

Factors Influencing Agricultural Land Conversion in Peri Urban Areas Based on the Landowner's Perspective (Case Study of Tulangan Subdistrict, Sidoarjo Regency)

Bahtiar Rahmaan Imaduddin^{✉ 1}, I Dewa Made Frendika Septanaya²

¹Institut Teknologi Sepuluh Nopember, Surabaya, Indonesia

²Institut Teknologi Sepuluh Nopember, Surabaya, Indonesia

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✉ bahtiar.urp@gmail.com

Abstract: Tulangan Subdistrict of Sidoarjo Regency is a peri-urban area with high attractiveness due to the availability of large land, complete facilities and strategic position. In the last 5 years, there has been a conversion of agricultural land into built-up land covering an area of 290 hectares, putting pressure on agricultural land in Tulangan Subdistrict. On the other hand, Tulangan Subdistrict is a Subdistrict with 2,540 ha of productive agricultural land, 1,302 ha of which is protected agricultural land. The continuous conversion of agricultural land has serious implications for food production, the physical environment and community welfare. In this case, the conversion of agricultural land will depend on the landowner's decision whether to maintain or convert their agricultural land. The results of research conducted on agricultural land owners in Tulangan Subdistrict, the factors that influence the conversion of agricultural land with the highest value are policy factors in the form of lack of incentives, social factors in the form of availability of other professions, farmer education and age level and economic factors in the form of farm income. Knowing the factors that influence the conversion of agricultural land is expected to be an input to minimize the conversion of agricultural land as an effort to control the use of space on agricultural land.

Keywords: Peri Urban 1; Agricultural Land Conversion 2.

1. Background

City development in Indonesia is taking place rapidly, especially in cities where the population continues to increase. As it is known that the availability of land in the city is fixed and limited, so that population growth results in the expansion of the city area to the periphery or known as peri urban Mahendra (2016). This area becomes strategic for migrants due to the availability of land and complete facilities Giyarsih (2010). The increase in population to peri urban areas triggers a process of spatial change that can be seen from the conversion of agricultural land into non-agricultural land. This triggers the phenomenon of land competition between agricultural land and built-up land. In this case, the phenomenon of land competition is indicated by the pressure from urban areas so that peri urban areas as rural - urban transition areas experience pressure in land use, especially forms of agricultural land use and non-agricultural land use Yunus (2008).

The increasing conversion of agricultural land is a threat to the achievement of food security and food sovereignty Eka Putra (2017). Agricultural land that has been converted to other land has very little chance of changing back to agricultural land Eka Putra (2017). Agricultural land should be protected in its conversion because it has a function to maintain the stability of food production. Pressure on agricultural land will trigger the potential for disruption of agricultural growth land processing, agricultural production and productivity Yunus (2008). The accumulative impact of continuous uncontrolled conversion of agricultural land will slowly or quickly result in a widening gap between production and consumption. The ability of national food security will be further away from expectations and food security will become a national strategic issue Mahendra (2016).

Tulangan Subdistrict of Sidoarjo Regency has high investment attractiveness and is in a strategic position because it has access to primary collector roads (RDTR, Tulangan Subdistrict 2024). In the last 5 years, there has been a conversion of agricultural land into built-up land covering an area of 290 hectares, putting pressure on agricultural land in Tulangan Subdistrict. On the other hand, Tulangan Subdistrict is a Subdistrict with 2,540 hectares of productive agricultural land, 1,302 hectares of which are protected agricultural land (RTRW, Sidoarjo District 2024). This phenomenon reflects that the growth of built-up land in Tulangan Subdistrict is increasing and agricultural land is decreasing. In this case, land conversion and the existence of agricultural land will depend on the behavior of landowners whether to convert or maintain their land (Setiawan (2012).. Land control that only relies on spatial policies or policies on the conversion of agricultural land does not work effectively because conversion actors always get loopholes from these policies Setiawan (2012). Therefore, this research will try to find out what factors influence the conversion of agricultural land in Tulangan Subdistrict, Sidoarjo Regency and based on the perspective of agricultural land owners as the main actors who have a role in the conversion of agricultural land. Knowing the factors that influence the conversion of agricultural land will be an input in efforts to create food security and control space utilization, especially on agricultural land.

2. Literature Review

2.1. Peri Urban

Physically, the development is dynamic in line with the increase in population which causes an increase in space requirements Pontoh (2018). The limited space in the city causes an increase in space requirements, which in turn will lead to land conversion in peri urban areas. Peri urban areas are areas with two different conditions, one having a physical appearance of urbanity and the other having a physical appearance of rurality Yunus (2008). In some peri urban areas, the dominant characteristics are either urban or rural. Peri-urban areas have an important role because they have a large connection to the concept of urbanization in the future.

2.2. Agricultural Land Conversion

The form of land use in peri urban areas is a very crucial issue and needs a wise solution because it involves urban life and rural life in two sides Giyarsih (2010). The peri urban area is the direction of future urban conditions and at the same time undergoes an ongoing process of spatial transformation and is always related to the existence of agricultural land. The phenomenon of agricultural land conversion in peri urban areas will lead to potential disruptions to irrigation systems, disruption of land management, crop growth, agricultural production and productivity Yunus (2008). These potential disturbances arise

directly and indirectly and will have a detrimental impact on the sustainability of agricultural land that needs to be maintained. In this case, it causes an erosion of farmers' commitment to agricultural activities and maintaining their agricultural land.

3. Methods

3.1. Data Collection

The data collection in this research is primary data by conducting interviews with agricultural land owners in Tulangan Subdistrict, Sidoarjo Regency. Before conducting interviews with landowners, an exploration of the factors that are thought to influence agricultural landowners in the conversion of their land will be carried out. The results of the exploration of factors will then be calibrated to agricultural land owners as a basic reference and technical justification related to factors that affect the conversion of agricultural land. In addition, secondary data collection is also carried out by conducting a literature review to obtain information related to the literature review of theoretical studies and other supporting data needed and related to this research.

3.2. Data Analysis

The data analysis used in this research is descriptive statistics using Likert analysis and quantitative descriptive analysis. Factors and variables tested on respondents were based on the results of exploration of literature reviews and previous research relevant to this study. 4 factors and 19 variables were found to influence the conversion of agricultural land.

Table 1. Factor dan Variable Research

Factor	Variable	Source
Policy	Agricultural Facilities and Infrastructure (K1)	Subarna (2007), Adrianto (2012)
	Agricultural Extension (K2)	Adimihardja (2006), Subarna (2007)
	Lack of Incentives for Farmers (K3)	Handoyo (2010), Adrianto (2012), Rozci (2023)
	Low Sanctioning of Agricultural Land Conversion (K4)	Handoyo (2010)
	Lack of Agricultural Insurance Procurement (K5)	Adrianto (2012)
Social	Age Level (S1)	Ruswandi (2007), Setiawan (2012), Eka Putra (2017), Nuhung (2018), Kumumastuti (2018), Zalsa (2023)
	Farmer Education (S2)	Ruswandi (2007), Eka Putra (2017), Nuhung (2018), Sompie (2021), Rozci (2023), Zalsa (2023)
	Number of Dependents Farmer (S3)	Eka Putra (2017), Nuhung (2018), Sompie (2021),
	Agricultural Experience (S4)	Setiawan (2012), Eka Putra (2017)
	Availability of Other Profession Options (S5)	Adrianto (2010), Setiawan (2012)
	Number of Farm Laborers (S6)	Setiawan (2012)
Economy	Income from Agricultural (E1)	Setiawan (2012), Eka Putra (2017), Yacoub (2020), Sompie (2021), Rozci (2023), Zalsa (2023), Zalsa (2023)
	Life Needs Met from Agricultural (E2)	Handoyo (2010), Setiawan (2012), Adrianto (2012), Kumumastuti (2018)
	Land Price (E3)	Handoyo (2010), Setiawan (2012), Sompie (2021), Rozci (2023)
Physical	Neighborhood Land Use (F1)	Land Collective phenomena Friedman Theory (1973), Setyoko (2014)
	Accessibility (F2)	Axis Theory (Babcock, 1932), Kumumastuti (2018), Rozci (2023), Zals a (2023)
	Physical Condition of Agricultural Land Use (F3)	Irawan (1999), Setiawan (2012)
	Land Area (F4)	Ruswandi (2007), Eka Putra (2017), Zalsa (2023)

Analysis of landowners' decisions to convert their agricultural land was carried out with Likert scale analysis using scoring. In this study, the Likert scale was used to assess the factors that influence landowners to convert their agricultural land. The Likert scale is carried out in the form of choices with a 5-point scale, with a description at point 1 for the lowest value and point 5 for the highest value.

Table 2. Likert Score Range

Description	Symbol	Score	Frequency
Strongly Agree	SS	5	F5
Agree	S	4	F4
Moderately Agree	CS	3	F3
Disagree	TS	2	F2
Strongly Disagree	STS	1	F1

Source: Daga, 2020

Descriptive statistical analysis is carried out with score interpretation by categorizing the results of Likert analysis based on levels using index numbers. The index number or average score value in this analysis is carried out to determine the tendency of respondents' answers to the variables that have been tested. This index number will be classified into 3 levels, namely high, medium, low with the following formula.

$$\text{Index Value} = [(F1 \times 1) + (F2 \times 2) + (F3 \times 3) + (F4 \times 4) + (F5 \times 5)] : 5$$

Description :

F1 : Frequency of respondents with strongly disagree answers

F2 : Frequency of respondents with disagree answers

F3 : Frequency of respondents with moderately answers

F4 : Frequency of respondents with agree answers

F5 : Frequency of respondents with strongly agree answers

Next the range or interval index interpretation is carried out by reducing the maximum and minimum values which are then divided into three determined interpretations of high, medium and low index values. The interval calculation formula (Daga, 2020) is carried out as follow

- Maximum Index Value = $(\%F \times 5) : 5$
- Minimum Index Value = $(\%F \times 1) : 5$

The factors tested in this study were obtained from the results of a literature review and relevant previous research related to agricultural land conversion. The factors were then subjected to a Likert scale analysis of farmland owners in Tulangan Subdistrict, Sidoarjo Regency. The final output of this research is the factors influencing the conversion of agricultural land in Tulangan Subdistrict, Sidoarjo Regency.

4. Result and Discussion

4.1. Respondent Characteristics

This study sampled 100 respondents of agricultural land owners in Tulangan Subdistrict, Sidoarjo Regency. Agricultural land owners in Tulangan Subdistrict consist of various ages. Therefore, farmers were grouped based on age range. Based on the results of the analysis of all respondents, it is known that the age of landowners is dominated by 50-60 years old, 34 respondents and then followed by the age range of 30-40 years old, 31 respondents, followed by the age group 20-30 years, 40-50 years. The education of agricultural landowners in Tulangan Subdistrict is dominated by high school education (39 respondents), elementary school education (35 respondents) and no school education (18 respondents). In Tulangan Subdistrict, farmland owners tend to have a large number of household members. The majority had 3 - 4 household members, 48 respondents, followed by 1 - 2 people, 41 respondents. The ownership status of agricultural land is grouped into 3, namely self-owned, rented and owned by friends / family / without rental fees. The land ownership status of landowners is dominated by no rental fees totaling 56 respondents, self-owned totaling 29 respondents and rental systems totaling 15 respondents.

4.2. Descriptive Statistics

The results of the analysis of the average value of the variables show that the variable availability of other professions is the variable with the highest average value of 4.51. Then followed by the incentive variable with a value of 4.49 and the education variable with a value of 4.45. The highest average value is dominated by social variables while physical variables tend to have a low average value compared to other variables..

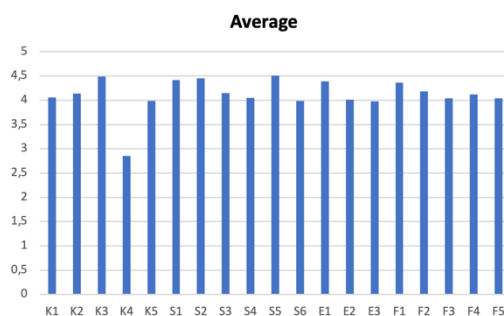


Image 3. Average Variables

4.3. Validity and Reliability

Validity and reliability tests were carried out on 100 samples using SPSS software. This test is carried out to measure the accuracy of variables with the consistency of respondents' perceptions. The r-count threshold for each variable is 0.195 with a significance level of 5%. From the analysis results, it was found that 19 variables were included in the valid group so that all variables would be used in the next stage, namely the reliability test and SEM analysis. The reliability test shows the Cronbach's Alpha value of 0.927. According to Hair et al. (2021) a Cronbach's Alpha value of ≥ 0.70 is considered adequate to demonstrate instrument reliability, the Cronbach's Alpha value of 0.927 is considered reliable.

Table 3. Validiy and Reability Test

Cronbach's Alpha	N of Items
0,927	19

4.4. Likert

This analysis was conducted with purposive sampling on agricultural land owners who have the intention not to continue agricultural activities in Tulangan Subdistrict, Sidoarjo Regency, totaling 100 respondents. Scores

from the results of Likert analysis were grouped with the three box method which divides the factors that influence the conversion of agricultural land into 3 categories, namely low, medium, high, and low.

Table 4. Likert Score

Factor	Variable	Total Score	Percentage	Information
Policy	Agricultural Facilities and Infrastructure (K1)	406	81,2	High
	Agricultural Extension (K2)	414	82,8	High
	Lack of Incentives for Farmers (K3)	449	89,8	High
	Low Sanctioning of Agricultural Land Conversion (K4)	285	57	Medium
	Lack of Agricultural Insurance Procurement (K5)	399	79,9	High
Social	Age Level (S1)	442	88,4	High
	Farmer Education (S2)	445	89	High
	Number of Dependents Farmer (S3)	415	83	High
	Agricultural Experience (S4)	405	81	High
	Availability of Other Profession Options (S5)	451	90,2	High
	Number of Farm Laborers (S6)	399	79,8	High
Economy	Income from Agricultural (E1)	439	87,8	High
	Life Needs Met from Agricultural (E2)	401	80,2	High
	Land Price (E3)	398	79,6	High
	Neighborhood Land Use (F1)	436	87,2	High
Physical	Accessibility (F2)	418	83,6	High
	Physical Condition of Agricultural Land Use (F3)	404	80,8	High
	Land Area (F4)	350	70	Medium
	Adverse Factors Between Land Use Functions (F5)	404	80,8	High

The results of Likert analysis and Spss test show the percentage score of variables with the 5 highest values are variables of lack of incentives for farmers (K3), availability of other professions options (S5), farmer education (S2), age level (S1), income from agricultural (E1), similar land use conditions (F1). These variables are factors of policy, social and economic variables. Variables in the physical variables are also dominated by high percentage score values but are not more significant than the other 3 variables.

4.5. Discussion

The results of the Likert analysis and SPSS test show the percentage score of the variable with the 5 highest values is the variable lack of incentives for farmers (K3), availability of other professions (S5), farmer education (S2), age level (S1), income from agricultural (E1), similar land use conditions (F1). These variables are factors of policy, social and economic variables. Variables in the physical variables are also dominated by high percentage score values but are not more significant than the other 3 variables.

The first variable with the highest average score is incentives. The lack of incentives from the government influences farmers not to continue their agricultural activities. The agricultural sector is often considered a less promising job. The income available in the agricultural sector is also considered less stable and far below the average income of workers in other sectors. In practice, there are no incentives on agricultural land applied by the Sidoarjo Regency Government to farmers, especially in Tulangan District. The agricultural community hopes that there will be incentives from the government to farmers that include a lot of financial support by providing pesticide subsidies to reduce the burden of farmers' costs and production. In addition to pesticides, the community also expects a subsidy program for the provision of fertilizers and environmentally friendly agricultural technology to support activities in the agricultural sector. On the non-financial front, the community

is looking for incentives in the form of training and education, both formal and non-formal. Quality agricultural training and education can be an instrument to improve farmers' competencies. The findings in this field reinforce the theory and previous research conducted by Handoyo (2010), Adrianto (2012), Rozci (2023) regarding the need for agricultural incentives. Previous research explains that the many challenges faced by agricultural businesses such as the high cost of controlling weather, pests, agricultural plant diseases, the unavailability of production facilities and the lack of agricultural business training have triggered the decline in agricultural activities. Agricultural incentives are one of the instruments to support the agricultural sector which can be provided in various ways such as land tax relief, infrastructure development, financing research and development of superior seed varieties, awards for outstanding farmers and other positive support that is considered capable of reinforcement and encouraging progress in the agricultural sector.

The availability of other professions is the variable with the second highest average score. The results of the existing identification show that the availability of more diverse professional options in Tulangan Subdistrict is one of the reasons why farmers are reluctant to continue agricultural, because work in the non-agricultural sector such as factory labor, services, trade, or other informal work is considered easier, faster to produce, and does not depend on natural factors. In Tulangan Subdistrict, which is increasingly developing, access to alternative and high-potential jobs that offer more stable incomes and do not require large amounts of land or capital is also increasingly open. As a result, many farmers choose to leave their land and change professions, because the agricultural sector is considered less stable and there are other employment opportunities in the region. This condition is relevant and in accordance with the theory and previous research conducted by Adrianto (2012), Setiawan (2012), Rozci (2023). Previous researchers found the same phenomenon due to the urge to fulfill the needs of life, causing the community to look for other jobs that are deemed capable of fulfilling their needs. The community considers income in the agricultural sector to be less promising because it depends on harvest conditions. The availability of other professions in an area such as office workers and factory laborers who have fixed wages is an alternative choice for the community not to choose to work in the agricultural sector.

The third variable with the highest average score is the level of education. The high level of education among farmers in Tulangan Subdistrict also influences the decision not to continue agricultural. The high education of young people in fields of expertise that are not oriented towards the agricultural sector and the limited knowledge of skills in the agricultural sector make it difficult for them to adapt to business in agriculture. People who are educated at the high school/vocational and tertiary levels tend to prefer jobs that are in line with their field of expertise. The existence of conditions in the field strengthens the theory and previous research conducted by Ruswandi (2007), (Setiawan, 2012), Eka Putra (2017), (Rozci (2023), Zalsa (2023). The results of research conducted by previous studies provide a tendency that the higher the level of community education, the weaker the interest in entering the agricultural sector Ruswandi (2007). This condition is also reinforced by the views of parents who have a pessimistic mindset in the agricultural sector so that they do not want children / families to enter the agricultural sector Eka Putra (2017). People with a high level of education, especially in villages, tend to want to give up their identity as farmers and choose jobs according to their expertise and education level.

The fourth variable with the highest average score is age. The majority of older farmers are one of the main reasons why agricultural businesses are discontinued, as their physical limitations and declining ability to work make it difficult for them to carry out agricultural activities that are strenuous and require strength and endurance. In addition, the low interest of the younger generation to continue as farmers means that there is no regeneration, so when older farmers are no longer able to work, farms tend to be abandoned or sold. This creates an age imbalance in the agricultural sector and accelerates the decline in the number of productive workers in the sector. This finding is in line with theory and previous research conducted by Ruswandi (2007), Setiawan (2012), Eka Putra (2017), Kusumastuti (2018), Zalsa (2023). Previous research states that age level will indicate a person's productivity at work. According to the findings in the field and previous research, Farmers in Indonesia are dominated by old age and the higher the age of a person when working will have an impact on declining productivity. In addition, if there is no regeneration at a young age in the agricultural sector

and the behavior of young people who prefer to work in the non-agricultural sector will have an impact on the decision of elderly farmers not to continue their agricultural land. This will have a direct impact, namely the stagnation in the agricultural sector that occurs in the resources of its main actors, namely farmers.

The fifth variable with the highest average score is income from agricultural. Income from agricultural tends not to be maximized and depends on the harvest period. This condition is not proportional to the cost of production and the increasing needs of life, making farmers reluctant to continue agricultural activities. Limited land due to development pressure, the high cost of agricultural inputs, and the unstable selling price of crops mean that profits are getting smaller. On the other hand, the cost of living in Tulangan Subdistrict tends to be higher than in rural areas, so that income from agriculture is no longer sufficient. This condition encourages farmers to look for other more profitable jobs or to sell their land in order to get a bigger instant income. The findings in this field strengthen the theory and previous research conducted by (Setiawan, 2012), Eka Putra (2017), Yacoub (2020), Zalsa (2023). Economically, the income earned by farmers is out of line with the market and lopsided with the district minimum wage. The results of previous research show that when the proportion of urban laborers is greater than the needs of fulfilling life, there is inequality in fulfilling the needs of life, especially those obtained in the agricultural sector. The difficulty of increasing farmers' wages and the seasonal pattern of farmers' work depending on the harvest period resulted in the majority of farmers not having enough income to fulfill their needs.

5. Conclusion

The development of built-up land has led to peripheral areas, especially in most border areas which are peri-urban areas. In this case, Tulangan Subdistrict in Sidoarjo Regency has become a target location for migrants because of its strategic location and complete facilities. The impact of developed land development in Tulangan Subdistrict has triggered the phenomenon of agricultural land conversion. In the last 5 years, there has been a conversion of 290 hectares of agricultural land into built-up land in Tulangan Subdistrict, putting pressure on agricultural land. On the other hand, Tulangan Subdistrict is a Subdistrict with 2,540 Ha of productive agricultural land, 1,302 Ha of which is LSD agricultural land. This research examines what factors influence the conversion of agricultural land based on the landowner's perspective. This research uses the landowner's perspective as the direct decision maker in the conversion of agricultural land. The conversion of agricultural land will depend on the landowner's decision whether to maintain the agricultural land or to convert the land.

The results showed that the factor influencing the conversion of agricultural land with the highest value was the policy factor in the form of a lack of incentives. The agricultural community hopes that there will be incentives from the government to farmers which include many policy and program support both financially and non-financially by providing assistance with pesticide subsidy programs and training in agricultural production. The second factor is social factors, namely the availability of other professions. The availability of other professions in an area such as office workers and factory laborers who have fixed wages is an alternative choice for people not to choose to work in the agricultural sector. The third factor is the social factor of farmer education. The high level of education of young people in fields of expertise that are not oriented towards the agricultural sector and the limited knowledge of skills in the agricultural sector make it difficult for them to adapt to business in agriculture. People with a high level of education, especially in villages, tend to want to give up their identity as farmers and choose a job according to their field of expertise and level of education. The fourth factor is social factors, namely age level. The majority of farmers who are old are one of the main reasons why agricultural businesses are not continued, because physical limitations and decreased ability to work make it difficult for them to carry out agricultural activities that are heavy and require energy and endurance. the absence of regeneration at a young age in the agricultural sector and the behavior of young people who prefer to work in the non-agricultural sector have an impact on the decision of elderly farmers not to continue their agricultural land. The fifth factor is economic factors in the form of farm income. Income from agricultural tends not to be maximized and depends on the harvest period. This condition is not proportional to the cost of production and the increasing needs of life, thus making farmers reluctant to continue agricultural activities.

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