HUMAN DEVELOPMENT AND POVERTY IN PAPUA PROVINCE (AN ANALYSIS OF SIMULTANEOUS APPROACH ON PANEL DATA REGRESSION)

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Abstract: Recently, development orientation shifted from economic development which only focuses on simply economics growth to be human-oriented development. From some previous researches, one of the indicators used to measure the success rate of development of a society is the Human Development Index (HDI). HDI value already created by the United Nations for Development Programme in 2010 and had ranked Indonesia at 108 of 169 countries with a HDI score of 0.600. This score is better than the score in 2009 of 0.593, with a rank at 111.

Indonesia known as big country in the world, either in size or in population (has around 235 million population in this 2012). This population spread or scattered in 34 provinces. From those 34 provinces, there are still many provinces are categorized as underdeveloped provinces but Papua province is debatable, due to its tremendous natural sources. This study is aim to analyze the two-way relationship between HDI and Poverty Level in Papua Province. In addition, other relevant variables are also analyzed in this study and their impact on the both main variables. Its formulation described as follow: (i). the impact of fitted Poverty Level; government expenditure for education, government expenditure for health, and economics function toward HDI; and (ii). the impact of fitted HDI, population growth, and open unemployment toward Poverty Level.

This study uses secondary data from Statistical Central Bureau and also from Finance Ministry. The method used in this study is simultaneous approach 2SLS manual on panel data model fixed effect in 20 districts and cities in Papua Province from the period of 2007 – 2011. Result on HDI equation shows that only economics function has positive and significant impact on HDI, while poverty level, government expenditure for education and health function have no impact on HDI. Meanwhile, the analysis on Poverty Level equation shows that fitted HDI has negative and significant effect on Poverty Level, population growth has positive and significant and open unemployment has positive and insignificant impact on Poverty Level. It can be concluded that there are no good policies in government expenditure and also there are a high level of poverty as well as population growth in Papua province.

Based on the result of estimation of both equations, HDI has negative and significant impact on poverty level, the opposite way is the same as well, poverty level has negative and significant impact on HDI. Therefore, this study supports the statement that there is two-way relationship and negative impact between HDI and Poverty Level. The proposed of managerial implication is that effects to reduce poverty level should be done hand in hand with effort to increase human development because human capacity is a determining factor for someone's ability to free themselves out of poverty trap.

Keywords: Government Expenditure; Human Development; Panel Data Regression; Poverty; Simultaneous Approach.

INTRODUCTION

One of the national development goals is poverty reduction. Poverty is one of the major problems for the government in terms of public planning and financial management, especially in terms of how to make public policy which takes side to poor society and allocated public expenditure properly in order to have optimal impact on poverty reduction. The phenomenon of poverty has been a long. Although many efforts have been made to mitigate them, but until now many Indonesian people still live in extreme poverty. World Bank data shows that in 2011, there were more than 29.7 million (16.2%) Indonesian people who live on less than US$ 1.25 per day (or Rp198.325 per person per month) and more than 105.5 million (43.3%) of Indonesia's population is only earning less than US$ 2 per day (or Rp396.650 per month).

Characteristics of poverty in Indonesia is marked by very high poverty disparity between regions in Indonesia where the poverty rate in Jakarta is very low, amounting to 3.75 % while 31.98% in Papua. Most of the poor society live in rural areas and work in agriculture, and many residents were moved between the poor to be near-poor and reverse (BPS, 2012). Based on the comparison between the numbers of poor people in the total population, Papua ranks first with the highest percentage of poor people in the amount of 31.98 percent, followed by West Papua and Maluku with respectively 31.92% and 23% (see Figure 1).

The low quality of human development is closely linked to the high levels of poverty. The low indicators of education, health, and the purchasing power of a country is a major causative factor of the high level of poverty in the country (UNDP 2013). Therefore, the Government undertaking various intervention through local expenditure allocation for the three elements those are expected to increase HDI. HDI will increase if the three elements can be enhanced, and high HDI value indicating the success of economic development. In other words there is a positive correlation between HDI values to the degree of success of economic development.

HDI is an indicator that used to measure one of the important aspects related to the quality of the results of economic development, that is the degree of human development. HDI is a composition index which based on three indicators, namely: health, educational attainment, and standard of living (purchasing power). Papua's HDI ranks lowest compare with other region in Indonesia which is 64,45 (see Figure 2).

This figure is far below the national average of 71.63. For more than half a decade Papua constantly be in adversity. If we look at the development expenditure in the districts/cities in Papua, has increased significantly during the period 2007-2011. Expenditure in the districts/cities as a whole has increased by 69 percent from Rp11.08 trillion in 2007 to Rp18.76 trillion in 2011. Increased in government expenditure for education function, health function, and the function of the economy during the five years from 2007 to 2011 have not been able to increase the quality of life in Papua, at least to be in one level or even exceed the average quality of human life in Indonesia. However, this increase has not been able to reduce the number of poor people in Papua significantly. Decrease in the rate of development of HDI, a high population growth rate, and a high unemployment rate may take effect for less optimal outcome achievement of poverty reduction in Papua Province. Based on the description above, in the context of state and local financial management, this research discusses about poverty in Papua through the analysis of the effect government expenditure on poverty alleviation through human development.

THEORETICAL BACKGROUND AND METHODS
Theoretical Background
1. Government Expenditure and Economic Growth
This model was developed by Rostow (1991), which connects the development of government expenditure with the stages of economic development that distinguished between the initial stage, intermediate stage and advanced stage. In the early stages of economic development, the percentage of the total government investment is a great investment. Because at this stage the government should provide infrastructure, such as education, health, infrastructure, transport, and so on. In the middle stages of economic development, the government investment is needed to boost economic growth in order to take off, but at this stage the role of private investment is greater. The role of government remains large at the intermediate stage (because of the greater role of the private sector which generated a lot of market failure), to provide goods and services in the pubic greater numbers and better quality. Moreover, at this stage of economic development leads to the relationship between increasingly complex sector.
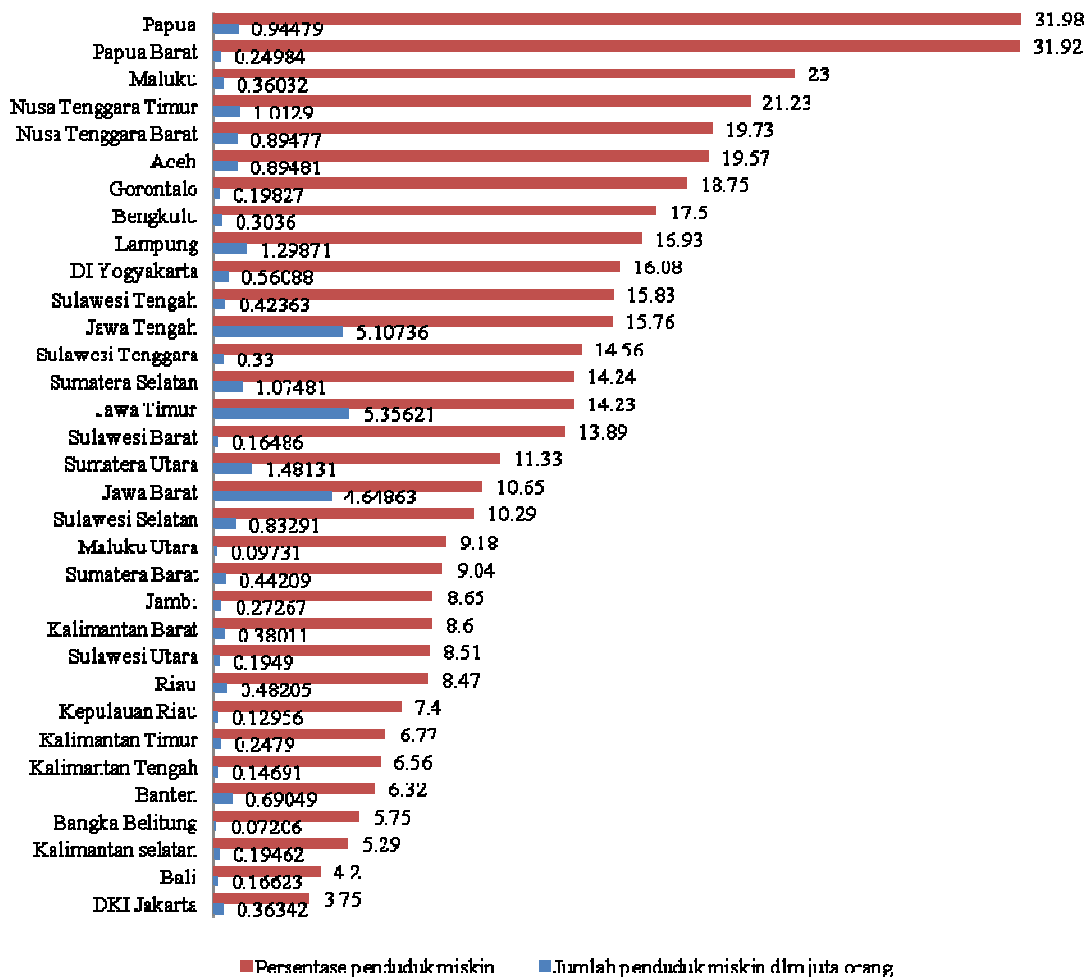
Figure 1. Percentage and Number of Poor People (million people) in Indonesia
In 2011 by Province

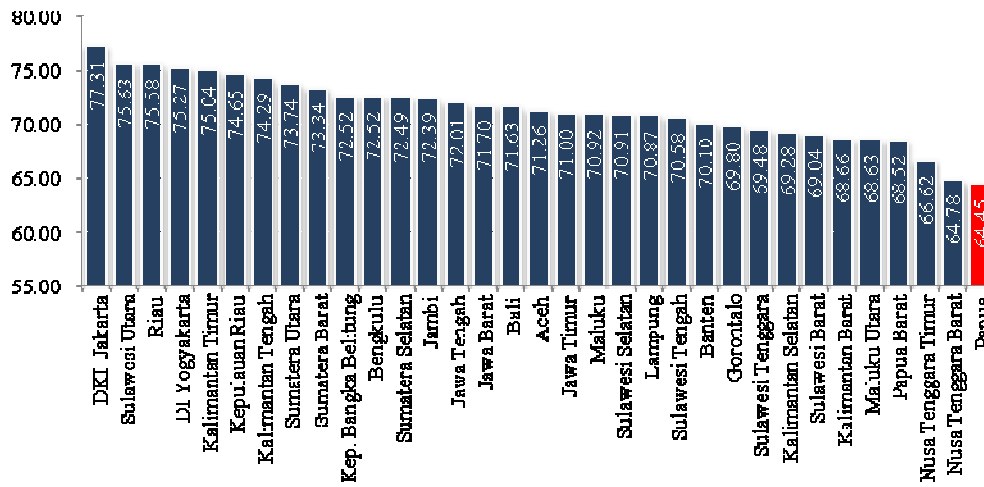Source: BPS 2012, data processed

Next page

Figure 2: Human Development Index in Indonesia in 2011 by Province

Source: BPS 2012, data processed

For example, economic growth caused by the development of the industrial sector, causing increasing levels of air and water pollution, and the government should step in to regulate and reduce the negative effect of pollution on society. The government should also protect workers who are in a weak position in order to improve their welfare.

Meanwhile Wagner stated in an economy where per capita income increases, the relative government expenditure will increase. Mainly because the government should regulate relations arising in society, law, education, recreation, culture and so on (Mangkoesoebroto, 2001). Wagner based his view on a theory called the organic theory of the state as the government considers the theory that individuals are free to act, apart from other communities. Peacock and Wiseman basing their theory on a theory that people have a tolerance level of taxation, which is a level where people can understand the magnitude of the tax levy required by the government to finance government expenditure. So people realize that the government needs funds to finance government activities so that they have the level of people's willingness to pay taxes. This tolerance level is a constraint for the government to increase tax collection arbitrary.

2. Human Development Index

Hicks and Streeten (1981) began to formulate a method of measurement of basic human needs, which is emphasized by Sen (1985) through his criticism of the GNP scale. According to Sen (1985), human lives should not only be viewed from just the level of income, but also the quality of life he had. Finally in 1995, Mahbub Ul-Haq, the Pakistani scientist who works at the United Nations Development Programme (UNDP) to develop new indicators of economic progress in the Human Development Index (HDI). The HDI is an aggregate amount of GNP, life expectancy, and literacy and the length of school. The HDI scale up to now used in many parts of the world as the benchmark the welfare of a nation. However, the HDI is also not free from criticism because these indicators can not measure the impact of environmental damage caused by development. Because according to the principle of sustainable development is development that meets the needs of the present without ignoring the interests of future generations. Environmental damage caused by the current development will degrade the quality of human life in the future (Jahan, 2001).

Understanding HDI released by UNDP in 1991 which stated that the HDI is one approach to measure the success rates of human development. HDI is starting to be used by the UNDP since 1990 to measure the achievement of human development of a country. Although not able to measure all dimensions of development, however, able to measure basic dimensions of human development which is considered to reflect the status of basic skills (basic capabilities) population.

HDI includes three components that are considered essential for humans and operationally easily calculated to produce a measure that reflects the effort of human development. The third component is the chance of survival (longevity), knowledge (knowledge) and a decent living (living standards). Chances of survival is calculated based on life expectancy at birth, knowledge is measured by the average length of the school and the literacy rate of the population aged 15 years and above, and a decent life is measured by expenditure per capita based on purchasing power parity (purchasing power parity).

3. Basic Concepts and Causes of Poverty

Friedman (1979) argued that poverty is inequality of opportunity to formulate social power base, which includes: assets (land, housing, equipment, health), financial resources (credit and sufficient income), social and political organisiasi which can be utilized to achieve the common , a social network for employment, goods or services, knowledge and skills are adequate, and useful information. Simpler definition of poverty raised by the World Bank (2007), namely "Poverty is pronounced deprivation in well-being." If freely translated, poverty is defined by the World Bank as a condition of deprivation that resulted in a person not able to achieve a decent degree of life (well-being).

According to BPS (2010) the poor are people who have an average monthly per capita expenditure below the poverty line. Poverty Line is the sum of the Food Poverty Line and Non Food Poverty Line. Food Poverty Line is the total value of expenditure of 52 basic food commodities consumed by the population reference real then synchronized with 2,100 kilocalories per capita per day. Non-Food Poverty Line represents the total value of the minimum requirement of non-food commodities was chosen that includes housing, clothing, education and health.

While Todaro and Smith (2006) said, the magnitude of poverty can be measured with or without reference to the poverty line. Concept that refers to the poverty line, called as absolute proverty while the concept is not based on a poverty line is called relative poverty. Absolute poverty is the number of residents who are unable to obtain sufficient resources to meet basic needs. They live under a certain minimum level of real income or below the international poverty line. The poverty knows no borders between countries, and also take into account the different levels of prices between countries by measuring the poor as people who live on less than U.S. \$ 1 or \$ 2 per day in purchasing power parity dollars. While relative poverty is a measure of the inequality in the distribution of income, usually can be defined in relation to the average level of that distribution.

Methods

Based on the above considerations, in this study, aspects that will be examined is the fucntion of government expenditure for education, government expenditure for health, economic functions of government spending, population growth rate, open unemployment rate, index of human development, and poverty. The data used are secondary data starting in 2007-2011, with a sample of 20 districts/cities in Papua province. Hence the form or structural simultaneous equations in this study is formulated mathematically as follows:

$$HDI_{it} = \alpha_i + \alpha_1 POV_{it} + \alpha_2 APDK_{it} + \alpha_3 AKES_{it} + \alpha_4 AEKO_{it} + \varepsilon_i$$
$$POV_{it} = \beta_i + \beta_1 HDI_{it} + \beta_2 POPULASI_{it} + \beta_3 TPT_{it} + \mu_{it}$$

where:

α_i and β_i	= Constant (intercept) province i
POV_{it}	= The poverty rate in the district/city i in year t
HDI_{it}	= Human Development Index in the district/city i in year t
$APDK_{it}$	= government expenditure for education of district/city i in year t
$AKES_{it}$	= government expenditure for health of district/city i in year t
$AEKO_{it}$	= government expenditure for economy of district/city i in year t
$POPULASI_{it}$	= Population growth rate of district/city i in year t
TPT_{it}	= The open unemployment rate of district/city i in year t
ε_{it} dan μ_{it}	= Error term

RESULTS AND DISCUSSION

Before performing the estimation of the simultaneous equations model, things that need to be done first is to test for simultaneity. If you have properties simultaneously, then one or more explanatory variables will be endogenous variables and therefore will be correlated with the residual. If there is no simultaneity, then the method of Ordinary Least Square (OLS) will result in the consistent and efficient value of the parameter estimators. While the prediction of variable instruments methods (including 2SLS and 3SLS) on the other hand will be consistent, but not efficient. Conversely, if it is simultaneous, OLS will be inconsistent (Pindyck and Rubinfeld, 1998 and Aldakhil, 1998 and Gujarati and Porter, 2009). After the test of simultaneous, the next step is to estimate the panel data model. Verbeek (2008:310) argues that the benefits of regression with panel data is able to identify the regression parameters for certain without restriction or constraint assumptions. In the analysis of panel data model, there are three approaches that can be used to estimate the parameters, that are least squares models, fixed effects model, and the random effects model.

Results

(1) Simultaneous test of Poverty towards Human Development Index

Table 1. Test results of POV toward HDI

Independent Variables	Notation	Coefficient	t-statistic
Poverty Rate	POVcap	-0,183375	-1,124265
Expenditure for Education	APDK	-0,016944	-0,102702
Expenditure for Health	AKES	-0,014027	-0,205397
Expenditure for Economy	AEKO	0,033718	1,757242
Error Term	ε_{it}	-0,123066	-12,94117
Amount of Observation			100
Adjusted R-squared			0,998777
F-statistic			3.370,879
Prob (F-statistic)			0,000000
Durbin-Watson stat			1,95816

Source: Processed by Eviews

Note: Dependent Variable: HDI = significant at α 1%

Based on the results of the t-test toward residual, showed significant results (t-stat> t-table), so there is a simultaneous relationship between Poverty towards Human Development Index.

Next Page

(2). HDI Simultaneous Test toward POV

Table 2. Test Results of HDI toward POV

Independent Variables	Notation	Coefficient	t-statistic
Human Development Index	HDI	-5,728192	-1,088538
Population Growth rate	POPULASI	2,217540	2,126822
Open Unemployment rate	TPT	0,191935	1,547286
Error Term	μ_{it}	-3,917679	-15,28310
Amount of Observation			100
Adjusted R-squared			0,963909
F-statistic			115,9591
Prob (F-statistic)			0,000000
Durbin-Watson stat			2,097551

Source: Processed by Eviews

Note: Dependent Variable: POV= significant at α 1%

Based on the results of the t-test toward residual, showed significant results (t-stat> t-table), so there is a simultaneous relationship between Human Development Index towards Poverty.
(3) Panel Data Regression Results of HDI
Based on the test results of panel data model selection, the fixed effect model will be selected and the regression results of HDI equation are summarized in Table 3.

Table 3. Estimation results of HDI Equation with Fixed Effect Model

Independent Variable	Notation	Coefficien	t-statistic
Poverty Rate	POV	-0,193218	-0,907886
Expenditure for Education	APDK	-0,008111	-0,035421
Expenditure for Health	AKES	-0,034867	-0,424222
Expenditure for Economy	AEKO	0,040491	3,923338
Amount of Observation			100
Adjusted R-squared			0,996785
F-statistic			1335,597
Prob (F-statistic)			0,000000
Durbin-Watson stat			2,090713

Source: Processed by Eviews

Note: Dependent Variable: HDI = significant at α 1%

Before interpreting the results of the model, firstly explain some of the results of tests on the basic assumption, namely: autocorrelation, heteroscedastisity, and multicollinearity. There are no autocorrelation, heteroscedasticity

and multicollinearity problem. Thus, the results of the panel regression are free from violations of the statistical assumptions to obtain an unbiased estimation.
Adjusted R-squared is 0.996, which means that a 99% variation in the level of human development (HDI) can be explained simultaneously by variations in the level of poverty, variation in government expenditure for education function (APDK), variations in government expenditure for health functions (AKES) , and the variation of the economic functions of government spending (AEKO).

F-statistic reaches 1335.59 which is much higher than the F-critical or F-table $_{(4,96,0,01)}$ = 2.00. This gives the sense that this model is significant and the overall explanatory power (adjusted R-squared) of 99% is significant. Thus, the model can be used to explain the influence of the level of poverty, the education function of government spending, government spending for health function, and the economic function of government spending to the level of human development.

Meanwhile, the coefficient or each variable can be explained as follow. Variable the level of poverty is -0.193218; variable of government expenditure for education is -0.008111; variable of government expenditure for health is -0.034867, and variable of economic functions of government expenditure is 0.040491. It means that the poverty level, government spending for education function and government spending for health function are negatively affect HDI, while the economic functions of government spending is positive.

(4) Panel Data Regression Results of Poverty
Based on the test results of panel data model selection, the fixed effect model will be selected and the regression results of Poverty equation are summarized in Table 4.

Table 4. Estimation results of Poverty Equation with Fixed Effect Model

Independent Variable	Notation	Cofficient	t-statistic
Human Development Index	HDI	-5,430692	-8,457321
Population Growth rate	POPULASI	2,239527	1,724780
Open Unemployment rate	TPAK	0,142486	0,838679
Amount of Observation			100
Adjusted R-squared			0,925294
F-statistic			56,73648
Prob (F-statistic)			0,000000
Durbin-Watson stat			2,028582

Source: Processed by Eviews
Note: Dependent Variable: POV= significant at α 1%

In this model is not occurred also the autocorrelation, heteroscedasticity and multicollinearity problem. Adjusted R-squared is 0.925, which means that a 92% variation in the level of poverty (POV) can be explained simultaneously by variations in the level of human development (HDI), variations in the population growth rate, and the variation of the open unemployment rate and it is significant. Thus, the model can be used to explain the effect of the level of human development, population growth, and the unemployment rate to the poverty level.

Meanwhile, the coefficient or each variable can be explained as follow. Variable of the human development index is -5.430692; variable population growth rate is 2.239527; variable of open unemployment is 0.142486. It means that human development index negatively affect the poverty and population growth rate and open unemployment are positively affect the poverty.

Discussion
From the preceding analysis, it has been described how the influence of each explanatory variable to the variables described, namely the equation of human development index and poverty equation. In this section we analyzed inter-relationship between them, so as to provide information regarding the

relationship between the mutual influence human developments through poverty reduction in government expenditures.

Based on estimation, the result shows that the poverty rate is negative and significant effect on the level of human development, as well as in the opposite direction, the human development index is negative and significant impact on poverty. Thus there is a two-way relationship and negatively affect each other between the level of poverty and human development through government expenditure. This finding is consistent with results of previous studies, particularly: Saleh (2002), Suliswanto (2010), Mulyaningsih (2008), and Jumikan (2012), which states that human development has an important contribution to poverty eradication and otherwise poverty influential in the development of quality human resources. When compared to the direction where the relationship is showing a stronger effect, the estimation results provide findings that the human development index is more strongly affect the poverty level compared to the level of poverty affecting human development index. This can be seen from the coefficient for the human development index of -5.430692 while the coefficient for the poverty rate of only -0.193218.

CONCLUSIONS AND SUGGESTIONS
Conclusions

Based on the discussion above, the conclusion of this study is: (i). Based on the results of Simultaneous test, both equations have simultaneous relationships; (ii). Results of regression analysis with the manual method of 2SLS fixed effect panel data model for the equation of HDI as the dependent variable shows that: a. Fitted poverty level, government expenditure for education, and government expenditure for health has a negative relationship and insignificant in improving the HDI in the District/City of Province of Papua; b. Government expenditure for economic function has a positive relationship and insignificant effect in improving the HDI in the District/City of Province of Papua; and c. Fitted poverty level, government expenditure for education, health, and economic function are simultaneously have a significant effect in improving the HDI in the District/City of Province of Papua. (iii). Results of regression analysis with the manual method of 2SLS fixed effect panel data model for the equation of poverty as the dependent variable shows that: a. Fitted HDI has a negative relationship and significant effect in reducing the percentage of poor people in the District/City of Province of Papua; b. Population growth rate has a positive relationship and significant

effect in reducing the percentage of poor people in the District/City of Province of Papua; c. Open unemployment rate has a positive relationship and insignificant effect in reducing the percentage of poor people in the District/City of Province of Papua; d. Fitted HDI, population growth rate, and unemployment rate are simultaneously have a significant effect in reducing the percentage of poor people in the District/City of Province of Papua. (iv). HDI and the poverty rate has a negative reciprocity and mutual influence significantly between them.

Based on estimates of both equations, the poverty rate has a negative and significant effect on the human development index, as well as in the opposite direction, human development index has a negative and significant effect on the poverty rate. Thus, there is a two-way relationship and mutual influence negatively the level of poverty in the human development index through government expenditure.

Suggestions

The role of government expenditure for education and health function has a negative and insignificant effect on the human development index which indicates the need for changes in government policies in education and health in the Province of Papua. Government to strive consistently and continuously meet the target allocation of the education budget by 20 percent of the total budget. Government expenditure for education function should be used for programs and activities that directly impact on improving the literacy rate and the average length of the school, such as the provision of educational facilities are evenly distributed throughout the territory of Papua and free educational programs. Government to strive consistently and continuously meet the target allocation of the education budget in the amount of 5 percent of the total budget.

Government expenditure for health should be used for programs and activities that contribute directly to increased life expectancy, including such as increased quality of health resources distribution in any health care facility. Every poor person gets quality health care and affordable, triggers that people behave in life clean and healthy, whole family counseling to nutrition conscious, and others. The results also showed that poverty alleviation through improved human development index will be hampered if not coupled with serious efforts from the government to reduce the rate of population growth and the unemployment rate.

High population growth rate without accompanied by efforts to improve human capital and job creation will

result in worsening poverty in Papua. Results of analysis of two-way relationship between the index of human development and poverty rates indicate that the human development index have a more significant impact on poverty than the opposite relationship. These results suggest that the government should focus on efforts that have a direct impact on improving the human development index when making policy and development planning in addressing the problems of poverty in the province of Papua.

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