THE INCOME AND FEASIBILITY ANALYSIS OF THE CORN FARMING IN CENTRAL BUTON DISTRICT

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ABSTRACT

This study aimed to determine the income and feasibility of corn farming in Central Buton District. The study was conducted in Central Buton District in March - April 2020. The population of the study was the corn farmers in Central Buton District, amounting to 53 people. The determination of the sample used census method by taking the entire population as the research sample. Research data collection was done through direct interviews with respondents using a questionnaire. Research variables include variable costs, fixed costs, total costs, prices, production, and revenues. The analysis of the data used was income analysis and R/C Ratio analysis. The results showed that the income of corn farming in Central Buton District was IDR1,251,453/season, while the coefficient on the R/C ratio was 6, meaning that corn farming in Central Buton District was financially feasible to be developed.

Keywords: corn farming; feasibility; income; R/C ratio

INTRODUCTION

Corn is one of strategic food crops which has high economic value. Corn (Zea mays) has the opportunity to be developed because of its position as the main source of carbohydrates and protein after rice (Zubachtirodin, 2007). The position of corn in the diversification of food consumption functions to reduce dependence on rice as staple food, in addition to that it also has an important meaning in industrial development because it is a raw material for the food industry and livestock, especially monogastric animal feed. The average proportion of corn in feed reaches 51 percent, especially for broiler and layer eggs. The relatively high use of corn is due to its relatively cheap price, high-calorie content, a protein with a complete amino acid content, and its easy production (Tangendjaya et al., 2003). Seeing these conditions, the development of corn as one of the food crop commodities has an important role in maintaining food security and raw materials in the industry.

Central Buton District is one of the areas in Southeast Sulawesi Province which is a center of food crop production, especially corn, this is indicated by data (BPS, 2018) which shows that corn is one of the food crop commodities with the largest harvested area of all types of commodities food crops are cultivated in Central Buton District which is 1,358 ha and with the second-highest production amount of 2,358 tons after peanuts. This shows that with the potential availability of ample land, providing opportunities for farmers in Central Buton District to improve the household economy by optimizing land use and developing corn farming management to the fullest.

A common problem in the process of developing corn farming in Central Buton District is the availability of production facilities such as quality seeds, fertilizers, and pesticides that have not been fulfilled at any time. This is supported by (Fadwiwati et al., 2014) who explained that the level of use of quality seeds from high yielding varieties of corn has only reached 28 percent.

The availability of production technology such as land processing machinery, corn planting machinery, shelling machines, and other supporting equipment are inadequate. Furthermore, there is also the lack of knowledge of corn farmers regarding farm management using modern technology
including the use of fertilizers and pesticides that are not in line with recommendations, pests and plant diseases that cannot be controlled by farmers causing crop failure and the lack of postharvest handling which then leads to the low quality of products so it is unable to compete with similar commodities or other food crops both from within and outside Central Buton District area. This is consistent with the opinion from (Taufik et al., 2015) stating that technology that supports the development of corn farming is the application of technology according to recommendations such as seed production technology, efficient cultivation technology, and postharvest technology to improve the quality and add value of products. The application of this technology can encourage an increase in corn production through the expansion of planting areas and increasing productivity. Based on these conditions, the purpose of this study was to determine the income and feasibility of corn farming in the Central Buton District.

MATERIALS AND METHODS

The study was conducted in Central Buton District in March - April 2020. The population of the study was corn farmers in Central Buton District, amounting to 53 people. The determination of sample used census method by taking the entire population as the research sample. Research data collection was done by direct interviews with respondents using a questionnaire. Research variables include variable costs, fixed costs, total costs, prices, production, and revenues. Income analysis was used to determine the amount of corn farm income in Central Buton District which was calculated based on the following formula (Soekartawi, 2002):

$$\pi = TR - TC$$

Information:
- $$\pi$$ = Income (IDR)
- $$TR$$ = Total Revenue (IDR)
- $$TC$$ = Total Cost (IDR)

Analysis to determine the feasibility of corn farming in the Central Buton District used R/C ratio analysis calculated based on the following formula (Soekartawi, 2002):

$$R/C \text{ ratio} = \frac{TR}{TC}$$

Criteria:
- R/C ratio > 1, meaning that corn farming in Central Buton District is feasible to be developed
- R/C ratio = 1, meaning that corn farming in Central Buton District is even
- R/C ratio <1, meaning that corn farming in Central Buton District is not suitable to be developed

RESULTS AND DISCUSSION

Characteristics of Respondents

The characteristics of respondents consisted of age, level of education, experience, and number of family dependents. Age is a variable that determines the mindset and physical ability of a farmer in managing his farming (Tuwo, 2011). According to (Soeharjo & Patong, 1984), the age range of 15-54 years is categorized as productive age, while age over 54 years is categorized as non-productive age. Relatively high education and young age cause a person to be dynamically reflected through work methods, thinking patterns, and whether or not easy to accept innovation and new information (Soeharjo & Patong, 1984). Experience is an educational process obtained outside of school from an event that has been experienced, which is very useful for someone to do better than before (Tuwo, 2011). Meanwhile, according to (Soeharjo & Patong, 1984), experience in farming activities consists of three categories based on the criteria of lack of experience (<5 years), quite experienced (5-10 years), and experienced (> 10 years). Furthermore, according to (Tohir, 1982), if there are 3 dependents on the family, it is considered as a small family, 4-6 people are considered as moderate family and more than 6 people are considered to be a large family. An overview of the characteristics of respondents in corn farming in Central Buton District can be seen in Table 1.

Table 1 shows that the majority of respondents’ age of corn farming in Central Buton District was included in the unproductive category. This means that the respondents of corn farming in Central Buton District tend to have decreased physical abilities and need be more careful because they have a more mature business capacity and sufficient experience in managing their business so that they were less dynamic and open to new things (Tuwo, 2011). Whereas at the education level, respondents of corn farming were more dominant at the elementary school level. This means that the respondents in corn farming lacked of knowledge and insights in creative and innovative thinking. This
is consistent with the statement from (Soeharjo & Patong, 1984) who explained that the higher the respondent’s formal education, the broader his knowledge and insight, and the more rational his way of thinking. Furthermore, the ability of respondents as measured by the experience of corn farming in Central Buton District showed that most of the corn farmers were in the quite experienced category. This means that corn farmers have a mindset and knowledge in managing and organizing their businesses based on experience or non-formal education during the business (Soeharjo & Patong, 1984). The characteristics of respondents based on the number of family dependents on corn farming in Central Buton District showed that as many as 29 people (54.71%) were included in the moderate family category. According to (Soeharjo & Patong, 1984), the size of the number of family dependents in farming can affect the fulfillment of living needs.

Table 1. Characteristics of respondents in corn farming in Central Buton District, 2020

| Characteristics                  | Frequency (People) | Percentage |
|----------------------------------|--------------------|------------|
| Age                              |                    |            |
| 15-54                            | 17                 | 32.07      |
| >54                              | 36                 | 67.93      |
| Level of education               |                    |            |
| No school                        | 22                 | 41.50      |
| Primary school                   | 22                 | 41.50      |
| Junior high school               | 6                  | 11.32      |
| Senior high School               | 2                  | 3.77       |
| Bachelor                         | 1                  | 1.88       |
| Experience                       |                    |            |
| Inexperienced                    | 4                  | 7.54       |
| Experienced enough               | 33                 | 62.26      |
| Experienced                      | 16                 | 30.18      |
| Family dependents                |                    |            |
| Small family                     | 21                 | 39.62      |
| Moderate family                  | 29                 | 54.71      |
| Extended family                  | 3                  | 5.66       |

Source: Primary data processed, 2020.

Cost, Revenue and Income Analysis

The amount of income does not always make a financially viable farm if it is followed by a large value of production costs (Karyanto & Suwasono, 2008). Therefore, the feasibility of developing corn farming in Central Buton District as one of the leading agricultural products was also done by using the R/C ratio value. The discussion on the income and feasibility of corn farming in Central Buton District is explained based on the following sections:

Input Cost

Production costs are all costs incurred during the production process, both fixed and variable costs (Soekartawi, 2006). The use of input costs in corn farming in Central Buton District consists of fixed costs, which are costs that are not affected by a large amount of production, calculated based on the costs of depreciation of tools such as hand sprayers, machetes, crowbar, and axes. Meanwhile, variable costs are costs that are used up in a one-time production process or costs that are influenced by a large number of products such as seeds, urea fertilizer, TSP, KCL, land management labor costs, and transportation costs for corn marketing activities. An illustration of the use of input costs in corn farming in Central Buton District can be seen in Table 2.

Table 2. The use of input costs in corn farming in Central Buton District, 2020

| No.  | Description | Cost (IDR/Season) | Cost (IDR/ha) |
|------|-------------|-------------------|---------------|
| 1    | Highest     | 1,171,000         | 2,188,000     |
| 2    | Average     | 364,962           | 337,215       |
| 3    | Lowest      | 81,500            | 88,250        |

Source: Primary data processed, 2020.

Table 2 shows that the use of input costs in corn farming in Central Buton District which was spent during one growing season, namely from December 2019 to March 2020 was the highest at
 IDR1,171,000/season, while the lowest was IDR1,500/season. This is due to the differences in the use of inputs used by each farmer. At the use of the highest input costs, farmers utilized available production facilities such as the number of seeds and wage labor in land management activities assuming it can increase the amount of production and used production equipment such as machetes and crowbars. Whereas, at the use of the lowest input costs, farmers only relied on the number of seeds available without using production facilities such as fertilization and utilization of wage labor in corn farming activities in Central Buton District and used production equipment such as machetes and crowbars. It is suspected that this is due to the limited capital owned by the farmers so as to minimize the use of substantial input costs. Meanwhile, the average use of input costs in corn farming in Central Buton District was IDR364,962/season. This figure is still relatively low due to the use of production facilities that have not been optimal or possibly due to the availability of inadequate production facilities. (Pratama et al., 2019) explained that the cost of using equipment which is a fixed cost, calculated based on the depreciation of the equipment and the cost of using the production facilities in corn farming was IDR5,362,300/season and IDR4,431,653/ha. The use of input costs in corn farming incurred by farmers in Central Buton District based on land area, was the highest at IDR2,188,000/ha, while the lowest was IDR88,250/ha. Meanwhile, the average use of input costs in corn farming in Central Buton District was IDR337,215/ha. The use of input costs in these farms was relatively low and still increased if corn farmers in Central Buton District made optimal use of production facilities such as the use of superior seeds, fertilization as recommended, pest and disease control, use of labor and postharvest in corn farming. As shown in the results of research conducted by (Talib et al., 2017), it explained that the cost of corn farming in an area of 1 ha by utilizing equipment and production facilities such as the use of seeds, fertilizing, controlling pests and diseases using pesticides, used labor work and postharvest amounting to IDR4,652,032. This is also supported by the results of research conducted by (Antara, 2010), (Anupama et al., 2005) and (Mignouna et al., 2012) stating that land is one of the factors that positively influence corn production.

**Revenue**

Farm receipts are multiplications between the products obtained with the product selling price. Meanwhile, total revenue or gross income is the total production value before being deducted by the production costs (Rahim & Diah, 2008). The revenue referred to in this study is the revenue received by farmers in corn farming activities, which is the result of multiplication of the amount of production with the selling price of corn in the research location, which was calculated based on the results obtained during one planting season, namely for four months from December 2019 to March 2020 and revenue calculated based on the unit area of land used by farmers in Central Buton District, which was an average of 1 ha. An overview of the revenue obtained by corn farmers in the Central Buton District can be seen in Table 3.

| No. | Description | Revenue (IDR/Season) | Revenue (IDR/ha) |
|-----|-------------|----------------------|-----------------|
| 1   | Highest     | 3,250,000            | 3,000,000       |
| 2   | Average     | 1,616,415            | 1,418,690       |
| 3   | Lowest      | 750,000              | 750,000         |

Source: Primary data processed, 2020.

Table 3 shows that the average revenue from corn farming activities in Central Buton District calculated based on the results obtained during one growing season, namely for four months from December 2019 to March 2020 which was IDR1,364,962/season, while the average revenue calculated based on the unit area of land used by farmers of 1 ha was IDR1,418,690/ha. Based on these conditions, it can be concluded that in general, the revenue obtained by corn farmers in Central Buton District was very low both based on the growing season and land area. This can be compared with some of the same cases, namely from the results of research conducted by (Talib et al., 2017) showing that the revenue of corn farmers in 1 ha area was IDR12,740,002, obtained from the product of the total production of 4,247 kg with a selling price of IDR3,000/kg. The results of this study are also supported by the research conducted by (Pratama et al., 2019) stating that the average amount of corn production was 6,211 kg with a selling price of IDR3,200/kg, so a total revenue of IDR19,876,003 was obtained. This is because the amount of corn production in Central Buton District was very low at 323 kg/season or as much as 351 kg/ha, even though it actually had a high selling price of IDR5,000/kg. This is a result of the very lack of utilization of corn farming production facilities.
in Central Buton District such as the use of superior seeds, fertilization, use of labor and the most important is a pest control and plant diseases. Based on the results of the field survey, it showed that most of the corn farmers in Central Buton District experienced a decrease in the amount of production due to caterpillar attack on the corn causing many corn crops to rot. Seeing these conditions, plant maintenance becomes very important especially the process of controlling pests and plant diseases, considering So far, farmers in Central Buton District have almost never carried out the process of controlling pests and plant diseases by using other production facilities. (Kabeakan, 2017) stated that production factors such as land area, labor, seeds, and fertilizer have a positive effect on corn production. So it can be concluded that the optimal use of production facilities plays an important role in increasing the number of products which will directly increase farm receipts, especially corn in Central Buton District.

**Income**

Farm income is closely related to the level of production achieved. If the level of production increases, then income tends to increase (Soekartawi, 2002). Income referred to in this study is net income, which is the difference between the sale of corn (production times price) and the total production costs incurred by corn farmers in Central Buton District. In general, the income earned by each corn farmer in Central Buton District has a different amount, this is due to differences in the area of land used for cultivation activities, use of production costs, the amount of product obtained, and management of farming. Corn farming income in this study was calculated based on the results obtained during one planting season, namely for four months from December 2019 to March 2020 and farming income calculated based on the unit area of land used by farmers in Central Buton District, which was at the average of 1 Ha. An overview of the income of corn farming in the Central Buton District can be seen in Table 4.

| No. | Description | Income (IDR/Season) | Income (IDR/ha) |
|-----|-------------|---------------------|-----------------|
| 1   | Highest     | 3,002,500           | 1,830,000       |
| 2   | Average     | 1,251,453           | 1,081,475       |
| 3   | Lowest      | 346,000             | 346,000         |

Source: Primary data processed, 2020.

Table 4 shows that the average corn farming income in Central Buton District calculated based on the results obtained during one growing season, namely for four months from December 2019 to March 2020 was IDR1,251,453/season. Meanwhile, the average income calculated based on the unit area of land used by farmers was 1 hectare of IDR1,081,475/ha. If the average income is classified based on the Central Statistics Agency (2018) criteria, namely very high (> IDR. 3,500,000), high (IDR. 2,500,000 - IDR. 3,500,000), moderate (IDR. 1,500,000 - IDR. 2,500,000) and low (< IDR. 1,500,000), it can be concluded that the average income of corn farming in Central Buton District-based both on the growing season and the area of land was classified as a low category.

Based on the results of the study, it showed that one of the factors that caused the low income of corn farmers in Central Buton District was the lack of utilization of equipment and production facilities for corn farming such as land management. Most farmers in Central Buton District still used manual methods in processing land with simple equipment such as crowbars and machetes because in general, the corn cultivation area in Central Buton District is a rocky area. In addition, they also experienced the lack of land fertilization to add soil nutrients. (Mandiri, 2010) stated that balanced and rational fertilization is the main key to the success of increasing corn productivity. Nutrient levels in the soil, suitable type of fertilizer, and physical environmental conditions are important factors that need to be considered in achieving optimal plant productivity. The practice of fertilization, which also needs to be considered is the type of soil and the environment.

Another production factor that caused low income of corn farmers in Central Buton District is pest control and plant diseases. This has an important role because, in the last harvest season, many corn farmers in Central Buton District suffered losses due to caterpillar attacks on fruit, causing a lack of production to be achieved. Then the use of labor production factors has an important role in increasing production, while in corn farming activities in Central Buton District, the use of labor is only inland processing activities, and even then not carried out simultaneously by farmers. Then, for other activities carried out alone in order to minimize the use of costs so the resulting product was also less than optimal. Under these conditions, it is necessary to combine the use of production factors in corn farming in Central Buton District. Because basically, farming activities have the aim to increase
productivity so that the income becomes higher. However, production and productivity cannot be separated from the factors of production owned by farmers and the management of their farming effectively and efficiently (Mardani et al., 2017).

R/C ratio

R/C coefficient ratio is the result of a comparison between the acceptance of corn farming and the costs incurred. R/C ratio was used to analyze the feasibility of corn farming in Central Buton District as one indicator in the process of developing superior agricultural products. Business feasibility is a measure to know whether a business is feasible to be developed. Decent in the sense that it can produce benefits for farmers (Soekartawi, 2002). Then, (Kasmir, 2008) also added that the feasibility of efforts made to identify problems that will come so as to minimize the possibility of missing the results to be achieved in an investment. This study used financial analysis which is based on the value of the coefficient R/C ratio to determine the feasibility of corn farming. An overview of the feasibility of corn farming in the Central Buton District can be seen in Table 5.

Table 5. R/C Coefficients Ratio in Corn Farming in Central Buton District, 2020

| No. | Description | R/C Ratio |
|-----|-------------|-----------|
| 1   | Highest     | 13        |
| 2   | Average     | 6         |
| 3   | Lowest      | 1         |

Source: Primary data processed, 2020.

Table 5 shows that the highest R/C coefficient ratio obtained by farmers in corn farming activities in Central Buton District was 13, the lowest was 1 and the average was 6. That means every one rupiah of the costs incurred for corn farming activities in the District Central Buton will generate revenue of IDR6. This shows that the average income of corn farming was greater than the costs incurred in the farming development activities. So, it can be concluded that corn farming in Central Buton District was financially feasible to be developed. The magnitude of the R/C ratio coefficient value on corn farming in Central Buton District was caused by the low use of input costs used in farming activities, including the production equipment only covering the costs of hand sprayers, machetes, crowbar, and axes, while the production facilities include the cost of seeds, labor in activities processing and transportation costs for marketing corn. The R/C coefficient of corn farming ratio in Central Buton District was high compared to the results of research conducted by (Ramini & Anzitha, 2019) which showed that the R/C ratio of corn farming in Peureulak District was 3.47.

CONCLUSIONS

Corn farming income in Central Buton District is IDR 1,251,453/season with an R/C ratio of 6, meaning that Central Buton District is financially feasible to support the development of corn farming. In increasing the production of corn farming in Central Buton District, it is necessary to optimize the farming management, especially the control of pest and plant diseases, and through the use of production facilities effectively and efficiently.

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