



THE STUDY OF THE BARRIER FACTORS TO THE ADOPTION
OF ORGANIC FARMING IN MAUK LEK IN
SARABURI PROVINCE, THAILAND

BY

MISS NAPATSORN AUAMNUAYCHAI

A THESIS SUBMITTED IN PARTIAL FULFILLMENT OF
THE REQUIREMENTS FOR THE DEGREE OF MASTER OF SCIENCE
DESIGN, BUSINESS AND TECHNOLOGY MANAGEMENT
FACULTY OF ARCHITECTURE AND PLANNING
THAMMASAT UNIVERSITY
ACADEMIC YEAR 2018
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ENTITLED

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the degree of Master of Science (Design, Business and Technology Management)

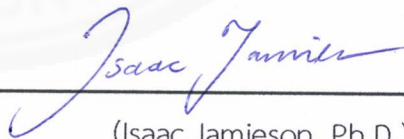
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ABSTRACT

The economic growth of Thailand has in many ways been shaped by agriculture, which has been noted as being the backbone of the country. At present around a third of its population is involved in farming. There are however, escalating anxieties about the negative impacts that agrochemicals used in conventional farming can have on human health, biodiversity and the environment which are disturbing its long-term sustainability. It has been forecast that the global organic farming market, which avoids such health and sustainability risks, will exhibit a compound annual growth rate of 8.4% through till 2026. Since it is critical that Thailand is able to successfully capture its fair share of the organic food market, both domestically and on the world stage, this present work investigates how this could be best achieved through undertaking both a critical literature review and qualitative interviews with Thai farmers investigating the barriers and entryways to the successful conversion of conventional farmers to organic farming. Important factors that can support successful transitions include the farmer's own personal characteristics as related to: self-sufficiency; self-development; persistence; leadership; and their resolve to reach goals that they have set themselves. It is additionally proposed that providing good incentives for conversion to organic farming, along with guidance on relevant logistics,

labour systems and management; plus offering and developing high-quality cooperation networks to support participants' non-expertise related to specific organic farm activities, will further enhance the likelihood of successful widespread adoption of organic farming nationally.

Keywords: Organic farming, Barriers to widespread adoption, Sustainability, Economic growth.



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Miss Napatsorn Auamnuaychai

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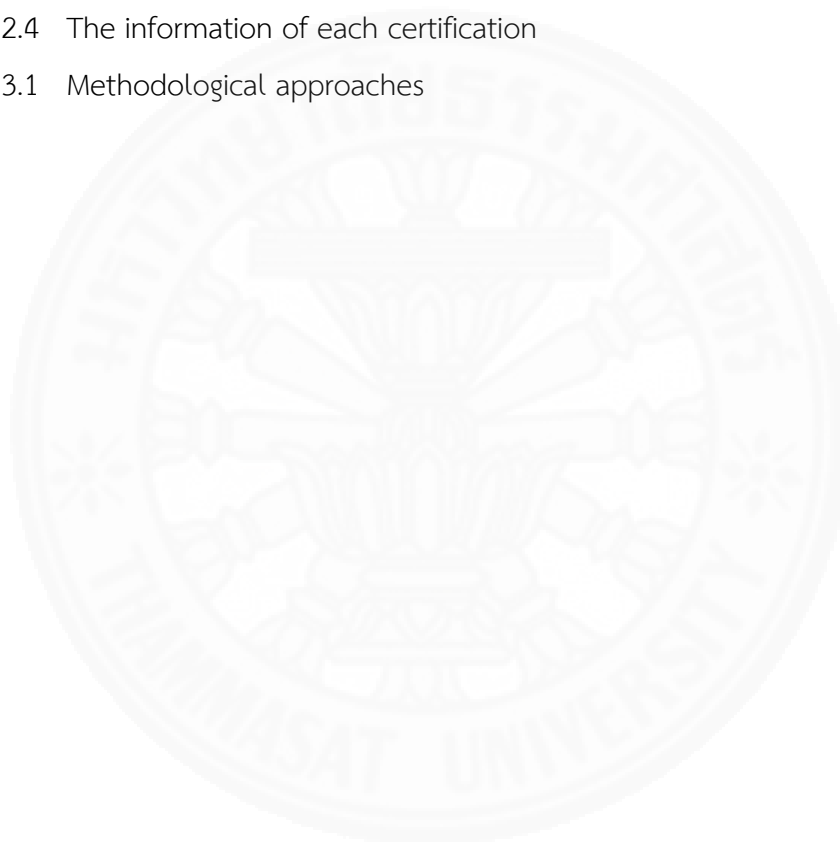
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CHAPTER 1

INTRODUCTION

1.1 Research Background

From the past through to the very present, agriculture has shaped Thailand's culture, its norms, and the practices of the people within its communities. Thailand's culture is deeply rooted in its agriculture-base, and the agricultural way of living has been responsible for shaping many life aspects such as the country's culture, political outlooks, its beliefs and even its language (Ministry of Agriculture, n.d.). Up until recent times, Thailand's development has been predominantly based on agricultural production. The agricultural sector supported by smallholders continues to be the basis of the livelihood for many of its 70 million population, of whom about one-third are presently employed in this sector (Singhapreecha 2014). Thailand does not just produce food for its own domestic consumption, it is also one of the world's leading exporters of agricultural commodities. Additionally, over 60% of its export income is generated by the sale of rice, sugar, rubber, tapioca, and other types of agricultural produce. It can be said that in many ways Thailand is still predominantly an agricultural country (EMIS, 2017). Since then, the Thai government has been encouraging the agriculture sector with supportive policies aimed to enhance its agricultural productivity. It has sought to improve the quality of people's living standards through a variety of initiatives, including projects such as: irrigation development; pledge price policy (price guarantees); the creation of knowledge centers, and agricultural machinery support (Ministry of Agriculture and Cooperative, 2019).

Thailand has a total land area of 321 million rais or about 51.4 million hectares. Of this total, 133 million rais, or 41%, are engaged in agricultural practices. With regards to these, 68 million rais, or 21%, are used as paddy areas, and 30 million rais, or 10%, is used for other croplands. Despite taking up such a huge amount of land area, agricultural production accounts for only 9% of the country's GDP. Despite

providing such a small proportion of its GDP, agriculture is still of great importance to the Thai economy (Singhapreecha, 2014).

The transition from traditional agriculture where the inputs were generated on-farm to Green Revolution agriculture, which required the purchase of synthetic chemicals to intensify productivity, led to the widespread establishment of rural credit institutions. Numerous small-scale farmers went into debt as a result of the loans they took to purchase chemicals, and some even lost their farmland. Moreover, a significant source of employment from the rural economy became displaced by the adoption of the agricultural mechanisation. Furthermore, as a result of wealthier farmers being able to access better credit and obtain land ownership easier, the Green Revolution increased class disparities, with the rich-poor gap widening as a result. The differentiation in agro-climate and interregional inequality in development were the driving forces behind the ability for Thailand to adopt Green Revolution agriculture more readily than other countries. The privilege of the wealthier farmers made it possible for them to possess and undertake large-scale farming, with the resultant economies of scale and the support of mechanisation they could partake in, leading to an increase in overall production which led many small farmers to suffer from dropping prices due to the increased levels of overall production. Though large farm companies account for less than 10% of Thailand's total farming capacity, their presence hurts the majority of farmers many of whom are saddled with debt due to high productions costs and low financial returns (Hicks, 2011).

Moreover, the severity of the climate change will make vulnerable farmers lives become more unstable through the alteration of the climate they rely on. Additionally, the risks of flooding will be more extreme and droughts may be present to a greater extent, creating further risks to their productivity and cashflows. As a further factor that can be used to help convince farmers that they should convert to organic farming methods, mention is made of the fact that soils with greater levels of organic matter can retain water more efficiently and produce higher crop yields than conventional fields in times of drought. Organic fields can additionally help recharging groundwater more efficiently than fields with conventional crops (Cornucopia Institute, 2013).

Meanwhile the continued use of chemicals results in diminishing returns, long-term degradation of soil quality, and harm to human health and biodiversity. This part of the outcome is not yet shown to any great extent, but the vulnerability of farmers and environment will reveal the severity of the price they have to pay: the failure of support on the crop fixed price, putting the small farmer in an impossible position to ensure a stable sale price while their expenses on chemical input always increases.

While the climate risks are alarming, the health risks posed by agricultural chemicals are also pushing public demand for organic produce. The growth of the organic market has become one of the opportunities to drive many small farmers to seek sustainable farming methods and shift the market of their crops to achieve better stability with premium customers and avoidance of expense on chemical inputs. In particular, busy cities like Bangkok are coercing the lifestyles of people to change and look towards protecting their health better. While people are often too busy to make their meals, the health issues they are increasingly concerned with related to what they eat can be addressed in large part through eating and drinking organic produce (Lemon Farm, 2016).

However, the impact of pesticides on the environment and human health has been under greater scrutiny. The organic movement has grown considerably since the ground breaking publication of 'Silent Spring' by Rachel Carson in 1962, explaining the formidable adverse side-effects of pesticides (Heaton, 2001). Today, pesticides are under ever more scrutiny from governmental and non-governmental organisations. Additionally, the United Nations (UN) has reported that annually pesticides cause around 200,000 acute poisoning deaths worldwide, and that the majority of these (around 99%) are in developing countries. It additionally condemns the 'myth' that agrochemicals are required to feed the population of the world (UN Human Rights Council, 2017).

The growth of the global trend in health has reinforced many concerns related to quality of health and wellness. One of the factors that people focus on is the quality of the food they consume. It plays a vital role in life quality (USDA, 2016). In addition, access to an adequate supply of food is one the most basic of needs for

human development, and a basic human right, as without a well-nourished and healthy population, proper development is impossible. Food safety implies the absence or safe levels of contaminants, bacteria, naturally occurring toxins, or any other substance that may make food injurious to health (Food and Agriculture Organization of the United Nations, 2018).

Most of the technologically advanced countries have nowadays prohibited the use of harmful chemicals like paraquat; meanwhile, it is still imported and widely used in Thailand. The effects of exposure to it are shown to have long-term consequences on producers, consumers, and the environment. The farmers suffer from inhaling the pesticide; the consumers develop an increased chance of cancer, while the chemical residue remains in the environment for a long time, harming the organisms living in the soil, degrading the quality of soil, and contaminating the water stream effecting aquatic lives too. Promoting conversion to organic farming and supporting farmers to undertake more sustainable farming processes will help them to produce more nourishing food for citizens' wellness. To address the food security issues, eco-system issues, and health issues that exist, such matters should be drawn to the attention of corporations in the public-private sectors and also the farmers and others involved in the agricultural industry as well.

Comprehension of the factors affecting adoption to organic farming, one of the sustainable farming practices, can reveal insights on the barriers, challenges, and motivations related to this issue. Providing the necessary support will help substantially increase the number of sustainable practices and reduced the use of agrochemicals in Thailand.

Organic farming is one of the methods of sustainable agriculture used in Thailand that has risen in prominence since the early 1980s. It is a method that produces food that is free from all artificial, man-made additives, and helps preserve and increase soil quality and protect biodiversity (Chinvarasopak, 2015). Organic agriculture was included in the Thailand Government's plan as an alternate type of agriculture to support the sustainable development of the country at the end of the Eighth National Economic and Social Development Plan (1997-2001) and has been included in every plan since then (Boonchit & Natenuj, 1998). Even though, organic

farming presents a more sustainable method of agriculture than conventional farming, growing products without pesticides is in practice much more time consuming and more complex than the conventional method. A fully functioning organic farm is a balanced, self-contained ecosystem, wherein the components of natural biodiversity solely rely on each other to form strong ecosystems of animals, birds, and insects to help control pests and aid crop pollination. One of the basic requirements of organic farming is the ability to work in harmony with nature. It is also necessary for farmers to acquire appropriate levels of knowledge on factors such as biodiversity, management, marketing, and selling of organic produce to achieve successful transition.

With the challenges faced in implementing it, only around 0.2% of the total land used in Thailand's agriculture industry is certified as organic, and it is a small figure compared to the amount of product that is produced through conventional farming methods. It has been demonstrated that crops grown through conventional farming methods provide unhealthier and less nutritious products more than crops that are organically grown. It has additionally been shown in many studies that the crop produced through the organic method have higher levels of desirable components such as dry matter, essential minerals, and vitamin C than non-organically produced fruit and vegetables (Heaton, 2001).

Descriptive statistics were used to investigate both organic and conventional farm types, and duration analysis was applied to investigate the factors affecting the adoption and diffusion of organic farming. The results reveal that crucial factors on the decision of the adoption of organic farming that are positively significant to conventional farming production problems.

1.2 Research Objectives

In order to encourage conventional farmers to convert to organic practices, it is necessary first to assess conventional farmers' intentions to convert to organic farming and then to investigate their reasons for not converting. This includes investigating the barriers they consider that they face as well as the motivational factors they have for converting to organic farming.

The objectives of this research are to investigate the real and perceived barriers to conventional farmers' converting to organic farming in order to seek to help government, policy-makers, and relevant stakeholders provide the support required to stimulate their conversion to organic farming. In particular, a focus is placed on determining the correct motivational and support factors that can be used to encourage the successful conversion of chemical farmers to organic farming in order to help us to understand the circumstances and perceptions the farmer is associating with such change and give suggestions to relevant actors to become a successful part of the transition.

Specifically, the author focuses on critical reflections of three broad categories, including the identification of the factors increasing conversion to organic farming, specifically for the farmer group in Muak Lek district, Saraburi province in Thailand.

The first objective is to understand the barriers and challenges farmers face in their potential conversion to organic farming. Secondly, investigating the factors related to the decision making to the organic transition of converted farmers, the beginning thought of changes and motivational factors involved in their shifting to organic methods. This method is used within the conceptual framework to prove whether the investigated factors are the factors influencing the chemical farmers in whether they will convert or not. Lastly, this research aims to discover the success factors of organic farming from the case study of farmers in the Muak Lek district.

Addressing the barriers and challenges that the chemical farmers are facing with regards to transition, and finding the motivational factors and success factors that will help lead those farmers in the right direction in conversion to sustainable farming methods, helps open up the opportunity for creating organic farming in Thailand. To stimulate the farmers to become organic, and enable their successful conversion, does not just benefit the farmer themselves. It also benefits the end customers who will consume healthier products as a result, better preserves arable land since it enables better soil quality for the next round of crops, lessens the overall inputs of agrochemicals, and even helps make crops more resilient to climate change.

1.3. Research questions

Table 1.1 The methodology of each questions

Research Questions	Methodology	Finding	Expected result
Why do farmers need to be motivated to transition from chemical to organic farming?	Literature reviews (Triangulate methodology).	The comparison of market and economic values of organic farming versus conventional farming.	Organic farming is proven to provide higher value than conventional method from both market and economic perspectives.
What is the rationale of why organic agriculture is not adopted by a larger proportion of farmers?	In-depth interviews.	The situation of the farmers in Muak Lek, Saraburi Province.	The financial barrier of conversion costs is one of the main barriers for chemical farmers, followed by cognitive barriers, etc.
What are the barriers and challenges experienced in the converting step?	Use of semi-structured interviews with four classifications of participants.	The barriers and challenges to conversion to organic farming.	Conceptual framework of factors effecting the conversion of chemical to organic farming.
What are the factors that drive the farmers convert to organic farming?	Use of semi-structured interviews with four classifications of participants.	The related factors motivating the conversion from chemical farming to organic farming.	Conceptual framework of factors motivating the conversion from chemical to organic farming.

The table describes the research questions, methodology, finding, and expected result used in the thesis from question one to question four to accomplish the expected result of this thesis.

1.4 Scope of the research

The scope of this present work is limited to the study of the barriers, challenges, and decision-making processes undertaken in the conversion of individuals to organic farming. The study period covered from January to June 2019 and was conducted only in the Muak Lek District in Saraburi Province, Thailand.

1.5 Structure of the Thesis

The study began with a critical literature review investigating organic farming, conventional farming, the process of conversion to organic farming through the innovation diffusion model, an empirical study of factors related to decision making in conversion to organic farming, the factors related to decision making for doing chemical farming, and existing and perceived barriers to individual farmers becoming organic farmers. These were initially assessed through desk research gathering, analysing and critically reviewing information already available on this topic and in related areas.

After undertaking the review of literature, plus theoretical, and empirical study work, the conceptual framework on factors related to decision making and motivational factors related to conversion were developed. This step covered a variety of related factors affecting the decision making by farmers related to chemical and organic farming. The author selected as priorities the factors seen as being significantly related to that transition, and after that these priority factors were incorporated into the interview questionnaire. This was then examined and completed by participants. The interviewees themselves were divided into three groups: The first group are established as having been taught organic practices from the initiated; the second group is comprised of farmers who have used organic farming methods for several years but are still going through the transitional period; and lastly the final group are comprised of farmers who certified as GAP practices but currently showing no sign in changing their production systems over to the organic method. The collected data from this survey work was used for descriptive statistics to analyse the results obtained.

CHAPTER 2

LITERATURE REVIEW

This chapter provided a critical overview of the practical and theoretical concepts related to “The study of the barrier factors to the adoption of organic farming in Muak Lek in Saraburi Province, Thailand”. It has been undertaken through detailed study of relevant literature reviews, research papers, books, documents, files, journals, articles, reports, and related research in order to gain more knowledge and understanding of data as a guideline and conceptual framework for the research that has been undertaken for this work including discussion on the following areas of high relevance.

- 2.1 Conventional Farming
- 2.2 Organic Farming
- 2.3 Saraburi Province
- 2.4 The innovation diffusion theory
- 2.5 Empirical Review

2.1 Conventional Farming

671.1.2 The Rise of “Conventional Agriculture”

Thailand is in many ways predominantly an agriculturally based economy, with the crops grown serving both domestic and international markets. The issues raised when the intensive transformation of the resource including soil, water, energy, and forestry into agriculture practices consequently exacerbated of land. Moreover, urbanisation and industrialisation have reduced the number of arable lands. So intensive farming is introduced to efficiently the crop as the valuable land is limited. Many of the remaining lands are contaminated or on soil poorly suited to the proposed forms of agriculture (Hermhuk et al., 2016). With the limited of land resource, the use of agrochemical has begun at the phrase of transformation from self-reliance or natural method for consuming to industrialise for trading which mass production is significantly considered on the quantity based production (Win, 2017).

The mass production of crops has triggered rapid expansion from the adoption of the Green revolution developed by the American agronomist Norman Ernest Borlaug since 1961. It began to spread the practices of using pesticide, herbicide, fungicide and other fertilisers. With the supporting of the government policy and capitalist, the research has initially developed the rice, through Genetically Modified Organisms (GMOs) method, which can persist and effective response with the pesticide and herbicide. Moreover, rapid and widespread urban expansion has converted much land historically used for agricultural practices into land for buildings (Jiang et al., 2013). It has also pushed agricultural food production into the production system in order to deliver and help satisfy growing consumer needs. At this point, the manufacturing of food production is adopted to profit-making through the use of chemical and GMOs become product standardise to intensified the crops as the rise of imported agrochemical to Thailand (Srimook, 2013).

The new foundation of GMOs represents a new innovation which provides a new type of crops that are more effective in their ability to resist vector-borne insects, but many critics question the benefits of GMOs products, especially when the negative aspects associated with them are taken into consideration. Nature has built itself into a chaotically complicated system that GMOs often seem to wish to dominate rather than work in harmony with (Greenpeace, n.d.).

The dominance of the Green Revolution is not only the discovery of scientific technology advancement of the GMOs method or the introduction of synthetic fertilizers, pesticides, herbicides, and fungicides to optimise the efficiently to meet the need of world population consumption, and improving the nutrition but it is the vulnerable of the adverse on the Green Revolution which the lack less of the effects on other aspects including social, environmental, and the intricate of the ecosystem. The current agricultural system or conventional system tries to seclusion the farming from the natural approach by control and enforcing nature in the direction that satisfies one own need. For example, planting plants in the unsupported climate or country or planting winter crops in tropical countries as well as forcing the trees to take off-season results etc (Fukuoka, 1975).

The extension of the agrochemical industry and the number of imported chemicals to Thailand were discrete resulted from the widespread of conventional transformation of agricultural practices and the consequences are manifest as the declining number of agricultural labours, the indebtedness of agricultural- based country, degradation of ecological systems as well as health problems of the general public and as the consumer of conventional products from this synthetic chemicals (Fukuoka, 1975).

Fatality and Death to farmers as a result of agrochemical usage is a critical issue in Thailand. The tremendous rise of the pesticides used in Thailand is caused by the lack of knowledge regards to the agrochemical administration and safety procedures. Moreover, the lack-less of chemical usage from farmers purposefully in intensify the productivity of the crops without accomplishing long term adverses. The study from Panuwet has identified that the main obstacle to effective pesticide regulation in Thailand is the lack of a consolidated, uniform system designed specifically for pesticide management (2013) likewise the government promotion of imported agro agriculture has found in many areas and resulted in overused and remained harmful synthetic chemical in the productions we consume and the environment we live (Tirado et al, 2008). Thai farmers are putting both their lives and consumers lives in death risk from using the harmful chemical into their crops. To prevent this pesticide user is hard as the use of it means as a powerful tool for crop protection in order to increase production levels, product quality, and product appearance. Most of people do not aware of what they are facing, there is even a well-paid freelance job for spraying chemicals available in the market, people are hired to spray harmful chemicals for their clients an average of 6-10 rai at a time. Some even put more chemical than it should be (Buathong, 2018).

Farmers have a very high chance of getting the effects of the chemical used in agriculture. The local studied shown that the use of chemical pesticide reached at the top of 32,706 liters in 2016 in 17,703 rai area and more than half is paraquat which is a dangerous residue and can see the seriousness of the chemical from the quickness of reaction within half an hours as withered weeds. The pesticides often not

just damaged the targeted but also the one without targeted. (Natural Resources and Environmental Policy and Planning Office, 2019).

2.1.2 The impacts of agrochemical usage in agriculture

The term of agrochemical which is used in agricultural activities covers a wide range of synthetic compounds including insecticides, fungicides, herbicides, rodenticides, molluscicides, nematicides, plant growth regulators and others (Majeed, 2018).

Pesticides are substances or mixtures of substances that are mainly used in order to protect plants from pests, weeds or diseases, and humans from vector-borne diseases, such as malaria, dengue fever, and schistosomiasis (Polyxeni et al., 2016). The term ‘pesticides’ covers a wide range of compounds including insecticides, fungicides, herbicides, rodenticides, plant growth regulators and others. The main purpose of pesticides is to be lethal to the targeted pests, but many have detrimental effects on non-target species and can be harmful to humans.

Among these are organochlorine (OC) insecticides, which proved successful in controlling a number of diseases, such as malaria and typhus, but were banned or restricted after the 1960s in most of the developed countries (Aktar et al., 2009). Meanwhile, it is still one of the types of pesticides that is still highly imported into Thailand, and which has vast amounts of usage in the Thai agriculture sector. Long-term use of these chemicals has been revealed to be one of the main reasons for cancer in both producers and consumers (Tanapong et al., 2016).

The chemical affects various aspects from environmental contamination to human exposure including land degradation, soil residue, polluted to rivers and underground water, and pose risks for human health (Tirado et al, 2008). Surprisingly, some studies have revealed that the toxic residues from pesticides have even been transported away in the air by wind drift and evaporation and then carried back to soil or water by later rainfall (Gönczi, 2016). The toxins from pesticide residues pollute water bodies used for drinking, harm fish and can accumulate in many aquatic organisms. The spread of the chemical by the natural wind is harmful, its residues find their way into the soil and degrade its quality.

Even though many studies have revealed the adverse impacts of agrochemicals and their effect on the environment, pesticides such as Paraquat, Chlorpyrifos, and Glyphosate are still continuously popular among Thai farmer. As these chemical are typically banned or restricted in other countries (Buatong, 2018). Nowadays, many organisations are involving in encouraging and assisting Thai farmers to be more sustainable agriculture with safer and provide them with better returns.

The consequences of chemical farming are intangibly seen through the initiate year of the green revolution, the use of a chemical to intensify crops. The effects of using the chemical not only impact on the environment but also the farmers and consumers health (Philpott, 2011).

The extension of the conventional agriculture model is fatally flawed because of declining crop yields and massive environmental adverse. The future of farming lies in the modern type of agriculture that harmonically works with nature and people, not against them. Millions of farms on all continents already prove that organic and sustainable agriculture can provide sufficient food, increase food security, replenish natural resources and provide a better livelihood for farmers and local community (Badgley et al., 2007).

The evidence of the increasingly chemical used in agricultural cultivation to meet the demand for domestic consumption and export are highly demanded due to the comparison of increasing of pesticides, herbicide, and fungicide imported and the limited cultivated area (Tirado et al, 2008). Although the use of chemical fertiliser as the approach to increase crop production has beneficially provided the efficient productions, generate income for the farmers, and reduce the food insecurity but thought the long-term losses, the overuse of chemical resulted in health concern as the direct effect to the farmers (Aktar et al, 2009). In 2007, it was reported that approximately 39 percent of farmers were at health risk from exposure to agrochemicals (BIOTHAI, 2011). There are also environmental costs resultant from the chemical residue in the soil, and water. Moreover, in economic terms, the cost of long-term losses through inappropriate use of agrochemicals is around 14 million thousand baht (Arthonpachachit, 2012). Apart from the economic losses directly caused by those factors, Thailand is at risk of losing its position as being the 'world's

kitchen' due to the possibility of the negative image being created due to its excessive agrochemicals affecting its large-scale exportation of foods on the world market. In 2010, the scale of losses in exports resultant from the presence of chemical residues on products was calculated as being around 800-900 million baht annually (Information Division- Chiawawiti Foundation, 2011).

2.1.2.1 Environment impacts

Excessive use of fertilisers in the agricultural industry has led to the contamination of groundwater with nitrates, a chemical compound that in large concentrations is poisonous to both humans and animals (Savci, 2012). Furthermore, the runoff of fertilisers into streams, lakes, and other surface waters can increase the growth of algae, leading to the death of fish and other aquatic animals. Moreover, pesticides that are sprayed on entire fields using equipment mounted on tractors, airplanes, or helicopters often drift away from the targeted fields, settling on nearby plants and animals. Some older types of pesticides, like the powerful insecticide DDT (Dichloro Diphenyl Trichloroethane), remain active in the environment for many years, contaminating virtually all wildlife, well water, food, and even humans with whom it comes in contact (Groth, 2016). Although many of these harmful pesticides have been banned, some newer pesticides still cause severe damage. There are evidenced that millions of wild birds are killed each year from the agricultural insecticide exposure, Carbofuran , in North America (Ravichandra, 2018).

The American researchers, Raven, Berg, and Johnson has identified the impacts of excessively used pesticide result in the environment distort such as the development of insect immune system to resist against pesticide, which means the increasingly used of pesticide every year. Many researches were discovered that in past 50 years, more than 400 species of insect are advanced the chance of survival from agrochemical, therefore, the pesticide is highly condensed each year furthermore led to the established the new chemical (1993).

The loss of diversity in the ecosystem is discernible, and a well-known example of this is the rapid decline in bee populations being observed in many areas worldwide. Plenty of insect species are represented as the plant's

pollinators and its fluctuated, including killed from pesticide, effects the natural system from the diminution of pollinators to the loss of insect killers such as spider, ground beetles, killer beetles. These are inauspicious of the pesticide in demonising the non-target plants. Even though pesticide contributed huge impact on risk minimising from insect pest but the variety of species can fasten adopt the chemical resistance.

Moreover, the accumulating of synthetic chemicals not only found in agricultural areas but circulated and remained within the community, water sources, even in the food chains. The chemical begins from the residue in the soil, leakage along with the water sources, spread around the nearby, consumed by the aqua organisms and endure in top of the food chain, a man. The residue of the chemical consequences the non-fertile soil, slows the plant growth responses (Jamjang, 2011).

The modern industrial, agricultural system or conventional method is slowly destroying the environment and natural ecosystems since the technique including the use of agrochemicals to kill an unwanted plant, disturbance insect, and the non-targeted plants which distorted the ecosystem and slowly adopt the new species of stronger insects.

2.1.2.2. Health issues

The world's population is expected to grow to reach 10 billion by 2050; therefore, there are multiple challenges faced in the agricultural sector in the 21st century including food quality and safety (Vázquez et al., 2018). To produce enough food to meet demand, the movement of agrochemical fertilisers in agriculture systems began in earnest last century (Lekeanju et al, 2016). More than 6 million chemical-based products have been invented to support agricultural activities. In large part due to this, many farmers are addicted to the administration of more than 400 kinds of chemical-based pesticides in an effort to protect their crops from their natural enemies (Suwit, n.d.).

Pesticides can be fatal to all the unwanted pests that can harm the crop yield and, unfortunately, they can harm more than just the pests at which they are targeted, but humans also. They are very harmful, toxic, and exposure

to pesticides, not only cause several health effects but linked to a range of serious illnesses and diseases in humans, from respiratory problems to cancer. From the international research, it showed that Paraquat, one of the restricted pesticide in many technology advanced country, has extended the percentage of Parkinson to 67 to 470 percentages (Liou et al, 1997). There were about 49,000 to 61,000 reported cases of pesticide intoxication each year with a morbidity rate between 76.4 and 96.6 per 100,000 populations. Most of the pesticides identified from patients were organophosphates, carbamates and herbicides, whereas approximately 85 – 90% of total cases could not be identified the causing pesticides.

In conclusion, a large number of pesticides are annually imported into Thailand and the intensive use of pesticides certainly which has consequences to human health and environments even though identifying the true extent of these is quite difficult (Tawatsin et al, 2015). In 2017, the case study has discovered a mechanism by which paraquat destroys nerve cells by creating toxic free radicals and Chulabhorn Research Institute's research has proven that Parquat can enter the central brain of the experimental animal (Thaipan, n.d.). Farmers and workers who related to the agricultural sector are the first people who are at risk of getting health effects from this harmful chemical and forward to the food chain.

2.1.2.3 Economic loss

The economic losses can be seen in various ways from direct effect to indirect effect. It was found that in 2010, the value of external impact was as high as 14 billion baht but when integrating the imported value of pesticides with environmental impact costs, the expected cost of loss is as high as 32 billion baht per year and still rising. Moreover, the damage from exports caused by chemical residues in agricultural products cause annually damage of approximately 800 – 900 million baht, affecting the image of the country as The world's largest exporter of agricultural and food products (Srimook, 2013).

Table 2.1 Value cost from pesticide impact in Thailand

	The data used to predict	Value (million baht) 1996	Value (million baht) 2009
Health	- Data of patients from agrochemicals - The number of patients receive chemical toxic in acute type and the data of herbicide usage	1.00 13.00	0.56 17.37
Toxic residue on food	- The analysis of agrochemicals residue amount on vegetables - The analysis of agrochemicals residue amount on fruits	2,067.00 2,950.00	2,280.27 8,620.43
Insect resistance	- The expense of the pest suppression when an outbreak occurs	57.40	83.38
Research of pest prevention	- Budget of pest prevention research	25.29	36.74
Tracking and monitoring pesticide used and environment residue	- Budget of tracking and monitoring the quality of pesticide and environment residue	48.47	70.41
Evaluation follow up and toxic residue on food investigation	- Budget of evaluation follow up and toxic residue investigation on food in various market	46.00	66.82
The support of agriculture-related to herbicide	- Budget of governmental support on agriculture about toxic agrochemical	284.64	413.48
Total	- Minimum external capital impact - Maximum external capital impact	462.80 5,491.80	671.39 11,588.90

Source: Srimook, (2013.)

Even though the agrochemical such as fertilizer can efficient the productivity and the pesticide can reduce the labour-related cost, the adverse of overused the chemical and economic loss are much higher than the financial value

obtained and might more severe for the long-term effects. The previous studied of Suwanna has calculated the impact assessment of agricultural by accumulating the actual cost of agrochemical imported value with Environmental Impact Quotient or EIQ using the Pesticide Environmental Accounting or PEA to analyse the visible effect.

The research found that the cost projected from the human's health impact for over-chemical residues in production, the insecticide tolerance, and the environmental residue is approximately 463 to 5,492 million Baht per year in 1996 meanwhile it is around 671 to 11,589 million Baht in 2009 as shown in the table below. The result from EIQ and PEA approaches show that the impact of the pesticide cost is rising every year (Praneetvatakul et al, 2009).

The effects of agrochemical are not only shown as a health effect, environmental adverse, or economic loss but the significant loss as intangible drawbacks can be seen through the possibility in restrict of 16 types of veggies on exporting to Europe as it was experienced on chili products before. The trade barrier of chili created the loss accounted around 800 to 900 million baht and so on (Thaipan, n.d.). To minimise the cost, Thailand as the kitchen of the world, should focus on the method of producing the food with a sustainable approach that is pragmatic to the environment which will improve its long term sustainability. As the effects of the using over chemical has shown us the cost of consequences such high. As the exporter country, the producers and relevant actors should take action in creating an alternative sustainable way to prevent the food insecurity.

2.2 Organic Farming

2.2.1. The Organic movement

The sustainable agricultural methods appeared antecedently the development of practicing agrochemical established as the traditional method. It reckons on triplet preeminent propose containing environmental health, economic profitability, and social equity (Ahlem & Hammas, 2017).

The sustainable agriculture movement is gathering the degree of support and acceptance in modern food production systems. Beside the dramatically

increasing use of agrochemicals to the establishing diversity of agricultural cultivation method that helps reduce the environmental impacts (Ganzel, 2007).

In Thailand, organic agriculture has been practiced since the 1980s; not a novel strategy. The Organic Agriculture Certification Thailand was set up in 1995 to provide the organic certification services for all agricultural production, processing and handling operations. Later in 2012, the policies and strategies were set up to incorporate all related plans, accreditation and certification service (Win, 2017).

2.2.2 The fundamentals of organic farming

There are many clarifications and definitions for organic agriculture from various sources yet all linked up to frame as a system which leans on environmentally friendly ecosystem management rather than using the extraneous agricultural inputs (Srutek et al., 2008).

The term “organic” is the best thought of the approach of the production management system as remarking to avoid the type of synthetic inputs and relies upon key priority for on-farm agronomic to organism in which all the components – the soil minerals, organic matters, microorganisms, insects, plants, animals and humans – collaborate to create coherently, self-regulating and holistic stability.’ Reliance on external inputs, whether chemical or organic, is reduced as far as possible, as described by United States Department of Agriculture (USDA, 2015, FAO/WHO Codex Alimentarius Commission, 1999).

Similarly, organic agriculture was portrayed by IFOAM as a sustainable agricultural production system. The term ‘sustainable’ is covered in a broad sense, including environmental, economic, and social sustainability. Its fundamental combines tradition, innovation, and science to benefit the shared environment and promote fair relationships and good quality of life for all involved.” (International Federation of Organic Agriculture Movement – IFOAM, 2008) which lies on health, ecology, fairness, and care philosophy. It stresses and supports the development of self-collateral systems both on local and regional levels. Maximum reliance is placed on mechanised ecological or biological processes and circulating resources whether chemical or organic is reduced as far as possible (IFOAM, 1998). The

relies on ecological processes, biodiversity, and cycles adapted to local conditions as a key to successful production.

In the conclude, the organic farming means the on-site design system of food production that focused on environmental friendly toward the holistic management by integrity the waste circulatory, minimise use off-farm input and ecologically management that harmoniously works not against nature and minimise the effects.

The organic farming initially appraises the potentiality of the environment and aggregating a conclusive on social impacts through the exclusion of synthetic inputs, like fertilisers, pesticides, veterinary drugs, genetically modified seeds, and breeds, preservatives, additives, and irradiation. The practices of organic are replaced with location-specific management which designed to secure and enhance long-term soil fertility and prevent pests and diseases under the ecosystem management (Srútek & Urban, 2008).

According to Ministry of Agriculture and Cooperatives on publication document (THAI AGRICULTURAL STANDARD, 2009) about production of organic farming, showing the principles and practices standard as follows.

- 1) Develop the production system towards Integrated agriculture approach by using complex rotations with a variety of crops and take benefits from the diversity of animals and plants.
- 2) Use self-sufficiency approach by managing organic agriculture input and take nutrition sources from plant and animal residues within the farm.
- 3) Sustain and enhance the health of the soil, water, plants, and animals continuously with organic matter such as manure, compost, and biological fertility based on the living ecological systems.
- 4) Organic farming systems should fit the cycles and ecological balances in nature.
- 5) Prevent and avoid any toxic activities that could harm the environment.

- 6) Adhere to the principle of after harvest and processed practice with 3 main points; natural method, saving energy and resource, and cause the least effect to the environment.
- 7) Understand and save natural ecosystems of a biological diverse agricultural system and environment including maintaining natural habitats on the farm.
- 8) Be able to maintain organic methods throughout the supply chain.

Organic agriculture does not only benefit the consumers but, as an environmentally friendly farming, it provides so many advantages in exchange for nature. The holistic process is cut down the use of synthetic chemicals. The perk starts from the soil preparation stage: it improves the quality of water and soil from the manure, to nourish the land, livestock, and pet's health with a qualified atmosphere unlike synthesized scent in conventional agriculture. With the prominent of ecology, it brings positive productivity. Moreover, some studies discovered that the organic producers are lessened in cost than the conventional ones, considering the minimizing of external supplementary input and premium price sold, but needs only extra care (Cusuntian, 2016).

Although, the transitioning from chemical farming to organic can be difficult on an individual level than a group or networking supported the conversion. As can be seen in many cases, the converted farmers often found themselves successfully changed due to their health condition consumed overdose of the chemical. The residue of the chemical in their body, or the comprehension of the input price of chemical is higher than organic and the crop can be sold at a lower price which results in losses and in debt later on. The organic farming is not easy to approach because of the processes, it requires more labours, patient, knowledge and management skills which somehow can put the farmers who want to change to organic farming losses the profit at the initiate of the transition periods and consequences to the reducing the income (Cusuntian, 2016).

2.2.3 The comparison of Agricultural Management system

The table below compare the Organic farming and Conventional farming approach in various aspect including the principle, inputs used, the ecological aspect, environmental aspect and economic value.

Table 2.2 The comparison of agricultural management system

Agricultural Management Systems	Conventional farming	Organic Farming
Principle	The principle is based on economic orientation, producing the crop to meet the need of population growth, intensify the productivity, relies on agriculture mechanization, specialisation and development of enterprises with unstable market oriented programme.	The principle of method is based on ecological orientation, circulating input use efficiently, bio diversification and organism balanced system.
Fertilizer Inputs	Supplement the nutrients through synthetic fertilizers, use of pesticide to restrict unwanted weed, chemical usage are indicated the plant protection and practically of mono agriculture with rarely involved livestock.	on farm generated agricultural inputs, use crop rotation and traditional practice to control unwanted weeds, non synthetic chemical usage on plant protection, including on livestock.
Soil Ecology Management	Based on the principle of to feed the crop or plant.	Focus on holistic organism ecology as the catch line to feed soil not the plant
Environmental aspect	The production is focus on quantity.	High input : output ration with no pollution
Economic value	Low proportion of input and output comparing the long term pollution adverse.	Higher input with less environmental effect.

Source: K.K. Behera et al., (n.d.).

2.2.4 Thailand agriculture approaches

Apart from mentioned on conventional and organic farming, the length of chemical usage on the production can be divided in various periods as it was explained by Green Net that the Organic Farming certification system in Thailand can conclude as four main types follow the range of the chemical safety production period by organic farming, safety farming, hygienic farming, and conventional farming, respectively (Apichart, 2018). The below table shown the comparison of various methods in chemical usage period on crop production in Thailand and some restrictions.

Table 2.3 The comparison of various farming method.

Method	Organic farming	Safety farming	Hygienic farming	Conventional farming
Chemical Fertilise usage	Not Allow	Allow	Allow	Allow
Chemical Pesticide usage	Not Allow	Allow	Allow	Allow
Chemical Herbicide usage	Not Allow	Allow	Allow	Allow
Synthetic Hormones usage	Not Allow	Allow	Allow	Allow
Genetically Modified Organism	Not Allow	not specify prohibition	not specify prohibition	Allow
The Responsible Organisation	Organic Agriculture Certification Thailand	Department Agricultural Extension	Agriculture Department	Unnecessary

Source: Greennet, (n.d.).

The comparison of hygienic farming and safety farming is the crop production that allow the use of synthetic chemical such as fertiliser, pesticide, herbicide, and plant hormone to intensify the yield but certified by different organization. The harvested products still contain toxic residues but not exceeding the prescribed amount and must be well harvested, cleaned and packed in purpose of consumer's safety. The Hygienic farming is represented the crop production system by Department Agricultural Extension while the Safety farming is under the Agriculture Department. To ensure that the crop is not contain residue the farmers have to

accredit from the accorded organisations. In the other hand, the organic farming is not allow Genetic modification crop or any synthetic chemical to intensify the yield but harmonically work with the environmental system not against it (Laophim, 2016).

2.2.5 Thailand organic market

The organic market in Thailand tends to tremendously growth in each years. In 2018 the value of the market estimated by Kasikorn Research Center is around 2,700-2,900 million baht and the projected of rising value to 5,400 million baht as the government anticipated in 2021. With the supporting of three main factors including the change of consumer behaviour as health concerning, the increase in population's purchasing power especially middle-class groups to middle high income together with the government policies on consumer health restrictions and the promotion in organic agriculture in both domestically and internationally (K SME analysis, 2018). On the overall market of organic suppliers, the proportion of the organic producers in Thailand still less than expected or which explained as Oligopoly. This market structure has few producers, and not often introduced the newcomer because it hardly achieved for the organic converting with the knowledge barrier, the complication of organic certified, the trustability, and reliability of the production system (Panyakun, 2002).

Nowadays, the organic products is more variety which influence the expansion of marketing channel from offline such as hypermarket, supermarket to online channel like e commerce which made the connection and accessible to customer more convenience and easily ((DIT London, n.d.) as cited in DITP Thailand, 2018).

Organic popularity is surging and creating healthier, environmentally friendly products that consumers are increasingly demanding. Sometimes, the organic product is double higher than regular crops and consumers are willing to pay for their advance due to the growth of the healthy lifestyle market without omission on health concern. With its advantages, elevate and enhances biodiversity, biological cycles, and agro-ecosystem health.

In conclusion, the organic product becomes “new trend” due to the availability of healthier choices and growing in health trends consumer awareness. It gives the opportunity for the farmers to find the shift in the new market which provided premium price in the products.

2.2.6 The Organic certification and Regulation in Thailand

Since the growing numbers of the concerning in food safety and environmental impacts, people is more conscious of what they consumed and the food production system. The aforementioned has compulsive the progress of organic production to standardise supported by both private and public sectors. The organic accreditation is the process of inspection scheme of the production system of the organic producer to ensure that the processes are followed under the regulation of organic certificate. However, the certified system may be one of the mechanisms of trustability formation between the producers and consumers. Nowadays, the accreditation body of organic are widely established over a hundred countries with their own certified moreover it was classified by different conditions.

Although there are only few accredited bodies internationally accepted such as IFOAM, Codex Alimentarius Commission, and etc. In some such way, the various standards or systems of certification for organically produce, safety producing system (such as hygienic farming and safety farming certified), and others certified system imposed the confusion among the consumers (Thai organic Trade Association, 2011).

In Thailand, the organic certification are established by both private and public sectors but the accredited body followed by two standardise including ACSF (National Bureau of Agricultural Commodity and Food Standard), and IFOAM (International Federation of Organic Agriculture Movements). The organic certification can be certified by Department of Agriculture, Ministry of Agriculture and Cooperatives, and Organic Agriculture Certification Thailand. Later on the certified process is dispersed into various as the shown on the table below

Table 2.4 The information of each certification

The Certified body by International organizations according to international systems		
	Developed by the International Federation of Organic Agriculture Movements (IFOAM) since 1992.	International Federation of Organic Agriculture Movements -IFOAM
	National Organic Program or NOP operated under United States Department of Agriculture or USDA since 2002	United States Organic
	EU Organic Program	European Union Programme
	Japan Organic Program operated under Ministry of Agriculture, Forestry and Fisheries – MAFF	Japanese Agricultural Standard or Organic JAS mark
Certified by Thailand Government department		
	Governmental organization under the Ministry of Agriculture and Cooperatives	Organic Thailand - National Bureau of Agricultural Commodity and Food Standards – ACFS
	Governmental organization under Ministry of Public Health	Department of Medical Sciences Ministry of Public Health
	Governmental organization under Department of Agriculture	Good Agriculture Practices or GAP

Table 2.4 The information of each certification (cont.)

Certified by the community under reinforcement from external academic organizations		
	Founded by Earth Net Foundation with a group of farmers and related agencies on Koh Phangan in 2011 under project “ Koh Phangan the land of organic agriculture” supported by Ministry of Commerce.	Participatory Guarantee System – PGS
	Founded by integration between farmers, consumers and researcher from governmental sector and private sectors together object to certified organic productivity that safe to consumer and environment.	The Northern Organic Standard Organisation
	Founded by an independent organization with support from alternative agriculture Network, NGO, Green shop network and Consumer organization. Organic agriculture standards of ACT is the only organisation with guarantee from International Organic agriculture standards like IFOAM	Organic Agriculture Certification Thailand – ACT
Certified by among group of farmers		
	Founded by a group of people in Patom Asoke community promoting non-toxic agriculture activities and herbal-based fertiliser. The organic newbie need to shown their agriculture activity to gain trust and acceptance from community to join the group	non-toxic Agricultural system from Patom Asoke community
	Founded by the researcher of Rajabhat University Phetchabun with local farmers community in 2010-11. This can certified only applicant in the Sufficiency Economy Institute in Phetchabun organic network.	Organic group certification of Phetchabun

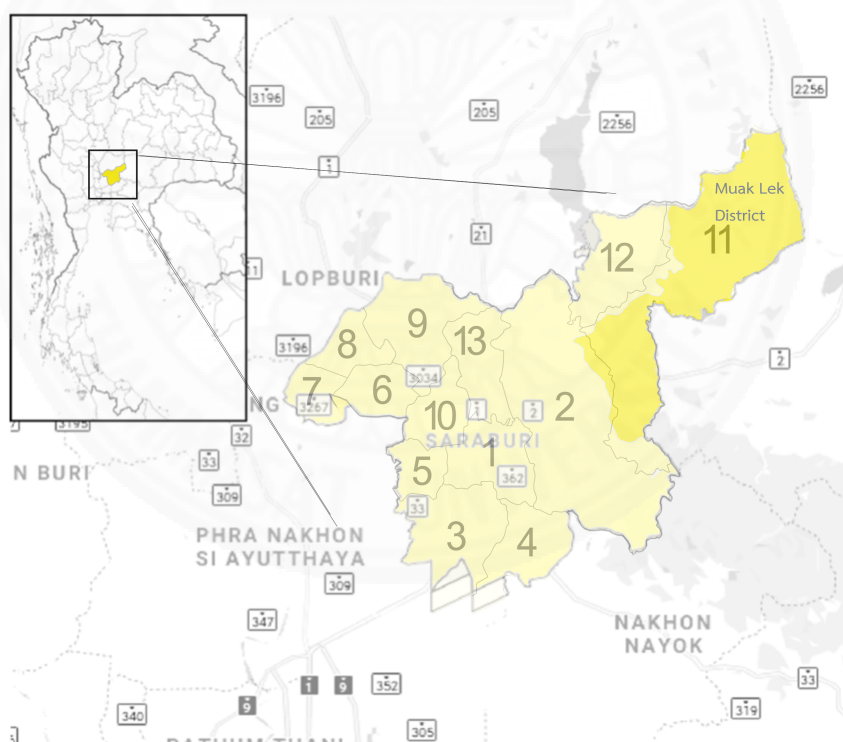
Source: NawaChiOne Foundation Article, (n.d.).

2.3 Saraburi Province

2.3.1 The study region

This study has taken place at Saraburi Province where it is divided into 13 districts; namely, (1) Mueang Saraburi, (2) Kaeng Khoi, (3) Nong Khae, (4) Wihan Daeng, (5) Nong Saeng, (6) Ban Mo, (7) Don Phut, (8) Nong Don, (9) Phra Phutthabat, (10) Sao Hai, (11) Muak Lek, (12) Wang Muang, (13) Chaloem Phra Kiat. Although, this study primarily concentrated on Muak Lek district as a study area under consideration reasons.

Figure 2.1 Location of the Saraburi province



Source: Department of Labour Saraburi Province, (n.d.).

2.3.2 Geographical Characteristics

Saraburi province is one of the central provinces of Thailand, northeast of Bangkok and surrounded by (from north clockwise) Lopburi, Nakhon

Ratchasima, Nakhon Nayok, Pathum Thani, and Ayutthaya. It is located some 108 kilometers from Bangkok and on the east side of the Chao Phraya River. It occupies an area of 3,576 square kilometers, representing 0.70 percent of the national territory. (Department of Labour Saraburi Province, n.d.). The eastern part of the province is covered by high plains and plateaus, while the western part is mostly low flat plains. Saraburi is a nature prosper province, it contains two national parks, forest, as well as several rivers and waterfalls.

2.3.3 Climate and Air quality

Saraburi has a tropical savanna climate, Aw (Climate Classification system of Koppen); Arid and a few amounts of rainwater in Winter, high temperature in summer. The average temperature is around 28-29 degrees throughout the year (Provincial Administration Organization, n.d.). Saraburi is also a province generated income from industrial sectors, so the air quality is quite low with dust and PM2.5 issue from 79 factories (more than 70% located in Chaloem Phra Kiat District). Although, Muak Lek is the only one district in Saraburi that the area prospered with only agriculture sectors surrounded by mountains and 180-402 meter high above sea level which provided the better air quality and the weather is improved compared to the other districts in the province.

2.3.4 Cultivation and Animals husbandry

Saraburi is a rural agricultural province which more than 70% of the population occupied as farmers. The principal agricultural product in this region is (1) Rice, (2) Dry crops such as Corn, Cassava, Sugar Cane, and Beans, (3) Vegetables, (4) Ornamental flower, and (5) Fruit plant. In 2007 a cultivated area was 1,404,108 rai or 62.81% of total area where Muak Lek district was the most cultivated land accounted for 161,990 rai or 7.24% (Saraburi of Social Development and Human security office, n.d.). Saraburi province produces the product from dairy cows and broilers as the second and third largest sources in Thailand, respectively. While the broiler farming is distributed in most of the areas in Saraburi, the dairy farm is accumulatively dense

in Muak Lek district and Wang Muang district as part of the great source of organic agricultural input.

2.3.5 Health

According to the statistic from the studied in the cause of death of people in Saraburi province that recorded on the death certificate, the study shown that Malignant tumors, including all types of cancer, are still the number one cause of death in Saraburi and tend to increase every year. The cause of illness that mostly found in this area is respiratory diseases which cause the sickness for the outpatient department, 578.07 per thousand population. While the highest cause of illness in the inpatient's department was Complications during pregnancy, birth and postpartum with a rate of 1894.50 per hundred thousand population (National Statistical Office, 2014).

2.3.6 Attraction

Saraburi have various of geography, climate, and culture which its has promoted themselves in 5 kinds of attractions; (1) Natural attractions - Nature study centre, Hiking trails, Waterfalls, etc. (2) Historical attractions - Temples , (3) Cultural attractions - Agro-tourism, Dairy farm tour, Organic homestay and etc. (4) Health attractions - Spas, Golf club, and (5) Recreational attractions - Boating, Kayaking, Cave exploring and Rock climbing. Recently, DOAE (Director of Saraburi Provincial Agricultural Extension office) has strived to promote Agro-tourism in many areas in Saraburi as a farm map where it provided 22 farms information and directions. There are 6 out of 22 farms are in Muak Lek district where most of them are GAP (Good Agricultural Practice) farms.

2.4 The innovation diffusion theory

2.4.1 The definition of innovation

The innovation can be defined in many perspective such as processes, methods, or products from tangible to intangible. Peter F. Drucker has described the

innovation as a tools to generate new ideas to further explore their feasibility as proper business models (1985). While Rogers gives the definition of innovation as the idea, practices, or new discovery that is perceived as new by individual or community that can be beneficially to human needs (1962). Somehow the purpose of innovation is to delivery the value creation contribution economics and social beneficial where those beyond as marketing perspectives extending. (Malithong, 1997) also given the definition of innovation as the idea, processes, or products that is novel, or improved from existed to fit current context. The innovation is purposed in enhancing the efficiency, save time, and reduce cost.

Roger explained that the diffusion of the innovation is defined as the process of adoption through variety of communication channel from one to another within the social system in particular time. Moreover, the right information at the right time can make the right decision leading the innovation adoption., therefore, it can be seen that the crucial elements were of the process of diffusion were classified into 4 composition: innovation, communication, time, and social system.

2.4.2 The principle of innovation diffusion

The process of innovation adoption can be explained as the method of changed through individual's decision. It is a process whether a person perceive the innovation information, analysis and compare with their own potential and opinions from people around. As well as experimenting the innovation by own's context before making decisions. Since the individual initially perceive of the detailed of innovation till accepting or rejecting it, however, the level of acceptance depends on individual's perspectives. Somehow, the individual's perspectives rely on the experienced, wants and needs, and the difficulties of innovation diffusion process. From the study, many researches has discovered the adoption process may be various classified of diffusion procedures meanwhile the widely accepted theory of innovation diffusion is the one invented by Everett M. Rogers (Roger, 2003 , as cited in Somabut, 2013).

2.4.3 The stage of innovation adoption process

The adoption is a decision made by individual to begin to be a right along of a product. The adoption process is the way of mentality decision which an individual passes from perceiving about an innovation to decision in adoption (Claessens, 2018). Diffusion is the mechanism in which explain the dispersal of innovation among the members of the social system through communication at certain channels over time. The length of the adoption rate can be long or short depend on the given context of the situation of society, neither the member of the social system nor individual are authoritative or collective decision of innovation adoption (Rogers, 2003). It can conclude that through the process of diffusion, the information system is represented as a crucial rule on the decision-making process. While the processes of innovation adoption are explained by Rogers including the five step of innovation diffusion: From perceiving the knowledge, change in attitude, decision making, the trial and error, and finalise the acceptance of new behaviour as the explanation below :

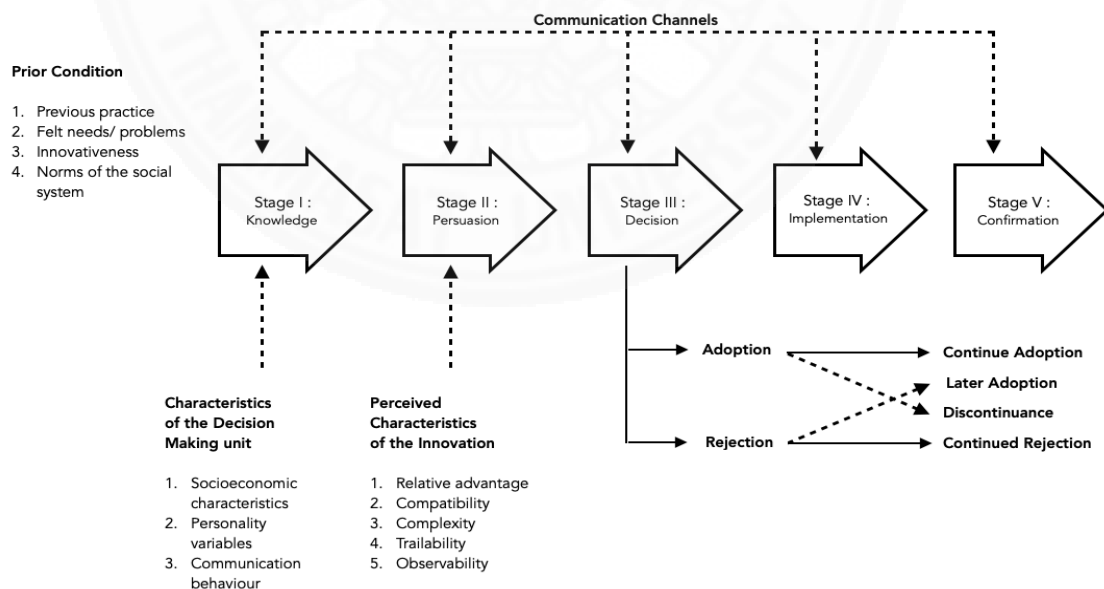


Figure 2.2 Model of the 5 stages in innovation-decision process

Source: Rogers, (2003).

1) Knowledge stage – This is the stage where the individual becomes aware of the existence of the innovation and gains knowledge on how it works. At this stage the information received can be basic knowledge such as: awareness on the need for innovation; the implication of the innovation; and the principle of the innovation along with comparison of what already exists.

2) Persuasion stage – The individual establishes interest, or an attitude of interest, towards the innovation. This process can involve deep knowledge being integrated with individual experiences to reach the conclusions made. The person uses the data received along with their personal experience to determine whether they have a positive or negative stance towards the innovation.

3) Decision stage – This is when a person decides whether or not to adopt an innovation. At this stage the empirical evidence related to the innovation and personal choices and biases also come into play, and the decision made can be dependent on the cost-benefit analysis of the advantage of using the innovation.

4) Implementation stage – The individual decides to execute an innovation and puts it into use.

5) Confirmation stage – The individual looks for support of the innovation-decision they have previously made. They may actually reverse that earlier decision if they experience conflicting messages related to the innovation in question.

Through the process of adoption, the final stage does not always end with the innovation acceptance due to the circumstances and decision is rely on personal's context, and the order of each stage may proceed across one another, some might be skipped. Moreover, the length and intensity of the diffusion stages leading to different adoption processes can be differ as a result of the individual's context and issues of self-uncertainty scale (Claessens, 2018).

It typically requires a number of years, hardly reaches absolute potential adopters population. Mostly for the success innovator, the adopter distributions follow a bell shaped curve depicts the number of new adopters along the same timeline meanwhile the cumulative rate of adoption overtime represented

as the S-shaped curve or diffusion curve (Briscoe et al., 2011). The following conceptual Model of Diffusion of Innovation was designed and explained by Everett M. Rogers in his book entitled ‘Diffusion of Innovations’ (Rogers, 2003). As its title suggests, it explains the process of diffusion of innovation and its likely acceptance or rejection by individuals.

Easily explain the process of diffusion, firstly the information gathered from variety of sources, then the individual formed the interest, need, or problem of the innovation. Secondly, the personal attitude toward the innovation will be the decision made on whether to engage or not. If a person have good attitude they’re likely to adopt, depend on circumstance. Lastly, after adopting a person might found a barriers, challenges during the process of adoption and may result in giving up and become later adopt or continue rejecting.

2.4.4 The characteristics of the adapter

To achieve the procedure of adoption the characteristics of innovators are required. The self-learning, determines, and persistence are the example of an innovation early adopters. From Rogers research, and other related works cited, the characteristics of innovator can classified into five attributes including (1) Innovators, (2) early adopters, (3) early majority, (4) late majority and (5) laggards.

Apparently, some farmers choose to be innovators (first users) while others prefer to be early adopters, late adopters, or non-adopters (Diederer et al., 2003). As Peter F. Drucker said: “Through all the process, innovation requires knowledge, ingenuity, and above all else, focus” (Drucker, 2002, as cited in Siririn, 2008) and not all participants are the same.

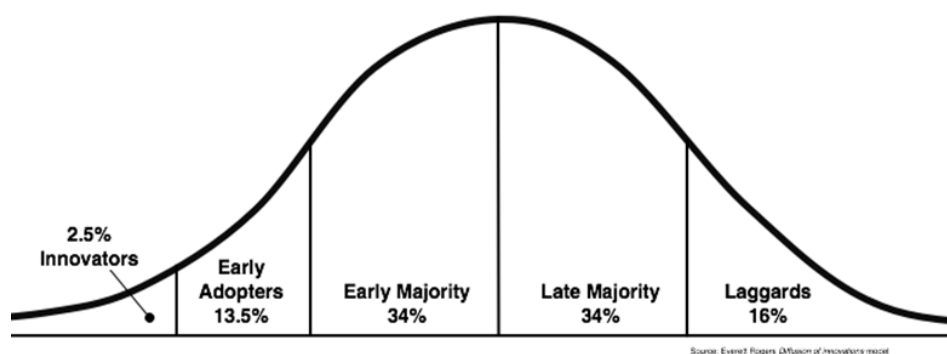


Figure 2.3 Simplistic visualisation of the four main elements in the diffusion of innovations (Rogers, 2003)

Source: Rogers, (2003).

There are five classifications of participants as defined by Rogers

- 1) Innovators - The first people who want to try the innovation. They are venturesome and interested in new ideas. These people are very willing to take risks, and are often the first to develop new ideas. Very little, if anything, needs to be done to appeal to this population.
- 2) Early Adopters - These are people who represent opinion leaders. They enjoy leadership roles, and embrace change opportunities. They are already aware of the need to change and so are very comfortable adopting new ideas. Strategies to appeal to this population include how-to manuals and information sheets on implementation. They do not need information to convince them to change.
- 3) Early Majority - These people are rarely leaders, but they do adopt new ideas before the average person. That said, they typically need to see evidence that the innovation works before they are willing to adopt it. Strategies to appeal to this population include success stories and evidence of the innovation's effectiveness.
- 4) Late Majority - These people are skeptical of change, and will only adopt an innovation after it has been tried by the majority. Strategies to appeal to this population include information on how many other people have tried the innovation and have adopted it successfully.
- 5) Laggards - These people are bound by tradition and very conservative. They are very sceptical of change and are the hardest group to bring on board. Strategies to appeal to this population include statistics, fear appeals, and pressure from people in the other adopter groups.

2.4.5 The decision made on adoption

Rogers explained the initiative of adoption is made by the comparing of cost-benefit for the individual in which the critical obstacle is defined as the uncertainty of those practices. Individuals tend to adopt whether they believe that will enhance their utility or fill their pain points. But to make far to the implementation stage, individual may analyse the uncertainty risky of their position toward change. As if it not risky, individual many tend to postpone the change even though they comprehend the innovation. Rogers cites more that the adoption of innovation decision is largely framed by personal characteristics and the possibility of innovation diffusion.

2.4.6 Social system

The social system refers to a network of relationships patterned constituted as a systematic holistic exists between individuals, groups, and institutions which affects the process of diffusing including types of innovation decision, social structure, opinion leaders and change agents, and the consequences of decisions. Hence, the innovation adoption rate is exerts a large influence on the behaviour of individuals, called adopters, where the opinion leader and change agents are a key performed to build interconnected interpersonal network in a social system. Somehow there are also other intermediaries between the media and the audience's decision-making (Infante et al, 1997).

2.4.7 Innovation characteristics affect the Rate of Adoption

From the literature review, it was mentioned that the effectiveness and efficiency of innovation is not directly correlated with the likelihood of being adopted and used of adopters. At the initiative of innovation diffusion procedure, practitioners is determined to know about characteristics of the innovation and ways the potential users discerned that will personally influenced and effectively merged. Rogers has mentions five characteristics that determine an innovation's adoption rate which is (1) relative advantage, (2) compatibility, (3) complexity, (4) trial ability and (5) observability (Rogers, 2003). Moreover, the comprehension of the variety factors

influenced the adoption process supports understand the adoption or target consumers and thereby enables to design effective strategies to adoption a better solution, more efficient and innovate (Claessens, 2018).

2.5 Empirical Review

This section simply explained about the investigated, experienced and observation on previous papers or researches done by other researchers concerning the barriers to organic conversion and motivation towards organic adoption, rather than on systematic logic. Some of the findings from relevant researches has been adapted to use as the main factors in in-depth interview and some based understanding of the author to investigate on the context of Muak Lek district, Saraburi province, Thailand.

The factors were found the investigation of quantitative and qualitative empirical in both domestically and internationally studies to discover the evidences as many as possible including.

Chinvarasopak (2015) studied the key factors affecting the success of organic agriculture in Thai communities using three case studies in the Ubon Ratchathani and Srisaket Provinces. These were selected because the participants of the research included two major farming groups: local domestic organic agriculture at the community level; and corporate organic agriculture that reaches out to the international market. The cases studied were conducted using the qualitative methodology to gain better understanding of farmer groups using the empirical data and information obtained from in-depth interviews and case studies. The study investigated three main issues: policy implementation; social capital; and sufficiency economy.

An investigation into the obstacles and factors that affect farmers transitioning from chemical agricultural production system to alternative agriculture was undertaken by Boonthueng et al. (2013) using case studies from the Ban Don Jiang, Sop Peung Sub-district, Mae Tang District, Chiang Mai Province. The case studies, 26 farming families, were separated into two groups consisting respectively of 13

chemical farmers and 13 alternative agriculture farmers. A mixed methodology was used for investigating the differences between both agricultural groups. The result was revealed that the obstacles of changing to organic farm were that the chemical farmers were in debt, there was inadequate technological knowledge of alternative agriculture and its markets. Providing access to required knowledge, gathering groups and fertility of the soil from land owners are the important factors to change farmers decision. Another thing, discovered, the main idea of changing to organic farming was to integrated crop system, a good management, self-reliance, reduction of the cost, and sufficiency. All these methods could reduce debts, have stable life and create immunity to farmers from the external effects (2013).

Lukrak & Athinuwat, 2013 used survey sample group from Rachaburi farmers who qualified in the organic farming develop project and questionnaires to collect all data. It was found that Problems and Barriers in Changing to Organic Vegetable Production of Ratchaburi farmers Who Qualified in the Organic Farming Development Project by Studying individual, knowledge, attitude, economic, and social factors which effect on the implementation of the organic farming standards were evaluated. The agriculturists lacked of knowledge in chemical fertilizers and any chemicals banned. Although the agriculturists have a positive attitude towards organic farming, but they suggested that organic farming comes with a complex process, makes difficulties for them for instance the process of manure fermented, so they prefer to use chemical to control their pests. In the solution approach, the interview data cited that the agriculturists who certified by Organic Thailand standards, using ecological principles, bio products and beneficial microbe to crop management and the principle of sufficiency economy is recognized. In order to solve the problems, the knowledge of using organic fertilizers, ecosystem management, bio products and beneficial microbe substitute the synthetic chemical using must be introduced. The training is required to support agriculturists to observe a successful organic farm by providing them a realistic example to generate interest and confidence in organic farming which represent a guideline for agriculturists to take into consideration in facts or knowledge for individual applied.

Jiumpanyarach, 2013 studied socio-economic factors, and attitudes among small-scale farmers, who have transferred from conventional to organic farming system small-scale farming. The researcher gathering data by interviewing local farmers, 124 households which were 59 families from Tumbon-Santa Aumpor- Narnoi Nan province, 23 families from Tumbon-Banlao Aumpor-Mayjai Prayao Province, 22 families from Tumbon-Sritoi Aumpor-Mayjai Prayao Province, and 20 families from Tumbon-Parfak Aumpor-Mayjai Prayao Province during January 2012 – October 2012, in north of Thailand. Most agriculturists wanted to convert from conventional farm to organic farm but they do not have adequate information and knowledge to do. Moreover, organic farm gives a better income than conventional farm and better in life quality. Government should provide the information to the farmers and funding some part of the money to initiate the organic movement for the farmers (2012).

Jiumpanyarach, 2013 also studied determinants which affecting to organic farming durability. The research was divided into 5 regions in Thailand, North, South, East, North-east, and central region. In-depth interview was used to be the methodology for gathering data. It was figured out that integrated farming system trended to convert to organic agriculture more than monoculture. Additionally, the safety farming could not convert to organic agriculture due to the environment. The main factors that have an influence to agriculturists in conversion is health of producers and consumers. Consequently, a policy of providing knowledge from government is important (2017).

Krishnan, n.d. explored different factors to motivate farmers to convert from conventional farms to organic farms, using qualitative research method to find out answers. Soil health and soil fertility was found to be the key reasons for the farmers to switch. Farmers suggest that use of chemicals inputs are causing problems to farming lands. Regulators may take into account the efforts farmers are making to 4 continue with organic farming. Subsidies for organic farming inputs and regular and effective distribution of inputs to farmers. It is shown that subjective norms have not much effect to farmers who wanted to convert. The farmers concern to soil health and soil fertility than economic, social responsibility and virtue. In the other hand,

others think that cost of farming could be just a minor influence on them when the farmers select organic farming instead of conventional farming.

Asadollahpour et al. (2014) examined factors affecting the conversion to organic farming by rice producers in the Mazandaran Province in northern Iran by using qualitative research methods, multiple-case study, questionnaire, and the purposive sampling method. The main instrument used for collecting information was a subjective questionnaire. The sample size was set as ten organic rice farmers in the Mazandaran province that received certification of healthy produce from the Standard Organization of Mazandaran Province.

The data they took was gathered until empirical saturation was approached, and the results themselves showed that the determinants affecting the conversion to organic farming consisted of facilitating factors and barriers to conversion to organic farming. Facilitating factors included motivations and profits. Out of these, health and safety, environmental, ideological, and philosophical and economic motivations were found to be the most important motivating factors mentioned by rice producers. Barriers to conversion to organic farming included challenges and costs. Lack of knowledge, lack of government support, fear of the future and production worries were mentioned as the most important challenges of the conversion to organic farming faced by the rice producers.

Niemeyer & Lombard (2014) undertook a study of the organic farmers of South Africa to identify the features of their decision-making process leading to their conversion to organic farming and the problems connected with their conversion process. The study used a multi-disciplinary approach, survey and questionnaires. The study concluded that younger age and higher education level increase the potential for conversion and several factors play different roles towards farmers' decisions such as financial support, and information sources.

Koesling et al., 2008 studied the factors influencing the conversion to organic farming in Norway by examining the determinants of the decision to convert to organic farming methods. Applying bivariate analyses and a multinomial logic made to a survey of 1018 Norwegian agricultures were the methods, used. The analysis shows that chemical agricultures, compared to organic farms, have less

farms, less education and be located further to urban areas. Unlike organic farms which is sustainable, close to the urban, eco-friendly. The results indicate that 4% of the conventional respondents plan to change by 2009, which may assume that the national objective of 10% organically managed area will not be succeeded.

Heaton, n.d. studied a comprehensive review of existing research reveals significant differences between organically and non-organically grown food. These differences relate to food safety, primary nutrients, secondary nutrients and health outcomes demonstrated by feeding trials. Organically grown foods are significantly different in terms of their safety, nutritional content and nutritional value from those produced by non-organic farming. Good health should be defined as more than simply the absence of illness, to include the promotion of positive health, encompassing such aspects as abundant energy, resistance to stress, good mental and sound reproductive health. The concept of food quality should recognize wider aspects than mere external appearances, including authenticity, functionality, biological and nutritional value, sensual and ethical dimensions. In the biological and nutritional areas of food quality examined here, the promotion of positive health is considered to be significantly dependence on the absence of toxins and presence of primary and secondary nutrients in foods. The available valid scientific evidence reviewed here demonstrates a clear trend toward organically grown fruit and vegetables having higher levels of desirable components such as dry matter, essential minerals and vitamin C than non-organically produced fruit and vegetables.

Sharifi et al., 2010 studied the barriers to conversion to organic farming: A case study in Babol County in Iran. The main purpose of this study was to identify these barriers in Babol County in Iran by A sample size of 150 farmers was selected for this research by using simple random sampling method, in Babol County in Iran. Major barriers or obstacles to the adoption of organic farming between farmers were: productive, natural, attitude and knowledge, infrastructural, institutional and economical barriers. These factors explained about 68% of the total variance of the research variables.

Shaban, 2014 studies the Factors Influencing Farmers' Decision to Shift to Organic Farming: The Case of Gaza Strip by focus group discussions and data collected

from 100 randomly-selected vegetables farmers in southern Gaza strip. There are three potential factors that lead to farmer's decision to be organic adopter; socioeconomic and the demographic characteristics of farmers; attitudes towards organic farming; and the perceived economic performance of organic farming. The studied shows farmer's education level was a good tool to predict new organic adopter as the result of studied proved the significant potential of education and awareness affecting on farmer's decision to convert.

Taotawin, 2011 studied from questioning an ideal of self-sufficiency and self-reliance are efficiency solution for helping small-scale farmer from poverty. The data collected from 27 families of small-scale farmer in Nasawan sub-province. From the observation, it is shows that small scale, medium scale, even big scale organic farming are mostly using bank loan where they use profit as interest payment. The studied stated that organic farming act more commercial agriculture than self-reliance agriculture as claimed. Organic farming approach cannot rely one source of income.

Tuomisto, n.d. studied barriers of conversion into organic farming in Poland. The study shows three main barriers as; financial, cognitive, and emotional barriers. The financial barriers consist of higher labour cost, long transition period (lower yields), and market accessibility. While the cognitive barriers are about farmers knowledge. Lastly, the emotional barriers that caused from social difference.

Phitthayaphinant, 2018 studied chemical paddy fields to organic paddy fields on a self-sufficient path in Khuan Kanun district, Phatthalung province. The study used qualitative method specifically select Ban Khao Klang community as a study area. The in-depth interview are main method to collet data from participants where it shows that there are five major factors for famer to be organic adopter: the high cost of rice production, Indeptedness, the farmers' health problem, the soil degradation, and the extension of government service.

Nooprom, 2015 studied Organic Vegetable Production including preparation process, seed selection, soil fertility, natural substitute pesticide, and after harvest process of organic agriculture. Organic production required standardize certification with strict regulation under involved organization which generally received higher price from consumer wiliness. The study conclude that success factor associate in

organic farming was depend on deep-root knowledge of organic production including ecological understanding.

Laosunthara, 2017 studied comparison of quality of life of Rice farmers in Chiang Rai Province by using case study of 498 sample in both Organic farmers and Non-Organic farmers. For non-organic farmer the result of the study shows that social factor of quality of being lives was the highest. While organic farmers found network factor are the most influencing factors.

Srimooks, 2013 studied the Impact of the Use of Agricultural Chemicals in Thailand. The study presented the high number of agrochemicals import each year with and upward trends. The chemical effect on health has direct cause farmer's disease as well as consumer. Organic policy on each countries had different restriction rules however Thailand needed a clear serious policy on agrochemical restriction for the advantages of future economic and environment.

Heryadi et al., 2018 studied why organic rice farmer in Priangan Timur West Java Province, Indonesia switch back to conventional farming by using survey method with 150 ex-organic rice farmers. The study shows economic barriers, certification, organic rice requirements, production & institutional and technical barrier factors were vital factors that influencing farmers to switch back from organic to conventional again.

Limnirankul et al., 2010 studied valuing Systems of Organic Agriculture as Perceived by Smallholder Farmers in Northern Thailand. The study used semi-structured interview and observation method in different sample group. The study concludes that market accessibility is important for sustain organic farming approach. Niemeyer & Lombard (2014) studied the challenges and potential of conversion to organic farming in South Africa by using the survey method. The data shows farmers in that country were concerned about socio-demographic aspects, farming operations, motivations and the problems of the conversion process. Those researchers proposed that not only financial support is needed among those farmers but also that the development of infrastructure for marketing, networking and information exchange are essential for sustainable organic agriculture both theoretically and practically.

Midmore & Padel, 2001 studied attitudes towards conversion to organic production of farmers in England by telephone survey with three groups of farmers.

Panta, 2007 studied Organic Agriculture Development of Vegetable Growers Group, at Moo 5, Huay Sai Subdistrict, Nong Khae District, Saraburi Province.

As several studies have discovered the effected factors is the combination of the various barriers of individual contexts. It can summaries by the main of factor including eight variables as the followed explanation.

2.5.1 Socioeconomic aspects

The socioeconomic aspect is defined here as the ages, genders, and educational background, indebtedness, land ownership, personal experience, and willingness to change.

2.5.1.1 General variables

Several studies mentioned factors such as age, gender, and education background as variables which can have direct impacts on the likelihood of organic adoption.

The investigation of the South Africa context by Niemeyer and Lombard (2003) assessed the ages and educational background of organic farmers and conventional farmers and found that most the organic farmers that participated in their postal survey were of younger age and higher education level than the conventional farmers that took part. It also revealed that more educated farmers tend to adopt organic farming methods more quickly than less educated farmers. Several factors played a role in the process that led to the decision to convert to organic farming. The specification comparison those authors undertook showed that organic farmers were generally more educated than commercial farmers, with 89.7% of them having received tertiary education in the form of a diploma or a university degree, compared to only 50% - 57% of the commercial farmers.

Shaban (2015), investigating factors affecting farmers' decision to convert to organic farming in the Gaza Strip, a self-governing Palestinian territory, also found that the farmers with higher education had positive attitudes towards

organic farming and comprehension toward the awareness on environment issues affecting the farmer decisions in conversion. The education might conclude as one of the factors motivate the conversion to organic farm. The education might ease the organic converting process by the approaching of the method more easily to proceed due to organic farming required complexity comprehension on the biodiversity.

2.5.1.2 Indebtedness

It has been mentioned in many studies that the high level of debt carried by many farmers is often one of the critical barriers preventing them from adopting the organic farming method. This is because the farmers are not confidence and lack of investment to experience on the alternative agricultural method including organic farming (Chinvarasopak, n.d., Boonthueng et al., 2003). Moreover, some research has found that land ownership represents one of the essential conditions in adopting decision making, the capital of production is reduced once the land status was possessed by farmer in which allows the farmers to experience organic farming trial as the financial stability and time is required through the process of changing (Boonthueng et al., 2003).

2.5.1.3 Characteristics of the farmers

Apart from financial barrier, the characteristics of organic farmers are played as the vital role in the adoption to organic because the conversion period to organic farming often takes time, so not giving up during the trial and error period might an important characters of the successful farmer as well as the self-determined, self-learning, and leadership. The characteristic are significantly the main factors in organic farming successfully. Additionally, the study by Boonthueng et al. (2003) mentions that self-sufficiency, and self-reliance are the keys leading to the successful in conversion to the organic farming method.

2.5.1.4 Personal experience

In this topic, there can be variety reasons influencing the willingness to change. Some farmers have their ideology in organic farming, some may have experienced suffering from their own health issues or their relatives' health

issues. Other might have found that the organic farming is only the ideology of agricultural system approaches that might not be able to achieve profitably.

2.5.2 Information accessibility and technical knowledge

The Information accessibility and Technical knowledge define as the lack of information, communication channel, limitation of existed knowledge, inability to perform organic farming approaches, the complexity of organic production, organic certified process, lack of experience in organic production and deep knowledge on ecology.

The accessibility of information is the critical stage to diffuse the organic farming method. Lack of information and limited existing knowledge can be concluded as one of the barrier factors in conversion operation. As a matter of fact, better information and comprehension on organic farming could lead to changes in farmer's attitudes (Rogers, 1973). The information access allow the farmers to differentiate the benefits of various farming methods. The study of Taotawin discovered the reason of majority farmers not adopting the organic method is not because of unknowing the consequences of agrochemical usage but inability to address the organic agriculture technology and techniques, as it is a complex and complicate rather than not wanting to adoption.

The information access might be a important through initially phrase of adoption, on the other hand, the technical knowledge takes the organic adoption to success. The technical knowledge of organic farming is described as the organic agriculture production procedures for instance the choices of crop variety, crop rotation, pest management system, weed control, contamination control, buffer zone management, product traceability, and etc. These elements can take part as the restriction in adoption organic farming.

Midmore have mentioned that the lack of technical, financial, and marketing information as a challenge to the expansive adoption of organic agriculture are the barriers in succession the organic adopting (Midmore et al., 2001) As well as the study of Nooprom who emphasis the deep knowledge about ecological system can be a part of successful factor in organic farming which the needs of different kind

of production techniques and farm organizations must be comprehensive to the farmers. The understanding of ecosystems, plant nutrients and the use of food chain system can be beneficial to efficiently on farm management level, and ability to identify the animal and plant sickness can be one of the barriers in the organic farming adoption as Cowan et al (2004) mentioned.

The study by Panta (2007) also found that the group of organic development in Nong Khae District Saraburi province revealed that the lack of knowledge and skills in management, planting, and organizing organic production is the main obstacle in adopting organic farming. The evidence is displayed on the operational stage of farming around the area. The majority of people in Nong Khae district still relied on a mono-cropping system, the use of agrochemicals such as plant hormone, pesticide, and chemical fertilizers.

According to the innovation diffusion model, the communication channels influenced the rate of organic adoption. The lack of information or knowledge resulted in the struggle of the existing proportion of organic farmers which can be concluded as the critical barriers in organic adoption along with the lack of technical support.

The medium such as the radio, represented as the most effective communication channel, in Laosunthara study revealed that 37.1% of total participants listen and receive the news from radio as it can be listened from anywhere at anytime. Some studies reveal that the study of dharma together with the organic farming principle and technique practices the participant's virtue and merit which enhance trust ability in organic farming and the comprehension on self-reliance and self-sufficiency assist the systematic thinking on the dynamics of changes. It creates the ideology of the balance in life. The farmers must learn to adapt in the vulnerable situation and fast-learn to lessen the impact.

2.5.3. Economical and financial conditions

The Economic and financial factors define as the reduction cost due to the lessening of input necessity, Farmers income rise, Organic crop price premium,

Demand-led organic production growth, Availability of the market support, provide a better life quality, Government support subsidies, monetary dimension.

Chinvarasopak concluded that the organic farmers adopter can minimize costs from hormones, pesticides, and herbicides which means the income increased and gained more profits. The others explained the cost of organic facilities are actually high due to the investment period including fix capital on cultivation house, supplementary for assisting the labouring related work, soil and water testing, organic farming certified, etc.

This indicates the adoption of organic farming is required the financial investment and additional cost. Some studies identify, the most important problems on financial is the intensively labour required which mean the higher expense as the investment burden cost on organic production (Tuomisto H., 2005)

A critical issue on monetary dimension as mentioned by Niemeyer and Lombard to support of organic farming, especially during the conversion period (2003). This variable found as a time of financial constraint and risks, support during this time is of decisive importance.

Taotawin discoveries, the majority of farmer struggling on the converting can divide into two categories depended on the objectives of the farm, including commercialize and self-consuming. When the farm is serving for the commercialize, the stable market of production is considering as the importance of the uncertainty concerning the yield. The uncertainty from the organic production can loose the contract customers and consequence in market accessibility.

The study has shown the most significant supporting factors in economic to conversion to organic farming, respectively due to the reduction of input factors, income increase by the price premium from production comparing with chemical, the higher crop yield per area, market availability to support certain products, the expansion of the demand of organic food. Meanwhile, the most influent factors in social aspects are supporting from family members, government policy and supports, labour aspect, and information accessibility. The success of the nearby organic farm has influenced the success of organic adopter as well as the financial

support from the government. The environment and health are valuable profits they would gain (Luklak & Atinuwatt, 2013).

Taotavin N., 2011 study from Taotavin has established by questioning: Does organic farming is the path of self-sufficiency for farmers? And Is it a way to solve poverty problems for small-scale farmers? The research has shown that understanding today's household issues in rural areas can guidance policy to loosen farmers' issues into the root cause. For instances, creating opportunities to owned the land, provide better equipment and technology to small-scale farmers, farmers aggregation for market and bargain power, promoting the potential of farmers' groups to be able to manage production by themselves, improved opportunities in communication and information accessibility, provide a variety choice of living (job), and create a stable welfare system for migrant workers from rural areas to work in the city. While encouragement only on organic farming without concerning the importance of power in the market would not go toward sustainability path for organic agriculture and not be able to improve the quality of those farmers' life.

While Koesling has studied the factors influencing the conversion to organic farming in Norway (Koesling et al., 2008) which the analysis of the survey results show that among the potential converters, Financial factors play a vital role in attracted farmers to adopt organic farming under conditions of economic incentives are further improved. Farmers needed encouragement about longer-term reliability of policies, markets, and the profitability of organic farming to introduce to organic farming. With similarity of the study from Asadollahpour, Najafabadi, and Hosseini examine factors affecting the conversation to organic farming by rice producers in Mazandaran Province, north of Iran where it is shown supportive factors under economic issues as the important factors mentioned by rice producers which were organic product earn more income. Farmers said: "I can sell my products the more expensive. I can change my car. These sentences mentioned 11times in farmers' statements. This has shown that the higher income can really attract adopters to conversion. While it could succeed or not depending on the farmer's ability to define the market and sell the product at an expected premium price (Asadollahpour et al, 2014).

The organic farming can help the farmers reduce the production cost by cutting the input necessity of agrochemical and increasing the price from selling organic products as the premium which in fact, some research has discovered that the excess of the different getting from the reduction of inputs and increasing of the price sold can be used as the fund to pay the debt of some farmers (Phitthayaphinant, 2018).

The government policy on organic farming including the production and marketing is one of the main factors that consequence on the conversion decision in farmers toward organic method. The result of Jiumpanyarach's research (Jiumpanyarach, 2017) about *Sustainable Impacts on Organic Farmers in Thailand: Lessons from Small-scale Farmers* have confirmed the idea of economic factors is the primary variable for adopting organic agriculture. Informing the knowledge of organic production, market, and distribution channel were needed for them to generally aware the existence and availability of organic farming thus governmental policy should be untiring advocate initially in advanced along with the whole systems based on sustainable methodology.

2.5.4 Social aspect

The social aspect defines as the social movement, peer pressure, nature of trusted, information networking, neighbours, and supportive activities.

The main social factors that motivate to organic agriculture accord to Daleethong study about Complex conditions affecting organic farming practices: Case study of Muang Wa Village, Luang Nuea Sub-district, Doi Saket District, Chiangmai Province (as cited in Lukrak & Athinuwat, 2013) were result as household labours, comments & suggestions from neighbours, and supportive activities from government & organizations have led to the conversion. The networking plays as a crucial part in converting the organic farming as it was explained in the innovation diffusion model that when the innovation begin to spread, it becomes more easily to diffuse to majority people. The cost per crop is less if farmers make organic fertilizer by themselves or buy from the group that buys it from other producers for the group members at a lower price. If a member does not have the money to buy organic fertilizer, they can

borrow from the group and return organic rice of the same value as what they had to pay for the organic fertilizer.

2.5.5 Environmental and Health condition

Several researches have mentioned the Environmental Awareness, willingness in environmental preservation, the environment resources restoration and the integrity of the soil, increase biological diversity Restoring the richness of the soil and general ecology, improved environmental conditions, visual health and the need for safe food consumption, the improvement of farmers and consumers' health.

Most of the farmers may find themselves motivated the conversion by the financial reasons but not all of them are. The study of Limnirankul et al. mentioned that most organic farming studied and practice aiming on production process, market channel, and certification but not much mentioned about values dimensions which is the primary fundamental for organic farming in valuing systems of organic agriculture as perceived by smallholder farmers in northern Thailand. The qualitative data from groups of safety and organic agriculture products producer shown that number one reason lead to motives in conversion was **Health and Consumers' demand for safety food** (51%). The statistic from average value based outlook and attitude on organic agriculture system at various farmer groups indicated **Ecological and environment value** (4.46) as the most important value, especially in order to remodify nature balance, creating soil fertility and managing bio-practice, following by Safety food and health value (4.42) and Social and cultural value (4.39) respectively.

As mentioned on the (Niemeyer & Lombard, 2014) study that the organic farmers were not mainly motivated by financial reasons, but more by concerns about the environment and soil fertility. Financial reasons such as higher prices or the reduction of input costs played a minor to average role in the decision. Therefore, it seems that farmers converted because of the added financial attractiveness of organic farming rather than as a solution to an unprofitable farming situation (2003).

Besides, the advantageous of growing cost reduction and better-quality crop, organic farming improves the environment, the farmer's health, and also provide sustainable source of local food.

Chemicals use in agriculture have been rising up as food demand which it is found residue in vegetables in over-standard rate and subsequent the health issues in both producers and consumers. From the random sampling test of vegetables that people usually consumed have shown 14 types of toxic substances contaminated. After the awareness of this hazard warning become more tangible, leading the rising number of organic producer and consumer who pay more attention on their health and quality of life (Nooprom, 2015).

According to Srimooks' study on The Impact of the Use of Agricultural Chemicals in Thailand. It was mentioned that the country has an upward trend on agrochemical usage according to the statistic compared the amount of agrochemical import before and after the introduce of economic development plan 10th as 3.6 million ton in 2006 to 6.3 million ton in 2011. The number of agrochemicals are rising while the agriculture area is the same, meaning agrochemicals per yield goes higher for maximize productivity which gave more income to farmers and overall economic. But the misuse of chemical and over necessity including the lack of strict policy and regulation caused a long term hazard health impact on farmers, consumers, and the environment (2013).

On the other hand, the study of Taotawin addressed that the area supported by agroclimatic has significantly in developing the converting of the organic farming. Especially, with the area that accessibility to irrigation is advantageous to agriculture as the Irrigation controlled amounts of water to plants at needed intervals. This allowed farmers to open up areas of their farms where it would otherwise be unable to grow pasture/crops as barriers

Therefore, it was emphasized by Office of the National Economics and Social Development Board that Thailand must consolidate the agriculture policies including the relevant topic of food safety, food insecurity, and stakeholder participation as well as the push of the consumer's involvement and awareness in agrochemical issues and effects. The accessibility of information must be extended by the relevant organizations to proper the user of the chemical, not exceeding the restriction. Moreover the supporting in knowledge, technical, at the practical level will

play as the incentives in conversion to organic farming, or other agricultural practice such as Good Agricultural Practice method or GAP (2016).

A large number of converted farmers has initially experienced health related issue. The converted farming from chemical to organic will give the prosperity to the environment, enhance the life quality and bring prosperity within the community (Laosunthara, 2017).

However, the motivation on organic converted mainly focuses on the process and quality, it is needed to understand the whole value system in order to create proper economic stability base for small-scale farmers as well as straighten localise food system as consequence in sustainable organic agriculture. (Limnirankul et al, 2010).

2.5.6 Institutional supporting

This factor was one of the most mentioned as the supporting factor in leading the organic conversion. The supporting can classified into two types which are financial and non-financial supports. Both of the support should play along one another as the financial might play a crucial role in considering stage and the non-financial support is well round on the transitioning stage. On the non-financial support, it was defined as knowledge and technical support, Information accessibility, activity supporting, equipment rental (Boonthueng et al., 2013. Lukrak et al., n.d, Jiumpanyarach. 2017). On the financial aspect, it composes of low interest rate loaning, credit granting, land ownership (Heryadi et al., 2018).

From the analysis of Chinvarasopak on Organic agriculture policy, It explained that the organic agriculture has become public policy in Thailand in 2005 and approved as one of the national agenda in 2008, influenced by the growth of healthy market, naturally produced food, and sustainable development to consume chemical free agricultural, internationally competed markets (2015). Although, the organic agriculture might gain attention on national level as policy implementation, only a few concrete projects are obviously successful. The allowance of agrochemical has not yet taken into account to prohibit the chemical imported and restrict endanger chemicals. Moreover, the organic budget shares a little part, representing around 1%

of total budget of the Ministry of Agriculture and Cooperatives (Bureau of budget, 2013). The policy, at the local community level, has been implemented by many organization which too various of stakeholder to take in account and make the confusion among the processes of changes as including the office of Provincial Agricultural Extension, Land development Department, and etc. Inefficiently promote and encourage the development is founded as the barrier in adopting and developing the farmer, farmer's organizations, and community farm enterprises; knowledge sharing, supporting and coordinating transference of technology on producing and managing such as supervise and render support. While the land evaluation, soil surveys, soil classification, soil analysis, land use planning are responded by The Land Development Department (LDD) as in order to assist farmers in soil and water conservation practices and improvement. As it was mention, the policies implementation failure from institution can be found as three main categories as follow.

- 1) The failure on policy objective have unclear goals, inefficient resource, poor corporation, opposition and unfavourable socioeconomic environment.

- 2) The failure on the policy structure which classified into top-down and bottom-up approaches. The top-down policy should be cleared, consisted goals, small number of actors, limitation on the extent of changes, implementation responsibility by an agency that able to achieve policy goals. On the other hand, the bottom-up policy must understanding the interaction of the stakeholders. The key actors in a specific policy should play an important role in addressing the problem along with local implementers and networks.

- 3) The failure on the policy implementation level was explained as the lack of ability to execute the plan or theory to take into account for real. As the general theory or policy formulation requires too many variables to design and most of the time it failed to evaluated the policy output and outcome.

Asadollahpour cited that the institution support plays as the vital role in organic conversion as well as mentioned on most of research papers as the great importance in information access, adopting process, and supporting factor lead to the

successful organic diffusion (2014). The lack of government supporting and addressing the issues was as a barrier mentioned for conversion.

On the other hand, the institutional barriers in the form of difficulty to obtain loans and certification barriers as mentioned by Heryadi et al. are the main cause that the organic rice farmers are returning to conventional rice farming (2018).

2.5.7 Managerial ability and marketing identify

The managerial and marketing identify define as the ability to plan, produce, and manage the farm operation level as well as designed the other activities along the main tasks for instance the ability to process the certified process, on farm resources production circulation, crop variety design, customized strategy follow the organic conditions and etc.

Nooprom has mentioned in the Scholarly Article of Organic Vegetable Production that the success path of organic production struggle with the barrier in understanding and following organic certification standard conditions. While today farmers generally know only chemicals fertilizer and pesticide as well as synthetic hormones as a support agriculture input. Due to the change in a farmer who lacks knowledge in nature or safety substitution agriculture input as well as believed in organic farming could be hard work to transform the mindset and attitude.

Even through, the organic product is a growing industry, it is actually not cluster marketing channel so the barrier of the farmers is occurred when one is unable to identified the premium market channel they are aimed, as the organic farmers aimed in selling high price, it needs different market from the conventional as to earn the premium price (Chinvarasopak P., 2017).

In the case of vegetables in the Sam Rong group, the amount of organic produce is less than the amount of vegetables from conventional farms because chemical herbicides are more effective than herbal herbicides. However, the price of organic produce is stable and higher than that for conventional vegetables which depend highly on market prices, and their organic produce supply never exceeds demand.

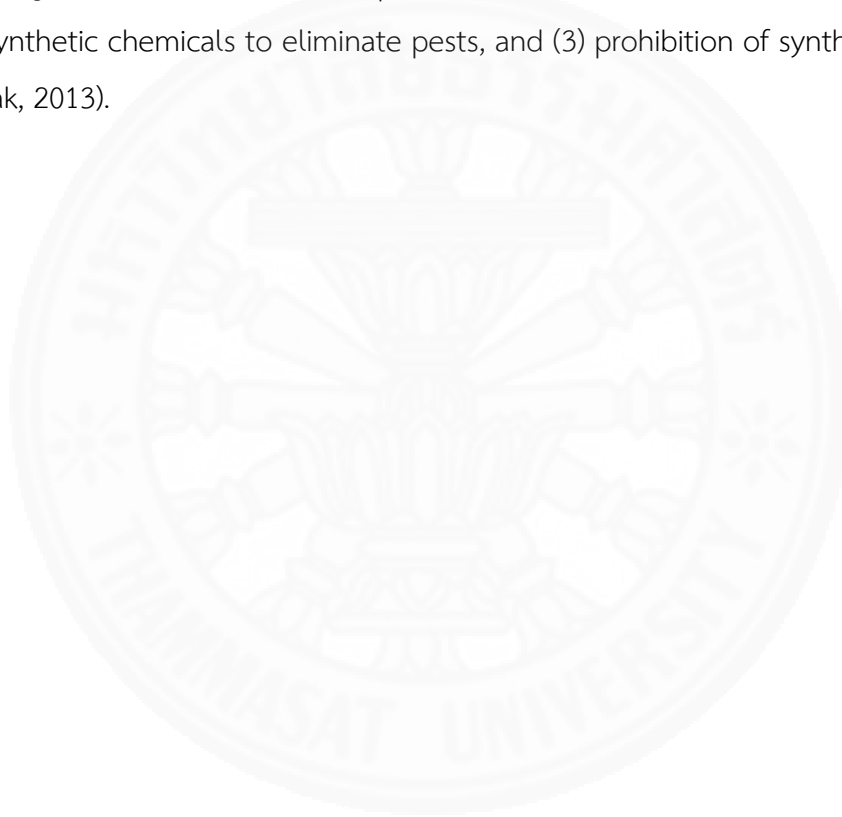
Moreover, it was found that success factors and essential techniques of doing Organic farming are done by using deep knowledge about the ecological system by understand the ecosystems, plant nutrients and use the food chain system to manage the farm efficiency. Barriers for organic farming consists of vary uncontrollable environmental conditions which can be classified in 3 main conditions as Biophysical limitations, Economic limitations, and knowledge limitations (Nooprom, 2015).

Chanjeam (as cited in Nooprom, 2015) mentions 14 important factors that lead to success in organic farming. These are listed below.

- 1) The sufficiently of agriculture input management under the organic standardize and resources accessibility.
- 2) Efficient production management and good comprehension of the organic farming business.
- 3) The potential in organic farming production and positive attitude toward the organic farming of producer and entrepreneur.
- 4) The understanding of organic consumers toward the organic market for the expansion of demand.
- 5) Supportive logistic management system.
- 6) Appropriate and confidence in consumer's behaviour towards organic food.
- 7) An extensive and strong group of organic networks.
- 8) The active advertisement and establishment caused a positive behavioural impact on organic production.
- 9) Clear and proper organic standards and certification systems.
- 10) Reliable and accessible organic comprehensively database.
- 11) Supportive research in organic conversion operations.
- 12) Continuous support from government agencies and the private sector.
- 13) The potential and attitude of relevant stakeholders, government office, toward organic farming.

14) Actual proper policies and laws supporting the conversion to organic farming.

The issue in following the guidelines of organic standards have mentioned in Lukrak studies of Problem level in compliance Organic standards using questionnaires, states the obstacle conditions that 63% of farmers found hard to follow. The most sequence result shows the barrier of lacking the knowledge on following these conditions; (1) the prohibition of chemical fertilizers, (2) Prohibition of any synthetic chemicals to eliminate pests, and (3) prohibition of synthetic hormones (Lukrak, 2013).



CHAPTER 3

METHODOLOGY

The purpose of this chapter is to introduce and discuss the research methodology used for this qualitative study regarding the perceived and actual barrier factors to the adoption of organic farming in the Muak Lek district in Saraburi Province, Thailand.

This chapter describes the data collecting method, and the data analysis method used: Section 3.1 covers the research questions used for the investigation of the factors affecting the adoption of organic farming including: the barriers and challenges; and motivational factors; Section 3.2 discusses the methodology approaches taken and also provides information on a variety of previous studies and features of survey methods. Section 3.3 discusses the sources of information used in this present work; Section 3.4 provides information on the research timeline adopted. Section 3.5 covers the procedures and the characteristics of survey analysis undertaken; Section 3.6 discusses the validity and reliability of the interview data.

3.1 Research Questions

This study was undertaken to investigate and build a conclusion on the factors influencing the adoption of organic farming. The questions that were set are as follows.

Question 1: What are the barriers and challenges faced in converting to organic farming?

Question 2: What are the farmers' motivations for converting to organic farming?

3.2 Methodology selected

This research used qualitative study to achieve a depth understanding on the barriers, challenges and motivations related to the adoption of organic farming as it is considered appropriate for use in explaining and relying on the perception of a person's experience in a given situation as many studies have previously demonstrated (Stake, 2010).

The use of the qualitative method is propitious when a researcher is attempting to understand relationships between variables, as outlined by ((Creswell, 2003), as cited in Techo, 2016). This approach was undertaken since the purpose of this study is to investigate the relevant factors effected to adoption of organic farming using case study in Mauk Lek district in Saraburi Province, Thailand.

The thesis's progression started with a detailed literature review and theoretical review undertaken as desk research which included investigation of related topics as well in order to form a more complete picture of the situation that exists. The study's empirical data and information have been obtained from a triangulated literature review, in-depth interviews and farm visits; including data collection and observation of the specifically selected nine farmers. All participants were selected particularly on a region of Thailand which is Muak Lek district, Saraburi Province in order to maintain control over region culture and environmental differences. All of the data collected was analysed and classified to find the connection between each variable and then documented through descriptive research.

3.2.1 Methodological approaches

This research used qualitative methodology as no single data collection method would be sufficient to cover all aspects of barriers, challenges, and motivation related to organic adoption. The methodological approaches of the data procedures used are described in the table shown below (Table 3.1).

Table 3.1 Methodological approaches

Data procedures				
Data Collection Methods	Data collection Instruments	Data collection sources	Overall Purposeful of data collection	Output
Literature Review		Original Research, Dissertations, Books, Handbooks, Textbooks.	To understand the background and circumstances related to the study topic.	Comparison of findings.
Theoretical Review		Website, Research papers, and Books.	To understand the process of organic diffusion.	The Process of organic adoption as innovation diffusion.
Empirical Review	Triangulation method.	Related researches on similar topics, Case studies.	The use of multiple sources of data, various aspects and case studies help deepen the researcher's understanding of the issues and maximise the confidence in the findings of qualitative studies.	Conceptual/ Theoretical Framework.

Table 3.1 Methodological approaches (cont.)

Data procedures				
Data Collection Methods	Data Collection Methods	Data Collection Methods	Data Collection Methods	Data Collection Methods
Individual-depth Interviews	Semi-structure questionnaire (Open question questionnaires and additional optional prompts).	The specification of the study participants into 3 classification farmers in Muak Lek district, Saraburi Province. All farms are selected in a particular region which is Muak lek	To obtain an in-depth, in-sight of the factors effected to organic conversion in Muak Lek district.	Data set collected from in-depth interview and farm visits.
Farm Visits	Sound recording and observation.	district, Saraburi Province in order to maintain control over region culture and environmental differences.	To gather accurate information about how the farming process actually operates, particularly about processes involved in conversion and running organic farms.	
Data Analysis Methodology				
Input	Methodology used		Output	
Selected Data set from In-depth interview	Qualitative Content Analysis		The finalised adoption process to organic farming model	
			Descriptive data collected from the interviews	

3.2.2 Content Analysis

The use of a variety of sources of information, data, interviewees, and theories is an established methodological strategy which is termed triangulation (Greene & McClintock, 1985). Triangulation is a method used to investigate and establish validity in the study by disquisition of the research questions from multiple aspects. It can be used to deepen researchers' understanding of the issues and maximize the confidence in the findings of qualitative studies (Guion et al., n.d.). Data triangulation involved using different sources of information and helped lead to greater steadiness, enrichment and clarification of results. In extension, these sources are presumably to be stakeholders of the study — farmers, other researchers, experts, other community members, and so on. This type of triangulation, where the researchers employ distinctive sources, is perhaps the most popular means of content analysis due to its ease of implementation. Data triangulation is particularly well suited for amplification given the different stakeholder groups that have vested interests in the similar study of the factors affecting conversion to organic farming.

The advantages of triangulation include the fact that its use: “strengthen(s) confidence in research data, generate innovative ways of comprehension a phenomenon, disclose unique findings, challenging or integrating theories, and providing a precise understanding of the issues” (Thurmond, 2001). These benefits largely result from the diversity and quantity of data that can be used for analysis.

3.2.3 In-depth Interviews

Interviewing is one of the various data collection methods which are employed when one adopts the qualitative methodology to conduct research. By adopting this approach, the author has embraced a critical and reflective approach to understanding the literature on interviews to develop alternative insights about the use of interviews as a qualitative research method.

3.2.4 Questionnaire

The interview questionnaire was specifically designed to investigate four key aspects: General information, such as farmer's demographic, and socio-economic aspects were investigated at the beginning stage; Farm information was then asked in order to understand the current situation about on farm operation; A non-structured questionnaire was then used by the author to discover purposes from personal interest to motivation factors, to seek individual drives and attitudes toward their interest in organic farming, and continue deep down into the struggles of the current situation to better scrutinise the barriers and challenges the farmers face; And lastly the supporting factors that lead to successful organic farming.

3.3 Data sources

3.3.1 Study Participants

There were nine participants in this research who were chosen using convenience sampling for in-depth interviews. All of the participating farmers were selected from a particular region, the Muak Lek district, Saraburi Province, Thailand, in order to maintain control over regional and environmental differences. The selected participants are classified as follows: four farmers undertaking organic initiatives; two farmers converting to organics; and three farmers uninterested in organics adoption.

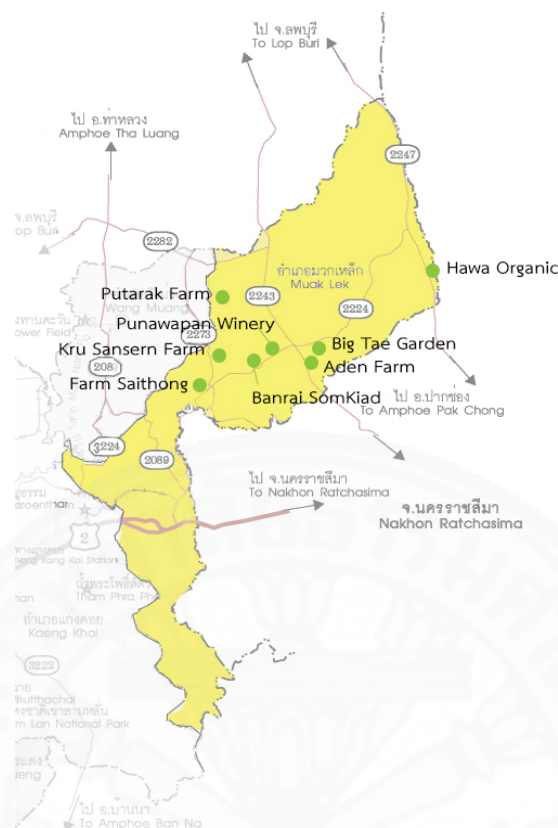


Figure 3.1 Location of study participants' farm

Source: Tourism Authority of Thailand, (2019).

3.3.2 Participant Specification

Most of the study participants selected for this present work were at various stages of adoption of organic farming from the initiative to duration of transitional period in adopting. All of them were concluded as the early adopters, as mentioned by Roger (2003) in innovation diffusion theory. The rationale of selecting participants from various different stages of adoption, this approach as considered, establish different perception of barriers, motivation, and supporting factors that is not restricted by participant type. The farmer initiatives on organic farming may more accurately recognise initiative motivations, while the farmers currently converting to organic can often more precisely validate the problems they are facing, and the uninterested group is able to provide the rationale of the perceived limitations in organic farming from their perception.

So, the sampling of the novices to organic farming therefore reduces the likelihood that recall errors will be made. Three groups of farmers were studied: The first group had established organic practices from the initiated; the second group was comprised of farmers who had used organic farming methods for several years but were still going through the transitional period; and the third group was comprised of farmers who were certified at GAP practices but were currently showing no signs in changing their production systems over to the organic method. None of the participants had received an organic certificate, and only some were certified by PGS and GAP.

3.3.3 Data Collection

Most of the primary data collection undertaken was devoted to in-depth interviews of organic adopters. The literature review, comparing the farming methods: conventional and organic farming, empirical study on relating factors of adoption organic farming were highly important in helping ensure that the right questions were asked. On the other hand, the interview form investigated the barriers in adopting organic farming, the motivations towards adopting organic farming, and what key factors supporting them towards success. The thoughts of the individual farmers, according to the innovation-diffusion model, were what required the most critical level of analysis for studying barriers to entry, motivation to change and support required for increased likelihood of success.

3.4 Research Timeline

There were four key phases to this present research. Details of these and their timelines are presented in Figure 3.4.

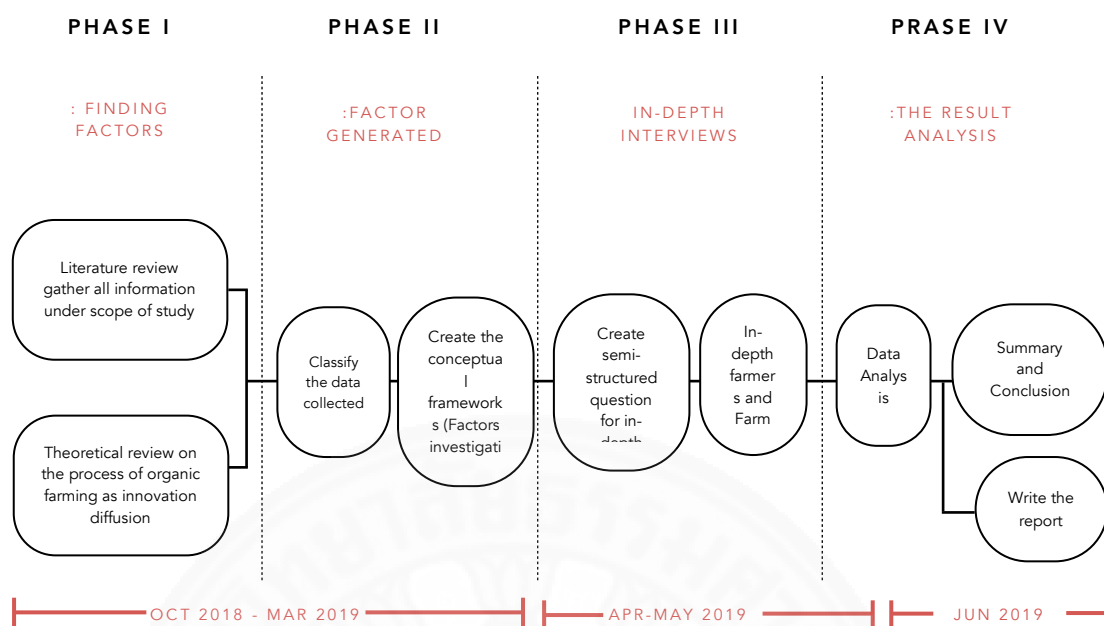


Figure 3.2 Research Timeline

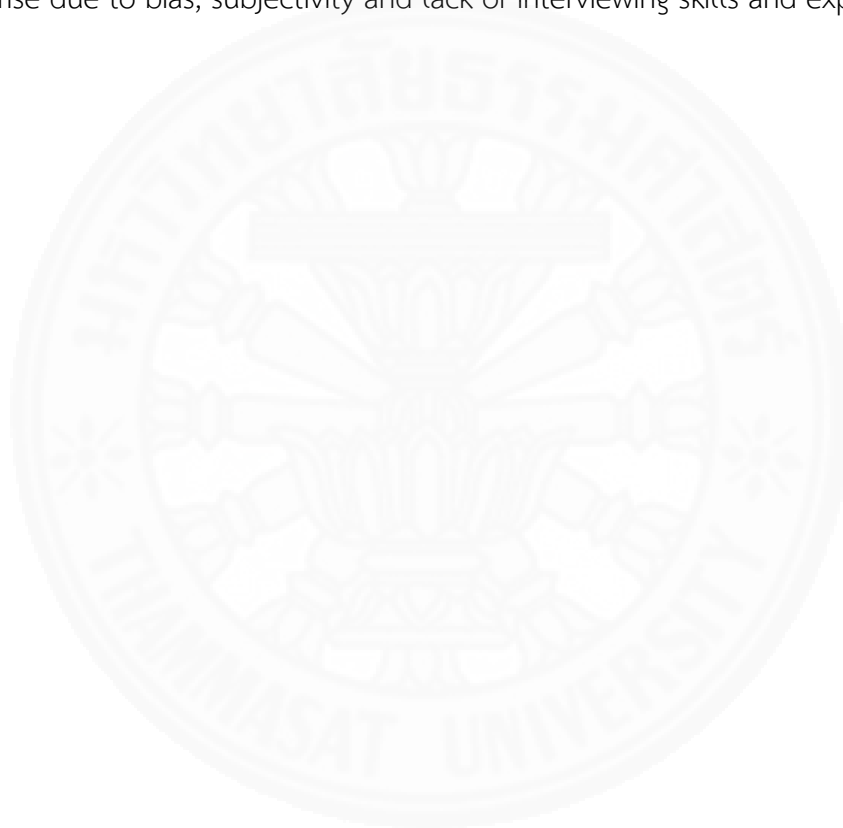
This table explains the timeline of the thesis which has divided into 4 phase which begins with finding factors, factor generated, In-depth interview and result analysis.

3.5 Data analysis

This present study uses the descriptive study methodology so all the data that was collected has been formed into categories, with emphasis on the most frequent factors that arose from the in-depth interviews of the farmers related to organic adoption. Descriptive statistics were used to investigate on the study of participants at the specific location chosen. It helps describe and understand the features of a specific data set that was applied to investigate the barriers and challenges of the organic farming and the factors affecting the adoption and diffusion of organic farming. The results reveal that critical factors related to the decision of adoption of organic farming. The research findings themselves may help assist policy formulation by better targeting and addressing the needs of farmers who are likely to adopt organic farming methods.

3.6 Trustworthiness

The research relied on an extensive literature review to provide critiques for in-depth interviewing as a data collection method. So, it is critical to note that the interviewer classified various forms and styles, as no individual style fits every occasion or all participants. The interviewer additionally diligently sought to certify the validity and reliability of the interview data, and sought to avoid the potential weaknesses that can arise due to bias, subjectivity and lack of interviewing skills and experience.



CHAPTER 4

RESULTS AND DISCUSSIONS

This chapter discusses the results and feedback obtained when conducting the in-depth interviews investigating the barriers and challenges faced by farmers in converting to organic farming. It is comprised of four sections:

Section 1: Documents the personal background and farm operation information for each of the interviewed farmers.

Section 2: Presents an analysis of the barriers and challenges faced in organic adoption.

Section 3: Covers the motivational factors that encourage farmers to adopt to organic farming.

Section 4: Describes the supporting factors lead to the successful organic adoption.

4.1 Hawa organic farm

4.1.1 Personal background and farm operation information



Figure 4.1 Mr. Yasin's farm

Hawa organic is a farm that was established by Mr. Yasin Boonmaread and Ms. Benyachada Boonmaread. The farm itself covers an area of 3 rais and has adopted a closed-system approach and an integrated crop system. Hawa organic undertakes a variety of agricultural activities including: growing cash crops such

as mangos, coconut, guava, banana, and rose apple; and undertaking animal husbandry with as goats and geese. Mr. Yasin has earned four Bachelor degrees and one Master degree, none of these however have any relevance to agriculture. He additionally has experienced working in a big company. He also dedicated part of his time to filming an agriculture documentary before he became inspired to do organic farming. Most of the agriculture input required for day-to-day running of the farm is generated within the farm itself, including the goat's manure which is used as plant fertilizer and plant leaves that are used as goat food. It is very much a sustainable circular approach that has been adopted with regards to the farm's operation. The farm uses the ecology principle in order to create the sustainability within the farm where every plants and crops support each other as well. The farm's irrigation is generated within its own source of water.

4.1.2 The barrier factors to adoption of organic farming

The organic approach required long period of conversion as well as effort, patience and the undertaking of many new work tasks. Organic farming is more suitable for the sufficiency way of life rather than the commercial one. Mr. Yasin's farm has only two workers, himself and his wife. They grow what they consume and what is left they sell in accord with the practice of the sufficiency economic philosophy. Mr. Yasin spends all day taking care of his plants. He uses hand weeding when tending his crops. An approach which works well for his size of farm but which may not control weed and disease effectively at larger scale.

4.1.3 The motivation factors for adopting organic farming

The awareness of chemical effects from Mr. Yasin's colleague's health issue (cancer) and the experience and knowledge he himself gained in filming an agricultural documentary were the main motives for him moving towards organic conversion. He admits "I'm afraid of chemicals and cancer". Such a statement is clear evidence that health issues have become a vital reason for individuals adopting organic farming.

Attitude toward organic farming is also a very important factor that can lead to organic adoption. The process of thought and mind needs to be ready for a change and aiming for a better quality of life. In the interview that he gave for this study, Mr. Yasin talked about how important health actually is and the sad fact that the majority of people would rather choose money instantly if they have to choose between money and health. He said: “Good health can make you make you happy and lead to a long life for you to enable you to gain more money”.

Realisation of the importance of the organic system concept came about as a result of the knowledge he received when he was involved in creating a documentary about the agriculture industry that covered issues related to organic counterfeiting which later inspire him to do organic farming to provide safety food to consumers. The production on his farm using organic farming methods requires less input from outer sources, is of higher quality, has no labour costs for additional workers and receives a better price at market than conventionally produced agricultural commodities.

Mr. Yasin believes that “There always will be a market for an organic product”. Accordingly, his farm’s productivity of produce is not enough to meet the demand in the market. To identify the market for organic products is not an obstacle. The produce from Mr. Yasin has been sold in local markets at higher prices than others.



Figure 4.2 Hawa organic’s vegetable garden

4.1.4 The supporting factors that lead to successful organic adoption

The agriculture knowledge obtained during filming the documentary plays a vital role in the elements required for the success of Mr. Yasin's farm. He has collected a great body of agricultural knowledge and techniques from lots of organic professionals which he has adopted and adapted for use within his farm.

Mr. Yasin mentioned "Planning and management are very important for an organic farmer to deal with". A good planning and systematic management skills are essential skills for farmers to succeed in organic farming. The organic approach of necessity must be a natural method for the whole production line through to the end of supply chain. Mr. Yasin's farm have used an integrated farming model to continuously neutralise the soil by natural methods and manage over-productivity into forms of processing foods.

Understanding the plants' characteristics and its seasonality are important. Each plant was designed and evolved by nature to grow in specific seasons so we need to follow the nature of its needs. Each season means a difference in temperature and climate. Mr. Yasin has used the knowledge he has gained and uses management skill to keep the productivities flowing throughout the year without gaps. The advantages of goat farming lead the farm to have a very good ecological system, as its manure provides strong nutrition for plants to grow healthily and efficiently and have higher resistance to disease.

4.2 Saithong Farm

4.2.1 Personal background and farm operation information

Mrs. Saisunee was an ordinary sales person in Bangkok who moved to Saraburi to follow a dream of being like an American's cowgirl who owned a dairy farm. She has grown the grass for cows to graze on without any use of chemicals. Physical work she has undertaken as a farmer for over 30 years includes raising cattle, trading cows and milking, and selling cows. She has turned her farm into a mulberry farm, instead of a dairy farm, five years ago because she was getting older. The farm is operated by only two labourers, Mrs. Saisunee and her son. Since the dairy farm and

also its conversion to a mulberry farm she has never thought of using chemicals. Any surpluses that arise are processed into either drinks and jam in order to extend their life cycle and add more value.

4.2.2 The barrier factors to adoption the organic farming

Lack of knowledge presents a huge barrier and can make what can be even relatively simple things unnecessarily difficult. Attending the training course in DPO, Dairy farm promote Thailand, helps by providing basic information for dairy farming as well as the research about the mulberry which helps break down the barriers of lacking knowledge for Mrs. Saisunee to overcome shortfalls and gain knowledge on the basic concept for organic agriculture. Organic farmers need to find source of information to deal with weeds and natural disease, and other issues they may face. Organic farming requires knowledge which is more complicated than that required for conventional farming. The farmer who does not have ability to identify good sources, or gain accessibility to, information on organic farming could consequence in no interest in organic terms at all.

Lack of labour can present a huge barrier to scaling-up organic farming as its standard methods are more suitable for small scale farms. As observed by Mrs. Saisunee: “Any bigger operation than this would be too much for me as I do not hire any labour”. The concept of the Saithong Farm is “fresh and clean as I do every part of it myself”, so it seems that using household labour could help generate more profit, or reduce risks for organic farming especially where there is low intention of farm scale-up.

The organic certification conditions presented a problem for conversion with regards to the complexity of organic conditions themselves and regulatory conditions. Mrs. Saisunee said “Some people in this area have a little issue about the land regulation where they cannot apply for a GAP certificate. Luckily I do not have that problem”. The land ownership was a barrier in this area to organic conversion. The GAP certificate for safety food or other organic label require loads of conditions to be met which farmers need to work with and sometimes they do not have enough power or knowledge to reach the finish line.

4.2.3 The motivation factors to adoption the organic farming

The health concerns for herself, her family, consumers and the environment has kept Saithong Farm chemical free since the beginning. Her ideology of love and good intention to produce healthy food for herself and the community have led to motivation to be an organic adopter. The chemicals use in agriculture cause environmental long-term impact, and as she said “chemicals can stay in the soil for more than 10 years so I believe it is not worth it”.

At Saithong farm it is believed that the organic approach is less expensive than normal agriculture. Without chemical use the cost of production is very little since the organic approach relies on a natural mutual support system on the farm, so mostly there is no extra cost for external agricultural input. This is a good motive for those who lack of capital investment.

4.2.4 The supporting factors that lead to successful organic adoption

The ability to access information and knowledge of Mrs. Saisunee comes from her characteristic self and her daughter. Since the beginning, her daughter has influenced her to grow mulberry, as well as to seek to access information which supports and increases the knowledge needed to deal with the plants with the right methods. The research she undertook increased potential successes in growing mulberries efficiently. “Yearning to know” can be use to describe her characteristic as a good learner with actual practice.

Some people often lack the courage to try new things which is not something that can be said for Mrs. Saisunee. She like trial and is not afraid of errors. The farm goes step by step to settle while she learns and taking notes until she is rich in experience.

The thinking systems approach she has adopted match with the needs of the organic approach. As she says: “Diligence, Patience and Passion. To do with your heart. If you eat your product and think it is good then that is enough.” The way of good intention and loving what you do are important factors in sustainable organic farming. “I use the Sufficiency Economy Philosophy from the late King as my

principle model of living so I do not aim big. I aim for happiness and enough". This shows that her farm for living is not primarily a commercial business.

Facilitating factors such as locally sourced agricultural input "my farm use cow manure and fermented plants as fertiliser which is easy and accessible". The area with lots of agriculture input will support organic farming more effectively.

The support from government come as information informing like Thai state enterprise (DPO) training course that supports Saithong's dairy farm and there was a policy that encourages agro-tourism in the study area by providing help in promoting this, providing indirect tools for support too, such as signs, posters, etc.

4.3 Dao Ruang Farm

4.3.1 Personal background and farm operation information

Mrs. Tuanjai has a full-time non-farming related work, with farming being her second job as one of her parents was a farmer.

4.3.2 The barrier factors to adoption the organic farming

Lack of knowledge presents a huge barrier for organic adoption. She states that much of what she needed to learn was found on the Internet such as "tricks to help flower still fresh" and "fertiliser recipe from household ingredients". Additionally, she mentions that most people do not know how to deal with animal husbandry and disease without chemicals. Mrs. Tuanjai has gained knowledge in these areas primarily through online sources which have enabled her to overcome this particular barrier. Online sources provide lots of information, for example on natural nutrition boosts or fertilisers, some of it is reliable and some of it is not, so experimentation is needed in order to find the right method for each farm or set of circumstances.

There is presently a lack of information by government on matters related to organic farming. What communication there is often not easy to access or particularly effective in covering transitioning farmers' needs. Mrs. Tuanjai mentioned during her interview that "The locals here do not know much about news or any

support from the government”. Even-though the support policies, facilities and activities exist the information on them and how to access them have often not reached the locals.

4.3.3 The motivational factors towards adoption of organic farming

The main motivational factors were the health and safety concern she holds for herself, her family and the consumer. She said “One of my customers used to say to me that she was allergic to the chemicals insides the flowers”. This inspired her towards organic adoption. An awareness of chemical hazards tends to occurs after participants, or those that are close by them experienced the side-effects of chemical exposure.

The available market was considered as an attractive factor to encourage the potential adopter. This was in part as a result of the participant’s ability to use social media as a marketing channel and to develop a good relationship to continuously expand her market.

4.3.4 The supporting factors that lead to successful organic adoption

This farm uses cow mature from its own cow that they use as fertiliser so that there is no extra cost of fertiliser. The cow is fed with organic corn in the farm so the cow’s manure is organic as well.

Social capital was an advantage that supports the farm owner according to Mrs. Tuanjai. As she owned the land itself this has enabled her to make more profits compared to others who do not have their own land.

Mrs. Tuanjai has good management skills. Crop rotation is used to prevent plant disease. She said “The farmer needs to have the ability to plan and manage their farm with a big picture and connect each productivity variable together to create a sustained system”. The farm system can be designed efficiently under the understanding of farm’s variables and the relation between each.

4.4 Punawapan Winery

4.4.1 Personal background and farm operation information

Mrs. Patcharee graduated from the Agriculture Department at Khon Kaen University after becoming an intern in this winery where the owner and I have become partners. The farm occupies an area of 117 rais with many cultivation houses. It focuses mainly on producing grapes and vegetables.



Figure 4.3 Punawapan Winery

4.4.2 The barrier factors to adoption the organic farming

In order to take care of plants, there are many variables the farmer needs to consider such as weather, soil and water quality. “I have tried many methods. Some may fail, some may succeed. I have learned along the way”. Mrs. Patcharee says cited that having knowledge in this field can shorten the time for success compared to randomly trying. Even farmers with knowledge in this field can still experience failure many times, so it is important for the organic adopter to pass through those errors and keep up with continuous learning.

The qualification for organic certificate is very complicated. Every source of input needs to be able to be tracked back to the first source that was taken. Some processes are uncontrollable and too complicated for farmer to practice for real.

The market standard is very strict, and hard to sell. Mrs. Patcharee mentioned “Some buyers from big companies require specific specifications”. The opportunities for organic produce can get narrower if it does not meet the industrial standard. As well as consumers’ perceptions on organic products, although the awareness of good health and organic food have become a favourable trend among consumers, their perceptions and decisions are often still based on food appearance for which conventional products are often the superior choice. Accordingly, “they still look for the clear, perfect piece of apple which obviously contain chemical”. “Even the farmer still thinks that chemical fruit looks more appetising”.

The advantages of owning the land, ability to provide good quality agriculture input, built strong agricultural building, etc. come from capital investment. Capital is a fundamental factor of agricultural production and development. Mrs. Patcharee has pointed to this as the reason that caused failure for adopting organic farming for most farmers. She said “Some farmers' plans have not covered all the working systems leading to failure in the farm” The organic farming approach needs extra care and sensitivity to the environment. Most farms with sensitive crops require fixed capital investment on land, building, and other areas.



Figure 4.4 Punawapan Winery’s grape vines

4.4.3 The motivational factors towards adoption of organic farming

Health concerns are a factor that is seriously taken into account by most organic farmers. Mrs. Patcharee said “Most conversions begin from the farmer

who has realised the harmfulness of pesticides and herbicides that might affect themselves before being concerned about their consumers”.

Farm workers are the main effected group with regard to health risks with direct exposure to hazards.

An awareness of the ethical relationship between human beings and the natural environment and knowledge of the harm that conventional farming has caused this relationship is a further motivational factor. The fact that agrochemicals damage the environment long-term increases Mrs. Patcharee’s motive towards good agricultural practice.

The agricultural knowledge of Mrs. Patcharee’s decree led her career path to go directly towards the organic concept: “I try to use what I have learned: theory and knowledge to make good food that is safe to eat” she said.

According to Mrs. Patcharee the fact that: “Grapes can give a higher price per yield”, shows one motivation that actually attracts some farmers to conversion with the concept of less work but higher returns.

4.4.4 The supporting factors that lead to successful organic adoption

The supply sources of agriculture input accessible in the area are cheap in price. With reference to this Mrs. Patcharee said: “The area is full of cow farms where we can easily find organic fertiliser everywhere, have support from organic farms and reduce the costs of input compared to others with similar areas of farm”.

The Farmers need to have both an organic heart and an organic business mind and seek to add more value and not waste any of their product. The business thought is important to manage the farm and gain more profits.

There are already governmental policies for providing farmers both financial and non-financial support, such as funding or price guarantees for some plants such as rice or sugarcane. The Collaborative Farm project gathers small-scale farmers together to boost up the potential of farmer’s produce to go beyond the local market. Moreover, they also encourage Agro-tourism. Mrs. Patcharee said: “The only thing they do not provide to the farmers is the market”.

4.5 Putarak Farm

4.5.1 Personal background and farm operation information

Mr. Somchai used to do a conventional farming and send products to big companies and big markets before experiencing serious plant disease and turning into an organic adopter.

4.5.2 The barriers to the adoption the organic farming

The complication related to organic certification acts as a barrier for farmers on conversion to organic farming. These farmers will encounter substantial obstacles associated with certification including: the financial cost; dealing with a confusing process; and complex paperwork. Mr. Somchai said “The farmer who knows about this whole qualification process, will probably quit applying for organic certification”.

The fact that the organic farming is 30-40% less productive than conventional farming directly affects uncertainty related to farmers decisions towards conversion. It has become a barrier for some farmers who are interested in adopting organic methods but are not ready for the risks.

The market for organic farming is generally perceived as not as favourable or as easy as conventional farming. Mr. Somchai talked about how the conventional agricultural market was “They provide instruction, seed, specific fertilizer and a big truck to bring it to small farms and farmers do not have to bare any additional cost”. The ability to identify and know about the requirements of the organic market can help farmers have the courage to make the transition and help prevent the risks of failure.

Mr. Somchai also talked about the indebtedness of Thai farmers: “80% of farmers owe debt”. The level of debt these farmers carry tends to be a barrier to adopting new things which require an investment in tools and equipment.

“Nowadays people use the chemicals as a general method to grow crops in areas where the local wisdom in taking care of plants has all gone” he said. This shows that the “lack of knowledge” concept of nourishing plants through natural or organic methods exists as a blockade against the ideal for conversion.

4.5.3 The motivational factors towards adoption of organic farming

The main reason that led Mr. Somchai to be an organic adopter was his experience of a virus-borne disease on plants which could not be prevented by any synthetic chemical. He stated that a pesticide might be beneficial to kill some unwanted pest but that the plants grown in the agrochemical environment are weaker and more sensitive to pests and disease which is one of the technical reasons motivating him to convert to sustainable agriculture for his farm by using organic approach to strengthen their resistance.

4.5.4 The supporting factors that lead to successful organic adoption

The farm owner critically focused on circulating waste on farm management in order to reduce the farm's input costs. For the example, the farm use chicken manure as the fertiliser for the organic plants and recycling the fruit residue for chickens' food. Moreover, the supporting low price of agricultural input such as cow manure from the nearby Dairy Farming Promotion Organisation of Thailand, and bat manure from a nearby bat cave.

Moreover, the organic farming gives lower production compared to conventional one which is more stable. One of the solutions used on farm management is networking, he started to build up a network of the surrounding farmers who have a mutual interest in organic farming to become a member of the group. The purposed of the group is to help each other in production technique, expertise, and marketing channels to maintain stability in production shortage derived. After harvesting, one of the members who has the ability to identify the premium market will be the one who collects all the crop and sells it in order to resolve the marketing barriers. The group notionally introduce and protect the premium price stability of organic product by balancing the type of demand-led organic crops by using the concept "When ones produce one product, the other produces the others".

The government support can also be one of the incentives to encourage the farmers to step into the organic adoption through both financial and non-financial support. Currently, the government only motivates a small group of

farmers to convert, and offers seed stock to farmers and supports only few existing research projects in the field of organics.

At the end of the interview he gave he emphasised the point that good farm management, networking and government support are very important to help the farmers get through the transitional period. These factors help the product flow to the market just in time without struggle. The farmers themselves must themselves be cultivated to be encouraged on what they can achieve, with self-learning related to managing farm activities letting them become part of a sustainable system in their own right.

4.6 Aden farm

4.6.1 Personal background and farm operation information

Mr. Narongridh worked in a private company in Bangkok before becoming a farmer in Muak Lek. His interest in organic farming was sparked from his predictions on Thailand's policies on Thai economic trends, development plan, logistics, and policies.

Since then he has realised that farming could be one of the long-term market opportunities for Thailand as food is a basic need and even through recession economics, it is still in demand both domestically and internationally. "So I obtained a piece of land while being a white-collar worker in order to follow my vision for long-term saving while most of my friends invested in stock market" he states. Previously, he used to cultivate agronomy crops such as corn, sugarcane and cassava but oversupply led to price drops and the pledging scheme on most of the field crops resulted in many chronic problems. Later on, the land was adapted to serve organic farming instead due to it being considered the right way of creating a food production system, sustaining both the environment and social aspects. The decision to choose durian, avocado, mulberry, and etc. as the main plants for cultivation in the area is because of the available consumer demand. In this area, the types of plant grown include durian, avocado, mulberry and lemon grass in order to create the ecosystem

of the farm. Cows near the area of farming provide the added advantage of locally sourced natural fertiliser being available.

4.6.2 The barriers to the adoption of organic farming

The challenges or the barriers to sustain organic farming are played along in various rationale. For example, farmers may consider that they face: a lack of appropriate knowledge, labour shortages; inability to control expenses; and unmanageable holistic operations. The lack of corporation and assistance due to poor or non-existent networking related to organic farming issues is also a very real barrier to converting, as well as the complications of organic detail and processes which can initially be hard to achieve at manageable level. It is a complex system from producing to selling which can challenge some with non-expertise and discourage their conversion to organic.



Figure 4.5 Aden Farm

4.6.3 The motivational factors towards adoption of organic farming

The initial idea of converting to organic started at the point where he became convinced that using chemicals carelessly is not good for the food supply chain, and that the adverse effects on the environmental and humans from the conventional production system are likely to continue. Social responsibility is something, many of us still lack. It is believed that organic farming is a friendlier choice than the conventional method which focuses most on intensifying the growth and product yield. Organic farming is not only an inoffensive method of farming, but it also gives the consumers a healthier choice and reduces the repercussions to victims such

as bio-diversity and the environment. He believes that the healthier products should be sold domestically first, with surplus production being sold internationally because “People deserve to have good and safe food as a part of their standard of living.” Marketing is also a prominent factor for the organic converting farmer as contract selling would not give a farmer a premium price, thus the farmers have to determine the market channel that offers premium price to them, without any bargain from customers.

4.6.4 The supporting factors that lead to successful organic adoption

Mr. Narongridh stated that the supporting factors needed to create sustainable organic farming come from various different areas such as: the farmer’s characteristics; comprehension of biodiversity and techniques of organic farming; knowledge on organic farm management; farm operational level; and marketing.

The personality traits of being ambitious, steadfast, and enjoying self-development are displayed from his statement: “I read a lot. My farm uses biodiversity to help in the farm’s management.” The biodiversity and ecosystem foundations were recognised for their huge importance and adapted for the practice on-farm management to dwindle the workforce besides allowing the farm design administration to moderate maintenance and its management system. From observation, all the durian trees have been specially trimmed using pruning techniques that simplify their harvesting. The farmer noted: “I don’t need to climb a ladder to collect durian, it accommodates fastidiousness and aids checking for the unordinary.” Some farmers might consider increased labour as the prerequisite for organic farming, in fact, the organic farm system is one of the farming method that can be used to reduce labour. The factors that help enable organic farming along the conversion period include: economic policy to support such agricultural practices; government support on matters such as information accessibility, and offers of marketing channels to establish stable demand for the farmers’ produce.

4.7 Ban rai Som Kiad Homestay

4.7.1 Personal Background and Farm operation information

Mr. Somkiad came from Samut Prakan Province. He initially gained expertise in the fiberglass industry and owned a construction company until he had a health issue that led him towards organic farming. The Homestay occupies an area of 50 rais but only 10 rais of it are used for crops and planting such as: Teak, Makha tree and Burma padauk; or trees with edible fruit like jackfruit, tamarind. Also included are crops for kitchen vegetables like: bergamot, lime, and lemon grass. The farm utilises a diversification cropping system with a variety of seasonal crops for many purposes in the homestay with many instances of husbandry too. There are only 4 labourers in both homestay and the farm.

4.7.2 The barriers to the adoption of organic farming

The proper identification of the organic market is an ability that is lacking in most farmers. Mr. Somkiad understands the importance of it so he helps collaborate with other local farmers by accepting the products from my neighbours' crops. Such encouragement can build farmers' confidence to do organic farming as there is already a steady distribution channel in place.



Figure 4.6 Ban rai Som Kiad Homestay

4.7.3 The motivational factors towards adoption of organic farming

The health issue that Mr. Somkiad experienced himself led to his strongly held resistance toward chemicals use. He said "I do not want to harm my health anymore

as well as the health of my customers”. The awareness of health concerns has a potential impact to farmers in conversion by discouraging the chemical usage on farm activities. The reason behind the production of safety food for self-consumption concept was mostly related to health conditions or healthcare.

4.7.4 The supporting factors that lead to successful organic adoption

The negative attitude towards chemicals became a major supporting factor to continuously be a chemical-free farm. Organic agriculture relies heavily on healthy eco-systems, including clean water and soil fertilizer provision within them. Mr. Somkiad understands the importance of this point so he has built all the resources within the farm such as a pond area and livestock to enable the farm to be self-reliant and create efficiency of eco-system services within the farm.

Moreover, the farmer with a self-learning and an active learning mindset tends to have a better chance in successful adoption with the trial and error characteristic. Some farmers do not have any knowledge of organic agriculture to begin with but achieve success with the information from various sources such as: online; others farmers; books; and research. “Mostly information comes to me” he said. The Homestay is also a place where seminars and meetings are held where lots of researchers, students and governmental officer share agricultural knowledge. The ability to receive information and adapt use that information within the farm has support his success.

Even though the farmers may at first start with a lack of knowledge on nourishing plants, sometimes the environment can support and benefit their endeavours with little input from themselves. According to Mr. Somkiad: “I don’t have any knowledge about growing plants at all. It has grown beautifully. I think it is because the weather and the soil in the area is good”. The perfect ecological environment and geography of a specific area can be of huge benefit as it can be rich with natural nutrition and not pass on any chemical destruction. Such advantageous elements can help plants to grow naturally. The farmers’ network is strong and is very helpful when people collaborate together for the greater good, and for bigger projects and for expanded development. There will be news, informing, brainstorming and others activities among the group.

The economic benefits created by financial advantages play a vital role in the success achieved in organic adoption as the farmers have no financial pressure.

Without such financial issues the farmers can focus more on the organic approach than profit in each yields.



Figure 4.7 Ban rai Som Kiad Homestay

The above illustrate shown the organic production at Ban rai Som Kiad Homestay. It is proved that the organic production and be grown efficiently similar as chemical grown as the size of the lime is equal to hand size.

4.8 Kru Sansern Farm

4.8.1 Personal Background and Farm operation information

Mr. Sangb took the Bachelor of Science Program in Animal Science minor and also worked in Agricultural College as a professor where he taught about cows and cattle for 18 years until he retired and started his own organic farm. His farm is 47 rais in area, and it has its own cultivation house for growing salad vegetables such as: Green oak, Red oak, Lettuce and others. The land is located 200 metres above sea level. There are more than 10 labourers on the farm who come as interns studying its operation.



Figure 4.8 Kru Sansern Farm

4.8.2 The barriers to the adoption of organic farming

Organic farming requires quite high investment at its starting point to create and organise the correct supportive environment. While the investment return period at the start of the initiative might not be enough to encourage most of the farmers to undertake organic adoption since it gives a lower initial yield and is relatively uncontrolled and inconstant compared to chemical growth. When organic farming is undertaken purposefully as commercial enterprise, it requires a lot of labour and sometimes it presents struggling with the shortage. At the present moment, organic farming is not yet of high popularity among the farmers, hence there are only a few networks existing just now providing support and covering the technical elements of organic farming.

In addition, the lack of the government support is a big barrier for the local people who share the biggest proportion of farming careers that could be stepped up for change. Some of the farmers own characteristics can be barriers due to their uninterest in organic farming and some lack the knowledge in operating the farm whereas it requires a holistic management system to be successful in organic farming.

4.8.3 The motivational factors towards adoption of organic farming

The environment where Mr. Sangb lived when he was young exposed him to the traditional way of the farmer's life in the past, which was in essence true organic farming. Seeing his elders and the surrounding communities using local agricultural methods without any need for the use of chemical fertilisers had a strong impact on him and helped him form his own deep-rooted philosophy. In addition, it showed him through first-hand observation that the natural way of growing and taking care of crops is possible. He then had the opportunity to work in the agricultural industry as a teacher in an agricultural college. Every element of his experience has drawn him towards adopting the organic approach.

4.8.4 The supporting factors that lead to successful organic adoption

The knowledge he had while he was in agriculture industry as teacher has helped greatly with enabling his smooth adoption of organic farming methods. The thought and mindset that he has was shaped according to the information and context he was exposed to including theory and techniques in farming.

The thinking system for assessing the effectiveness of farm management, marketing, and land. This included considering natural sources such as: biodiversity, land and water, leading to a detailed understanding of the whole system of the organic farming process. The advance of agricultural material, technology and innovation such as Bio-fertilisers or hormones can provide better productivities while the traditional method use experimental method.

Factors contributing to local production seeking to use the closed-loop approach, such as if there are dairy farms throughout the area enabling local farmers to have cheap manure to use as fertiliser instead of having to purchase chemicals. Government support with fund assistance and marketing assistance to encourage the conversion in local farmers can also make a difference, as well as informing news knowledge to those who lack accessibility.

4.9 Big Tae Farm

4.9.1 Personal background and farm operation information

Mr. Puthana's family used to run a plastic bag factory as a family business. After a downward sales trend was projected due to competition from China, the family decided to change their business over to agriculture. The decision to undertake Chrysanthemum farming came from a belief that "easy to do = low profit". At the heart of business was the intention to maximise profits, with the thinking that as there were few competitors they could seize opportunities in the market and start doing good agricultural practice.

The farm occupies an area of 100 rais and is still owned by Mr. Puthana's family. The main source of income is from floral merchandise while agro-tourism provides an extra source of income. Chrysanthemums are the main crops in production. The areas is

suitable for ornamental production as it is on a hill 500 metres above sea levels. The water that is needed for the crops comes from artesian wells that have been drilled, and agricultural input is also obtained off-farm from neighbouring areas. In addition, the farm employs approximately 30 labourers to take care of its crops.

4.9.2 The barriers to the adoption of organic farming

The market for produce was a major barrier for this farm in the beginning. It was important to identify the correct market to gain good returns for running the farm. If the process of gain is stopped, the process in the farm is stopped as well. The agricultural marketplace is usually more difficult for the small-scale farm. In addition, the output amount is usually not enough to meet the logistics cost, so the organic market for small scale production goes to local markets which are sometimes not as attractive to farmers as the productivity achieved by conventional farms.

Another factor for consideration is the fact that the term ‘organic approach’ can differ with different requirements being held for various of organic criteria and labels. Most farmers confuse the organic approach with the GAP standard, which they think is an organic practice, so they called themselves organic farmers when in reality they are not. Mr. Puthana said “Organic is 100% chemicals free which most (non-organic) farmers believe can only be achieved in backyard vegetable gardens”. GAP is used as good agriculture practice which allows chemical use during the safety period. This label has increasing popularity among farmers as it is easier to get unlike organic standards where farmers are required to identify source of approved input.

Without pesticides it is pretty hard to prevent thrips destroying flowers and to effectively undertake weed control and fertility management. There are also environmental and climate factors to be reckoned with which can cause issues or advantages to the crops. The farmers require good knowledge and rely on the ecology of the farm, as well as having a deep understanding of the plants’ characteristics. Conversion to organic farming requires farmer to learn management that does not rely on agrochemicals, identify new input suppliers, and develop relationships with new customers.

Access to land and capital are often significant barriers for farmers wishing to convert. He said “The capital factors are also important because the experience period requires money for trial and error which can sometimes take 5-6 years to settle”.

4.9.3 The motivational factors towards adoption of organic farming

Having a living environment that is safe and clean for family members is an importance element in organic conversion. As he said: “My family live here so we just don’t want to live in a harmful environment”. The health concern on “own and family health” tends to be a predominant issue and a main reason for most farmers to consider converting, while “consumer’s health” was seen as an additional morally beneficial and indirect motive.

4.9.4 The supporting factors that lead to successful organic adoption

The globalisation of ever more readily available information in today’s world that is accessible through a variety of sourcing, can more easily enable contact with experts and the discovery of much useful research to help farmers deal with the challenges they face with regards to learning techniques and different methods of farming.

Even so, the conversion period for organic farming requires the ability to be able to financially cover trials and errors, and invest in new equipment, and methodologies. Even when the conversion can be done little by little, such a method still needs financing to enable its daily use.

The promotion of agro-tourism has somehow helped me as the tourists pay to visit the farm. It can also support other means of income generation. Online marketing is a tool for the farmers to gain access to customers, particularly as the consumers definitely want healthier products. The operating system for it can at first cause some problems, especially while expanding the farm with a worker shortage but I use labour incentives strategy to maintain the labour motivation “The more they sell, the more they get in return” which can encourage the worker to work more to gain more.

CHAPTER 5

CONCLUSIONS AND RECOMMENDATIONS

In order to undertake this investigation into the study of factors that can be used to encourage the adoption of organic farming in Muak Lek in Saraburi Province, Thailand, the researcher conducted a detailed review of relevant literature, scientific articles, and the theory of innovation diffusion. An empirical study was also undertaken to explore relevant factors that had been revealed in that critical review.

This chapter explains and documents the main findings obtained through investigating the research objectives of this present work through literature review and theoretical review, along with the findings made from in-depth interviews with farmers on what the barriers and challenges are that farmers face when considering whether they should convert to organic farming, the motivational factors that can lead them towards them adopting organic farming, and lastly the supporting factors that they consider can lead to successful organic farming.

There were nine farmers who participated in the detailed interviews conducted for this research. They were all chosen using convenience sampling for in-depth interviews of populations that was undertaken using opened questions. Most of the study participants selected for this work were at various stages of adoption of organic farming from the initiative to duration of transitional period in adopting. This approach was adopted to establish different perception of barriers, motivation, and supporting factors and was not restricted to any particular type of participant.

Three groups of farmers were studied. The first group are established as using organic practices from those initiated in organic practices. The second group is comprised of farmers who have used organic farming methods for several years but are still going through their transitional period. The third group of farmers is comprised of those who are certified for GAP practices but currently show no sign in changing their production systems to the organic method. All of the participants have not yet received an organic certificate, and only some are certified by PGS and GAP.

The interview questionnaire was specifically designed to investigate five sections which included general Information such as farmers' demographics. Socio-

economic aspects were also investigated for the initiate, along with information on participants' farms in order to gain increased understanding of the current situation related to their farm operations. After this the author used a non-structured questionnaire to discover other reasons for the farmers seeking to convert to organic farming from personal interest to motivational factors. Section three, seeks to document the individual drives and attitudes of participants toward their interests and continues to delve deep down into the struggle related to the current situations the farmers find themselves in order to scrutinise the barriers and challenges faced, and lastly the examination is undertaken of supporting factors that can lead to successful organic farming being achieved.

All data collected has been formed into appropriate categories which emphasise the frequent factors and areas of concern that arose from the in-depth interviews. Descriptive statistics were used to investigate the findings obtained from the study participants at their farms or other specific location. The researcher then interpreted the sentence details from the interviewees and improved the idiomatic expressions used in order to refine the analysis. This particular chapter is comprised of: Section 5.1 discussing the research objective, including the main conclusions; Section 5.2 which provides an explanation of thesis limitations; and Section 5.3. which discusses the final suggestions from the findings.

5.1 Conclusion

In this section 5.1, the conclusion is expanded upon and developed further following the sequence of research questions, respectively. In order to discuss the barrier, challenge, and motivation of organic adoption the reader must comprehend on how this issues being address, and why it should be tackled by starting with the need in motivating the farmers to transition from chemical to organic farming, then the rationale of why organic agriculture is not adopted by a larger proportion of farmers. The literature review demonstrates the fact that conventional agricultural practices which intensify the use of agrochemicals lead to various environmental problems, health issues and often economic losses. It also revealed that organic farming, as a

representative of the drive for sustainable agriculture, is oriented as a “new trend” in farming where it could be an important method to bring the Green concept to fruition and help counterbalance the negative impacts of chemicals used within conventional agriculture method. It heavily relies on farm input, circulating organic waste as a value stream and improving biodiversity.

The transitioning from chemical farming to organic can be difficult on individual level than a group or networking supported. The organic farming is not easy to approach because of the processes, it requires more labour, patience, knowledge and management skills to set the new environment system which the majority of farmers are lack of skill sets that required. During the transitional period, the farmer do not allows to use any synthetics or fertilizers therefore the production is reduce and profit losses which consequences to reduce farmers’ income. It can be concluded that the rationale of the organic farmers is not adopt by a larger proportion because the decision to adopt organic farming methods and conversion can be challenging, as a holistic system change, and requires a prolonged transitional period and financial support.

5.1.1 Research Question 1: What are the barriers and challenges faced in converting to organic farming?

The barriers and challenges to adoption can be explained in part as lack of knowledge and often poor initial ability with regards to technical approaches required as organic farming is a complex system, requiring deep understanding on biodiversity and the ecological design approaches that should be used.

It has been highlighted that financial issues also have to be seriously taken into account, as they can often create a critical barrier to the adoption of organic methods by many farmers due to the long period of time required for transition and gaining organic certification. This means that the farmer that already has financial stability can often be at a considerable advantage to other farmers who are less well off in terms of being able to learn, experiment and fail at times during conversion. They are also better placed in terms of being able to invest in equipment, stock, and materials.

Good access to relevant information is found as one of the most crucial factors in organic diffusion, with the rate of successful adoption often heavily relying on the accessibility of information and being related to innovation complexity. It was revealed that one of the main barriers of the conversion to organic farming is often found to be poor access to relevant information. A factor that should be urgently addressed.

Important supporting factors that can enable successful organic farming were mentioned by the majority of participants. These include the farmer's own personal characteristics as related to: self-development; leadership; self-sufficiency; persistence; and their determination to reach goals that they have set themselves.

Out of all the success factors that every one of the interviewees concluded should be taken into consideration, having good management ability was listed as the most important factor leading to the transition to becoming successful organic producers. This skillset is not often found in the late adopter, and laggards. However, if we can create good incentives for conversion, provide guidance on management, logistics, and labour systems, plus provide high quality cooperation networks for organic farmers to support aspects of non-expertise related to specific farm activities, the chances of success the subsets would appear to rise.

5.1.2 Research question 2: What are the farmers' motivations for converting to organic farming?

The motivation in adopting is classified into two variables which is intrinsic and extrinsic incentives. Firstly, the intrinsic incentives which describes as the **Personal reasons** such as own's or relative health background, personal interest, attitude toward organic farming and **General reason** such as social motivate, social pressure, etc. Secondly, the extrinsic incentives which describes as the **Environmental reasons** and **Economics reasons**.

Although, the health effects of producers and consumers from agrochemical usage can change farmers' attitudes towards organic farming and lead to their adoption of it. The economic incentives of the product's premium price related

to non-organic alternatives also comes into play, especially when the increasing costs of chemicals are factored in.

5.2 Limitations

Due to the complexity of the topic consisted of many conditions involved in the research studies which its research activities experienced several limitations that associated in-directly to the results of the studied. Therefore, the limitations will be clarified the constrains of the thesis study to provide the comprehension of the data and relevant information as it composed of study area limitation, and data collection method.

5.2.1. Study area limitations

Study area limitation presented as a diversity of human characteristics towards the topic which each specific area have shown unique perception and attitude. Participants who share common characteristics may give completely opposite opinions towards interview questions consequences in harder analysis approach for researcher. The study location is restricted as the participant only consisted of a particular location which is Muak Lek district, Saraburi province, Thailand. The conclusions for this study may be differ from those that could be found in other areas due to differences in individual circumstance.

5.2.2 Data collection method

Lack of time available to conduct the research acted as a limitation with regards to the use of the qualitative method in this study. Each of the interviews undertaken was of necessity very time-consuming in order to obtain the in-depth information sought from each of the participants. Additionally, the logistics of making appointments for the interviews proved challenging as most of the participants had little free time for interviews as their farms generally require their attention fully throughout each day. Moreover, the studied area is more than two hours travel time from Bangkok. Because of its distant location, sometimes the researcher was required

to schedule interviews with more than two participants within a day, which researcher believed was a less than ideal situation. The data collection was limited to one months, including the period allocated to the analysis process. As a result of having to work with the time constraints that existed, the researcher was required to use only in-depth interview as the main research methodology, while openly recognising that the mix methodology approach would have given more precision to the analysis of data collected. The use of the in-depth interviews approach explored the various boundaries of the problems and challenges that were being faced by the participants. This method of data collecting may obtain the context of any problem. So it is critical to note that the possibility of the data collected with relied on the researcher perspectives, mostly and might contained the bias.

5.3. Suggestions

In this chapter, the suggestion is compose of 2 topics which are : the suggestion for institutional supporting and relevant stakeholder and the suggestion for further study.

5.3.1 The suggestion for institutional support and relevant stakeholder involvement.

From the study, it can conclude that the organic network represented as one of the critical factors in doing organic farming and persuading the organic conversion, as providing the diverse aspect of assistances, apart from the government supported. One of the biggest barriers of not converting to organic of farmers in Saraburi Province, Thailand is not the lack of understanding the impact of pesticides but the lack of knowledge on how to manage the biodiversity of organic farm, management techniques, marketing identify, and the misunderstood of organic principles. However, the organic principle gives various beneficial aspects, it still hardly to achieve on majority of farmers, due to the long process of adoption and the needed of financial variable. In order to develop the organic sector, relevant stakeholder should be concentrated in reducing barriers and providing incentives

As a matter, the support from institutions can play as a crucial role in providing support for non-stabilized farmers with regards to financial matters through the adoption period.

The farmers only adopt the organic farming once they realizes the benefit-cost analysis. Although the financial incentives is not the main factors in motivate the farmers in shifting to organic method but the health issues of themselves and consumers also plays as a crucial part in adoption. However the organic farming is considered as the complicated method of farming due to the required of the good understanding of the natural complexity, and particular contexts of each area is required. The comprehension of the root causes of problems for farmers is key to being able to effectively persuade and help support them in the journey to convert to organic farming and help them get past the obstacles that they are facing.

For instance, it is proposed that the creation of a government blueprint to achieve high quality local organic farming institutes where organic practices can actively be practiced and learned, along with the provision of adjacent organic farmlands where farmers wishing to transition can actually earn a living and grow organic crops while their own farmlands are left fallow, could be a very sensible way to aid such transitions and encourage a high level of success.

Moreover, the institution could take further step in developing the organic training center where people in the community can seek organic technical approaches. The knowledge network and physical training will provide them the example physical training. It allows them to rapidly gain actual practical experience using systems and methods that are already in place for the types of farming they want to undertake. That either organic land or land not yet used for farming in the local area is purchased to enable farmers to fully transition to organic while their own fields transition. Once the transition is done. They hand back that land to others, (or possibly keep it and pass over their original land? This would depend a large part on the individual's mindset).

It is further proposed that when aiming to help agriculturists convert successfully and providing them with support, setting targets and evaluating results should be undertaken as standard. Moreover, support should be provided for farmers

in terms of logistics for exchanging products and also doing marketing or promoting them. Thus farmers will definitely know that they have place for their products and that it can be sold. Even though, the consumers have positive attitude toward on conversion products, the market is still limited in particular high purchasing power area like urban; thus efforts to develop the sector should be concentrated on the fully organic sector. As it is proposed that organic farmers collectives should be set up to enable the middleman to be cut out from their sales enabling them to get an even better price for their goods and improved livelihoods.

5.3.2. Suggestions for further study

As the factors effecting the conversion of farmers to organic farming can be varied from personal reasons to peer pressure depended on the various perspectives and issues. The study of alter geography may give the advantageous to further discoveries and enhance the proper incentives for institutional policies development. Moreover, the development in the organic techniques farming and organic converting blueprint might help many struggles in adopting. More specifically, the study has not indicated, on which context, organic production leads to higher income in comparison with conventional farming.

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APPENDICES

APPENDIX A

THE INVITATION LETTER INTERVIEW PARTICIPANTS



คณะสถาปัตยกรรมศาสตร์และการผังเมือง มหาวิทยาลัยธรรมศาสตร์
FACULTY OF ARCHITECTURE AND PLANNING, THAMMASAT UNIVERSITY
อาคารคณะสถาปัตยกรรมศาสตร์และการผังเมือง มหาวิทยาลัยธรรมศาสตร์ ศูนย์รังสิต อำเภอคลองหลวง จังหวัดปทุมธานี 12121
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ที่ ศธ 0516.26/ว ๙๔๐

๗ พฤษภาคม 2562

เรื่อง ขอความอนุเคราะห์เก็บข้อมูลและสัมภาษณ์เพื่อทำการวิจัย
เรียน กลุ่มเกษตรกร และเจ้าหน้าที่ด้านการเกษตร จังหวัดสระบุรี

ด้วย นางสาวณัฏฐา เอื้ออำนวยชัย นักศึกษาระดับปริญญาโท เลขทะเบียนนักศึกษา 6016120211 โครงการการจัดการออกแบบ ธุรกิจ และเทคโนโลยี คณะสถาปัตยกรรมศาสตร์และการผังเมือง มหาวิทยาลัยธรรมศาสตร์ ได้ทำวิทยานิพนธ์ในหัวข้อเรื่อง "THE STUDY OF MOTIVATION FACTORS OF CONVERSION CHEMICAL TO ORGANIC FARMING" หรือ ปัจจัยที่ส่งผลต่อการเปลี่ยนแปลงของเกษตรกรเคมีเป็นอินทรีย์ โดยมี Dr. Isaac Adam Jamieson เป็นอาจารย์ที่ปรึกษา การทำวิทยานิพนธ์ในครั้งนี้เพื่อเก็บข้อมูลรายชื่อเกษตรกรในจังหวัดสระบุรี และนำไปพัฒนางานวิจัย จึงขอความอนุเคราะห์ข้อมูลจากสำนักงานเกษตรจังหวัดสระบุรี โดยหวังว่างานวิจัยในครั้งนี้จะเป็นประโยชน์ต่อการเกษตรของไทยต่อไป

ในการนี้ คณะฯ จึงเรียนมาเพื่อโปรดพิจารณาวันและเวลาที่เหมาะสมเพื่อการเข้าพบสำหรับ นักศึกษาหวังเป็นอย่างยิ่งว่าจะได้รับความอนุเคราะห์จากท่าน หากผลการพิจารณาเป็นประการใด ขอได้โปรดแจ้งกลับด้วย จักเป็นพระคุณยิ่ง

ขอแสดงความนับถือ

Kallaya Tamhyakul

(ผู้ช่วยศาสตราจารย์ ดร.กัลยา ตันติยาสวัสดิกุล)
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ปฏิบัติการแทนคณบดีคณะสถาปัตยกรรมศาสตร์และการผังเมือง
มหาวิทยาลัยธรรมศาสตร์

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คณะสถาปัตยกรรมศาสตร์และการผังเมือง มหาวิทยาลัยธรรมศาสตร์
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APPENDIX B

THE INTERVIEW FORM

Consent to Participate in Research

Interview session for Farmers : The investigation of related factors lead the conventional of small farmers conversion to the organic farming method in Muak Lek district, Saraburi Province, Thailand

Introduction and Purpose :
 My name is Napatsorn Auamnuaychai, a master student of Design Business and Technology Management, Architecture and Planning faculty at the University of Thammasat. I am working with my faculty advisor, Professor Isaac Jamieson, PhD DIC RIBA DipAAS BSc(Hons) MInstP International Expert, Department of Business and Technology Management Program. I would like to invite you to take part in my research study.

Procedures :
 The interview will involve questions about General questions, Farming details, Personal interest and motivation, and farming Barriers. It should last about couple hours to complete. With your permission, I will audiotape and take notes during the interview. The recording is to accurately record the information you provide, and will be used for transcription purposes only. If you choose not to be audiotaped, I will take notes instead. If you agree to being audiotaped but feel uncomfortable at any time during the interview, I can turn off the recorder at your request. Or if you don't wish to continue, you can stop the interview at any time.

Confidentiality :
 This interview form is being conducted as part of a master research. All the information gathered from interview will be handled as confidentially as possible. If results of this study are published or presented, individual names and other personally identifiable information will not be used unless the interviewer give explicit permission.

☐ I am allowed to use the information collected as part of the Educational purposed.

The interview will be separated to four parts :
 General Information (Demographic), Farming details (situation and limitations), Personal interests, Farmers Challenges and Barriers, motivation factor (facilitators), and Farmer plans

Signature

.....

Date

DATE

SECTION I GENERAL INFORMATION		
Location :		Farm name :
Name :		Age : Number of Child :
Marritual status : ☐ Single ☐ Married ☐ Others.....		Highest Education :
Household composition : ☐ Together ☐ Separated		Personal income : ☐ 0 20,000THB ☐ 20,001-50,000THB
Have you ever applied certification? : ☐ Yes ☐ No		☐ 50,001- 70,000THB ☐ More than70,000THB
SECTION II FARMING DETAILS (Situations and limitations)		
Type of Crops :	Size of land :	Land : ☐ Owned ☐ Rent
Cropping system : ☐ Specialization (mono crop) ☐ Diversification (integrated crop system)		Inputs accessibility : what kind of inputs used ? ☐ In-farm generated ☐ Off-farm generated
Income generate : Per rai	Water : Source of water...	
The price of Input used : Per rai		
Please specify the farm status : ☐ organic farmers ☐ chemical farmers ☐ converted farmers ☐ converting farmers		Soil :
List all crops or products requested for certification :		
Have you ever try to apply the organic certified : ☐ Yes ☐ No which year	Do you understand the current organic standards? ☐ Yes ☐ No Do you have a copy of current organic standards? ☐ Yes ☐ No	
Have you ever been denied certification? : ☐ Yes ☐ No	If yes, describe the circumstances:	
SECTION III PERSONAL INTERESTS AND MOTIVATIONS		
Can you tell me about your experiences and interests ?		
What make they are they today (status quo)		
What make you interesting in the organic farming ?		
<u>Economic, Financial, and Marketing factors</u> ☐ Farmers income rise ☐ The reduction cost of input necessity ☐ Price premium of organic production ☐ The subsidies support from government	<u>Social Dominants</u> ☐ Peer pressure in organic movement ☐ Family support ☐ ☐	<u>Environmental and Health risk</u> ☐ Producers and consumers' health ☐ The virus-borne decease in plant ☐ Long term soil degradation ☐ Productions Nutrition ☐ Organic foods taste better

APPENDIX C

RECORD OF INTERVIEWS

Interviewee No. 1: Mr. Yasin Boonmaread

Location: Hawa Organic

Address: 245 Lamphaya Klang Sub-District, Muak Lek District, Saraburi
Province 30130

Q : What did you do for a living before becoming an organic farmer?

A : I finished 4 Bachelor degree in Construction, Business, Entrepreneurs, and Communication Arts in 8 years and 1 Master degree in Management. I have experienced in the Land&house company, BTS, GDH. After I finished my Master degree I changed from Land & Houses company to the entertainment industry. I used to be an actor in channel 7 but because it is very competitive so I think to take a course in script writing would be better and I have a chance to write one for Channel 7 with Daoneai as a pseudonym then start doing the documentary about agriculture.

Q : What is the reason to do organic farming rather than regular farming?

A : I'm afraid of chemicals and cancer. The agricultural products in the market today are all full of harmful chemicals. Since I've lived in Bangkok, I used to work in a TV program company and making agriculture documentary in my free time and day off from my main job in BTS company. I have able to talk with lots of knowledgeable farmers, keep learn tips and techniques until getting inspired when filming in Petchaboon province. The local farmer told me that 99% of productivity there was all chemical. When he wants to eat something, he will grow in his backyard for only several plants that we want to eat but the one in the crops was only for sells. All of his crops look so nice and perfect. This has reminded me in the lesson that we learn since primary school that when choosing vegetables in the market we should choose the one with the worm hold is it true - I have asked him. He said that nowadays we cannot tell

that. Sometimes people use too many chemicals and plant enemies also becoming more resistant so it still eats the chemical plant as well. Some even worse, when the market demand bad appearance vegetable to confirm its non-toxic, they will heat the sand and sprinkle on their productivity then there was a warm hole on their product. If we give monkey a banana and money, the monkey would choose banana instantly without thinking that money could buy its more banana. For human, if we give human good health and money, human would choose money instantly without thinking that good health can make you make you a happiness and lead to a long life for you to gain more money. And also 2 of my colleagues in BTS company have died from cancer without any sign first. I believed it was because of the food lifestyle that eats from a restaurant or street food all the time. This is all the reason I start moved to Saraburi and produce my own organic food for myself and family. When I plan to grow, I am not growing what people or markets want me to. I grow only whatever I want to eat. I do not care whether there is enough left for selling. The profit that I gain is health.

Q : How was the land before an organic farm?

A : Before we come, the area was a grass field for feeding cow with the pond that the old owner has canalized already. We are lucky that the bottom of this pond was clay. Our neighbour's pond was sandy soil so the water holding capacity is very low while ours is very high from clay characteristics. This is why our pond still has water all year.

Q : What kind of plant you grow In this all 3 rai area?

A : Mostly a fruit tree such as coconut, rose apple, guava, banana. When we cannot think of any things to grow we gonna start with banana.

Q : Is this is all organic?

A : Yes! since the beginning. We use manure from our goat farm for fertilizing.

Q : How do you have knowledge in this field?

A : It was like a bit of luck. My wife's father already raises around 10 goats for a living so he has some knowledge in raising goat and one day he just asks Hawa which is his daughter that whether she interested in raising goats because

he just got new goats breeder. Her father used the freestyle method in his farm; feed, collect milk and take to the hospital when it needs. The problem for this method is when the goat sick and needed doctor, sometimes doctors in rural areas like this were not available all the time and we cannot control so if we want to do this we want it to be more systematic. I have been to a seminar and trying the course of many big goat farms in Korat province, Saraburi province, and others. “ If we use other’s nose, when they got sick we get too”.

Q : What factors make it hard for a farmer to convert to organic agriculture?

A : Planning and management are very important for an organic farmer to deal with. In organic agriculture, the farmers needed to use the integrated farming model to keep neutralize the soil. Some people using the monoculture method to maximize profits, the cultivation of a single crop is not suited with the organic agriculture system as I believed. Organic products relied on many factors. If we want it to be pure and natural we cannot force winter plants to grow in summer. Each plant has its seasonal time of the year to be ready for the harvest. The Off-season crops can be sold in the market with a higher price than a normal season so most farmers try to force the plant to grow with the chemical. While organic farmer considers weather as a factor to grow plants. In the farm organic farm consist of many kinds of plant and change throughout the year. The farmer needs to manage all the factor so the farm system becomes efficiency and start to make some profits. If farmers understand the whole process, they can easily succeed in doing organic farming. For my farm, we start with raising the goat for milk for sale and use its dung to fertilize plants like mango and use mango leaf to feed the goat. We create a closed system that we don’t need to pay any extra agriculture costs. At the beginning of doing organic farm, it needs to go step by step, start from one area and slowly expand when it all settles. We cannot control everything in one time because we don’t have knowledge and know-how yet. People like to think that money is a barrier for conversion to organic farming while it is not. The most important things are the heart that persistent and consistency to change to a better life.

Q : What the difference in using the chemical and organic method on productivity?

A : The organic did not give max productivity on its capacity of each plant but the quality is more. Most of the customers willing to pay the product at a higher price.

Q : Are there a demand in the market?

A : There always have a market for an organic product. The capacity of our productivity still not enough for the demand in the market but we did not want to increase our capacity. We do as we wish. We don't want it to be a business-like model. We want to go on a sufficient economy path. Which month gain less so we eat less, which month gains more so we eat more. If we expand our farm meaning that will be more labour cost to pay. Right now we can stand on our own two feet and we are happy with this. I do not focus on the market, I focus on myself.

Q : Do you apply for certificate your farm as an organic farm?

A : We have tried but because of the limitation under the law about the land, we not have the ability to certify our farm but it is not a problem at all because locals all know us and trust our product as an organic product. We have ethics and trust system between consumers and us.

Q : Where was the productivity from goat goes?

A : We use goat milk to make skincare and cosmetic in our own brand that sells online and some part we use for feeding the cat that we breed for sale and what left we take it to the baby goat.

Q : Do you use any technology to help on the farm?

A : We use a sprinkler system to water the plant and social media for marketing for cosmetics.

Interviewee No. 2: Mrs. Saisunee Suwandee

Location: Saithong Farm (Mulberries Farm)

**Address: Nong Yang Sua Sub-District, Muak Lek District, Saraburi Province
18180**

Q : What did you do for a living before becoming an organic farmer?

A : I was an ordinary seller who moved from Ladprow, Bangkok for almost 40 years. I always have an American dream to be a cowgirl like in the western movies so I start to follow my dream by buying land here. Before became an organic mulberries farm, I have done the milk farm. The reason I have changed was that my kids were all graduated and be able to take care of themselves so I don't have to earnestly for more money as milk farm requires lots of workforce, tasks, and labours. There was no free time back then. I start to grow mulberries because my daughter brought for me.

Q : How do you have knowledge in this fields?

A : I took a training course in Dairy Farming Promotion Organization of Thailand or DPO to learning how to take care and manage a milk farm. For mulberries, I grow it for 5 years I never seen any of its fruit at all. It only grows bigger and bigger without any productivity until one day I decided to cut it down since it not provide me any benefits. After I cut it for a week, the point where I cut it starts to form a shape of a berry. That made me start to take note and count days that going to ripe and ready to eat. The first mulberry that I taste was very souring. I asked my daughter to find me some information to grow this mulberry tree and make it sweet. I normally like to read so my daughter gives me some research about the mulberry from The Queen Sirikit Department of Sericulture which consists the information since growing steps to processed steps (mulberry jam). And keep adjusting the taste accord to Martha Stewart's magazine until getting the right recipe for sell.

Q : Have you use any chemicals to grow?

A : Not at all. Since the first place, this field was a Lucy grass for feeding cow so I cannot use any pesticides unless the grass going to die. Another reason that I did not use chemical was health. All the productivity we eat in our family as well and once you use chemical it is going to stay in the soil for more than 10 years so I believed it is not worth it. I also think that the taste from organic was better than the chemical one. It is more crisp and fresher. In addition,

organic farming use less cost than normal agriculture; no chemical cost which is really high price. My farm use cow manure and fermented plant as fertiliser which is easy and accessible.

Q : How big is this mulberry farm?

A : I grow for only 3 rai and just start 2 more rai. More than this going to be too much for me as I didn't hire any labour. I can confirm that my product is fresh and clean as I do it myself in every step. Even the water that uses in the mulberry water bottle, I use water from the Phorn Water company in Saraburi town where its water got a certificate from the Department of Medical Sciences. Moreover, I use Sufficiency Economy philosophy from the King as a principle model of living so I didn't aim big, I aim for happiness and enough.

Q : Do you have organic certification?

A : I already have GAP or Good Agricultural Practice from FAO. Some people in this area have a little issue about the land regulation where they cannot apply for GAP certificate . Luckily I do not have that problem. I didn't seek for more certificate to proof, I trust in myself, my activity confirms how organic my farm is. I like the Japan model that if the customer wants to eat these fresh organic mulberries, they have to come here. I have taken my customers for a tour on my farm every single of them. As I got GAP certificate I need to be honest and trustworthy to responsible to the label I had.

Q : What factors that you think it make you success in doing organic farming?

A : Diligent, Patient and do with your heart. You eat your product and think its good then that is enough.

Interviewee No. 3: Tuanjai Jitkard

Location: Dao Ruang Farm

Address: Muak Lek District, Saraburi Province 18180

Q : What did you do for a living before becoming an organic farmer?

A : I do have a job and this farm is like a second job.

Q : What is the reason to do organic farming rather than regular farming?

A : I used to use chemical in my Marigold farm many years ago before became non-chemical. The reason I do not use the harmful chemical in my Marigold farm was that my flower is used to make flower garlands that people use for religious activities and generally hangs inside the car to warship so in its every function is very close and contact to human's body. That's why chemical input in these flowers can be so harmful to me, my family and customer. One of my customers used to say to me that she allergic to the chemical inside the flower which that conversation inspired me to be a non-chemical farm. Despite the flower farm, I also grow some fruit and vegetable in the garden as well. Using cow mature as fertiliser and which season it grows well we do sell it in the local market as well. According to the sufficient economy from the king's lesson that we grow as we eat and what left we sell. This philosophy accordingly to my life path absolutely well and happy.

Q : How do you have knowledge in this fields?

A : I learned from the internet. There is a lot of tricks to help flower still fresh like it just be picked from the garden. I found one fertilizer recipe from the internet that uses energy drink like M150 to boost flower to bloom more. Some using eggs and sour milk. I seek for a trick on online and agriculture websites. My grandfather and grandmother were farmers so they quite have some knowledge to grow and raise animals. I have learned from them, online information and experienced.

Q : Have you use any technology to help in the farm?

A : Not at all. Ours farm is a small farm, there are no complicated systems in use.

Q : Why you choose to do a flower farm?

A : Because I already sell flowers for a living and this area did not have any flower farm yet back then. I generally make flower garlands every day to worship because it is hard to find one so I start doing this as a business. In some seasonal the Marigold price goes really high; 1-2 baht per 1 flower so I decided if I grow flower by myself I don't have to meet any problem with supplies.

Lucky myself that my family has owned land so I can start with not high investing costs. Now we don't have to go to far away market to buy flowers like before.

Q : Are there any policy support from governmental department?

A : There are very few in this area. It might have some policy about agriculture supply support or training seminar but the problem is the communication in our community is really bad to distribute news. The locals here did not know much about news or any support from the government.

Q : Is it hard to find the market?

A : Our flower garlands sell out every Buddhist Sabbath day, that is 4 times every month. Most of our customers are habitual customers in the area. They like to order through Line and Facebook or call so we can prepare fresh garlands ready for them to pick up. For some big orders, we can delivery our flowers to their own front doors. Our customers appreciate this added level of convenience that we can provide and it increases their loyalty to our shop. We try to actively adapt to the changes in today's society such as online shopping and fast-response chat.

Q : What are the factors that make it hard for farmers to convert to organic agriculture?

A : When we do not use chemical the plant can get decreases so we have to do some crop rotation sometimes corn sometimes Marigold, can prevent this problem. We can use the corn to feed our cow and also use its mature to fertilise our crops. The farmer needs to have the ability to plan and manage their farm with the big picture in mind and connect each productivity variable together to create a sustainable system.

Interviewee No. 4: Patcharee Taktalee

Location: Punawapan Winery

**Address: Nong Yang Sua Sub-District, Muak Lek District, Saraburi Province
18180**

Q : What did you do for a living before becoming an organic farmer?

A : I graduated from the agriculture department at Khon Kaen University. After I graduated I first became an intern in this winery and then later the owner and I have become partners.

Q : What is the reason to do organic farming rather than regular farming?

A : Chemical use in soil definitely destroys the soil. I try to use what I have learned; theory and knowledge to make good food that safe to eat. The area was also full of cow farms where we can easily find organic fertiliser everywhere.

Q : How do you have knowledge in this field?

A : I use what I have learned in university and also learn from experience. In practice was not always the same as a theory because there were lots of factors we need to consider such as weather, soil and water quality. I have tried many methods. Some may fail, some may success. I have learned along the way.

Q : Do you think that the fact that you have knowledge in this field helps you to do organic farming?

A : As I said that in practice and in theory is not the same but I admit that having knowledge in this field can shorten the time then randomly try. Sometimes learning from the farm that success and settle in their system already was like a short-cut for our farm but still it all needs to pass through management and adaptation to fit with what we have.

Q : Do you have organic certification?

A : our farm have GAP certificate.

Q : What do you think is the reason that people don't converse to organic farming?

A : Firstly, the qualification for organic is very complicated. Every agriculture activity needs to track back to the first source that has been taken from. For example, if the farmer use cow mature to fertilise their plant then the certification inspector going to track since what were those cow have eaten. The grass needs to be non-chemical. Secondly, the market standard is very strict. Sometimes the market for organic products can be very hard to sell.

Some buyer from big company requires specific specification like the size of the mushroom, but the organic product cannot reach that perfect product size in every crop.

Q : What factors make it hard for the farmer to convert to organic agriculture?

A : I think capital investment. Winery farm in an open area, the grape generally weak and need extra care so under sunlight it will be very weak so the cultivation house is needed. The cost of a good quality plant. The grape needs 9 months before harvest so it needs working capital. Some farmers' plan have not covered all the working systems leading to failure in the farm. Even though the consumers understand that organic productivity is good to the health but they have to admit that they still look for the clear, perfect piece of apple which obviously contain chemical. Organic product appearance did not look so so fresh or glow and shiny. It does have some holes and yellow on its leaf from long-time transportation. Even the farmer still thinks that chemical fruit looks more appetite.

Q : As you said the grape required more work and capital why didn't you grow other plants?

A : Grape can give a higher price per capita so I believed it is more worth for the input effort. Moreover, if the farmers plan and organize the farm well or can say good management it can return profits pretty good.

Q : What is the factor that makes some conversion fails?

A : Farmers need to have both an organic heart and business minds. These are very important factors to manage their farm toward sustainable business. Management skill for the leftover product is needed. For example, the productivity that left from sell activity should be sent to processed. The farmer need to create ideas to add more value and not waste any of their product. Weather also the important factor which we cannot control but must be aware of its every season. Market and logistic also be one factor that leads to an organic farmer's failure. Local farmers like to array to grow high price plants while at the end of the season the productivity became over the demand in

the market which makes the price drop and did not get the expected profits. Academic principles and practice principles also need to go parallelly together.

Q : What are the factors that you think it changes farmer decision in chemical to organic agriculture?

A : I think it all starts with a health concern. Most conversions begin from the farmer who has realize the harmfulness of pesticide and herbicide that might affect themselves before concerning about their consumer. After became the organic, farmer would feel proud and responsible on their consumer.

Q : Is there any policy support from the governmental department?

A : Yes, they do have funding for some plants such as rice or sugarcane and some productivities input such as seed, fertilizer. Recently, Saraburi Provincial Agricultural Extension Office also has a Collaborative Farm project that gathers small-scale farmers together to boost up the potential of farmer's productivities to goes beyond the local market. Moreover, they have encouraged Agro-tourism to promote tourism in the province. The only thing they did not provide to farmers is the market for those organic products. I wish there are some organization can help in marketing fields or distribution such as souvenir center, hospital, school, and hotel.

Interviewee No. 5: Mr. Somchai Ponken

Location: Putarak Farm

Address: Muak Lek District, Saraburi Province 18180

Q : What did you do for a living before becoming an organic farmer?

A : I used to have 12 labourers on my farm. Back then I grow papaya tree. The result was not going well. There were not any profits left for me. Even gain a profit of around 200,000 THB per month without cut any expenses. I did not have time to do the farm accounting. Just taking care according to the company classification and harvesting was really exhausted.

Q : Do we have to follow the company instruction?

A : We have to follow the instruction or more like a program to make our product meet their standardize and they do guarantee the price so we can not break the rules. This is talking about the chemical farm I used to do before this organic farm. The output product classifies by the man from the company as A Grade for 500-600 out of 1000 pieces from the farm but after goes to the company it classifies as A Grade only 200 and lower month by month until 1 year then I decided to stop as it is not enough for living. A grade was 12THB per Kg, B grade was 8THB per Kg and C grade was 5THB per Kg. They resell in the department store at 35-40THB per Kg. I have changed from sending my product to that company to a big wholesale market called “TaladThai” for 3 months but still, the grade of the fruit was not gain a good price from them. Then the virus and plant decease had destroyed the whole farm. This cannot use chemicals for help. It is all about the plant’s immunity. The seller at Taladthai used to drive all the way here just because he did not believe that my farm getting the virus. That's why he starts to talk that our product was the top 3 A grade in Taladthai so he was afraid we going to find a new market. They all lie about the grade that we have sent to them and force the price down so we did not get the guaranteed price for the A grade. In a good point, I have realized to note my farming program as it gives A grade product.

Q : Do you have an organic certificate?

A : My farm was during the conversion period. It is already applied to the system and status right now is converting organic farmer. It is actually really hard to tell which farm is organic which is not. Mostly in this area, less than 10% are purely organic. They’re just safety farm but consider themselves as organic. If the farm claims themselves as organic but have no certification, actually they can use only the word “non-toxic or safety farm”.

Q : Is it hard to get the certificate?

A : The process in applying for the certificate was not difficult. After you send the application the inspector will randomly come to the farm, he will note that what types and how many of your crops. After you get the certificate, it would have only the plants you grow according to the note of the inspector at that

time. For example, we want to grow 20 kinds of the plant as a crop rotation plan but on the day inspector came we got only 10 kinds of plants in the crops so we can get only 10 kinds in the certificate. If the ordinary farmer knows this whole qualification process, they probably quit applying for organic.

Q : What the different on productivity between using the chemical and organic method?

A : Organic one was naturally sweeter and smell better. There is a plant holes nursery for the sapling. Each hole has one seed to grow so it can grow more efficiency than sprinkle directly on the soil. After the sapling grows I will move to the soil and the celery would smell really strong. I used chicken manure, bat mature and sea salt to fertilize coconut tree and made it sweet instead of sour. I used under standard milk from the factory to fertilize crops. We can use those things to prevent the plant's natural enemies away instead of chemical use.

Q : How do you have knowledge in these fields?

A : I asked and observed from the other farm. Most organic farmers willing to share their stories and trick to take care of the plants. I know lots of organic farmers. I experienced almost 100 farms so I have collected their knowledge and adapt use with my farm. Organic and chemical farming has a different on chemical farming have a specific recipe and fix amount to use but for organic, there was no fixed recipe. It needed a concern on other factors like weather and soil quality as well. Each house had a different technique of taking care the same plant. The more you know about the plant, the more you take benefits from it.

Q : What is the challenge that is hard for organic farmers?

A : Despite the plant, care was the after harvest. After the product have been picked, every activities during the transportation to customer need to be chemical-free including basket, car, and package.

Q : How was the checking process work?

A : If the inspector did not found any chemical after collect randomly sample from the farm but found chemical when random test in the market so the

transportation activities may be contaminated. After getting a certificate there is no random test again. This time it is the customer or supermarket duty to check the organic product.

Q : Comparing any difference of productivity from chemical and organic?

A : Organic agriculture productivity provides 30-40% less than chemical agriculture but the taste is better and the price per piece is higher.

Q : How was the market for organic products?

A : Most farms in this area were a regular farm where the big contracted producer have buy bulk from farmers for their brand and today's there also have a “Long” which is a big market to distribute product to other small markets. They provide instruction, seed, specific fertilizer and a big truck to brought from a small farms and farmers did not have to bare any cost. It is easy to find market for those people. For organic product is different. The market is narrow and far to reach for local farmers. Most success organic farm already had their market in the town or capital city.

Q : What do you think is the factors that lead to conversion?

A : Firstly, I think money plays a big role in the decision for conversion. Around 80% of farmers owned debt. The reason for the debt usually comes from the old agriculture system; high investment on chemical fertilizer but have no money so they need to borrow money first and pay by their profits and start the cycle again. Some farmer has to rent agriculture equipment like tractor and others so they generally do not have spare money. During the beginning in organic farming, farmer has to deal with less income which going to be twice harder for those who owned debt as well. Secondly, the available market can help farmers have the courage to change. There was one couple in the town that sell salad plants like red oak, green oak. It is really new for people in rural areas like this so they have been ignored by customers. When they know that I have a market at a department store, they came to me and ask me whether I want to buy their salad and sell in a department store or not. I wanted to help so I agree to buy them under conditions. Their plant has to be organic. I can teach them everything about organic farming. Since then they have grown

organic salad for me and I became a middle man for them and department store. I believed that if the farmers know the available market for organic, some of them might ready to change. Nowadays people use the chemical as a general method which the local wisdom in taking care plant had all gone. Since organic becoming as a trend among young farmers, old farmers did not understand even if they want to change too. Because of the age gap, it is really hard for them.

Q : Is there any policy support from the governmental department?

A : There is some recipe to make plant fertilizer from natural ingredients developed by the Land Development Department and also give to the farmer for free.

Q : What skill do organic farmers need to have in order to succeed?

A : Organic farmers also need to have good management skills. For example, when I grow the first lot of banana tree, I have to plan for the second lot so that after it has been harvested for a couple of times the second lot would be ready for the harvest subsidizing the first lot. This makes the product still flow to the market just in time without the gap. When I go to sell the product in a department store I often ask the smoothie shop for fruit waste to feed my chicken. The smoothie shop was also the shop that order products from my farm. The farmers need to learn and manage farm activities so that it became a complete sustain system

Interviewee No. 6: Narongridh Sukchaiprakarn

Location: Aden Farm (Durian Farm)

Address: Pad Chong District, Nakhon Ratchasima Province 18180

Q : What did you do for a living before becoming an organic farmer?

A : I used to work in a company. It has been 20 years as a farmer. I start this investment after reading Thailand's Economic development plan and Transportation and Logistics development plan like Railway from China- India path. I found the long-term market opportunities here at this location so I start

an investment. In the very beginning, I have grown a single crop plant like sugar cane, cassava, and corn before decided to change to grow only premium price crops like Durian, Avocado, Mulberries, and others. I focus on Durian as it is an economic crop. It's price range get higher every year and the demand also very high in both domestics and international market. It starts little by little until now, I owned around 2,000 trees in the area of 60 rai with only 3-4 men's labour input. I moved from the city to live here. My house also located right on the farm and I do grow the plant to eat myself as well so I definitely not brings chemical to harm myself.

Q : Do you have an organic certificate?

A : During the conversion period. I have applied for GAP certificate for 1 year and I have to clear the soil for 3 years until it chemical-free.

Q : What is the reason to do organic farming rather than regular farming?

A : Despite the environmental quality in my living area, I do believe in social responsibility. People deserve to have good and safe food as a standard of living. In doing good for society by providing healthy food gives me a personal value.

Q : What the different on productivity between using the chemical and organic method?

A : The organic productivity can sell at a higher price compared to no label product. In the market, the price for Durian is 120 but I sell at 200 without any bargain from customers. Most agriculture products in international standard usually required chemical in order to meet the specific spec.

Q : How do you have knowledge in these fields?

A : I read a lot. My farm using biodiversity to help in the farm management system as you can see, there are lots of bees' house for a bee to pollination and water vat for a frog to live in. Making a perfect ecosystem to boost productivity in the farm. As you can be noticed, all my Durian trees are shorter than other places was because it was good to manage. I don't need to climb high to collect the durian and also easier to taking care and observed.

Q : Where is your market?

A : Mostly I sell the product in front of the farm and sent to Or Tor For Market.

Interviewee No. 7: Somkiad Chumpanya

Location: Ban Rai Som Kiad Homestay

**Address: Nong Yang Sua Sub-District, Muak Lek District, Saraburi Province
18180**

Q : What did you do for a living before becoming an organic farmer?

A : I came from Samut Prakan Province. I have owned the fiberglass industry and construction work for around 20 years. It was all happen because I realize that I have a spot in the chest after the doctor see the x-ray results when I was just an annual health check with my friend. I had to do a CT scan for more than 9 rounds and stayed in the hospital for around 2 months. I had a serious chronic cough and my health keep getting worst and worst. Until one day I have a chance, My auntie sells land in Saraburi to me for 10 rai. I love the big tree so I decided to grow hardwood tree species like Teak, Makha tree, and Burma padauk as a long-term asset. I like one phrase from the King's philosophy " growing tree is giving breath to the land ". I stayed here to cure my health and it really worked. My first appointment with doctors after I came back from Saraburi was shocking him and myself. My health getting better, my mind also. Doctor have ask me that “ Life and money what would you choose?” That was the reason I decided to move here permanently. At first, I have named this place as "Ban Rai Som Kiad" (meaning Somkiad's country house) and place a sign at the front gate just like a house number but far bigger and back then I have lots of friends came to visit me and they have added the word homestay behind the sign just for fun because I have a lots of friends came to visit. There were lots of visitors who have asked me whether I have room to stay a night or not because they misunderstand that my house was a homestay from the sign so I decided to do this seriously and became Ban Rai Som Kiad Homestay today. It starts from 2 rooms to 30 rooms where we can

support 100 people now and expand the land to 50 rai. After that, I start to grow non-chemical vegetables to use in the homestay.

Q : What is the reason to do organic farming rather than regular farming?

A : I do not want to harm my health anymore as well as my customers. The areas where we lived should be fresh, clean, and safety.

Q : How was the start in organic farming?

A : I have grown lots of plants that are a useful ingredient in the kitchen such as lime, chili, bergamot, lemongrass, galangal, and seasonal vegetables in the areas of 10-20 rai. The more guest I have, the more plant I grow. It became bigger and bigger so I need labour to help me manage the farm and homestay. I have a total of 5 labourers including me. All the productivities are not for sells, I used within the homestay and what left I gave to others. My attitude towards chemicals became so negative and I believed in the ecosystem where everything can support each other. I also have livestock so I can have manure to use on the farm. This farm is chemical-free.

Q : How do you have knowledge in this field?

A : I don't have any knowledge about growing plants at all. I ask my worker to grow but my worker do not have the knowledge as well so I just pot in in the soil that it. Surprisingly, It have grown beautifully. I think it because of the weather and the soil in the area is good. According to the worm I saw in my farm, the size was incredibly big. Some information has found on the internet but mostly information came to me. A lot of organisations in both the private and public sectors use my homestay as a place for field-trip or seminars. I have gained much useful knowledge and trick about organic from them. The EM Kyusei company comes to use this place every year. It is an EM (Effective Microorganisms) or the effective microbial group comes in a nutrient liquid solution, which uses efficiency in agricultural crops and livestock. My farm also use cow's manure to neutralise the plants which can be easily found around here with a very cheap price.

Q : How was the market for organic products?

A : I do not sell any of my productivities. The amount used in the kitchen sometimes not even enough so I did not have any left and do not have an intention to sell as well. I also understand that the market for an organic product is pretty hard to find so I like to encourage local farmers by accepting the productivities from my neighbour's crops under one condition. It had to be chemical-free. When I have a seminar or event, I would let them sell their productivities in my area. I also provided them good service with coffee and boiled rice.

Q : How do you know that the outsource farmers are really organic?

A : In these areas we know each other already and we became like a network that guarantees each other by our own.

Q : Why you are not apply for organic certificate?

A : Honestly, farming is not the main business for me. It was more like a hobby. I think that why would I need the certificate for because since the first place I just want to grow it for eat myself and shared with my visitors. I owned other business as well.

Q : Do you think a farmer needs to have a steady income from other sources to be able to do organic farming?

A : Well, I don't think so. I think that doing organic farming did not use lots of investment and the income is acceptable meaning it is enough for living unless they owned the debt. If it was that case it is not going to work. There is going to be a Farm outlet not far from here. I and my group have an idea to create a place that is like a farmer market. The network I was in is like Community enterprise which have 65 farmers joined where people shared idea and develop the city towards sustainable achievement.

Q : Does the farm in the Community enterprise is all organic farm?

A : Most of them were GAP certificate farmers such as Punawapan Winery, Kru Sansern Farm, Saithong Farm, and Phu viboon Winery. This area we have two main groups. It was divided from the characteristics and personal preferences of each farm.

Interviewee No. 8: Sangb Piantamdee

Location: Kru Sansern Farm

Address: Muak Lek District, Saraburi Province 18180

Q : What did you do for a living before becoming an organic farmer?

A : I come from Samud Prakarn then moved to Singburi for 18 years and moved to Ayuttaya for 17 years for work in Agricultural college as a professor. I get the Bachelor of Science Program in Animal Science minor and taught about cow and cattle for 18 years. Before came to Bang Sai Royal Folk Arts And Crafts Center at Patum-Thani where I have brought a house there. The place in Bang Sai was not suitable for taught about cow in practice so I have been a seminar coordinator for improved rural farmers' quality of life in the land reform area which is a 4 months intensive course. I have realized the inequality and difficulty for those farmers. They have lack of opportunities. And I have retired in 2009.

Interviewee No. 9: Mr. Puthana Prompitak

Location: Big Tae Farm

Address: Muak Lek District, Saraburi Province 18180

Q : What did you do for a living before becoming an organic farmer?

A : My family used to do a plastic bag factory but after my dad saw the downward trend of this kind of business with China competition where they owned the whole supply chain so we cannot beat them with the price. My dad have an idea to change business industry to agriculture instead. We choose what to grow by brainstorming under conditions of premium price. We decided to grow Chrysanthemum because it hard to take care and grow. We have a believe that “easy to do = low profit” and heart of business is maximising profits. Chrysanthemum farming not have much competitors so we take that as opportunities for market.

Q : How do you have knowledge in this field?

A : We have no ideas about the basics of growing and caring for this kind or any kind of flower but luckily today, there are loads of online information that the accessibility is not a problem at all. We have done this for 13 years now. We still find information through Agriculture professor and Royal project.

Q : How was the start in organic farming?

A : My family live here so we just don't want to live in a harmful environment. The flower with chemical can be sell in a cheaper price because the customer didn't care much about the harmfulness of chemical residue as it did not use for consume but for aesthetic. The investment on hothouse is quite high but needed in rainy or storm season. We start with only 5 rai and expanded little by little until 100 rai now. My dad is one of the smartest guy I ever known who always has beyond normal people vision. The suggestion about agro-tourism and online marketing also one of that. We have approximately 50 people per day on average but in high season would be around 100 people and holiday would goes up to 1,000 people per day. At first I got a problem while expanding the farm in worker shortage but I use Amway strategy that "The more sale, the more return" which can encourage worker to work more to gain more. Each farmer has their own section to deal and which produce more product will gain higher income in percent from profits.

Q : What is the challenge that is hard for organic farmers?

A : Most people are actually unaware of the true definition of the word "organic" and what it signifies. A lot of GAP farmers also use agrochemicals but within a safe period with least chemical use so the real organic is something really hard. The food that cows receive needs to be organic in order for the farmers to get organic manure from them. The organic approach is often difficult to undertake with uncontrollable factors such as environment, and with output amounts often not enough for commercial markets but appropriate for household or local markets. Organic certification also requires laboratory proof, and groups of farmers cannot just certify themselves. Chemicals found only a small amount considered as GAP, did not found any but used to use chemical also considered as GAP not an organic product.

Organic is 100% chemicals free which most (non-organic) farmers believe can only be achieved in backyard vegetable gardens. Besides the environment factor acting as a barrier, there is also the scale of the farm that needs to be taken into consideration. For industrial purposes, it has to be neither GAP or chemical farming. The factor of financial capital is also of great importance because the experience period needed money for trials and error which sometimes take 5-6 years to settle. Additionally, the wholesale buyer often does not have clear specific specification of what is required because often the products produced are for the domestic market and not the international market.

“The farmers need to be able to clearly identify their market. In the first period of doing this farm, there was no available market for a new face. Back then my brothers and I looked at lots of markets trying to get someone to accept our flowers. Chrysanthemum demand is high during February and March which is the favourite season for weddings. Such events need lots of flowers so our sales increase during at such times. However, when it is off-season the sale of our flowers goes really low. Chrysanthemums grow better in winter or in the new year season, so when it is winter the flower will be in over supply and actual demand will be higher in summer as there were not many flowers in the market. The market needs flower suppliers that have flowers available in every season. Chrysanthemums after being picked can live for just a week, so the flower farmer needs to have good planning ability and management skill.

Q : What the different on productivity between using the chemical and organic method?

A : With no pesticide, it is pretty hard to prevent thrips destroying the flowers but we have our own secret special recipe that we use to control them.

BIOGRAPHY

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