whether positive or negative, and the attitude will affect the behavior of the stimulus to stimulate (Suwan, 1983). The right or wrong of knowledge is based on the academic principle. (Kijpreedaborisuthi, 2006), and attitudes, as a dimension of evaluation, to indicate that people like something or not is considered intrinsic. Interpersonal communication is influenced by exposure to behavior (Jehteh, 2013). Information and knowledge are important factors for accelerating agricultural development through appropriate production planning, and the adoption of improved marketing (Ali and Kumar, 2011).

OECD (2005) defined marketing innovation as the implementation of a new marketing method, involving significant changes in product design or packaging, product placement, product promotion or pricing. In addition Naidoo (2010) stated that marketing innovation, defined as improvements in the marketing mix (Product, Price, Place, Promotion). Even though Thai government emphasized on promote via online marketing. This study was attempt to evaluate knowledge of organic rice farmers towards marketing innovation. Organic rice farmers in Sanam Chai Khet Organic Agriculture Group, Chachoengsao Province was selected as a case study, since, this area was identified as one of the areas with the organic farming network under the Alternative Farming Network Organic with more than 200 members covering 1,500 rai of cultivation area. Network members produce their organic rice by sharing information. Their organic rice productions are in the line with many standards; International Federation of Organic Agriculture Movements (IFOAM), EU Program (EU), and Canada Organic

Regime (COR). However, farmers sell their organic rice products through a number of channels, for example by collecting and sending to mills of the network for milling and processing, by selling directly to consumers in using a member system, or by delivery produces to schools or sent to Lemon Farm shops (Kerdsriseam and Suwanmaneepong, 2015).

Therefore, the study aimed to investigate knowledge and attitudes towards marketing innovation of organic rice farmers in Sanam Chai Khet Organic Agriculture Group, Chachoengsao Province. The results obtained from this study can encourage organic rice farmers to adopt marketing innovation for selling their products directly to consumers. In addition, related organizations can use the results to prepare information and training programs in order to encourage farmers to accept marketing innovations for selling their products.

Materials and methods

Population and sample size

The population participated in this study was 20 organic rice farmers in Sanam Chai Khet Organic Agriculture Group, Chachoengsao Province, Thailand, who had experience in growing rice more than 5 years.

Data collection and data analysis

The questionnaire was divided into four parts as follows:

Part I contained general information of respondents, production, and marketing, namely gender, age, education, the number of household members, the number of members producing organic rice, monthly income, farmer institution membership, experience in organic rice production, size of area for organic rice farming, rice breeding, average yield, organic rice distribution, training on marketing innovation, organic rice standard, organic rice product for selling, product branding, packaging and labeling, marketing channel, promotion and bargaining.

Part II was consisted of the knowledge about marketing innovation by using scoring; score 1 was given if participants answer correctly (true), and scores 0 was given if they answer incorrectly (false). The scores varied from 0-13 points and were classified into three levels as shown in Table 1: low (less than 60%), moderate (60%-80%), and high (more than 80%) (Bloom, 1956; Mondal *et al.*, 2014). The questions were also divided into four aspects of marketing mix which was adapted from OECD (2005) and Naidoo (2010) as follows 1) Knowledge of product marketing innovation, 2) Knowledge of price marketing innovation. 3) Knowledge of place marketing innovation and 4) Knowledge of promotion marketing innovation.

Table 1. Level of knowledge about marketing innovation

Score	Description
0 – 8 (less than 60%)	Low level
9 – 11 (60% - 80%)	Moderate level
12 – 13 (80% - 100%)	High level

Part III contained the attitudes towards marketing innovation. The attitudes were measured by Likert's rating scale (Likert, 1932), where 1 was strongly disagreed, and 5 was strongly agreed. The five levels of farmer's attitudes can be interpreted as follows:- strongly disagree, disagree, undecided, agree, and strongly agree. Based on the research by Lucian-Florin, (2012) and Leeyakittikorn (2015) stated that the attitude towards marketing innovation were classified into the following four aspects (4Ps) as follows:-1) Attitude of product marketing innovation, 2) Attitude of price marketing innovation, 3) Attitude of place marketing innovation and 4) Attitude of promotion marketing innovation.

Table 2. Level of attitudes towards marketing innovation

Average	Description
4.50 – 5.00	Strongly disagree
3.50 – 4.49	Disagree
2.50 – 3.49	Undecided
1.50 – 2.49	Agree
1.00 – 1.49	Strongly agree

Frequency and percentage were used to describe socio-economic and knowledge of marketing innovation by the respondents. In addition, the mean and standard deviation analysis was chosen to examine the farmer attitudes towards the marketing innovation.

Results

Characteristics of the organic rice farmers

The findings revealed that majority of farmers are female (65%), aged between 51-60 years old (35%), graduated from primary school (80%). The number of household members was 3 - 4 (40%), and the number of members producing organic rice was 2 (50%). Income from agriculture was less than 10,000 baht per month (55%). Participant farmers had experience in organic rice production at 11-20 years (55%). The area of organic rice production was less than 15 rai (50%), most of which were their own areas (95%). The most rice breeding was Jasmine Rice (Red How Mali Rice) (85%). The average yield of paddy was 201-300 kg/rai and 301-400 kg/rai which was equal to 35%. The farmers managed their organic rice production by selling (100%), storing for consumption (95%), and keeping for breeding (90%). Fifty percent of the participants attend trainings on the innovative

marketing of organic rice. The farmers produced rice production in accordance with the organic standard of IFOAM, EU, and Canada Standard Organic Farming Procedures (90%). Rice was produced for selling in the form of paddy (85%), following this was rice (40%) and seed (15%). The main marketing channel for organic rice products was farmer's group shops (70%). Most of them (95%) do not have product branding, packaging, or labeling. Moreover, only 5% of the farmers sold their product online. Interestingly, there was no bargain with buyers (70%) and no marketing promotions for customers (90%). All figures and characteristics of the organic rice farmers are presented in Table 3.

Table 3. Characteristics of the rice farmers in Sanam Chai Khet Organic Agriculture Group

Item	N (%)
Gender	
Male	7 (35%)
Female	13 (65%)
Age	
Less than 40 years old	2 (10%)
41 – 50 years old	6 (30%)
51 – 60 years old	7 (35%)
61 – 70 years old	4 (20%)
More than 70 years old	1 (5%)
Education	
Primary school	16 (80%)
Lower secondary school	2 (10%)
High school	1 (5%)
Diploma	1 (5%)
The number of household members	
1 - 2 people	5 (25%)
3 – 4 people	8 (40%)
5 – 6 people	5 (25%)
More than 6 people	2 (10%)
The number of members producing organic rice	
1 people	7 (35%)
2 people	10 (50%)
3 people	2 (10%)
4 people	1 (5%)
Monthly income (Thai bath)	
Less than 10,000	11 (55%)
10,001 – 20,000	5 (25%)
More than 20,000	4 (20%)
Farmer institution membership*	
Alternative agriculture network	20 (100%)
Sanam Chai Khet organic agriculture group	20 (100%)
Agricultural cooperative	2 (10%)
Bank for agriculture and agricultural cooperatives (BAAC)	10 (50%)
The savings of the village	15 (75%)

Table 3. (cont.)

Item	N (%)
Experience in organic rice production	
Less than 10 years	8 (40%)
11 – 20 years	11 (55%)
More than 20 years	1 (5%)
Size of area for organic rice farming	
Less than 15 rai	10 (50%)
16 – 30 rai	7 (35%)
More than 30 rai	3 (15%)
Rice breeding	
Jasmine Rice (Red How Mali Rice)	17 (85%)
Khao Dawk Mali 105	8 (40%)
New Jasmine Rice	3 (15%)
Average yield (kg / rai)	
Less than 200	2 (10%)
201 - 300	7 (35%)
301 - 400	7 (35%)
More than 400	4 (20%)
Organic rice distribution	
Consumption	19 (95%)
Selling	20 (100%)
Keep for breeding	18 (90%)
Training on marketing innovation	
Ever	10 (50%)
Never	10 (50%)
Organic rice standard	
Standardized by IFOAM, EU, COR	18 (90%)
Do not get organic rice standards	2 (10%)
Organic rice product for selling*	
Paddy	17 (85%)
Rice	8 (40%)
Seed	3 (15%)
Product branding, packaging and labeling	
Yes	1 (5%)
No	19(95%)
Marketing channel*	
Organization of the group	14 (70%)
Home	4 (20%)
Local market	4 (20%)
Online/Social media	1 (5%)
Market in tourist attractions	1 (5%)
Bargaining	
No bargain with buyers	14 (70%)
Have a bargain with buyers	6 (30%)
Promotion	
No promotion for customers	18 (90%)
There are promotions for customers	2 (10%)

* answering more than 1 choice

Knowledge of the organic rice farmers

The result in Table 4 represents the levels of participant farmer knowledge of marketing innovation. The result exposed that average farmers were knowledgeable about organic rice marketing innovative in a moderate level (55%), followed by high level (25%) and low level (20%), respectively.

Table 4. Description of knowledge level of rice growers on marketing innovation

Knowledge level	N (%)
Low level (less than 60%)	4 (20%)
Moderate level (60% - 80%)	11 (55%)
High level (80% - 100%)	5 (25%)

Source: Computed by the authors from survey data

Table 5. Knowledge about marketing innovation

Items	True (%)	False (%)
Product	13.75 (68.75)	6.25 (31.25)
1. Organic rice products can be considered as a product for specific customers.	12 (60%)	8 (40%)
2. Farmers can create a brand for organic rice products.	15 (75%)	5 (25%)
3. Organic rice packaging is a costly and costly process.	8 (40%)	12 (60%)
4. Diversification of organic rice products can create alternatives for customers.	20 (100%)	-
Price	18.33 (91.70)	1.67 (8.40)
5. Organic rice products can be sold at a higher price than conventional rice.	17 (85%)	3 (15%)
6. The color of rice as the order of customers (Make to order) can get the right price.	18 (90%)	2 (10%)
7. Storytelling can increase the value of organic rice.	20 (100%)	-
Place	14 (70.00)	6 (30.00)
8. Farmers can sell organic rice products by themselves via social media.	17 (85%)	3 (15%)
9. Selling organic rice products through social media is costly.	9 (45%)	11 (55%)
10. Farmers can sell organic rice products according to social media provided by government agencies.	16 (80%)	4 (20%)
Promotion	16.33 (81.65)	3.67 (18.35)
11. Farmers can return goods in case of problems or the customer's dissatisfaction.	17 (85%)	3 (15%)
12. Promotion of organic rice products make a loss.	12 (60%)	8 (40%)
13. Advertising and promotion of organic rice products can increase sales.	20 (100%)	-

Source: Computed by the authors from the survey data

Considering the four aspects of marketing mix as shown in Table 5, farmers had a high level of knowledge of price (91.70%), and followed by promotion (81.65%) While the knowledge of place and product were at moderate levels (70% and 68.75%, respectively). Only three questions: 1) diversification of organic rice products can create alternatives for customers, 2) storytelling can increase the value of organic rice, and 3) advertising and

promotion of organic rice products can increase sales, could be answered correctly by the farmers (100%). The question that most farmers answered incorrectly was that organic rice packaging is a costly and costly process (60%), followed by selling organic rice products through social media is costly (55%), and both organic rice products can be considered as a product for specific customers and promotion of organic rice products make a loss (40%).

Attitudes towards marketing innovation

Figure 1 reveals farmer's attitudes towards marketing innovation. The result showed that the farmers had a high level of attitude towards marketing innovation (80%). Interestingly, they strongly agreed on a price ($\bar{x} = 4.37$), but they just agreed on a product ($\bar{x} = 3.98$), and on promotion ($\bar{x} = 3.64$). However, the farmer's attitude towards place was undecided ($\bar{x} = 3.47$).

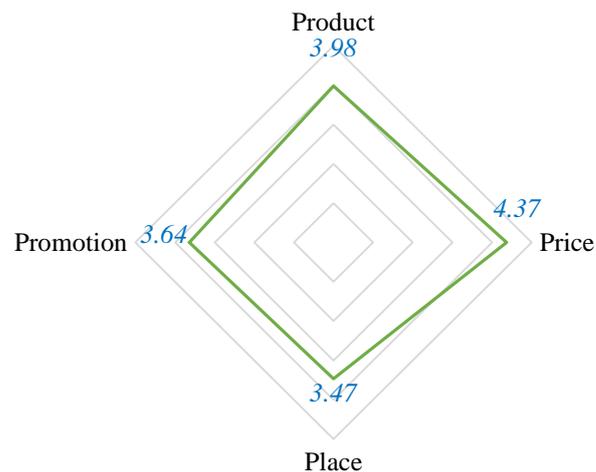


Figure 1. Attitudes towards marketing innovation

The farmers strongly agreed on three items: rich organic rice products can make choices for customers ($\bar{x} = 4.75$), advertising and promotion of organic rice products can increase sales ($\bar{x} = 4.75$), and storytelling can increase the value of organic rice ($\bar{x} = 4.60$). The farmers agreed with six items: made to-order products are not easy to produce ($\bar{x} = 4.25$), changing the organic rice packaging can increase the value of the product ($\bar{x} = 4.25$), making a difference between organic rice products and those of competitors can raise prices for organic rice products ($\bar{x} = 4.25$), farmers can create a brand for organic rice products ($\bar{x} = 4.20$), farmers cannot sell organic rice products through social media ($\bar{x} = 3.85$), selling organic rice products through social media increases revenues more than traditional sales ($\bar{x} = 3.65$). The farmers undecided with four items: return of

goods from defects, problems or from customer's dissatisfaction are complicated ($\bar{x} = 3.30$), farmers can sell organic rice products on social media agencies of the state ($\bar{x} = 2.90$), promotion of organic rice products make a loss ($\bar{x} = 2.85$), and organic rice products can be considered as a product for specific customers ($\bar{x} = 2.70$).

Table 6. Attitudes towards marketing innovation

Statements	\bar{X}	S.D	Description
Product	3.98	0.499	Agree
1. Organic rice products can be considered as a product for specific customers.	2.70	1.838	Undecided
2. Farmers can create a brand for organic rice products.	4.20	1.005	Agree
3. Made to-order products are not easy to produce.	4.25	1.251	Agree
4. Rich organic rice products can make choices for customers.	4.75	0.444	Strongly agree
Price	4.37	0.591	Agree
5. Changing the organic rice packaging can increase the value of the product.	4.25	0.786	Agree
6. Storytelling can increase the value of organic rice.	4.60	0.681	Strongly agree
7. Making a difference between organic rice products and those of competitors can raise prices for organic rice products.	4.25	1.070	Agree
Place	3.47	0.939	Undecided
8. Farmers cannot sell organic rice products through social media.	3.85	1.461	Agree
9. Selling organic rice products through social media increases revenues more than traditional sales.	3.65	1.182	Agree
10. Farmers can sell organic rice products on social media agencies of the state.	2.90	1.553	Undecided
Promotion	3.64	1.008	Agree
11. Return of goods from defects, problems or from customer's dissatisfaction are complicated.	3.30	1.720	Undecided
12. Promotion of organic rice products make a loss.	2.85	1.694	Undecided
13. Advertising and promotion of organic rice products can increase sales.	4.75	0.444	Strongly agree

Discussion

According to the survey results, with respect to product innovation, organic rice with standard certification (IFOAM, EU, and Canada Standard Organic Farming Procedures) is an innovation in production process. As indicated by IFOAM (2008), organic agriculture combines tradition, innovation, and science to generate benefit to share environment, promote fair relationships, and a good quality of life. By the way, the farmers still lacked of processing, and packaging innovation, since most of them sold products in the form of paddy, without branding or packaging. Also, they still lacked of innovation in distribution channels and promotion for selling for innovative marketing (OECD, 2005).

Additionally, the results revealed that farmers were knowledgeable about organic rice marketing innovative at a moderate level. They had a high knowledge on price and promotion. This might be because the paddy price of organic rice is highly and statistically significant than that of conventional farms (Pornpratansombat *et al.*, 2011), such as they gained information from the network and can set up price for their products. Considering the attitudes towards marketing innovation, the farmers had a high level of attitudes towards marketing innovation. Interestingly, they strongly agreed on a price, but they just agreed on product, and on promotion. However, the farmer's attitudes towards place was undecided. Farmer expressed a different attitude towards marketing innovation. This finding was in consistent with the study by Modirwa and Oladele (2017) that the farmers expressed different attitudes towards collaboration with agricultural innovation systems.

Organic rice farmers in Chachoengsao Province, Thailand produced rice production in accordance with the organic standard. They gained product innovation, but they still lacked of innovation in price, place, and promotion. In addition, the uptake marketing innovation by organic rice farmers seemed to be low. This research provided important empirical evidence of farmer knowledge on marketing innovation. Whilst the government promotes marketing innovation, policy level requires understanding farmer knowledge and attitudes. Thus, extension information on marketing innovation may be an effective way to encourage farmers to accept marketing innovation.

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References

- Ali, J. and Kumar, S. (2011). Information and communication technologies (ICTs) and farmers' decision-making across the agricultural supply chain. *International Journal of Information Management*. 31:149-159.
- Annunziata, A. and Vecchio, R. (2016). Organic farming and sustainability in food choices: an analysis of consumer preference in Southern Italy. *Agriculture and Agricultural Science Procedia*. 8:193-200.
- Arayesh, M. B. (2015). Investigating the financial and legal - security infrastructure affecting the electronic marketing of agricultural products in Ilam Province. *Procedia - Social and Behavioral Sciences*. 205:542-549.
- Bloom, B. S. (1956). *Taxonomy of educational objective*. New York: David McKay Co., Ltd.
- Department of Internal Trade (2018). Organic database system. Retrieved from <http://organic.dit.go.th/News.aspx?id=182>
- Gautam, R. K. (2012). Success determination by innovation: a theoretical approach in marketing. *Kvalita Inov ácia Prosperita / Quality Innovation Prosperity*. 16:18-24.
- Hoffman, D. and Novak, T. (1996). Marketing in hypermedia computer-mediated environment. *Journal of Marketing*. 60:176-196.
- IFOAM (2008). One earth, many hands 2008 annual report. Retrieved from https://www.ifoam.bio/sites/default/files/page/files/ifoam_annual_report_2008.pdf
- Ilić, D., Ostojić, S. and Damnjanović, N. (2014). The importance of marketing innovation in new economy. *Singidunum Journal of Applied Sciences*. 11:34-42.
- Jehteh, M. (2013). Factors related to environmental conservation in the schools of junior high school students: case study of Thamavitya Mulniti School, Muang District, Yala Province. (Master Thesis). National Institute of Development Administration, Thailand.
- Johne, A. (1999). Successful market innovation. *European Journal of Innovation Management*. 2:6-11.
- Kambara, K. M. and Shelley, C. L. (2002). The California agricultural direct marketing study. California Institute for Rural Studies. Retrieved from <http://www.cirsinc.org/CAgriculturalDirectMarketingStudy.pdf>
- Kerdsriseam, C. and Suwanmaneepong, S. (2015). Organic agricultural producer strategies in supply chain of sustainable agriculture network, Chachoengsao Province. Thailand. *Journal of Agricultural Technology*. 11:1731-1742.
- Kijpreedaborisuthi, B. (2006). *Techniques for creating data collection tools for research*. Bangkok: Chamchuree products Co., Ltd.
- Kotler, P. and Armstrong, G. (2010). *Principles of marketing* (13th ed.). New Jersey: Pearson Prentice Hall.
- Leeyakittikorn, B. (2015). *Marketing innovations for herbal products*. (Master Thesis). Thammasat Univasity, Thailand.
- Likert, R. (1932). A technique for measurement of attitudes. *Archives of Psychology*. 140:5-55.
- Lucian-Florin, O. (2012). Marketing and innovation: young people's attitude towards new products. *Annals of Faculty of Economics, University of Oradea, Faculty of Economics*. 1:1179-1186.

- Modirwa, M. S. and Oladele, O. I. (2017). Knowledge and attitude towards collaboration in agricultural innovation systems amongst stakeholders in the North West Province, South Africa. *South African Journal of Agricultural Extension*. 45:10-19.
- Mondal, S., Haitook, T. and Simaraks, S. (2014). Farmer's knowledge, attitude and practice toward organic vegetables cultivation northeast Thailand. *Kasetsart Journal*. 35:158-166.
- Naidoo, V. (2010). Firm survival through a crisis: the influence of market orientation, marketing innovation and business strategy. *Industrial Marketing Management*. 39:1311-1320.
- National Bureau of Statistics Ministry of Information and Communication Technology. (2015). Summary results: explore the use of information and communication technology in the household in 2015. Retrieved from service.nso.go.th/nso/nsopublish/themes/files/icthh58.pdf
- Nayga, J. R., Fabian, M. S., Thatch, D. W. and Wanzala, M. N. (1994). New Jersey farmer-to consumer direct marketing operations: sales, advertising and other issues. Rutgers University Agricultural Experiment Extension. N.J.:New Brunswick.
- OECD. (2005). Oslo manual: guidelines for collecting interpreting innovation data. OECD, Paris.
- Onianwa, O., Wheelock, G. and Mojica, M. (2005). An analysis of the determinants of farmer-to-consumer direct-market shoppers. *Journal of Food Distribution Research* 36(1):130-134.
- Panmanee, C., and Kongtanajaruanun, R. (2012). Willingness to pay and ability to pay for fresh organic vegetables of the consumers in Chiang Mai province. Maejoe University, Thailand.
- Panyakul, V. (2016). Overview of the organic situation of Thailand in 2016. Retrieved from <http://www.greennet.or.th/article/411/>
- Pornpratansombat, P., Bauer, B. and Boland, H. (2011). The adoption of organic rice farming in northeastern Thailand. *Journal of Organic Systems* 6(3):4-12.
- Reed, J. (2012). Get up to speed with online marketing: how to use websites, blogs, social networking and much more. Upper Saddle River, N.J: FT Press.
- Research Institute of Organic Agriculture (FiBL) and International Federation of Organic Agriculture Movements (IFOAM). (2018). The world of organic agriculture statistics and emerging trends 2018. Retrieved from <https://shop.fibl.org/CHen/mwdownloads/download/link/id/1093/?ref=1>
- Seline, S., Delia, C., Oluyede, C., Gudeta, W. and Maarten N. (2015). The role of knowledge, attitudes and perceptions in the uptake of agricultural and agroforestry innovations among smallholder farmers in sub-Saharan Africa. *International Journal of Agricultural Sustainability*. 13:40-54.
- Spiller, A., Zihlsdorf, A. and Mellin, M. (2007). Farmer-to-consumer direct marketing: the role of customer satisfaction measurement for service innovations. *International European Forum on Innovation and System Dynamics in Food Networks*. 1:344-354.
- Suwan, P. (1983). Attitude: measurement, change and hygiene. Bangkok: Odeon Store Co., Ltd.
- Timothy, A. P. (2009). Assessing the returns from organic marketing channels. *Journal of Agricultural and Resource Economics*. 34:483-497.

Ueasangkomsate, P. and Santiteerakul, S. (2016). A study of consumers' attitudes and intention to buy organic foods for sustainability. *Procedia Environmental Sciences*. 34:423-430.

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