

Article

Determination of Farmer's Welfare and Its Impact on the Economy of the Livestock Sub Sector in Aceh Province, Indonesia

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Abstract: This study analyzes the effect given by the implementation of the SIKOMANDAN program policy, inflation, and investment on the economic growth rate of Aceh Province in the livestock sub-sector directly or indirectly through the welfare level of farmers in the livestock sub-sector. This study uses time series data consisting of quarterly data for the 2012-2021 research period in Aceh Province. The results of the research conducted by the SIKOMANDAN program have a direct significant effect on the welfare level of farmers in the livestock sub-sector. These findings indicated that the SIKOMANDAN program can be felt optimally by farmers in the livestock sub-sector in Aceh Province. Based on the results of the study, various appropriate policies are needed in the context of better economic development, so that they can be felt equally by all groups, especially farmers in the livestock sub-sector by optimizing existing programs such as seedling assistance, supervision of production stages, and so on.

Keywords: inflation; investment; economic growth; livestock rate; sub-sector.



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1. Introduction

Economic growth that has an equitable impact on all elements of society is the main goal of a government (Maulana et al., 2020). The economic growth of each region has a different base sector or leading sector, including Aceh Province (Rajab & Rusli, 2019). Aceh province with all its characteristics has great potential for the agricultural sector, especially the livestock sub-sector (Saputra et al., 2009). This is inseparable from the various cultures and behaviors of the Acehnese people who have a high level of consumption in the livestock sector (Handayani & Rasyid, 2012). The level of consumption that tends to be high is illustrated by the role of the livestock sub-sector in the GRDP of Aceh Province. Figure 1 shows that the GRDP of the livestock sub-sector in Aceh Province continues to increase. In 2010, the GRDP of the livestock sub-sector in Aceh Province was 3.5 trillion rupiah and continued to increase until 2020 to 7.7

trillion rupiah. This illustrates that the livestock sub-sector has great potential in the economy in Aceh Province.

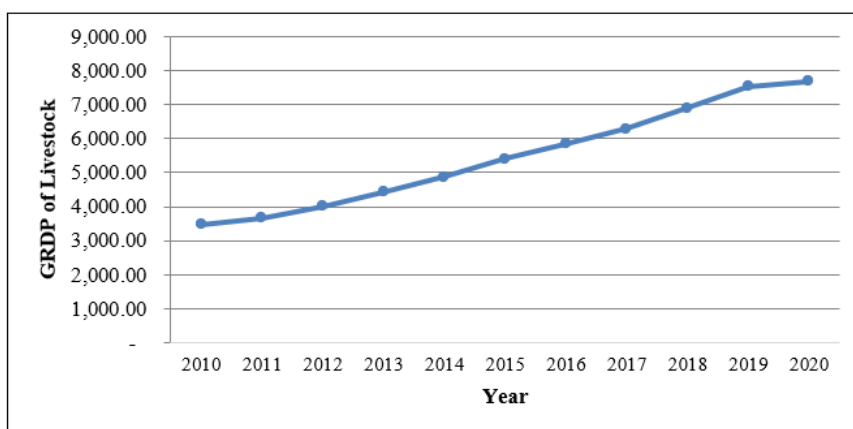


Figure 1. GRDP of the Livestock Sub-sector in Aceh Province (in Billion Rupiah)

Source: Badan Pusat Statistik Aceh (2021)

However, Figure 2 shows the share given by the livestock sub-sector to the value of GRDP in the agricultural sector in Aceh Province.

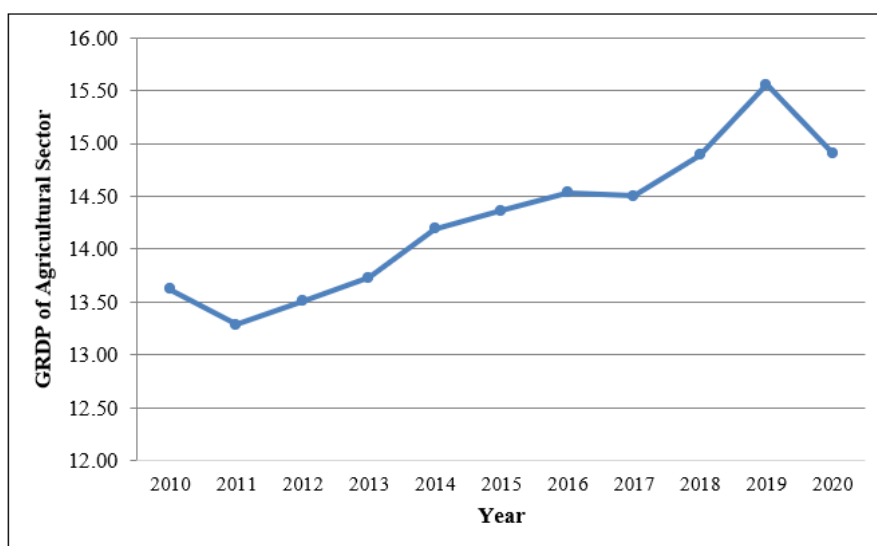


Figure 2. Share of GRDP of the Livestock Sector to GRDP of the Agricultural Sector in Aceh Province.

Source: Badan Pusat Statistik Aceh (2021)

Figure 2 shows the contribution made by the livestock sub-sector to the agricultural sector in Aceh Province which tends to fluctuate. This shows that although the GRDP value of the livestock sub-sector continues to increase, this increase has not been able to have a greater influence on the economy of the Aceh Province. In 2010, the livestock sub-sector was able to contribute 13.62 percent to the value of the GRDP of the agricultural sector in Aceh Province. Although it decreased in 2011 to 13.29 percent, the role of the livestock sub-sector continued to increase in the following year to reach 15.56 percent in 2019. However, in 2020, the share provided by the livestock sub-sector again declined to 14.91 percent. This is due to various factors that have caused an economic slowdown in all regions such as the COVID-19 pandemic and so on (Tran et al., 2020).

The dominant livestock activities in Aceh Province include beef cattle farming (Marliah et al., 2010). Beef cattle farming is an agribusiness activity that has been widely cultivated by livestock farmers in Aceh Province (Suryana, 2009). The pattern of livestock development carried out by livestock farmers in Aceh Province is generally still a people's livestock business. The beef cattle farming business has been carried

out for a long time with a traditional maintenance pattern, marked by the absence of recording of the costs incurred so that the amount of income obtained from this business cannot be known with certainty by livestock farmers.

Increasing the cattle population is the main thing to increase the income of beef cattle farmers in Aceh Province. Aceh Province is one of the provinces with a large demand for meat in Indonesia. This is related to the increasing demand for beef for the needs of meugang traditions, holidays and birthdays in Aceh Province. Therefore, high market demand is an opportunity for livestock farmers, especially beef cattle commodities in Aceh Province to increase their income. Based on data from the Aceh Livestock Service, the beef cattle population in Aceh Province increased from 2019 – 2020 from 403,031 to 435,376, and in 2021* the beef cattle population increased from 435,376 to 452,284. For this reason, the role of the government is very much needed in empowering the world of animal husbandry in Aceh Province, both by the Regional Government and the Central Government.

The SIKOMANDAN program is expected to be able to improve the welfare of farmers in the livestock sub-sector by increasing production yields by reducing various risks that can occur during the production process (Triani, 2019). The indicators that can be used to be able to see the welfare of farmers in the livestock sub-sector are NTP in the livestock sub-sector (Keumala & Zainuddin, 2018). In addition to these factors, other factors that affect the welfare of farmers in the livestock sub-sector in Aceh Province are inflation and investment. Inflation has an impact on increasing prices, causing an increase in the income of farmers in the livestock sub-sector, which is only a pseudo-increase (Simanungkalit, 2020). Likewise, high investment can increase the production that can be produced so that it can improve the welfare of farmers in the livestock sub-sector (Teja, 2015). In addition, it is hoped that the SIKOMANDAN program, inflation, and investment can increase the economic growth of the livestock sub-sector to be faster directly or through the NTP of the livestock sub-sector as an intermediary factor or as an indirect influencer on the economic growth rate of the livestock sub-sector in Aceh Province.

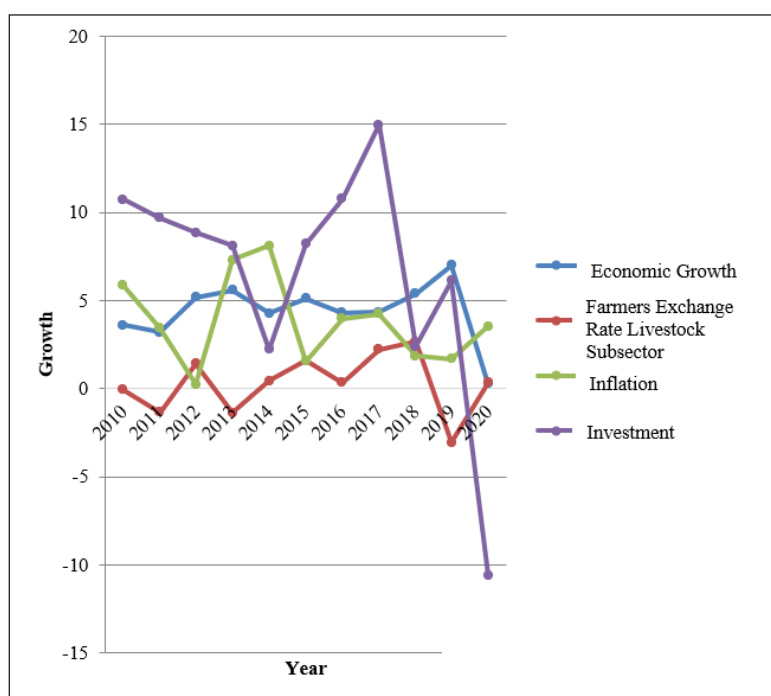


Figure 3. Livestock Sub Sector Economic Growth Rate, Farmers Exchange Rate Livestock Subsector, Inflation, and Investment in Aceh Province.

Source: Indonesia (2021)

Figure 3 shows the movement of the livestock sub-sector's economic growth rate, inflation, and the rate of investment which tends to fluctuate. Inflation that occurred in Aceh Province showed a very unstable trend, even above the rate of economic growth in the livestock sub-sector. The highest inflation occurred in 2014 which was 8.09 percent, very high when compared to the economic growth rate of the livestock sub-sector in that period, which was 4.28 percent. Although the movement improved in the next period, in 2020

the livestock sub-sector economic growth rate (0.27) was again lower than inflation (3.54 percent). This indicates that there are several periods where the increase in the income of farmers in the livestock sub-sector is only a nominal increase due to being eroded by the flow of inflation.

Investment in Aceh Province has a very fast pace. In 2010, the investment growth rate in Aceh Province of 10.72 percent continued to slow down to 2.22 percent in 2014. In the next period, the investment growth rate continued to increase to 14.95 percent in 2017 as well as the investment growth rate. highest during this period. However, in the next period, the rate of investment growth continued to decline to -10.59 percent as a result of the COVID-19 pandemic that hit Aceh Province. The investment growth rate has not been able to produce an increase in the production of the agricultural sub-sector, where the investment growth rate tends to be faster than the economic growth of the livestock sub-sector in Aceh Province. Furthermore, if it is related to the NTP of the livestock sub-sector, it can be seen that the increase in farmer's welfare is not higher than the increase in the economic growth rate of the livestock sub-sector. This illustrates that the welfare of farmers has not been evenly distributed so that it can only be felt by a few groups. The rate of increase in the value of NTP in the livestock sub-sector also shows that the rate of investment provision that tends to be high has not been able to produce a high level of welfare and is evenly distributed among all elements of farmers in the livestock sub-sector in Aceh Province.

In this regard, the Central Government, in this case, the Directorate General of Livestock and Animal Health, Ministry of Agriculture, has determined that beef cattle are 1 of 5 food commodities stipulated in the 2020-2024 RPJMN as strategic commodities. Therefore, a study is needed that can examine how much influence the SIKOMANDAN program, inflation, and investment have on the economic growth rate of the livestock sub-sector directly or indirectly through the NTP of the livestock sub-sector in Aceh Province.

2. Literature Review

Farmer's exchange rate (NTP) is one indicator to be able to see the development of welfare felt by agricultural sector actors (Nasional, 2013). The NTP is calculated based on the comparison between the index value of the price obtained by the agricultural sector actors and the index of the price that must be issued by the farmer. NTP which is worth above 100, it can be stated that the price obtained by farmers is higher than the price that must be issued by farmers so it can be concluded that farmers tend to be more prosperous, and vice versa (Statistik, 2020). One of the sub-sectors of the farmer's exchange rate measured in Indonesia is the livestock sub-sector. The commodities included in the livestock sub-sector include large livestock such as cows and buffalo, small livestock such as goats and sheep, poultry such as chickens and ducks, as well as products from livestock activities such as milk and eggs. This research itself focuses on developing the welfare level of farmers in the livestock sub-sector. This is due to the low level of welfare of farmers in the livestock sub-sector in Aceh Province.

In addition, various policies related to the development of the agricultural sub-sector have been carried out, such as the SIKOMANDAN policy, namely the country's flagship commodity buffalo cattle program. This program is expected to support increasing the level of welfare of farmers, especially in the livestock sub-sector in Aceh Province. The value of NTP itself has various benefits if it is used for various interests and policies related to the livestock sub-sector. The index obtained by farmers in the livestock sub-sector (It) can be an indicator to see fluctuations or price movements produced by farmers in the livestock sub-sector so that this index can be a projection for calculating income in the livestock sub-sector. Furthermore, the price index that must be issued by farmers in the livestock sub-sector (IB) is an approach to see the price movements of goods consumed by farmers in the livestock sub-sector and can describe the development of the inflation in rural areas. NTP itself also aims to be able to measure the exchangeability of products produced by farmers to be sold with products needed by farmers for both production needs and household consumption needs. This can describe the level of welfare of farmers in the livestock sub-sector.

The State Mainstay Commodity Buffalo Cattle Program (SIKOMANDAN) is one of the main activities to increase the supply of domestic beef production for the community as stated in the Minister of Agriculture Regulation Number 17 of 2020 concerning Increased Production of Domestic Mainstay Cattle and Buffaloes. SIKOMANDAN is packaged in a series of activities that are integrated and synergized from upstream to downstream, starting from efforts to increase births followed by efforts to reduce mortality and efforts to increase livestock productivity by providing adequate feed, which in the end the meat production can meet the needs of the community (Triani, 2019). The SIKOMANDAN program as the main activity was launched by the Minister of Agriculture on February 20, 2020, in North Sumatra Province, precisely in Serdang Berdagai Regency. The SIKOMANDAN program is one of the main focus activities for the ranks of the Directorate General of Livestock and Animal Health.

The series of activities of the SIKOMANDAN Program is designed with an approach that involves more active roles of technical officers and the community as development actors. The implementation of the SIKOMANDAN program consists of a series of activities such as increasing births, increasing productivity, distribution and marketing. Samuelson et al., (2004) state that inflation is a general price movement for goods and services in an area during a certain period. Inflation itself can describe people's purchasing power of goods and services and inflation can also describe the real value of a currency. Inflation itself occurs due to many factors, such as an imbalance between aggregate demand and supply, resulting in general price movements. Rahardja & Manurung, (2004) state that the characteristics of inflation are based on 3 characteristics, namely the occurrence of price increases, price increases are general and occur continuously. Several indicators can see whether there is inflation or deflation in an area at a certain period, including the consumer price index (CPI), wholesale trade price index (IHPB), and the GDP deflator.

The theory that underlies inflation on the welfare level of farmers in the livestock sub-sector is demand-pull inflation which states that inflation will occur when the amount of goods and services offered is less than the goods and services demanded. This resulted in the increase in income obtained by farmers only increased in nominal terms because the nominal value was eroded by inflation. Therefore, it is hoped that the increase in production produced by the SIKOMANDAN program can increase the income of farmers in the livestock sub-sector in real terms so as to improve the welfare of the farmers in the livestock sub-sector. Investment is a commitment between economic actors, both private and government in terms of providing a certain amount of capital and or natural and human resources to obtain economic benefits in the future (Tendelilin, 2001). Jogiyanto (2003) states that investment is an activity to delay current consumption so that it can be used as an efficient production input within a certain period of time. Investment activities carried out continuously will stimulate the economy through increased production activities in a region. This will have an impact on increasing job opportunities and in the long term can prosper investors and the community.

The important role of investment in the economy is one of the components of aggregate expenditure so an increase in the value of an investment in a region can increase the economy and employment opportunities of the region in the aggregate. Furthermore, investment can increase capital goods in order to increase production capacity. In addition, investment is always followed by technology development so that it can streamline and optimize the resources needed in the context of production activities. This will have an impact on increasing the welfare of society in general. InvestmentRobiyanto, (2021) stated that investment is divided into two types, namely investment in finance and investment in assets. Investment in finance can be divided into direct investment or indirect investment. Direct investment is done by buying financial assets offered on the money market and capital market. This type of investment is usually obtained by commercial banks or can be in the form of savings or certificates of deposit. Indirect investment is done by buying shares or securities from investment companies.

Susanti et al., (2014) in their research entitled Development of Beef Cattle Farms for Economic Improvement of Central Java Province: A Regional Planning Approach stated that the role of beef cattle in Central Java Province made a positive contribution to meeting beef needs both at the provincial and national levels, but the contribution of beef cattle the contribution of GRDP and employment in Central Java Province is still relatively small. This study is supported by the findings of a study conducted by Aiba et al., (2018) with the title Analysis of beef cattle farming business income in South Weda District, Central Halmahera Regency stated that cattle supply at the end of the year affected beef cattle business income, while the education and age of the respondents had no statistical effect on beef cattle business income.

Another study examining the SIKOMANDAN program was conducted by Iman et al., (2021)) entitled Business Model Canvas Development Strategy in the State Mainstay Buffalo Cattle program (SIKOMANDAN) states that several strategies must be carried out to get maximum results from the program such as using technology, facilitating communication between elements from upstream to downstream, cutting communication chain so that policies to be formulated can be issued on time, and so on. Bahari (2021) concluded that there are differences in income obtained by farmers which are influenced by differences in the scale of the beef cattle business they have. Judging from the income per head, it can be seen that the higher the scale of the beef cattle business, the greater the income per head obtained. Ibrahim et al., (2014) stated that by implementing policies that can support increasing the output of the livestock sub-sector, the community in general increases the number of jobs so that it decreases.

3. Materials and Methods

This research was conducted to be able to see the direct and indirect effects of the SIKOMANDAN program, inflation, and investment on the economy of Aceh Province through the NTP livestock sub-sector.

The data structure used is time series data in the form of quarterly data for the period 2012-2021 in Aceh Province. The data used in this study is secondary data sourced from the Aceh Industry and Trade Office and the Central Statistics Agency of Aceh Province. This study uses two types of analysis, namely descriptive analysis and inferential analysis. Descriptive analysis is an analysis that provides a general description of things that happen to the data without being based on the purpose of making general conclusions. Descriptive analysis was used in this study using tables and graphs. While inferential analysis is an analytical method used with the aim of forecasting and drawing a conclusion related to various economic phenomena that occur.

The inferential analysis in this study uses path analysis. Streiner (2005) states that path analysis is a development of linear regression so that it can analyze more complex economic phenomena. This analytical method can test the alignment of the correlation matrix of more than two causality relationships (Garson, 2013). The purpose of using path analysis is to be able to see the effect given by an independent variable on the dependent variable, both direct and indirect effects through mediating variables (Alterman et al., 1993). Meanwhile, according to Sarwono, (2011)), path analysis is an analytical technique that aims to analyze causality relationships arranged according to a temporary order between variables by using the path coefficient as the amount of influence produced by each independent variable on the dependent variable. The general equation of path analysis according to Timm (2002) is as follows:

$$Z = \rho_{yx_1}X_1 + \rho_{yx_2}X_2 + \dots + \rho_{yx_n}X_n + \varepsilon \tag{1}$$

$$Y = \rho_{zy}Z + \rho_{yx_1}X_1 + \rho_{yx_2}X_2 + \dots + \rho_{yx_n}X_n + \varepsilon \tag{2}$$

As the purpose of the analysis proposed in this study, a path diagram is made to facilitate understanding related to path variable notation so that it can be formulated in an equation form. The proposed path diagram is the investment variable, the SIKOMANDAN program, and inflation affecting the rate of economic growth. In addition, the path analysis was also carried out, but through the livestock sub-sector NTP as a mediating variable.

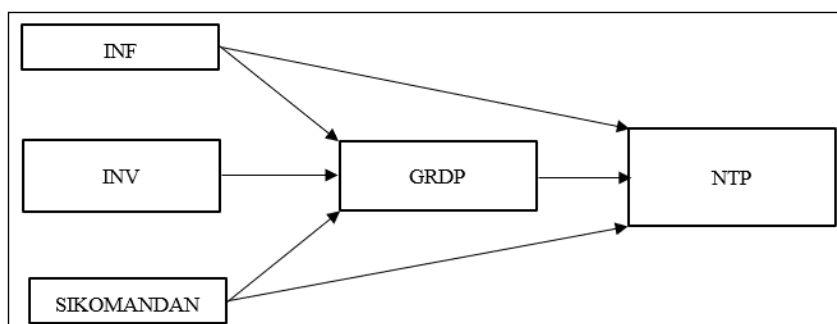


Figure 4. Research Framework

On the basis of Figure 4 above, the equations proposed in this study are as follows (Gujarati & Porter, 2004):

$$Z = \rho_{yx_1}X_1 + \rho_{yx_2}X_2 + \rho_{yx_3}X_3 + \varepsilon \tag{3}$$

$$Y = \rho_{zy}Z + \rho_{yx_1}X_1 + \rho_{yx_2}X_2 + \rho_{yx_3}X_3 + \varepsilon \tag{4}$$

Where: INV is Investment, SIKOMANDAN is SIKOMANDAN program, INF is inflation
 NTP : Farmers' Exchange Rate Livestock Subsector
 GRDP : Economic growth rate
 ρ_{zx1} : The coefficient of the investment path to the NTP of the livestock sub-sector
 ρ_{zx2} : The coefficient of the SIKOMANDAN program path to the NTP of the livestock sub-sector
 ρ_{zx3} : The coefficient of the inflation path to the NTP of the livestock sub-sector

- ρ_{zy} : The coefficient of the NTP path of the livestock sub-sector on the rate of economic growth
 ρ_{yx1} : The coefficient of the investment path to the rate of economic growth
 ρ_{yx2} : The coefficient of the SIKOMANDAN program path to the rate of economic growth
 ρ_{yx3} : The coefficient of the inflation path on the rate of economic growth
 ε : Residual

4. Results and Discussion

Path analysis is used in this study to be able to see and analyze the magnitude of the influence given by each variable to the dependent variable either directly or indirectly, namely through a mediating variable. The indirect effect is an analysis which states that the influence of a variable is not only something that has a linear relationship but also has other impacts through intermediary variables. The first step taken before proceeding with the path analysis is an examination of the classical assumptions where the model formed in this study has fulfilled the elements of classical assumptions in the form of normality, heteroscedasticity, multicollinearity, and autocorrelation assumptions.

Table 1. Hypothesis Testing

Independent Variable	Direct Effect		Indirect Effect (2) x (3)
	Dependent Variable GRDP	NTP	
(1)	(2)	(3)	(4)
GRDP	-	-0,1743	-
INF	0,4979**	-0,0853	-0,0425
INV	-0,1990	-0,0376	0,0075
SIKOMANDAN	-0,0527	3,7048***	-0,1952

Note: *** Significant at the alpha level of 1 percent; ** Significant at the alpha level of 5 percent; * Significant at the alpha level of 10 percent

The model that is formed shows that all the variables used in this study do not have a significant influence indirectly through the intermediary variables of GRDP. In addition, only the SIKOMANDAN program variable has a direct influence on the welfare of farmers in the livestock sub-sector in Aceh Province. The livestock sub-sector GRDP variable does not have a significant effect on the welfare of farmers in Aceh Province. This finding shows that although the GRDP of the agricultural sector is the sector that has the highest share of the economy of Aceh Province, this sector has not been able to improve the welfare of farmers, especially the livestock sub-sector in Aceh Province. This is because the highest share generated by the agricultural sector comes from several large-scale business actors while the majority of agricultural sector workers in Aceh Province are farm laborers (Ringga et al., 2022). In addition, the value of GRDP in the agricultural sector is the gross added value produced by the agricultural sector in aggregate where this value is in line with the number of workers in the agricultural sector which is the highest compared to other sectors in Aceh Province. Therefore, although the share generated by the agricultural sector is high, if it is seen based on the welfare level of the livestock sub-sector farmers, it does not appear to have a significant impact.

The next variable is the inflation variable where this variable has not been able to significantly affect the level of farmers' welfare. Inflation can only affect the GRDP of the livestock sub-sector but has not been able to have an impact on the level of farmers' welfare either directly or indirectly. This is because most farmers in Aceh Province are subsistence farmers where these farmers sell and consume their own agricultural products. Therefore, any price movements produced by other commodities in aggregate have not been able to have a significant impact on the welfare level of farmers in Aceh Province. The next factor is the investment variable where this variable has not been able to affect the welfare level of farmers in Aceh Province either directly or indirectly. This finding is because in general investment in Aceh Province tends to be low and the users of investment facilities are farmers who have a large medium scale or only a few MSMEs so this has not been able to have a significant influence on the level of welfare of farmers in Aceh Province (Fijay et al., 2021).

The last variable used in this study is the SIKOMANDAN program where this variable does not yet have a significant effect on indirectly having a positive and significant direct influence on the level of

farmers' welfare in Aceh Province. This shows that the SIKOMANDAN program that has been carried out can touch all levels of farmers so that it can affect the level of farmers' welfare. In addition, various supervision and training that have been sought by the government, especially the Aceh provincial government to be able to improve the standard of living of farmers, especially the livestock sub-sector, have been going very well.

5. Conclusions

The conclusion that can be drawn from this study shows that all the variables used in this study do not have a significant indirect effect on the welfare level of farmers in the livestock sub-sector in Aceh Province. However, only the SIKOMANDAN program variable has a significant influence on the welfare level of farmers in the livestock sub-sector in Aceh Province. Therefore, various appropriate policies are needed to improve the welfare level of farmers in the livestock sub-sector in Aceh Province. Optimization of various programs, especially the SIKOMANDAN program, is expected to increase the level of welfare of farmers in the livestock sub-sector so that welfare can be felt evenly. Equitable welfare can have an impact on the GRDP of the livestock sub-sector so that economic growth in the agricultural sector can be felt by all workers in the agricultural sector, including the livestock sub-sector. Steps that can be taken to improve the welfare of farmers in the livestock sub-sector are to provide understanding to all business actors in the livestock sub-sector to be able to maximize the potential provided by an investment. In addition, the ease of access and various policies that do not burden livestock sub-sector business actors must also be designed optimally so that investment distribution can be carried out optimally.

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