

POTENTIAL DEVELOPMENT OF GLUTINOUS RICE COMMUNITY TOWARDS NEW AGRICULTURAL CULTURE TOURISMS IN UPPER NORTHEASTERN THAILAND

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ABSTRACT

Glutinous rice growing is concentrated in Northeastern Thailand. It not only impacts people's livelihoods, culture and traditions, but is also unique in its taste, consumption and extensive utilization. Thus, those in the glutinous rice community should make use of their unique glutinous rice culture to promote agricultural/cultural tourism. The study locations were Ban Phu in Mukdahan province, the Khao Mao Wan Community Enterprise, Ban Prong in Nakhon Phanom, and the Noi Chomsi Community Enterprises in Sakon Nakhon in January-March 2017. The study showed that the communities in Upper Northeastern Thailand have the potential to develop as an agricultural/cultural attraction. Moreover, the study indicated that glutinous rice attraction has high potential based on 10 indicators: production, processing, culture and tradition, location, facility, natural resource management, community participation, community administration, services, and promotion of glutinous rice attractions. However, the glutinous rice community can improve attractions by focusing on food security issues. It is anticipated that by integrating rice cultivation and cultural activities into the overall community development program, glutinous rice attractions will increase awareness of the role of glutinous rice regarding food, jobs, and cultural security to ensure a sustainable quality of life for glutinous rice farmers and their associated communities.

Key words: agricultural tourism, cultural tourism, development

INTRODUCTION

In the Greater Mekong Subregion (an emerging economic subregion of Southeast Asia), rice is culturally preferred for production and consumption, especially in the Mekong River Basin, where the local variety is known as glutinous rice. It is believed that the glutinous rice is associated with the Tai ethnic people who migrated along the Mekong River to Southeast Asia in the past. People in Southeast Asia consume glutinous rice as the staple food, especially in Thailand and Lao PDR. The scientific name of glutinous rice is *Oryza sativa* var. *glutinosa*, and the common names are sticky rice, waxy rice and sweet rice (Nguyễn, 2001). Glutinous grains have a brown or black or purple seed coat depending on the type of the variety; the color of milled grains is white or black or purple. Generally, the milled grains of glutinous rice are an opaque white color and become translucent after cooking. Normally, rice grains contain two types of starch (amylose and amylopectin), but glutinous rice grains are distinguished from ordinary rice by having negligible amounts of amylose and high amounts of amylopectin (Falvey, 2000; Nywikol, 2008). Moreover, glutinous rice is gluten-free, therefore, it is safe for people who have celiac disease and gluten sensitivity. The world distribution of glutinous rice varieties has resulted in glutinous rice varieties being found in 37 countries—Lao PDR, Thailand, Indonesia, China, the Philippines, India, Vietnam, Myanmar, Cambodia, Japan, Malaysia, South Korea, Taiwan, Nepal, Bangladesh, Sri Lanka, Brunei Darussalam, Brazil, the United States of America,

Hungary, Senegal, Tanzania, Turkey, Burundi, Colombia, Ethiopia, Georgia, Guinea, Guinea Bissau, Guyana, Iran, North Korea, Pakistan, Russian Federation, Surinam, Uzbekistan, and Venezuela. The continent from where the majority of glutinous rice varietal samples were collected for conservation at IRRI was, as expected, Asia, with 6,484 varieties or over 99% of the collection. The largest collection was from Lao PDR (2,470 varieties), followed by Thailand (1,289 varieties) and Indonesia (529 varieties), respectively (Figure 2) (Sattaka et al. 2014).



Fig. 1. Geographical distribution of glutinous rice globally (Source: Sattaka et al. 2014)

Geographically, glutinous rice growing is concentrated around an area in the northeastern part of Thailand. This glutinous rice 'zone' covers an area of approximately 2.49 million ha. For the people in this rice zone, glutinous rice is much more than an agricultural commodity as it is their livelihoods, their culture and traditions. It is, indeed, their food security as well as their jobs and cultural security. The small cultural differences between the different Tai speaking groups are overshadowed by their overwhelming cultural similarities which include language, rice cultivation system, glutinous rice consumption, and many traditional cultural practices. In most, if not all, glutinous rice farming communities or towns, people usually observe and carry out various rice-related traditional practices and celebrations, such as the Ploughing Ceremony at the beginning of the rice cultivation season, usually around May, and the Rice Harvest Celebration in December. Glutinous rice is also unique in its taste, consumption, and utilization—much of which is culturally related. As such, it can serve as a geographically specified 'trade mark' of the country. Many traditional local products are being developed to become OTOP products (One Tambon (Subdistrict) One Product) such as Hang rice. Other popular local products include Khao Mao which is made from green and young parboiled rice. Other more common products are Sweet Fermented Glutinous Rice and Local Glutinous-Rice Wines. Moreover, increasingly, tourists are appreciative of the natural environment, especially in developing regions. Local agricultural production and local markets are also increasingly popular, even in urban cities. Agricultural landscapes, including glutinous rice farms in traditional rural settings, can be and are amazingly beautiful and attractive sights, especially to urban tourists. Form the above point it has accorded with Choeichuenjit and Sapsanguanboon (2014) reported that one of the most interesting tourism sectors is cultural tourism that use culture and tradition of community as a product to differentiate from other types of tourism which adds value to tourist destinations. Furthermore, Richards (2018) explained that cultural tourism is a type of tourism activity in which the visitor's essential motivation is to learn, experience and consume cultural attractions in a tourism destination. Riddhagni (2018) indicated that cultural tourism is becoming popular in Thailand that increase number of tourists. It has taken the position as the importance segments of country's economic. Leopenwong (2014) and Ornrat (2018) reported that the culture tourism was the important policy to promote tourism in the upper

northeastern provinces. But the cultural tourism has also just a festival-based tourism activity, there is no development of support activities for additional revenue. The major problems were insufficient budgets to develop the attraction, community's participation, and lack of public relations and good management about the tourism activities. The concept to promote glutinous rice community towards new agricultural culture tourism is one of the strategy for sustainable community development by using by using capitalization on nature and cultural assets of places.

Moreover, the current study aimed to show that the communities in Upper Northeastern Thailand have the potential to develop to be cultural attractions based on the community or farmers' management. The more specific objectives of the study were i) socio-economic information of glutinous rice community; ii) facts on glutinous rice planting, production, security; iii) factors affecting the potential to develop new cultural tourism opportunities. Because Thailand is an emerging country for cultural tourism, the country should make use of its unique glutinous rice culture to promote eco-cultural tourism to selected glutinous rice producing communities. Research and development support to identify and promote such cultural traditions relating to glutinous rice would certainly help keep the young generation of rice farmers on the farm and ensure sustainable production of glutinous rice toward the sustainable development goals of the country.

RESEARCH METHODOLOGY

Study area. This project was undertaken in three provinces in the upper northeastern region of Thailand where farmers grow glutinous rice and are famous and unique in glutinous rice culture and products. The study locations were Ban Phu in Mukdahan province, the Khao Mao Wan Community Enterprise, Ban Prong in Nakhon Phanom, and the Noi Chomsi Community Enterprises in Sakon Nakhon,

1. Ban Phu village in Mukdahan province, Ban Phu is an old Phu Tai ethnic community located in Nong Sung district, Mukdahan province. There have a unique culture and traditions, especially regarding food as the people consume glutinous rice as staple food. Tourists can join and experience a homestay with the villagers and learn all the preserved cultures of this village via living locally. The village is surrounded by mountains and beautiful natural resources, especially glutinous rice fields that provide clean, fresh air.

2. The Khao Mao Wan Community Enterprise in Nakhon Phanom province, grows Khao Mao or young flattened rice which is made from young glutinous rice. The best Khao Mao has to be made from local glutinous rice varieties that are harvested in October. It is consumed as an indigenous snack by local communities in Thailand, Lao, and Vietnam. The processing method of Khao Mao has been transferred from ancestors to descendants so Khao Mao knowledge is well-known local wisdom of Thai people in the northeastern region. Thus, the Khao Mao Wan Community Enterprise use this local wisdom to produce Khao Mao as a famous glutinous rice product. The Khao Mao Wan Community Enterprise receives a high income from Khao Mao (about USD 31,250 per month) during October to January. There is a learning center for glutinous rice processing where tourists can study, test, and experience Isaan's warm hospitality. Moreover, the community is located in That Phanom District, which is also the site of the most important Buddhist temple in the region and tourists can visit the most cherished chedis in Southeast Asia.

3. The Noi Chomsi Community Enterprise in Sakon Nakhon is well known as a provider of Hang rice in Sakon Nakhon province. It has a learning center for farmers, students, and foreigners. Hang rice is geographical indicator (GI) of Sakon Nakhon province that is made from both non-glutinous rice and glutinous rice. Hang rice originated because the famers did not have enough glutinous rice to consume before the next harvest season. Therefore, they harvested grain at the immature stage (about 85% of grain maturity) to make Hang Rice for their own consumption. Hang rice is soft has a good flavor and aroma and is highly nutritious. Nowadays Hang Rice is used as a main food source in some

household in Thailand. Because of the fame of Hang rice, the Community Enterprises Noi-Chomsi has developed Hang rice quality by using the organic rice standard of the USDA and good manufacturing practices for value adding and market expansion. Tourists can study Hang rice processing and visit various organic glutinous rice and non-glutinous rice fields.

Data collection. Data were collected using a community survey and interviewing schedule according to the objective of the research namely to obtain socio-economic information, facts on glutinous rice planting, production, and security, and factors affecting the potential to develop new cultural tourism opportunities based on glutinous rice. The data were collected in January-March 2017. Simple random sampling method was used to select where farmers grow glutinous rice and are famous and unique in glutinous rice culture and products. Based on the total members of the group which are 250 members in Ban Phu village Mukdahan, 30 members in The Khao Mao Wan Community Enterprise Nakhon Phanom, and 30 members in The Noi Chomsi Community Enterprise Sakhon Nakhon. Thus the required sample size was determined to be 90 respondents in total with equal numbers from Mukdahan, Nakhon Phanom, and Sakhon Nakhon.

Data analysis. 1. The survey used *rai* for area measurement and the Thai currency (THB) for all monetary values to make it easier for the farmers to provide their data. All survey results were converted into hectares (6.25 rai=1 ha), and THB were converted to USD at a rate of USD 1=THB 32.50 (Bank of Thailand, 2016).

2. Glutinous rice production and measurement were divided into: growing area (ha), yield (kg.ha⁻¹), annual glutinous rice production (kg per household), and annual farmer income from glutinous rice (USD).

3. Monthly glutinous rice consumption sufficiency of the farmers was determined and the criteria for scoring and measurement were: 0 indicated “Insufficient” and 1 indicated “Sufficient”. Therefore, the total annual maximum score for glutinous rice security was 12 being (modified from Jenson and Nord, 2012; Prachasan, 2012).

4. Glutinous rice production stability comprised six situations: farmers kept water in a well for use on farm; improving soil fertility every year; planning to produce glutinous rice for the whole year’s consumption; keeping some glutinous rice for emergencies; having a plan to reduce chemical agents used in glutinous rice production; and have sources of glutinous rice knowledge in the community. The criteria for scoring and measurement were: 0 = “Unstable” and 1 = “Stable” and the maximum total score for glutinous rice security was 6 (modified from Jenson and Nord, 2012; Prachasan, 2012).

5. Glutinous rice utilization consisted of three items: farmers consume clean and safe glutinous rice; farmers consume other dishes instead of glutinous rice; and farmers are able to process glutinous rice to make edible dishes, with the criteria for scoring and measurement being: 0 = “No” and 1 = “Yes”. Thus, the maximum total score of glutinous rice security was 3 (modified from Jenson and Nord, 2012; Prachasan, 2012).

6. Factors affecting potential of glutinous rice community to develop new cultural tourism aspects consisted of three main sections and a Likert Scale (1-5 score) was used for scoring and measurement:

6.1 The potential of glutinous rice community was evaluated using 10 components: production, processing, culture, location, facility, natural resource management, community participation, community administration, services, and promotion.

6.2 The components of glutinous rice attractions were: infrastructure, knowledge of attractions, culture and tradition, glutinous rice products, services, natural resource management, promotion, and community participation, community administration and supporting organization.

Likert Scale interpretation, the range was calculated ($5 - 1 = 4$) and then divided by five as this was the greatest possible value for the scale ($4 \div 5 = 0.80$). The score range for each evaluation criterion was: 1 to 1.80 (Very low); 1.81 to 2.60 (Low); 2.61 to 3.40 (Moderate); 3.41 to 4.20 (High); and 4.21 to 5.00 (Very high.)

7. After collecting the data and checking the data for errors, a computer program was used to determine percentages, arithmetic means and standard deviations for analysis. Regression analysis was used to determine how the important factors influenced the potential of the glutinous rice community toward new cultural tourism aspects in Upper Northeastern Thailand. The dependent variable was the score of potential of the glutinous rice community. The independent variable was the score of infrastructure, knowledge of attractions, culture and tradition, glutinous rice products, service, promotion, natural resources, community participation, community administration, supporting organization

RESULTS AND DISCUSSION

Socio-economic information of glutinous rice community

Glutinous rice farmers. Of the farmers, 56.3% were female and 43.8% were male. Approximately 66.3% of the farmers were 40-59 years old, with an average age of 52 years. Of the farmers, 76% had completed elementary school education and 10.8% had completed their senior high school education. Nearly 59.5% had more than 30 years of glutinous rice planting experience, with the overall average experience being 25 years. It was found that 68.8% of the farmers owned less than 2.00 ha, with the average area being nearly 1.22 ha.

The study indicated that most farmers were elderly with an average age of more than 50 years, and most had elementary school education. Therefore, these facts indicated that the farmers had limited access to knowledge on glutinous rice production. However, the farmers had large amounts of experience over a long time in planting glutinous rice with the average being more than 28 years but some of them could not understand, accept, and apply the new technology on glutinous rice development from their friends and the agricultural extension workers. Moreover, the farmers operated at a small agricultural scale, each owning an area less than 1.90 ha (Ngee-on, 2001; Sarast and Wongsamun, 2008; Nithiyanan et al. 2012; Srisompun et al. 2013) because the growing area had been progressively subdivided through ancestral lineage or by liability, which had an effect on the available agricultural area and glutinous rice production. Thus, the farmers need to improve the production system by using knowledge and appropriate technology to increase both the quantity and quality of glutinous rice.

Glutinous rice planting methods. The study found that 70% of farmers grew glutinous rice using the transplanting method and 30% used the broadcasting method. Approximately 93.5% of respondents used the RD6 seed variety and only 3.3% used local seed varieties. Glutinous rice seed was produced mainly by farmers (62%) while 22% purchased their seed from a government organization. Approximately 33.5 and 60% of farmers applied chemical fertilizer once and twice, respectively. Most farmers harvested their glutinous rice by hand (78%) and kept their harvest in their barn (75.8%). The study indicated that most Thai farmers used the RD6 seed variety which is a photoperiod-sensitive rice variety. Moreover, the RD6 seed variety is also considered to be a good glutinous rice variety because the cooked rice is soft and aromatic and fetches a high price. Because it is photoperiod-sensitive, it can be grown only once a year in the wet season during June-November using the transplanting method (Bureau of Rice Research and Development, 2009). Thus, a non-photoperiod-sensitive variety of RD6 was developed by Maejo University and the Rice Department so that it could be grown in the dry season, whilst still having the same quality and quantity as the RD6 photoperiod-sensitive variety (Agriculture and Food Cluster, 2015). Even though, most farmers used the RD6 seed variety for their consumption but local seed varieties was used for processing rice products such as the Khao Mao Wan Community Enterprise in Nakhon Phanom province. The best Khao Mao has to be made from local glutinous rice varieties with its natural, pandan-like aroma as well as soft and sticky texture (Fig. 2). During October to February the tourists - who visit Khao Mao Wan Community Enterprise - can study local wisdom to produce Khao Mao that to be made from various local glutinous rice.



Fig. 2. Khao Mao at Khao Mao Wan Community Enterprise in Nakhon Phanom province

For Hang rice in Noi Chomsi Community Enterprise could be produced from many varieties both non-glutinous rice and glutinous rice. Normally, RD6 glutinous rice were used to produce Hang rice, cooked hang rice is soft, aroma and has good flavor. One of the important of Hang rice in Sakon Nakhon province was registered geographical indication (GI) on July 26, 2006. The registration of GI provides protection for rice strains by certifying their origin and quality in relation to a farming community. Thus, Noi Chomsi Community Enterprise has a learning center for tourist (Fig. 3).



Fig. 3. Participants of international workshop on “Climate Smart, Innovative Food Preservation and Processing Technologies Applied by Women in Rural Environments” by Food and Agriculture Organization (FAO) visited Hang rice processing in Noi Chomsi Community Enterprise

Glutinous rice as food security. Sustainable production of glutinous rice is, undoubtedly essential for Upper Northeastern Thailand, considering its role as a staple food and in relation to the many cultural traditions and livelihoods of the people. The study showed that 100% of the respondents had glutinous rice consumption sufficiency for a year. To provide glutinous rice stability of availability, most farmers (93%) sourced water from a well for use on the farm, 94% improved soil fertility every year, and 98.8% had a plan to produce glutinous rice for the whole year’s consumption. Furthermore, 96% of the Thai farmers kept glutinous rice for emergencies, 92% had a plan to reduce chemical agents for glutinous rice production, while only 83% sourced glutinous rice knowledge in the community. Considering glutinous rice utilization, 78% of farmers were able to consume clean and safe glutinous rice and 51% of farmers consumed other dishes instead of glutinous rice. Moreover, 95% of farmers were able to utilize glutinous rice in other edible dishes.

The study indicated that the community had food sufficiency in glutinous rice because of the importance of glutinous rice as an attraction and to show visitors the potential of glutinous rice production. Moreover, most of the glutinous rice areas were in rain-fed catchments and 71.3% of farmers had encountered increased drought during 2013-2016 and flooding in 2017 but they tried to maintain their level of glutinous rice planting. Glutinous rice is important not only for food security but also for nutritional security. One serving of glutinous rice can provide, in addition to approximately 169 calories and 7-8% of protein, significant amounts of essential vitamins and minerals (Gray 2010). Many local glutinous rice varieties are known to provide special quality tasting products, such as Black glutinous rice and Hang glutinous rice in Sakon Nakhon province and Ban Phu village in Mukdahan province (Fig. 4).



Fig. 4. Hang rice products

There are many traditional glutinous rice products which are locally consumed in all GMS countries and form part of their economies but with limited market. In addition, it should be noted that in each member country of the GMS, some of the potential glutinous rice community destinations are, in fact, already tourism sites, but without focusing on the rice and food security issues. It is anticipated that by integrating the rice cultivation and cultural activities into the overall community development program, the promotion of Glutinous Rice Corridor can be effectively carried out.

Factors affecting potential of glutinous rice community toward new cultural tourism in Upper Northeastern Thailand. Increasingly, people are appreciative of the natural environment, especially in more developed regions. Local agricultural production and local markets are also increasingly popular, even in urban cities. Agricultural landscapes, including glutinous rice farms in traditional rural settings, can be and are amazingly beautiful and attractive sights, especially to urban tourists. Moreover, in glutinous rice farming communities or towns people usually observe and carry out various rice-related traditional practices and celebrations, such as the Ploughing Ceremony at the beginning of the rice cultivation season (usually around May) and the Rice Harvest Celebration in December. In addition, it should be noted that in each glutinous rice area of the country, some of the potential glutinous rice community destinations are already popular tourism sites, but without a specific focus on rice and food security issues. It is anticipated that by integrating the rice cultivation and cultural activities into the overall community development program, the promotion of a Glutinous Rice Corridor can be effectively implemented. Thus, developing glutinous rice attractions will help to showcase the potential of the glutinous rice community toward agricultural cultural tourism. This concept supported the tourism policy 2018 in Thailand that would be sustainable tourism, focus on quality tourism, create higher economic value, and distribute tourism income to the regional areas and pride of local heritage (Wattanavrangkul, 2017). The study indicated that the glutinous rice attractions in the study area have high potential based on 10 indicators: production, processing, culture and tradition, location, facility, natural resource management, community participation, community administration, services, and promotion of glutinous rice attractions (Table 1). The potential of glutinous rice production had the highest score because the farming community has glutinous rice in excess of its domestic needs, and the surplus can be sold and processed. For glutinous rice production and natural management, glutinous rice production is grown using sustainable agriculture and agriculture standards such as the Good Agriculture Practice Standard and the Organic Rice Standard. It can build confidence with the consumer and the tourist to visit and learn, and also friendly with the environment. Moreover, these system lead farmers to self-sufficiency, a concept developed by His Majesty the King. As the report of Khamung (2015) indicated that local communities possess advantages of natural resources and culture heritage to attract tourist; its success will greatly increase if the communities observe and practice self-sufficiency farming and use sustainable agricultural production while preserving. For value added, the quality yields were used in processing based on integrated the local wisdom and appropriate technology to improve local products on glutinous rice to become One Tambon One Product (OTOP products) or One Sub-district One Product with five stars level such as Khao Mao at Ban Prong in Nakhon Phanom and Hang rice at Noi Chomsi. Even though, Ban Phu village do not have processing products from glutinous rice, but they have culture and tradition on food made from glutinous rice to serve for visitor such as Khao Tom Mat or Khao Tom Pat, grilled glutinous rice, and steamed glutinous rice in the meal. Moreover,

glutinous rice was used in traditional welcome ceremony for visitors that stayed in Bam Phu called the ceremony as “Bai Sri” or “Bai Sri Su Kwan”. (Fig. 5).



Fig. 5. Grilled glutinous rice, steamed glutinous rice in the meal and “Bai Sri” or “Bai Sri Su Kwan” in Bam Phu

For location of glutinous rice attractions, there are located on local road but do not far from main road and have guidepost for the guidance of travelers. Moreover, glutinous rice attractions have facilities to support travelers such as clean toilets, accommodations, free parking lot, and souvenir shop etc. The activities of glutinous rice attractions were managed by the members in community by using participation process. They have annual production plans and the activities; the member duty was assigned based on ability and proficiency by the community committees. For services, the attractions showed the process of glutinous rice production, products, culture and tradition by the community guides, that the tourists can try and learn. Besides, the tourists can test the glutinous rice products and purchase from the souvenir shop in the community. Although, the attractions have high level of promotion of glutinous rice attractions because of the famous products, but they have limited the channel communication to promote the attractions especially in Ban Prong in Nakhon Phanom and Hang rice at Noi Chomsi. Given rising interest in cultural tourism, local communities are developing more and more travel-related businesses, including homestays, shops, and restaurants. This has created jobs and generated income for communities. However, it has often also changed the local ways in a manner that erodes long-term tourism potential. Therefore communities and stakeholders should promote glutinous rice attraction by emphasize long-term benefits rather than short-term income, to ensure timely supply-side development (Amornvivat et al. 2016).

Table 1. Potential of glutinous rice community toward agricultural cultural tourism

Indicator	Mean	Std.Dev.	Interpretation
Glutinous rice production	3.88	0.75	High
Glutinous rice processing	3.57	0.56	High
Glutinous rice culture and tradition	3.60	0.85	High
Location of glutinous rice attractions	3.50	0.78	High
Attraction facility	3.60	0.83	High
Natural resource management	3.53	0.82	High
Community participation	3.73	0.88	High
Community administration	3.70	0.95	High
Services	3.61	0.81	High
Promotion of glutinous rice attractions	3.47	0.86	High
Total	3.66	0.58	High

As mentioned earlier, glutinous rice is unique in its origin and distribution. It is also unique in its taste, consumption, and utilization—much of which is culturally related. As such, it can serve as a geographically specified trademark of the upper northeastern region of Thailand. Many traditional local

products are being developed to become OTOP products. In fact, GI glutinous rice has been identified and certified (for example, Hang rice from Sakon Nakhon province in Thailand). Other popular local products include Young Glutinous Rice Cereal or Khao Mao which is made from green and young parboiled rice. It is also used to produce many rice snacks and desserts. Other more common products are Sweet Fermented Glutinous Rice and local Glutinous-Rice Wines in Nakhon Panom province. Thus, upper northeastern tourism is one of the programs in regional development in recognition of its important contribution toward socio-economic development and the conservation of natural and cultural heritage resources. Thus, the upper northeastern tourism strategy was defined to develop and promote eco-tourism as a single destination and offering a diversity of good quality and high yielding sub regional products-by fostering a sustainable tourism development approach. In the case of glutinous rice attraction development, the study indicated that infrastructure ($p = .021$), knowledge of attractions ($p = .001$), promotion ($p = .042$), and supporting organizations ($p = .013$) affected the potential of glutinous rice attractions (Table 2)

Table 2. Factors affecting the potential of glutinous rice community toward new agricultural cultural tourism in Upper Northeastern Thailand

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	-.181	.329		-.549	.585
Infrastructure	.243	.104	.253	2.347	.021*
Knowledge of attractions	.308	.088	.322	3.498	.001*
Culture and tradition	.035	.022	.104	1.597	.114
Glutinous rice products	.045	.110	.044	.407	.685
Service	.037	.027	.117	1.336	.185
Promotion	-.060	.029	-.163	-2.063	.042*
Natural Resources	.007	.014	.049	.527	.599
Community participation	.031	.028	.098	1.114	.269
Community administration	.010	.115	.009	.083	.934
Supporting organization	.256	.101	.215	2.542	.013*

Dependent Variable: Potential of glutinous rice community

* $p < .05$, $F=17.78$, $p\text{-value}=.000$, and $R\text{-square} = 0.692$ (69.2%)

Infrastructure plays a major role in the development of attractions. The study found that the development infrastructure associated with glutinous rice attractions should improve accommodation (clean and safe, good food), accessibility (transportation, signpost, location, road, etc.) and amenities (internet, toilet, shopping facilities, etc.). Moreover, the tourist would like to do different things including gaining knowledge from experiencing attractions (Haneef, 2017). Thus, glutinous rice attractions should provide new knowledge about glutinous rice that shows its importance, uniqueness, and culture and tradition, while also creating activities involving glutinous rice such as planting, cooking, and eating. The farms attractions would then allow tourists to have the opportunity to see culturally constructed landscape, local culture, and local agricultural practice. While competition among tourism sites and number of new developments are increasing, it is very important to identify market niches. Therefore, promoting glutinous rice tourism is a challenge and it is important to increase the potential of glutinous rice tourism by making it better known and ensuring cleanliness highlighting the magic and spirit of each destination, and using Social Media to promote tourism. To develop the potential of the glutinous rice community toward new cultural tourism there needs to be support to improve attractions to be better, more beautiful, and convenient. Moreover, the knowledge for improving the glutinous rice community toward new agricultural cultural tourism opportunities needs to be applied based on the appreciated technology and what the community wants.

The study showed that culture and tradition and glutinous rice products is not an essential factor affecting in the development by the reason of the unique of glutinous rice production and culture in the community, that take well-known attractions. For example, glutinous rice products-Khao Mao and Hang rice, received five stars level of OTOP and Ban Phu homestay is one of attractions that recommended by the Mukdahan Provincial office of Tourism and Sports. Moreover, culture and tradition tourism should preserve their local culture and wisdom. The same as the study of Khamung (2015) indicated that local communities need to employ sustainable agriculture practices and at the same time preserve their local cultural heritage. The same as natural resources is not essential factor because glutinous rice attraction used GAP and organic production standards. These standards are friendly with environment. Moreover, the farmers also preserved local glutinous rice varieties for utilization and learning.

CONCLUSIONS AND RECOMMENDATION

Glutinous rice tourism was one of the programs of the GMS Economic Cooperation Program in recognition of its important contribution to socio-economic development and the conservation of natural and cultural heritage resources. Thus, the upper northeastern region tourism strategy was defined to develop and promote agricultural cultural tourism as a single destination, offering a diversity of good quality and high yielding sub regional products-by fostering a sustainable tourism development approach. The study results indicated that glutinous rice community development toward new agricultural cultural tourism opportunities should have a socio-economic basis as most farmers have small scale production of less than 2 ha, based on rainfed irrigation, and low glutinous rice yields, so the productivity per area of glutinous rice production should develop not only for food security but also for the job security of the farmers. Moreover, glutinous rice communities considering change to increase attractions need to consider food security and the identity of each community. The promotion of a Glutinous Rice Corridor can be effectively carried out by integrating rice cultivation and cultural activities into the overall community development program. The potential development of glutinous rice communities toward new agricultural cultural tourism ventures will require considerable infrastructure, knowledge of the attractions, and their promotion, as well as the need to support improvements to develop better, more beautiful, and convenient attractions based on appreciated technology and the community's needs. It is hoped that glutinous rice attractions will increase awareness on the role of glutinous rice for food, jobs, and cultural security, especially for the low-income population, and that this will lead to greater research and development effort to ensure the sustainable quality of life for glutinous rice farmers and communities. Quality tourism to these communities throughout Upper Northeastern Thailand to the East-West Economic Corridor (the Glutinous Rice Corridor) will, hopefully, help contribute to the same development goals for all.

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