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Testing the Effects of Economic Growth, and the Role of the Agriculture, Forestry and Fisheries Sectors, and Other Influential Factors in Forming Community Welfare

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The welfare and poverty of farmers are still being discussed by researchers regarding economic growth, the role of the agricultural, fisheries, and forestry sectors, as well as other factors. This research aims to analyze the achievements of economic growth, the role of the agricultural, fisheries, and forestry sectors in the economy, as well as the influence of income inequality, labor absorption, and infrastructure factors on welfare. This research was conducted in Southeast Sulawesi Province, Indonesia. Using a quantitative approach to test the relationship between variables based on secondary data during the 2013-2022 period. Data were analyzed using panel data regression. The results of the analysis show that the economic growth of Southeast Sulawesi Province in the last ten years has been less than encouraging, the same thing also happened in important sectors contributing to GRDP, namely the Agriculture, Forestry, and Fisheries Sectors. Furthermore, economic growth, economic inequality, employment, and infrastructure are proven to be able to have a direct influence in creating social welfare, but on the other hand, the Agriculture, Forestry, and Fisheries sectors have a negative influence. The factor that plays the most role in determining social welfare is income inequality. Then successively followed by infrastructure, employment, and finally economic growth.

Keywords: Community Welfare, Economic Growth, Agricultural, Forestry and Fisheries Sectors, Income Inequality, Labor Absorption, and Infrastructure.

INTRODUCTION

Economic growth is an increase in people's economic activities which causes an increase in the production of goods and services or an increase in national income. Economic growth is seen from community activities that produce output. Kuznets (Jhingan, 2000; Putong, 2013) describes economic growth as a long-term increase in a country's ability to provide more types of economic goods to its population where this ability grows along with technological advances and necessary institutional and ideological adjustments. The economic growth of a region is based on an increase in GRDP or GDP (Kusumaningrum and Yuhan, 2019; Saputri, 2019; Novri, 2017; Jhingan, 2000).

Experts agree that economic growth is related to the process of increasing the production of goods and services in society's economic activities (Razak, 2019; Permata, 2019; Nazir, 2009; McConnell and Brue, 2005; Jhingan, 2000). It can be said that economic growth involves one dimension of development and is measured by increasing production and income (Sen and Anand, 2000; Jhingan, 2000; Todaro, 2000; Suryana, 2000). Economic growth is a process that causes changes in people's lives, namely changes in politics, social structure, social values, and the structure of economic activities (Permata, 2019; Evi, 2018; Erwin, 2014).

Every country and region places economic growth as a macro measure of development achievement, which is expected to shape prosperity. The word welfare is used because there is general inequality which is termed poverty (Saranani *et al*., 2023; Hasddin and Melati, 2023). Thus, economic growth remains a priority to improve welfare while suppressing and reducing poverty down to the smallest level such as rural areas

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(Djaja *et al*., 2024; Supardi *et al*., 2024; Balaka *et al*., 2023; Mukaddas *et al*., 2023).

Several researchers who study economic growth to reflect prosperity and poverty use several different variables due to the different population characteristics of each country (Brockington, 2021; Johnston and Abreu, 2016; White *et al*., 2012; Alkre and Foster, 2011). Referring to studies such as Yusnika and Asmara (2023); Wikarsa *et al*. (2023); Prasetiyaningtyas *et al*. (2022); Bado *et al*. (2022), the variables used in assessing economic growth for poverty alleviation are the Human Development Index (Welfare), Income Inequality, Labor, Infrastructure, and Investment. Likewise, Inayah and Aisyah (2021); Ededme (2018); Annahar (2018); Fitriyatus (2017); Khairul (2017); Kim (2017); Lestari (2016); Ibnurrasyad (2014); Santika (2014); Janeski and Whitacre (2014) have proven this.

Conceptually and theoretically uneven people's welfare (human development index) will cause income inequality (Mukaddas *et al*., 2023b; Westi, 2016; Yasa, 2015; Putri *et al*., 2015; Boediono, 2009). This happens because income (large and small) will determine how the ability to meet household needs such as food, health, and education (Hasrimi *et al*., 2024; Dwijatateaya *et al*., 2024; Supardi *et al*., 2024; Faoziyah, 2023; Sari *et al*., 2023; Widjaja and Meylinda, 2021), including social, cultural and environmental happiness (Thomas, 2013). The welfare of the community is also supported by the absorption of the workforce because more and more workforce that work can increase the purchasing power of households (Todaro and Stephen, 2006;Sen and Anand, 2000).

The availability of infrastructure is also recognized as a welfare-forming variable (Hapsari, 2011). The better the infrastructure development index, the greater the welfare and poverty reduction (Eliana and Endang, 2023; Eduardus, 2021; Nizar *et al*., 2013). Mulyadi (2017); Brudeseth (2015) continued that the availability of infrastructure has been proven to be able to increase the added value of production of various agricultural commodities, all of which lead to increased farmer income.

However, there are different facts reported by researchers. Eliana and Endang (2023); Ka'arieni *et al*., (2020) found that economic growth did not have a significant influence on people's welfare. Mangunsong *et al*. (2023); Kholosah and Lestari (2023) in their research reported that increasing income does not consistently provide a positive influence on welfare. This means that its influence is still very weak in reducing the gap in opinion in explaining the increase in welfare (Kholosah and Lestari, 2023).

Other research reported by Ka'arieni *et al*. (2020) continues that the ability to absorb labor and unemployment does not have a significant effect on community welfare. Likewise, infrastructure development and investment have not had a significant positive influence on community welfare, as reported by Eliana and Endang (2023). The results of the analysis show that infrastructure and investment have a positive effect on community welfare. The research gaps above open new insights for further research.

In Indonesia including the province of Southeast Sulawesi, the highest GRDP contribution is still produced from the agricultural, fisheries, and forestry sectors. The contribution of this sector to the GRDP during 2019-2023 is consistent as the highest, namely 23%, and the mining and excavation sector is around 21% (Southeast Sulawesi Central Statistics Agency, 2024).

The agricultural, fisheries, and forestry sectors in Southeast Sulawesi Province are generally based in rural areas, but the fact is that the distribution of poverty is still higher in the village. Data from the Southeast Sulawesi Central Statistics Agency, (2024) states that the poor population in the city is 23.45% and in the village by 76.55%. Therefore Mardianto *et al*. (2023); Dini and Fauzan (2020) said that the issue of welfare in Indonesia is still the focus of development, as well as in Southeast Sulawesi Province.

There are two research objectives, the first is to analyze the achievement of economic growth and the role of the agricultural, fisheries, and forestry sectors in the last ten years (2013-2022). The second goal is to analyze the influence between variables, namely economic growth, as well as the growth of the agricultural, forestry, and fisheries sectors including other main factors that affect welfare. The main factors in question are income inequality, labor absorption, and infrastructure.

The originality of this study is to explore one sector in the regional economy (Gross Regional Domestic Product or GRDP) which has the largest structure and contribution to GRDP. The renewal or novelty of this research is the effect of economic growth for the agricultural, fisheries, and forestry sectors on the welfare of the community, income inequality, labor absorption, infrastructure, and investment.

MATERIALS AND METHODS

This study was conducted in Southeast Sulawesi Province, Indonesia. Done for about 8 months for 2023. The time starts from the preparation of the instrument to the research report.

This study uses a quantitative approach to test theory (presented in Figure 1). The study was conducted in Southeast Sulawesi Province, Indonesia. Using the Panel Data Regression Model, to explain the cause and effect relationships between variables. The model seems to be called explanatory research.

The variables analyzed are the welfare of the community (processing with the human development index) as the dependent variable (Y). Then the independent variables are economic growth (X1), the growth of the agricultural, fisheries and forestry sectors (X2), income inequality (X3), labor absorption (X4), and infrastructure (X5). There are five hypotheses tested as presented in Figure 1.

Secondary research data was obtained from searching from the authorized institution/agency. Data collected according to the research variable between 2013-2022. The data referred to collected from the Southeast Sulawesi Central Statistics Agency (2024; 2020; 2017), the Department of Manpower and Transmigration, and the Penana Capital and Integrated Services Office of the One Door of Southeast Sulawesi Province.

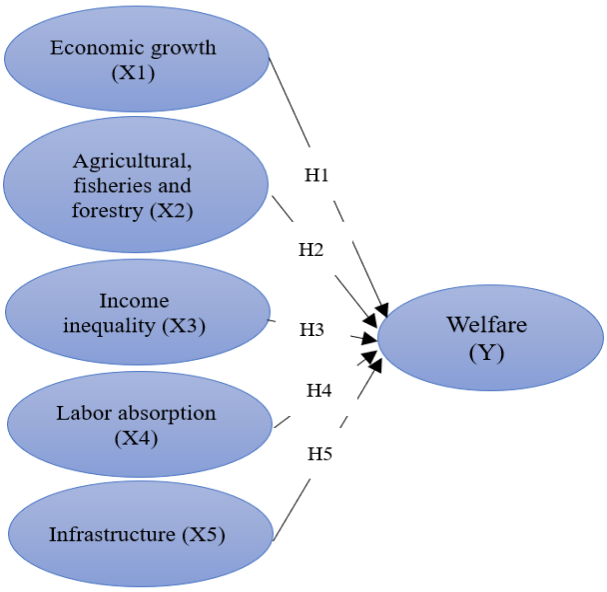


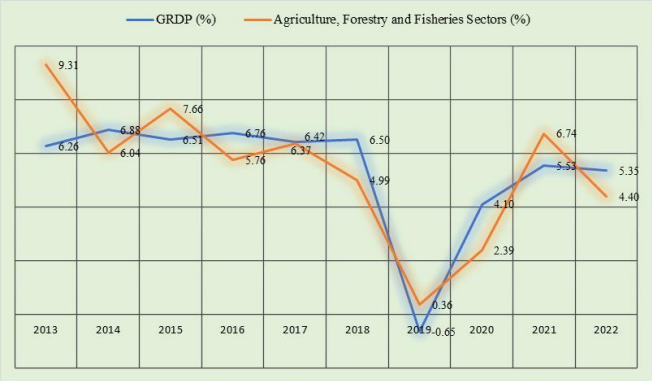
Figure 1. Conceptual Framework and Hypothesis.

Data analysis using panel data regression, to test the independent variables of the dependent variable in the causality pattern using 2013 data to 2022. Data Panel Regression Analysis using the *EViews 10* software application.

RESULT

***Economic growth in the agricultural, fisheries, and forestry sectors in Southeast Sulawesi Province*:** The economic growth of Southeast Sulawesi Province in the GRDP during the year of observations of fluctuating trends, and in the last three years showed the decline curve. As presented in Figure 2, the growth of the GRDP of Southeast Sulawesi Province in 2012 was 6.26%, and in 2021 of 5.35% or down around 0.91%. The highest economic growth occurred in 2015 which was 6.88% and the lowest occurred in 2019/2020 namely -0.65. The Mines' growth rate is a result of the Pandemic Covid-19.

Economic resistance in Southeast Sulawesi Province results in the agricultural, fisheries, and forestry sectors. As shown in Figure 2, the growth of this sector from 2013 to 2022 has decreased by around 4.91%. The highest growth of the agricultural, fisheries, and forestry sectors occurred in 2013 which was 9.31% followed by 2015 amounting to 7.66 while the lowest occurred in 2020 and 2019 below 3%.



Source: Processed from the Southeast Sulawesi Statistics Clothing Agency (2024; 2020; 2017)

Figure 2. Development of economic growth and agriculture, fisheries, and forestry sectors in GRDP in Southeast Sulawesi Province.

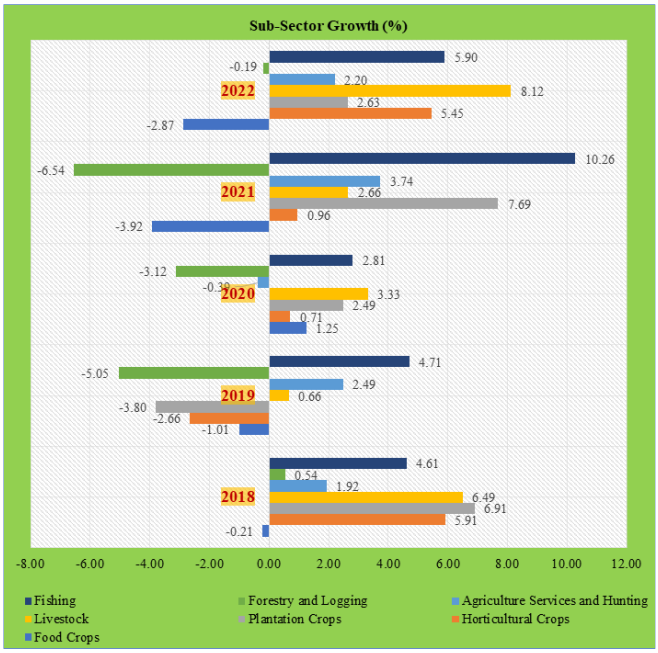
In the GRDP structure, the agriculture, fisheries, and forestry sectors are formed from seven sub-sectors. Two sub-sectors perform both positive values and show an increase, namely the fisheries sub-sector, and the livestock sub-sector. It's just that seen from the distribution of penumbra is quite fluctuations that indicate that the performance is very dynamic (presented in Figure 3).

As shown in Figure 3, in 2018, the largest growth contribution in the agricultural, forestry, and fisheries sectors and the plantation crop sub-sector was 6.91% followed by the livestock sub-sector at 6.49%. The lowest sub-sector is a food crop with a minus value of -0.21%, followed by a forestry sub-sector and logging only 0.54%.

But then, the growth of plantation plants sub-sectors in 2022 fell to 2.63%, while the livestock sub-sector increased to 8.12%. Even in 2022, fisheries sub-sectors crawled up as the highest with a growth of 5.90%, followed by a horticultural plant sub-sector of 5.45%. The lowest is the food crop sub-sector with a growth of -2.87% and the forestry sub-sector and logging -0.19%.

The development of agriculture, forestry, and fisheries according to sub-sectors is very dynamic. Among the causal factors are First, the Covid-19 pandemic which was affected between 2019-2022, where several achievements decreased drastically. The second cause is the transformation and change of the labor market to the mining industry, and the third is the conversion of agricultural land into built-up areas. Facts regarding the trend in the decline in agricultural, forestry, and fisheries performance in Southeast Sulawesi Province are also experienced by other regions such as in Banyumas Regency, East Java Province (Gusmanto *et al.*,

2023). The same thing happened in India, Brazil, China, and the United States (Deshpande, 2017).



Source: Data presented from various sources only in 2018-2022 (Source: Processed from the Southeast Sulawesi Statistics Clothing Agency, 2024; 2020

Figure 3. Development of the Growth of the Agriculture, Fisheries, and Forestry Sector Sub-SUB in GRDP in Southeast Sulawesi Province in 2018-2022.

This was also recognized by the Food and Agriculture Organization (FAO) in its report that in the last 50 years, there has been a decrease in the relative contribution of agriculture to GRDP as a result of the transformation of the Economic Sector (FAO, 2017). According to (Deshpande, 2017; FAO, 2017) the impact of a decrease in agricultural growth and contribution to GDP, in addition to transformation, is also influenced by the reduction of agricultural land ownership areas, gaps in access to modern technology, and limited provisions on agricultural facilities.

***The effect of economic growth; The growth of the agricultural, fisheries and forestry sectors; Income inequality; labor absorption; and infrastructure for the welfare of the community*:** This analysis is needed to explore the facts of economic growth, and the performance of the agricultural, forestry, and fisheries sectors together with the impact of follow-up such as income inequality, work, and infrastructure in explaining the welfare of the community, especially farmers.

This analysis begins with a hypothesis testing selection approach (Figure 1) as generally the regression panel data is called the Chow Test. The results of the objectives of the two options, the first is *Ho* = selecting and using the common effect method, and the second is *H1* = selecting and using the fixed effect method.

Choose *H1* or reject *Ho* if the probability value of F-Statistics> α 0.05 (5%), and if the value is produced on the contrary, then choose *Ho*. The results of testing the choice of models used are presented in Table 1.

Table 1. Chow test results.

Redundant Fixed Effects Tests			
Equation: PERNS1			
Test cross-section fixed effects			
Effects Test	Statistic	d.f.	Prob.
Cross-section F	3.061720	(16,148)	0.0002
Cross-section Chi-square	48.60778	16	0.0000

Based on the results of the Chow test regression, the probability value of F-Statistics 0.0000 <α 0.05 which means analysis uses the fixed effect model.

After this, it is continued at the next stage to select and determine the best model between the Fixed Effect Model and the Random Effect Model with the Hausman Test. The Hausman test was conducted to select the most appropriate estimation model between fixed effect models and random effect models with hypothesis formulations; *Ho* = reject the use of the random effect model, and *H1* = receive a fixed effect model. The provisions are: *Ho*, if the probability value of F-statistics> α 0.05 (5%), and *H1* or reject *Ho* if the probability value of F-Statistics <α 0.05 (5%). The complete analysis results are presented in Table 2.

Table 2. Hausman test results.

Correlated Random Effects - Hausman Test			
Equation: PERNS1			
Test cross-section random effects			
Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	4.806883	5	0.4399

The results of the Hausman test regression obtained a probability value of 0.4399 > α 0.05. This means that Ho is accepted so it uses a Random Effect Model (REM). Random Effect Model is one of the models in panel data regression where residual variables are considered to be able to explain inter-time events. The analysis results are presented in Table 3.

From the results of the Fixed Effect Model regression, the following model equation can be written:

- W = W (1) + W (2) EG + W (3) AFF + W (4) InQ + W (5) LA + W (6) INF + E
- W = W (1) + W (2) EG + W (3) AFF + W (4) InQ + W (5) LA + K (6) IN=F + E

Table 3. Random Effect Model.

Cross-section random effects test equation:				
Dependent Variable: welfare (K/W)				
Method: Panel Least Squares				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
welfare (W)	3,679	2,619	1,404	0.162
economic growth (EG)	0,146	0,068	2,133	0.034
agricultural, fisheries and forestry sectors (AFF)	-1,450	2,439	3,294	0.001
income inequality (InQ)	0,201	0,014	1,390	0,000
labor absorption (LA)	0,162	0,035	4,642	0,000
Infrastructure (INF)	0,184	0,007	2,554	0,000
Effects Specification				
Cross-section fixed (dummy variables)				
R-squared	0,961	Mean dependent var		4,567
Adjusted R-squared	0,956	S.D. dependent var		3,712
S.E. of regression	0,776	Akaike info criterion		2,451
Sum squared resid	8,91	Schwarz criterion		2,857
Log likelihood	-1,863	Hannan-Quinn criter.		2,616
F-statistic	1770,51	Durbin-Watson stat		1,370
Prob(F-statistic)	0,000			

- W = 3,679 + 0.146 (EG) + -1,450 (AFF) + 0.201 (InQ) + 0.162 (LA) + 0.184 (INF).

The results of panel data regression analysis can be interpreted as follows:

a. The constant value obtained is 3,679, it can be interpreted that if the independent variable (x) rises to an average unit, then the dependent variable (Y) ie welfare will also increase by 3,679.
b. The regression coefficient value of the economic growth variable (EG) is positive by 0.146, meaning that if the PE variable increases, the welfare variable (W) increases by 0.146, and vice versa. This means that the hypothesis (*H1*) is accepted.
c. The coefficient regression coefficient of the variables of agriculture, forestry, and fisheries sectors (AFF) is positive amounting to -1,450, so that if the AFF variable increases, the welfare variable (W) also decreases by 2,450, and vice versa. This means the hypothesis (*H2*) is not proven or rejected.
d. The coefficient of regression coefficient of the income inequality (InQ) is positive of 0.201, it can be interpreted that if the variable increases, then the welfare variable (W) will also increase by 0.201, and vice versa. This means that the hypothesis (*H3*) is accepted.
e. The regression coefficient value of the labor absorption variable (LA) is positive of 0.162, it can be interpreted that if the LA variable increases, the welfare variable (W) also increases by 0.162, and vice versa. This means that the hypothesis (*H4*) is accepted.
f. The value of the regression coefficient of the infrastructure variable (INF) is positive amounting to 0.184, meaning that when infrastructure (infrastructure) increases, the welfare variable (W) will also increase by 0.184, and vice versa. This means that the hypothesis (*H5*) is accepted.

DISCUSSION

***The influence of economic growth on welfare*:** The results of the panel data analysis that have been presented found that economic growth has a positive and significant influence on the level of community welfare (Table 3). The coefficient value produced is 0.162, which means the dynamics of economic growth in Southeast Sulawesi, although there is a decline (Figure 2) has not directly harmed welfare. If you look at the Southeast Sulawesi welfare index data between 2023-2019, it shows an increase from 63 to 71. So it is increasingly clear that the welfare of society in the last 10 years can be formed from the results of economic growth, and vice versa. Theoretically, this finding is in line with Yusnika and Asmara (2023) findings, and Sari *et al*. (2023) that economic growth will influence the formation of the community welfare index. At the same time criticized the results of the research of Eliana and Endang (2023); Ka'arieni *et al*. (2020) who stated economic growth had no significant effect on the welfare of the community.

These results show the stronger economic growth that is beneficial for the welfare of the community, the better the achievement of economic growth that will be followed by improving the welfare of the community. From the findings of the results above, the government must practically be careful in making policies in terms of economic growth, at least ensuring that the policy can improve the welfare of the community.

***The influence of the growth of the agricultural, forestry, and fisheries sectors on the level of welfare*:** The results of the analysis found that the agricultural, forestry, and fisheries sectors were proven to have a significant influence on community welfare, with a coefficient value of -1.450 (Table 3). This means that the growth in the agricultural, forestry, and fisheries sectors which has experienced a decline in the last 10 years has reduced the welfare index by around -1,450, and vice versa. The same thing was reported by Isnaini *et al*. (2022) that the contribution of the agricultural, forestry, and fisheries sectors is still weaker in explaining welfare.

As shown in Figure 2, the growth of the agricultural, forestry, and fisheries sectors from 2017 to 2020 experienced quite poor conditions due to the lowest achievement during the year of observation. When it is associated with the welfare index data, it seems to have a description which from 2017 to 2022 has decreased. The results of the analysis then emphasized that the decline in the growth of the agricultural, forestry, and fisheries sectors in correlation had a direct effect on the decline in the welfare index.

As shown in Figure 3, it is precisely agricultural bases such as food crops sub-sectors. Meanwhile, data on the number of farmers in Southeast Sulawesi around 45% are engaged in food and horticultural crops, 20% are fishermen, around 9% of breeders, and the rest of farmers in plantation crops and farm laborers.

***The influence of income inequality on the level of welfare*:** Proven income inequality has a positive effect on the welfare of the community with a coefficient value of 0.201. This means that economic inequality is getting better, and can raise the community welfare index.

The 2013 Southeast Sulawesi inequality index was around 2.41 then in 2017 dropped to 2.30. In 2021 it was increasing with the economic inequality index in numbers 2.16 to 2023 remaining at 1.96. The trend of the inequality index is getting better, so the results of the analysis can be said that it has been able to create an increase in welfare by around 0.201 points per year.

These theoretical facts have been proven by previous research such as Hasrimi *et al*. (2024); Yusnika and Asmara, (2023); Sari *et al*. (2023); Santika (2014). At the same time corrected the findings of Mangunsong *et al*. (2023); Kholosah and Lestari (2023) that there is no direct correlation between decreased inequality and welfare.

***The influence of labor absorption on the level of welfare*:** The results of the panel data regression analysis show that the labor absorption variable has a positive and significant effect on the level of people's welfare in Southeast Sulawesi Province (see Table 3) with a coefficient value of 0.162. This finding means that employment from 2013 to 2022 which has increased has led to an increase in the welfare index of Southeast Sulawesi people around 0.16 points per year. It can be said that every workforce that works can generate income to meet household needs as a proxy for the level of welfare.

Theoretically, the results of this study supported Brudeseth (2015), as well as correcting and challenging the findings of Ka'arieni *et al*. (2020) which states that labor absorption does not affect welfare. The results of the research analysis confirm the truth of the concept of welfare developed to be wider compared to measuring aspects of nominal income. Welfare is Standard Living, Wellbeing, Wellare, and Quality of Life. Brudeseth (2015) states welfare is a quality of life satisfaction aimed at measuring the position of community members in building a balance of life including, (a) material welfare, (b) social welfare, (c) emotional welfare, (d) security. The same thing was reported by Permata (2019), that the structure of labor absorption has a positive and significant effect on the welfare of the people in Indonesia.

***The influence of infrastructure on the level of welfare*:** The results of this study indicate the effect of positive and significant infrastructure at the level of welfare of people with a coefficient value of 0.184. This means that the infrastructure development index in Southeast Sulawesi plays an important role in realizing the level of people's welfare. The infrastructure in question is roads, bridges, transportation networks, office facilities, schools, houses of worship, markets, and others used by the community.

Factually, the infrastructure development index in Southeast Sulawesi in 2013 was around 74.77%, then rose to 77.51% in 2014 to 2022 to 84.31%. These aspects are important capital in special development related to community economic activities, including the agricultural, forestry, and fisheries sectors as the sector most sought by the Southeast Sulawesi community.

Theoretically, this finding supports the study of Eduardus, (2021); Mulyadi (2017) that the better the infrastructure development index, the more open welfare and the same time poverty can be overcome. At the same time corrected the results of previous studies by Eliana and Endang (2023) that infrastructure could not have a significant effect on the welfare of the community. Practical implications are that the government must increase the availability of infrastructure to support the achievement of community welfare.

***Conclusion*:** The economic growth of Southeast Sulawesi Province in the last ten years has not been very good. The same thing happened to an important sector that contributed to GRDP, namely the agricultural, forestry, and fisheries sectors. As a sector that contributes highly to the economy, in the end, this sector has not been able to explain its contribution to improving the standards of people's lives, especially farmers.

Economic growth, economic inequality, labor, and infrastructure have been proven to have a direct effect on creating the welfare of the people in Southeast Sulawesi. The better the four variables performance, the better the welfare of the community. Interesting facts are the performance of the agricultural, forestry, and fisheries sectors indeed have a

significant effect but produce negative values. This means that the development of the agricultural, forestry, and fisheries sectors during 2013-2022 has not been able to contribute to improving the welfare of the community, even the performance of this sector during 2017 to 2020 contributes to reducing poverty by around -1,450 points.

Based on the value of the regression coefficient, the strongest factor that plays a role in determining the welfare of the community is income inequality. Then successively followed by infrastructure, work, and finally economic growth. Specifically, the agriculture, forestry, and fisheries sectors are negative, which means very weak in forming prosperity.

It is very interesting to discuss in the future academic space because the Southeast Sulawesi economy is supported by this sector because of its contribution as the highest among other sectors. But then that has not been directly able to create prosperity. Many assumptions were born, whether the development policy of this sector is more upstream, thus ignoring the effects downstream for farmers. Another assumption is that the development policy taken so far is not built on the interests of the community, especially farmers. This assumption is an interesting research topic in the future.

***Conflict of interest*:** This research did not involve sponsors therefore the contents of this manuscript are free from conflicts of interest.

***Authors' contributions*:** First author as main contributor. The second to fourth authors assisted the researcher in testing the research instruments and the sharpness of the analysis. The fifth author to the eighth author checks the quality of the manuscript content.

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***SDG's Addressed*:** No Poverty, Decent Work and Economic Growth, Industry, Innovation and Infrastructure.

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