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DETERMINANTS OF CREATIVE AGRICULTURE AMONG FARMERS IN MAIN URBAN AREAS OF NORTHERN THAILAND

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ABSTRACT

The agricultural sector is a cornerstone of the northern Thai economy, contributing substantially to income and employment, but it is beset by various challenges. Creative agriculture is an approach farming whereby agriculturists must rely on initiative, application of knowledge and technology, social networks and valuing effective farming. This article aims to explore determinants of creative agriculture amongst farmers in the main urban areas of northern Thailand. A set of questionnaires was used for data collection from 400 farmers obtained by systematic sampling. Data were analyzed by using descriptives statistics and multiple regression. Results of the study revealed that most of the respondents were male, 44 years old on average, married and elementary school graduates. They lived in extended families and engaged in various agricultural occupations in their own area. They had not less than 5 years of experience in farming and were group members established in their respective communities. Some of the respondents were extended knowledge about farming. Determinants of creative agriculture of the respondents included age, educational attainment, agricultural group/ organization membership, debt burden, occasional participation in social activities, self-adaptation/appropriate implementation method, and production management. All variables could explain variance of the determinants for 68.3 percent (R^2 = 0683). Thus, the provincial government agencies responsible for agricultural extension or public sector should put the importance the extension of knowledge about agricultural production management to farmers. This also includes production technology processing and standard agricultural products which are safe for consumers to address the challenges faced by farmers and provide them with viable solutions.

Keywords: Creative agriculture; determinants; farmers; agriculture innovation

1. INTRODUCTION

Challenges arise due to rapid economic, social, and technological changes (Meedaycha et al., 2020), and the outbreak of new diseases poses another risk for farmers (Beck, 1992), adding to the risks they already face such as floods, droughts, and low agricultural product prices. Hence, farmers may need to change production methods and management, which requires creativity in addition to farming knowledge and skills.

This can be understood as agricultural innovation, utilizing technology and innovation to support the production of modern agricultural products and applying the knowledge gained from agricultural training to agriculture (Sura, 2013; Meekaew & Chamaratana, 2024).

In Thailand, the agricultural sector employs more than 20 million people. However, most agriculturists are poor and burdened with debt; many of them have no land of their own for farming and have relatively low competitiveness as well as sustainable development (Sumnaphan et al., 2023). Especially due to educational restrictions, productivity remains low, and the average income of farmers is relatively low. According to data on the socio-economic attributes of farming households from the Ministry of Agriculture and Cooperatives in 2022, the average annual income of Thai farmers was 420,198 baht, whereas their expenses were 306,608 baht. In addition to this, the farmer population has continually decreased while the average age of farmers has increased (59.44 years old on average). Meanwhile, the agricultural labor aged 40-60 increased significantly from 39 percent of the workforce in 2003 to 49 percent in 2013, while younger farmers aged 15-40 declined from 48 percent to 32 percent over the same period (United Nations Thailand, 2020). It is expected that Thailand will face an agricultural workforce shortage in the near future.

Chiang Mai province plays an important role in the economic development of northern Thailand. Aside from tourism, the province has significant agricultural potential, accounting for 19.2% of its economic structure with more than 12 million rai of cultivated land. This allows for year-round cultivation of agricultural crops, especially temperate ones (Maneetorn, 2023; Strategic and Information Group for Provincial Development, Chiang Mai Provincial Office, 2022). In addition, Chiang Mai has the highest number of agricultural households in northern Thailand. Nevertheless, most farmers in Chiang Mai province are small-scale farmers with small landholdings. They mainly depend on natural water sources and lack a social safety net, meaning they face risks from uncertain economic and social changes. Most agricultural products there are upstream commodities that have not yet been developed into new product forms (Maneetorn, 2023). Coupled with the COVID-19 pandemic, farmers have had to deal with agricultural-related epidemics (Sinha, 2021), particularly the disruption of transportation and logistics systems, which has resulted in decreased incomes. Hence, they have had to rely on the non-agricultural sector and general employment. Debt burden and other limitations have impacted farmers' livelihoods (Chenphuengpawn et al., 2019; Strategic and Information Group for Provincial Development, Chiang Mai Provincial Office, 2022).

Technological change presents both opportunities and impacts, especially in the agricultural sector. Agriculture plays an important role in the economic growth of Thailand. Thailand's 4.0 policy is an important national policy. It aims to encourage the agricultural sector to restructure the traditional production leading to modern agriculture. It can be done by using innovation, technology and knowledge for agricultural product development. This helps create value added, quality and standard agricultural products which are safe for consumers (Office of the National Economic and Social Development Council, 2019; Sikkhabandit, 2017).

Farmers must be the main element of initiative and then combine it with creative agricultural activities. An example is the combination with arts, culture, ritual, agricultural product. Creative agriculture is the expansion of working scope of farmers both agricultural production and management. There is use of existing materials and new ones for further development of agricultural products. Value added creation of agricultural products which is responsive to both of the producers and the consumer is the external economic characteristic. This type of agriculture is consistent with the goal of the country based on use of innovation and technology. Besides, there is knowledge transfer to agriculturists to access and utilize agricultural technology and innovation (Office of the National Economic and Social Development Council, 2019).

Creative agriculture is a method that may lead to the appreciation of agricultural products, aligning with the goal of Thai farmers applying innovation and technology to agriculture. However, there is a lack of research on the factors that affect creative agriculture, especially among small farmers in provinces with high agricultural potential such as Chiang Mai. Although the research of Thongsrikate and Kanokhong (2024) found that demographics, socioeconomics, farmers holdings, and agricultural practices were factors related to creative agriculture, it did not confirm which variables were responsible for determining creative agriculture. Therefore, this article focuses on the determinants of creative agriculture among farmers in the main urban areas of northern Thailand. This is important for determining an approach to develop farmers to be progressive in their occupation and livelihoods. In addition, they need to have systematic management in the face of rapid changes or disruptions in society, technology, and the environment.

2. LITERATURE REVIEW

Creative agriculture involves innovative farming as a main element. Then, it is combined with agricultural activities together with creativity to make it different from before. For example, the combination of arts, culture, rituals, and farming or agricultural products. This helps extend the working scope of farmers,

both agricultural production and management. Besides, it may be the use of existing materials and new ones to further develop agricultural products. In addition, creative agriculture also focuses on value-added creation for agricultural products, which is responsive to the producer and the consumer (external economy). This is because the value of creativity does not involve shortage, but it depends on popularity. That is, if agricultural products are in high demand, it will increase their value. Meanwhile, the use of new technologies helps create value for agricultural products and will also help maintain agricultural culture. Creative agriculture includes the following components:

2.1 Skills and creativity

To perform creative agriculture, agriculturists must have positive skills together with creativity inherent in farmers. Examples are farmers' expertise in cultivation; caring for quality agricultural products; and use of agricultural tools. In other words, it may be knowledge gained from relationships among farmers' (Simonton, 2003). Then, it will lead to the creation or development of agriculture to be different from before (Pink, 2009). Nonetheless, the problem that agriculturists face is that some of them do not accept ideas for changing farming practices or new product development (Maneetorn, 2023).

2.2 Mentorship system

Farmers may need a good mentor or team to carry out agricultural activities to encourage farmers to create agriculture and share their creativity among group members. This stimulates the creativity of group members (Freifeld, 2014). The study by Soonthornvipat et al. (2023) found that the mentorship system is very important for the development of farmers in Chiang Mai. Mentors will collaborate with knowledgeable people to provide professional learning that suits themselves and the community, thereby increasing the value of community products and creating a competitive advantage. Agriculturists may benefit from having a mentor or family members, neighbors, friends, internet sources, agricultural products and machinery salesmen, government agencies, university agriculture to support their agricultural activities. This aims to motivate farmers to engage in creative farming. Creativity among group members fosters innovation and inspires others within the group (Kavi et al., 2018; Msoffe & Ngulube, 2016).

2.3 Technology, media, and information integration

A knowledge-based society and economy, it is an important factor used for creating innovation for a developing society, economy, politics, and culture amidst the competition in a rapidly changing world (Pholphirul, 2013). Farmers' must keep up with the trends of change. Also, they must integrate information communication technology to increase the efficiency in farming and yield selling. However, the agricultural sector in Thailand still faces problems, especially in the dimension of productivity. This is because it is still at a low level and farmers' income is low. It may be because they have inadequate knowledge and marketing insights for production planning. This includes knowledge about high quality agricultural production based on environmentally friendly agriculture (Penpong, 2022). Technology plays important roles in the agricultural product market. That is, people in the community can access easily through selling agricultural or processed products online (Sayamol et al., 2023). Meanwhile, customer services and response to customers to create satisfaction as well as immediate problem solving are required (Kaewchuer et al., 2019). Use of technology for farming may rely on specialists for suggestions as well as farmers' farming (Khamraeva et al., 2024).

2.4 Utilization of available capital in the area

Creative agriculture not only involves creativity but also the application of knowledge derived from expertise, social networks and cultural capital. All of these are used for farming, marketing and management. Awareness of product quality and services based on safety for consumers are accumulated in the form of human capital. Body of knowledge and skills in the integration of farmers' also varies with the amount of income (Chomtohsuwan, 2016). Besides, it can be further developed for the creative production of goods and services (Bunsin, 2014; Mungkhun et al., 2021). Meanwhile, Sukprasert (2015) claims that creative agriculture differs from traditional farming. The former emphasizes the application of meaningful culture which is valuable to create value. The approaches utilize local wisdoms include the following: 1) utilization through assimilation/all original features; 2) utilization through method/technical modification; and utilization through modification of component characteristics/structure of local wisdoms.

2.5 Efficient and valuable agriculture

Creative agriculture involves efficiency and value in farming, which are responsive to the needs and feelings of consumers. This is because there is continuous adaptation to keep up with events and changes in the global agricultural sector. In addition, there are rapid changes in the agricultural market structure and the food that consumers can access data about, leading them to prioritize food production safety. This is particularly true of practicing environmentally friendly agriculture or responsible farming (Zscheischler et al., 2022; Hong et al., 2023). Moreover, farmers themselves must possess entrepreneurial skills that can be used

for commercial farming (Kahan, 2012; Sullivan, 2017). In the past, to promote agriculture, Chiang Mai province has encouraged farmers to become entrepreneurs and organized projects to develop the potential of agricultural entrepreneurs, such as increasing production potential, competitions, and entrepreneurial training, to enhance farmers' skills (Strategic and Information Group for Provincial Development, Chiang Mai Provincial Office, 2022).

Creative agriculture can be described as an approach that combines farming with creativity to establish a sustainable food production system. This system must be effective and responsive to the current needs of consumers. It can be achieved by applying new technologies, arts, and design in farming, which will lead to new innovations in the agricultural sector. This aligns with the direction of agricultural development in Chiang Mai province, which aims to improve the quality and standards of agricultural production, increase the competitiveness of farmers and entrepreneurs, and enhance the value of agricultural products by developing areas based on creative culture towards a comprehensive high-value economy. Possessing entrepreneurial skills, farmers are the key players who have accumulated agricultural knowledge and practical experience related to agriculture.

This study conceptualizes the determinants of creative agriculture among farmers in major urban areas of northern Thailand, as illustrated in Figure 1. We hypothesize that demographic attributes, socio-economic attributes, farm holdings, and agricultural practices of these farmers are key determinants of creative agriculture. This hypothesis aligns with previous research by Simonton (2003), who concluded that successful creative agriculture requires agriculturists to possess positive skills alongside their inherent creativity. Examples of such skills include expertise in cultivation, meticulous care for producing high-quality agricultural products, and proficiency in using agricultural tools. Additionally, Chomtohsuwan (2016) found that farmer characteristics significantly impact the ability to create or design innovative practices within agriculture.

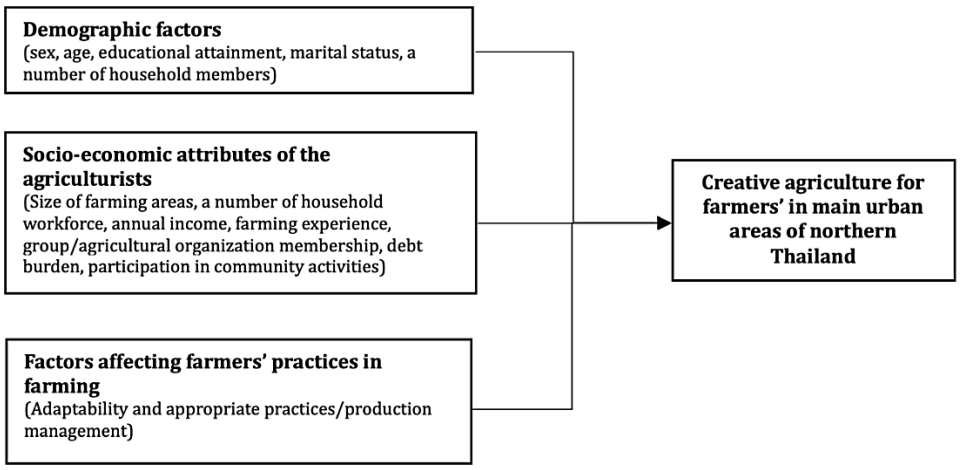

Figure 1: Conceptual framework

3. MATERIALS AND METHODS

3.1 Research design

This study employed a quantitative methodology, specifically a cross-sectional design. This is because the research collected data from a sample group at a single point in time to describe the characteristics of the population or the relationships between variables at that time. This research focuses on the determinants of creative agriculture among farmers in the main urban areas of northern Thailand.

3.2 Participants and sampling

This study designates Chiang Mai province as the primary urban area for researching creative agriculture among farmers in the main urban areas of northern Thailand. The population consists of 181,371 agricultural households in Chiang Mai province (Chiang Mai Agricultural Extension Office, 2020). The sample group in this research consisted of representatives of farmers' households in Chiang Mai province. The sample size was obtained from Yamane (1973). The sample group consisted of 400 agricultural households gained by two-stage random sampling (Stratified sampling) based on household size (big, medium, small) and simple random sampling. The sample size in each area was determined by probability proportional to size method as

follows: Mae Taeng district—178 samples, San Sai district—130 samples, and Hang Dong district—92 samples (400 samples altogether). For sampling, inclusion criteria were: 1) at least 5 years of experience in farming, as agriculture is a labor-intensive profession, farmers must have a passion for it. At the same time, during this period, farmers have practiced agriculture for 5 years or more, exchanging experience and knowledge. This indicates that information providers have gone through a period of trial and error to adapt to the constantly changing environment and develop various technologies and methods until obtaining a certain level of professional knowledge. 2) 18 years old and above; 3) healthy body; 4) ability to read or write Thai; and 5) be willing to provide data.

3.3 Data collection

The research instrument in this study was a questionnaire. It comprised 4 parts: 1) demographic attributes, with both closed- and open-ended question types; 2) socio-economic attributes and farmers' holdings, with both closed- and open-ended question types; 3) agricultural practices of the farmers, with closed-ended questions with a rating scale, with the weight of the assessment set at 5 levels, based on the Likert scale; and 4) creative agriculture, with closed-ended questions with a rating scale, with the weight of the assessment set at 5 levels, based on the Likert scale. The research tool used to collect data was a questionnaire. The quality of the questionnaire was examined by three professionals, who investigated the accuracy of the questionnaire content. After implementing the professionals' recommended modifications, the questions were trialed on 30 farmers who had similar characteristics to those in the study sample group. The questionnaire was then analyzed for reliability using Cronbach's alpha coefficient to test the trial data. The reliability coefficient of the questionnaire overall was 0.93 (Cronbach & Shavelson, 2004), which is in the criteria that the questionnaire can be used to collect data from the samples.

A set of questionnaires was used for data collection, which lasted 10–15 minutes. In addition, this research had been approved by the Human Research Committee, Maejo University, Approval Number: MJUIRB No. HS 099/66.

3.4 Data analysis

Data analysis was conducted using a statistical program. Statistics used to describe the data and to identify the determinants of creative agriculture among farmers in main urban areas of northern Thailand included frequency distributions, percentages, averages, standard deviations, and multiple regression analysis.

4. RESULTS AND DISCUSSION

Results of the study to be presented comprised 2 aspects: 1) Demographic attributes, socio-economic attributes, farmers' holding and agricultural practice of the farmers. 2) Determinants of creative agriculture among farmers in main urban areas of northern Thailand. The results of the study were as follows:

4.1 Demographic attributes, socio-economic attributes, farmers' holdings and agricultural practice of the sample group

The results of the study revealed that more than half of the respondents were male (55 percent), 44 years old on average, 80.5 percent married, and 49 percent elementary school graduates. About one-half of the respondents had 5–8 household members (51.2 percent). Almost one-half ages 50–59 years old (48 percent), followed by 40–49 years old (30.8 percent).

Regarding agricultural activities, the respondents did various activities such as rice growing, orcharding, vegetable growing, ornamental plant growing, animal rearing. About 44.8 percent of the respondents had 4–12 rai of farmland, only 29.7 percent had 12 rai and above (2 ngan–45 rai of farm land). Almost all of respondent, 80.5 percent, had 1–4 household workforce. Most of the respondents, 78.5 percent, could earn an annual income from agricultural activities for 500,000 baht.

According to farming experience, the respondents had 11 years of experience in farming on average. They mostly had experience in farming for less than 5 years (31.3 percent). Only 29 percent had 5–10 years of experience in farming. Most of the respondents, 66.0 percent, were members of an agricultural group/organization. The respondents received capital (loan) from various sources: own capital, fund, agricultural savings group, the Bank for Agriculture and Agricultural Cooperatives, general bank and agricultural credit. More than one-half of the respondents had a debt burden (72.2 percent). In addition, half of the respondents always participated in social activities (50 percent).

It was found that the respondent's agricultural practice of the farmers is at the middle level (45.3 percent), 41.2 percent high level, and 13.5 percent low level, respectively. About half of the respondent's adaptation and appropriate operational method is at the high level (49.5 percent), 40.5 percent middle level, and 10 percent low level, respectively, as shown in Table 1.

Table 1: Percentage of the demographic attributes, socio-economic attributes, farmers' holdings and agricultural practice of the sample group

Profile of the samples	Cont. (n = 400)	Percent
Gender		
Male	220	55.0
Females	180	45.0
Total	**400**	**100.0**
Age		
18–39 years	48	12.0
40–49 years	123	30.8
50–59 years	192	48.0
Over 60 years	37	9.2
Total	**400**	**100.0**
Min = 18, Mean = 44, Max = 80		
Status		
Single	40	10.5
Married	322	80.5
Widowed/Divorced/ Separated	38	9.0
Total	**400**	**100.0**
Education		
Lower than elementary school	17	4.3
Elementary school	196	49.0
Secondary school/vocational or higher vocational certificate	125	31.3
Bachelor's degree and higher	62	15.4
Total	**400**	**100.0**
A number of household members		
Less than 4 people	187	46.8
5–8 people	205	51.2
More than 6 people	8	2.0
Total	**400**	**100.0**
Min = 1, Mean = 4, Max = 12		
Farmers' holding		
Less 4 rai	102	25.5
4–12 rai	179	44.8
Over 12 rai	119	29.7
Total	**400**	**100.0**
Min = 0.2 ngan, Mean = 8, Max = 45 rai		
A number of household workforce		
1–4 people	322	80.5
More than 4 people	78	19.5
Total	**400**	**100.0**
Min = 1, Mean = 2.2, Max = 7		
Annual income		
Less than 500,000 baht	314	78.5
More than 500,000 baht	86	21.5
Total	**400**	**100.0**
Min = 5,000, Mean = 748,620, Max = 5,000,000		
Farming experience		
Less than 5 years	125	31.3
5–10 years	116	29.0
10–20 yeas	109	27.3
Over 20 years	50	12.4
Total	**400**	**100.0**
Min = 1, Mean = 11, Max = 40		
Agricultural group/organization membership		
Membership of agricultural group/organization	264	66.0
No membership of agricultural group/organization	136	34.0
Total	**400**	**100.0**

Table 1: Percentage of the demographic attributes, socio-economic attributes, farmers' holdings and agricultural practice of the sample group (continued)

Profile of the samples	Cont. (n = 400)	Percent
Receiving promotion		
No	346	86.5
Yes	54	13.5
Total	**400**	**100.0**
Debt		
No debt burden	111	27.8
Having debt burden	289	72.2
Total	**400**	**100.0**
Social activities		
No participation	29	7.2
Rare participation in social activities	171	42.8
Regular participation in social activities	200	50.0
Total	**400**	**100.0**
Agricultural practice of the farmers		
High	165	41.2
Middle	181	45.3
Low	54	13.5
Total	**400**	**100.0**
Adaptation and appropriate operational method Production management		
High	198	49.5
Middle	162	40.5
Low	40	10.0
Total	**400**	**100.0**

4.2 Determinants of creative agriculture among farmers in main urban areas of northern Thailand

This study employed multivariate analysis using multiple regression analysis because creative agriculture is unlikely to be determined by a single factor. Multiple regression analysis allows for the simultaneous consideration of the influence of several independent variables, such as demographics, socio-economics, and farming practices on the dependent variable (creative agriculture), leading to a better understanding of the complex dynamics involved. It was required that the independent and dependent variables have an interval or ratio level of measurement. Any variable with a nominal or ordinal level of measurement was included as a dummy variable. In this analysis, seven variables had to be adjusted: sex, marital status, educational attainment, agricultural group/organization membership, debt burden, farming promotion, and participation in social activities. Aside from this, the variables entered into the analysis must not have a correlation higher than 0.93 to avoid multicollinearity. In other words, a high correlation value will decrease the predictive value of the equation (Hair et al., 2014).

Regarding an analysis of correlation coefficients to test the relationship between pairs of variables entered into multiple regression analysis, it was found that all variables had a correlation between variables of no higher than 0.93. Therefore, it could be used in regression analysis. Results of an analysis of determinants of creative agriculture among farmers in main urban areas of northern Thailand are shown in Table 2.

Table 2: Determinants of creative agriculture of farmers in main urban areas of northern Thailand

Independent variables	b	Beta
Demographic attributes		
Male (1)	0.659	0.0025
Age	-0.200	-0.131**
Elementary school (2)	-3.634	-0.136
Secondary school/vocational or higher vocational certificate (2)	-3.000	-0.104
Bachelor's degree and higher (2)	-2.368	-0.064
Married (3)	-1.772	-0.053
Widowed/Divorced/ Separated (3)	-2.609	-0.057
A number of household members	-0.020	-0.063

Table 2: Determinants of creative agriculture of farmers in main urban areas of northern Thailand (continued)

Independent variables	b	Beta
Socio-economic attributes/Farmers' holding		
Size of farm land area	0.029	0.014
A number of household workforce	0.646	0.093
An annual income	-4.187	-0.088
Farming experience	0.085	0.049
Agricultural group/organization membership (4)	-3.245	-0.115**
Receiving promotion (5)	2.754	0.071
No debt burden (6)	3.600	0.121**
No participation in social activities (7)	-0.604	-0.012
Rare participation in social activities (7)	-4.260	-0.158**
Agricultural practice of the farmers		
Adaptation and appropriate operational method	1.282	0.273**
Production management	1.063	0.296**
A (constants)	45.773	
$R^2 = 0.683$ F = 17.441		

Note: Group refer (1) Female (2) Lower than elementary school (3) Single (4) No membership of agricultural group/organization (5) No receiving promotion (6) Having debt burden (7) Always ** P< .01 * P< .05

4.2.1 Personal attributes

Age of the respondents has a negative effect on their creative agriculture (β = 0.131). This was because most of the respondents were aging. In addition, advancing age might be associated with learning ability, application of media, farming technology, including familiar farming methods which might be difficult to change. It conformed to a study of Meedaycha et al. (2020) which found that aging farmers often have problems about perception and use of technology/innovation to increase agricultural yields. Meanwhile, young farmers could perceive agricultural information. This was in line with a study by Kungwon (2019) which found that young farmers find it easier to make a decision to move into organic farming compared to aging farmers who were familiar with traditional farming. A study by Guo et al. (2015) showed that aging people usually had a lower acceptance rate of learning and using technology compared to other groups.

4.2.2 Socio-economic attributes and farmers' holdings

Membership of an agricultural group/organization had a negative effect on creative agriculture of the respondents (β = 0.115). That was, farmers must adapt to rapid social and economic changes. Meanwhile, they must have determination using accumulated knowledge together with the application of information technology. This would be beneficial to innovation in agricultural products. This conformed to a study of Sukglun et al. (2018) which found that farmers must apply information technology to agriculture, both production and marketing. A study by Sumnaphan et al. (2023) revealed that farmers must have a commitment to their agricultural career and preserve agricultural land for future generations. Importantly, farmers must be happy and satisfied with their agricultural career.

Little participation in social activities had a negative effect on creative agriculture of the respondents (β = 0.158). Most community activities focused on strengthening social relationships within the community rather than agricultural practices. This aligns with the findings of Suriyachaipun et al. (2023), which showed that membership in village groups had a significant negative impact on organic farming. Conversely, Jeerat et al. (2019) found that participation in agricultural activities or traditions positively influenced the adoption of the sufficiency economy philosophy in farming. However, social participation can have both positive and negative impacts on farmers, depending on whether they prioritize their farming or their social activities.

4.2.3 Agricultural practice of the farmers

Production management had a positive effect on creative agriculture of the respondents (β = 0.296). Farmers must adapt themselves, integrate, set goals and maintain a routine of agricultural activities. If they have good management and can adapt knowledge appropriately, it can create an economic opportunity for them (Wirakul, 2021). This conformed to a study of Omthuan et al. (2023) which found that farmers use the new agriculture theory as a concept in business management on the basis of agriculture. They can further develop their business by opening an eatery, coffee shop and photo zone for tourists.

The Model used in the study can be considered in terms of the independent variables' collective ability to explain variances in creative agriculture among farmers in main urban areas of northern Thailand, which was shown to be 68.3 percent (R^2 = 0683).

Determinants of creative agriculture if farmers in main urban areas of northern Thailand comprised age, membership of an agricultural group/organization, having no debt burden, occasional participation in social activities, self-adaptation/appropriate operation methods and production management. Interestingly, educational attainment and knowledge promotion about farming were likely to be variables determining creative agriculture of the respondents. However, these two factors did not have an effect on the determination of creative agriculture. This was because an increase in educational attainment enriched learning ability and could be used for designing farming. According to Yanpiboon et al. (2020), it was found that acquiring new knowledge from outside and adequate existing knowledge will lead to the production of new products. In addition, Chomtohsuwan (2016) points out that modern farmers are more knowledgeable and will be able to generate higher incomes. In contrast, as farmers become more educated, they will have more opportunities to choose non-agricultural jobs (Sakkatat & Kruekum, 2017; Suriyachaipun et al., 2023).

Regarding an analysis of determinants of creative agriculture of farmers in main urban areas of northern Thailand, there were factors concerning with socio-economic attributes of the respondents and their holdings /agricultural practice. Therefore, the farmer must transform the farming methods from the traditional into creative farming. However, there have been attempts to do farming in new forms such as organic farming, alternative farming, sustainable farming. However, few farmers can successfully practice these farming methods. It is time consuming to care for cultivated crops and sources of organic produce selling are limited. Moreover, many farmers cannot follow all the steps of organic farming. In order to help promote farmers to utilse creative agriculture public agencies such as the department of agricultural extension and educational institutions should put the importance on continuous management of agricultural production. Also, measures and policies about debt assistance for farmers, production technology and food processing should be encouraged or promoted. Agricultural products must reach standards and be safe for consumers. Meekaew and Chamaratana (2024) found that providing farmers with knowledge and training in business planning, finance, risk management, and entrepreneurship has made significant contributions to their development.

The increasing awareness of the importance of creative agriculture offers farmers a significant pathway to reduce their vulnerability to the control and centralization of agricultural information. In a world characterized by volatility, including the risks of conflict, economic instability, and ecological crises (Hinviman, 2010), proactive risk management, as highlighted by Beck (1992), it empowers individuals to confront challenges and adapt. Creative farming embodies this proactive approach, enabling farmers to face these multifaceted risks head-on. Farmers who successfully adopt creative farming methods often develop innovations that provide a competitive edge in agriculture, leading to outcomes distinct from those of traditional farming.

A key advantage of this new agricultural approach is the reduced dependence on external production factors and information, which can often be controlled by centralized entities. Creative agriculture, with its emphasis on utilizing available capital in the area, efficient and valuable agricultural natural resources, and managing ecosystems sustainably, inherently lowers the risk of reliance on external inputs like synthetic fertilizers and pesticides, which can be subject to price fluctuations and supply chain disruptions. This approach not only enhances farmers' autonomy but also aligns with a growing global movement towards chemical-free and environmentally conscious food production. Furthermore, creative agriculture encourages production diversity, moving away from the risks associated with monoculture. By cultivating a variety of crops and integrating livestock, farmers can mitigate the impact of market price volatility for a single commodity or the devastation caused by diseases specific to one type of plant. This diversification strengthens the resilience of the entire farming system. The adoption of technology and innovation, such as efficient water management techniques, biological pest control methods, and value-added processing of agricultural products, further contributes to risk reduction and the creation of new business opportunities. This aligns with the research of Thongsrikate and Kanokhong (2024), which found that the creative agriculture approach in Chiang Mai province empowers farmers to achieve self-reliance through three key models: 1) conscious agricultural practices 2) designing and creating agricultural alternatives, and 3) utilizing media, technology, and information. This approach boosts creativity among farmers, ultimately fostering economic recovery, social well-being, and sustainability within the agricultural sector. It significantly enhances competitiveness in the dynamic agricultural landscape.

Initiatives like smart organic farming and agroforestry exemplify how innovation can enhance productivity while minimizing environmental impact and promoting sustainability. For instance, integrating livestock with crop production can enhance resource use efficiency and reduce reliance on external fertilizers. However, it's important to acknowledge that creative agriculture has limitations when dealing with certain systemic risks, such as severe natural disasters or global market instability. These external factors often require broader policy interventions and support mechanisms to effectively manage their impact. For example, climate change and water scarcity remain significant challenges for Thai agriculture. Therefore, the role of

government, the private sector, and communities is crucial in fostering a supportive environment for farmers transitioning to sustainable agriculture and effectively reducing their exposure to various risks. Collaborative efforts can provide access to resources, knowledge, and infrastructure necessary for the widespread adoption and success of creative agriculture practices, ultimately leading to a more resilient and sustainable agricultural sector. This includes supporting the formation of farmer networks for knowledge sharing and mutual support.

5. CONCLUSION

In conclusion, this study underscores the need to comprehend the diverse factors shaping the adoption of innovative agricultural practices and the generation of added value for agricultural products, particularly within Chiang Mai province. The research findings yield strategic recommendations aimed at fostering and empowering urban farmers to adapt and cultivate agricultural methods that align sustainably with evolving social, economic, and technological landscapes. Cultivating creative farming necessitates prioritizing demographic shifts through tailored support programs catering to farmers' age and experience, transforming agricultural groups into hubs for exchanging innovations and technologies, encouraging creative social engagement linked to agricultural progress, enhancing modern production management skills, and promoting practical, market-responsive knowledge. Ultimately, advancing creative agriculture demands multi-sector collaboration to holistically support farmers with knowledge, skills, networks, and economic opportunities, enabling them to adapt, innovate, and develop sustainable agricultural practices genuinely suited to the local context.

6. RECOMMENDATIONS

1. For farmers in the main urban areas of Northern Thailand to embrace creative agriculture, they should prioritize robust agricultural practices, cultivate adaptive skills, develop strong production management and administrative capabilities, and exercise prudence in their farming ventures to mitigate the risk of debt. Government agencies should concentrate on disseminating agricultural knowledge, promoting the integration of technology in production and processing, and implementing effective debt relief mechanisms for farmers.

2. In terms of future research directions, it is recommended that further investigations delve into the intricate relationship between social participation and agricultural innovation, the specific mechanisms through which production management skills foster creative agriculture, and longitudinal studies tracking the implementation and impact of creative agriculture methods. Additionally, exploring the role of risk awareness in farmers' decisions to adopt creative agricultural approaches warrants further research. These in-depth studies will contribute to a more profound understanding of the dynamics of creative agriculture within the Thai context and inform the development of more targeted and impactful policies and support measures in the future.

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