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POTENCY OF RICE FARMING IN LEBONG REGENCY BENGKULU PROVINCE BY DIFFERENT CROPPING SYSTEM

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ABSTRACT

Eventhough wetland rice productivity in Lebong Regency has already been quite high, the need for rice continues to increase along with population growth. This condition need to be handled by increasing rice production, especially the production of upland rice. This study aims to study the crop management in rice farming implemented in Lebong Regency and analyze the production and productivity of rice for every crop management. Research data are primary data and secondary data collected through Focus Group Discussion involving 20 farmer groups' leaders. Qualitative data are analysed descriptively by examining their farm management focused on variation role of crop and session. The study of crop management pattern in Lebong Regency can be concluded as follows: (1) land management depends on the readiness of farm workers and peasants to work and provide capital so that the cultivated land is limited to the availability of capital owned by farm workers which is influenced by socio-economic, technical, and market factors, (2) less optimal maintenance of centre of production, especially in irrigated rice fields, so that efforts should be made to increase production and productivity, and (3) lack of synergy in developing centre of rice production for staple food providers as a measure of achievement of food security.

INTRODUCTION

Lebong Regency is one of the regencies in Bengkulu Province which has high specifications dominant product for agricultural commodities such as rice. But behind it all, it turns out that Lebong Regency has obstacles to increase its Rice planting/cropping index from 100 to 200 or even 300 per year. This situation occurs due to the existence of several patterns of management of wetland rice farming run by the farming community in Lebong. Such as only introduced 1-time planting rice each year, and the remaining time is used for inland fisheries (goldfish and tilapia). Such Planting management that is deliberately done by farmers to avoid rat attacks in certain seasons through ~~pool~~ pond water in the rice field. The basic

problem is, among others, that some rice fields with technical irrigation facilities run the Crop Production Index (CPI) 100 cropping pattern, although some areas have fully implemented CPI 200 or even 300 (Erythrina, 2010).

Rice farmers in Lebong Regency who run their rice farming management with a "slash-grow" pattern, ie farmers harvest their rice yields in the 1st harvest period by cutting down rice stalks, and then the remaining ricestalks are maintained so that they will grow back until entering the next harvest period (Nduru et al. 2014). The increase in food production in Lebong Regency, for rice, is an average of 6.98% per year, while for palawija production (corn, cassava and sweet potato) is 5.6% per year. Food production tends to increase nearly the same as national food production rate, that is (6%) for rice. But not so for crops, the trend of increasing production in Lebong Regency on average is far from the national crop production trend which averages around 18% (Indonesia Agriculture Ministry, 2018).

The productivity of wetland rice in Lebong Regency has been already high, ie, an average of 5.52 tons per hectare, whereas the productivity of upland rice is only 1.824 tons per hectare. In line with population growth in Lebong Regency, the need for food, especially rice, continues to increase. This situation certainly must be balanced with efforts to increase rice production. In the livestock and fisheries sector also continues to increase. Fisheries production in Lebong Regency in 2015 was recorded as 2,161 tons from pond, 127 tons from floating net and 2,597 tons from wetland rice field (Indonesia Statistic Center Biro, 2018).

Fisheries production in wetland rice fields is a result of the use of rice fields in one planting season each year, because in Lebong Regency a cultural habitual has been developed for rice-fish planting technology in rice fields. Food production from rice fields produced in Lebong Regency, in general, is 1 time the planting season of rice and 1-2 times the season of fish, which is developed in rotation.

The various planting management options in each region have high potential specifications. The level of production and productivity can be used as a basis for measuring the potencies. In addition, the ability of farming to be competitive based on the superiority of each management pattern also determines the merits of the crop management choices implemented. For this reason, it is necessary to conduct a study related to the superior potential of wetland rice farming in Lebong Regency based on the planting management options applied. Because by looking at the tendency of each farming community group to survive relative to the cropping pattern practiced, it is possible that the planting pattern is the most adaptive to be applied.

Based on data on the rice production in 2017, nineteen nine percent of rice production is contributed from rice wet land and the remaining 1% is dry land. The distribution of rice production areas throughout the Lebong Regency is fairly evenly distributed with a distribution of 3-18% in each district. Lebong Atas District is the highest wet land area of rice, followed by Bingin Kuning, Belang Pinang, and Lebong Sakti. In Lebong Regency as a whole, rice is only produced in four subdistrict areas, namely North Lebong District, Central Lebong, Pinang Belapis, and Rimbo Pengadang. The highest production that can be achieved by North Lebong District in the range of 224 tons per year. This situation shows that the production of upland rice is still very low (Asriani et al. 2018). In fact, the need for food, especially rice, will increase along with the increase in population and income. This problem should be addressed immediately. This study aims to identify the crop management in rice farming were implemented in Lebong Regency and to analyze the production and productivity of rice in each planting management.

RESEARCH METHODS

Method of Collecting Data

Research data are primary data and secondary data. Primary data in the form of results of in-depth interviews through Focus Group Discussion (FGD) with farmers (20 farmer group leaders), agriculture extention, head of agriculture departement, and head of food safety department about planting management implemented on rice farming field and other informants (Head of Lebong Regency Food Security Service and Head of Production Division of Lebong Regency Agriculture Office). Secondary data in the form of production data for each district is used to determine the potency of rice farming in each district. Other secondary data are also used to support research results.

Data Analysis Method

The data analysis method is descriptive analysis (Loeb etc., 2017) with consists of two step, namely:

1. Identification and Analysis of cropping system. The role of planting system implemented by farmers in district areas in Lebong Regency was identified and analyzed descriptively.
2. Production and Productivity of Rice Farming in Different Planting Management. The level of production and productivity in each planting management applied by farmers is determined by the variable amount of production produced by farmers. As for productivity is the amount of rice production on the area of paddy fields.

RESULTS AND DISCUSSION

Rice Farming Management Pattern

Rice farmers in Lebong Regency almost as a whole (based on the results of Focus Group Discussion (FGD)) do rice planting season 1 time in 1 year (cropping index - IP 100). Food crops in the form of technical irrigated rice fields in the next planting season by farmers are partly used for inland aquaculture in rice fields. Optimizing rice harvesting from the results of the 1st season by sprouting buds from old stems (known as *Ratun/Batet* system). The panicles may appear new rice and can be reharvested. A small portion is used for planting crops, and most of it is emptied until the next planting season (*Bero* system).

The determination of cropping patterns is carried out individually without considering group decisions. Almost all farmers choose cropping patterns based on the readiness of their own independent capital and the technical considerations of cultivation which are the constraints of their respective lands. The technical obstacle most often taken into consideration by farmers is the adequacy of water availability, because in the dry season some of the irrigation water sources experience drought. Even though the rice fields are irrigate, they still rely on the rainy season to guarantee water availability. The number of rat pests in certain seasons (a certain number of months in a year) is another technical obstacle most often faced by farmers.

The socioeconomic constraints that occur in Lebong Regency are very distinctive and conditional. There is a specific production-sharing system In Lebong Regency which *penggarap* farmers required to provide revenue sharing for the rice field owners. The distribution agreement is 50:50. The provision of farming capital is 100% provided by smallholders, while the rice field owner only provide land. This profit-sharing agreement applies to every rice farm, but not to non-rice farming that is cultivated in the next growing season, including inland fish and *Ratun/Batet* system. This agreement was built based on the amount of risk that will be borne by farmers if they carry out the 2nd or 3rd planting season outside the main one (1st season planting season).

Some irrigated rice farmers in Lebong Regency have also partly diverted their fields to plant horticultural crops, especially chili. This farming choice is only based on a very lucrative market prospect, where the price of chili in the last 2 years is relatively high stable. This situation attracts the attention of farmers to convert irrigated rice fields to horticultural crops land. Aside from being a very profitable market prospect, planting chili in this rice field is also relatively able to cope with rat pests better. Proven to grow chili, farmers can carry out an average of 2 planting seasons in 1 year.

Determining the cropping pattern requires special study to get alternative solutions to the most appropriate problem solving. The determining factors for the selection of cropping patterns carried out by farmers in Lebong Regency are highly determined by socio-economic, technical, and market factors. The choice of farming that is carried out is greatly influenced by patterns of hereditary habits that have been going on (Dyah, 2017). Farmers have not thought about the management of their farming carefully and planned. The individualist nuance is very obvious, because farmers still manage and make their farming decisions personally, and even if there will only involve the closest families (Fajar, 2014).

Rice Production and Productivity

Dry Grain Production (*Gabah Kering Giling*, GKG) in Lebong Regency experienced a very sharp decline (35%), from 66,121 tons in 2017 to 42,597 tons in 2018. Based on secondary data analyzed dan the discussion results directly on the survey, among them can be said that the decline in GKG production was caused by :

1. The planting area decreased. It is known that a part of the area of technical irrigated rice cultivation in Lebong Regency in 2018 and 2019 has canged the planting functions from rice to chilli. This condition is also supported by the high price of chili compared to the price of rice.
2. Long dry periods throughout 2018 and 2019. This also causes damage to irrigation instalations due to lack of maintenance and improper functioning.
3. Lack of water availability in some rice fields, so it is not possible to plant twice. The majority of wetland rice farming in the research location relies on irrigation from rainwater, even though it has an irrigation network.
4. Pest attacks are high, so that in 2018 some rice fields should be harvested sooner. There have not been any techniques for preventing and controlling rat pests which in certain seasons carry out large-scale attacks so as to massively destroy farming.

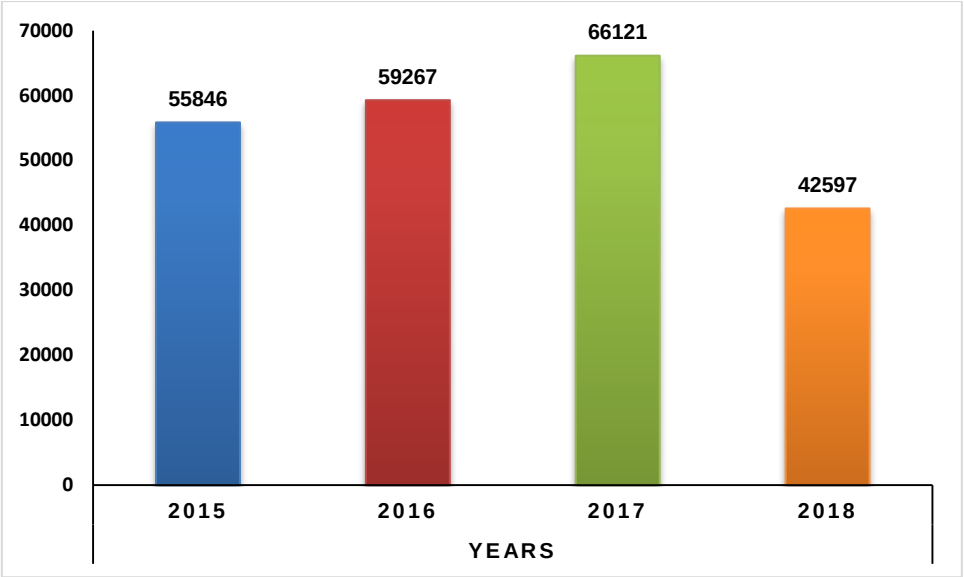

Figure 1.
Food Crop Production in Lebong Regency 2015-2018
(source: primer data analysis, 2019)

Figure 5.1. shows that the food production in Lebong Regency from 2015 to 2017 increase. In 2018 rice production has decreased significantly. This situation must be watched out for, because even though the current adequacy of food from carbohydrate sources is still stable and adequate, there is no guarantee of food availability in Lebong Regency.

The decline rice production in Lebong Regency, from 2017 to 2019 was recorded at 34.8%, while for the production of crops (maize, cassava and sweet potatoes) an average of 20%. Food production trends that decline when there is a shock of changes in weather conditions, the economy, and agricultural commodity market trends must be used as a basis for consideration to implement the most appropriate agricultural policy (Dwiarsyah et al. 2017). The production trend in Lebong Regency is on average far from the national secondary crops production trend which averages around 18% (Indonesia Agriculture Ministry, 2018).

An important note is the productivity of wetland rice in Lebong Regency in 2018 has decreased quite high (reaching 20%). It must be watched out because the productivity of wetland rice farming in Lebong Regency fell from 5.52 tons per hectare in 2017 to 4.4 tons per hectare in 2018. Meanwhile, the productivity is relatively stable at an average of 1.83 tons per hectare.

Area for Rice Production

The staple food is the main source of carbohydrate in Lebong Regency, which is able to produce rice independently on wetland and dryland rice fields. Based on the amount of rice production in 2018, it can be said that 99% of rice production is contributed from wetland and 1% is from dryland. The distribution of rice fields throughout the Lebong Regency is fairly by 3-18% in each district.

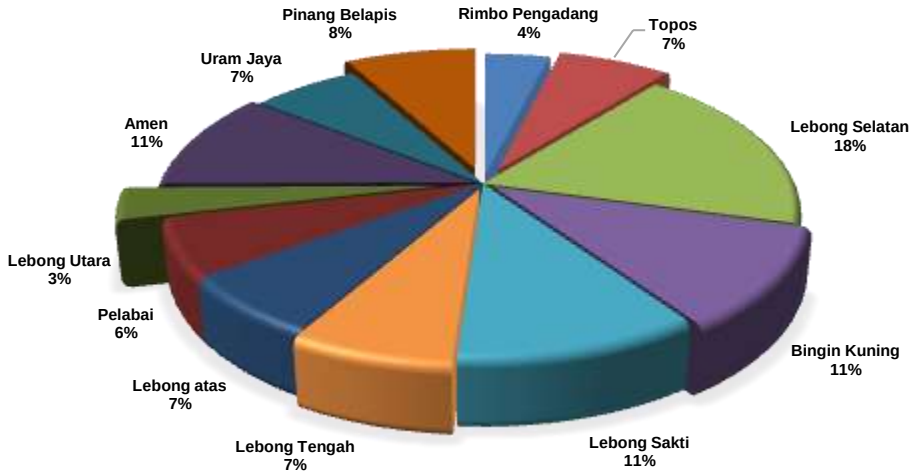

Figure 2.
Rice Production Distribution in Lebong Regency in 2016-2018

Lebong Selatan sub-district has a large area of wetland rice production. There are several villages that have high production levels, namely Bingin Kuning, Amen, and Lebong Sakti. Figure 2. shows the potential planting area.

The high rice production in almost all of the Lebong district makes this area able to meet its rice needs, but it is not yet commercial in nature. Because in this region there are no food barns at the regional level, as a guarantee of food stock, it only relies on community-owned warehouses which are managed privately by rice milling business owners and there are also very few that go through *Toko Tani Indonesia* managed by the Agricultue and Food Plant Service.

This condition also causes wetland rice farmers in Lebong District to be less motivated to develop their business commercially. Rice farming development is only done traditionally without a clear business target. All rice harvested are only intended to meet local food needs. In line with the research results of (Sihombing et al., 2019) in Druju Village, Sumber Manjing Wetan, Malang Regency, it can be said that with good planting management, it is possible to increase the productivity of rice yields in irrigated rice fields by increasing the cropping index, even on dry land, though.

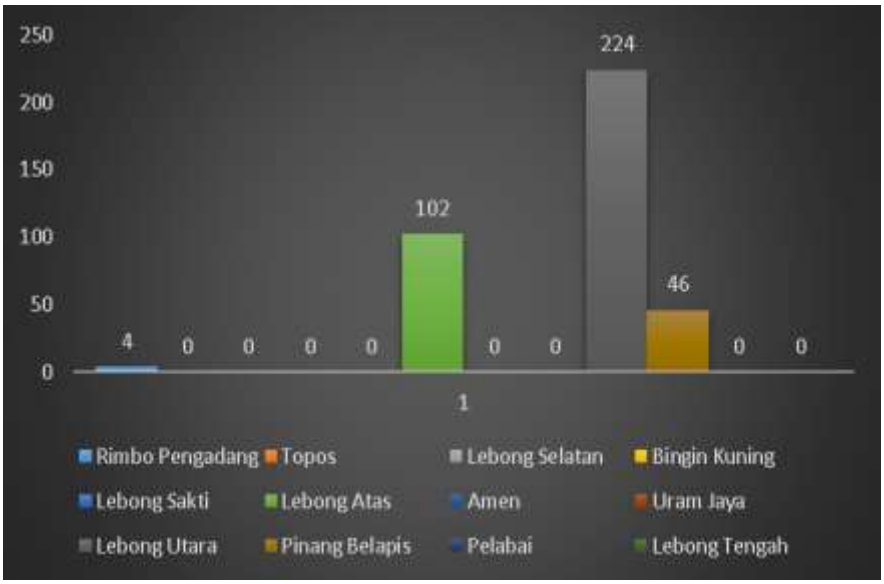

Figure 3.
Production Average of Rice Farms Per District in Lebong Regency in 2015-2017 (tons/year)

In Lebong Regency, the development of wetland rice farming is not carried out properly and planned for all regions that have the highest average rice production, namely Lebong Utara, Lebong Tengah, Pinang Belapis, and Rimbo Pengadang. In Figure 3. it can be seen that the highest average production is in Lebong Utara by 224 tons/year. This situation shows that the production of upland rice is still very low. The main source of carbohydrate food sources, namely rice still relies on the source of wetland rice fields.

Accurate observations on multiple cropping practices are required to better understand the status and potential of cropland use intensity. However, previous studies largely relied on multiple cropping index (MCI), which only measures the average state for an administrative unit (Xiang et al., 2019).

CONCLUSIONS AND POLICY IMPLICATIONS

Conclusions

The study of crop management pattern in Lebong Regency can explain the following conclusions. Wetland rice farming cropping system in Lebong Regency depends on the readiness of smallholder farmers who work and provide capital so that the cultivated land is only limited to the ability of capital owned by smallholder farmers which is influenced by socio-economic, technical, and market factors. Other than that less optimal maintenance of food production centers, especially in irrigated rice fields, so that efforts should be made to increase production and productivity. For it all, lack of synergy in developing rice production centers for staple food providers as a measure of achievement of food security.

Recommendations

Based on the results of the studies, for a more optimal management of the wetland rice cropping system in Lebong Regency, it can be suggested to optimize the role of extention agent to mentoring and managing their farming. Farmers need assistance, including in determining the plan to be planted. In addition, to support the technical needs of farm management is needed for the maintenance of the irrigation network and its water management system so that availability can be maintained throughout the growing season. Integrated policies between sub-systems by the local government can be an important key in

developing a farming system with the compatible cropping pattern so that optimal levels of productivity and production can be achieved.

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