

# Role of the Agriculture Sector in Poverty Reduction in East Kalimantan

Mariyah Mariyah\* and Agung Enggal Nugroho

Department of Agribusiness, Faculty of Agriculture, Mulawarman University.

\*Corresponding author. Email: [ademariyah81@gmail.com](mailto:ademariyah81@gmail.com)

## ABSTRACT

The agricultural sector provides support for food availability, employment, and increases household income in the urban or rural area. Household income determines expenditure and becomes the basis for determining the poverty line. East Kalimantan economy is still dominated by the mining sector. The development of agriculture has shifted the contribution of the sector to Gross Domestic Regional Product (GDRP). The research purpose was to analyze the role of the agriculture sector in poverty reduction. The data was time-series data of poverty and GDRP of East Kalimantan from 2011 to 2020. Descriptive analysis and regression analysis were used in this research. The results indicated that the poverty rate was average 0.10 %, the urban poverty rate was 4.77 %, and the rural poverty rate was -3.32 %. The contribution of the agriculture sector to GDRP was average 7.19 % and the average growth of agriculture GDRP was 9.06 %. Average agricultural labor absorption was 23.82 % from the working population, 76.99 % in rural and 23.01 % in urban. The agriculture sector has a statistically significant impact on reducing rural poverty. The coefficient regression was -0.1771 and t-value -7.78. It is significant at level 5 %. This implies that agriculture can be reducing poverty by labor absorption, increasing labor productivity, and shifting agriculture towards increasing products that provide added value.

**Keywords:** GDRP, Income, Labor, Rural, Urban

## 1. INTRODUCTION

Poverty is one of the biggest challenges facing every country today, including Indonesia. In 2020, the number of poor people in Indonesia reached 25.77 million people or approximately 10.19 %, an increase of 0.97 % from the previous year [1]. This condition is also the effect of the COVID-19 pandemic that started in early 2020. Large-scale social restrictions have reduced people's purchasing power, which in turn has contributed to the increase in the number of poor people in Indonesia.

As an agricultural country where most of the people work in agriculture, agricultural development has a strategic role in encouraging poverty alleviation in Indonesia. Research [2] stated that *econometric evidence indicates that agriculture is significantly more effective than non-agriculture in reducing poverty*. Agriculture is considered one of the sectors that can have a significant impact on poverty alleviation.

One area that is a measure of the success of poverty alleviation in Indonesia in the future is in the province of East Kalimantan. The determination of this area as the location of the new capital city of Indonesia gives special attention to all parties. The support of all

resources will be decisive in accelerating development and the success of the grand plan, including of course when it comes to the issue of poverty.

The number of poor people in East Kalimantan is 6.67 % of the total poor in Indonesia. Although it is not in the top position in contributing to the poverty rate, the effect of the planned relocation of the capital city also needs to pay close attention to how the impact or impact will be. This policy is expected to open up employment opportunities and new economic resources.

The composition of the poor population in East Kalimantan is not only in rural areas but also in urban areas. The rural poor are generally involved with activities in agriculture and are local natives, working as subsistence farmers with low wages [3]. Meanwhile, the poor who lived in urban areas initially occurred because of urbanization from villages to cities (Udo, 1992 in [4]). The livelihood characteristics of the poor in urban areas generally tend to be more diverse than those in rural areas, both in the agricultural and non-agricultural sectors.

One of the priority actions in poverty reduction is increasing access to sustainable livelihoods, entrepreneurial opportunities, and productive resources.

Therefore, agriculture is the main supporting sector. The income of poor households in East Kalimantan is 48.09% dependent on agriculture, the remaining 15.35% are unemployed, 1.81% work in the industrial sector, and 34.76% work in other sectors [1]. This figure further emphasizes how close the agricultural sector is to poverty.

Based on the above background, research is needed that can systematically measure the extent of the role of the agricultural sector in poverty in East Kalimantan. So that it can produce agricultural development policy recommendations that have a significant influence on poverty alleviation in the region. The purpose of this research is to analyze the role of the agriculture sector in poverty reduction in East Kalimantan Province.

## 2. LITERATUR REVIEW

There have been a relatively large number of empirical studies about agriculture and poverty. There is a complex link between the agricultural sector and poverty and many factors that influence the role of the agricultural sector in poverty alleviation. The growth in agriculture is on average more poverty reducing than an equivalent amount of growth outside agriculture [5]. There are eight empirical evidence on the relationship between sectoral growth and poverty reduction consist of (1) The proportion of 2-3 times the growth of the agricultural sector is more effective in reducing poverty, (2) Agriculture has advantages in reducing poverty over non-agriculture, (3) There is a substantial effect from non-agriculture on the agricultural sector that push poverty reduction, (4) The advantages of growth in agriculture over growth in non-agriculture in reducing poverty can also extend to other welfare outcomes such as food insecurity and, (5) The degree of traceability of food (and non-food) and the range of economies experiencing the increase in productivity, (6) Rising agricultural productivity not only reduces poverty by releasing (agricultural) labor to nonagricultural activities, it can also do so by pulling surplus labor from less productive home production into agriculture, (7) reallocation of labor from agriculture to the productive sector, (8) An increase in public capital formation.

Agricultural growth reduces poverty by the ability of agriculture to generate employment, stimulate the rural economy through linkages, and reduce the real cost of food, but depending on the conditions in each region [6]. Rural (urban) poverty is highly responsive to agricultural (non-agricultural) productivity growth [7].

## 3. RESEARCH METHODS

This research used the time series data from the Central Bureau of Statistics, East Kalimantan Province period from 2011 to 2020. The data consist of the number of poor population in East Kalimantan, Gross Domestic Regional Product (GDRP) total, GDRP Agriculture sector, GDRP Mining sector, and GDRP others sectors, urban poverty, and rural poverty, poverty

based on regency/city, agriculture labor. The data is secondary data obtained through publications from Bureau of Statistics, East Kalimantan.

The basic model to estimate the role of GDRP Agriculture in poverty reduction can be defined as:

$$\text{Poverty}_t = \alpha_0 + \beta \text{GDRP}_{\text{tot}} + \varepsilon \quad (1)$$

$$\text{Poverty}_t = \alpha_0 + \beta \text{GDRP}_{\text{agr}} + \varepsilon \quad (2)$$

$$\text{Poverty}_t = \alpha_0 + \beta_1 \text{GDRP}_{\text{agr}} + \beta_2 \text{GDRP}_{\text{min}} + \beta_3 \text{GDRP}_{\text{oth}} + \varepsilon \quad (3)$$

where  $\text{Poverty}_t$  refers to the number of poor population at province/urban/rural,  $\text{GDRP}_{\text{tot}}$  refers to GDRP total,  $\text{GDRP}_{\text{agr}}$  refers to GDRP from the agriculture sector,  $\text{GDRP}_{\text{min}}$  refers to GDRP from the mining sector,  $\text{GDRP}_{\text{oth}}$  refers to GDRP from others sector,  $t$  is period,  $\varepsilon$  is the error term.

The test statistics in regression analysis used F-test and t-test. The software used is SPSS Version 26.0.

## 4. RESULTS AND DISCUSSION

### 4.1. Poverty Trends and Agriculture Profile

#### 4.1.1. Poverty Trends

The poverty in East Kalimantan tends to increase. The number of poor population in 2020 is 243,990 people (Table 1). Rural area dominates the poverty in the East Kalimantan period from 2011 to 2020. Average rural poverty as 57.17 % and urban area poverty as 42.83 %. However, the number of poor population in 2020, urban poverty higher than the rural poverty. It is caused by pandemic Covid-19 that limit people moving to work. Empirical results showed that the poverty rate in Indonesia increase from 9.2 % in September 2019 to 9.7 % in 2020 [8].

Poverty line in September 2011 at province, urban, rural setting was IDR 336,019; IDR 359,290; IDR 297,986 per capita per month, respectively. Poverty line in September 2020 at province, urban, rural setting was IDR 669,622; IDR 675,399; IDR 656,069 per capita per month, respectively. Gini Ratio in September 2011 at province, urban, rural setting was 0.320; 0.300; 0.300 and in september 2020 was 0.335; 0.330; 0.286, respectively. Poverty Gap Index (P1) in September 2011 at province, urban, rural setting was 1.073; 0.610; 1.830, respectively and in September 2020 was 1.031; 0.675; 1.801. Poverty Severity Index (P2) at province, urban, rural setting was in September 2011 was 0.293; 0.165; 0.293 and in September 2020 was 0.248; 0.140; 0.420, respectively. The smaller the Poverty Gap Index (P1), the average population spending is getting closer to the poverty line and the income inequality of the poor is getting narrower. The Poverty Severity Index (P2) describes the distribution of the expenditure of the poor. This result holds more strongly by Ferezagia, East Kalimantan is included in cluster 3, namely, a cluster that has a low poverty index with an average Poverty Gap Index (P1) of 1.018, a Poverty Severity Index (P2)

of 0.233, and a percentage of the poor population of 6.59 % [9].

**Table 1.** The Number of Poor People on Rural and Urban in East Kalimantan

Year	Urban Poverty (Thousand)	Rural Poverty (Thousand)	Total Poverty (Thousand)
2011	87.9	159.23	247.13
2012	91.52	154.59	246.11
2013	96.09	152.6	248.69
2014	98.48	154.2	252.68
2015	80.82	129.16	209.99
2016	89.64	121.6	211.24
2017	102.39	116.28	218.67
2018	108.34	114.05	222.39
2019	108.16	112.75	220.91
2020	128.11	115.88	243.99

Poverty Rate at urban area is higher than in rural areas (Figure 1). Urban Rate as 4.77 % and Rural rate as -3.32. The average of poverty rate in the province is 0.10. Poverty rate in 2014-2015 showed a decline caused by regional expansion of East Kalimantan to be North Kalimantan. East Kalimantan includes 10 regencies/city and North Kalimantan includes 5 regencies/cities. This situation changes the population and budget performance. The number of poor people at

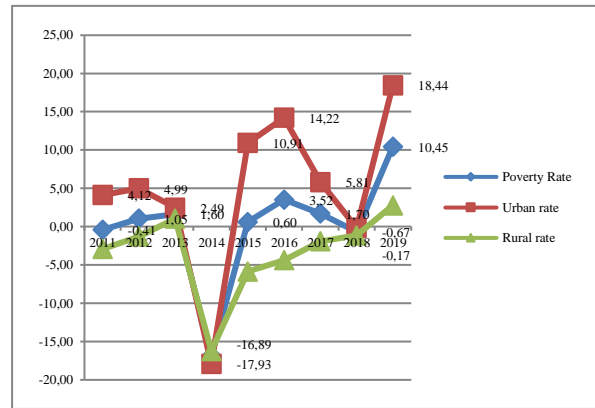
**Table 2.** Distribution of Poor Population Based on Regency/City in East Kalimantan Province, 2015-2020

Regency/City	Year					
	2015	2016	2017	2018	2019	2020
Paser	10.72	10.88	11.49	11.48	11.57	11.63
Kutai Barat	5.69	5.94	5.81	6.16	6.12	5.98
Kutai Kartanegara	26.77	26.22	25.69	25.84	25.62	25.37
Kutai Timur	13.89	14.17	14.51	15.08	16.06	16.06
Berau	5.27	5.39	5.39	5.18	5.28	5.34
Penajam Paser Utara	5.72	5.48	5.45	5.37	5.24	5.18
Mahakam Ulu	1.33	1.35	1.39	1.48	1.45	1.42
Balikpapan	8.40	8.24	8.11	7.77	7.18	7.39
Samarinda	18.44	18.29	18.17	17.92	18.10	18.20
Bontang	3.77	4.04	3.97	3.70	3.39	3.44

4.1.2. Agriculture Profile

Agriculture is a sector of concern in development programs because the contribution of the mining and quarrying sector tends to decline. The economic structure of East Kalimantan tends to remain unchanged and is dominated by 4 sectors, namely the mining and

the provincial level is changing as the distribution of poverty areas changes. Budget Performance affected the development program in each region include poverty reduction program and agricultural development sector. Empirical studies show that the expansion of the region did not affect the amount of local government budgets [10].



**Figure 1.** Trends of Poverty Rate at Province, Rural and Urban Period 2011-2020

The highest distribution of poor population in East Kalimantan is Kutai Kartanegara as 25.37 % from the total poor population in the province (Table 2). The lowest distribution of poor population is in Mahakam Hulu. Poverty in Kutai Kartanegara Regency is caused by social, cultural, and structural factors [11].

quarrying sector, the manufacturing sector, the trade sector, and the agricultural sector [12].

The average agricultural sector contribution to GDRP is 7.19 % (Figure 2). The contribution of agriculture tends to increase during the period from 2011 to 2020 compared to the mining and quarrying sector which has shown a decline since 2013. The

contribution of agricultural sector lower than others sector. The average growth of the agricultural sector was 9.06 % and the average growth of the others sector was 5.98 % (Figure 3). The GDRP of the agriculture sector is strongly influenced by the agriculture expenditure budget [13]. Allocation budget of local government is a reflection of the commitment of the policy makers in advancing the agricultural sector. Agricultural expenditures budget can be used to research, extension work, or physical assistance which encourages higher agricultural production, lower input, and transportation costs, and a higher price for the agricultural products in the village market.

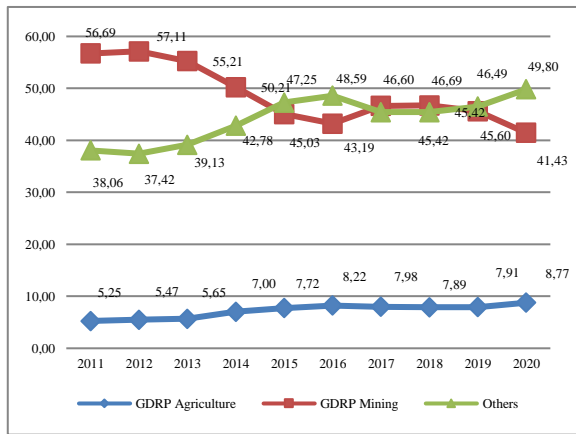


Figure 2. GDRP trends in agriculture compared to mining and other sectors in East Kalimantan.

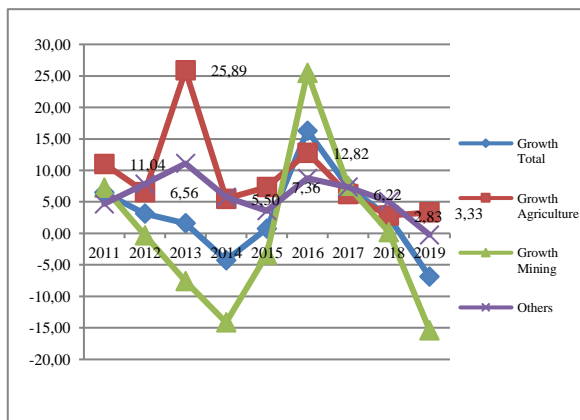


Figure 3. Economic performance trends in East Kalimantan

The agricultural sector is one of the sectors that absorb labor. Labor absorption in agricultural sector tends to decrease. Labor absorption in 2011 as 454,258 and 2020 as 346,768. Average of labor absorption in agricultural sector from 2011 to 2020 as 23.82 % from total employment (Table 3).

Table 3 showed that agricultural labor tends to decline. Agricultural labor is shifting from agriculture towards non-agriculture. It is caused by industrialization and excess urbanization [8]. Wages in the industrial sector are relatively higher than wages in the

agricultural sector. The existence of mining companies and palm oil mills also encourages the shift of labor.

Table 3. Agricultural Labor Absorption (%)

Year	Agricultural Labor	Employment	Agricultural Labor Absorption (%)
2011	454,258	1,591,003	28.55
2012	459,077	1,619,118	28.35
2013	432,277	1,624,272	26.61
2014	466,980	1,677,466	27.84
2015	320,344	1,423,957	22.50
2016	345,522	1,581,239	21.85
2017	328,448	1,540,675	21.32
2018	347,901	1,618,285	21.50
2019	325,013	1,693,481	19.19
2020	346,768	1,692,796	20.48
Average Labor Absorption (%)			23.82

The labor absorption in the agricultural sector is the largest compared to other sectors in the last ten years. The absorption is not only in rural areas but also in urban areas. The average of agricultural labor absorption in rural areas is 76.99 %, while the remaining 23.01 % is in urban areas. Table 4 shows the dominance of agricultural labor in rural areas. However, this data also shows that urban areas also absorb a fairly large agricultural workforce and must be a concern in agricultural development policies.

Table 5 compares the share of agriculture in GDRP and its share in employment from 2011 to 2020. This is apparent from the increasing ratio of GDRP to employment share from 0.18 in 2011 to 0.43 in 2020. The increase in agricultural productivity will be the key factor in reducing the income inequality and poverty. The increase in agricultural sector labor output is influenced by strategic policies in agriculture. There are three national priority policies in the strategic plan of the Ministry of Agriculture that affect these achievements, namely (1) policies related to food security, (2) added value and agricultural competitiveness, and (3) improving the quality of human resources and agricultural supporting infrastructure.

Table 4. Distribution of Agricultural Labor in Rural and Urban

Year	Urban Agricultural Labor	%	Rural Agricultural Labor	%
2011	103,916	22.88	350,342	77.12
2012	92,261	20.10	366,816	79.90
2013	99,880	23.11	332,397	76.89

2014	106,182	22.74	360,798	77.26
2015	59,225	18.49	261,119	81.51
2016	102,067	29.54	243,455	70.46
2017	57,667	17.56	270,781	82.44
2018	71,298	20.49	276,603	79.51
2019	83,756	25.77	241,257	74.23
2020	104,347	30.09	242,421	69.91
Average	88,060	23.01	294,599	76.99

**Table 5.** GDRP and Agricultural Labor Shares

Year	GDRP Agriculture (IDR Million)	Agricultural Labor (%)	Ratio of Agricultural GDRP to Agricultural Labor (%)
2011	5.25	28.55	0.18
2012	5.47	28.35	0.19
2013	5.65	26.61	0.21
2014	7.00	27.84	0.25
2015	7.72	22.50	0.34
2016	8.22	21.85	0.38
2017	7.98	21.32	0.37
2018	7.89	21.50	0.37
2019	7.91	19.19	0.41
2020	8.77	20.48	0.43

Table 5 shows that although the percentage of the number of agricultural labor tends to decrease, the trend of the GDRP produced by agriculture is increasing. This condition is not only supported by the provision of supporting infrastructure to increase productivity in farming but is also influenced by the added value received by agricultural laborers from the agricultural sector.

#### **4.2. The Role of Agricultural on Poverty Reduction**

The role of agriculture on poverty reduction used regression analysis. Table 5 present the regression analysis results of the role of the agriculture sector in poverty reduction. The results estimations in column 2 indicate that the coefficient of the GDRP total is negative sign. Negative sign indicated that an increase in Total GDRP can reduce poverty in the province, but statistically insignificant. The link between GDRP and poverty in East Kalimantan from research in Bontang, Kutai Barat, and Penajam Paser Utara used time series data from 2013 to 2017 also shows strong correlation results [15]. In the rural area, the GDRP total significantly affected poverty reduction at 5 % level. In the urban area, the GDRP total is positive sign and significant at 5 % level.

The GDRP Agriculture has negative and statistically significant coefficients for total and rural poverty (Column 4). In the urban area, the GDRP Agriculture is positive sign and significant at 5 % level. The growth of the agricultural sector to contribute toward the economy could reduce rural poverty [16]. The agricultural sector plays an essential role in rural poverty reduction rather than urban poverty. The decrease of rural poverty is strongly linked with an increase in productivity labor. The agricultural sector has a significant effect on poverty reduction in rural areas because most agricultural activities and agricultural labor are in the village. The realization of agricultural development policies by the government is also more down in the village by targeting directly to farmers in rural areas. Strategic programs of family food security, increasing the capacity of farmers through training and mentoring, as well as providing adequate agricultural infrastructure (such as input subsidies, construction of agricultural roads, etc.) also support agricultural development in rural areas. The positive contribution of the agricultural sector in achieving the Sustainable Development Goals (SDGs) especially for goals one and two related to "No Poverty" and "Zero Hunger". Agriculture is an important component in the achievement of the SDGs, as well as one of the largest and most important economic activities and has a significant impact on the growth of Gross Domestic Product (GDP) in developing countries [17]. However, the agricultural sector can also increase poverty if the income earned is controlled by the company [18]. The agricultural sector is positive and significantly influenced the number of poor people in West Kalimantan caused by expansion the oil palm estate. Farmers do not have large land and low bargaining positions.

Estimates in column 6, the agricultural sector and other sectors have a negative coefficient but not significant, while in the mining sector the coefficient is positive and not significant. The agricultural sector and other sectors have an impact on reducing poverty in the provinces and villages, while in urban areas, all sectors have a positive sign, but statistically insignificant. Government budgets in urban areas generally focus more on industrial development, manufacturing, and other development goals that do not directly touch the poor in urban areas. The contribution of the agricultural sector to poverty reduction in the combined equation of sectors showed insignificant results due to the agricultural sector have less contribution when compared to the mining sector and other sectors. The agricultural sector needs to be supported along with the strengthening of other potential sectors in the region. The added value of agricultural products in East Kalimantan was very low, the price of the agricultural commodity was low, and limitation in landownership. Agricultural products need to be processed into processed products in order to increase the GDRP of the agricultural sector. Based on data analysis, it is also known that regional expansion, pandemic conditions,

and changes in agricultural labor productivity to GDRP affect the ability of agriculture to reduce poverty.

**Table 6.** Regression Analysis Results of The Role of Agriculture Sector on Poverty

Variables	GDRP Total		GDRP Agriculture		GDRP Sectoral	
	Coefficient	t-value	Coefficient	t-value	Coefficient	t-value
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Total Poverty						
Total GDRP	-0.0077	-0.86				
Agriculture GDRP			-0.08438 *	-1.72	-0.0434	-0.08
Mining GDRP					0.0232	0.34
Others Sector GDRP					-0.0093	-0.07
Constant	275.0189 ***	5.46	266.0738	13.09	210.4410 **	2.55
Number of Observations	10		10		10	
F-test	0.73		2.95 *		1.34	
R-squared	0.0838		0.2693			
Rural Poverty						
Total GDRP	-0.0245 ***	-3.65				
Agriculture GDRP			-0.1771 ***	-7.78	-0.0776	-0.28
Mining GDRP					0.0082	0.75
Others Sector GDRP					-0.0228	-0.37
Constant	268.613 ***	0.00	204.182 ***	21.69	198.1443 ***	4.92
Number of Observations	10		10		10	
F-test	13.32		60.6		16.75 ***	
R-squared	0.6248		0.8834		0.8933	
Urban Poverty						
Total GDRP	0.0167 ***	3.62				
Agriculture GDRP			0.0927 ***	2.91	0.0342	0.1
Mining GDRP					0.0150	1.06
Others Sector GDRP					0.0135	0.17
Constant	6.398	0.25	61.89033 ***	4.7	12.287	0.24
Number of Observations	10		10		10	
F-test	13.11		8.47 ***		3.31 **	
R-squared	0.621		0.5144		0.6234	

Note: \*\*\* Significant at 5 % level; \*\* Significant at 10 % level; \* Significant at 20 % level.

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**5. CONCLUSION**

This research found that the agricultural sector has a positive and significant effect on poverty reduction. Rural poverty reduction is influenced by the agricultural sector more than urban areas because most of the agricultural workforce is in rural areas.

Another important note in this study is that the increase in GDRP has not had a significant effect on poverty reduction, especially in urban areas. So that an evaluation is needed in the formulation of policies and programs that are directed at reducing poverty in the future in East Kalimantan.

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