
Organic Agricultural Producer Strategies in Supply Chain of Sustainable Agriculture Network, Chachoengsao Province, Thailand

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Organic agricultural market in Thailand has incessantly grown from organic consumers, whilst organic agricultural areas in Thailand are merely 213,183 Rai or 7% of total agricultural areas nowadays. Thai government has undertaken policy to enhance the strengthening for the organic agricultural producer. However, most of organic agricultural producers in the country are members of sustainable agricultural networks. Therefore, this study aimed to 1) investigate organic agricultural product supply chains of farmers who are members of sustainable agricultural network, and 2) study the strategies of organic agricultural producer in supply chain of sustainable agriculture network. The study selected organic agricultural producers under the sustainable agricultural network in Sanam Chai Khet District, Chachoengsao Province. Organic agricultural areas in the study area contributed approximately 1,500 Rai with 130 farmers as sustainable agricultural network members. Data were collected from survey and in-depth interview, and focus group discussion was conducted among selected farmers in major organic agricultural product in sustainable agricultural network to identify the strengths, weaknesses, opportunities, and threats related to organic agricultural farming activities. SWOT Analysis was used to evaluate the internal and external aspects impacting organic agricultural production in the study area from which organic agricultural producer strategies were developed. On the basis of the analysis, the relevant suggestions on facilitating the interests of producers in the supply chain of sustainable agricultural products are improving the technology for production; increasing the agricultural production yield; establishing the promotional strategies to expand production area and members, and improving the quality of organic agricultural products to satisfy the safety quality product standard and consumer needs.

Keywords: organic agricultural product, organic agricultural producer, organic farming, organic agricultural network, sustainable agricultural network, organic supply chain

Introduction

The global demand for organic food products is growing at a very rapid rate. This increasing awareness has caused shifts in consumers' tastes and

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only 7% of total agricultural areas. preferences which have led to the domestic as well as global rise in demand for organic products (Sikka *et al.*, 2006). However, the production of organic products in Thailand is still very small sector in country's agriculture, in fact

In Thailand, organic agriculture market initiated in 1990 from the people's healthy and environmental concerns in consuming healthy and safety food. Healty food industries increase exponentially and rapidly at that time. From the economic downfall in 1998, organic agriculture market was stagnation. The market has started recovering since 2003 after the international conference in Thailand organized by International Federation of Organic Agriculture Movements (IFOAM) together with Food and Agriculture Organization (FAO). Additionally, other important factors contribute to the expansion of organic agricultural products, for example the use of the standard organic agriculture seal certified by government and private sections, which assist consumers to access to organic agricultural products conveniently (Kasikorn Research Center, 2011).

Organic agriculture production in Thailand can be categorized into two groups: Self-reliance organic agriculture and Standardized organic agriculture for commerce. Self-reliance organic agriculture uses local wisdom in growing organic agriculture products which is manly used in households and sell residue products to markets. Standardized organic agriculture for commerce increases rapidly in response to the increase of consumers' healthy and environmental concerns. One exemplars of the expanding of organic agriculture markets can be noticed from the increase in cultivated area from 86,104 Rai in 2004 to 213,183 Rai in 2013 or 7% of total agricultural areas in Thailand, which is approxiamtelly 150 million Rai. Greenet estimated that during the past ten years, in 2013, the total of 71,847.2 ton of organic agricultural products increased from 15,966.1 ton in 2004 in Thailand. In 2013, the value of organic agricultural products was 1,914.8 million Baht which boosted from 1,752.1 million Baht in 2003. In terms of price, from a survey of organic agricultural products such as fresh vegetables in supermarkets in Bangkok in 2007, the investigation revealed that organic vegetable price was 122.80 Baht per kilogram, whilst regular vegetable price was only 42.13 Baht per kilogram or 191 percent higher. This can demonstrate that on average the price of organic agricultural products is far higher than regular agricultural products (Greenet, 2015).

From the abovementioned situations, famers in Sanam Chai Khet District, Chachoengsao Province change to be an individual organic agriculture for commerce. After that, the farmers merge together to be the Sanam Chai Khet Organic Agriculture Group under the alternative agricultural network

which consists with the first issue of the Organic Agriculture National Strategic Plan (2008-2011) focusing on strengthening, as well as knowledge and innovation management in order to support research and knowledge and innovation development for the whole supply chains, and promote knowledge generation and accurate understanding regarding organic agriculture for producers, entrepreneurs, consumers. It is also in line with the organic agriculture strategic development for local wisdoms in order to improve production, create a self-reliance network, together with develop marketing channels for surplus production.

Supply chains of organic products are often considered as alternative supply chains, which are shorter, more locally oriented, and in which the producers and consumers are more tightly connected to each other than those in the conventional food supply chains (Kottila, 2006). Therefore, the Sanam Chai Khet Organic Agriculture Group focuses on systematic and sustainable organic products from group members. However, insufficient water in a drought is one of supply chain problems for organic agriculture production, causing insufficient products to market demands. Moreover, the increase of production size and the extension of new organic agriculture members are also at sluggish rate. These predicaments result in a belated delivery to purchasing orders and the loss of opportunity in prospective markets. Consequently, management strategies of the Organic Agriculture Network in Sanam Chai Khet District, Chachoengsao Province are required to be studied in order to create stable and sustainable production systems for the members. Furthermore, results from this study are beneficial for organic agriculture supply chain management in eastern region of Thailand, apply to develop a sustainable supply chain management model, and establish a policy to other regions.

Therefore, the objectives of this study are 1) to investigate the current situation of organic agricultural product supply chains of farmers who are members of sustainable agricultural network, and 2) study the strategies of organic agricultural producer in supply chain of sustainable agriculture network. The result of this study provides strategic plans, suggest as a guide for developing of organic agricultural network in Thailand.

Literature Review

The market of organic products is one of the most dynamic in the world (Mishev and Stoyanova, 2009). Under the dynamic situation of growth and the change, strategic planning is to bring an organization into balance with the external environment and to maintain that balance over time.

Strategic planning is defined as an organization's process of formulating its strategy based on a thorough analysis of its internal and external situations which enable organizations to reach their long-term objectives. Various theories and tools have been developed to help top executives formulate and manage their strategies. SWOT analysis became one of the most popular tools for strategic planning (Lu, 2010).

A SWOT analysis is another strategic tool which focuses on evaluating 4 factors that compete in pairs to assess both internal factors which are strengths and weaknesses and external factors which are opportunities and threats (Haberberg, 2000). The challenge is to find the right balance of these factors and build-up strengths, eliminate or control the weaknesses, take advantage of the opportunities and monitor-react to the threats. This is used as an instrument for the systematic analysis of internal and external environments of an organization. SWOT analysis is considered as an effective instrument for identifying the problems and drawing lines of future actions (Terrados *et al.*, 2007), and this helps enterprises learn about themselves as well as competitors and can be used as the foundation for developmental strategies (Chang and Huang, 2006).

TOWS Matrix is a strategic tool using the output from SWOT analysis to identify the appropriate strategies for the business. There are four strategies which are (Wehrich, 1982).

1) SO strategy is the strategy coming from strengths of the business which matches with the opportunity in the market.

2) ST strategy is the strategy coming from strengths of the business but having some threats from competitive environment. Therefore, the business will prepare strategy to maintain their market share.

3) WO strategy is the strategy where organization has to improve their weaknesses in order to capture existing and future opportunities.

4) WT Strategy is the strategy where organizations might decide not to do it by themselves but to out source to someone else so that they can focus on their core competencies.

A review of previous research, several studies have attempted to use SWOT analysis and TOWS matrix for organic product strategy formulation. Keravan and Swaminathan (2008) used SWOT matrix to formulate strategies model for agricultural sustainability in developing Asian countries. Sikka *et al.* (2006) applied SWOT analysis and TOWS matrix to reveal and develop strategic for global competitiveness for Indian organic food exports. Poongpermtrakul and Waisarayutt (2012) used SWOT analysis and TOWS Matrix for establishing strategic plans, suggested as guidelines for developing quality and safety management system of agriculture and food products in

Thailand. Abas (2014) used SWOT analysis to evaluate the internal and external aspects impacting rice production and then developed self-reliant for small farmers in Batann, Philippines.

Previous studies have found that SWOT analysis and TOWS matrix as a tool to formulate the strategy for agricultural product. However, no research has been conducted to determine the strategy of organic agricultural in supply chain of sustainable agricultural network in Thailand. Therefore, this study investigated organic agricultural producer strategies in supply chain of sustainable agriculture network in Thailand.

Materials and methods

Sanam Chai Khet district of Chachoengsao province, located at the east of Bangkok, Thailand, was selected as the study area. Sanam Chai Khet Chachoengsao Organic Agricultural Group as a organic producer listed in the central of Thailand. Organic rice growing mainly consists of farmers who are members of alternative agriculture network or sustainable agricultural network with more than 10 years a organic agricultural networking programme for 130 members and cultivated area 1,500 rai.

To clarify the current situation in supply chain of the organic agricultural producer in supply chain of sustainable agriculture network in Thailand a in-depth interview analysis was employed, all data were collected through field survey, interview a representatives of participants and stakeholders along the chain (Fig.1). SWOT analysis and TOWS matrix were used as a tool for establishing strategic plans, suggested as guidelines for developing organic agricultural producer strategies in supply chain of sustainable agriculture network, Chachoengsao Province, Thailand.

Focus group discussion was conducted among a representatives of main actors in supply chain; organic farmer as a network member, group leaders , chiefs and deputy chiefs of network, network secretary, finance and accounting, network committee, network coordinator and the government agencies. which is a comment about SWOT analysis and strategy formulation from TOWS matrix (Figure 2).



Fig.1 In-depth Interview



Fig.2 Focus group on SWOT analysis and TOWS matrix

Results

Current situation of supply chain of organic products in

The supply chain in the organic agriculture of sustainable agriculture network consists of many actors from the upstream organic rice growers to the downstream distributor to the customer (figure 3). These businesses are linked together across the supply chain from the upstream to the downstream and may be divided into 4 sub-sectors as follows:

1) Organic rice farmers as member of the group define the upstream supply chain. Farmers as the basic supplier of paddy, twice a year. Rice production in this supply chain is organic farming where cultivation of the paddy is based on the use of green manure, compost and the approved natural substances while without any use of the manufactured chemicals, fertilizers, and pesticides including the insecticides, fungicides and the herbicides. Rice production will be random verified by the internal audit committee in complied with Organic Agricultural Certification Thailand (ACT) standard. Farmers usually sell paddy through organic sustainable agricultural network as a intermediary traders of the network.

2) Organic sustainable agricultural network define as a intermediary between upstream and middle stream in supply chain. The operation process of a organic sustainable agricultural network involves collection of production, distribution of inputs to members, disseminating market demand and price information; pest, and risk-management information; best practices to meet certification standards; collecting management data from the field; and ensuring traceability.

3) Distributor of organic rice production in supply chain of sustainable agriculture network can be divided into three grouping;

3.1) Large distributor define as a major distributor of organic rice in supply chain. The operation processs of large distributor is to collect rice

production from the network intermediary and process to the rice milled by their own rice mill plant. After finally it goes through the process of packaging and distributed directly to the customers.

3.2) Small distributor define as a small enterprise who also collect rice production from the network intermediary, but trade volume is smaller than that of large distributor. Small distributor involve; processed rice product by their rice mill, and processed into the organic rice products such as pasta and so on for sell to customers.

3.3) Local rice mill define as a processing processor. The operation process of local rice mill is to process paddy rice into organic rice milled, then, packaged and distributed directly to the customers.

4. Consumers defined a consumers who bought and consumption on organic rice product through intermediary, distributor and local rice mill.

It was noticed that, rice processing unit and the distributor must share their information with each other in order to collaboratively forecast and plan the rice production inventory and to meet market demand.

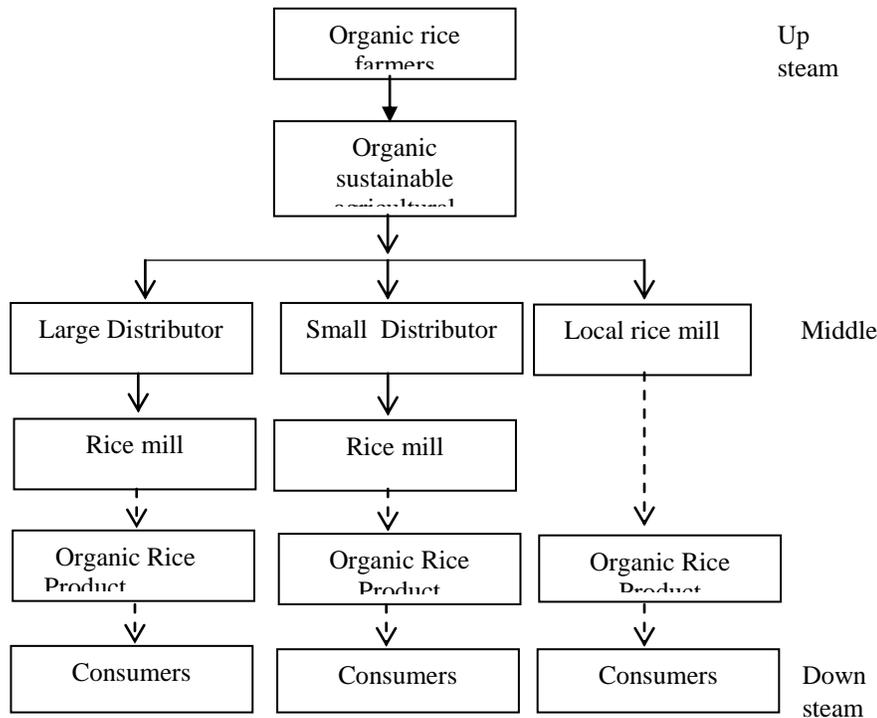


Fig. 3 The supply chain of organic products in Sustainable Agriculture Network, Chachoengsao Province, Thailand.

Note: - - - -> Organic rice milled marketing channel
 ———> Organic paddy marketing channel

SWOT Analysis

The condensed internal and external evaluation of the assessed areas of concern as well as the development potentials for organic agricultural producer in supply chain of sustainable agriculture network, Chachoengsao province, Thailand is illustrated in the SWOT analysis.

The results have been summarized in Table 1 which reveals that the global competitiveness for organic food exports from India is marked with number of weaknesses, whereas lot of opportunities does exist in the domestic and international market. The major threats are from that of global warming and competition for which area-specific varieties are to be developed. Government and other institutions should come forward to overcome the weaknesses such as infrastructure, market linkages, information, capacity building etc.

Table 1. SWOT analysis of organic agricultural producer in supply chain of agriculture network, Thailand

Strengths	Weaknesses
<p>S1: The agricultural production is systematic. The production management is complied with the Organic Agriculture Certification Thailand (ACT) standard.</p> <p>S2: Essential agricultural inputs are provided to members in order to reduce production cost.</p> <p>S3: Members are encouraged to keep and use their own seeds in order to maintain production standard.</p> <p>S4: Production technology, knowledge and information are transferred regularly to members in order to maintain and improve their productions in accordance with current trends.</p> <p>S5: Random inspections of production environments are operated in order to ensure that organic product quality meets with the organic agricultural standards.</p> <p>S6: Price insurance is provided to guarantee the members' income.</p> <p>S7: Markets are promptly available to serve all products from the network members.</p> <p>S8: Some rice productions are processed to increase their value, and they are sold directly to consumers in different forms.</p>	<p>W1: Rice yields decrease due to water shortages during a drought causing insufficient rice productions to market demands.</p> <p>W2: In long-term, using reproduced from their own seeds may cause crossbreed, which may affect to the decrease of yields.</p> <p>W3: Agricultural machines used in organic farming may contaminate with agricultural chemicals when they were used in chemical agriculture.</p> <p>W4: The insufficiency of agricultural machines in rice production affects the imprecision of production planning.</p> <p>W5: Scattered members' paddy plots increase buffer zone building cost, as well as lose organic farming area.</p> <p>W6: Unbranded members' products sold in markets are not well known or recognizable by consumers.</p> <p>W7: Budget is insufficient to run activities in order to develop the network members.</p>

Opportunities	Threats
<p>O1: Government policies on organic agriculture promotion increase opportunity to the network in various aspects, such as academic knowledge, budget, and marketing provisions.</p> <p>O2: The increase of consumer's demands for organic products and the ASEAN free trade agreement expand network's organic rice markets.</p> <p>O3: A campaign on an organic product consumption raised by the network's distributors expands network's organic rice markets.</p> <p>O4: Non-member farmers notice concrete success from the network which is a key motivation for non-member farmers to participate in the organic agricultural network.</p>	<p>T1: Cropping system is in rain-fed and non-covered irrigation areas causing water shortages during a drought.</p> <p>T2: The increase of industrial factories results in the conflict of inadequate water resources between the industrial sector and agricultural cultivation.</p> <p>T3: Numerous conditional constrains of organic agriculture policy transmission from a local government agency to local communities have an effect on a slow support provision to the network.</p> <p>T4: The disunity among organic farming communities leads to different opinion communication to the public.</p>

Strategies for improving the supply chain for organic agricultural product of sustainable agriculture network, Thailand

The TOWS matrix is an important decision-making tool that helps organic agricultural network develop four types of strategies by matching internal strengths and weaknesses with the environmental opportunities and threats: SO (Strengths-Opportunities), WO (Weakness-Opportunities), ST (Strengths-Threats), OT (Opportunities-Threats). These four sets of strategies have been worked out (Table 2) and key strategic dimensions have been identified.

SO Strategy: Collaborate with related organizations, contact information and supported programs for organic products. Enhance the production capability to meet market demands and improve the production process through supply chains. Expand organic farming members by adding incentives to encourage new farmers to participate in the organic farming network.

WO Strategy: Search for a government agricultural machinery support program, and apply for a financial support for agricultural equipment and machinery purchasing. Reduce members' scattered cultivation plots by encouraging neighborhood farmers to become members. Create a product brand to acquire consumer's recognition.

ST Strategy: Transfer production technology in a drought condition and organize training on contamination risk management. Monitor and study

the condition of organic supported program of provinces policy and improve a product process in accordance with the policy condition in order to gain financial support. Develop an implementation plan to enhance members' self-reliance.

WT Strategy: Make a crop yield forecast and manage a production plan to deal with a drought. Strictly control a production process in accordance with the organic standard certification. Record information about seeds store for production, seed origins, varieties of seed, and date collection in order to request academic assistance from pertinent organizations.

Table 2. Strategies for organic rice product in supply chain of sustainable agriculture network, Thailand

SO strategy	WO strategy
<p>1. Collaborate with related organizations, contact information and supported programs for organic products. (S1, S2, S3, S4, O1)</p> <p>2. Enhance the production capability to meet market demands and improve the production process through supply chains. (S7, S8, S9, O2, O3)</p> <p>3. Expand organic farming members by adding incentives to encourage new farmers to participate in the organic farming network. (S2, S4, S7, S8, S10, O4)</p>	<p>1. Search for a government agricultural machinery support program, and apply for a financial support for agricultural equipment and machinery purchasing. (W3, W4, W7, O1)</p> <p>2. Reduce members' scattered cultivation plots by encouraging neighborhood farmers to become members. (W5, O4)</p> <p>3. Create a product brand to acquire consumer's recognition. (W6, O2)</p>
ST strategy	WT strategy
<p>1. Transfer production technology in a drought condition and organize training on contamination risk management. (S4, T1, T2)</p> <p>2. Monitor and study the condition of organic supported program of provinces policy and improve a product process in accordance with the policy condition in order to gain financial support. (S4, T3)</p> <p>3. Develop an implementation plan to enhance members' self-reliance. (S3, S4, T3, T4)</p>	<p>1. Make a crop yield forecast and manage a production plan to deal with a drought. (W1, T1, T2)</p> <p>2. Strictly control a production process in accordance with the organic standard certification. (W2, W3, W5, T4)</p> <p>3. Record information about seeds store for production, seed origins, varieties of seed, and date collection in order to request academic assistance from pertinent organizations. (W2, T4)</p>

Conclusion

Organic rice in supply chains of sustainable agriculture network in supply chain of sustainable agriculture network, Chachoengsao province, Thailand ranged from the very short where a number of different actors are involved in moving the organic products along from farmer to customers

directly. The research deploys SWOT analysis and TOWS matrix strategic tools to develop the organic agricultural producer strategies in supply chain of sustainable agriculture network, Chachoengsao province, Thailand. In-depth interview has also been conducted with main actors in supply chain and verify the data by focus group with network member representative. On the basis of the analysis, the relevant suggestions on facilitating the interests of producers in the supply chain of sustainable agricultural products are improving the technology for production; increasing the agricultural production yield; establishing the promotional strategies to expand production area and members, and improving the quality of organic agricultural products to satisfy the safety quality product standard and consumer needs. For successful implementation organic agricultural in supply chain of sustainable agricultural network, good strategies are inevitable. The results from TOWS matrix analysis, shows that there are 12 strategies could be implemented to develop sustainable and competitive organic agricultural in supply chain of sustainable agricultural network, taken from the alternative strategies formulate from TOWS matrix. However, it is recommended to implement the strategy base on priority especially strategy to improve the collaborate with related organizations, contact information and supported programs for organic products. Enhance the production capability to meet market demands and improve the production process through supply chains. Expand organic farming members by adding incentives to encourage new farmers to participate in the organic farming network.

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