



## Urbanization and farmer adaptation in the Bangkok Suburban area

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### Abstract

This article examines how urbanization contributes to the variation of farmers' adaptation in Southeast Asia. The variation of farmers' adaptation to urbanization results from urban expansion transforming local communities' environment and social structure. The patterns of farmers' adaptation can be categorized into the following: (1) reducing their production capacity; (2) establishing local groups to mobilize resources and manpower; and (3) changing their mode of production to other products and services. In addition, if urban expansion weakens local networks or participation from local communities, farmers hardly ever adapt themselves to new production modes or services. On the other hand, if urban expansion contributes to opportunities for farmers to collaborate with outside markets or external actors, the farmers can, to some extent, adapt their mode of production. The implication from this paper contributes to how policymakers can facilitate collaborative food governance system serving for specific needs of farmers, in particular peri-urban areas, and encourage positive environment between urban communities and farmers in peri-urban areas.

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### Introduction

Urbanization has tremendously affected agricultural farmlands, especially those which are located around urban areas or peri-urban areas. Scholars have argued that urban sprawl leads to social and cultural transformation of peri-urban communities, which contributes to changes in mode of production of farmers in the peri-urban communities (Askew, 2000; Rigg et al., 2018). Food security and sustainability has become one of the peri-urban and urban relation topics to which scholars

have increasingly paid attention. Changes in the mode of farmers' production has led to food security and governance system in that farmers in peri-urban areas have to abandon their farmlands due to higher production costs from urban expansion while some adapt to urban food supply chain to serve for urban customers (Abu Hatab et al., 2019; Boossabong, 2019; Cabannes & Marocchino, 2018). In other words, urban sprawl in peri-urban areas can cause food shortage and insecurity in urban consumers if there is no systematic solving fringe in peri-urban and urban relation. To prevent food insecurity and sustain food supply chain in urban areas, scholars (Abu Hatab et al., 2019; Boossabong, 2019; Cabannes & Marocchino, 2018;) propose collaborative food governance among public agencies, food business, local government, and local food merchants and farmers.

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However, such collaborative food governance is structured as top-down in that food business and public agencies are more powerful than other stakeholders. More importantly, not all local farmers join collaborative food system. While some local farmers depend upon food supply chain network initiated by public agencies, others in some peri-urban areas independently produce and sell their products and access urban consumers on their own. This article attempts to explain the variation and patterns of farmers' adjustment amid urban expansion and analyze and discuss the impact of urbanization, community participation, and collaboration on farmers' adjustment. The research questions are: (1) How does city expansion affect farmers, and in what ways?; (2) How do farmers adapt to city expansion?; and (3) Why do some local enterprises survive and adapt to urbanization while others fail to do so, or constantly depend upon assistance from government agencies for adaptation? It is argued that urban expansion leads to the social and environmental transformation of local communities around the city. Such transformation affects farmers' modes of production and their everyday life since economic and social structure upon which they previously depended have been changed. This negatively affects farmers in terms of land conversion and climate change while it provides an opportunity for farmers to expand their customers and markets. Farmers are likely to adapt their way of life, production, and marketing in order to give urbanites access to local communities and to survive in the midst of economic fluctuation and social transformation. To survive in the urban expansion, some groups have to downsize their production and harvests, while others process their products and provide services, such as local sightseeing for urban customers. The variation of farmers' adaptation derives from how urbanization affects the environmental and social structures of farmers' communities, how farmers' communities are active and participate in the adaptation process, and how farmers can collaborate with external stakeholders such as public agencies, private entrepreneurs, and civil society.

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## Literature Review

### *Urbanization, Social Transformation and Local Community Adaptation*

The rise of city and urban areas contributes to economic and social and cultural transformation in negative ways (Abu Hatab et al., 2019). Urbanization results from the interrelations among the global economy,

national economic development, political and policy directions, and social transformation. After World War II, international trade gradually increased, and foreign investors heavily invested in developing countries due to their cheap labor costs and agricultural commodities and abundant natural resources. Governments in developing countries decided to implement state-directed policies and centralized economic planning in order to respond to the growth of international trade and foreign investment (Anderson, 2009; Kohli, 2004; Toledo & Smith, 2012.). Cities and their vicinity in developing countries have been the center of national economic development. Regarding Thailand, the national economic and social development plans during the 1950s to 1980s contributed to urban expansion around Bangkok vicinity and transformed such to be housing projects for unskilled, lower-middle, and middle-middle class workers and industrial estates (Rongwiriyaphanich, 2012). The government's land ownership policy, which encouraged industry and real estate business to freely purchase farmland from local farmers, contributed to a reduction in farm production and food supply due to higher cost of production and abandonment of local farmers' communities. Scholars point out nicely about the social and cultural effect of urbanization on peri-urban areas. Urban expansion affects the social networks of local communities. It threatens farmers' mode of production, the expansion of residential communities, and industrial estates can negatively affect farmers in that such can reduce their production capacity due to a decrease in agricultural land supply. Brook et al. (2005) and Adger (2006) interestingly point out that urbanization leads to farmers' vulnerability to land entitlement due to the expansion of residential communities and industrial estates. Because of an increase in the demand for residential and industrial estates, land prices gradually increase, and farmers who are landowners are more likely to sell their land to private investors, real estate companies, or industrial investors. Abandonment of local communities due to expansion of urban communities brings about the decline in local community networks. Younger generations whose employment relies upon industry and modern business are less likely to continue farming. Therefore, older farmers are more likely to reduce their production capacity or even sell their land to real estate business and move out (Rigg et al., 2018). Such phenomenon negatively affects local people's agricultural production and market access. Those farmers who still practice farming are more likely to reduce to small-scale farmland. In this way, they become tenant farmers, and they have to rent land for their production and harvesting.

However, some local farmers in peri-urban areas continuously farm and harvest fruits with limited production scale (Rigg et al., 2018). They may exchange their products with their neighbors or sell them to other local community members. Some access urban markets via social network outlets such as Facebook while other local farmers may join a food supply chain network established by private business, non-profit organizations, or social enterprises (Boossabong, 2019). Having specifically argued the various patterns of farmers' adaptation, previous works indicated the variation of farmers' adaptation to urban sprawl in peri-urban areas. This paper attempts to further previous works by analyzing the variation of farmers' adaptation in Bangkok suburban areas. Previous works suggested that farmers' adaptation in developing countries use limited resources for changing production modes. Pribadi et al. (2017) found that the farmers had tried to use their small size of land for multiple purposes such as producing organic farming or accommodation. The adaptation strategy depends upon their resources, production network, and access to market. Chandra and Diehl (2019) found that the farmers became the sources of food security for urban consumers, especially the low-income ones. It depended upon the farmers' resources (i.e. land and capital) and the network the farmers belong to. Tsuchiya et al. (2015) indicated that the farmers in Bangkok's wet markets used their traditional networks to distribute commodities to urban communities. If public agencies had facilitated the communication among farmers from various communities, farmers would have had better access to Bangkok consumers.

This paper argues that farmers in peri-urban areas adapt to urban sprawl in various ways. Farmers' adaptation depends upon their community structure amidst the urban sprawl in their areas, level of community participation, and selection to join external network. The researcher argues that: (1) if the production network in a local community is vibrant and active; (2) if the community members join the farmers' adaptation programs initiated by group leader(s); and (3) if the farmers actively seek to join an external network, farmers are more likely to provide other products such as local tourism or processed products besides farming commodities.

## Methodology

Farmer communities near Bangkok were chosen, where people recognized that the communities used to be major agricultural areas. The majority of people who live in each selected community work in Bangkok

metropolitan area. Therefore, the income is not totally based on agricultural production. The case selection varies from less to more active farmer groups. The selected farmers' groups are ordinary groups in that they have not been rewarded by any organizations as the outstanding farmers' groups. In Thailand, rewarded farmers' groups were more likely to receive more governmental budget than the ordinary groups. The rewarded groups are more likely to better adapt than the ordinary ones because they receive more budget than others. In other words, studying the rewarded farmers' groups will be affected by selection bias problem.

Nong Chok and Suan Pak were previously known as major farmer communities that produced fruit and vegetables for Bangkok. Bang Kra Chao and Bang Rak Yai are located in Samut Prakarn and Nonthaburi provinces, respectively. Those areas are considered as the major fruit producing communities. Ang Thong province is 113 kilometers from Bangkok. The farmers' community is in Sa Wang Ha district, which is 25 kilometers outside the province's center. Therefore, the areas are considered semi-urban.

The farmers establish their associations or community-based enterprises in order to mobilize their resources and to improve their production. Due to scarce resources and pollution, they join and share resources and products in order to plan for marketing in large quantities. Bang Rak Yai and Ton Khao Nong Chok community-based enterprises are examples of farmer collaborations in order to mobilize resources and manpower and to upgrade their production. Farmers in Bang Rak Yai have worked as a group for eight to nine years. They have collected their fruit from members and have increased their fruit processing production so that they have sufficiently supplied the customers' demands. Similarly, Nong Chok's farmers have worked together for 20 years in order to mobilize the paddy rice from members and sell milled rice under the brand 'Ton Khao Nong Chok'.

## Data Collection

The author interviewed and conducted focus group discussions with farmers from March 2018 to November 2021. The interviews were conducted based on the farmers' convenience. The interviews and focus group discussions were conducted in the following areas:

The interviews were semi-structured. For the structured part, the questions involved four issues: (1) the farmers' personal background; (2) production and marketing; (3) the effect of city expansion on their production and everyday life; (4) their networks in and outside the communities; and (5) the modes of the

farmers' adaptation. For the unstructured part, the informants were invited to identify details such as how they initiated or adapted their modes of production. The contexts surrounding their communities such as the types of urban communities or public infrastructures were observed while the author spent time in the communities in order to understand the relationship between urban communities and farmers.

### Data Analysis

For analyzing the participation of local community members, two categories were used. The first one is how strong a leadership (either persons or organizations) the farmers' groups had so that they could appeal to local people to participate in the groups' activities. Here, leadership is defined in terms of who initiates and directs the farmers' adaptation strategy. If there is clear evidence of the strategy, then there is clear evidence of leadership (either one person or a group of persons). Second, local participation could be clearly observed when the groups asked for assistance. Here, participation is defined as the involvement of local people on the farmers' adaptation strategy. If there is clear commitment of local members, then there is clear evidence of participation. In case some groups of farmers were providing ecotourism and agrotourism services, the category proposed by Donohoe and Needham (2006) was used to categorize the purposes of selected farmers' adaptation.

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## Results

### *Effects of Urban Expansion on Community Structure, Community Participation, and Relation with External Network*

Urbanization has effects on peri-urban farmers' community structure, community participation, and relation with external network. First, due to a decrease in farmland and conversion to residential communities and industrial estates, farmers cannot find land for rent since the landowners have sold their land to real estate and industrial companies, which have transformed it into residential communities and industrial parks. More importantly, the farmers cannot afford to rent land from private enterprises. Community structure and network have been greatly reduced due to the abandonment of farmers. If the farmers are confined by residential and industrial communities, it is very difficult for local farmers to reach out to local production network and markets. Nong Chok and Suan Pak farmers are affected

by the decrease of agricultural land since the residential areas have gradually expanded over more than two decades. One of the farmer informants in Nong Chok mentioned, "*They (the billionaire landowners) have not yet raised the rent, but one day they will because this area is near the government's Eastern Economic Corridor*" (Focus group on March 23rd, 2018). Farmers at Suan Pak said that they have faced more difficulty in asking for assistance from their production network upon which they had previously relied because their farmer friends left the community and migrated to other provinces due to higher production costs and difficult access to middlemen and outside markets. Second, urbanization can contribute to low level of community participation in peri-urban communities. Due to several farmers selling their farmland and abandoning a community, and the younger generation abandoning farming, community members in peri-urban communities are not familiar with each other. As a result, community members hardly ever engage in farmers' adaptation programs such as local tourism, which highly need community members' engagement. Third, urbanization can lead to some farmers' incentive to reach out to external networks for adaptation programs. When urban communities affect local farmers' farming production such as with water pollution, some local farmers have incentive to initiate adjustment programs. City expansion affects farmers' decision. The farmers at Suan Pak indicated that they had to reduce their production area from 10 rai to 2 rai because their land was surrounded by new houses (Interview with one farmer, June 12, 2018). Some of the farmers had to move their production to rural areas far from their residence. For instance, some of the farmers from Nong Chok said that they had to move their production to Cha Cheung Sao Province, and rented land there for growing rice. They complained, "*We could not afford to rent land here in Nong Chok and Bangkok because the leasing price was very high. Land here was sold to convert to residential areas. More importantly, there were big enterprises buying land to prepare for the government's Eastern Economic Corridor (EEC)*" (Focus group on March 23, 2018).

### *Participation of Community Members*

The participation of community members is categorized into three levels. The first level is highly active participation. A high level of participation appears in Nong Chok, Bang Rak Yai, and Sa Wang Ha. For Nong Chok, the farmers were originally from the northeastern region and migrated to the area of Bangkok suburb in the

1980s for growing rice due to easy access to irrigation and cheap land rent at that time. They established a community-based enterprise in 2017 for receiving government assistance and collectively selling their milled rice to local communities near Bangkok, such as Nong Chok or Pathum Thani. For Bang Rak Yai, the farmers, local people, and local administration have worked together to create local markets for two decades. They established a community-based enterprise in 2017 in order to be eligible for governmental assistance. The enterprise's leaders and the village headman were highly active and enthusiastic about upgrading their products and tourist services. For Sa Wang Ha, the farmers and the vice president of the municipality have worked with Thai and German investors to supply basketry products to global markets for two decades. They established a community-based enterprise in 2009 to make their group more credible in terms of business network expansion.

The second level is moderately active participation. A moderate level of community participation and activity appear in Bang Kra Chao. In Bang Kra Chao, the local people were originally white-collar workers in government agencies, state enterprises, or businesses. Once they were retired, they continued their ancestors' fruit gardens and delivered sight-seeing tours. They have sought to collaborate with other groups from other communities for providing tourist services and add more interesting programs for customers.

The third level is poorly active communities. The farmers in Suan Pak are not very active. They did not establish a group and they did not have any clear leadership. There were two farmers leasing a small piece of land and growing vegetables separately, and there was no sign of collective action among the farmers. They individually produced vegetables for their own consumption. The farmers did not have a plan to expand their production capacity. They only relied upon local merchants and their farmer friends in the neighboring provinces of Nakhon Pathom.

Urbanization has negatively affected Suan Pak's community participation in that it has destroyed the production network of some peri-urban farmers. According to personal interviews with Suan Pak farmers, since urban residences have had confined farmland for more than 2 decades, the farmers' production network has been reduced due to migration to other provinces. Farmers at Bang Kra Chao have faced low level community participation because most farmers have left the community to produce and harvest rice in nearby provinces, where the production cost is less than Bang Kra Chao's. However, urbanization did not have much

effect on community participation at Nong Chok and Bang Rak Yai. This is because the urbanization has come with infrastructure and transportation. In the case of Nong Chok, several roads have been built over more than 2 decades in order to have access to the Eastern Economic Corridor (EEC). The farmers at Nong Chok benefitted from the infrastructure project. In the case of Bang Rak Yai, urbanization has come with the construction of the elevated electric railroad (i.e., the Purple line). The elevated train opened opportunities for Bang Rak Yai farmers to deliver farm products for urban customers and provide tourist service (see later this section).

### *Collaboration with External Actors*

The major struggle regarding farmers' adjustment is access to markets. Although farmers have products to supply to customers, they do not have adequate resources to advertise their products nationwide. The farmers need assistance in accessing markets or in reaching the right groups of customers. Collaboration with stakeholders matters. Public agencies, private enterprises, non-profit organizations, and civil societies are key players in giving farmers opportunities for accessing bigger markets.

External actors can be categorized into actors at the local or community level, and at the national and international levels. In the case of Suan Pak, there was hardly any evidence found of collaboration with external actors from these farmers' groups. In the case of Suan Pak, the farmers did not indicate any attention to collaborate with external actors; they focused more on selling their products to local merchants.

Nong Chok and Bang Rak Yai strongly engaged with the local actors within their communities and other areas. In the case of Nong Chok, the farmers sought production collaboration with other farmers in Buriram and Pathum Thani provinces. They also sought technical and financial assistance from the Office of Agricultural Extension in Bangkok and Pathum Thani. In terms of market access, they reached out to an industrial estate nearby their office. One of the automobile companies allowed the farmers to sell their milled rice to the workers at the company's cooperative.

Similarly, some farmers in Bang Rak Yai actively sought collaboration with local and external actors from other provinces. They saw city expansion as an opportunity for them to sell more products, and they could reach out to a new generation of urban people through social media. Younger consumers like to know about the products they buy, and for this reason the farmers take pictures of their products and upload them on Facebook pages in order to demonstrate how they are grown.

In the case of Bang Rak Yai, the farmers worked with village leaders, the Head Office of Nonthaburi province, and the Department of Community Development (2018) for officially establishing their enterprise and for opportunities to go to market fairs. Those stakeholders helped the farmers develop local markets (i.e., the Wat Moli weekend market). The government agencies told them to register for government assistance programs such as the 9101 Project and the New Way of Tourism Development Project.

Bang Rak Yai collaborated with the municipality administration and the Nonthaburi Office of Community Development for financial assistance and knowledge regarding project management and market access. The leaders collaborated with nearby community-based enterprises for exchanging production and processing knowledge and knowledge about market access. Local businesses, such as automobile dealers, helped them to access the market by allowing the farmers to sell their products in the showroom. Not only did they sell their products to employees, but they also had an opportunity to sell to the dealer's customers. Moreover, Bang Rak Yai collaborated with other community-based enterprises from other provinces by joining the network of farmers' enterprises and by visiting other enterprises for exchanging ideas. Finally, they collaborated with non-profit agencies such as the Chamber of Commerce's Small- and Medium-Sized Enterprise Unit to upgrade their processed products to appeal to urban customers and to access foreign customers for sight-seeing services.

The farmers were supported to provide agrotourism service by the Office of Small- and Medium-Sized Enterprises Development (non-profit organization). The office suggested them to create a one-day touring program. The program aims to make tourists familiar with local areas and demonstrate fruit processing. In the afternoon, the tourists could relax or sleep at waterfront pavilions before heading back to Bangkok.

During the COVID-19 pandemic, the farmers at Bang Rak Yai focused more on selling processed fruits and sold such to Bangkok customers since sight-seeing was prohibited by the government's restriction on travelling. Moreover, the farmers reached out to public agencies for support. The group's leader and village headman said that they won the Government Lottery Office (GLO)'s program for social responsibility. Once selected by the GLO, the agency helped the farmers' group by providing packages and labels for the processed fruit, and marketing their activities via the GLO's website and Facebook page. The GLO hired blockers and YouTube reviewers to visit and create a YouTube video, which told the story about

the community and interesting activities. *“During the pandemic, we had a difficult time to adjust. Our weekend market had to shut down because no tourists visited us during the pandemic. Fortunately, we were selected by the Lottery Office to participate in its social responsibility program. We have had groups of tourists coming to visit us at least once a week”* (Interview with the leader of the community-based enterprise, November 19th, 2021).

The farmers in Bang Kra Chao actively collaborated with external actors at national and international levels. In the case of Bang Kra Chao, the farmers' group reached out to high schools and vocational training schools to teach students to do herbal joss stick and printed fabric. Collaboration with outside stakeholders has enabled the Bang Kra Chao farmers to access markets and has provided new services for customers by mobilizing their resources. It has reached out to nationally recognized public and private enterprises to conduct corporate social responsibility (CSR) activities in Bang Kha Chao, such as growing mangrove forests or cleaning up the community. The Baan Thoob Sa Moon Prai (herbal incense) community-based enterprise collaborates with high schools and universities in local areas to exchange knowledge with those institutions and to access high school and university students who want to experience traditional ways of life. The enterprise volunteers to be an educational center for students and tourists and teaches them how to produce herbal incense and printed fabric. Moreover, the group reaches out to corporations and state enterprises in order to initiate sight-seeing and natural conservation programs.

In Sa Wang Ha, the Chak San Sampan community-based enterprise is also another example of active farmer collaboration with outside networks for accessing global markets. The community leader decided to informally establish a group of housewives and began to weave wooden baskets and sold them to shops in the Jatujak flee market in Bangkok. German customers were happy with their craftsmanship and came to see them in Sa Wang Ha, and they began to collaborate and change the manner of weaving from wood to plastic. The group helped German customers find other groups to supply more baskets.

Urbanization affects farmers' incentive to seek external networks. On the one hand, if local farmers are confined by urban communities so that the farmers have a difficult time to reach out to external actors, they are less likely to seek assistance from external networks. Farmers at Suan Pak have been confined by urban residences. They do not have incentive to join external networks. On the other hand, if urbanization comes with transportation infrastructure, peri-urban farmers have incentive to reach

out to external networks for expanding market opportunity. The farmers at Bang Kra Chao and Bang Rak Yai have taken the urban opportunity of transportation infrastructures (i.e., expressways and electric train) to reach out for assistance and market opportunity from urban customers and external networks.

### *Farmers' Adaptation*

The farmers' adaptation can be categorized into three types. First type is called *reducing their production capacity*. Farmers do not have any clear strategy to adapt their production. It is very difficult for them to adapt and decide to reduce their production in the long run. If land is continuously converted to residential areas or subdivisions, they will have to stop growing and harvesting due to higher costs of production. They aim to grow products that are easy to sell in local areas. This group of farmers risks being pushed out of the business in the end since urban residences continue to grow in suburban areas. Suan Pak illustrates the first category of farmers' adaptation. The farmers seemingly accepted that they had to reduce their production capacity and move to other provinces to grow their vegetables.

Reduction of production comes along with the increase of land conversion and the decline of the farmers' network in the area. Several farmers in Suan Pak have moved to other provinces due to land conversion. Thus, the farmers who remain in the community had a difficult time to mobilize production inputs and labor and collaborate with others for adaptation. In addition, they had a difficult time to access to market since their vegetable plot was surrounded by residential subdivisions. "Only do local merchants who know our plot come to buy our vegetables, said the farmers (Interview with one farmer on June 12th, 2018)." Moreover, they did not know their white-collar neighbors, who did not consume their products. The farmers and their neighbors in the subdivisions are strangers to each other.

The second type is called *establishing local groups to mobilize resources and manpower*. Farmers continue to produce agricultural commodities and upgrade them in order to appeal to urban consumers. Nong Chok's farmers are examples of this type of adaptation. They grow and mill rice themselves to sell to local customers. They also sell vegetables and fruit. The farmers create packages for their milled rice and fruit to appeal to customers. They also deliver their products to customers nearby their site. Bang Rak Yai is also categorized in this type of adaptation. The farmers in Bang Rak Yai have upgraded their products by processing their fruit to be fruit snacks for

younger customers. They arrange fruit basket services for special occasions such New Year's or Songkran (i.e., Water Throwing Festival).

At Nong Chok, the group's leader actively seeks new networks from nearby and farther provinces. The group has mobilized and bought agricultural commodities from neighboring provinces. Since the group's members are active participants, the farmers can deliver their products to subdivisions and industrial estates near the community. In the case of Bang Rak Yai, the active members and the group's leaders use Facebook to advertise their processed fruit and deliver their products if the customers purchase in high volumes.

The third type of adaptation is called *changing their mode of production to other products and services*. Farmers upgrade their products in order to appeal to the urban market. The farmers in Sa Wang Ha changed their mode of production from growing rice to weaving baskets. Most of the members are "tenant farmers," and therefore, only growing and harvesting did not provide sufficient income for their households. Worse still, some families have domestic problems, such as family separation or drug addiction within family members. The leader introduced weaving basketry for other farmers in order to increase their income. The farmers then completely changed their mode of production from growing rice to weaving basketry.

Farmers adapt themselves by changing their mode of production from agriculture to "agrotourism services". At Bang Kra Chao, Baan Thoob Sa Moon Prai is an example of farmer adjustment of this type. The group was established 10 years ago when the trend of ecological tourism and agrotourism and corporate social responsibility began to boom among Bangkokians and multi-national corporations. The group provides program for organizations which want to conduct socially responsible activities such as growing trees. The farmers in Bang Kra Chao changed their mode of production from selling fruit to delivering sight-seeing services and socially responsible activities.

Some farmers adapt themselves by providing sightseeing tours to urban consumers. Urban expansion has led to an ecological and agrotourism trend among urban people, and this trend among city people has grown over the years—they want to retreat from the hectic life of the city and take a rest during the weekend in an area near the city. The growth of ecological tourism gives farmers opportunities to adjust from farming to providing ecological and agrotourism services for urban consumers. In Bang Kra Chao, Bang Rak Yai, farmers provide agrotourism programs for Thai and foreign tourists, and

they provide sightseeing tours and overnight home stays. **Table 1** illustrates the variety of farmers' adaptation. Most of the selected farmers establish local groups such as community-based enterprises for mobilizing resources and manpower. Bang Kra Chao's and Bang Rak Yai's farmers have seriously engaged in a change of production mode. Sa Wang Ha also has tried to engage in weaving basketry. As a result, the farmers in those communities are able to access domestic and international markets. Meanwhile, it seems to be difficult for Suan Pak to change its production mode, which limits their access to the local market.

## Discussion

Urbanization contributes to changes in farmers' way of life in developing countries. Urban expansion leads to negative consequences in this regard in terms of production and marketing difficulties. Pollution and increasing temperature negatively affect farmers' production and harvesting. Nonetheless, urbanization also provides opportunities for farmers in terms of market accessibility. Farmers can sell more products to urban consumers in large quantities. Unfortunately, not all farmers are able to adapt their production and marketing amid this urbanization, and some have reduced their production and risk losing their production in the long run. Meanwhile, some have tried to mobilize their resources among their neighbors and communities in order to increase and upgrade their production even though the resources are very scarce. As a result, collaboration with public agencies, private corporations, non-profit organizations, and civil societies is a crucial key for farmers' adjustment.

Farmers who actively engage in changing their mode of production and collaboration with external actors can access domestic and international markets. Bang Kra Chao and Bang Rak Yai are examples of the farmers that have been highly active in adapting to producing new products and delivering agrotourism services. They engage in mobilizing local people to participate in their

new products or services and distribute benefits to the community members. Meanwhile, Sa Wang Ha focuses on producing basketry products for international markets. Regarding ecotourism, both Bang Kra Chao and Bang Rak Yai's ecotourism services focus on sustainability and education. The adaptation to ecotourism with focusing on sustainability, education, and ethics and responsibility is in accordance with Donohoe and Needham (2006), in that local ecotourism services can be successful once they deliver service different from tourism business. However, farmers' adaptation to ecotourism cannot always guarantee the sustainability of the local ecotourism business. Since farmers need mobilization of resources from local community, there can be conflict between promoting ecotourism and natural resource preservation (Das & Chatterjee, 2015).

Networks among farmers, public agencies, private enterprises, and non-profit organizations are important for supporting farmers' adjustment. Farmer adjustment plans should be included in city strategic plans for enhancing opportunities to access markets. The city can be a "connecting point" between farmers in their vicinity and local and international markets. Further, policymakers at the city level can open public space for farmers to exhibit their products and to access customers at all levels. In other words, the city can become a "market match" between farmers and customers. Additionally, the city can support farmers' adjustments in terms of communication technology so that local farmers can use communication to access customers at both local and international levels.

City expansion is associated with a variation of farmers' adaptation choices. Such depends upon how city expansion affects social and ecological structures of farmers' communities, and, also, how city expansion affects the environment and social structure of farmers' communities, which farmers depend upon for mobilizing resources and labor and collaboration of community members. City expansion comes along with variation of social and ecological changes. In some areas, the city expansion leads to absolute decline in farmers' network, difficulty in access to market, and distant relationship among community members. Farmers are discouraged to

**Table 1** Farmer Adaptation

Group/ Farmer Adaptation	Reducing their production capacity	Establishing local groups to mobilize resources and manpower	Changing their production modes to other products and services		
			Agro-tourism service	Products	
1. Nong Chok District		•			
2. Bang Kra Chao		•	•	•	
3. Suan Pak	•				
4. Bang Rak Yai		•	•		•
5. Sa Wang Ha		•		•	

adapt and choose to reduce their production. In other areas, the community structure and network does not severely decline. Moreover, the expansion of public transportation encourages farmers access to markets and collaboration with external actors. Thus, farmers can mobilize resources and collaboration of community members for changing mode of production and delivering new services for urban consumers. The farmers choose to upgrade their products and deliver agricultural or ecological tourism, which depends upon their particular environment and products in their local areas. The adaptation of farmers in Bangkok suburb is similar to farmers in other areas. Rigg (2019) argues that farmers in the northern part of Thailand adapt to off-farm work and activities in order to increase their income while they face the fluctuation of commodity prices. Farmers in developed countries increasingly adapt to deliver tourism services by appealing to exotic experience of countryside and agricultural tourism (Kubickova & Campbell, 2020) while they use the opportunity to sell their commodities. Therefore, government support for farmers' adaptation programs such as food governance or local tourism should not formulate universal programs for all peri-urban areas, but the government should facilitate particularity of local programs and bottom-up and participatory program-making by local actors. The bottom-up and participatory program-making of local farmers' adaptation can contribute to the debate on sustainable food governance, which encourages inclusiveness and participation of local actors.

Leadership is one of the significant factors which encourage (or discourage) farmers to adapt. Even though the farmers in selected communities face the decline of network or participation among community members, some farmers' groups can mobilize resources from groups' members and collaborate with external actors. The leaders of those groups significantly play roles of mobilizing resources from local communities, initiating and planning the tourism programs, and seeking markets outside communities. Meanwhile, weak leadership can discourage farmers from changing their mode of production such as farmers' groups at Suan Pak. It illustrates that farmers' adaptation still depends upon strong leaders since such leaders can mobilize and allocate resources, coordinate community members for support, and collaborate with stakeholders for access to markets. Due to a decline in farmers' network, low level of trust, and distant relationship among community members, strong leadership becomes a necessary condition for efficient mobilization of resources and collaboration with community members and external actors.

## Conclusion and Recommendation

Collaboration among farmers, public agencies, private corporations, and civil societies encourages sustainable development. As equal partners, farmers can participate in the adjustment process and determine their course of production and market access. Public agencies and private corporations are able to participate in local development and better understand farmers' needs. The local community development process can be more inclusive and responsive to local people's needs, and the process can be more accountable since farmers and local people can participate in the decision-making process

Participatory policy-making process encourages local farmers and community members to initiate and allow them to collaborate with external actors. The government agencies facilitate local farmers and link them to external actors who are interested in investing in farmers' adaptation programs. The government agencies can encourage farmers by promising those farmers' groups to increase budget, technical assistance, and market opportunity if they are able to develop a plan for adaptation, encourage local community members to participate in the program, and seek collaboration with other actors outside communities. The government can encourage public and private agencies by tax reduction program. If those agencies collaborate with farmers for adaptation and invest in farmers' adaptation program, the government will promise to reduce taxes for those agencies.

However, this paper has limitation in that it does not explore some conditions that can be associated with the variation of farmers' adaptation along with city expansion. First, cultural background can play an important role in encouraging farmers' adaptation. In spite of increasing city expansion, some local communities in suburban areas continue to preserve their traditional activities in everyday life. Farmers can deliver cultural tourism by promoting traditional activities as one of the tourism programs. Second, religiosity can play a role of mobilizing resources and labor and collaborating with external actors whose religion is the same as farmers. In some communities, the members are connected by religion, so they are engaged in the community's activities. Due to religious commitment, the leaders are able to mobilize resources from a local community and appeal to community members to participate in the new modes of production and service.

Since the role of public agencies and private business on rural communities is important, the impact of

collaboration with public and private agencies should be examined in terms of how investment and assistance from public and private agencies can help farmers and local communities to improve their production and deliver new service for sustainability. Future research can be conducted in terms of examining the variation of public and private agencies' role in farmers' adaptation by comparing the roles of public and private agencies in different farmers' communities.

## Conflict of Interest

The authors declare that there is no conflict of interest.

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