

Analysis of Factors Affecting the Income of Farmers of Corn (*Zea mays*) in The District of Tiga Binanga, Karo District

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ABSTRACT

Corn (*Zea mays*) is one of the crops that thrives in Indonesia that has been very popular. One of them is the sweetened corn that is consumed much because it has a sweeter taste compared to ordinary corn. In addition, the production life is shorter, so it is profitable. The research area was chosen purposive, in the District of Tiga Binanga, Karo District, North Sumatera Province. A sample amount of 98 respondents, which is estimated based on the number of farmer populations in the sub-district of three Binanga 6,500 people by doing simple random sampling. Based on the results of the study, workforce cost is negatively and insignificant effect the income of corn farmers in the sub-district of Tiga Binanga. Fertilizer cost is negatively and significantly affect the income of corn farmers in the sub-district of Tiga Binanga. Pesticide cost is negatively and insignificant effect the income of corn farmers in the sub-district of Tiga Binanga. Land lease cost is negatively and significantly affects the income of corn farmers in the sub-district of Tiga Binanga.

Keywords: Corn, Workforce Cost, Fertilizer Cost, Pesticide Cost, Land Lease Cost, Income

INTRODUCTION

Agricultural sector is one of the sectors that Indonesia can reliably to support the rate of national economic growth, because the agriculture sector is one of the bases that are expected to support the

growth of good economy at this time and in the future. Indonesia is a tropical country and rich in crops. The climate of Indonesia allows for the growth of various plants, fruits and crops (Soekartawi, 2002).

Corn (*Zea mays*) is one of the crops that thrives in Indonesia that has been very popular. One of them is the sweetened corn that is consumed much because it has a sweeter taste compared to ordinary corn. In addition, the production life is shorter, so it is profitable. This commodity is an important source of Karbohidrat yang so that it can be a good alternative food in addition to rice. Corn is also a source of raw materials for industrial sectors including the food industry. Nutritional content of sweet corn every kilogram of material that can be eaten quite high i.e. energy 96 calories, protein 3.5 grams, fat 1.0 grams, carbohydrates 22.8 grams, calcium 3.0 mg, Phosphorus 111 mg, iron 0.7 mg, vitamin A 4000 SI, vitamin B 0.15 mg, and vitamin C 12 mg, water 72.2 gram. Sweet corn plants are suitable for a variety of planting patterns so that can further increase the income of farmers. Corn also gives benefits to people involved in processing and marketing activities. According to studies conducted at Cornell University, Corn is one of the sources of antioxidants that can fight cancer caused by free radicals. Corn is a rich source of the phenolic acid ferulic compounds, an anti-cancer agent that has

been shown to be effective in combating tumors in breast cancer and liver cancer. In addition to sweet corn, there is also pearl corn (flint corn) which has the Latin name *Zea mays* var. *indurata* and is the type of local corn that is most widely planted by farmers in Java. The name of the pearl on this corn is caused by the seeds of its seed type of pearl seed. The seeds are round, slippery, shiny and also hard because the hard part of the starch is at the top of the seeds. This type of corn is liked by farmers because it has a resistance to pest warehouse (Marvelia, 2006).

In terms of consumption indicates that corn is a substitute for rice and cassava. For Indonesians corn is the second staple food after rice. There are regions in Indonesia that are cultured to consume corn such as Madura, the south coast of East Java, the south coast of Central Java, Yogyakarta, south coast of West Java, eastern South Sulawesi, Kendari, south East Sulawesi, Gorontalo, Bolaang Mongondow, North Maluku, Karo, Dairi, Simalungun, East Nusa Tenggara, and parts of West Nusa Tenggara.

The production of the World Corn ranks third after rice and wheat amounting to 612.5 million tonnes. The distribution of corn cultivation continues to expand in various countries in the world because this plant has a wide adaptation power in subtropical or tropical areas. Indonesia is the largest producing country in the Southeast Asian region, so there is no exaggeration for Indonesia to produce the self-sufficiency of corn (Purnomo & Hartono, 2011).

Based on data show from 17 sub-district in Karo District, Tiga Binanga Sub-district was first in terms of corn production in Karo district with a total production of 135,289 tonnes. Then followed by Mardinding subdistrict, Laubaleng subdistrict, Kutabuluh Sub-district, Munte subdistrict, Juhar Sub-district, Tiganderket subdistrict, Tigapanah subdistrict, Barusinger Sub-district, Simpang Empat Subdistrict, District umbrella, Kecamatan

brand, Kecamatan Kabanjahe, District Dolat Rayat, Naman Teran subdistrict and last district Berastagi.

The community in the Sub-district of Tiga Binanga, Karo regency is generally a farmer's livelihood, especially in the cultivation of corn. The public interest to grow corn increased by 3-4 times the number of farmers who plunged into the cultivation of corn because of its obvious demand, land is still wide, labor is available so that it can affect the magnitude of the income of corn farmers in the sub-district of Tiga Binanga, Karo District.

The problem of low income that farmers acquired is a complex problem faced by farmers in corn farming. These problems are caused by several factors, among others, the number of land owned by farmers where this condition causes farmers difficult to strive only at a favorable level, the low economic value of the agricultural products themselves so that the reason the banks should sort out in providing credit funds and capital participation, still the low education of farmers who cause most farmers still focus on the traditions of the past in conducting agricultural practices so that farmers do not want to implement technical recommendations to the fullest, the difficulty of access to financing for rural areas where most farmers do not get the loans they need to invest so that they can not increase productivity through the use of better production facilities (Saprodi), lack of farmers skills that are also assessed is still low because smallholders do not have a source of income, especially during maintenance activities and lack of access to information that makes farmers only rely on information from the market that can eventually bring up information inequality and difficulty negotiating so that many farmers Sell its production with the Ijon system.

LITERATURE REVIEW

2.1 Income

Farming income is the amount of benefits or results received by farmers that

are calculated based on the production value minus all types of expenditures used for production. Therefore, the income of farming is strongly influenced by the cost of production facilities, maintenance costs, post-harvest costs, processing and distribution as well as production value.

In general, income can also be used as a tool to measure the economic condition of a person or household. income shows all money or other material results achieved from the use of wealth or services received by a person or household during a certain period of time in an economic activity (Winardi, 1998).

2.2 Production Theory

In general, production is interpreted as an activity or process that Menstranspormasikan input into output. In this common sense of use is quite widespread, so it includes outputs that are in the form of goods or services. In a narrow sense, the sense of production is meant only as an activity that crosses goods both finished and semi-finished goods, industrial materials and spare parts or Spareparts and components. The products can be both consumer goods and industrial goods. Production is an activity to create or add to the usefulness of a goods or services (Assauri, 1999).

2.3 Workforce

According to Moehar (2004) Labor production factors, is an important product and need to be taken into account in the production process in a considerable amount not only in the availability of manpower but the quality and kind of workforce should also be considered.

2.4 Fertilizer

Fertilizer is needed as vitamin nutrients in the growth and development of optimal crops. Fertilizer that is often used is fertilizer

Organic fertilizer and inorganic fertilizers. Organic fertilizer is a fertilizer derived from the breakdown of parts-parts

or the rest of plants and animals. Organic fertilizer commonly used by farmers is manure. The use of manure is beneficial for supplying organic materials and essential nutrients, stimulating the growth of soil microorganisms as well as improving the physical, chemical and biological properties of soil (Djoehna, 2003).

2.5 Pesticides

Pesticides are substance that are used to kill or control various pests. The word pesticide comes from the word pest meaning pest and cida which means killer. So simply pesticides are interpreted as pest killers namely mites, plant disruptors, plant diseases caused by fungi, bacteria, viruses, nematode, slugs, rats, birds and other animals that are considered detrimental (Djojosemarto, 2008).

2.6 Land

Land has a broader meaning than the meaning of land considering the land is just one aspect of the land. The process of changing utilization is quite complex where the change mechanism involves several strengths such as market forces, administrative systems developed by the Government as well as political interests (Darwis, 2008).

RESEARCH METHODS

The research area was chosen intentionally (purposive), in the District of Tiga Binanga, Karo District, North Sumatera Province. This is supported by data from Karo District Statistical Center year 2019, which shows that the subdistrict of Tiga Binanga is the region that has the highest production of corn in order of 1 compared with other sub-districts in Karo district.

Based on the results of the calculation of the Slovin formula, it was obtained a sample amount of 98 respondents, which is estimated based on the number of farmer populations in the sub-district of three Binanga 6,500 people

by doing simple random sampling or simple random sample.

Data was analyzed using multiple linear regression statistical tests which are between income with workforce cost, fertilizer cost, pesticide cost and land lease cost.

RESULT AND DISCUSSION

Multiple linear regression analyses can be seen in Table 1 as follows:

Table 1. Analysis of Effect Workforce Cost, Fertilizer Cost, Pesticide Cost and Land Lease Cost to Income in The District of Tiga Binanga, Karo District

Information	Regression Coefficient	t _{count}	Sig
Constant	-1991466.251	-0.343	0.584
X ₁ : Workforce Cost	-0.350	-0.365	0.431
X ₂ : Fertilizer Cost	-4.231	-2.265	0.029
X ₃ : Pesticide Cost	-1.639	-0.378	0.442
X ₄ : Land Lease Cost	-2.676	-5.086	0.000
R : 0.648			
R-Square : 0.526			
Fcount : 18.572			
Sig F : 0.000			

Source: After Processed Primary Data (2020)

Measurement of the accuracy or suitability of the model (goodness of fit) is conducted or calculated using r square which shows an independent variable of 0.526 which means the variance of workforce cost, fertilizer cost, pesticide cost, and land lease cost contributed 52.6% to the income of corn farmers of 47.4%.

Based on Table 1 can be seen a free variable that has significant effect on the income of corn farmers in sub-district Tiga Binanga is the fertilizer cost and land lease cost, while for variables that have no significant effect on the income of corn farmers in sub-district Tiga Binanga is workforce cost and pesticide cost.

Hypothesis testing can be seen the value of Fcount and significance F. Based on the results of the analysis, acquired Fcount (18.572) > (2.47), in which the free variable simultaneous (X₁, X₂, X₃, X₄) has a noticeable effect on its variable (Y). Or there is a linear relationship between the independent variable (workforce cost, fertilizer cost, pesticide cost, and land lease cost) to the dependent variable (income of

corn farmers in the sub-district of Tiga Binanga).

Significant influences can also be seen from the significance value F (0.000) < α 0.05. As such, hypotheses that declare workforce cost, fertilizer cost, pesticide cost, and land lease cost have a real effect on the income of corn farmers in the sub-district of Tiga Binanga. Because the value of significance is less than 0.05 (0.000 < 0.05) then H₀ rejected and H₁ accepted which means there is a linear link between workforce cost, fertilizer cost, pesticide cost, and land lease cost of corn farmers in sub-district Tiga

To find out which factors have significant influence and significance to the income of corn farmers in the sub-district of Tiga Binanga can be seen from the significance value described as follows:

1. Effect of Workforce Cost on The Income of Farmers of Corn in The District of Tiga Binanga, Karo District

Based on the results of the study showed that the workforce cost negatively and insignificant to the income of corn farmers in the sub-district of Tiga Binanga. It can be seen in Table 1 shows the value of tcount of -0.365 with significance 0.431. The significance value is greater than α 0.05, which means that H₀ accepted H₁ is rejected.

Workforce cost have no significant effect on the income of corn farmers in the sub-district of Tiga Binanga because the average corn farmer in the sub-district of Tiga Binanga uses more labor than in the family than the workforce outside the family, where the workforce in the family is not accounted as costs so that labor costs are only paid to labor originating from outside the family. This information is directly obtained from interviews with corn farmers in the sub-district of Binanga.

The results of this study were not in accordance with previous research by Surviani (2007) with the research title of "Analysis of factors affecting the income of corn farmers in Bulu Cenrana village of Pitu Riawa District Sidenreng Rappang Province

of South Sulawesi" which states that labor costs significantly affect the income of corn farmers.

2. Effect of Fertilizer Cost on The Income of Farmers of Corn in The District of Tiga Binanga, Karo District

Based on the results of the study showed that fertilizer cost are negative and significant against the income of corn farmers in the sub-district of Tiga Binanga. It can be seen in Table 1 shows the value of tcount of -2.265 with significance 0.029. The significance value is less than α 0.05, which means H_0 rejected H_1 accepted. With the value of regression coefficient of -4.231 which means if the cost of fertilizer increased Rp1/Kg, the income of corn farmers in the sub-district of Tiga Binanga will be reduced by Rp4.231.

Based on the foundation of theory used is the production function which explains that the output produced in a given period is equal to the function of the capital and labor where the fertilizer used in this research as one part of the capital.

The results of this research also in accordance with the previous research conducted by Susanti (2013) which shows that the cost of fertilizer has a negative and significant influence on the income of corn farmers.

3. Effect of Pesticide Cost on The Income of Farmers of Corn in The District of Tiga Binanga, Karo District

Based on the results shows that pesticide cost negatively and insignificant to the income of corn farmers in the sub-district of Tiga Binanga. This can be seen in Table 1 showing the value of the tcount -0.378 with significance 0.442.

Pesticide cost has no significant effect on corn income. According to the corn farmer in the sub-district of Tiga Binanga, this is due to the weeds that adabelum too high until the harvest time so that it is not made a nest of pests or the growing place of pests.

It is also supported by the previous research conducted by Isnuriyadi (2019) In his

studies conducted in Saentis Village, Percut Sei Tuan subdistrict, Deli Serdang Regency with sampling method was conducted in purposive sampling, as many as 129 corn farmers and which were taken to sample as many as 33 farmers of corn, where the research showed that pesticide cost is not significant to the income of corn farmers.

4. Effect of Land Lease Cost on The Income of Farmers of Corn in The District of Tiga Binanga, Karo District

Based on the results of the study showed that land rental costs negatively and significantly affect corn Farmer's income in the sub-district of Tiga Binanga. It can be seen in Table 1 shows the value of tcount of -5.086 with significance 0.000. The significance value is less than α 0.05, which means H_0 rejected H_1 accepted. The value of regression coefficient of -2.676, which means if the cost of land rental increased by Rp1, the income of corn farmers in the sub-district of Tiga Binanga will be reduced by Rp 2.676.

Corn farmer in the district of Tiga Binanga as a whole rented land used to grow corn. According to the results of the research that has been done, the cost of land rental affects the income of corn farmers in the sub-district of Tiga Binanga because when the land is rented better the location of the site, the higher the rental cost that should be issued by corn farmers in the sub-district of Tiga Binanga.

CONCLUSION AND SUGGESTION

Based on the results of the study, the following conclusions are taken:

1. Workforce cost is negatively and insignificant effect the income of corn farmers in the sub-district of Tiga Binanga.
2. Fertilizer cost is negatively and significantly affect the income of corn farmers in the sub-district of Tiga Binanga.
3. Pesticide cost is negatively and insignificant effect the income of corn farmers in the sub-district of Tiga Binanga.

4. Land lease cost is negatively and significantly affect the income of corn farmers in the sub-district of Tiga Binanga.

Based on the conclusions obtained, some suggestions are as follows:

1. Based on the results of the research that has been done, where the conclusion gained that to increase the income of corn farmers in the sub-district Tiga Binanga is expected to the corn farmers to continue to increase production by using a productive workforce and fertilizer use according to the recommended dosage and use of land efficiently.

2. To further researchers who want to research further, the authors expect to be held a more complete research or review other factors that affect the income of corn farmers such as labor costs, seed costs, farming age, farming experience, etc. as well as increasing the number of research samples.

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