Small scale corporate model and rice farming efficiency

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Abstract. The land is one of the production factors directly influencing farming efficiency, especially due to the division and fragmentation of land plots. The multi-dimension of land issues could bring serious impact to agricultural development goals as well as the general goals of development, i.e., the goals of production, productivity, and food crop farming efficiency, especially in rice commodities. It could also threaten the food sovereignty program. The research aims to make farming modeling to increase efficiency and effectiveness in land tenure for rice farming and employed descriptive analysis. The research result shows that the existence of rice farming was dominated by the family farming system, where since production to marketing was conducted by the farmer individually. Farmers were generally have joined in a long-established farming group. The farming group played a role as a non-formal organization in receiving subsidies from the government, either production equipment or agricultural machinery subsidies. Further, farming managed to incorporate reduced farming land division and fragmentation as well as governed the varied land tenure systems. The management of agricultural land tenure systems through the Small Scale Corporate Farming (SSCF) model improved farming efficiency in terms of agricultural production equipment, machinery, and labor utilization. In addition, it also improved the effectiveness of the subsidy program and farming protection.

1. Introduction

The land is one of the factors of production that directly affects farm efficiency, especially with the existence of division and fragmentation of land plots. Splits and land dispersal are caused by a variety of reasons, including buying and selling, inheritance, and grants and systems of communication. The problem of the process of centralizing land ownership, either through leasing, pawning, or through ownership with purchase, until now is still running. This process, however, will further encourage the increase in the number of landless farmers. Locally South Sulawesi and also occur in other regions that the conversion of paddy fields to non-agriculture, especially property, is higher, especially in urban areas. In addition, the transfer of functions also occurs in an expanded area where new cities will be created, and sadly most of those who change their function are irrigated rice fields where planting is usually 2 to 3 times [1].

Viewed from the social aspect, agrarian differentiation in the form of the diversity of agricultural land structure into the dichotomy of land ownership, polarization, and stratification, is not caused by changes in economy and technology. The structure occurs because of the cultural values that have
been formed for a long time according to the history and influence of the local environment. Multidimensional land problems can have a very serious impact on agricultural development goals, namely the objectives of production, productivity, and efficiency of farming crops, especially rice commodities, which can simultaneously threaten food sovereignty programs. South Sulawesi, as part of the Sulawesi Economic Corridor (SEC) in the master plan for the acceleration of economic development of Indonesia, has long been known as a food barn, primarily rice [1]. But if there is no effort to manage an increasingly fragmented land tenure system, then it does not guarantee the certainty that food security, especially wishful sovereignty in general, can be sustainable.

In the agricultural production system, the land is one of the factors of production that directly affects farm efficiency, especially with the existence of devision and fragmentation of land plots, which from the beginning was conveyed by Mubyarto [2] due to various reasons, including buying and selling, inheritance as well as grants and systems of understanding. The problem of the land tenure system model can be seen from two sides, namely the distribution side and the concentration side. Regarding distribution, Word Bank argues that at least in developing countries, income inequality and inequality of assets can slow down the rate of economic growth in two ways. First, those who have power and wealth can cause distortion of the cost of capital between social groups. Secondly, this distortion causes waste and inefficient allocation of resources and closes opportunities for those who are not lucky. The ruling elites also tend to form and maintain institutions and regulations that only benefit themselves, at the expense of the wider public.

The problem of the process of centralizing land tenure, either through leases, pawning-pawning, or through ownership with purchases, until now is still running. This process will somehow further encourage the increase in the number of landless farmers (tunakisma). Some of the factors causing the concentration of land tenure include: 1) the existence of income surplus in the class of society that controls large land so that it encourages the desire to invest in the form of land tenure expansion and the purchase of agricultural equipment such as tractors, water pumps, grain grinding machines, and others, 2) inadequate banking services in the countryside so that the excess revenue is more allocated for the procurement of assets, especially land assets [3,4].

In the history of polarization and land ownership shifts, Verburg [5] has argued that fragmentation and division accompanied by extreme economic pressures have increased the concentration of ownership and control of land in Java and therefore widened the distance between wealthy villagers or landowners wide with villagers who do not own land. Adiwilaga, 1954 and Mubyarto, 1989 stated that the process of disintegration of private land (due to distribution) and concentration of land (land fragments piled in one property through the loan shark system, purchase and so on). The existence of land split through purchasing, the loan shark system and perhaps even more importantly, through various transactions that tend to focus control over land in the hands of rich people in the village even tends towards the transfer of land ownership rights [2], mapping land tenure institution [6], conserve biodiversity [7], reducing agrarian land conflict [8], affecting farmers income [9] and contributing to poverty alleviation in a rural area [10] and food security sustainability [11].

Agricultural development policy affects farmers in the control group 0.5 ha - 1.0 ha, while in smallholder groups with land tenure under 0.5 ha, agricultural development policies tend to have no impact. This is in line with the efficiency of resource allocation. Bakri, 2013, Michler and Shively, 2015 finding that land tenure regulation has a significant impact on technical efficiency, in other words, that the management of the land tenure system by integrating land will have an impact on efficiency rice farming [3,4]. The research aims to make farming modeling to increase efficiency and effectivity in land tenure for rice farming.

2. Methods
The research was carried out in two typologies of paddy fields in South Sulawesi, Indonesia. Highland rice field typology in Salo Dua Village, Enrekang District, and lowland in Ganra Village, Soppeng Regency, South Sulawesi, Indonesia. We interviewed 120 farmers, each of which 60 people in each
village were taken randomly. Data were collected by interview and focus group discussion. The research employed a descriptive analysis.

3. Results and discussion

3.1. Current rice land management pattern

The current pattern of land tenure control is generally indicated by the results of this study, where the families of farmers who carry the land below 0.5 ha are still dominant (49.17%) following those who control the land between 0.5 - 1.0 hectares (28.33 %) and greater than 1 hectare (22.50%). These results indicate a shift in land tenure patterns with the previous one, as conveyed by [12] that in 1983 in South Sulawesi, the dominant farmer family (30%) is the "middle" group which controls 1.0 - 2.0 hectares of land, following the 0.5 - 1.0 hectare (21%), 2.0-3.0 hectares (18%) and in fact the lowest (10%) is the family of "small" farmers who carry less than 0.5 hectares. There is a shift in the dominance of "middle" farmers (controlling 1.0 hectares to 2.0 hectares) into farmers who live under 0.5 hectares. The results of this study also reinforce the argument that land clearing has occurred in the past 30 years and continues.

On the other hand, land concentration gradually also occurs. This is found primarily in lowland rice fields, namely in the village of Ganra. This village, which is one of the rice producers in South Sulawesi, shows a different land tenure pattern in general. The middle group, namely the family of farmers who control 0.5 - 1.0 hectares of land is more dominant (38.33%), following the "rich" group who controls above 1.0 hectares (36.67%) and the last is the "poor" group "Which controls land under 0.5 hectares (25.0%). This pattern is different from the Salo Dua village, which represents upland rice fields whose pattern is the same as the general pattern where the "peasant" farmer families who control the land under 0.5 hectares are more dominant (73.34%) as shown in Table 1.

| No. | Land tenure | Highland | Lowland | Total |
|-----|-------------|----------|---------|-------|
| 1.  | < 0.5       | 44       | 15      | 59    | 49.17 |
| 2.  | 0.5 - 1.0   | 11       | 23      | 34    | 28.33 |
| 3.  | 1.0 <       | 5        | 22      | 27    | 22.50 |

The family structure of farmers in the two research villages seen from their land tenure patterns. The families of farmers living in the highlands are structurally like "pyramids" where the "poor" land still dominates, while the farmers' families in the lowlands are structured "rhombus," the middle class is more dominant. There is a difference in the mastery of rice field assets at the farmer's family at this time, in addition to the result of the land division with inheritance and buying and selling, also due to the production and institutional systems that exist in farmers. The rice farming production system is dominated by individual or family systems, where the entire production process is carried out on a family basis. Farmers only manage owned land or land controlled by families where the dominant is below 0.5 hectares, so the production process is inefficient, and government programs are less effective.

3.2. Farmer institution in the production process

It is known that farmer institutions, one of which is a farmer group has been known by farmers for a long time, even the results of this study indicate that if 100% of farmers are already members of farmer groups, the reason is that they will not be able to access government programs, especially seeds and fertilizer if not registered in one farmer group. Although all of the respondents were registered as members of one of the farmer groups, not all respondents felt the benefits of the farmer group were
further as they expected. Farmer groups by farmers are still considered to be limited to the
determination of planting schedules, a forum for mutual cooperation in cleaning water channels,
develop detailed plans for group needs and distribution of assistance.

Although the farmer group has become a forum by farmers to accept government programs so far,
it was revealed in interviews and focus group discussion that farmers use the group to receive
programs, after that they return to production by individual so that the farming is not efficient yet
again the utilization of production facilities and uncontrolled agricultural equipment and machinery so
that sometimes the benefits are wrong. The existence of land tenure problems that result in inefficient
farming and institutions, especially farmer groups and even a combination of farmer groups, are the
main potential in realizing a corporate agricultural system with a scale that adapts the potential of each
region.

| No | Village Name | Number of Farmer Group | Number of Member (person) | Land Area |
|----|--------------|------------------------|--------------------------|-----------|
| 1  | Salo Dua     | 12                     | 250                      | 367.90    |
| 2  | Ganra        | 25                     | 625                      | 388.65    |
|    | Amount       | 37                     | 775                      | 756.55    |

3.3. Small corporate farming
Based on the results of research related to land tenure and the role of farmer groups as well as various
government institutions and policies that are not optimal, the model of group-based wetland
governance, group-based agriculture is an alternative that is expected by farmers, so that the
production process takes place efficiently, institutions increasingly role and effective government
program. The farmer group has been the center of farmers' activities, mainly during the pre-production
phase. Farmer groups have not been utilized in the production phase, while farmers' expectations,
farmer groups can facilitate the accumulation of farmers' land, which is under 0.5 hectares on average
or 0.5-1.0 hectares, which they control into land with groups of 25.0-100.0 hectares are efficient in the
production process. Likewise, in utilizing government programs, especially are facilities and
infrastructure, tools, agricultural machinery as well as production guarantee programs such as farm
insurance. The activities carried out are limited to the procurement of production facilities, agriculture
machinery is still not effectively utilized by the group, even though the designation is a group.
Because of this, the production system that is still a farmer household should be converted into a
farming system in groups, stretching 25 to 100 hectares in one stretch, as well as required in the
formation of farmer groups and farmer groups.

The farmer group has carried out its function as a forum for the preparation of the group needs a
detailed plan; the actual needs of farmers for seeds, fertilizers, pesticides, and others. It is also
necessary to prepare alsintan needs during production preparation, production, and post-production. It
is necessary to prepare the need for water pumps, hand sprayer needs, transplanter requirements, and
harvester requirements. The production process is no longer carried out individually to reduce the
diversity of land areas that are very varied and tend to decrease, the dominance of land area below 0.5
ha, the area that does not reach economies of scale. This problem is overcome by a group farming
system. Farmers do not need to take "rations" of production facilities for government programs that
are sometimes evenly divided and not enough, the head of the farmer group does not need to master
the tools and agricultural machinery (called Alsintan) belonging to the group, so there is no social
jealousy among members of the farmer groups. The group-based production process will reduce lost
use of production facilities, lost use of labor, and lost use of capital. Group-based production processes
will overcome simultaneous planting problems which sometimes cannot be fulfilled, differences in
plant varieties. Group-based production processes can streamline the use of mechanization. In the
marketing subsystem, group agriculture will strengthen the farmers' position, especially if they can collaborate with institutions such as Bulog, banking, and insurance.

4. Conclusion
It can be concluded that farmer families are generally dominated by family groups that control, managing rice fields under 0.5 hectares. However, if sorted between upland rice fields and lowland rice fields, there is a difference where in the lowland rice fields, the family group that manages 0.5 to 1.0 hectares of land dominates. Farmers use farmer groups in the pre-production stage, such as procurement of fertilizer and subsidized seeds. The farming model with a group-based production system in a relatively small area 25-100 or small scale corporate farming is a solution to overcome land tenure patterns that are dominated by "small" farmers. Small Scale Corporate Farming (SSCF) model streamlines the function and role of farming groups in the production process, marketing phases, institutional access for the farmers.

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