

Decomposition Model of Poverty Formers of Causality Effects in East Nusa Tenggara, Indonesia

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Abstract— In many developing nations, rural areas with a focus on agriculture are where poverty is concentrated. However, due to its use for commercial and industrial purposes, agricultural land is disappearing. East Nusa Tenggara Province, which has a high rate of poverty, is the subject of this study. Although the directions follow the theory, agricultural land conversion and village funds factors do not significantly affect poverty, according to path analysis of the decomposition model. The income of informal laborers acts as a mediating factor between poverty and economic growth and dependency ratios.

Index Terms— Poverty, Informal Workers' Wage, Decomposition Model, Path Analysis.

I. INTRODUCTION

Many impoverished individuals reside in rural areas, which is a unique sort of poverty in developing nations. Additionally, the agricultural sector's primary part has a history of being resistant to technological advancement. This problem causes villagers to migrate to urban areas (city or capital city), which is also accompanied by the transition of work, particularly among informal workers (Arouri et al., 2017). However, the city has undergone unprecedented growth, necessitating a huge land use adjustment (Dewi & Sarjana, 2015).

From an individual assessment, the migration of villagers from rural to urban following the shift in job types is not a blunder. Migrants wish for welfare in their lives. However, from a social perspective, the movement of people to new places carries more complex social problems (Deichmann et al., 2009). In the emerging issue of food security, the agricultural sector is predicted to be the key to overcoming the food crisis in the future (Adhila Amalia et al., 2022). At the time of the covid-19 disaster, the agricultural sector was to be predominant in the economic structure (Liu et al., 2020). Nevertheless, the reality is that people are in a dilemma to choose to stay in rural areas even though they are trapped in poverty or migration to guarantee better welfare.

The most recent literature on poverty was presented by (Brady, 2019). In his writings, he mentions that poverty can be influenced by people's behavior, economic structure, and government politics. Meanwhile, from previous research reviews, economic growth is still an instrument capable of reducing poverty. In a more specific view, economic growth is also influenced by the development of other variables, such as people's

income and labor conditions. As for the study of rural poverty, some researchers added land conversion and government policies as variables that determine rural poverty.

East Nusa Tenggara, one of the provinces in the central part of Indonesia, has a high poverty rate of more than 24 percent annually (Badan Pusat Statistik, 2022). The number of people migrating to urban areas has increased yearly. It decreased when the Covid-19 disaster occurred. Likewise, the shift in the function of agricultural land is followed. Thus, this study is urgent to carry out to contribute to the government that is proficient in making a policy.

II. METHODOLOGY

This study uses a quantitative approach with path analysis of the decomposition model as a data analysis method (Riduan & Kuncoro, 2017). This research relates to the use of data and theories of the causes of poverty which is formed by behavioral, economic, and political. The data is traced from secondary data published by the Central Statistics Agency and the Bank of Indonesia. The novelty of this research is the integration of the three theories in influencing poverty with labor wages as a mediating variable, as described in the following framework. Detail of all variables capturing in the Table 1.

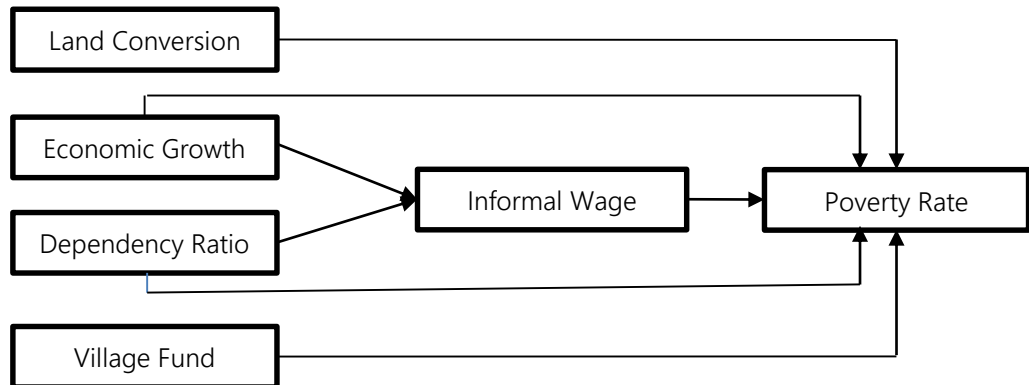


Figure 1. Conceptual Framework

Table 1. Variables

No.	Variable	Abbreviation	Unit	Source
1.	Land Conversion	L	Hectare	Ministry of Environment
2.	Economic Growth	Y	Percentag	Bank of Indonesia
3.	Dependency Ratio	DR	Percentag	Statistics of Indonesia
4.	Village Fund	K	Rupiah	Ministry of Finance
5.	Informal Wage	W	Rupiah	Ministry of Labor
6.	Poverty Rate	P0	Percentag	Statistics of Indonesia

From the framework above, the regression equation model is:

$$\begin{aligned}
 1) \quad & \text{Wage (W)} = f(Y, DR) \\
 & = \delta_0 + \delta_1 Y_1 + \delta_2 DR_2 + \varepsilon_1 \\
 2) \quad & \text{Poverty Rate (P0)} = f(L, Y, DR, K, W) \\
 & = \gamma_0 + \gamma_1 L_1 + \gamma_2 Y_2 + \gamma_3 DR_3 + \gamma_4 K_4 + \gamma_5 W_5 + \varepsilon_2 \\
 & = \gamma_0 + \gamma_1 L_1 + \gamma_2 Y_2 + \gamma_3 DR_3 + \gamma_4 K_4 + \gamma_5 (\delta_0 + \delta_1 Y_1 + \delta_2 Y_2 + \varepsilon_1) + \varepsilon_2 \\
 & = \gamma_0 + \gamma_1 L_1 + \gamma_2 Y_2 + \gamma_3 DR_3 + \gamma_4 K_4 + (\delta_0 \gamma_5) + (\delta_1 \gamma_5 Y_1) + (\delta_2 \gamma_5 DR_2) + (\gamma_5 \varepsilon_1) + \varepsilon_2
 \end{aligned}$$

III. DESCRIPTIVE DATA

East Nusa Tenggara Province is one of the provinces in the Central Region of Indonesia, with Kupang City as the provincial capital. This province has 22 regencies and 1 city. The main activity of the economy there is still dominated by the agricultural sector. Over the last decade, poverty in East Nusa

Tenggara has been on the national list of severe poverty. The poverty rate is always above 20 percent every year. Rural poverty accounts for a large portion. This condition is exacerbated by the increasing use of agricultural land for other sector activities. This increasingly unfavorable situation encourages residents to migrate to urban areas.

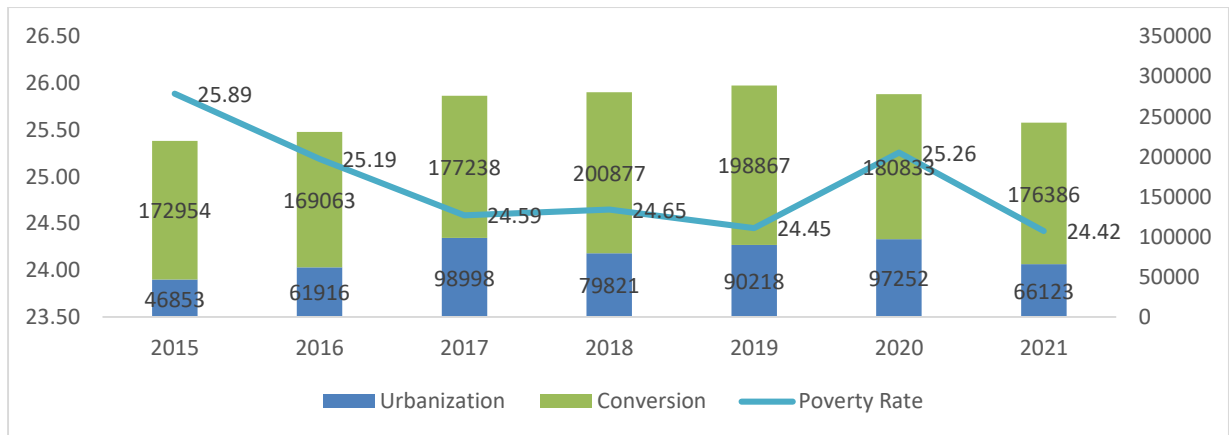


Figure 2. Urbanization, Agricultural Land Conversion, and Poverty Rates in East Nusa Tenggara Province

The number of poor people has dropped. In 2020, the COVID-19 pandemic resulted in a substantial surge. However, considering the high percentage of poverty in the province, the issue of poverty still needs to be addressed. People come to urban regions in quest of a better living as a result of the poverty problem.

Urbanization is increasing. This situation causes the need for land for activities outside the agricultural sector to increase. From Figure 2. above, during the Covid-19 pandemic, there was a decline in the population who urbanized, and conversions also decreased. The agricultural sector is used as a focus.

IV. EMPIRICAL RESULTS

Table 2. Descriptive Statistics

No.	Variable	Unit	Minimal	Mean	Maximal
1.	Land Conversion	Hectare	220	8802	25404
2.	Economic Growth	Percentage	-1.330	2.245	5.540
3.	Dependency Ratio	Percentage	49.46	63.83	82.36
4.	Village Fund	Rupiah	Rp.70,606,507	Rp.145,546,099	Rp.292,714,790
5.	Informal Wage	Rupiah	Rp.547,811	Rp.964,482	Rp.1,611,938
6.	Poverty Rate	Percentage	10.84	22.32	34.62

First Equation: Informal Worker Wage Model

Table 3. Results of Panel Data Regression Estimation for Informal Wage (W)

	Dependent Variable: Informal Wage (W)		
	CEM(W)	FEM(W)	REM(W)
Y	0.01531*** (0.00527)	0.01495*** (0.00303)	0.01504*** (0.00315)
DR	0.00365** (0.00163)	0.00848*** (0.00133)	0.00719*** (0.00128)
Constant	5.70544*** (0.10465)		5.47995*** (0.08360)
Observation	63	63	63
R2	0.19493	0.63639	0.49313
Adjusted R2	0.16810	0.43641	0.47623
F Statistic	7.263*** (df = 2; 60)	35.004*** (df = 2; 40)	58.372***

Note: *p<0.1; **p<0.05; ***p<0.01

The three models above are then tested to determine the best. The Chow test was used to compare CEM(W) and FEM(W) resulting in a

P-Value of 0.00 < 0.05, which means FEM(W) is the elected model. Furthermore, to compare FEM(W)

and REM(W) Hausman test resulted in a P-Value of 0.00 < 0.05, which means that FEM(W) is the picked model.

Second Equation: Poverty Model

Table 4. Estimation Results of Panel Data Regression for Poverty Rate

	Dependent Variable: Poverty Rate (P0)		
	CEM(P0)	FEM(P0)	REM(P0)
L	0.98987 (1.91744)	-0.01999 (0.33655)	-0.02190 (0.33976)
Y	0.43132 (0.37914)	0.01338 (0.02459)	0.01614 (0.02145)
DR	0.37842*** (0.11426)	-0.01180 (0.00830)	-0.01097 (0.00841)
K	-3.38487 (5.08786)	-2.60716 (9.08607)	-1.71373 (6.56112)
W	-30.13566*** (9.31889)	0.85748 (0.70080)	0.78532 (0.70972)
Constant	200.98680*** (73.2443)		32.31843 (53.42879)
Observation	63	63	63
R2	0.23456	0.16653	0.10794
Adjusted R2	0.16741	-0.39662	0.02969
F Statistic	3.493** (df = 5; 57)	1.47 (df = 5; 37)	6.89719

Note: *p<0.1; **p<0.05; ***p<0.01

Chow test results show a p-value of 2.2e-16 < 0.05, which means FEM(P0) is the selected model. While the Hausman test results show a p-value of 0.9924 > 0.05, REM(P0) is the chosen model. The test continues to the Lagrange Multiplier test, where the p-value is 0.3775 > 0.05, meaning CEM(P0) is the most appropriate model.

$$z = \frac{ab}{\sqrt{b^2SE_a^2 + a^2SE_b^2}}$$

- a : The coefficient of the independent variable on the mediating variable
- b : The coefficient of the moderating variable on the dependent variable
- SEa : Standard error of estimation from the influence of a
- SEb : Standard error of estimation from the influence of b

Mediation Test with Sobel Test

The Sobel Test helps determine whether the relationship through the mediating variable is considerably capable of serving as a mediator in the relationship (Abu-Bader & Jones, 2021). The Sobel test employs the z-test using the following formula:

$$z_Y = \frac{(0.01531)(-30.13566)}{\sqrt{(-30.1566)^2(0.00527)^2 + (0.01531)^2(9.31889)^2}} = -2.16133$$

$$z_{DR} = \frac{(0.00365)(-30.13566)}{\sqrt{(-30.1566)^2(0.00163)^2 + (0.00365)^2(9.31889)^2}} = -1.84908$$

From the calculation results above, it is obtained that the z-Y value is -2.62 and the z-DR value is -2.72, which is greater than -1.96 (z-value for a significant level of 5% and left side test) so that the informal workers' wage is competent to mediate the relationship among economic growth to poverty and dependency ratio to poverty.

There are three categories for calculations

utilizing route analysis and a causal impact decomposition model between variables. First, direct causal effects are those that an exogenous variable has on an endogenous variable without passing through any other endogenous variables.

The second is the indirect causal effect, which is the result of an exogenous variable having an effect on an endogenous variable via another endogenous

variable present in the causality model under consideration. Third, the Direct Causal Effect and

the Indirect Causal Effect are added to determine the Total Causal Effect. The table of the decomposition model is shown below.

Table 5. Decomposition Model of the Effect of Causality Between Variables

Variables	Causality Effect		Total
	Direct	Indirect through IWW	
L → PR	0.98987	-	0.98987
Y → PR	0.43132	0.01531***	0.44663
DR → PR	0.37842***	0.00365***	0.38207
K → PR	-0.38487	-	-0.38487
W → PR	-30.13566***	-	-30.13566***

V. DISCUSSION

Conversion of land for agriculture affects the poverty rate directly. It gives a positive path but is insignificant. This effect is consistent with the theory that reducing agricultural land will increase poverty. If land conversion continues, it is feared that it will further exacerbate the poverty in East Nusa Tenggara. Land transformation for agriculture in East Nusa Tenggara shows that land use could be more optimal for industrial and service activities. It benefits agricultural land, such as rice or other crop farming, fisheries, plantations, and forestry. This sector absorbs more labor than other sectors.

Economic growth affects poverty directly and indirectly through informal workers' wages with positive and significant. Economic growth can increase people's income. The other effect of this economic growth is the reduction of poverty. Economic growth indicates increased economic activity in the community so that the wheels of the economy spin faster. The demand for labor also adds to the spread of public consumption. This finding is a previous confirmation study by Klasen (2008).

Income is positively and significantly impacted by the dependency ratio. The DR demonstrates that less income is available for consumption the less people are insured. The poverty rate will drop as a result of the subsequent influence on poverty. Dependency ratio refers to the ratio of the total population between the ages of 15 and 64 (labour force/productive age) to the total population between the ages of 0 and 14, plus the population aged 65 and over. People and families who are insured have an impact on the rising poverty rate even though the income is fixed. This conclusion backs with the earlier research done by Clark (2007).

Village Fund has a direct effect on poverty, negative but insignificant. It has a negative direction, according to the theory. The village economy is meant to be developed via the Village Fund, which the central government has entrusted to the village authority. Due to the substantial amount of village finances handed to the village government, there will be more money available for development initiatives. With these funds, poverty alleviation at the smallest level of government

can be carried out according to the problems encountered. Therefore, the village government must conduct a poverty study in its village.

Informal Workers' Wage has a negative and significant effect on poverty, meaning that if the income received by the community increases, it will reduce poverty. If income decreases, poverty will increase. In this study, economic growth influences wages, and the dependency ratio has a significant effect. Several literatures reviews state that wages are fixed and will not decrease. It is the case, but when a crisis occurs, employers will reduce the number of employees, which will impact the number of unemployed people even though wages will not go down on the one hand. From this study, we can conclude that wages may decrease due to layoffs. People affected will potentially become poor if they have many dependents (high dependency ratio), and economic growth has not shown improvement as when COVID-19 hit.

VI. CONCLUSION

Although the trend matches the theory, it can be inferred from this study that village funds and land conversion have no appreciable impact on poverty. The incomes of the informal laborers, meantime, have a favorable and considerable impact on poverty due to economic growth and dependency ratio. Therefore, initiatives are required to boost economic growth and lessen dependence, for instance by investing in agriculture and growing human resources through education and training.

VII. ACKNOWLEDGEMENT

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