

Transitioning to Organic Rice Farming in Thailand: Drivers and Factors

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ABSTRACT

This research focuses on determining the drivers and factors that influences conversion to organic rice farming in order to better inform local and national policies. It provides an insight into the processes in the decision-making process of famers and the practices they use. Questionnaire and interview data from farmers from the leading rice production region, Surin was analysed using logistic regression to understand the driver for of organic rice farming and well as the barrier and challenges of adopting to this practice. The findings highlight the critical role of extension farm officers in promoting, educating and motivating farmers to take on organic farming. The ability to access (affordable) loans through local cooperative and land-ownership were also key motivational factors. Young people (under 25) are not engaging with farming generally and this is a major barrier to long-term growth in the organic rice industry in Thailand.

Keywords: Organic Rice, Extension, Adoption

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1. INTRODUCTION

The adverse impacts of industrialized agriculture on social, ecological and economic sectors in the last 50 years has prompted more sustainable methods of farming that protect the environment and provide more healthy food for the world's growing population (Bacenetti et al, 2016). Increasingly, food safety and quality issues in the media have increased consumer awareness about 'what they eat' and in some cases has led to individuals questioning the health benefits of mass-produced food from conventional farms and a corresponding movement towards an increasing demand for organic foods (IFOAM, 2016). In particular, more sustainable agricultural production which are big drivers of organic rice farming; such as approaches were are friendlier to the environment, particularly in light of climate change and the role intensive agricultural practices plays in producing green-house gases and deforestation (Wani et al, 2013).

Food products purported to be 'organic' are produced with minimal impact on the environment using an agricultural system which operates as naturally as possible without the use of synthetic fertilizers (Charles, 2009). These food products have continued to see unprecedented growth in the last 15 years (FAO, 2016; IFOAM, 2016; Seerasarn, 2015). The organic market has seen a double-digit growth in the last two decades, both in terms of their market and the area of organically managed agricultural land (FAO, 2016). The global market for organic food surpassed US\$100bn in 2018 (IFOAM, 2020). However, at the same time it is important to acknowledge that despite growth demand for organic food amongst European consumers, the development of the organic farmland area is slowing down and, in some cases, stagnating or even decreasing (Far Eastern Agriculture, 2018; IFOAM, 2016). Although it has become increasingly globally important, the concept of organic farming is still not promoted enough (Tudorache and Sârbu, 2013). In light of its potential to be a more sustainable form of agricultural, it contributes less to climate change and greenhouse gases, increase in food security and produces much healthier food for the world's growing population, organic farming lags far behind conventional farms and strategies need to be developed to create a better balance between the two (IFOAM, 2016).

Rice is a staple food for more than half of the world's population and in recent years, particularly in Asia and Europe, there has been a steady increase in the proportion of which is organic (Sam, 2015). The drivers for more organic rice are related to the environmental and health factors identified above. Another prime reason is the increase demand for plant protein which is organic in nature. According to SyndiGate Media (2016) the organic rice protein market will grow at projected rate of over 18% and with the market value at USD 96.5 million by 2021. This growth is directly in relation to consumers increase preference

for plant protein and non-allergen, lactose-free, and gluten-free products. These factors provide new growth opportunities for the players in organic rice protein market. Thailand is the world's third leading rice exporter (Shahbandeh, 2019) and the Thai government has made it part of the long-term strategy to produce more organic rice, particularly for the Chinese market, where demand continues to grow for such premium products (Bandumula, 2018). The Thai government has made a concerted push to increase the proportion of farmers engaged in the organic method of farming. This has been achieved through a range of strategies including policy development for example. 'Crop diversification' programme (Kasem and Thapa, 2011), financial incentives (Ellis et al, 2006) and training programmers (Seerasarn, 2015). Whilst there has been an increase in the number of farmers taking up organic rice farming, the rate has been relatively slow compared to conventional methods. 'Buying-in' to this method of farming by local rice farmers in Thailand is still limited (Aker et al, 2005). The reasons for this range from, a lack of developed-markets, a lack of financial feasibility, being too labor intensive, ineffective government policies (Seerasarn, 2015) and the failure of Government to develop strategies to get the younger generation involved in agriculture (Shams and Fard, 2017). The Thai Government recognizes that organic rice production, whilst more labor intensive is much more profitable for local farmers as it is a premium product, it is more sustainable, it is a more marketable product and has significant potential to transform local economies and contribute to national growth (DOAE, 2019)

Organic farming area of the world is approximately 361.25 million rai. Most organic products are in the area of Oceania (Australia and neighboring islands). There are 47 percent of the organic farm production area. Europe, accounts for 23 percent of organic. Just less than 30 is in Asia. (Office of Agricultural Economics, 2019). China is the number one organic rice produce in China, account for approximately 45% of production. Thailand is only seventh in Asia (6.2%) of Asia total, hence the need for them to grow this part of agriculture industry. Organic rice accounts for 59% of organic products in Thailand (Surin Provincial Commercial Office, 2019).

In 2018, Thailand exported 11.13 million tons of rice and exported 11.13 million tons of rice increased compared to 2017, volume and value increase of 17.25 percent worldwide consumption of rice. (Office of Agricultural Economics, 2019). The organic product market in Thailand is worth 2,700 million baht divided into the domestic market 30% worth 800 million baht. In which the organic market value has been growing continuously for over 3 years since 2014, the domestic trading value is 500 million baht, an average expansion of 20% annually, while the foreign market 70% worth 1,900 million baht. Overseas marketing channels continue to expand and provide opportunities for Thai farmers and Thai entrepreneurs who wish to export organic products. (Prachachat Business, 2018)

However, adaptation to organic rice farming has been growing at a slower rate than conventional inorganic rice farming (Seerasarn, 2015; Mekong Common, 2016). The Thai government has recognized that trying to convert exiting farmer to switch to organic rice farming is going to is critical to in order to grow this lucrative industry. As such, the barrier to conversion to organic rice farming needs to be clearly understood, as well those factors that influence farmers to engage in this method of farming. This research therefore aims to explore the factors that have contributed to farmers' adoption or non-adoption of organic rice farming in order to better inform strategies and decision making at the local level that will encourage more farmers to take up this practice.

The economic, environmental and social benefits of organic rice farming to Thailand are immense and therefore, convincing and converting exiting farmers to this practice is a national priority (DOAE, 2019; Pornpratansombat, Bauer, and Boland, 2011). There is still not enough information available as to why some farmers convert to organic farming and others do not. It is therefore important to gain an understanding from the perspective of existing farmers, both organic and non-organic, as to why they choose to adopt organic farming practices or otherwise. This research therefore explores factors contributing to the adoption/non-adoption of organic rice farming using the Surin Province, located in Northern Thailand, as a case study.

The aim of the research was to determine the drivers and factors that influences rice farmers to switch to organic farming in order to better inform local and national policies. The key objectives were to: engage with a wide range of rice farmers to facilitate data collection and explore the drivers and challenge of organic rice farming in Thailand; undertake qualitative and quantitative data analysis to determine the key drivers and factors influencing farmers decision to convert or not convert to organic rice farming; formulate recommendations to inform government strategies

2. METHODOLOGY

The study was undertaken mainly around Muang Surin and Sikhorphum, districts of Surin province of Northeastern Thailand (Figure 1), Surin province in one of the leading area for organic rice farming and a considerable number of farmers in the district have shifted from conventional rice farming to organic rice farming (Mekong Common, 2016). As highlighted by Bureau of Agricultural Economics Research (2014) this shift is due to many rice farmers facing difficulties due to accumulated debts, health problems associated with chemical use on farms and overall, are battling with the challenge of environmental degradation as a result of their involvement in so-called “modern farming” practices that are chemically intensive (Bureau of Agricultural Economics Research, 2014). At the same time, some farmers are

increasingly finding conventional agricultural methods utilizing chemicals cannot guarantee consistent rice yields particularly for small holdings and as a result are turning to organic farming. There is also an added financial benefit, where they may be able to get a high price for their products, which contribute to farms becoming more economically viable (Tashi and Wangchuk, 2016). That said the exact driver/s for this conversion to organic rice production is not clearly understood and this research, within the study area provides the opportunity to gain a much in-depth understanding to better inform regional and national policies.

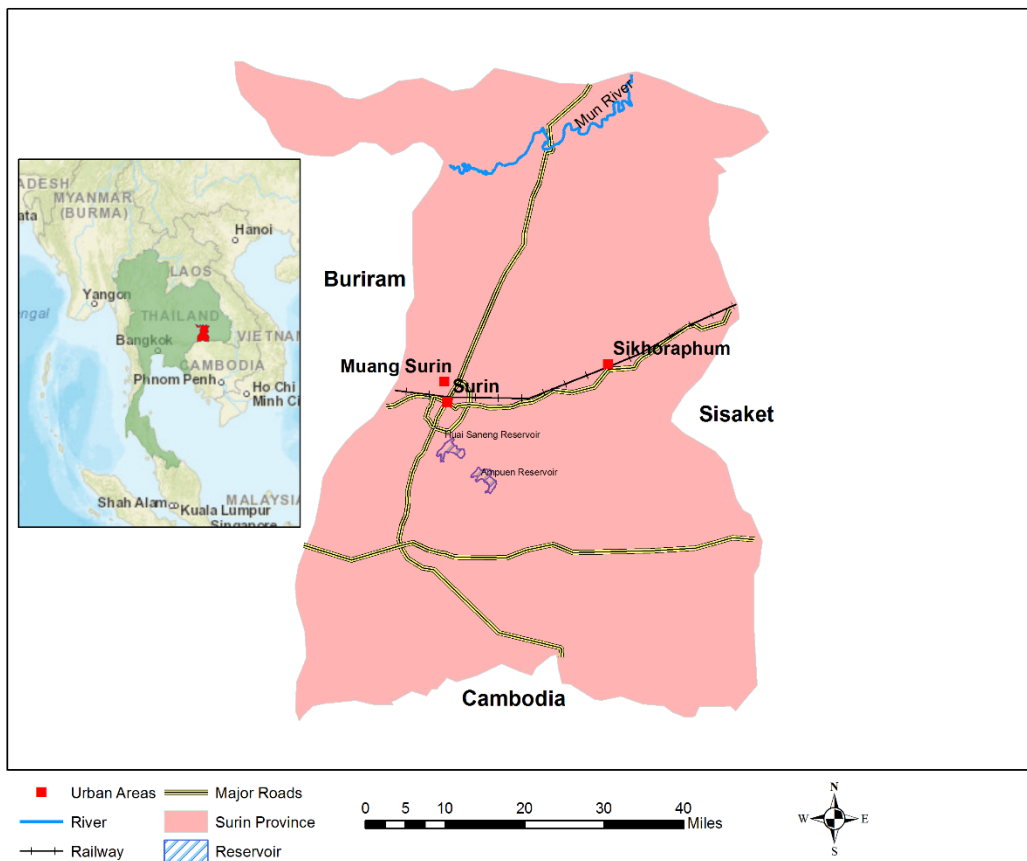


Figure 1. Location map of Surin Province

2.1 Data Collection and Data Analysis

A mixed method approach (Questionnaire and interview with farmers) to gain understanding of why some farmer converted and others did not. Logistic regression analysis and bi-variate correlation were done to determine the factors that best predict adaptation/non-adaptation of organic rice farming. Questionnaire was distributed to farmer directly in the field. As it was important to equally understand why farmer converted to organic rice, as it was to understand those that did not both group of farmers were selected.

Farmers were selected at random to ensure a geographical spread of respondents. To ensure a good spatial distribution respondents, at least 10 farmers from each of the 17 districts were selected. Additional farmers (N=30) were then randomly selected from the 17 province to be part of a focus group and further interviews. Firstly, this study uses descriptive and thematic analysis to identify the similarities and differences of two farming groups (organic and inorganic). Statistical analyses was then used to explore some of the most common factors that are associated with the adoption of organic farming and the influence of each factor (Ullah et al, 2015). Both a non-parametric Bi-variate correlation statistical test and logistic regression analysis were undertaken to determine which factors were best at determining the conversion to organic farming. Logistic regression as a statistical method is useful in this context where there are a large number of proposed independent variables.

In the logistic regression undertaken the dependent variable (organic or inorganic) is coded as 1 (TRUE, organic) or 0 (FALSE, inorganic). The goal of logistic regression is to find the best fitting model to describe the relationship between organic/inorganic farming. The logistic regression process goes through a series of iterations, first inputting all the variables, and then gradually through a number of stages eliminate the less significant ones to create a “best bit model”. The final iteration of the logistic regression generates the coefficients, and its standard errors and significance levels, of a formula to predict a *logit transformation* of the probability of presence of the characteristic of interest, where the formula is:

$$\text{logit}(p) = b_0 + b_1X_1 + b_2X_2 + b_3X_3 + \dots + b_kX_k$$

Where p is the probability of presence of the characteristic of interest. The logit transformation is defined as the logged odds:

$$\text{odds} = \frac{p}{1-p} = \frac{\text{probability of presence of characteristic}}{\text{probability of absence of characteristic}}$$

3. RESULTS AND DISCUSSION

One of the main theme that emerged from the analysis data gathered through the interview was that one of the main driver for switching to organic farming by local farmers was the need to provide healthy food for their family. As one female farmer stated “*the rice and other vegetable produce using fertiliser, makes us ill*”(Seerasarn, 2015). Farmers also stated that a large proportion of the organic produce are used for their family and the non-organic component is sold on. Other farmers cited the protection of the environment as their main driver for switching to organic farming. Common comments includes; “fertiliser pollute the river”; “soil is being destroyed, became hardened and hard to farm”; “wildlife need to be protected”. Farmers alluded to the changes they had witnessed over their lifetime in terms of the changing landscape and disappearance of flora and fauna that were once common to the area. Overall, organic farmers believed in a need to encourage more wildlife and most of these farmers mentioned the need to integrate their farming practice with the encouragement of wildlife. Statements such as “organic farming brings more bees and insect”; “*the bees are good for our plants, it makes them healthier*”. (Charles, 2009) The benefits of bees and insects were associated with perceived healthier and more robust rice crops as well as other vegetable produce. Farmers also felt that the presence of insects and other wildlife is an indication of a healthy environment, which is what should be typical of rural communities.

Organic farmers also alluded to the impact taking loans to mechanise and buy fertiliser has had on the farming community. They have experienced personal loss on their farm in the past as results of debt incurred and/or seen fellow farmers going out of business. As one 79 year old farmer stated “*20 years ago we were told to gain more yield and produce more, so we had to take some loans from the bank to invest in machine and chemical fertilizer. (Seerasarn, 2015). We ended up in debt and lose our farm.*” Organic farmers were now more likely to currently take a loan from their local agricultural cooperative society/bank rather than from commercial bank. Avoidance of large loan associated with purchase of fertilizer and machinery is one of the most common themes that emerged amongst organic rice farmers. However, those farmers who have not switch to organic farming perceive the opposite to be true. These non-organic farmers believe that without the loans, they would not be able to have a farm that is profitable “*the loan has enabled us to extend the farm and employ more people*” (Ellis et al, 2006.) Organic farming they believe is not practical on a large scale nor profitable. Organic farming they believe is too labour intensive and unless you have large family to support it is not viable “*organic farming takes too many people, it is not profitable to pay them all*”. The organic farmers on the other hand tend to utilize their family to help on the farm “*we are a family of 7, we all come together to help*”. (Kasem and Thapa, 2011). Other farmers alluded that with organic farming there is much more weeding and care required

but prefer to do so, as there are no chemicals to deal with. Receiving help from family members, spreading the work load in order to keep these farms viable.

The role of friends and agricultural extension officers, appears to play a key role in helping to encourage farmers to convert to organic farming. Farmers indicated that it was not until their friends or farmers that has gone into organic farming that has told them about the benefit before they change their practice. A farmer of 20 years stated “*my friend has been a part of the [Rice Fund Surin \(RFS\)](#), and told me about growing better rice. I went to see his farm and since then I been doing organic rice farming*”. Other farmers alluded to the visits from Agricultural extension officers and the help provided; to access loans from local cooperative, to develop integrative pest management system, certification of the farm as an organic producer and access to market where they can get a higher price for their products as reason they continue to engage in organic rice farming practices.

For those farmers that did not convert, the main factors was that they are familiar with what they do and to change is too risky. The comment below typify the comments from some farmers.

“We have been doing this for years, why change, we are a profitable farm and not worth taking the risk”. (Ellis et al, 2006.)

If farmers can't see the benefits of switching to organic farming this is major challenge to government trying to influence change to organic farming. It also reflect the failure at local message to communicate the benefit sand opportunities.

Other farmers cite the high labor input. “*This is modern times, there is no need to hire lots of workers to tend for the crops, just too much hassle*” (Seerasarn, 2015). *This* is a major challenge and barrier to organic farming. Large and usually more profitable farms are moving away from large labor forces. The question is does government need to subsidize farmer owners to encourage them to hire a larger work force. The challenges of weed control associated with organic farming requires a larger labour and this is a major barrier. There needs to much more research in develop organic weed killers and weed control mechanism. As such, govern grants to research institutes must be a focus of any government policy.

3.2 Factors influencing the adaptation of Organic rice farming

A non-parametric correlation and binary logistic regression were done to evaluate the most significant factors contributing to the decision to adopt organic farming. All the independent variables were utilised

in the analysis. Correlation at the 0.01 and 0.05 confidence levels were accepted as significant relationships (Table 1). At the 0.1 level, experience of farming both organic and inorganic rice, higher price received for their products, getting information about organic farming from other sources, in other words not through formal government channel and gender show statistically significant relationships with the choice of farming practice. At the 0.05 confidence level the variable which showed a strong relationship was; land tenure (Table 2), visit from Extension officers, evidence of the difference in price they received for organic compared to inorganic rice and access to loans (Table 3). The binary logistic model which explores the best set of variables which predicts the likely farming practice is outlined in Table 3. As part of the logistic regression a log likelihood ration of 99.930 was obtained and the chi-square statistic for the goodness of fit of the model is 26.906, significant at 1% level (Table 4). Thus, the overall model is significant and a good fit. When assessing the contribution of individual predictors in a given model.

Table 1: Results of Bi-variate Non parametric correlations highlighting factors that statistically shows a significant relationship with organic farming

	Gender	Land owned	Experience	Con- income	Informed about organic via e.g. media	Different in price received for organic/compare to inorganic	Higher Price receive	Co-loan	Extension. visits
Pearson Correlation	.170*	.259**	.209*	.173*	.169*	.215*	.217*	.251**	.244**
Sig. (1-tailed)	.046	.005	.018	.043	.046	.016	.015	.006	.007
N	100	100	100	100	100	100	100	100	100

*. Correlation is significant at the 0.05 level (1-tailed).

**. Correlation is significant at the 0.01 level (1-tailed).

Table 2: Landownership and its relationship to Organic/inorganic farm practice (percent)

	Tenant	Owned	Other
Organic	4.0	56.0	7.0
Inorganic	6.0	27.0	0.0

Table 3: Results of Binary Logistic regression

	<i>B</i>	<i>S.E.</i>	<i>Wald</i>	<i>Sig.</i>	<i>Exp(B)</i>
Land owned	-2.269	.763	8.851	.003	.103
Higher Price receive	.489	.309	2.506	.013	1.631
Extension. visits	.937	.597	2.462	.017	2.553
Farm size	-.036	.026	1.970	.160	.964
Gender	.439	.530	.688	.007	1.551
Con-income	-.334	.231	2.081	.049	.716
Other-information	-.527	.626	.708	.040	.590
Experience	-.482	.990	.237	.026	.617
Constant	.728	2.026	.129	.019	2.070

Table 4: Results of Omnibus Tests of Model Coefficients

	Chi-square	Sig.	-2	LogCox & Snell R	Nagelkerke R
			likelihood	Square	Square
Block	26.906	.001			
Model	26.906	.001	99.930	.236	.328

3.3. Discussion and policy implications

It has been reaffirmed by this research organic rice farming is labour intensive. Large families with upwards of 5-7 members helping are more likely to be engaged in organic farming than non-organic. This is very common for organic farms particularly when it is on a small scale (Kafle, 2011). This within itself can be a barrier to organic farming, if a cheap and readily available labour force is unavailable then there is less chance of a farm engaging in organic farming and more likely to continue with conventional methods, utilising chemical based fertiliser and weed killer. This is one of the first issues that government policy needs to address otherwise organic farming will not be sustainable (IFOAM, 2016). The use of innovative practices and technology (for example, precision agriculture, robotics, irrigations systems, organic fertiliser), and modern machinery needs to be an integral part in the push if Thailand is to become a leader in the organic rice farming industry. Farmers need to have access to efficient machinery and technology without it creating large debts, which points to the government needing to initially subsidise this industry to reap its long-term benefits (Mekong common, 2016; Tashi and Wangchuk, 2016). There is also the need to invest into research and development of rice variety with higher yields to ensure sustainability and profitability (Bacenetti et al., 2016). For example in part of Surin Province, some farmers have trialed a new technique known as the System of Rice Intensification (SRI), which uses less seeds per acre, can be started off in a greenhouse and overall, give better yield and resistant to extreme climate changes (Mekong common, 2016). It is this type of innovation and research that needs to be encouraged and funded to better drive organic rice farming initiatives.

One of the main findings of the research, was that organic rice farmers tended to be more experience and older, with only a small proportion of under 30s involved in agriculture industry. Whilst it is good that organic farmers are more experienced, it is worrying that the younger generation are not actively involved in farming generally and organic farming more specifically. In Europe for example, which has seen a boom in organic farming, it is the younger generation who appear to be adopting to emerging technologies and the ones who are taking more interest in health and environmental issues which dominate the organic farming landscape (IFOAM, 2016). Encourage more of the younger generation to be involve in farming has to be a major focus of the government. The Thailand government if they want to be a leader in organic rice farming need to develop strategies to better target resources to engage, empower and encourage more youngsters to be involved in organic farming. As is typical of most developing and middle income countries, the younger generation is choosing to move away from rural

communities and/or choose other careers rather than farming. Organic farming do need a bigger labour force than conventional farming, there will be an impact on the ability labour and farm ownership/managers to adopt organic farming as well as maintain existing farms. As highlighted above organic farmers tend to be much older and experienced than their inorganic counterparts. This is contradictory to studies for example Hattam et al. (2012), where younger farmers who are influenced by the adoption of a new technology, were more interested towards the adoption of organic farming than the older farmers. As such, in this study age does play a vital role influencing adaptation. However, farming experience of the household head is a driver for adoption of inorganic farming. Organic adopters were more experienced than their inorganic counterparts. Encouraging the younger generation to be involved in farming is a challenge in a country like Thailand, where youngsters gravitate to major urban centres rather than staying in rural ones. As one 36 year old female farmer stated;

“It is only because I lost my job in a factory in the city why return to the farm. The land was owned by family and after speaking with the Surin Farmers Support (SFS) I decided organic farming was the most economical way to farm” (Seerasarn, 2015)

Unless the government can develop strategies through education programmes, viable jobs in agriculture, development of production facilities and associated jobs in rural areas and use of technologies, it is unlikely to attract more youngster to farming which is vital for the inorganic farming industry.

This result corresponds to the results of Läßle (2010) and Ramesh et al. (2010) who outline that the conversion of conventional land to organic land was due to the expected additional benefit from organic produce. The benefits in these cases, was perceived to be; difference in price received compared to inorganic rice. Generally, farmers who got a higher price for their product were more likely to adapt.

“I farm both type of rice together, but for the organic rice I get a better price. This is what keeps the farm going” Male farmer in Surin.

However, that said, some organic farmers cultivated inorganic rice alongside the organic products. They cite the convenience and the security of selling to two different market. Study by Musara et al. (2012) found that adopters had more diversified crops and farming practices, which is borne out of this study. Generally, the more land farmers have the possibility to utilise some parts of their land for new and more risky technologies and farming practices. Farmers who owned their land were more likely to be adopters of organic practices. This is due to control they have over what they can do and the confidence to plan long-term.

Kallas et al. (2010) suggested that small farms need ‘credit’ in order to adopt to organic farming. Where farmers were able to access loans they were more likely to adopt to organic farming. As highlighted in this study, farmers were more likely to adopt if the loan was from the cooperative society rather than the government and/or commercial banks. This may be due to a number of factors, including, accessibility (less bureaucracy), lower interest rates, more favourable payment terms and generally, more understanding and trust from the cooperative than government and/or commercial sources. However, the biggest driver for taking loans from local cooperative was the ability to incur smaller debt and the experience that, farmers who have taken large loans from commercial entities such as banks to buy machinery and fertiliser to increase productivity on their farm. Was left with large debts and in some instances loss of their farm and livelihood.

“The Cooperative bank understand use, they the loans are small and the give us longer to pay it back. It means we are not incurring large debt and we don’t have to worry they will come and take our farm away if we run into trouble”- Farmer for 20 years in Surin”.

In Surin province, the farmers formed a small group in their district called the Surin Small-scale Farmers Network, in association with Surin Farmers Support (SFS) now called the Community for Agro-Ecology Foundation (CAEF). Which develop, workshops to share learning about sustainable agriculture techniques and to exchange experiences. Local farmers interested in organic farming in Surin went on to develop the Rice Fund Surin (RFS) which created a pool of funds from which members can borrow (Meakon Commons, 2016). It is this type of local funding that appears to drive organic farming, which central government needs to support and invest more than it does currently. As such, it is imperative for more adoption of organic farming there needs to be much easier access to loans for farmers with much

more favourable terms than what is currently being offered by commercial banks to help them to adopt to organic rice farming. Furthermore the loans need to be structured in such a way to prevent the farmers incurring significant debt (for example very low interest rate, and longer repayment times). It is preferable that these loans are available through local rather than national or regional financial institutions.

In addition, this study found the extension service to be one of the most powerful drivers of organic rice farming. Whilst organic rice farmers, appear to be influenced by friends and interest in the environment, it is the visit and support provided by extension officers that gives them the confidence to share good practices and encourage them to contribute most to starting and continuing organic rice farming. This area needs to be funded and supported by both central, regional and local governments, if more farmers are to adopt to organic rice farming practices (Rana, Parvathi, and Waibel, 2012).

This study did not find any significant results of parameters influencing the adoption decision of farmers based on the variables, education, the channel through which they sell their products, the size of the farm as highlighted by studies such as Ullah et al, (2015); Shams and Fard, (2017); Pradhan, Tripura, Mondal, Darnnel and Murasing, (2017). The dominant drivers of the adoption decision were found to be, farming experience, land ownership, assets, access to credit from a local source for example cooperative banks/credit unions and the extension service provided by local bodies such as Extension Services

4. CONCLUSION

The Findings highlight the critical role of extension farm officers in promoting, educating and motivating farmers to take on organic farming. Where extension officers provided support through training, working with cooperatives and help to create standards of good farm practice, there was higher probability of farmers converting to organic farming. Farmers' participation in training and/or those who had visits from extension officers appear to have gained a better understanding of organic farming, which influenced their decision to convert to this method of farming. Those farmers who are more experience tend to be more likely to be engaged in organic farming. However, there is a worrying trend of an ageing farming workforce and the government needs to invest more in encouraging the younger generation to take up farming. Numerous studies have shown that the younger population adopt much quicker to organic farming and strategies to better engage this section of the society need to be put in place with

urgency. The ability to access loans at a local level, for example farmers' cooperatives, is a strong driver to adopting to organic farming. Farmers cite they trust working with local organizations that understand them and the ability to not incur large debts as a driver for adopting the organic method. The Thai government therefore needs to provide the support and funds to these smaller entities in order to better drive organic farming at a local scale. Land ownership is a strong driver, those who own land are much more confident in making the decision to change to organic farming. They are more likely to want to protect the environment and land for future generations. Mechanisms to help finance farmers to own their own property, should be a key policy drive to encourage more organic farming.

Land-ownership is a key driver in the conversion to organic farming. As such, to encourage more organic farming, the government needs to put in a programme to encourage more farmers to purchase their own property. Farmers trust local cooperatives and as such, we recommended channeling these loans through such institution and providing favorable (low interest).

The challenges of weed control associated with organic farming requires a larger labor and this is a major barrier. There needs to much more research in develop organic weed killers and weed control mechanism. As such, govern grants to research institutes must be a focus of any government policy

This research has and will continue to feed into the development of local policy as well national strategies. The key role of Extension officer was critical in Surin becoming a leading area in promoting organic farming. The government needs to continue to fund these roles. This could be achieved by building local capacity by training more local officers, funding to local education institution and provide funding from more training to farmers in their local area. Farmers do not want to have to leave their farms to go to a city to access training and it is imperative that more local training is developed and provided.

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