Sustainability land conversions in Tadokkong Village

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Abstract. Farmers are rational creatures who always consider the advantages and disadvantages of all actions taken, in this case including the land conversion by farmers. This research focused on farmers who have converted land particularly the change of garden land into paddy fields, conducted by farmers in Tadokkong Village, Pinrang Regency. The main reason underlying farmers to convert land in addition to achieving economic benefits was that the plantation land to be converted is idle land. It needs action to increase the usability of the farmland. This research was conducted in Tadokkong Village, Lembang District, Pinrang Regency, South Sulawesi. Analysis data in this study used descriptive qualitative which collecting information through interviews and questionnaires obtained from farmers. The data was processed using a Likert scale. The results of this study indicated the rationality of farmers in doing land conversion was based on effective rational actions and reasonable actions was based on values (value rational action).

1. Introduction
The concept of land conversion in Tadokkong district does not fully enter the land use function. It has a negative impact both in terms of economic, social, and ecological. Land conversion activities can support the creation of food security both at the regional and regional levels because of the formation of several new fields. According to Hartati [1], one of the triggers for the low production of food farming is caused by the narrow land area. Therefore, in this case, it is necessary to convert land or printing new land that can provide benefits in the present, in the future, or sustainable. This is consistent with the opinion of Irawan [2], increasing food security is one of the goals of national development. In terms of production, the boost in food security is pursued by increasing rice production, especially those produced from paddy fields. This can also become a good concept of sustainability from the results of land conversion. According to the opinion expressed by Salikin[3], agricultural development must be conducted in a balanced manner and adjusted to the carrying capacity of the ecosystem so that production continuity can be maintained in the long term by suppressing the level of environmental damage as small as possible. The indicators used to see the sustainability of this land conversion were economical, ecological and social aspects.

2. Methods

2.1. Research location and time
This research was carried out in Tadokkong Village, Lembang District, Pinrang Regency, South Sulawesi. The selection of this location was made by purposive sampling with the consideration that
there is a lot of farmer population who perform the activity of changing the land into a paddy field in Tadokkong village. The majority of people in the area have livelihood as farmers. The research was conducted in February-March.

2.2. Population and respondents
The number of samples used in this study was 46 farmers. The method applied in determining the sample using the census method. The population was the farmers who carry out land conversion activities in the Tadokkong village, Lembang District, Pinrang District. According to Sugiyono[4], "saturated sampling is a sampling technique if all members of the population are used as samples. Another term for saturated samples is the census".

2.3. Data analysis method
The analytical method used in this study was a qualitative analysis method. The research method used a type of qualitative research with a descriptive approach. According to Hidayat[5], qualitative research describes a thing namely data in the form of speech, tangible words, writing, behavior that can be observed from the person (subject) itself, stated in symbolic forms such as statements, interpretations, and oral verbal responses. The purpose of descriptive research is to explain things systematically, factually, and accurately as well as the characteristics of populations in certain areas[6].

Data obtained from further research were tabulated and proceed with a scoring system. The scoring system was to score each statement related to each indicator of rationality and sustainability. Scoring was done by using a Likert scale. According to Budiaji[7], a Likert scale that contains four or more question items combined to form a score with five levels of answers regarding the respondent's agreement and explained descriptively in the discussion by looking at indicators of rationality and sustainability as a foundation.

The indicator of measuring the level of sustainability of conversion land into rice fields looked for how many benefits that can be generated from the rice fields that have been converted referring to the three dimensions. First, economic dimension with indicators; a) meet the household food availability of farmers, b) increase in grain prices, c) increase in household income of farmers, d) the potential of paddy land compared to plantation land before conversion and e) the ability of the land to be able to plant seasonal crops. Second, the ecological dimension with indicators; a) water availability, b) land carrying capacity, c) land drainage and aerate capability; d) resource management (nutrient cycle, plant pests, etc.). Third, social dimensions with the indicators; a) influence from other farmers who carry out land conversion activities, b) cooperation between farmers, c) higher status of paddy land ownership, d) management of land that has been converted by farmers. The scoring systems are:

a. Determination of answer scores
   Score 3: High
   Score 2: Medium
   Score 1: Low
b. Interval score
   The formula used to determine the interval score from the Likert scale calculation as follows:

   \[ I = \frac{100}{\text{total score}} \]  

   Then, \( I = 100/3 = 33 \) (this is the interval from the lowest 0% to the highest 100%). The following criteria for interpretation of scores are based on intervals:

   Where:
   - Figures 0% - 33.99% = Low
   - Figures 34% - 66.99% = Medium
Figures 70% - 100% = High

c. Ideal score
The ideal score is the formula used to find out the value of n on the Likert scale final equation. Meanwhile, the formula used to find out the ideal score is as follows:

\[
\text{Ideal Score: Scale Value} \times \text{Number of Respondents}
\]

Then, the Ideal Score = 3 x 46 = 138
Thus, the ideal score on the use of a scale 3 value with 46 respondents, namely 138.

d. Percentage/Final completion
To find out the high standard of the low level of expectation of sustainability in the conversion of plantation land into paddy fields, a formula used is:

\[
P = \frac{F}{n} \times 100\%
\]

Where:
\begin{align*}
P & \quad = \text{Percentage} \\
F & \quad = \text{The frequency of each answer} \\
N & \quad = \text{Maximum / ideal number of scores} \\
100 & \quad = \text{Fixed number}
\end{align*}

3. Results and discussion
Sustainability can be interpreted as maintaining an ongoing effort, the ability to survive and keep from deteriorating. In the context of agriculture, sustainability means the ability to remain productive while still maintaining a resource base. In assessing agriculture to be sustainable, a stable ecology can continue it economically, reasonably, humanely, and flexibly.

Economic sustainability means that farmers can produce enough to meet their own needs, income and sufficient income to return the labor and costs incurred. The concept of sustainability wanted to be seen in this study was how the level of durability of the results of the conversion of garden land into paddy fields carried out by the farmers. The results of the sustainability or sustainability of this land conversion activity are how much benefit can be given to land that has been converted based on three dimensions of sustainability. The three dimensions of sustainability used in the study of the conversion of garden land into paddy fields can be seen in table 1.

| Sustainability    | Sustainability score | Percentage of approval (%) | Rating scale (interval) |
|-------------------|----------------------|----------------------------|-------------------------|
| Economic dimension| 79.9                 | 52.82                      | Medium                  |
| Ecological dimension| 113.0               | 81.88                      | High                    |
| Social dimensions | 123.6                | 89.10                      | High                    |

In table 1, it can be seen that there are three sustainability results of the conversion of plantation land into paddy fields in Tadokkong Village, Lembang District, Pinrang Regency, namely the economic dimension, ecological dimension, and social dimension. In the economic aspect, it can be noticed that the average sustainability score was 79.9 with a percentage of approval of 52.82%. Therefore, the level of sustainability of the economic dimension of conversion of farmland to paddy land on a scale rating was categorized (interval) medium. The scale rating according to Arikunto [8] is
the result of the calculation of the highest scale of 100 divided by the many scale scores used. To see the level of expectation of sustainability results of farmers' land conversion used 3 scale counts, the criteria in the feasibility table was based on the scale presentation according to the percentage of total score as in Figure 4.

![Figure 1](image)

**Figure 1.** Economic Dimensions of Sustainability Converting Plantation Land to Rice Field.

Where:
- T = height
- S = Medium
- R = low

In the picture above, it can be noticed that the level of expectation for the sustainability of the conversion of plantation land into paddy land based on the economic dimension is at medium intervals. The indicators used as benchmarks to see the sustainability of the economic dimension namely the first land conversion activities are considered to be able to maintain the household rice food availability. Based on information obtained from the farmers, 73.91% of farmers or 34 of 46 farmers, who were also the respondents in this study, claimed that land conversion activities could provide expectations of high rice food availability. This is possible because by carrying out new rice field printing activities, it can increase the production of farmers' grain, which is added to the output of other fields owned by farmers. However, 26.08% of the farmers in this study preferred to sell all grain production produced from the print of new fields they do, so as not to increase the availability of household rice food.

Additionally, if the increase in grain production continues to increase with the existence of new fields that have been printed, it can also assist the government in achieving food self-sufficiency that the government continues to program year by year. The concept of food security is essentially aimed by realizing guaranteed food availability for humanity. The second indicator is that the increase in the price of unhusked rice is considered to be one of the reasons why the farmers are so insistent to carry out the land conversion [9-11]. Fluctuation in grain prices is one of the triggers for the farmers’ decisions to change their farmland into paddy fields. Farmers feel uninterrupted by grain fluctuation that often occurs due to the price of grain goes down. If the price is not too low, it is not a problem for them. According to the farmers, falling prices are usually caused by climate/weather factors or pests/diseases that destroy rice.

The third indicator is that land conversion activities are considered to be able to increase the income of farmers. This is consistent with what was conveyed by farmers, who were respondents in this study, that by printing new fields, the revenue of farmers also increased. It was caused by the land that has not been planting yet. Currently, it can be planted with rice or other seasonal plants, for example, corn and other annual plants.

The fourth indicator of the economic dimension of the conversion to paddy land is considered more potential than when it was still paddy land. This is confirmed by the opinion of farmers who declared
that land is more useful when it has been used as rice fields. The land potential has an essential meaning in land management and land use. High potential land for agriculture can produce high-qualified plants and more agricultural crop production. Finally, rice fields that have been converted in addition to planting rice were planted as their main function. Rice fields can also be planted with seasonal plant species, which are suitable for the soil type as well as climatic conditions. This was reinforced by the decision of several farmers who chose to plant their paddy fields that had been converted to other types of plants.

The results of the ecological dimension of the sustainability of the results of the conversion of garden land into paddy fields were at high intervals with an average sustainability score of 113 and an approval percentage of 81.88%. Based on the presentation of the scale according to the percentage of the total score, the criteria can be seen in the feasibility table as in figure 2.

![Figure 2. Sustainability Ecology Dimensions Conversion of Farm into Farmers.](image)

| R  | S  | T  |
|----|----|----|
| 0% | 33.99% | 66.99% | 100% |

(Results = 81.88%)

Where:
T = High
S = Medium
R = Low

Based on the picture above, the level of expectation for the sustainability of the conversion of plantation land into paddy land was seen from the ecological dimension at high intervals. The indicators that serve as benchmarks are the farmers conducted the land conversion activities due to its availability of water that can irrigate the paddy fields that have been printed. According to the farmers who convert land, even though the status of land as rainfed land, the land is still irrigated only once a year. Since irrigation is also more intended for paddy land, which must produce twice a year, it was different with rainfed land which is usually only once a year. Even so, some farmers have a personal water pumping machine and direct assistance from the government. Thus, it can be used to irrigate paddy fields when the farming season arrives and the land needs more water. Water resources are the essential part of natural resources which have unique characteristics compared to other resources. The availability of water resources is one of the capitals needed to support food self-sufficiency and fulfill domestic needs.

The second indicator, the farmers decided to convert the garden land into paddy fields because of the land’s ability in carrying the capacity to plant rice or other types of seasonal plants as previously explained. The potency of available land is useful for agricultural activities. The indicator on the ecological dimension is the ability to absorb land, in this case, the ability of the land to absorb water and retain water entering the land. In addition, the land is close to large rainfed rice fields so the texture of the soil is the same even though the land was previously a garden land. According to Mr. Suparno as one of the farmers who carried out land conversion activities, the ability of the land to absorb and maintain water entering the converted land was quite good. It is related to resource management efforts, such as the soil nutrient cycle by resting land that has been converted before it is used for farming activities.
Finally, the results of the sustainability of the social dimension of the conversion of plantation land into paddy fields were at high intervals with an average sustainability score of 123.6 and an approval percentage of 89.1%. Based on the presentation of the scale according to the percentage of the total score, the criteria can be seen in the feasibility table as shown in figure 6.

![Figure 3](image)

**Figure 3.** Sustainability social dimensions conversion of plantation land to the rice field.

Where:
- T = Height
- S = Medium
- R = Low

Based on the picture above, the level of sustainability of the results of the conversion of plantation land into paddy fields was seen from the social dimension at high intervals. The indicators are farmers choose to do land conversion activities because many other farmers do the same way. The farmers feel interested in doing the same thing because they see the potency and benefits of paddy land instead of retaining it into paddy land.

The second indicator is the high level of cooperation among the farmers. As expressed by the farmers who carried out the land conversion in this study, the cooperation is still well established, in the planting process both the process of planting rice and plant species other seasonal things like corn and so on. Moreover, cooperation in the process of water distribution, the farmers fairly understand each other. The other forms of cooperation such as providing information about good planting time and the use of agricultural machinery that will be beneficial to cultivate the rice fields by tractors and to harvest rice using a combine machine.

The third indicator is that paddy fields are considered to have a higher status than plantation land so the farmers are aggressively carrying out land conversion activities. The reason is paddy fields have a higher selling value and their production yields are also higher than plantation land. The farmers in Tadokkong village prefer to own paddy fields rather than plantation land. Even if there are still farmers who have garden land, the farmers will possibly convert it into paddy fields. Furthermore, it was supported by the location of land in the lowlands. The last indicator is the ability of proper management by farmers, in this case concerning governance in the supply of inputs such as seeds, pesticides, or agricultural technology or machine tools that will be applied by the farmers. Later on, the availability of markets or buyers will increase to promote farmers’ agricultural production both rice and other seasonal crops cultivated by the farmers.

4. Conclusion

Based on the discussion that has been described related to the sustainability of the results of the conversion of plantation land into paddy fields, the economic dimension at a high level, the ecological dimension is at a high level, and the social dimension is at a high level.

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