

# LEVERAGING SMART FARMERS' INCOME THROUGH MARKETING MANAGEMENT OF SAFE VEGETABLES IN NAKHON PATHOM PROVINCE

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## Abstract

The objective of this research was to study smart farmers' income through marketing management of safe vegetables in Nakhon Pathom Province. The data was collected from 3 operators and 750 customers who bought safe vegetables via an electronic commerce system. The research results revealed that: 1) The decision made to buy the safe vegetable through multi-channel marketing stems from the combined influence between the e-marketing mix and technology adoption with statistical significance. 2) In order to deliver to consumers in a timely manner, a safe vegetable delivery system and standardized packaging for safe vegetable delivery should focus on maintaining freshness, cleanliness, and product quality. 3) The development of a safe vegetable traceability system among smart farmers in Nakhon Pathom Province must focus on making QR code to provide complete information at every step from upstream to downstream of the cultivation process, maintenance, and harvesting, ready to deliver to consumers. 4) Online marketing channels will reduce the number of middlemen while increasing the value of safe products. For offline marketing, farmers sell products in the market by themselves. The emphasis should be placed in the form of contract farming. Furthermore, 5) the proactive marketing media public relations strategy for safe vegetables in Nakhon Pathom Province should focus on the creation of brand communication on the safe vegetables to be recognized, remembered, and trusted.

**Keywords:** Smart Farmers, Multi-Channel Marketing, Marketing Management

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## **Introduction**

Leveraging smart farmers' income through marketing management of safe vegetables in Nakhon Pathom Province is essential. Agreeing with the National Organic Agriculture Development Strategy 2017 - 2021, the vision was set for "Thailand as a regional leader in production, consumption, trade in organic agriculture products and services that is sustainable and is recognized internationally". The emphasis is put on promoting the use of information system, public relations and development of organic farming networks as well as marketing promotion distribution channel and logistics system. This is in accordance with the vision of Nakhon Pathom Province that focuses on positioning an agricultural city and industrial safety. Safe vegetables are an important agricultural product of Nakhon Pathom Province as the center of production and delivery of safe vegetables to the main market in Bangkok (Upstream activities). There is the lack of systematic production management. The high levels of chemicals used in cultivation are caused by misunderstandings that negatively affect farmers and consumers. There is the raw material collector problem (Midstream activities) in terms of inefficiency in checking standards or quality of important agricultural products such as safe vegetables, etc. There is also the lack of technology to help increasing the distribution channels. The products are unable to reach target customers effectively. The innovation and technology is also lacked in helping the marketing promotion and there if the problem of consumers who lack knowledge and awareness of safe food consumption (downstream activities). The inspection of standards or quality is not in line with international market acceptance. As a result, consumers lack confidence.

Agriculture in Thailand still encounters many problems. Especially, the productivity is still at a low level and the average income of farmers is low because farmers do not have enough knowledge. They lack marketing insights for production planning as well as the knowledge to produce high quality agricultural products that are safe for consumers and environmentally friendly (Ruthaichanok, 2013). The aforementioned issues reflect that farmer's occupation still lack sustainable development especially in strengthening to be self-reliant in the long term. Therefore, the smart farmer concept in the view of the Ministry of Agriculture means a farmer who has a thorough knowledge of the agricultural occupation being able to plan by knowing the market demand and preparing the production accordingly. This includes the ability to increase production efficiency and to solve problems quickly by analyzing the data as a component of decision-making based on principles and reasons. They know how to apply technology in agriculture emphasizing on the production of high quality agricultural products which are safe for consumers and environmentally friendly to modernize farmers to be self-reliant in a sustainable way.

The smart farmers in Nakhon Pathom Province produce the safe vegetables with the fund contributed for supporting the greenhouses for growing safe vegetables from the Agricultural Nakhon Pathom Provincial Agriculture Office. According to the results from the preliminary survey by meeting with Nakhon Pathom Provincial Agriculture and Head of Strategy and Information Group, Nakhon Pathom Provincial Agriculture Office, it can be concluded that most smart farmers in Nakhon Pathom

Province do not have sufficient knowledge and management skills for safe vegetable marketing in a new marketing situation that combines both offline and online media to provide the multi-channel marketing. They lack the insights into the purchasing behavior of consumers or customers. This leads to a lack of connection among producers, traders and consumers. There is no safe delivery system for vegetables directly to consumers. The standardized safe vegetable packaging design technology is not used to help establishing a system of traceability that creates confidence and credibility to customers or consumers in the new era. The public relations strategies are lacked for brand communication to help promoting the sale of safe vegetables to the target group. This agrees with the research of Kanchanik (2012) who suggested the development of farmers that the supporting information should be provided to farmers in terms of technology, production, production management, marketing and business operations to enable farmers to increase their production capacity, exporting quality, and safe products from toxic substances as well as adopting technology to help facilitating the work along with the paradigm adjustment and adaptation of farmers.

From the aforementioned statements, the research team realized the need to create a series of research project on “Leveraging smart farmers’ income through marketing management of safe vegetables in Nakhon Pathom Province”. This consisted of 5 sub-projects covering from the study of consumer behavior and decision to buy safe vegetables, the study of delivery system development, the study of traceability system, the marketing channel development, and the media strategy for proactive marketing with participation from farmers of safe vegetable products. Research results useful to those who were interested were presented.

### **Research objectives**

1. To study the consumer behavior and factors affecting the decision to buy safe vegetable products via electronic commerce and multi-channel marketing systems.
2. To study the development of safe vegetable delivery system among smart farmers in Nakhon Pathom Province
3. To study the development of safe vegetable traceability system among smart farmers in Nakhon Pathom Province
4. To study the development of offline and online marketing channels for safe vegetables among the smart farmers in Nakhon Pathom Province
5. To study the promotion of marketing of safe vegetables for the smart farmers in Nakhon Pathom Province through the media strategy of participatory proactive marketing.

### **Literature Review**

#### **Multi-channel marketing**

The new market concept entering the business which is highly competitive by using the concept in approaching the customers first will have the competitive advantage. Kerin Hartley and Rudelius

(2007) defined it as the mean to integrate multiple marketing channels, communicate and send information to reach customers and attract them to buy any time, any place and any way. Thus, there are many marketing channels such as retail stores, websites, mail order with catalogs, or direct communication through letters, e-mails or text messages via mobile phones. Anuchit (2002) suggested that multi-channel marketing is a combination between communication and delivery of goods or services to customers including linkage and reinforcement among channels. It is a synergy with the goal to attract customers and maintain a good relationship with customers.

Multi-channel marketing focuses on developing mainly the e-commerce marketing channels as an alternative to the new generation of consumers with behavioral changes to use digital media. These media are starting to play an increasingly important role in daily life (Prachachat Business, 2010). In the modern media improvement era, the role of media will be a channel for consumers to have access to change the channel to buy products that focus on convenience and ease of use. There are recommendations for methods and easier access to the required information. The consumers are more inclined to buy products when there are more marketing channels to buy (Baran, Galka, & Struk 2008).

In the past 5 years, the development of information systems has evolved greatly. There is continuous development until there is research in the marketing field mentioning multi-channel marketing. The development begins from Single Channel marketing to Multi-Channel marketing through multiple channels at present. However, the current trend of e-commerce has started to have entrepreneurs stepping over to the market through Cross-Channel method including Omni-Channel marketing more. With the development of more complete information technology, it is possible to bring data from all channels and scattered parties and process them altogether. It allows us to enable each party to work altogether under the same data set. Thus, all channels can work altogether and can respond well to the needs of customers. This is therefore the era of Omni-Channel marketing in using every channel to help meeting the needs of customers in All Moment of Customer Journey (Netway, 2021).

### **Safe vegetable delivery system**

It is the system for transferring goods from one point to another such as transferring products from warehouses to customers (Ecommerce Platforms, 2014). There are many ways and different vehicles for safe vegetable transportation to the markets. The distance to be transported also causes the operators to consider durability and strength of the packages to protect the products to be safe during transportation. Transferring the safe vegetables with different equipment will cause different damage to products. The entity must consider the method of transportation used to determine the comparative disadvantage to a minimum. The economy of transportation due to weather factors must also be considered. When the products are delivered through a place or to a place with different weather conditions, the temperature and humidity can damage the safe vegetables when the packaging is not protected. The transaction of safe vegetable transportation can be divided into two types; 1) Business to Business (B2B) and 2) Business to Consumer (B2C) (Department of International Trade Promotion,

2018). Currently, as the consumers are more likely to buy products online and some working age groups are busy of work until they have no time to buy products. Therefore, the business of delivering products between the operators to consumers as Door to Door Service is more popular whether for small or large operators because it can facilitate both buyers and sellers.

### **Traceability system**

It is a way for consumers to check the products they want to consume in order to ensure the produce that farmers send to consumers. This can guarantee confidence in the products to see how they are planted, cared, and produced. The consumers can know the growers. It can also encourage repeat purchases in the future (Chalermchon Waisayadamrong, 2006; Schwagele, 2005). In making regular buyers become loyal customers, the production traceability can be used to verify confidence using QR Code. It also plays an important role in the traceability system to growers or production sites (Soratham Kettaphan, 2017). In the era of rapidly developed technology, farmers can use technology to participate in the distribution of products more than in the past year. It can be said that the producers can have loyal customers and the consumers are confident in the sources of vegetables and fruits.

The developed prototype of safe vegetable traceability among modern farmers in Nakhon Pathom Province is compliant with Good Agricultural Practices (GAP) and can be used to meet the needs of users and consumers who wish to trace the safety of vegetables produced in the community of farmers effectively. QR Coding and labeling of agricultural products is very important because it will be one of the channels for contacting farmers back to consumers. Each type of vegetable can be planted with good care. QR Code system will be able to tell the “substance” to consumers to understand the agricultural process from the cultivation process, maintenance, harvesting from upstream to downstream.

### **Online marketing channels**

These includes e-commerce systems and social media of facebook, Instagram, shopee, Line and online ordering. The development process of marketing channels both online and offline will help leveraging farmers by increasing the competitiveness to be able to expand the market to customers more (Angeline, 2012).

The development of online marketing happens when companies do most of their marketing activities through digital communication channels. As digital media is the coded medium to identify the users, the marketers are enabled for Two-way Communication with customers. Digital channels are channels that help creating the opportunities for farmers as well as reducing the disparity in terms of costs that affect small businesses. It also creates opportunities for small businesses to be known and expand the customer base widely.

In choosing a digital channel that is suitable for the business, the digital channel that is generally known is through websites, e-mail, blogs, social networks, internet browsing program, online video,

digital games and mobile commerce. The current marketing channels mean the channels that businesses can use to contact their customers including online channels such as Facebook or Line and offline channels such as printing media and TV (Kwon & Lenno, 2009; Close, 2012).

### **Public Relations strategy**

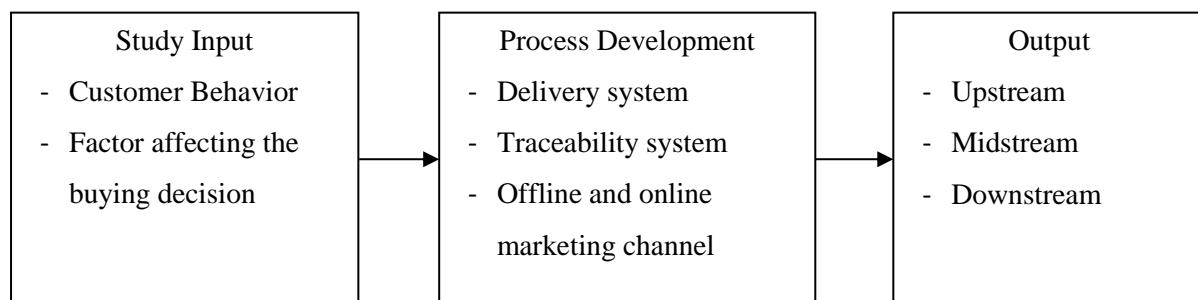
It means public relations marketing to implement the successful and engaging proactive branding which comes from the formulation of a comprehensive and well-defined strategy with systematic planning and rigorous management. The researches are defined for the clear objectives and the audience. The design of the message and the selection of various types of media and communication channels are carefully made with appropriate monitoring and response (FAO, 2014c). The synthetic outcomes for development communication campaign strategies presented by international development organizations and academics with contributions to the ongoing developments include FAO (2015), FAO (2014b), FAO (2014c), IFAD (2010), Tufte and Mefalopulos (2009). It outlines the elements of the communication strategy that researchers can implement and apply as a conceptual framework for developing a participatory proactive public relations strategy with 11 elements; 1) Main problem or starting point of marketing public relations, 2) Target group, 3) Marketing public relations goals, 4) Marketing public relations objectives, 5) Marketing public relations concept, 6) Marketing public relations strategy, 7) Marketing public relations media strategy, 8) Indicators for monitoring and evaluation, 9) Budget, 10) Responsible person, and 11) Marketing public relations action plan.

Developing a media strategy for participatory marketing is a continuation step from the development of marketing public relations strategy. It is to develop the participatory public relations media strategy to promote safe vegetable marketing among modern farmers in Nakhon Pathom Province to consumers considering about message and story, methods/media used to increase consumer's knowledge, change attitude, and create new behaviors to understand abstract things into concrete, reduce misunderstandings, and increase memorization. The group process is applied by allowing farmers to develop messages, contents, tones and design media according to their experiences. There are media experts to give advice to consider the suitability, divided into 5 main steps; preparation, production planning or decision making, test before use, final media production, and the field use. In this section, the participatory tool has been developed only in the preparation and production planning processes by applying a conceptual framework proposed by the Food and Agriculture Organization of the United Nations (FAO, 2015; FAO, 2014b; IFAD, 2010).

There are important issues in the formulation of media marketing public relations strategy which are divided into 2 parts; 1) Determination of communication methods by choosing strategic communication methods or activities that enable interaction, sharing and exchanging information. This may be interpersonal communication, medium communication, or mass communication in only one way or in combination (FAO, 2014b). 2) Strategic choice of communication channels mean any medium, tool or activity used to deliver messages to a defined target audience, e.g. personal media, folk

media, community media, mass media, internet, new media and social media, etc. There are 3 criteria for selecting media; 1) Appropriateness and correspondence with the target group considering the need, characteristics, or exposure style, communication skills, communication channels, communication potential of each target group or the results of analysis on the knowledge gap, skills, attitudes and behaviors, 2) Communication objectives and content of the strategy, and 3) Cost effectiveness (IFAD, 2010; FAO, 2015; FAO, 2014b).

In this research, the researchers studied the leveraging of smart farmers' income through marketing management of safe vegetables in Nakhon Pathom Province through the research process according to the following research framework:



**Figure 1** Research framework

#### Input

Studying the behaviors of consumers and factors affecting the decision making to buy the safe vegetables via e-commerce and multi-channel marketing systems using the combined research methods. The data was collected from 750 customers who bought the safe vegetables via e-commerce system and the interview was conducted with 3 operators who sold the safe vegetables.

#### Process

1. The development on the safe vegetable delivery of the smart farmers in Nakhon Pathom Province consisted of the development on the quick parcel delivery form of safe vegetables of the quick parcel service provider as well as the service quality of the quick parcel delivery service provider (SERVQUAL).

2. The development on the safe vegetable traceability system in the smart farmers in Nakhon Pathom Province showed the data from the upstream to the downstream including the data of the manufacturer, vegetable species, growing process, maintenance, manufacturing area, and data of the distributor. All were as determined by the National Agricultural Commodity and Food Standards.

3. The development on the offline and online marketing channel for the safe vegetables in the smart farmers in Nakhon Pathom Province consisted of:

1) Offline marketing channel including the community market, point-of-sale market, and network market, 2) Online marketing channel including the e-commerce system and social media

4. The promotion on the safe vegetables of the smart farmers in Nakhon Pathom Province through the PR strategies of participatory proactive marketing by developing the PR strategies of participatory proactive marketing and determining as the PR strategies for safe vegetables with the participation of smart farmers in Nakhon Pathom Province, government agencies, private agencies, customers, and consumers divided into 11 elements.

#### Output

The gained produce can be leveraged from; 1) Upstream: The farmers have knowledge in the consumer's behaviors in order to plan the production, 2) Midstream: The farmers can be leveraged in generating more income from multi-channels of marketing, and 3) Downstream: The customers can be leveraged in traceability towards the production source in order to reinforce the confidence in all sectors as well as leveraging the income generation to the smart farmers for the safe vegetables in Nakhon Pathom Province concretely.

### **Research Methodology**

The goal for the study of “Leveraging of smart farmers’ income through marketing management of safe vegetables in Nakhon Pathom Province” focuses on the profound understanding of consumer purchasing behavior leading to strategy formulation, proper marketing management, standards for safe delivery and packaging of vegetables, traceability system that builds confidence for customers and consumers, increasing number of offline and online multi-channel marketing. The offline and online proactive engaging marketing media can reach and drive purchasing decisions between farmers and customers and directly between farmers and the final consumers. Thus the smart farmers in Nakhon Pathom Province can have the ability to use marketing to lead production. They can sell products in higher volumes and prices leading to an important result in the economic dimension to leverage the smart farmers’ income in Nakhon Pathom Province. In this research, the data were collected from a group of operators, and customers who purchase safe vegetables via e-commerce. The emphasis is put on participatory action research among smart farmers in Nakhon Pathom Province, consumers/customers, government agencies, private sector and related parties. The tools used in the data collection include the questionnaires, interview forms, and group discussions. Such results are synthesized altogether.

### **Research Findings**

From the result of knowledge synthesis using the system theory consisting of input, processes and output, the research and development process is applied by dividing the research process into 3 parts as follows:

**1. Input:** It is the study of consumers' behaviors and purchasing decisions towards safe agricultural products through multi-channel marketing. It was found that most of the purchasing

behaviors via online channels were female, single, aged between 21-30 years old with bachelor's degree. Most of them earn more than 20,000 baht. The average daily time spent buying vegetables through e-commerce systems takes about 1-2 hours between 8AM – 8PM. It is commonly used to buy vegetables through the e-commerce system. The frequency of buying safe vegetables through the e-commerce system is 1-2 times per month for most consumers. Each time is approximately 100-300 baht. The most popular e-commerce marketing channels to buy are Facebook, Line and Shopee. Electronic commerce payment methods include paying cash to employees upon receipt of products, cash on delivery and via mobile payment. The consumer behaviors in purchasing safe vegetables are through marketing channels using multi-channel marketing both online and offline.

The decision making through e-commerce system regarding the safe vegetable marketing mix consists of good quality products and clear information on safe vegetables. The prices of safe vegetables sold on the app are clearly identified with the delivery fee. The distribution channel through e-commerce system is ready to use 24 hours a day. Marketing promotion through e-commerce system has a variety of marketing promotions such as discounting, collecting points, free delivery. The service is to provide information that is useful to individual customers via telephone, email and SMS. For the privacy, the personal data are kept secure and reliable including password security.

The consumers pay much attention to the process of decision making to buy safe vegetables. They research from multiple sources before making the buying decision. They will evaluate the options based on cost, cost-effective price and quality comparison. In addition, behavior after purchase depends on the received experience such as recommending and telling to relatives and friends if the consumers receive good quality products and impressive services. The research model determines the study of behaviors and buying decision of safe vegetables as the input to be adjusted to the proactive marketing model that uses the market to lead the production. The farmers can plan the production correctly suiting their needs and the needs of consumers to achieve maximum satisfaction

**2. Process:** Leveraging of smart farmers' income through marketing management of safe vegetables in Nakhon Pathom Province is divided into 4 processes as follows:

**1<sup>st</sup> process:** The safe vegetable delivery system of the smart farmers in Nakhon Pathom Province is developed. This process will implement the safe vegetable delivery system of the smart farmers in Nakhon Pathom Province. This consists of the development on the quick parcel delivery form of safe vegetables of the quick parcel service providers. There are two types of service quality of express courier service (SERVQUAL) which are the traditional delivery mode (offline). It is the delivery of vegetables from farmers' farms to the distribution sources such as local markets and shopping malls. The online delivery mode uses courier companies to deliver the products to consumers. In comparison, traditional (offline) delivery costs are higher in case of low sales volume. In case of online sales, the delivery costs will be borne by the buyer. In this process, 2 types of packaging for safe transportation of vegetables have been developed, namely 3 types of pre-formed paper boxes which are packaging for transportation to help maintaining the quality of vegetables and 3 types of plastic bags

which are packaging that are attached to the vegetables to reduce spoilage of vegetables and maintain freshness for a long time.

**2<sup>nd</sup> process:** The system for safe vegetable traceability is developed among smart farmers in Nakhon Pathom Province. It will display the information from upstream to downstream such as information of producers, vegetable varieties, planting procedures, maintenance, production area and distributor information. It is in accordance with the National Agricultural Commodity and Food Standards. The efficiency of the safe vegetable traceability system that appears in the safe vegetable packaging can ensure the consumers who can monitor the production process. Standard production sources will raise the production standards for farmers who use technology in the production process.

**3<sup>rd</sup> process:** The marketing channels are developed consisting of 1) Offline marketing channels, i.e. community market, point-of-sale market, and network market, and 2) Online marketing channels, i.e. e-commerce system and social media via facebook, Instagram, shopee, Line, and online ordering. The process of developing both forms of marketing channels is to enhance farmers by increasing their competitiveness to expand the market to more customer groups. In comparing offline and online marketing channels for safe vegetables among smart farmers in Nakhon Pathom province, it can be divided into Activity Based Costing (ABC). It is found that using offline marketing channels will cost more than offline marketing channels. The efficiency of selling online marketing channels to be better may be due to the impact of the COVID crisis which changes the consumer behaviors. It results in more online shopping. Both traditional offline channel to buy safe vegetables from local markets, department stores, and online channel to buy some rarely-found vegetables such as lettuce will be operated well in online marketing channels. From the researches, the knowledge gained from researches have been managed as a sales guide through offline and online marketing channels in the form of an e-book content. It will consist of Algorithm of selling both offline and online and successful strategies for selling offline and online.

The development has been made in marketing public relations strategy, message public relations strategy, and public relations media strategies. The public relations strategy for participatory proactive marketing is developed in a form of public relations strategy to promote the marketing of safe vegetables with the participation of smart farmers in Nakhon Pathom Province. Personnel from government agencies, private sector, customers and consumers are divided into 11 elements; 1) Main problem or starting point of marketing public relations, 2) Target group, 3) Marketing public relations goals, 4) Marketing public relations objectives, 5) Marketing public relations concept, 6) Marketing public relations strategy, 7) Marketing public relations media strategy, 8) Indicators for monitoring and evaluation, 9) Budget, 10) Responsible person, and 11) Marketing public relations action plan.

The strategy of participatory public relations is determined to promote the marketing of safe vegetables for smart farmers in Nakhon Pathom Province to consumers divided into 6 steps; 1) preparation of specific characteristics of the message, 2) determine the content, 3) select the motivation point in the message, 4) select the form of message presentation, 5) determine the message position,

and 6) determine the method of organizing the message. The most challenging step is to develop a media strategy for participatory marketing to promote the marketing of safe vegetables for smart farmers in Nakhon Pathom Province to consumers considering about message and story, methods/media used to increase consumer's knowledge, change attitude, and create new behaviors to understand abstract things into concrete, reduce misunderstandings, and increase memorization. The group process is applied by allowing farmers to develop messages, contents, tones and design media according to their experiences. The process of producing and distributing media consists of 11 components; 1) issues/problems, 2) contents/messages, 3) stakeholders/key target groups, 4) media goals, 5) format, 6) quantity, 7) budget, 8) production timeline, 9) prototype media testing, 10) field implementation, and 11) training on participatory proactive marketing public relations media strategies. The main knowledge and products are media for public relations for the Nakhon Pathom safe vegetable participatory proactive brand marketing to attract both offline and online for brand communication and promotion of safe vegetable products to the final consumers and customers. This can reinforce and create instant and continuous consumer recognition and drive decision-making.

**3. Output:** From the development process of all 5 research projects, the produce can be upgraded upstream. The farmers have knowledge of consumer behaviors that can be used in proper production planning and appropriate marketing to lead production. The efficient delivery of vegetables and packaging suitable for transportation can maintain the quality of vegetables safely from the source to the consumer for the highest satisfaction. The farmers have a database system that can disseminate knowledge about the location of safe vegetables, production process and useful knowledge. In the midstream level, the farmers can be leveraged in terms of generating more income from various marketing channels both traditional offline and online marketing channels by adding knowledge of strategies that are explained to be understood and able to implement successful sales methods to increase competitiveness. In the downstream level, the customers can trace the production source, build confidence, build acceptance of safe vegetables through participatory marketing communications. This can raise awareness among consumers, focus on safe food consumption, and create acceptance. The consumers can be aware of buying safe vegetables in Nakhon Pathom Province integrated into all sectors. It will help raising the income for smart farmers for safe vegetables in Nakhon Pathom Province in a concrete way.

## **Conclusion and Discussion**

1. From studying the consumer behaviors, it was found that buying through online channels is different from buying from offline channels that focuses on buying 1-2 kg packaging. The main reason to buy is for health. Meanwhile, for the group buys through traditional offline markets such as local markets, flea markets, the reason for buying is to help farmers. This agrees with the research of Withoon Panyakul and Chaiwat Kongsom (2015) finding that the factors affecting the decision to buy organic products through the membership system are knowing the producers, a system that allows them to know

the farmers and build trust through the membership system by talking to one another. Online shopping behavior is highly price sensitive. The price factor is primarily considered as it is easy to compare prices.

2. The development of safe vegetable delivery by smart farmers in Nakhon Pathom Province was found that private freight forwarders in terms of physical characteristics, trust, reliability, timely response sentiment, and compassion had the high level of quality in all aspects. This was consistent with Worachonok Tengwongwattana (2015) finding that the service quality factor in terms of reliability on demand response, confidence and awareness of the price affects the decision to choose a private company's parcel delivery service.

3. Many farmers or entrepreneurs in Thailand are not actively using online marketing channels and making the most of it (Gilmore, Gallagher & Henry 2007). This study provides insight into fundamental changes in customer behaviors and online marketing activities which type is suitable for what kind of target audience and which type of product is suitable. The digital transformation trend is critical to online efficiency (Simmons, Thomas & Truong 2010). The online marketing form is the next generation of proactive marketing that will rapidly transform the traditional commerce model. Everyone has to keep pace with the changes to create competitive advantages to reach more accurate goals, market, interact directly with customers and get real-time feedback to get the right answers that can best meet the customers' needs. Effective marketing will always be a key component of business success.

4. Regarding the approaches for developing the buying decision of safe vegetable products through e-commerce and multi-channel marketing, the entrepreneurs must understand the differences of buyers. Each group of those who use the application to buy must adapt to the context and the changing trend in adopting more technology in a new way of life to follow the marketing channels that are likely to turn into marketing through a mix of marketing channels and through the integration of all channels of change. The sales strategies must be adjusted to respond to customers and such channels. Kushwaha and Shankar (2012) suggested that multi-channel marketing has started to play a role and value to customers. A good turnover will correlate between channel settings and monetary value to satisfy different customers. The results of China's research by Cui, Zhu and Chen (2018) also suggest that use of the application in mobile commerce has caused the impact to reach the local offline retailers. For the substitution effect between mobile commerce and retailers, the trend of change arises because 1) traditional transactions have low mobility and 2) adoption of technology of the new generation becomes higher.

5. The development of public relations strategy for participatory proactive marketing is the formulation of public relations strategy to promote safe vegetable marketing by participation of smart farmers in Nakhon Pathom Province. The proactive public relations will work towards the goals according to the proactive public relations plan that has been identified by the activities. The media that will be used in the public relations as well as the target audience for which the publicity will be disseminated to specify the duration of the operation, clearly specify the budget and the person responsible for the work. This is in the same direction as the study of Chaiyanan Nantaphan (2016)

stating about the public relations strategy that public relations planning strategy is important to make public relations operation to reach the targets or goals set according to the public relations plan. The publicist must be able to identify what the public relations plan has. The policies, goals, and activities must be clearly stated.

### **Research recommendations**

1. The change of the era has led to the shifting of trade patterns to more advanced e-commerce transactions. Operators cannot avoid such changes. The prior adjustment will be able to create an advantage in this competition. For the trends of doing business in the age of globalization, the traders and smart farmers will have to skip from doing traditional business to use the online system to go from single channel marketing to marketing through multiple channels. In an era where online systems are simplified with mobile transactions, the entrepreneurs and farmers may start by learning more in social networks and developing their own sales channels early on before they become outdated in the trading system.
2. Understanding of smart farmer's income leveraging through the management of the safety vegetable market in Nakhon Pathom Province is necessary to develop the entire system from the inputs to understand the part of the customers and entrepreneurs who accept agricultural products to sell. This includes understanding the process factors in the part of the vegetable delivery system which is safe. The development is on the safe vegetable traceability system, marketing channels both offline and online, and marketing public relations strategies. The aim is to expect results or export factors that will help raising the income of smart farmers for safe vegetables in Nakhon Pathom Province in a concrete way.

### **Recommendations for further researches**

1. This research aims to study the smart farmers through the management of the safety vegetable market in Nakhon Pathom Province only. Those who are interested may extend their work to farmers groups in other provinces as well as farmers in other types of markets. It should be interesting research results for further case studies.
2. This research focuses on customer groups and entrepreneurs who are sellers and entrepreneurs who are farmers. However, the data collection is a separate collection of results for specific groups and then gradually integrate the results altogether. In terms of research, it is still considered that the 360-degree view is not complete. Those who are interested in further developments may develop the results of the research together with qualitative data collection with group discussion arrangement to have a meeting among customers, vendors and manufacturers. The deeper dimension should be obtain

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