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Farm Owners' Perception toward Farmland Conversion: An Empirical Study from Indonesian Municipality

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Malang Municipality, the second-largest municipality in East Java Province, has a role as an education and business growth pole. The increasing housing and public service demands in the area correspond with the population growth. It then triggers agricultural conversion, which is predicted to be fully converted in 2024 without any control measurement. Therefore, farm owners have an essential role in agricultural land use. The present study aimed to identify the factors that affect farm owners' decisions in converting their lands. This study employed correlation analysis to determine the factors influencing the degree of intention to convert farmers' farmland to settlement. This present study addressed farmland conversion intention, socio-economic factors of farm owner, land use condition, and spatial regulation based on farm owners' perception. The results showed that the degree of farmland conversion corresponded with the importance of the variable to land conversion. This study demonstrated that farm owners' perceptions were important and had an essential role in farmland conversion. Moreover, the upcoming regulation should address farm owners' perception along with tangible variables, such as total income.

Keywords: land use, settlements, farmland conversion, farm owner, farm owner's perception.

Introduction

Urban population growth will affect housing demand, public facilities, and infrastructures. The urban area has limited vacant space and affects the land price increase, especially urban centers or CBD. Therefore, low- to middle-income families are likely to move to suburbs, which have a more affordable price (Turner, 1998). In selecting housing location, residents consider accessibility, environment, and rental fees of the house or land (Harvey, 1996). Public service development will then follow and grow where new settlements grow.

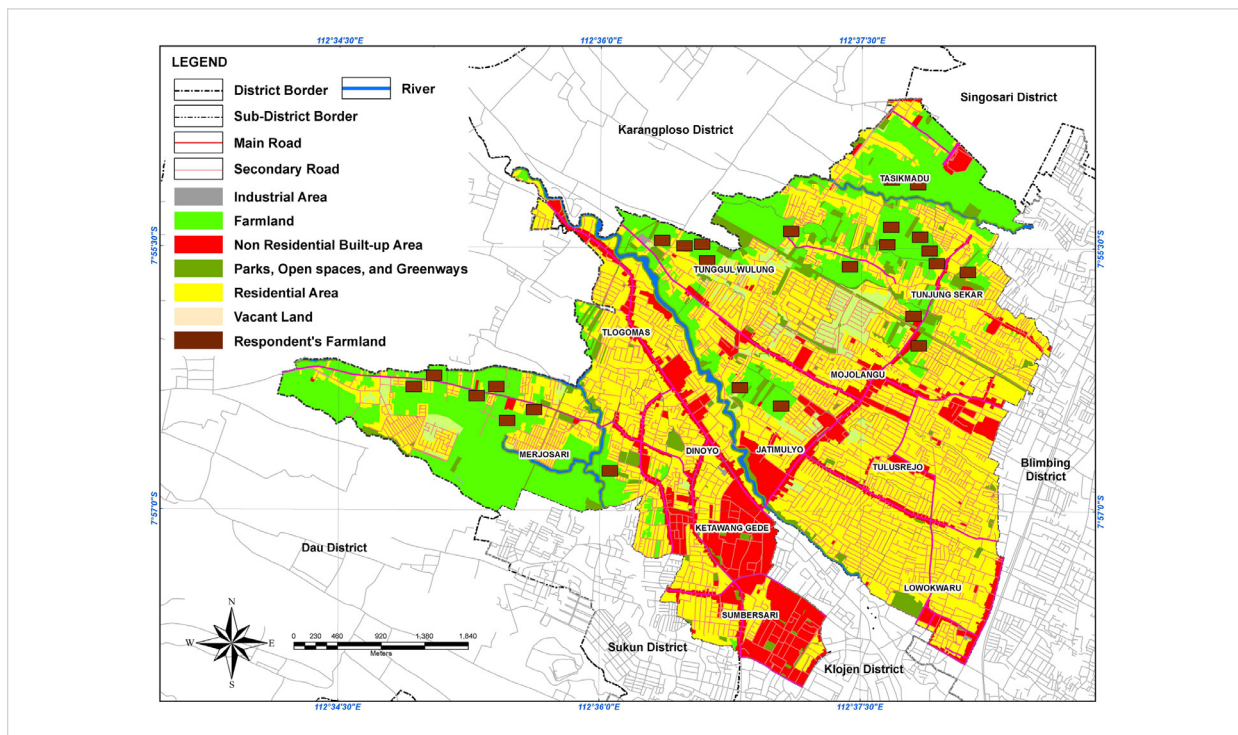
The uncontrolled suburban development will trigger uncontrolled urban land conversion, urban sprawl, and environmental issues (Simon, 2008), where suburban is dominated by farmland. According to the Regional Spatial Plan, Malang Municipality, a big-sized municipality in East Java Province, consists of vast farmland prone to urban sprawl (Walikota Malang, 2011). Farmland in the peri-urban has a multifunctional system beyond, for instance, food production, nature conservation, and recreational value (Ives & Kendal, 2013; Zasada, 2011).

Preserving farmland in the urban area enables the promotion of sustainability in the urban area (Sanyé-Mengual et al., 2019). Also, it promotes healthy social interaction in the urban area by reducing the distance between producers and consumers (Carolyn et al., 2016).

The farmland conversion process can be performed by farmers who own the land (Irawan & Friyatno, 2002). Farm owners and governments hold an essential role in controlling land use and farmland conversion by implementing spatial regulation. Farmland conversion is influenced by economic, social, behavior changes, relationships between owners and the land, land divisions, and farmland conversion control regulation. However, the study in farm owner's perception regarding farmland conversion is limited (Hidayat, 2018). Farmland conversion in the suburban area will thus elicit environmental problems and rapid conversion (Pribadi & Pauleit, 2015; Pribadi et al., 2018).

Preserving farmland for sustainable food production has been an amendment to local governments. Yet, according

Fig. 1. Land use map of Lowokwaru District and respondents' farmland location



to the provincial spatial plan of East Java, Malang Municipality as growth pole development of East Java Province has no obligation to preserve any farmland. Instead, the municipal government tends to control farmland conversion to balance the environmental and municipal development. This present study aims to understand the role of farm owners in farmland conversion. Farm owners hold the authority of the land, and each of their decisions will affect the land use (Hidayat, 2018). This study discusses the farm owners' perception of land-use conversion, particularly in the growth pole and big-sized municipality.

Case Study Area

The case study area of the present study was Lowokwaru District, Malang Municipality, East Java, which comprised 12 sub-districts. Most of the district area was built-up areas (69% or 1,578.176 ha). Meanwhile, the residential areas and public facilities accounted for 53% and 47% of the built-up area, respectively. Lowokwaru District is the most populous district in the Malang municipality (22,72%). The Statistic of Malang Municipality (2019) reported that 196.793 inhabitants settled in this district. In comparison, the farmland conversion accounted for 77 ha in the last three years (2016-2018); thus, Lowokwaru District has lost 6,74% of its farmland (BPS 2019). Figure 1 presents the current condition of the district.

The "non-agricultural" land-use types dominated the land-use area in Lowokwaru District in 2014-2018, which amounted to 86% or 1.935 ha, while the agricultural land use size was 247 ha (BPS, 2019). Farmland in Lowokwaru District would be converted faster than the government projection due to the population growth and the rapid housing development (Harisandy et al., 2018).

Literature Review and Method

Literature Review

Urban area development in Asian countries started in the 1970s (Sui & Zeng, 2001). It turned periphery areas into urbanizing rural-urban interfaces within the municipality administrative boundary. Periphery is characterized as a farm area and has low density (Lange et al., 2013; Yagi

& Garrod, 2018). The farmland is prepared for a built-up area to accommodate urban activities, including housing, infrastructure, and public services. Unequal development, however, will spur social conflict (Winarso et al., 2015). The conversion must consider environmental health and landscape; otherwise, it will raise environmental, socio-economic, and landscape issues (Antrop, 2004; Pribadi et al., 2018; Simon, 2008). Thus, farm conversion and land-use change for spatial development are required to be firmly regulated.

Agricultural land and its activities in the urban areas produce food and contribute to urban open and green space (Dubbeling et al., 2009). To promote urban agriculture's multifunctional benefits, policy and spatial planning are necessary (Lovell, 2010), which would be the key to sustainability in urban areas.

Meanwhile, spatial planning gives guidance for spatial development, which is characterized by uncertainty and conflicts around it (Faludi, 2000). Spatial planning needs to be synchronized with other development planning documents (Firmansyah, 2018), which helps the stakeholders and people to understand the land use and development. Spatial planning contributes to sustainable developments (Krellenberg et al., 2019), and government regulation on spatial planning affects farmers' motivation for farming (Aprildahani et al., 2018).

Farming and farm owners stand between rapid urbanization and natural landscape maintenance. Farmer and farm owners rely on their livelihood. At the same time, rapid development affects agricultural production due to environmental degradation. Farmers thus concern environmental and ecological conditions in the farming business (Aprildahani et al., 2018). Therefore, investigating farm owners' cognitive behavior and perception gives a better understanding of how land conversion occurs (Aprildahani et al., 2018; Hidayat, 2018). The farm owners' responses tend to vary depending on their behavior and perception.

Variables

This study employed eight independent variables derived from Hidayat (2018) and Harvey (1996), which were based on farm owners' perceptions. The variables were the income of the agricultural sector (X1), the agricultural capital (X2), the availability of successor (X3), the distance of farmland to the road (X4), the distance of

land to the settlement (X5), the farm size (X6), the easiness of land conversion permit (X7) and the respondents' knowledge of the regional spatial plan (X8). This study's dependent variable was the response to farmland conversion. The present study aimed to capture how respondents perceived the variable. We asked this question to the respondent: "In what degree (the independent variables) affect your decision to convert your farmland?" The answers were in the form of a five-point Likert scale ranging from 1 (not affecting the farmland conversion decision at all) to 5 (very affecting the farmland conversion decision).

The degree of farmland conversion intention also became the dependent variable. We asked the following question to the respondents: "In what degree is your farm conversion intention in the next 20 years?" The answers were scored using a five-point Likert scale ranging from 1 (have no intention to convert the farmland) to 5 (very strong intention to convert the farmland). We consequently can understand the farmland's future condition based on farm owners' perspective by asking the question.

Respondents

The respondents of this study were farm owners. To determine the number of respondents, this study was conducted in two steps due to a lack of secondary data availability. The first step was conducting the random sampling technique on several farmers using Yamane's formula (1967). The population was 818 farmer households, from which we then randomly selected 90 respondents.

Then, the second step was selecting farm owners out of the 90 respondents from the first step. The samples were deliberately chosen based on these specific criteria: they were farm owners and have currently lived in the case study area. Consequently, they have a strong sense of place and place attachment than the others, since the sense of place affected the behavioral intention (Masterson et al., 2017). Eventually, we identified 25 farm owners residing in the case study area.

Analysis

This study utilized Spearman's rank correlation analysis which can draw a correlation between farm owners' perspective and land conversion. The data of the study were parametric and non-parametric inferential statistics. The non-parametric inferential analysis techniques

were employed to analyze the sample data, and the results were applied to the population (Sugiyono, 2013).

Reliability and Validity Test

a Validity test

The validity test aims to prove that data can be trusted according to reality; then, the instrument can be eventually used as a measurement (Sugiyono, 2013). Validity shows the accuracy level of the data obtained from the field survey. This present study, therefore, employed the face validity test. The face validity test has been used in psychological-related studies (Connell et al., 2018) and is based on researchers and spatial planning experts' judgments. We conducted discussions to assess the questionnaire and data, which then passed the validity test.

b Instrument Reliability Test

Reliability tests can find out whether the data collection tool shows the level of accuracy, stability, or consistency in expressing specific symptoms (Sugiyono, 2010). Reliability represents the degree of data consistency. Reliability thus aims to assess consistency in objects and data, whether the instrument used several times to measure the same item will produce similar data. This study employed Cronbach's alpha coefficient method. The data passed the reliability test's minimum score (0.7) with Cronbach's alpha of 0.928.

c Determination Coefficient Test

This present study employed Spearman's rank correlation test to investigate the correlation among variables. The coefficient calculation results could be interpreted based on Table 1 to observe the strength of the relationship between the independent and dependent variables. The correlation analysis results were used to describe how strong the level of relationships among the variables

Table 1. *The interpretation of Spearman's rank correlation value*

Value	Interpretation
0.00 – 0.199	Very weak
0.2 – 0.399	Weak
0.4 – 0.599	Average
0.6 – 0.799	Strong
0.8 – 1.00	Very strong

Source: (Sugiyono, 2010)

is. Interpretation provided by Spearman's rank correlation coefficient was presented in Table 1 (Sugiyono, 2010).

Result and Discussion

Demographics of the Respondents

The present study on the role of farm owners in farmland conversion made farm owners the main object. The respondents of the present study had various characteristics as well as educational and economic backgrounds. Male farm owners had a higher share of respondents than female farm owners (21 respondents or 84%). Female farm owners only accounted for 16% of the total respondents. It implies that farm owning was dominated

by males, while females were allowed to own farmland. They commonly inherited the land from their parents. There was no evidence to support those female farm owners actively expanding their farms during the survey. They tended to continue farming due to cultural and economic reasons. Their spouse assisted them in running the agricultural business.

The age range was grouped into five classes. Farmers with the age range of 41-50 years dominated with nine people. Meanwhile, there were three farmers in the age range of over 70 years. The respondents' educational level categories were also varied, ranging from elementary to Bachelor's degree. Respondents with elementary level were prominent with ten people. Meanwhile, junior high school level was the fewest group, with a total number of three people. Moreover, the high school, Associate, and Bachelor levels had four people per group.

Table 2. *The demographics of the respondents*

Demographics	N	Demographics	N
Gender		Age	
Female	4	31-40	2
Male	21	41-50	9
Education		51-60	5
Elementary school	10	61-70	6
Junior high school	3	>70	3
Senior high school	4	Income (Indonesian Rupiah/IDR)	
Associate degree	4	< Rp2,500,000	10
Bachelor's degree	4	2,500,000 – 3,000,000	2
Main occupation		3,000,001 – 3,500,000	3
Fulltime farmer	12	3,500,001 – 4,000,000	5
Government employee	3	4,000,001 – 4,500,000	1
Entrepreneur	10	4,500,001 – 5,000,000	1
		> 5,000,000	2

Compared to the other income classes, farm owners' income in the first class (less than 2,500,000 IDR) was the highest. Farm owners who had an income of more than 5,000,000 IDR were entrepreneurs and government employees. Figure 1 illustrates the location of respondents' farmland. Based on the survey, 72% of the respondents' land locations were close to the road, while 84% were

close to the existing settlements. This condition is likely to encourage the farm owners to sell or convert their farmland (Hidayat, 2018; Prayitno et al., 2018).

Land-use Change

Land demand for development in Lowokwaru District has been projected by Harisandy et al. (2018). The

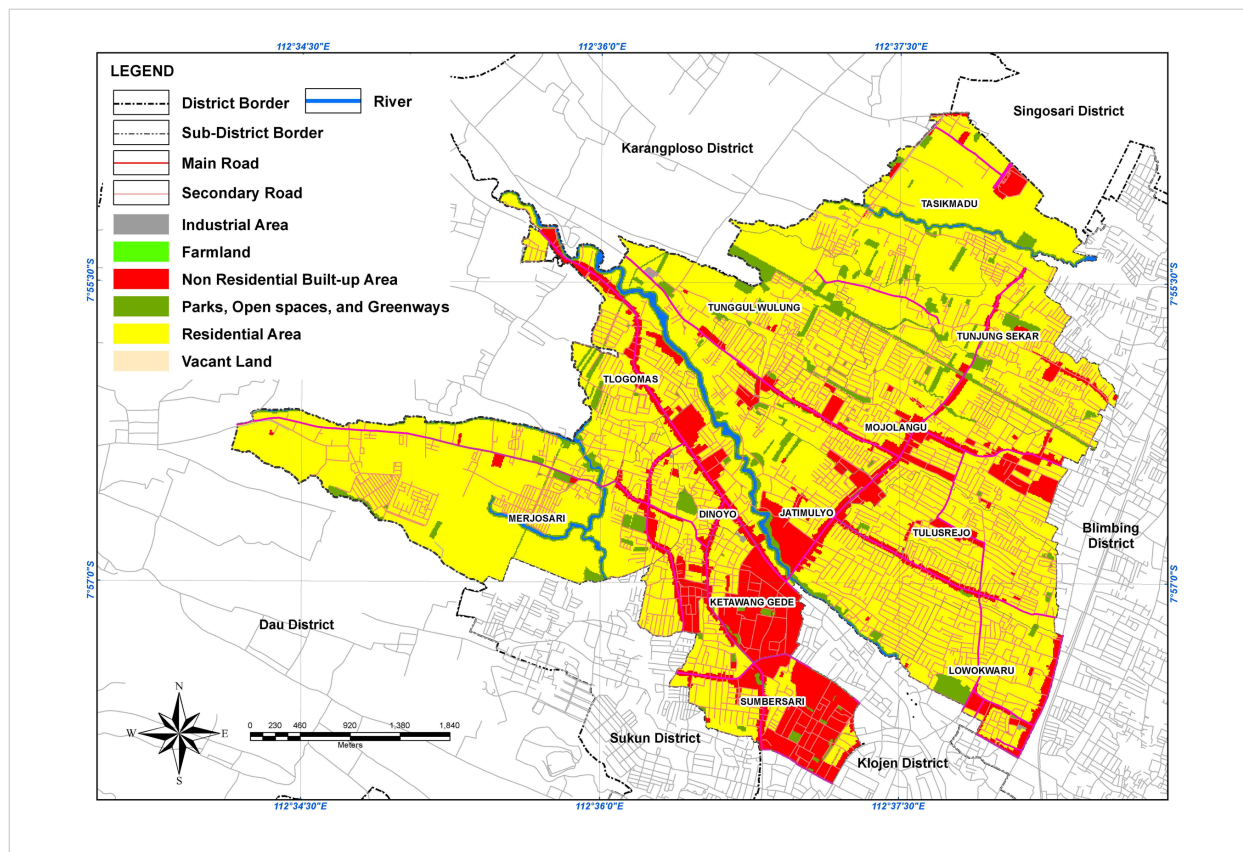
prediction considered the population growth and the residential land necessities that affect settlements' needs for the next 20 years. Lowokwaru District requires 1,433.6 ha of land to meet the residential projections in 2035, whereas the available land is only 595.23 ha. Lowokwaru District will experience a shortage of residential land even before 20 years.

In 2035, only 12,60 ha of the farmlands are available (Walikota Malang, 2011). This agricultural land is included in the other allotment spatial pattern plan. Meanwhile, according to the prediction of settlement growth based

on the population growth rate, the farmland in Malang Municipality will be depleted in 2024. By comparing the results of Harisandy et al. (2018) on the prediction of land use, the agricultural land conversion, and the spatial planning document, the agricultural land, which was initially a reserve for settlements, will run out more rapidly.

Figure 2 illustrates the land use projection of Lowokwaru District in 2024. Compared with Figure 1, the settlements in Lowokwaru District proliferated. The agricultural land locations of the 25 respondents in the present study indicated that the lands closer to the road or the existing

Fig. 2. The land use prediction of Lowokwaru District in 2024 (Harisandy et al., 2018)



settlement were likely to change earlier than the lands farther from the road.

Farm Owners' Perception

The majority of farm owners had the intention to convert their farmlands, with around 72% of total farm owners

having strong and very strong intentions to convert their farmlands. Furthermore, their intention also corresponded with the conversion time frame. During the interaction with the respondents, they stated that strong intention means they wanted to convert their farmland sooner and vice versa. However, their intention did not

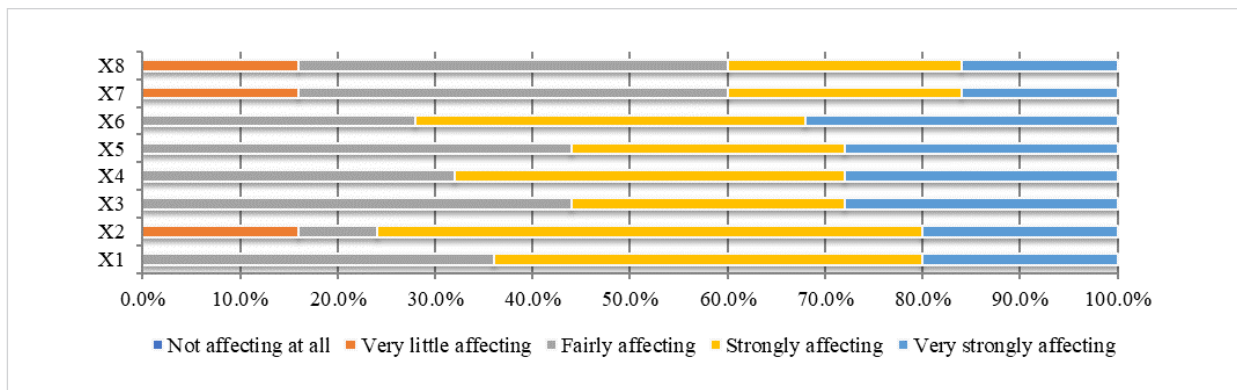
correspond with the firm plan. They did not have a firm plan that leads to actual decisions.

Approximately 28% of the respondents answered a fair degree of farmland conversion. It implies that they considered converting their farmland while doing farming. They could convert their farmland whenever they had a good reason to do it, such as receiving good offers from a housing developer agency. The farm owners claimed that the case study area was preferable for developing the new settlement. This district was also designed to

accommodate urban expansion, particularly for settlement (Walikota Malang, 2015).

Figure 3 displays the respondents' answers to the questionnaire. The respondents' responses ranged from "fairly affecting" (rank 3) to "very strongly affecting" (rank 5), almost in all variables except agricultural capital, easiness of land conversion permit, and respondent's knowledge of the regional spatial planning. Around 18% of the respondents answered: "very little affecting" (rank 2) for each of these variables.

Fig. 3. *The respondents' answers*



It was revealed that 56% of the respondents stated that the agricultural capital (X2) variable had a very strong influence on farmland conversion decision, in which the farming capital was strongly influenced by the results of farming income. Farmers' capital depends on the previous yield price for the next farming cycle. Furthermore, according to their opinion during a short interview, the respondents believed that the farming capital required in urban areas was higher than in rural areas due to several arguments. Firstly, the availability of agricultural production facilities in urban areas was limited. Therefore, it encouraged farmers to buy things at the more distant places (Malang Regency) with additional transportation costs. Consequently, the available agricultural production facilities in urban areas had high prices, which, in turn, increased the capital needs for farming. Secondly, farmers felt the government provided less attention to improve agricultural production. Thus, farm owners were reluctant to continue if there was any opportunity to switch professions.

Most farmers (44%) stated that the availability of successor (X3) fairly affected the farmland conversion decisions.

The rest of the respondents stated the variable strongly to very strongly affected the farmland conversion decision. According to the respondents' characteristics, this area mostly had aging farmers. This condition could encourage them to start thinking about the future of their farming business. Therefore, the availability of a successor was an essential factor in determining the future of their farmland.

Approximately 40% of the respondents answered that the distance between farmland and road (X4) affected their farmland conversion decision. Simultaneously, the respondents with "fairly affecting" and "strongly affecting" answers were as many as 32% and 28%, respectively. According to the farmers' opinions, the farmland distance to the road corresponded with the land price and value. The distance to road corresponds with land accessibility, which has a significant role in land development, mainly housing and business activities in Malang Municipality. The accessibility is important for the farmers, land development agencies, and business entities. Housing and culinary are currently booming due to the growing population and turning into prominent issues (Adrianto

& Ravetz, 2020; Wikantiyoso et al., 2020). They surely require vacant (e.g., farmland) land for new buildings. Indirectly, this condition creates farmland conversion demand that affects farm owners' behavior.

The land's distance to the existing settlement (X5) factor has a role in the farmland conversion. Farm owners who answered "strongly affecting" and "very strongly affecting" accounted for 28% of each option. Approximately 44% of the respondents answered: "fairly affecting". Based on the field survey and respondents' opinions, agricultural land located close to the settlement would experience land conversion quicker than those far from settlements because agricultural activities were disrupted by land use, such as waste pollution, microclimate change, and radiation. These conditions thus encouraged farmers and farm owners to convert the land. Besides, the environment also influences land use. The influence of surrounding land use also encourages agricultural farm owners to conduct land conversion (Harvey, 1996).

Approximately 40% of the total respondents answered that farm size (X6) affected land conversion. Farm owners in Indonesia are smallholders, and they complained that yields were deemed unprofitable. The economic aspect is an important factor in determining smallholder farmland's agricultural activities (Wickramasinghe et al., 2014). Rather than getting simultaneous lose, farm owners tend to abandon farming activities altogether (Ismail et al., 2015). Therefore, farmland conversion aims to maximize the benefits.

The ease of permission to convert land (X7) was dominated by the "fairly affecting" answer with a percentage of 44%. Approximately 40% of the respondents answered "strongly affecting" and "very strongly affecting". It implies that government regulation regarding land conversion must address this issue more seriously because

farmland converting permission is relatively easy. Moreover, farmland in the urban area is designed for the built-up area. However, protecting farmland as the natural landscape of the urban area will provide a healthy environment. In consequence, the conflicts between farmland and urban land use emerge. The government argued that Malang Municipality is a non-agricultural city. Yet, even when the government establishes a counter measurement to reduce farmland conversion, rapid changes still occur (Wagistina & Antariksa, 2019).

For spatial knowledge (X8), 44% of the respondents chose "fairly affecting." About 16% of the respondents responded that spatial knowledge did not affect their intention to convert their farmland. Farm owners had various levels of understanding regarding spatial planning, and some of them still had no idea about the spatial documents and the direction of spatial patterns that have been determined for their areas. The government has disseminated the spatial plan to Malang residents, yet this result demonstrated that the disseminating process was not entirely successful.

Spearman's Rank Correlation Test

a Income

Income in this study refers to the earnings coming from agricultural activities. The majority of farm owners (44%) considered that the agricultural sector's income would influence their decision to convert their agricultural land into other land uses, including converting the land into settlements. Table 3 represents the correlation coefficient of the Spearman's rank correlation test, which is 0.705 and significant at the level of 0.01, which implies the criterion of a strong correlation strength level between the farm owner's income level and the response to land conversion.

Table 3. The Spearman's rank correlation test of farm owners' income and response to farmland conversion

		Income	Response to Land Conversion
Income	Correlation Coefficient	1.000	0.705**
	Sig. (2-tailed)	.	0.000
	N	25	25
Response to Land Conversion	Correlation Coefficient	0.705**	1.000
	Sig. (2-tailed)	0.000	.
	N	25	25

Hidayat (2018) argued that food commodities are less elastic to income than the demand for non-agricultural commodities in general. Consequently, the economic development leading to the increase in income tends to generate a higher demand for off-farm activities than agricultural activities. According to Farah et al. (2019), agricultural activities in urban areas are no longer able to make a better living standard. Farm owners instead conduct non-agricultural work to meet the living needs of their family members. Nonetheless, the concept of urban farming is still less popular. However, the aim is to maximize the utilization of agricultural and vacant lands available in the cities to produce agricultural products.

Wickramasinghe (2014) employed the return on asset (RoA) analysis in his study, indicating that some countries with high agricultural assets experienced a negative trend toward the results of agricultural commodities in the range of 2004-2012. Income from farming was not

one of the causes of the farm owners' dissatisfaction. Instead, macroeconomic factors affected the land-use change. The increase in built-up land mainly comes from converting arable land for economic development purposes (Li et al., 2016). Thus, farm owners saw that the land value was greater than the income earned from farming activities.

b Agricultural Capital

56% of the farm owners considered that agricultural capital would influence their decision to convert their farmland into other land uses, including converting farmland into settlements. The results revealed that agricultural capital had a significant correlation with the response to land conversion (0.651) at the level of 0.01, which indicates a strong correlation between them. This correlation was bidirectional, implying that these variables affected each other.

Table 4. *The Spearman's rank correlation test of farm owners' agricultural capital and response to farmland conversion*

		Agricultural Capital	Response to Land Conversion
Agricultural Capital	Correlation Coefficient	1.000	0.651**
	Sig. (2-tailed)	.	0.000
	N	25	25
Response to Land Conversion	Correlation Coefficient	0.651**	1.000
	Sig. (2-tailed)	0.000	.
	N	25	25

Lack of agricultural capital becomes the determinant of agricultural activities' sustainability (Wickramasinghe et al., 2014). Individual and smallholder farm owners have faced capital difficulties since agriculture requires enormous investment to get superior results to reach the broad market. Then the farm owners will start considering that agriculture did not have good prospects. Therefore, the central government is willing to increase agricultural investment to improve such conditions (National Ministry of Development Planning, 2019).

Furthermore, the correlation between these variables was significant. They had a significant relationship at the level of 0.01. Farm owners considered that the money spent on initial capital could not provide more substantial profits. The large farming capital needs and the limited profits then became the rationales they converted

the land. The result demonstrated that lack of capital stopped the farm owners from engaging in agricultural business and inspired farmland conversion. Therefore, the agricultural subsidy is vital to sustaining the agricultural business (Wirakusuma, 2020)

c Availability of Successor

Based on the survey results, 28% of the farm owners considered that a successor's availability would significantly influence their decision to convert their agricultural land into other land uses. The result was indicated by Spearman's rank correlation coefficient that was 0.398 and significant at 0.05 level. It implies that these variables had a low correlation.

The declining number of young people in the agricultural sector creates issues in the regeneration and raises

Table 5. *The Spearman's rank correlation test of availability of successor and farm owners' response to farmland conversion*

		Successor	Response to Land Conversion
Successor Generation	Correlation Coefficient	1.000	0.398*
	Sig. (2-tailed)	.	0.049
	N	25	25
Response to Land Conversion	Correlation Coefficient	0.398*	1.000
	Sig. (2-tailed)	0.049	.
	N	25	25

concerns about losing valuable skills and knowledge when the older and experienced people leave this sector (Koppert et al., 2015). The children of Indonesia's farming household are reluctant to be involved in agricultural activities (Hariadi & Widhiningsih, 2020; Santoso et al., 2017; Widiyanti et al., 2020). Indeed, the farm owners' children will inherit the farmland, yet it does not guarantee them also to become farm owners. From the previous explanation, the relationship between land conversion and future generation's existence was low, but future generations can be one of the significant drivers of land-use change in urban areas.

The analysis based on farm owners' perception implies that farmers without successors were more likely to convert their farmlands. Studies on young farmers were mainly conducted in rural areas, while the present study provided evidence that a similar problem also occurred in urban agriculture. Furthermore, non-farming job opportunities are widely available in urban areas. These

opportunities contribute to the declining number of farmers' children engaging in agricultural activities.

d The Distance of Farmland to the Road

As many as 28% of the farm owners considered that the distance between farmland and road would significantly influence their decision to convert their agricultural land. Table 6 demonstrated that the location of land to the road and the response to land conversion had a significantly strong correlation (0.768) at the 0.01 level.

Road influences a new settlement's growth since it is an essential infrastructure to support settlement activities and accessibility. Farmland conversion likely happens in the locations that offer better accessibility, mainly road availability. The distance between land location and road would affect accessibility. Thus, the locations closer to the main road is likely to increase the land value (Suharyanto et al., 2017). Also, farmlands located at the second line have a lower value than the first line (beside the road).

Table 6. *The Spearman's rank correlation test of the distance of farm to the road and farm owners' response to farmland conversion*

		Location of Land to Road	Response to Land Conversion
Location of Land to Road	Correlation Coefficient	1.000	0.768**
	Sig. (2-tailed)	.	0.000
	N	25	25
Response to Land Conversion	Correlation Coefficient	0.768**	1.000
	Sig. (2-tailed)	0.000	.
	N	25	25

Unfortunately, the development of urban infrastructure has scraped irrigation land (Asadi et al., 2016). The infrastructure will stimulate the growth of settlement support facilities and the expansion of settlement areas, yet the

uncontrolled expansion will induce urban sprawl. Therefore, road networks and agricultural land conversion have a significant attachment to land changes. Road infrastructure development eventually inspires the farm owners in

the rural areas to convert their farmland due to the increasing land value (Prayitno et al., 2018).

A previous study based on satellite imagery found that road networks and road hierarchy were the determinant factors of built-up area growth (Harisandy et al., 2018). The present study, focusing on farm owners' perceptions, demonstrated a similar result, which implied a strong correlation between farmland conversion intention and the farmland distance to the road. Farmland closer to the road was more likely to be converted by the farmers. Converting farmland thus allows the farmers to have various non-agricultural job opportunities, such as store and rental homeowners. Besides, the lodging house business in Malang Municipality provides promising yield by only utilizing small land parcels (Rahmawati, 2018).

e Location of Farmland to the Settlement

The survey results revealed that 28% of farm owners considered that the land located near the settlement would significantly affect their decision to convert their agricultural land. The Spearman's rank correlation value was 0.642 and significant at the level of 0.001. It implies that the location of the existing settlement would affect farm owners' response to land conversion. The farmland located approximately 100 meters from the nearest settlement is more likely to turn into a built-up area (Chairunnisa et al., 2019). Such pressure has affected farm owners' behavior, which is explained in this present study's finding. The result demonstrated that farm owners considered the distance to the nearest settlement would affect their conversion intention.

In Indonesia, agricultural land experiences a decline in fertility and soil damage and has a decrease in productivity, especially in the rice field intensification caused by pollution from the surrounding activities (Wahyuni,

2018). Settlement areas produce domestic waste and pollute the surrounding farmlands (Hasibuan, 2016). As a result, environmental degradation occurs and disturbs agricultural production, which later affects farm owners' income.

Environmental degradation was not solely the reason behind the farm owners' intention. The growing population also affected the housing demand. Housing developers and even residents tend to find space that is located close to the present settlement due to infrastructure availability. Besides, infrastructure availability is the best consideration in investment since it affects the land price and land value escalation for the built-up area. Therefore, the increasing land price and environmental degradation threat were the reason behind the farm owners' behavior.

f Farm Size

Approximately 28% of the farm owners considered that land area would significantly influence their decision to convert their agricultural land into a built-up area. The significant Spearman's rank correlation test showed that the perception of farm size significantly affected farmland conversion intention (0.398) at the level of 0.05. Table 8 presents that the correlation was relatively weak, indicating that farm size influenced conversion intention along with income and agricultural capital.

The majority of farm owners in Indonesia are smallholder farmers, and they rely their income on the farming business. When farmlands produce low yields, the income will be disrupted. Furthermore, farm size corresponds with agricultural activities options. Farm owners with wider farmland can cultivate diverse crops or proportionally cultivate the farmland to sustain their income. Conversely, farm owners with narrower farmland have limited options. Rather than suffering from continuous

Table 7. The Spearman's rank correlation test of the distance of land to the settlement and farm owners' response to farmland conversion

		Location of Land to Settlement	Response to Land Conversion
Location of Land to Settlement	Correlation Coefficient	1.000	0.642**
	Sig. (2-tailed)	.	0.001
	N	25	25
Response to Land Conversion	Correlation Coefficient	0.642**	1.000
	Sig. (2-tailed)	0.001	.
	N	25	25

Table 8. *The Spearman's rank correlation test of farm size and farm owners' response to farmland conversion*

		Farm Size	Response to Land Conversion
Farm Size	Correlation Coefficient	1.000	0.398*
	Sig. (2-tailed)	.	0.049
	N	25	25
Response to Land Conversion	Correlation Coefficient	0.398*	1.000
	Sig. (2-tailed)	0.049	.
	N	25	25

loss, smallholder farm owners tend to quit farming by converting their lands. Therefore, farm owners' perception of farm size significantly corresponded with farmland conversion intention in a weak correlation.

g Easiness of Land Conversion Permit

About 16% of the farm owners considered that the ease of obtaining farmland conversion permission would significantly influence their decision to convert their farmland. Table 9 demonstrated that Spearman's rank correlation coefficient produced a significant correlation (0.465) at the level of 0.05. It implied a medium correlation strength level criterion between the level of easiness of land conversion permit and farm owners' response to land conversion.

Government attempts to regulate and control farmland conversion. Therefore, farmland conversion should follow a strict procedure stipulated in the regulation of the National Land Agency of the Republic of Indonesia no. 2 of 2011 (BPN, 2011). Farmland with specific functions such as conservation, heritage value, and food security are forbidden to be converted. The Presidential Regulation no. 59 of 2019 (President of Republic Indonesia, 2019) on controlling agricultural land conversion assigns the specific farmland to be sustainable agricultural land

for food security. Malang Municipality, however, has no obligation to maintain sustainable agricultural land. Yet, the municipality aims to preserve the existing farmland.

The result indicated that farm owners considered land conversion permit procedures when converting their farmland. The easier procedure was favorable for the farm owners, but it would put the environment in danger. The easy procedure allows farm owners to have diverse farming options that offer better income, such as converting the land into a boarding house (Rahmawati, 2018).

Population growth affects housing demand; therefore, the ease of issuing conversion permits should be applied appropriately. Tightening the conversion permit procedure, however, is not an ideal solution. Instead, the government should tightly regulate the issuing of farmland conversion with regional spatial planning as the main tool. Alternatively, government leaders' influence effectively controls the conversion and promotes sustainable development (Chen et al., 2019) because the government leaders are usually indigenous people who have a strong sense of place. They have an emotional attachment to the municipality and make any effort to make the municipal a better place for the residents.

Table 9. *The Spearman's rank correlation test of the ease of land conversion permit and farm owners' response to farmland conversion*

		Easiness of Land Conversion Permit	Response to Land Conversion
Easiness of Land Conversion Permit	Correlation Coefficient	1.000	0.465*
	Sig. (2-tailed)	.	0.019
	N	25	25
Response to Land Conversion	Correlation Coefficient	0.465*	1.000
	Sig. (2-tailed)	0.019	.
	N	25	25

h Respondents' Knowledge of Regional Spatial Planning

The present study addressed the degree of spatial regulation knowledge to farmland conversion intention. About 16% of the farm owners considered that knowledge of spatial regulations very strongly affected their decisions to convert their farmland into built-up areas. Table 10 indicated that the correlation between the respondents' knowledge of regional spatial planning and farm owners' response to farmland conversion was significant at the level of 0.05. It had a low correlation, inferring that farm owners addressed spatial planning regulation when they considered converting their farmland.

Only a few farm owners knew about the protected farmland in this district. If they convert their farmland without sufficient knowledge, this probably leads to regulation infringement and disturbs the spatial development. Consequently, it affects food security achievement at the regional level. Losing farmland, in turn, will increase dependency on neighborhood municipalities to supply foods (Hidayat et al., 2019).

Spatial planning is strategic planning (Hersperger et al., 2018) that requires government at any level, citizen (including farm owners) involvement, data availability, and strong theoretical understanding. Knowledge of spatial policy is fundamental since it is closely related to sustainable management. On the other hand, the government holds a pivotal role in establishing good planning and governance for the municipality. Farm owners' lack of information and understanding of the spatial plan will affect spatial development. The result demonstrated that farm owners paid less attention to their spatial regulation knowledge when doing farmland conversion.

Regional spatial planning is a public document. It is a tool to regulate land use, including the procedure of land

development and conversion permit. Once the regulation is adopted, the government is obligated to disseminate the regulation to the residents. According to respondents, they were not invited to a dissemination seminar regarding regional spatial planning. Therefore, they had less knowledge of regional spatial planning. Before converting their farmland, farm owners checked its spatial plan. If their farmland was located in the yellow area (area designed for settlement), they had less hesitation to convert their farmland. They knew a norm that farmland was subjected to be preserved. However, the economic condition has forced them to convert their farmland.

From the government's perspective, the regulation has been disseminated and publicly available. They admitted that the dissemination seminar only invited the key persons among the resident. The invited residents were expected to distribute the information to others. Besides, other residents could also access the information on the internet or directly come to the government office. Unfortunately, farm owners paid less attention to find further information. In this case, we found there was a gap between governments' actions and farm owners' knowledge. The government should give more attention to, educate, and protect farm owners since farmland is crucial for the dwellers and regional development.

The effectiveness of spatial planning implementation is therefore questioned (Suyeno & Sekarsari, 2018). We checked the land conversion permit procedure and regional spatial planning, in which regional spatial planning is the foundation to issue the land conversion permit. It was discovered that land conversion permit was practically not easy to obtain, and the regional spatial planning addressed the farmland conversion issues. Here, we found a gap between the permits and the planning. Farm owners could easily obtain land conversion permits if their

Table 10. The Spearman's rank correlation test of the respondents' knowledge of regional spatial planning and farm owners' response to farmland conversion

		Knowledge of Regional Spatial Planning	Response to Land Conversion
Knowledge of Regional Spatial Planning	Correlation Coefficient	1.000	0.398*
	Sig. (2-tailed)	.	0.049
	N	25	25
Response to Land Conversion	Correlation Coefficient	0.398*	1.000
	Sig. (2-tailed)	0.049	.
	N	25	25

farmland was designed for settlement or built-up areas. However, the land conversion permit procedure did not consider the urgency of farmland conversion. To some extent, this condition exposed a deviation of the spirit of farmland preservation in regional spatial planning. It could produce built-up area fragments, which induced farmland conversion (Qiu, Swallow, Jeffrey, & Laliberté, 2015). Moreover, the regional spatial planning addressed the urgency issue of farmland conversion but did not expressly state it, which, in turn, produced an adverse effect on regional spatial planning and land conversion permit.

Conclusion

Harisandy et al. (2018) predicted that farmland soon decreases and disappears in less than 20 years due to urban growth using remote sensing data. The development of road networks and neighboring built-up areas contributes to farmland land conversion. The phenomenon also happens in developed countries as well (see Qiu et al., 2015; and Skog & Steinnes, 2016). Farmland with better

accessibility has a higher value and higher range of land use; therefore, it tends to be converted. This study investigates farm owners' perspectives that address such an issue and utilizes variable that has not been observed using satellite imagery.

According to the results, all variables are likely to correlate with farmland conversion intention; the distance to the existing settlement has the strongest correlation with farmland conversion intention. Looser regulation and less knowledge on spatial planning positively correlate with the intention. Those aspects have not been observed in Harisandy et al.'s (2018) findings. The results indicate that personal factors also contribute to farmland conversion in Malang Municipality.

The present study only considers farm owners residing in Lowokwaru District since they are connected to the social, physical, and natural environment on a daily basis. Those aspects shape the sense of place and contribute to developing behavioral intent (Masterson et al., 2017). Further research is necessary to increase the empirical understanding of farm owners regardless of farm owners' addresses to give a broad perception of farmland conversion.

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