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The Potential Commodities as a Support of Farm Sustainability and Supply Stability in Grobogan Regency

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Abstract. The research method was a secondary data method with strategic agricultural commodities, namely rice, soybeans and beef cattle. These commodities are also commodities that are the mainstay of Central Java. Data were analyzed by Location Quotient (LQ) and Co Variance. The results showed that Grobogan Regency was the regency with the highest rice and soybean production in Central Java, which were 848,912 tons (43.9%) and 53,969 tons (53.13%) respectively, while the production of rice and soybeans in Central Java respectively was 1,933,627 tons and 105,553 tons. From the results of potential analysis, the three commodities were potential commodities for Grobogan Regency, with LQ values for rice, corn, soybeans and beef cattle respectively 3.37; 3.46; 2.66 and 3.65. This condition was also supported by the Co variance value of 3.37; 2.68; 2.8 and 3.8. The analysis indicated that Grobogan Regency is an area with stable supply or food stocks in Central Java.

1. Introduction

The food problem has been a serious concern of the government and the public since the beginning of 2013. Indonesia's population of more than 250 million people requires the production and consumption of large food commodities. Based on Law No.7 of 1996 concerning food, the definition of food security is the condition of the fulfillment of food for each household, which is reflected in the availability of sufficient quantity and quality of food, safe, equitable and affordable. Food availability is not enough to create food security but also has access to food and food absorption if the three indicators of food security, namely the availability, access and absorption of food cannot be fulfilled. Meanwhile, food insecurity is a condition which is unable to obtain sufficient food. This is inseparable from the availability of agricultural commodities.

Development of agricultural commodities requires an understanding of market prospects, resource capabilities and technological potential. The imbalance between supply and demand will affect the price and profitability, so that it requires an intervention policy and planning to deal with the situation. Projected demand or supply is very important for production planning which will have an impact on how much the level of supply to maintain price stability [1].

The results of the demand for food commodities are useful as one input in determining the target of food commodity production, how much is needed and a picture of price developments. Meanwhile, the supply of food commodities is useful as an illustration of the level of production of the relevant



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agricultural commodities that can be achieved based on the assumptions used. By comparing the demand and supply results, it can be seen the status of the supply and demand balance of the commodity concerned whether it is in a surplus or deficit. In the short and medium term this condition will be related to the current distribution of food commodities which has an impact on supply and price stability. Food supply and price stabilization is a problem faced by almost every region in Indonesia. Some factors that affect the stability of supply and food prices are the amount of production, population increase, demand, climate change, trade barriers [2].

The price of food commodities that are too fluctuating can harm farmers as producers, processors, traders to consumers and has the potential to cause social unrest [3]. Therefore, almost all countries intervene in policies to maintain the stability of staple and strategic food prices. In addition, several things also become obstacles to the creation of food security in Indonesia due to the absence of a synergized and well integrated system. Therefore, demand and supply side projections are very relevant as input for making intervention policies. The trend of Indonesia's population projections shows that Indonesia will become a very densely populated country in the coming decades. The prospect of demand and supply of food commodities is an important indicator in considering the food security of the Indonesian people. Projections need to be developed based on population growth, income, price changes, elasticity, area and level of productivity.

Development of food crops in Central Java in 2015 - 2019 is prioritized on rice, corn, and soybean commodities with indicators used to measure the performance of food crop development over the past five years including production and productivity. To develop the economic potential of new areas need to be assessed what the potential winning by identifying available resources in order to increase the community's economy and develop the agriculture sector.

Grobogan is one of the regencies in Central Java that has potential land area, production and productivity of agricultural commodities. Agricultural commodities, especially food that have become development programs in Central Java include rice, corn, soybeans and beef cattle. The economic condition of foodstuffs, both those relating to supply, demand and the price of rice, corn, soybean and beef cattle continue to experience fluctuations due to changes in the phenomenon that occurs. This research needs to study the phenomenon of supply, demand and price phenomena into an economic model. In order to obtain the phenomenon of quantitative economic relations between economic models of rice, corn, soybean and beef cattle related to supply, demand, prices and stability of that commodity. Hence, the aim of research was to analyze the stability of the supply and price of rice, corn, soybeans and beef

2. Materials and Methods

Secondary data was used for the research in Grobogan Regency. Purposive method was used to determined the location of the study [4] based on the potential the area of planting and food production including rice, corn, soybeans and cattle.

Data were analyzed by Location Quotien and Co-Variance through observing the production, supply and demand and observed commodity price movements hence supply and price stability will be indentified. Determine of agriculture superior commodities were the main step to identified efficient agricultural development. There were more methods of superior commodities identification, such as Location Quotient (LQ). Commodities of rice, corn, soybeans and beef as superior commodities were analyzed by Location Quotient with the formula as follow [5]:

$$LQ = \frac{X_r/RV_r}{X_n/RV_n}$$

Note:

LQ :Coefficient of *Location Quotient*

Xr : commodity production of rice, corn, soybeans and beef in Grobogan Regency

Xn : commodity production of rice, corn, soybeans and beef in Central Java Province

RVr : total production of rice, corn, soybean and beef commodities in Grobogan Regency.

RVn : total production of rice, corn, soybean and beef commodities in Central Java Province

Measurement criteria:

LQ > 1: The food commodity sector is a leading sector in the region and potential to be developed as a driver of the regional economy

LQ < 1: The food commodity sector is a non-leading and deficient sector potential to be developed as a driver of the regional economy

The use of LQ analysis in identifying a commodity was carried out in order to find out whether the commodity is included as a superior or non-superior commodity. The focus of LQ analysis in this study was the commodity of rice, corn, soybeans and beef cattle in Grobogan Regency. The role of a commodity will be more prominent in an area if it has a value of LQ > 1, so that the commodity sector can be distributed to other location. This was inversely proportional if the commodity has an LQ value < 1, meaning that the sector commodity cannot meet the needs of the local market and tends to import from other regions.

Whereas supply and price stability were analyzed by Coefficient of Variation (CV)

- Price and supply stability represent fluctuations (increase or decrease) in prices or supply over a period time.
- The smaller the price or supply fluctuations, the condition is said to be stable and vice versa
- Price or supply fluctuations are measured by coefficient of variation (CV) [6]

$$CV = \frac{\text{Deviation Standard}}{\text{Average}} \times 100\%$$

The coefficient of variation from supply and price describes the fluctuations and it can be used to determine the supply and price stability of a commodity. The smaller the coefficient of variation in commodity prices can indicate supply stability and controlled commodity prices, or in other words the average supply and prices of these commodities do not experience extreme fluctuations. Supply and price in a city / province are said to be stable if the coefficient value of the price variation is in the range of < 9%, in accordance with the target of the Indonesian Ministry of Trade until 2019 [7]. Meanwhile, the coefficient of variation is more than 9%, the price indicates high and unstable fluctuations.

5 Results and Discussion

Recently the potential of the agricultural sector is still the dominant economic sector in supporting Grobogan Regency. In 2018 approximately 84.91% of the land used for agricultural activities in Grobogan Regency [8]. The results showed that Grobogan Regency was the area with the highest rice, corn and soybean production in Central Java, namely 848,912 tons (43.9%), 81,01 tons (22.65%) and 53,969 tons (53.13%), while Central Java's rice and soybean production were respectively 1,933,627 tons and 105,5553 tons. Besides three commodities, Grobogan Regency is also one of the centers of beef cattle with a total of 185,771 head/cattle (10.86%) or number 2 in Central Java after Blora Regency and the total population of beef cattle in Central Java is 1,710,769 head/cattle.

Beef cattle is the main commodity in Grobogan Regency. The determination of national and regional leading commodities is the first step towards agricultural development which is based on the concept of efficiency to achieve comparative and competitive advantage in the face of trade globalization. The steps towards efficiency can be taken by developing commodities that have comparative advantages both in terms of supply and demand. In terms of supply of superior commodities was characterized by superiority in several aspects, such as: biophysical, technological and socio-economic conditions of farmers in a region. Meanwhile, from the demand side, leading commodities are characterized by strong demand in the domestic and international markets [5].

The results of LQ and CV form three commodities, namely rice, corn, soybean and beef cattle is presented in the Table. 1.

Table 1. Potential Commodities of Rice, Corn, Soybeans and Beef Cattle in Grobogan Regency 2018

Commodities	Farm Scale	Production	Productivity	Rank of Production in Central Java	LQ	CV
	--- ha ---	--- ku ---	--ku/ha --			
Rice	135,908	848,912	62.46	2	3.37	2.37
Corn	129,692	810,103	62.33	1	3.46	2.68
Soybean	26,489	53,969	20.37	1	2.66	2.8
	Population					
	--- head --					
Beef cattle	185,71			2	3.65	3.8

Source : [8]

3.1. The potential commodity

Based on Table 1, it is known that rice production in Grobogan has ranked second in Central Java after Cilacap Regency. When viewed from productivity, the productivity of rice in Grobogan Regency is higher than that of Cilacap Regency, but in third place after Sukoharjo (74.66 ton/ha) and Sragen Regencies (63.67 ton/ha). The yield of rice productivity is still higher than the average rice productivity in Central Java, which is 5.74 tons / ha [8].

Detremining of agriculture superior commodities are the main step to go in the direction of efficient agricultural development. Location Quotient (LQ) is one of methods of superior commodities identification. Production results (LQ) indicated that the commodity is a potential commodity in Grobogan Regency and Central Java and can be support for sustainable farming. This is shown from the analysis of rice production, LQ was greater than 1 i.e. 3.37, which means that Grobogan Regency was able to meet the needs of rice consumption and even able to meet the needs of other regions. The surplus of production in one region will be distributed to other regions [9].

Commodity production of corn, soybeans and beef cattle showed the same results with an LQ value greater than 1. Rice, corn, soybeans and beef cattle are strategic commodities in Central Java Province, hence the LQ results indicated that Grobogan Regency can support Central Java's food development program

The population of Grobogan Regency in 2018 was 1,365,207 people, hence the consumption of rice is as much as 87,482,464,560 kg / year, or 8,748,246,456 Kw /th. It means that the rice consumption in Grobogan Regency was smaller than their production, equal to 848, 912 kw / year. The excess of production can be used to supply other regions. This is in accordance with the LQ value. It can be said

that the commodity of rice, corn, soybeans and beef cattle is a basic commodity and has economic potential as a support for the economic growth in Grobogan Regency. This is shown from the GRDP value of the agriculture, forestry and fisheries sectors of IDR 7,202,069,740 and the Gross Regional Domestic Product (GRDP) of Grobogan Regency was IDR. 23,564,118,240 or 30.56% contribution from the agricultural sector. The contribution value of the agricultural sector supported economic growth in Grobogan Regency, especially rice, corn, soybeans and beef cattle. The potential of the agricultural food subsector can contribute to a region's GRDP because there are potential agricultural commodities [10].

3.2. The supply and price stability

Supply stability can be reflected in the results of the production and consumption of public food. Besides that, the condition was actually also related to the LQ value. From the results of the analysis of potential commodities, it is known that the food commodities of rice, corn, soybeans and meat had a value of $LQ > 1$. Table 1 shows that the food commodity in Grobogan Regency was in a stable condition. With this food stability, it was possible to distribute food from Grobogan Regency to other regions. The stability of supply can support price stability, because with a stable supply means possible to stabilize prices. Prices play an important role in the market economy. Price was one of the factors that determines every decision of producers and consumers in allocating limited resources to lead to the optimal Pareto conditions or equilibrium conditions [11].

Food prices continue to change from time to time, and tends to increase every year. As described in the previous section, stabilizing the price of food became one of the targets of economic development. Increasing of food prices will have an impact on the purchasing power of low-income households and increase inflation. Increasing the price of food can also effect on psychologically behavior traders to increase other food prices. The adoption of the price of production principle policy was the main instrument for anticipating the upheaval of food prices. Price stability throughout the year can be measured by the coefficient of variation (CV) values [12] [13] [14].

Table 2. The CV Value of Rice, Corn, Soybean and Beef in 2018

No	Month	Medium Rice	Corn	Soybean	Beef
1	January	9228	4835	7691	108504
2	February	9109	5013	7946	113584
3	March	9172	5063	8057	112461
4	April	9163	5658	8286	118743
5	May	9213	5867	8596	100898
6	June	9286	5832	9031	100338
7	July	9497	5939	8876	118312
8	August	9625	5954	8261	114406
9	September	9437	5615	8733	113827
10	October	9738	5966	8258	110378
11	November	9725	5987	8327	110807
12	December	10238	5850	8482	111085
	CV	2.59	5.06	3.37	1.31

Based on the value of CV, it is known that food commodities especially rice, corn, soybeans and meat product have a CV value of 2.59%; 5.06%; 3.37% and 1.31%, respectively, which is lower than the Ministry of Trade's value of 9%. Based on the CV value, it can be said that the price of rice, corn, soybeans and meat was stable in 2018. The stability of the price can also be seen from the price movements every month that are not so volatile so that prices can be said to be stable [9] [10] This price stability is basically supported by the availability of food stocks and in stable conditions. Based on the results of the analysis, it can be said that the results of the study indicated that rice, corn, soybean and meat commodities are potential commodities and in stable conditions both for supply and prices in order to support the sustainability of the farming commodity.

4. Conclusion

Rice, corn, soybeans and beef are potential commodities in Grobogan Regency. Meanwhile, supply and price stability of rice, corn, soybean and beef have been occurred in Grobogan Regency. Moreover, rice, corn, soybean and meat commodities are potential and stable commodities so that the supply of these commodities must be maintained in order to keep the prices stability.

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