Economic Impact of Land Use Change on Rice Paddy Farmers in Palembang City Indonesia

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Abstract: - Agricultural land conversion has the potential to have complex economic impacts on communities and related sectors. This change can alter income patterns and cause a decrease in welfare for farmers and business actors related to agriculture. This study aims to analyze the economic impact of land conversion on rice farmers in lebak rice fields in Palembang City. The research location was purposively chosen, by taking a sample of 250 respondents who were divided into two, namely farmers who changed land use and those who did not change land use. Economic impact analysis is looking at farmers' income before and after land conversion in the last 5 years interval, 2019-2023. The results showed that there was a difference in farmers' rice farming income before and after land conversion obtaining a tcount value of -5,450, significant at the 0.01 confidence level (0.000 <0.01). The economic impact of land conversion on rice farmers is in the form of a decrease in rice farming income.

Key-Words: - Land conversion, economic impact, farming, paddy fields, decline, income, agriculture.

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1 Introduction

Indonesia is an agricultural country with one of its main incomes from the agricultural sector, [1]. Which means that the agricultural sector plays an important role in the national economy, which can be seen from the large number of people or laborers who work in the agricultural sector or from products originating from the agricultural sector. The characteristics of Indonesia are a tropical climate [2] and fertile soil, which makes Indonesia suitable for planting various crops such as food crops and plantation crops . Land is one of the resources that cannot be produced, causing availability to be limited, due to the high demand for land causing land to be limited, [3]. Indonesia's agricultural land area in 2016-2018, is divided into non-field agricultural land and paddy fields. The area of non-field agriculture in 2016 was 28,555,790 hectares, followed by 29,121,269 hectares in 2017, and 27,724,917 hectares in 2018, [4]. Based on these data, in the last three years, namely 2016-2018, the area of non-field agricultural land has decreased and in 2018 occupied the smallest area compared to the previous two years. While the area of rice fields in 2016-2018, 2016 amounted to 8,187,734 hectares, then in 2017 rice fields amounted to 8,164,045 hectares, and in 2018 rice fields amounted to 7,105,145 hectares, [4]. The data shows a decrease in the amount of paddy fields in the last three years.

The implications of uncontrolled conversion of agricultural land as the population increases can threaten the reduced food supply capacity, now many agricultural lands are converted into residential land or residential settlements, therefore

the increase in population is what is felt as if the land becomes narrow, becomes little, while demand is always increasing. This is in line with research results [5] which show that the population variable is an external variable that has a positive and significant effect on land conversion.The increase in population also affects the need for built-up land, one of which is housing development, while the amount of land area is fixed or does not increase. High population growth is caused by natural population growth and the impact of urbanization factors. In line with the increase in population and high economic growth, the need for land continues to increase. Residents choose safe areas, namely areas far from the sea and close to cities as their place of residence so that there is agricultural land that can be converted into residential land, [6]. This is consistent with the resultsresearch in 2019 on the conversion of agricultural land in Pekalongan, Central Java, which shows that the trend of agricultural land conversion in Pekalongan City is positive, so there is a tendency for agricultural land conversion to increase from year to year, [7].

Other impacts that occur due to the conversion of agricultural land include an increase in poverty so that slums also increase. Economic growth causes a decrease in environmental quality. The effects of land conversion lead to many dimensions. The negative impact of changing the function of rice fields does not only reduce agricultural production, but also has an impact on the socio-economic conditions of the community and the environment around the area concerned. In certain cases, conversion of rice fields cannot be avoided. negative impact on socio-economic aspects such as changes in land ownership, employment opportunities, changes in work patterns, [8].

By the designation contained in the RTRW (Regional Spatial Plan), land conversion occurs due to government policies or regulatory aspects issued by the government. The increase in urban growth will cause various kinds of problems and bring consequences in all aspects of life, the development of housing and residential areas in Palembang City is currently focused on the suburbs. There is a lot of housing development that was originally used as agricultural land, which is now being converted by developers to become housing and residential areas. Efforts to protect agricultural land carried out by the government have been stipulated in Law Number 41 of 2009 concerning the Protection of Sustainable Food Agricultural Land, [9].

Palembang City is the capital city of South Sumatra which has a lot of agricultural land, especially rice fields, but over time the rice fields in Palembang City began to decrease. Based on data from the Palembang City Agriculture and Food Security Office, the standard area of paddy fields in Palembang City 2017-2021 in 2017 was 5,938 hectares (ha), followed by 2018 there were 4,582 ha, there was a decrease of 0.04%. 2019 has an area of 4,462.60 ha, which has decreased from the previous year by 0.29%, and in 2020 it decreased by 0.20% of the land area to 3,661.31 ha. Based on the data in Table 1, there is a reduction in paddy fields that occurs every year. Factors triggering the reduction of paddy fields may be due to the conversion of paddy fields that occur in Palembang City.

Table 1. Size of Rice Paddy Fields in Palembang City (km)

No	District	The standard area of wet rice paddies				
		2019	2020	2021	2022	2023
1	Ilir Barat I	12,3	12,6	12,5	12,7	17,7
2	Ilir Barat II	10,3	12,1	10,5	10,6	10,0
3	Gandus	1.129,4	911,1	867,6	620,3	505,7
4	Seberang Ulu I	38,7	14,5	14,5	14,5	13,7
5	Kertapati	1.916,7	2.165,5	1.581,0	1558,0	1638,3
6	Seberang Ulu II	4,8	6,7	4,0	5,0	16,0
7	Kalidoni	817,2	682,2	741,0	741,5	543,8
8	Plaju	361,9	307,2	328,0	304,0	329,4
9	Ilir Timur II	31	31,0	32,0	32,0	26,8
10	Sematang Borang	140,3	116,1	70,0	85,0	0,0
11	Jakabaring	0,0	0,0	0,0	25,5	51,1
Total		**4.462,6**	**4.259,0**	**3.661,1**	**3.409,0**	**3.152,4**

Source: Agriculture and Food Security Office of Palembang City, 2023

The area of wetland rice paddies in Palembang City has experienced a reduction in land area every year from 2019 to 2023 as shown in Table 1. Table 1 shows that the area of wetland rice fields in Palembang City decreased every year during that period. The decrease that occurred in each year was also different, with the smallest decrease occurring in 2023 which amounted to 3.132,4 km, and the largest decrease occurred in 2019 which amounted to 4.462,6 km, the average decrease that occurred during the period from 2019 to 2024 was 3.788,82 km. The conversion of rice field area in each sub-district in the 2017-2021 period can be seen in Figure 1.

Figure 1 shows the graph of changes in the total area of rice fields in Palembang City. It is known that the three largest areas have the largest rice fields in Palembang City, namely Kertapati District, Gandus District, and Kalidoni District, it can be seen the dynamics of changes in the area of rice fields in 2017-2020 due to land conversion. In this case, a transparent conversion process, fair compensation, as well as effective and targeted government with business strategies are needed to prevent farmers from falling into poverty, [10].

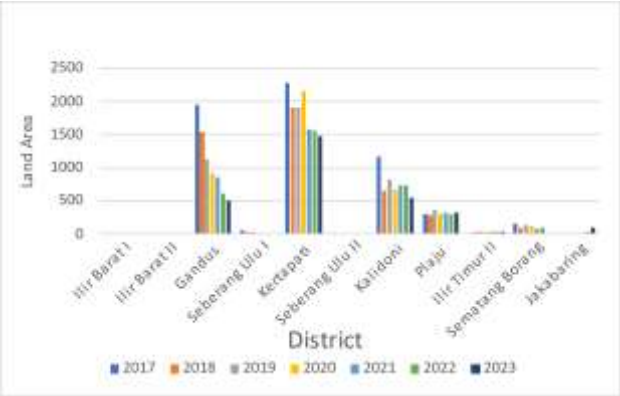

Fig. 1: Graph of Land Use Change of Rice Field in Palembang City

Source: Agriculture and Food Security Office of Pelembang City, 2023

Research on land conversion is important, given that it is a significant and relevant issue in the context of urbanization and economic development. Previously, similar research has been conducted on this topic, but there is a novelty or difference with previous research in this study in terms of commodities and also the allocation of research. The research on the economic impact of land conversion on Paddy crops has been conducted by [6]; oil palm plantations by [11] there are also those that discuss the impact on agriculture in general as conducted by [8], [12], [13]. The choice of location in this study is also another novelty because previously similar studies have also been conducted on the impact of land use change in several other locations such as those conducted in Sleman Regency by [5]; in Aceh Besar District Province by [6]; and in South Sumatra Province by [13] This research raises topics that are relevant to current conditions, namely related to the increasing population. Also, the selection of locations and commodities are analyzed by raising this topic

As a result of this land conversion, many farmers whose livelihoods have changed or switched professions have become business owners (owning boarding houses, stalls, etc.), and some have become factory workers or motorcycle taxi drivers. This will affect changes in rice production and farmers' income, which will affect food security. Land conversion will impact the community, especially rice farmers, so it is necessary to conduct research to analyze the economic impact of land conversion on rice farmers.

2 Research Methods

This research uses quantitative methods, analytical quantitative research is conducted to accept or reject hypotheses that are described by significance values. In qualitative research by conducting interviews, data collectors have prepared research instruments in the form of written questions whose alternative answers have also been prepared. aims to analyze in depth the opinions of policymakers regarding land conversion of community leaders and representatives, farmers who know the occurrence of land conversion in Palembang City.

This research is planned for the implementation of research conducted in early May 2023 until completion. Researchers determined the research location by the research theme and by the formulation of research problems. By these provisions, the location of this research took place in the Palembang City government. Palembang City is a metropolitan city that also has agricultural land around it so the right area for land conversion to non-agriculture which is the target of this research is the Palembang City Development Planning Agency and the Palembang City Agriculture and Food Security Office. This research location was chosen with consideration of the researcher's assumption of the reality that might appear in the field with the existing reality administratively. The complete research location map can be seen in Figure 2.

The methodology employed in this study involves the Disproportionate Stratified Random Sampling technique, also known as proportional stratified random sampling. In practical scenarios, populations often exhibit heterogeneity, meaning there are significant differences between various segments within the population. The degree of heterogeneity directly impacts the effectiveness and precision of sampling methods. To accurately capture the characteristics of a heterogeneous population, it is divided into distinct and uniform layers, known as strata, from which random samples are drawn. In a proportionally stratified random sample, the chances of selection from one stratum to another may be equal or vary. The selection process aims to ensure representation from each layer, allowing for a more comprehensive understanding of the population's characteristics.

Two conditions must be met to use the proportional stratified random sampling method, namely

(a) There are clear criteria that will be used as a basis for stratifying the population,
(b) The exact number of elementary units of each layer in the population is known.

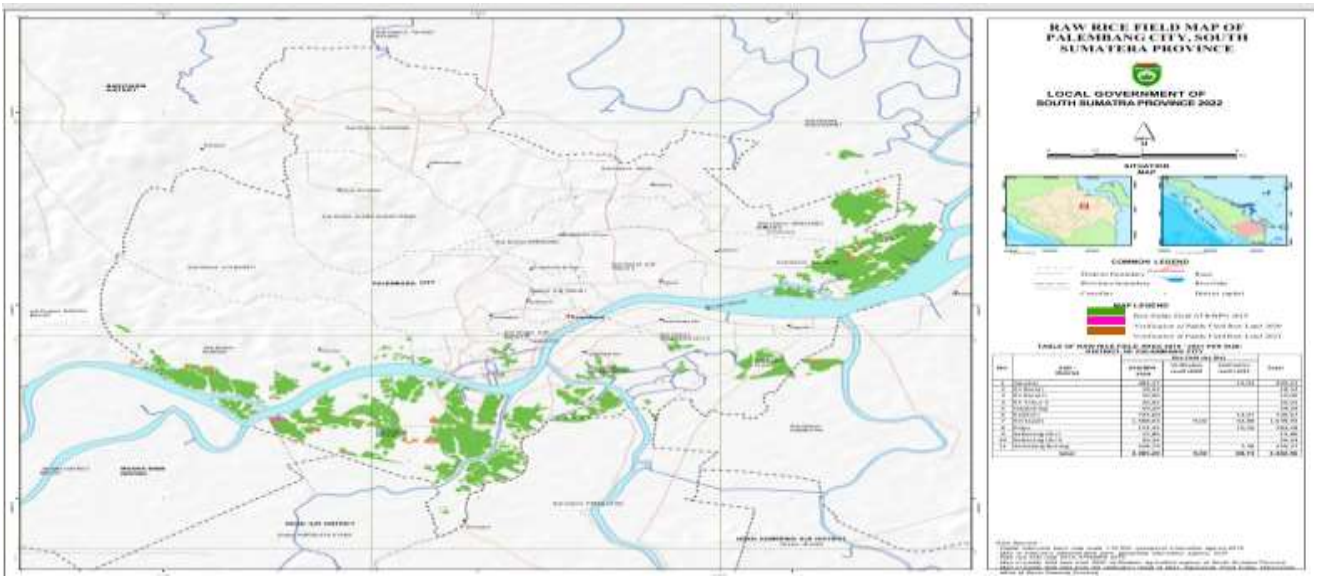

Fig. 2: Location Distribution Map of Rice Paddy Fields in Palembang City

Table 2. Number of Farmers in Three Districts in Palembang City

District	Land Area (Ha)	Jiwa	Farmer Population				Sampling			
			Tenant Farmers		Owners Farmers		Tenant Farmers		Owners Farmers	
			No land conversion	land conversion	No land conversion	land conversion	No land conversion	land conversion	No land conversion	land conversion
Kalidoni	650	466	236	19	171	11	23	11	22	16
Gandus	581	958	450	151	267	90	23	21	23	20
Kertapati	1558	1132	187	497	192	268	22	24	22	23

Source: Agriculture and Food Security Office of Palembang City, 2023

The size of the sample taken from each stratum can be balanced and can also be unbalanced. In balanced sampling, the unit elements taken from each stratum are directly proportional to the number of elementary units in the stratum concerned. If the researcher uses the unbalanced method, then he can determine the number of sample elements he will take himself.

In the selection of the research place, this research was conducted in three sub-districts in Palembang City in the selection of several sub-districts this was done with consideration of the most rice fields and also the most cases of conversion in Palembang City which are Kertapati, Kalidoni, and Gandus. This research was first conducted by a pre-research survey, for the results of the survey can be seen in Table 2 which is based on data from the agriculture office and has been done a survey.

The formula used to determine the number of informant samples using the Slovin or Yamaneformula is [14]:

$$n := \frac{N}{1+Ne^2} \quad (1)$$

Description:
n: Sample size
N: Population Size (Number of farmers)
e: Acceptable error (20%).

The total land area and farmer population in Kalidoni Sub-district, Gandus Sub-district, and Kertapati Sub-district be seen in Table 2.

Table 2, shows the number of samples in this study totaling 250 respondents. The sample was taken from three different areas, namely Kalidoni Subdistrict, Gandus Subdistrict and Kertapati Subdistrict. The sample was subdivided into land-use change farmers and non-land-use change farmers who were then subdivided into two categories, namely some as tenants and some as owners and tenants. Details of the sample distribution in each region are Kalidoni Sub-district cultivators: 11 not converted, 23 converted, and tenants/owners: 16 not converted, 22 converted. Gandus Sub-district area: tenants: 23 non-diversion, 21 land conversion and tenant/owner samples: 23 no land conversion, 20 land conversion. Kertapati sub-district owners: 22 who did not convert, 24 who did,

and tenants/owners: 22 who did not convert, 23 who did.

To answer the problems in this study, data or information is needed using data collection techniques. In quantitative research, validation and reliability tests were carried out on the questionnaires to be used in Phase One and Phase Two. Researchers use triangulation data collection techniques for qualitative methods. Triangulation is a data processing technique that involves analyzing results using multiple methods of data collection to enhance validity, create a more comprehensive understanding, and examine different perspectives on a research problem [15], to make it easier researchers will divide the type of data into two:

a. Primary data
Primary data is data that is directly on the source of information obtained through in-depth interviews. An in-depth interview is a process of obtaining information for research puIDR oses using question and answer. Field observations, researchers will make observations in the field by systematically recording the phenomena and symptoms that take place in the social processes that occur in the field to collect qualitative data measured indirectly in the form of attitudes, behaviors, and activities.

b. Secondary Data
Secondary data is data collection carried out indirectly which is obtained to complement primary data using:

1) Literature study, namely data collection techniques by examining books, magazines, research journals, or other writings to strengthen theoretical considerations relevant to the problem to be studied.
2) Documentation study, namely data collection obtained by examining written records, both from documents and archives concerning the problem under study.

A sampling of farmers who have the potential to change the function of paddy fields using in-depth interview techniques with the guidance of questionnaires distributed. The selection of respondents was determined by cluster-stratified random sampling to fulfill the representation of each observation area. Respondents were selected from farmers who own paddy fields from three sub-districts in Palembang City. In taking primary data samples, purosive sampling is a non-random sampling method (intentionally). Purposive sampling can be thought of as a subset of convenience sampling, in that respondents are chosen subjectively [16] then continued using stratified random sampling in practice often encountered populations that are not homogeneous. The more heterogeneous a population is, the greater the difference in properties between these layers of sampling methods, among others influenced by the degree of uniformity of the population,. The basis for consideration in determining respondents, namely:

1. Availability of informants to be used as respondents
2. Has a reputation, position, or position that has shown credibility as an expert or expert in his field
3. Has experience in his field.

By the research objectives, after the data is collected, the next process is to simplify the data obtained into a form that is easy to read, understand, and inteIDR ret which is essentially an effort to find answers to existing problems. Therefore, the data obtained will then be analyzed qualitatively. This means that the existing data is analyzed as detailed as possible by carefully abstracting any information obtained in the field so that it is hoped that adequate conclusions can be obtained.

The economic impact that occurs as a result of the conversion of agricultural land in Palembang City using the respondent interview method using a questionnaire. The results of the interviews will be analyzed and described using primary and secondary data. The economic impact is to see the income of farmers before and after land conversion in the last 5 years interval, namely 2017-2021, the formula for analyzing farmer income using the data analysis design carried out in this study, among others:

a) Cost Analysis
According to [17], to calculate the amount of total cost (Total Cost) obtained by summing up fixed costs (FC) with variable costs (Variable Cost) with the formula:

$$TC = FC + VC \quad (2)$$

Where
TC = Total Cost (IDR/Hectare)
FC = Fixed Cost (IDR/Hectare)
VC = Variable Cost (IDR/Hectare)
IDR= Indonesian Rupiah

b) Revenue Analysis
In general, the calculation of total revenue (TR) is the multiplication of the amount of production (Y) by the selling price (Py) and is stated by the following formula:

$$TR = Py.Y \quad (3)$$

Where
TR = Total Revenue (IDR/Hectare)
Py = Produk Price (IDR/Hectare)
Y = Production Quantity

c) Income Analysis
Income is the difference between revenue (TR) and total costs (TC) and is expressed by the formula, [18] :

$$I = TR - TC \quad (4)$$

Where :
I = Income (IDR/Hectare)
TR= Total Revenue (IDR/Hectare)
TC= Total Cost (IDR/Hectare)

Then the paired sample t-test analysis is used to determine whether there is a difference in the average value between two groups of data that are paired. Paired here means that one sample gets a different treatment from the time dimension. The paired samples t-test is a statistical method used to compare the means of two related groups or a single group measured at different times, [19]. If the results of the calculation of changes in income before and after the land conversion show a minus value, it means that changes in income that occur at the household level show that household income has decreased. Conversely, if the value shows a plus value, household income has increased. Previous research shows that the decrease in land area due to land conversion is followed by a decrease in productivity and income from agriculture, [20].

3 Results and Discussion

3.1 General Situation of the Research Location

This research was conducted in three sub-districts in Palembang City whose land was converted from wetland rice fields to non-agricultural land. The three locations were Kalidoni Subdistrict, Gandus Subdistrict, and Kertapati Subdistrict. The three sub-districts have similar characteristics because they are located in the same city. Rainfall, air temperature, customs, and geographical conditions in the area are almost the same. The geographical conditions in the three sub-districts are still a lot of wetland rice fields which are the source of livelihood for the community.

Geographically Palembang City is located between 2052' to 305' South latitude and 104037' to 104052' East longitude with an average altitude of 8m above sea level. Palembang City is the capital of South Sumatra Province and also the largest city and the center of socio-economic activities in the South Sumatra region. The area of Palembang City is 400.61 km^2 or 40,061 hectare which is administratively divided into 16 sub-districts and 107 villages Administratively Palembang City is bordered by:
North: Banyuasin Regency
East side: Banyuasin Regency
West side: Banyuasin Regency
South: Ogan Ilir and Muara Enim Regency

The administrative area of Palembang City can be seen in Figure 3. The location of Palembang city is quite strategic because it is traversed by the Sumatra Island crossroad that connects between regions on the island of Sumatra. There is also Musi River which functions as a trade transportation between regions and is a Water City.

The topography of Palembang City, in general, is lowland with an average height of +4 ± 12 meters above sea level, with a composition: 48% of the land is not flooded, 15% of the land is seasonally flooded and 35% of the land is continuously flooded throughout the season. The location of the highest area is in Bukit Seguntang, Ilir Barat I Sub-district, with an altitude of about 10 meters above sea level. The lowest area is located in the Sungai Lais area, Ilir Timur II Subdistrict. The city of Palembang can be divided into areas with flat to gentle topography, with slopes ranging from ± 0 - 3^o and areas with undulating topography with slopes ranging from ± 2 ± 10^o.

There are differences in topographic character between Seberang Ulu and Seberang Ilir. Seberang Ulu area generally has a relatively flat topography and most of the original land is below the maximum tide level of the Musi River (± 3.75m above sea level) except for the lands that have been built and will be built where the land surface has been filled and reclaimed. In the Seberang Ilir area, there are variations in topography (elevation) from 4 m to 20 m above sea level and there are micro-uses and valleys that are “continuous” with steep topography. Thus from the topographic aspect in principle, there are no limiting factors for spatial development, either in the form of slopes or large slopes. The majority of Palembang City is a gentle lowland with an average land elevation of +12 meters above sea level, while undulating areas are found in several

places such as Kenten, Bukit Sangkal, Bukit Siguntang and Talang Buluh-Gandus.

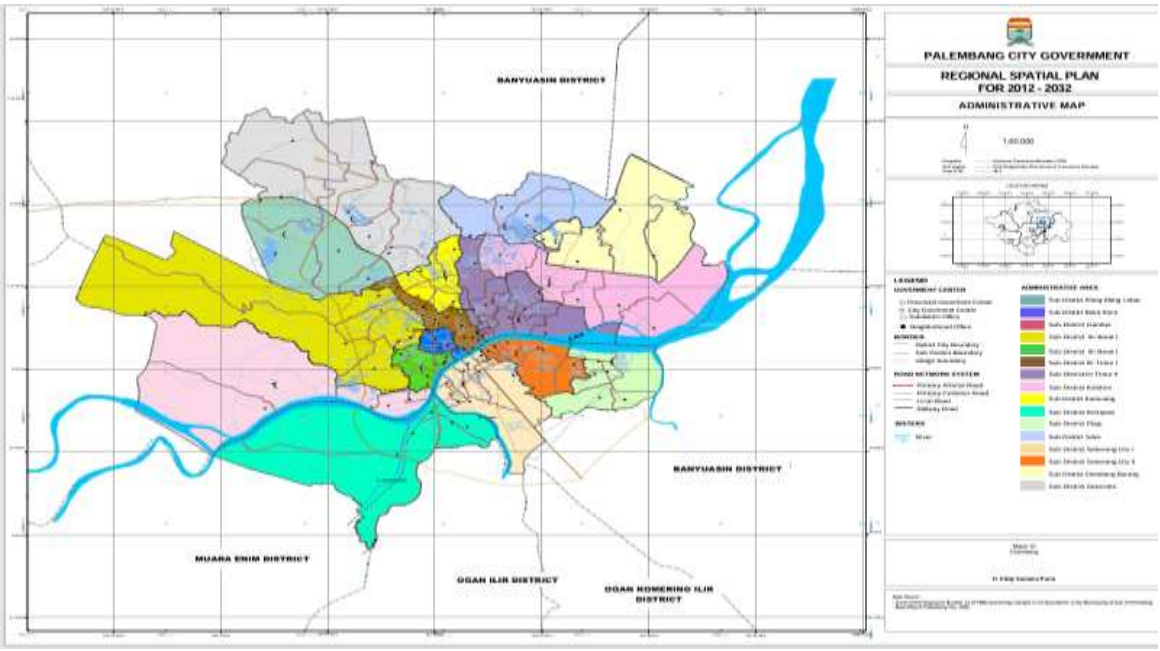

Fig. 3: Administrative map of Palembang City

There are differences in the topographic character of Palembang City (Seberang Ulu and Seberang Ilir) related to hydrological conditions, in the form of tributaries in the region. In the Seberang Ulu area, there are relatively large tributaries with estuaries in the Musi River.

The relatively large tributaries of the Musi River that have their headwaters in the Bukit Barisan Mountains are the Ogan River and the Komering River. The relatively small tributary of the Musi River are the Keramasan River which has its headwaters in the Muara Enim Regency. In addition to these tributaries, there are also small and short tributaries that drain into the Musi River and have their headwaters in Palembang City and surrounding areas, such as the Aur River and Sriguna River. In the Seberang Ilir area, the flow of the tributaries is divided into 2 (two) according to the existing topographic characteristics, in the form of a topographic ridge. In the southern part of the ridge, some tributaries flow to the Musi River and upstream on the topographic ridge. These tributaries include the Lambidaro, Sekanak, Buah, Batang, Selincah, and others. In the northern part of the ridge, tributaries are flowing north, which empty into the Kenten River, among others.

3.2 Characteristics of Respondents

Respondent farmers in this study were selected with the criteria that the agricultural land they own is included in the Palembang City area in 3 sub-districts, namely 72 respondents in Kalidoni sub-district, 87 respondents in Gandus sub-district and 91 respondents in Kertapati sub-district consisting of farmers who own and cultivate land which is divided into 2, namely farmers who transfer land functions and farmers who do not transfer land functions and tenant farmers which is divided into 2, namely farmers who transfer land functions and farmers who do not transfer land functions. Farmers who fall into these criteria are then randomly selected. The characteristics of respondents in this study are discussed by grouping respondents into several categories, namely age level, education level, number of dependents, and income level. Thus, the majority of farmers who are landowners are male.

3.2.1 Age Levels

Age level of respondent farmers in three sub-districts (Kertapati, Gandus, Kalidoni) in Palembang City. The majority of farmer respondents are in the age range of 52-57 years and 58-63 years with a percentage of 45 percent. Judging from the highest percentage of farmers aged in the age range of 52-63 years means that the age of farmer respondents is in the old working age category. Farmers at working age are 40-45 years and 46-51 years with a percentage of 26 percent. The lowest percentage of farmers in the age range of 28-33 years and 76-81 years is 3 percent each. The level of age comparison of respondents can be seen in Figure 4.

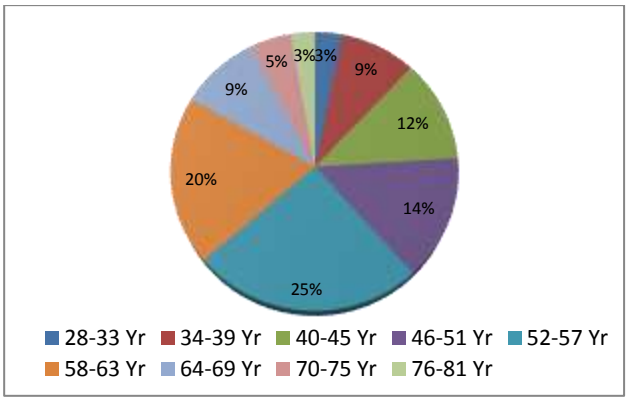

Fig. 4: Characteristics of Respondents by Age

3.2.2 Level of Education

Farmers in Palembang City generally have a low level of education. The education level of respondent farmers in the three sub-districts (Kertapati, Gandus, Kalidoni) in Palembang City has not graduated from school and only reached elementary school, junior high school, and senior high school. This is because in the past the obligation to study only up to six years, namely reaching the elementary level or equivalent. The education of farmers who are respondents in the three sub-districts of Palembang City is mostly low, namely only reaching elementary school, which is 62 percent, while the rest are junior high school at 17 percent, high school at 12 percent and not finishing school at 10 percent. The level of education will help shape the mindset and perception of farmers, also related to the ability of farmers to accept and desire to seek information about the technologies needed to support their farms. The full education level can be seen in Figure 5.

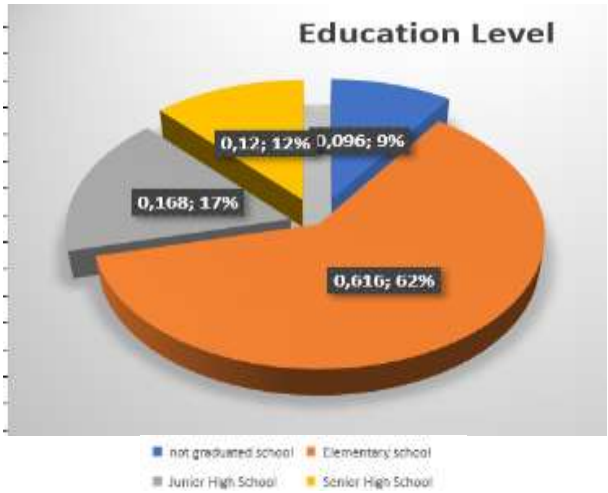

Fig. 5: Education Level of Respondents

3.2.3 Land Area and Ownership Status

The size of cultivated land is a variable that can indicate the scale of farming run by respondents. In this study, land area is the only land in three sub-districts (Kertapati, Gandus, Kalidoni) which are the research areas. The land is categorized based on the Central Bureau of Statistics (BPS) which is the minimum land area to meet the needs of a decent life for farmers. Small-scale farmers with a farm size of <0.5 hectares, medium-scale farmers with a farm size of 0.5-1 hectare, and large-scale farmers with a farm size of >1.0 hectare were categorized. The cultivated land area and land ownership status of farmers who were respondents in this study are presented in Figure 6.

Farmers' cultivated land area is around medium-scale land (74.80%) and small-scale land (18.40%) and the remaining 6.80 percent are farmers with large-scale cultivated land. Judging from the area of cultivated land owned by respondents in three sub-districts (Kertapati, Gandus, Kalidoni) in Palembang City area is the farming scale of medium-scale farmers and small-scale farmers. From the area of land owned by respondents, the profit cannot meet the needs of a decent life. Land area is consistently identified as a significant factor, positively impacting income in horticultural farming [21] and upland rice production [22].

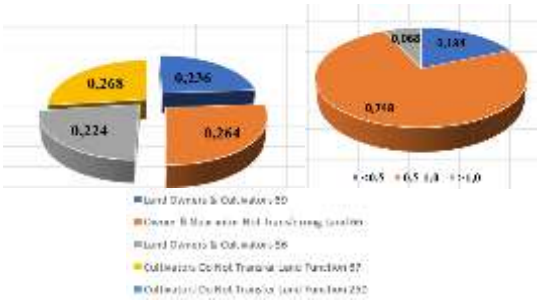

Fig. 6: Characteristics of respondents based on: (a) Land size, (b) Land Ownership Status

Land ownership status illustrates the existence of landowners to keep their land as rice fields or convert it into non-agricultural land. Land ownership status is divided into two groups, namely: owners and cultivators, and cultivators are then re-divided into 4 parts, namely owners and cultivators of land conversion, owners and cultivators not converting land functions, cultivators of land conversion and cultivators not converting land functions. The distribution of land ownership can be seen in the Figure 6. Farmers who cultivate in their ownership status are owners and cultivators who do not change land use (27%) while those who own

and cultivate land use change are (24%), and tenant farmers do not change land use (27%) and tenant farmers change land use by (22%). Tenant farmers are relatively limited in terms of education and capital, so they take up farming because there are no other options for their household income.

3.2.4 Experience

The length of time farmers have been farming rice in the swamp is an aspect that can see the experience of farmers. Farmers who are classified as long in farming are considered to be able to more easily accept the innovations given and dare to make decisions without fear of being wrong due to the learning process from previous experiences. The length of farming here is divided into three categories based on the highest and lowest values of the respondents, namely low (<10 years), medium (10-20 years), and high (>20 years). The distribution of farmers based on the length of farming can be seen in Figure 7.

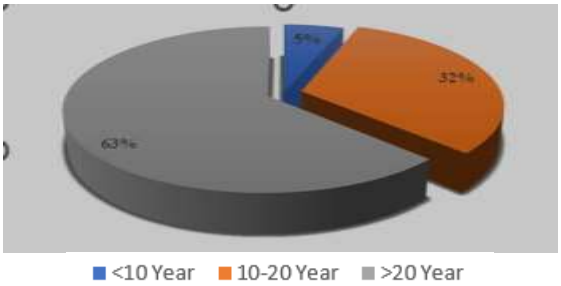

Fig. 7: Respondent characteristics based on experience

Figure 7, it can be seen that the distribution of farmers with the highest number in order is high experience (63%), medium (32%), and low (9%). When viewed from the number of farmers who have high experience and compared with the medium/productive age, then rice farming has good potential in terms of its human resources, regardless of external factors or other internal factors. According to Rahayu and Riptanti (2010), this experience allows farmers to manage farming well and manage constraints, obstacles, and opportunities that exist.

3.2.5 Number of Dependents

Farmers in Palembang City generally have two to three children and one wife. In this study most respondents had two to three dependents, namely 60 percent, respondents had four to five dependents at 24 percent, respondents had 1 dependent person at 12 percent, respondents had six to seven dependents at 3 percent and respondents had eight to nine dependents at 1 percent. From the percentage results, most respondents have 2 to three dependents at 60%. The family responsibilities of respondents in this study can be seen in Figure 8.

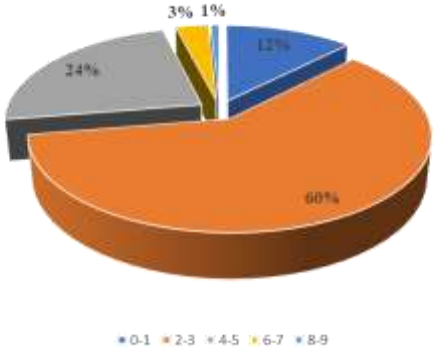

Fig. 8: Characteristics of respondents based on the number of dependents

The respondent's number of family dependents is one of the important variables in the study as it can affect various aspects of the respondent's life, including economic conditions, psychological well-being, and consumer behavior. In an economic context, a larger number of dependents tends to increase the financial burden on the head of household or main breadwinner. This may affect their ability to save, invest, or allocate funds for other needs such as education and health. Thus, understanding the number of dependents can help researchers in analyzing and understanding household financial dynamics as well as the level of poverty or economic well-being in the community.

3.3 The Impact of Agricultural Land Conversion of Rice Fields in Lebak Swamp

Economic impact is the indirect influence of the object of analysis on the number and type of economic activities in an area that focuses on economic indicators, and changes in farmers' income after converting wetland rice land into non-agricultural land. The economic impact is looking at farmers' income before and after the conversion of land use in the last 5 years interval, namely 2017-2021.

Operational costs in this study are all costs incurred by farmers, both those that directly affect the production process activities (variable costs) and those that do not directly affect the production process activities (fixed costs). Fixed costs are costs that must be incurred by farmers whose use is not exhausted in one production period. Fixed costs were obtained in this study in the form of tools.

Fixed costs of farmer production can be seen in Table 3.

Based on Table 3 shows that the fixed costs that must be incurred by farmers are only in the form of tools, which are used by land conversion and non-land conversion farmers, respectively calculated based on per hectare and cultivated area. The average fixed costs of land conversion farmers per hectare amounted to IDR 34,321/hectare (ha) the fixed costs of tenant owners amounted to IDR 36,130/hectare a and the fixed costs of cultivators amounted to IDR 32,513/hectare. The average fixed costs of land conversion farmers per cultivated area amounted to IDR 38,275, the fixed costs of tenant owners amounted to IDR 36,229 and the fixed costs of cultivators amounted to IDR 40,321. So the average fixed costs that must be incurred by land conversion farmers is IDR 34,321/hectare or IDR 38,275..

Meanwhile, the average fixed costs of non-land conversion farmers per hectare amounted to IDR 59,703/hectare, fixed costs of tenant owners amounted to IDR 64,268/hectare and fixed costs of cultivators amounted to IDR 55,139/hectare. The average fixed costs of non-land conversion farmers per cultivated area amounted to IDR 32,642, the fixed costs of tenant owners amounted to IDR 36,644 and the fixed costs of cultivators amounted to IDR 28,640. So the average fixed cost that must be incurred by farmers who do not convert land function is IDR 59,703/Ha or IDR 32,642.

Variable costs are the overall costs incurred to obtain factors of production and can change according to the number of products to be produced or costs that are easily exhausted in one production period, [17]. Variable costs are costs whose total size depends on production scale costs or costs]incurred are used up in one production in other words costs that cannot be used many times in the production process. The following is the number of variable costs incurred by land-conversion farmers and non-land-conversion farmers during one growing season. Variable costs in this study can be seen in Table 4.

Based on Table 4, the variable costs of land conversion for farmers in farming consist of land rent, seeds, fertilizers, wages and equipment rent, and transportation. The variable average cost of land rent is IDR 848,831/Ha or IDR 668,304, the variable average cost of seeds is IDR 384,457/Ha or per cultivated area of IDR 244,040, the variable average cost of fertilizer is IDR 455,490/Ha or per cultivated area of IDR 279,734, the variable average cost of wages and equipment rental is IDR 2,124,325/Ha or per cultivated area of IDR 1,361,336 and the variable average cost of transportation is IDR 111,210/Ha or per cultivated area of IDR 64,968.

Therefore, the average variable cost of farmers switching functions is IDR 3,987,456/ha or per cultivated area of IDR 2,665,882. The amount of variable costs of transferring the function of rice cultivator owners is per hectare of IDR 2,775,989/ha and cultivated area of IDR 1,653,729, while the amount of variable costs of transferring the function of rice cultivators is per hectare of IDR 5,198,923/ha and cultivated area of IDR 3,678,036. Variable costs for Non-land use farmers can be seen in Table 5.

Based on Table 5, the variable costs of non-land conversion farmers in farming consist of land rent, seeds, fertilizers, wages and equipment rent, water, taxes, and transportation. The average variable cost of land rent is IDR 1,194,350/Ha or IDR 407,353/cultivated area, the average variable cost of seeds is IDR 286,564/Ha or IDR 195,030/cultivated area, the average variable cost of fertilizer is IDR 371,425/Ha or IDR 265,391/cultivated area, the average variable cost of wages and equipment rental is IDR 1. 717,678/Ha or IDR 1,292,888, the average variable cost of water is IDR 76/Ha or IDR 10,000/acre, the average variable cost of taxes is IDR 3,295/Ha or IDR 117,500/acre, and the average variable cost of transport is IDR 63,225/Ha or IDR 45,160/acre.

Thus, the average variable cost of non-transferring farmers is IDR 3,039,438/Ha or per cultivated area of IDR 2,333,322. The amount of variable costs of non-land conversion of rice cultivator owners is per hectare of IDR 3,876,531/Ha and cultivated area of IDR 3,173,409, while the amount of variable costs of non-land conversion of rice cultivators is per hectare of IDR 2,202,345/Ha and cultivated area of IDR 1,493,235. The variable costs of non-land conversion farmers are smaller than the variable costs of land conversion farmers, although in non-land conversion farmers there are additional variable costs in the form of water and taxes.

This difference can occur due to different types of costs incurred in the farming business. Total production costs are the sum of fixed costs and variable costs. Production costs for land conversion farmers can be seen in Table 6.

Table 6, shows that the costs incurred by the farmer's transfer function of tenant owners and rice cultivators are each divided into two costs, namely fixed costs and variable costs.

Table 3. Farmers' fixed costs in the planting season

No	Fixed Cost Type	Fixed Cost/Hectare (IDR/acreage /Growing season)			Fixed Cost/ cultivated area (IDR/acreage/planting season)		
		Owners	Workers	Average	Owners	Workers	Average
1	Farmer Tool Costs for Land Conversion	36.130	32.513	34.321	36.229	40.321	38.275
2	Tool Costs Non-Land Use Farmers	64.268	55.139	59.703	36.644	28.640	32.642

Table 4. Farmer Variable Costs of Land Conversion

No	Variable Cost Type	Variable Cost/Hectare (IDR/acreage /Growing season)			Variable Costs (IDR/acreage/planting season)		
		Owners	Workers	Average	Owners	Workers	Average
1.	Land rent	0	1.697.662	848.831	-	1.336.607	668.304
2.	Seedlings	369.859	399.056	384.457	210.847	277.232	244.040
3.	fertilizer	423.037	487.943	455.490	234.915	324.554	279.734
4.	Pesticides	64.251	62.035	63.143	50.000	45.000	47.500
5.	wages and tool rental	1.772.571	2.476.080	2.124.325	1.076.780	1.645.893	1.361.336
6.	Water	-	-	-	-	-	-
7.	Tax	-	-	-	-	-	-
8.	transportation	146.271	76.148	111.210	81.186	48.750	64.968
	Jumlah	2.775.989	5.198.923	3.987.456	1.653.729	3.678.036	2.665.882

Table 5. Variable Costs of Non-Conversion Farmers

No	Variable Cost Type	Variable Cost/Hectare (IDR /Ha/Growing season)			Variable Costs (IDR/acreage/planting season)		
		Owners	Workers	Average	Owners	Workers	Average
1.	Land rent	-	1.194.350	1.194.350	-	814.706	407.353
2.	Seedlings	451.108	122.020	286.564	307.045	83.015	195.030
3.	fertilizer	495.528	158.005	326.767	368.305	99.559	233.932
4	Pesticides	65.690	23.627	44.658	48.286	14.632	31.459
5.	wages and tool rental	2.753.203	682.154	1.717.678	2.116.364	469.412	1.292.888
6.	Water	152	-	76	20.000	-	10.000
7.	Tax	6.591	-	3.295	235.000	-	117.500
8.	transportation	104.260	22.189	63.225	78.409	11.912	45.160
Jumlah		3.876.531	2.202.345	3.039.438	3.173.409	1.493.235	2.333.322

Table 6. Total Cost of Farmers Switching Farm Functions

No	Type of Cost of Switching Farm Function	Farming Cost/Hectare (IDR/Ha/planting season)			Farming Costs / Area Cultivated (IDR/acreage/planting season)		
		Owners	WorkesPengara	Average	Owners	Workers	Average
1.	Fixed costs	36.130	32.513	34.321,5	36.229	40.321	38.275
2.	Variabel Cost	2.775.989	5.198.923	3.987.456	1.653.729	3.678.036	2.665.882
	Jumlah	2.812.119	5.231.436	4.021.777,5	1.689.958	3.718.357	2.704.157

Table 7. Total Costs of Non-Convertible Farmers for one Farming Season

No	Type of Non-Function Cost of Farming	Farming Cost/Hectare (IDR/planting season)			Farming costs/acreage (IDR /acreage)		
		Owners	workers	Average	Owners	Workers	Average
1.	Fixed Costs	63.268	55.139	59.203,5	36.644	28.640	32.642
2.	Variabek Costs	3.876.531	2.202.345	3.039.438	3.173.409	1.493.235	2.333.322
Jumlah		3.940.800	2.257.483	3.098.641,5	2.962.477	1.521.875	2.365.964

The amount of costs incurred by tenant farmers is per hectare of IDR 2,812,119/Ha and cultivated area of IDR 1,689,957, while the amount of costs incurred by tenant farmers is per hectare of IDR 5,231,436/Ha and cultivated area of IDR 3,718,357. So the average cost incurred by farmers' transfer function is per hectare of IDR 4,021,777.5/Ha and area of cultivation of IDR 2,704,157. The total

production costs of non-land conversion farmers can be seen in Table 7.

Table 7, shows that the costs incurred by farmers' non-transfer function of tenant owners and rice cultivators are each divided into two costs, namely fixed costs and variable costs. The number of costs incurred by farmers' non-transfer function of rice cultivator owners is per hectare of IDR 3,940,800/Ha and cultivated area of IDR 2,962,477, while the amount of costs incurred by farmers non-transfer function of rice cultivators is per hectare of IDR 2,257,483/Ha and cultivated area of IDR 1,521,875. So the average costs incurred by farmers transfer function is per hectare of IDR 3,098,641.5/Ha and the area of cultivation amounted to IDR 2,365,964.

Analysis of farm income is the multiplication of production obtained by the selling price. Farmers' income in this study is divided into two categories, namely land conversion farmers and non-land conversion farmers. The revenue obtained is the average revenue from the owner of the cultivator and the cultivator. A comparison between the acceptance of land conversion and non-land conversion farmers can be seen in Table 8.

Table 8. Revenue of Non-Switch Farmers Farming Function One Farming Season

No	Farmer Revenue	Revenue (IDR /ha/planting season)	Revenue / Acreage (IDR / Planting Season)
1.	Farmer Acceptance of Land Conversion	19.830.562	14.412.557
2.	Non-land conversion farmer revenue	20.557.442	16.144.992

Based on Table 8, it can be seen that the acceptance of land conversion farmers is per hectare of IDR 19,830,562/Ha and cultivated area of IDR 14,412,557. At the same time, the acceptance of non-land conversion farmers is per hectare of IDR 20,557,442/Ha and cultivated area of IDR 16,144,992. This shows that the acceptance of land-conversion farmers is smaller than the acceptance of non-land-conversion farmers. This difference in income due to land conversion is also evident from the results of research, [6].

Income analysis is used to determine total revenue and net income, which means gross income or total revenue minus total costs, [17] . Farmers' income is known to be divided into two, namely gross income and net income. Gross income is the value of production received by farmers before deducting production costs, while net income is the value of production received by farmers minus production costs during the production process. Calculation of income is also divided into two categories as in the analysis of acceptance, more details about the income of farmers can be seen in Table 9.

Table 9. Comparison of Farmers' Farm Income from Land Use Change and Non-use Change in One Planting Season

No	Farmer Revenue	Revenue (IDR /ha/ planting season)	Revenue / Acreage
Farmer Land Conversion			
	Revenue	19.830.562	14.412.557
	Cost	4.021.777	2.704.157
	Income	15.808.785	11.708.400
Non-land conversion farmers			
	Revenue	20.557.442	16.144.992
	Cost	3.099.142	2.242.176
	Income	17.458.300	13.902.816

Table 9 shows that there is a difference between the income received by land-conversion and non-land-conversion farmers. It can be seen that the income of land conversion farmers per hectare of farming is IDR 15,808,785/Ha and per cultivated area of IDR 11,708,399. At the same time, the income of farmers who do not change the function of farmland per hectare is IDR 17,458,300 / ha and per cultivated area of IDR 13,902,816. This shows that the income of land-conversion farmers is smaller than the income of non-land-conversion farmers. This shows that there has been a change in farming conditions due to changes in one of the factors of production in the form of land.

Land conversion can have a significant impact on income, with a decrease in agricultural income but an increase in off-farm income, [23]. This result is supported again by the results of research by [24] showing that land conversion has a negative and significant influence on the income of affected farmer households. The decline in farmer household income in the 5 villages in Temon sub-district is partly due to the reduction of agricultural land.

Land conversion from agriculture to non-agriculture, such as housing, industry, or infrastructure development, can directly reduce farmers' income as land previously used for farming becomes unavailable. When farmers lose access to their farmland, they also lose the main source of income from selling crops. For example, rice farmers who no longer have land to grow rice will lose the income previously earned from selling rice. This land conversion may force farmers to seek

alternative employment that may not be comparable in terms of income, skills, and job stability.

Land conversion is often accompanied by an increase in land prices and the cost of living around the developed area. Affected farmers may find that they cannot afford to buy or rent new land at higher prices, or that available replacement land is not as productive as their original land. This can lead to reduced productivity and efficiency in their farming practices, further reducing their income. Even if there is financial compensation from the government or developers, it is often insufficient to cover the long-term losses that result from the loss of agricultural land. As a result, farmers may face prolonged economic hardship, which can negatively impact their well-being and that of their families. These changes are also experienced by salted anchovy processors who experience changes in their production factors, more fully in the sensitivity simulations conducted in research, [25]. The simulation of changes in production factors has an impact on the condition of the processing business.

Land conversion, particularly from agricultural to non-agricultural use, has significant socio-economic impacts in developing countries. While it can lead to increased income for some farmers, [26], it often results in negative economic consequences, such as endangering household revenue, [27]. The difference in income of land conversion and non-land conversion farmers was analyzed using an independent t-test. The results of the analysis showed that there was no significant difference between rice farming income of land conversion and non-land conversion farmers, seen from the significant value of 0.159, non-significant at the 0.05 confidence level (0.159 > 0.05). It can be concluded that there is no difference between rice farming income of land conversion and non-land conversion farmers. Analysis of income differences using an independent t-test can be seen in Table 10.

Table 10. Analysis of Differences in Farmer Income Using the t Test

No	Income Differences	t hitung	Sig (2-tailed)
1	Farmers before and after conversion	-5,450	0,000**
2	Change of Function and Non-Change of Function Farmers	-1,435	0,159

*Note: ** significant at the 0,01 level (2-tailed).*

A paired t-test was used to analyze the difference in farmers' income before and after land conversion. A significant difference in farmers' income from rice farming before and after land conversion was revealed by the analysis, with a t-count value of -5,450. This difference was significant at the 0.01 confidence level (0.000 <0.01). Farmers made more money on average before land conversion than they did after it. Table 10 illustrates how farmers' average incomes before and after land conversion differed from one another. This is consistent with research findings that show there are differences in rice farmers' income due to land conversion [6]. The study's findings [12], which indicated that all respondents' farm income decreased following land conversion, corroborate this conclusion.

In addition to having advantages when compared to similar studies, research must also have disadvantages. This research only discusses the impact of land conversion from an economic point of view. Considering the limitations of this research which only looks from a financial point of view, it is hoped that future researchers will conduct more research by analyzing research on the impact of land conversion on various aspects such as social, environmental, and ecosystems.

4 Conclusion

The findings of the research about the economic impact of land conversion on rice farmers suggest there is an association between land conversion and farmers' economies. The analysis shows that there is a difference in farmers' rice farming income before and after land conversion, obtaining a count value of -5,450, significant at the 0.01 confidence level (0.000 <0.01). Farmers' income from land conversion on 1 ha of land area amounted to IDR 15,808,785 and non-land conversion of IDR 17,458,300, on the average cultivated area of respondents' income from land conversion of IDR 11,708,400 and non-land conversion of IDR 13,902,816. The average income of farmers before land conversion is greater than farmers after land conversion, so it can be concluded that the economic impact of land conversion on rice farmers is in the form of a decrease in rice farming income.
This research raises research topics closely related to the current conditions where the population continues to grow and will cause a reduction in agricultural land converted for household needs. The income difference between land conversion farmers and non-land conversion farmers is influenced by the reduction in the land area so that production decreases and the greater costs required in growing lebak swamp rice.

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Conflict of Interest

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