

Poverty Determinants in the Provinces of Central Java and West Java with their Alleviation Strategies

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Abstract- Pro-poor and pro-job economic growth is one of the goals in the 2020-2025 Indonesia mid-term development plan. Unfortunately, Central Java Province with economic growth above the national average still facing the highest poverty rate at Java Island in 2019, this in contrast to West Java Province which success to push poverty rate become lower. The purpose of this study is to map poverty and economic growth, to analyze the factors that influence poverty at the Provinces of Central Java and West Java in 2015-2019 using the Dynamic Panel Data SYS-GMM, and find priorities strategies of poverty alleviation for Central Java Province using the AHP model. The results showed that the poverty cluster in most of the cities/regencies at Central Java Province was high and West Java Province was categorized as medium, while the results of the klassen typology of Central Java and West Java Provinces were categorized as fast growing regions (Cluster III). Significant determinants affect the poverty rate in the two provinces was, poverty in the previous year, economic growth, inflation, Human Development Index (IPM), and the Open Unemployment Rate (TPT). The amount of savings only affects in Central Java Province, and inequality (gini ratio) only affects in West Java Province. Meanwhile, based on the judgement from the experts analyzed using AHP, the most priority target for alleviating poverty in Central Java Province is reducing the unemployment rate, with the most priority strategy being to create jobs.

Keywords- Poverty, Growth, Dynamic Panel Data SYS GMM, AHP, Klassen Typology.

I. INTRODUCTION

Economic growth and Gross Domestic Product (GDP) are one of the main focuses of the country in carrying out development, because it can be directed to encourage the improvement of the quality of human life or quality of life [1]. Quality economic growth should prioritize Pro-Growth, Pro-Poor, and Pro-Job, even accompanied by income distribution. This is in line with the theme of the 2020-2025 RPJMN regarding a prosperous, just, and sustainable middle-high income Indonesia [2]

The island of Java as the center of the Indonesian economy is still faced with a high percentage of poverty, which is 11% or 11 million poor people. Central Java Province with economic growth above the national average (5.4%) is still faced the highest poverty rate at Java Island (10.6%) in 2019, this is different from West Java Province which recorded lower economic growth (5.2%) but success to push poverty rate become 6.8% [3].

II. LITERATURE REVIEW

The main factor causing poverty in the majority of developing countries is low consumption from low production due to lack of capital. This lack of capital (savings/investment) will repeatedly lead to low education

and public health so that productivity decreases. Low productivity, in turn, results in insufficient income to meet basic needs and the poverty trap occurs repeatedly [4]

Main factor that causes poverty is the inability of a group of residents to obtain resources to meet basic needs (clothing, food, housing, education, health). Basic needs or minimum needs for life are assessed using units of rupiah called the poverty line. Every resident whose income or expenditure is below the poverty line can be declared as absolute poor. [5] The situation in south Asian country as a social system. The system consist of several factor which interrelated and could affect the poverty, that is: Output and incomes, condition of production, levels of living, attitudes toward work and life, institution, and policies [6]

Research on poverty and economic growth is still a widely discussed topic. Within the scope of Asia, research on the condition of China, Vietnam, and Malaysia, shows that poverty reduction is significantly influenced by economic growth [7-9]. In Indonesia, research also concludes that economic growth significantly reduces poverty. Poverty modeling with the GMM Dynamic Panel has been carried out [10], especially to find factors that influence poverty. Using data from 34 provinces in 2012 to 2017, only poverty in the previous year and the HDI variable

significantly affect poverty. Meanwhile, the Gini ratio or inequality and GRDP are not significant.

Continuing previous research related to poverty, a research gap in this article was raised. Research in Indonesia that explores the determinants of poverty by comparing the two regions, as well as the formulation of strategies for alleviation, is still rarely done. Therefore, the purpose of this study is to map poverty and economic growth, to analyze the factors that influence poverty at the Provinces of Central Java and West Java in 2015-2019 using the Dynamic Panel Data SYS-GMM, and find priorities strategies of poverty alleviation for Central Java Province using the AHP model.

III. RESEARCH METHODOLOGY

1. Data:

This study uses a combination of secondary cross-sectional data at the city/district level of Central Java (35) & West Java (27) and the 2015-2019 time series sourced from BPS, Bank Indonesia, and primary data from expert interviews. The research variables are poverty rate, previous year's poverty rate, economic growth, HDI, Inflation, Open Unemployment Rate (TPT), Gini Ratio, and Total Population.

2. Analysis:

This study uses 3 methods to answer 3 research objectives. The objective of mapping poverty and economic growth is answered by using cluster analysis methods and Klassen typology using Ms Excel and SPSS software. The purpose of analyzing the determinants of poverty is answered by the SYS GMM Dynamic Panel Data analysis method using Stata software. Furthermore, the purpose of formulating a priority strategy for poverty alleviation was answered using the Analytical Hierarchy Process (AHP) method by interviewing 7 experts with data processing using expert choice software.

3. Poverty Cluster and Klassen Growth Typology:

Cluster analysis is intended to group areas that have similarities into certain clusters [11]. In this study, cities/districts in Central Java and West Java provinces will be classified into 3 poverty clusters based on the Central Java TKPKD standard [12]. Cities/districts that are included in the high poverty cluster are those with poverty rates above the provincial and national averages, while the moderate poverty clusters are those with poverty levels above the national average but below the provincial average. Meanwhile, the Cities/Regencies of the poverty cluster are low, namely those with poverty levels below the provincial and national averages.

Klassen Typology Analysis is used to divide the cities/regencies in Central Java and West Java provinces into 4 quadrants based on their level of economic growth. Briefly, the quadrant criteria are:

Table 1. Klassen Typology Quadrant Criteria.

Economic Growth (r)	GDP/capita (y)	
	(y _i < y)	(y _i > y)
(r _i > r)	Quadrant III Fast growing region	Quadrant I Fast growing and developed region
(r _i < r)	Quadrant IV Underdeveloped area	Quadrant II Developed but depressed area

4. Statistical Model Analysis of Poverty Determinants: Referring to Blundell and Bond's SYS GMM model [13], and previous research [14], in this study the determinants of poverty for Central Java and West Java uses Dynamic Panels (levels), described by the equation:

$$\ln y_{it} = \alpha_0 + \alpha_1 \ln y_{it-1} + \alpha_2 \ln y_{it-2} + \alpha_3 \ln y_{it-3} + \alpha_4 \ln y_{it-4} + \alpha_5 \ln y_{it-5} + \alpha_6 \ln y_{it-6} + \alpha_7 \ln y_{it-7} + \alpha_8 \ln y_{it-8} + \alpha_9 \ln y_{it-9} + \alpha_{10} \ln y_{it-10} + \alpha_{11} \ln y_{it-11} + \alpha_{12} \ln y_{it-12} + \alpha_{13} \ln y_{it-13} + \alpha_{14} \ln y_{it-14} + \alpha_{15} \ln y_{it-15} + \alpha_{16} \ln y_{it-16} + \alpha_{17} \ln y_{it-17} + \alpha_{18} \ln y_{it-18} + \alpha_{19} \ln y_{it-19} + \alpha_{20} \ln y_{it-20} + \alpha_{21} \ln y_{it-21} + \alpha_{22} \ln y_{it-22} + \alpha_{23} \ln y_{it-23} + \alpha_{24} \ln y_{it-24} + \alpha_{25} \ln y_{it-25} + \alpha_{26} \ln y_{it-26} + \alpha_{27} \ln y_{it-27} + \alpha_{28} \ln y_{it-28} + \alpha_{29} \ln y_{it-29} + \alpha_{30} \ln y_{it-30} + \alpha_{31} \ln y_{it-31} + \alpha_{32} \ln y_{it-32} + \alpha_{33} \ln y_{it-33} + \alpha_{34} \ln y_{it-34} + \alpha_{35} \ln y_{it-35} + \alpha_{36} \ln y_{it-36} + \alpha_{37} \ln y_{it-37} + \alpha_{38} \ln y_{it-38} + \alpha_{39} \ln y_{it-39} + \alpha_{40} \ln y_{it-40} + \alpha_{41} \ln y_{it-41} + \alpha_{42} \ln y_{it-42} + \alpha_{43} \ln y_{it-43} + \alpha_{44} \ln y_{it-44} + \alpha_{45} \ln y_{it-45} + \alpha_{46} \ln y_{it-46} + \alpha_{47} \ln y_{it-47} + \alpha_{48} \ln y_{it-48} + \alpha_{49} \ln y_{it-49} + \alpha_{50} \ln y_{it-50} + \alpha_{51} \ln y_{it-51} + \alpha_{52} \ln y_{it-52} + \alpha_{53} \ln y_{it-53} + \alpha_{54} \ln y_{it-54} + \alpha_{55} \ln y_{it-55} + \alpha_{56} \ln y_{it-56} + \alpha_{57} \ln y_{it-57} + \alpha_{58} \ln y_{it-58} + \alpha_{59} \ln y_{it-59} + \alpha_{60} \ln y_{it-60} + \alpha_{61} \ln y_{it-61} + \alpha_{62} \ln y_{it-62} + \alpha_{63} \ln y_{it-63} + \alpha_{64} \ln y_{it-64} + \alpha_{65} \ln y_{it-65} + \alpha_{66} \ln y_{it-66} + \alpha_{67} \ln y_{it-67} + \alpha_{68} \ln y_{it-68} + \alpha_{69} \ln y_{it-69} + \alpha_{70} \ln y_{it-70} + \alpha_{71} \ln y_{it-71} + \alpha_{72} \ln y_{it-72} + \alpha_{73} \ln y_{it-73} + \alpha_{74} \ln y_{it-74} + \alpha_{75} \ln y_{it-75} + \alpha_{76} \ln y_{it-76} + \alpha_{77} \ln y_{it-77} + \alpha_{78} \ln y_{it-78} + \alpha_{79} \ln y_{it-79} + \alpha_{80} \ln y_{it-80} + \alpha_{81} \ln y_{it-81} + \alpha_{82} \ln y_{it-82} + \alpha_{83} \ln y_{it-83} + \alpha_{84} \ln y_{it-84} + \alpha_{85} \ln y_{it-85} + \alpha_{86} \ln y_{it-86} + \alpha_{87} \ln y_{it-87} + \alpha_{88} \ln y_{it-88} + \alpha_{89} \ln y_{it-89} + \alpha_{90} \ln y_{it-90} + \alpha_{91} \ln y_{it-91} + \alpha_{92} \ln y_{it-92} + \alpha_{93} \ln y_{it-93} + \alpha_{94} \ln y_{it-94} + \alpha_{95} \ln y_{it-95} + \alpha_{96} \ln y_{it-96} + \alpha_{97} \ln y_{it-97} + \alpha_{98} \ln y_{it-98} + \alpha_{99} \ln y_{it-99} + \alpha_{100} \ln y_{it-100} + \epsilon_{it}$$

Where ln is the natural logarithm, ϵ_{it} is the error term, i is the cross section index of 35 cities/districts of Central Java Province and 27 cities/districts of West Java Province. Furthermore, t is the research period 2015-2019, $it_{(-1)}$ is the lag of order 1, and α_0 is the intercept. Meanwhile, α_1 is the regression coefficient of the explanatory variables of the previous year's Poverty Level (1), Economic Growth (2), Human Development Index (3), Open Unemployment Rate (4), Gini Ratio (5), General Inflation Rate (6), Total Savings (7), Population (8).

Model above has met the 3 criteria for the best model, namely consistent, valid, and unbiased. It was concluded after the model passed the arellano-bond estimation consistency test, the Sargan test validity test, and the SYS GMM coefficient was between the PLS and FEM estimation results so it was not biased.

5. Analytical Hierarchy Process (AHP):

Saaty [15] describes AHP as a method for determining hierarchical choices to obtain quantitative decision making. As well as respondent (expert) approval, the AHP model used in this study is shown in Figure 1.

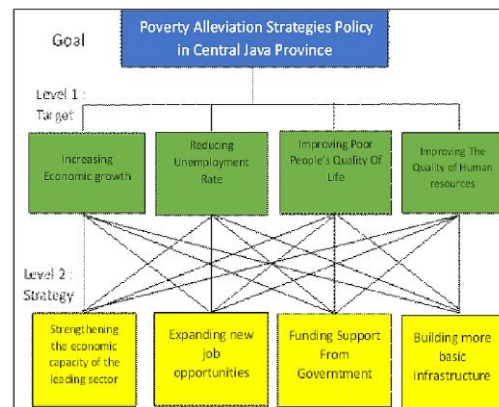
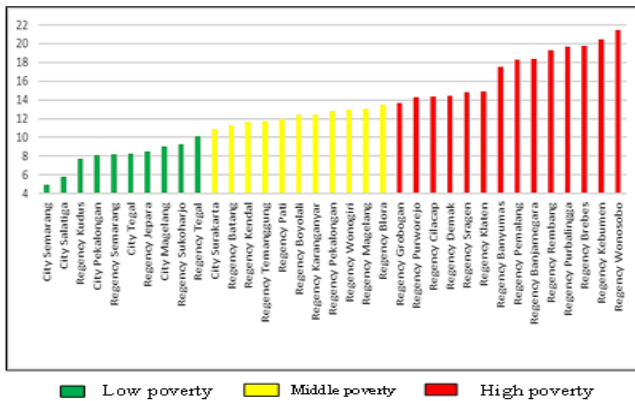


Fig 1. The AHP Model Framework.

IV. RESULTS AND DISCUSSIONS

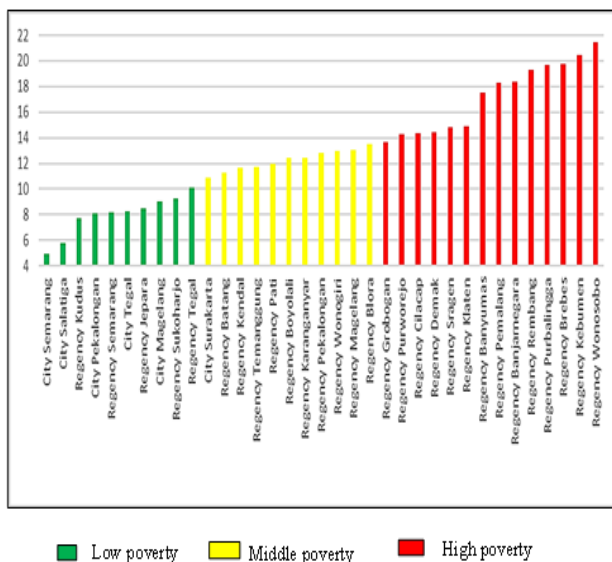
1. Poverty and Economic Growth Cluster of Central Java and West Java Provinces:

The urban/district poverty cluster in Central Java Province remained relatively unchanged from 2015 to 2019, while the city/regency cluster in West Java Province experienced a significant change. West Java Province has succeeded in pushing several cities/districts out of the high poverty zone to moderate poverty, while Central Java Province still has many cities/districts with high poverty rates. This shows that poverty alleviation efforts in West Java Province are relatively more effective than poverty alleviation in Central Java Province. The poverty maps of the two provinces are presented below.



Source: Indonesia Central Bureau of Statistic of Cetnral Java Province, 2022.

Fig 2. Poverty Cluster of Central Java 2015.

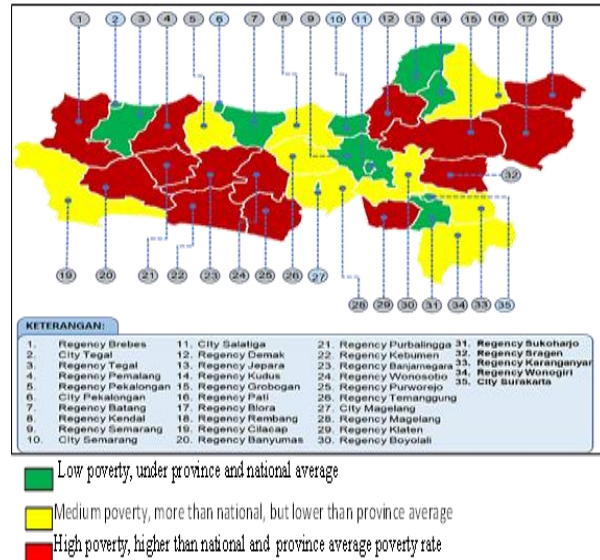


Source: Indonesia Central Bureau of Statistic of West Java Province, 2022.

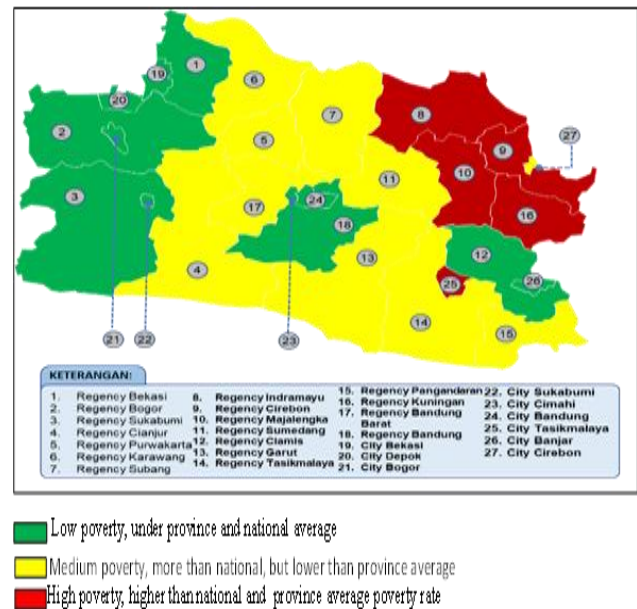
Fig 3. Poverty Cluster of West Java 2015.

Cities/districts that are included in the high poverty cluster in Central Java Province have not succeeded in moving to

the medium poverty cluster. This is due to the high depth of poverty index (figure 1b) and the economic dependence in the traditional agricultural sector in line with the results of the Klassen typology (table 2) and previous research [16].



Source: TKPKD Central Java Province, 2022.
Fig 4. Central Java Poverty Map 2019.



Source: TKPKD West Java Province, 2022
Fig 5. West Java Poverty Map 2019.

On the other hand, West Java Province has succeeded in changing 5 cities/regencies with high poverty rates to low poverty levels. This is achieved by accelerating the economic growth of the agricultural sector through agglomeration and industrialization as stated in the publication of the West Java Bappeda [17], so that the

city/regency moves from an underdeveloped area to a developing one (table 3).

Table 2. Klassen Typology Clusters per City/Regency of Central Java Province 2019.

Quadrant III (Fast growing)	Quadrant I (Fast growing and developed)
<ul style="list-style-type: none"> Regency: Boyolali, Brebes, Kebumen, Wonosobo, Klaten, Grobogan, Purbalingga, Purworejo, Banyumas 	<ul style="list-style-type: none"> City : Tegal, Semarang, Surakarta, Salatiga, Magelang Regency: Cilacap, Semarang, Kudus, Kendal, Sragen, Sukoharjo, Batang
Quadrant IV (Underdeveloped)	Quadrant II (Developed but depressed)
<ul style="list-style-type: none"> City : Pekalongan Regency: Blora, Sragen, Pemalang, Rembang, Banjarnegara, Magelang 	<ul style="list-style-type: none"> City : Salatiga Regency: Kudus & Cilacap

Source: SPSS Data Processed (2022).

Table 3. Klassen Typology Clusters per City/Regency of Central West Province 2019.

Quadrant III (Fast Growing)	Quadrant I (Fast growing and developed)
<ul style="list-style-type: none"> City : Bekasi, Depok, Tasikmalaya Regency: Bogor, Cianjur, Bandung, Majalengka, Kuningan, Tasikmalaya 	<ul style="list-style-type: none"> City : Bogor, Bandung, Cirebon, Sukabumi, Cimahi
Quadrant IV (Underdeveloped)	Quadrant II (Developed but depressed)
<ul style="list-style-type: none"> Regency: Cirebon, Garut, Subang 	<ul style="list-style-type: none"> Regency: Bekasi, Karawang, Purwakarta, Indramayu, Bandung Barat

Source : SPSS Data Processed (2022).

2. Poverty Determinant in Central Java and West Java Province:

Table 4. The SYS GMM Dynamic panel model has met 3 criteria, consistent, valid, and unbiased.

Variables	Estimated Coefficient	Standard Error	P-value
$Kem_{i,t-1}$	0.675	0.64	0.000***
PE	-0.138	0.19	0.000***
Inf	0.27	0.36	0.000***
IPM	-0.96	0.09	0.000***

TPT	1.8	0.06	0.099*
Gini	0.002	0.06	0.96
lnTab	-0.513	0.20	0.014**
lnJP	0.49	0.18	0.729
Arellano Bond Test			
	Z	Prob>Z	
Arellano-Bond m_1	-1.5	0.12	
Arellano-Bond m_2	0.25	0.8	
Sargan Test	$Chi^2(35)$ $Chi^2(35) = 124$		
	Prob> Chi^2	Chi^2	
	=0,1		
Model	Estimated Coefficient	Standard Error	P-value
SYS-GMM	0.675	0.64	0.000***
PLS	0.95	0.15	0.000***
FEM	0.45	0.06	0.000***

Based on the test results above, the model meets the consistent requirements because the arellano bond test results on the parameter m_2 (0.8) are greater than Z (0.25) for Central Java and the parameter m_2 (0.23) is greater than Z (-1.1) for West Java. The validity test was also fulfilled because the results of the p-value sargan test (0.1) for Central Java and p-value (0.1) for West Java, were greater than the 5% significance level. The model is unbiased, as the coefficient of lag $Kem_{i,t-1}$ of SYS-GMM (0.675) is between the coefficients of FEM (0.45) and PLS (0.95), as well as the West Java Province model with the coefficient of SYS-GMM (0.289) between FEM (0.192) and PLS (0.9)

Table 5.

Variables	Estimated Coefficient	Standard Error	P-value
$Kem_{i,t-1}$	0.289	0.11	0.013**
PE	-0.35	0.19	0.000***
Inf	0.22	0.08	0.008***
IPM	-0.57	0.144	0.000***
TPT	0.7	0.009	0.09*
Gini	0.5	0.25	0.047**
lnTab	-0.45	0.21	0.4
lnJP	0.58	-0.6	0.547
Arellano Bond Test			
	Z	Prob>Z	
Arellano-Bond m_1	-2.9	0.003	
Arellano-Bond m_2	-1.1	0.23	
Sargan Test	$Chi^2(28)$		

	$Chi^2(28) = 103$		
	$Prob > Chi^2$ $Chi^2 = 0,1$		
Model	Estimated Coefficient	Standard Error	P-value
SYS-GMM	0.289	0.11	0.013**
PLS	0.9	0.2	0.000***
FEM	0.192	0.068	0.006***

Based on the model estimation results, the previous year's poverty rate had a positive effect on this year's poverty rate, supported by [10], with an elasticity of 0.675% in Central Java Province and 0.289% in West Java Province, ceteris paribus assumption. The impact of poverty in the previous year was greater in Central Java, because the poverty depth index of Central Java Province was higher than West Java [3]. The higher the index, the further the average expenditure of the poor is compared to the poverty line of Central Java Province.

Economic growth has been shown to have a negative effect on poverty levels, supported by research [18] & [19]. Statistically, the elasticity of economic growth is 0.138% in Central Java and 0.35% in West Java, ceteris paribus. The effect of economic growth in Central Java Province is lower because the agricultural sector, which according to research [20] is effective in reducing poverty, only grew 2-3% in 2015-2019. On the other hand, West Java, with its leading sector, manufacturing and trade industries, was able to record 4-5% growth in 2015-2019, where research [7] also stated that the sector was effective in reducing poverty.

General inflation has a positive effect on poverty levels, with an elasticity of 0.27% in Central Java Province and 0.22% in West Java Province, ceteris paribus. Price inflation elasticity is relatively large in both regions, because in general inflation suppresses purchasing power and if it crosses the minimum consumption line or poverty line, the number of poor people and the poverty level will increase [21].

In the year of the study, the Human Development Index had a negative effect on poverty levels, supported by research [22]. Each HDI increases by 1%, it will reduce the poverty rate by 0.96% in Central Java Province and 0.57% in West Java Province. The influence of the quality of human resources in Central Java Province is higher than West Java, [3] shows that the leading economic sector of Central Java Province tends to be labor intensive, while West Java is capital intensive.

In line with research [23], the unemployment rate affects poverty in Central Java and West Java Provinces and is positively related, with elasticity of 1.8% in Central Java Province and 0.7% in West Java Province. The effect of

unemployment on poverty is greater in Central Java Province than West Java Province, because the population of Central Java Province who work in the informal sector is relatively more than West Java Province [3], where it is easier to lose work and can cause more family members to become unemployed poor too [24].

Inequality in household income has a significant and positive relationship with poverty levels, supported by research by [18] & [25]. The inequality elasticity is 0.5% in West Java Province, but has no significant effect in Central Java Province. This condition occurs because the main economic sector of West Java Province tends to be capital intensive and controlled by a limited number of people so that there is a significant difference in income, while Central Java Province with the main sector of agriculture has relatively the same average income [3].

The amount of savings in Central Java Province affects the poverty rate and is negatively related to the elasticity of 0.5%, but has no significant effect in West Java Province. This is in line with Nurkse's theory [4] where low savings will lead to low health and education, and according to hamper economic growth, thereby hampering poverty alleviation.

3. Priority of Poverty Alleviation Strategy in Central Java Province:

Based on the results of interviews and filling out questionnaires by experts in Figure 8, the most priority poverty alleviation target in Central Java Province is reducing the open unemployment rate (39.5%), with a priority strategy of creating jobs (39.8%). Expanding job opportunities can be achieved by absorbing the supply chain of labor and industrial raw materials from local MSMEs [26], building start-ups [12]. There is also an adaptation of the strategy to create jobs in the West Java [17], including a new technology & digital-based business incubator, as well as cooperation between regional agglomerations.

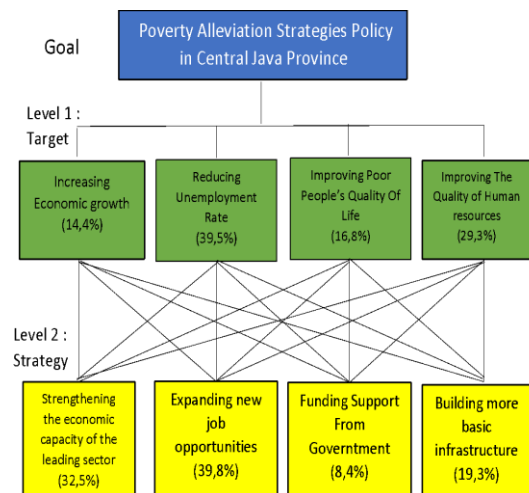


Fig 6. chain of labor and industrial raw materials

VI. CONCLUSION

The poverty cluster in Central Java Province has not improved relatively, while in West Java it has decreased, while the classification typology of the two provinces shows similarities, namely the number of cities/districts that are in developing conditions. The results of the analysis of the SYS GMM dynamic panel data method show that in Central Java and West Java, most of this year's poverty rate stems from the previous year's poverty rate, and areas with high unemployment and low HDI will relatively face higher poverty rates. Based on the results of the AHP analysis. The priority target of the Poverty Alleviation Policy in Central Java Province is to reduce the open unemployment rate with a priority strategy of creating jobs.

Based on the research results, suggestions that can be proposed include:

The government needs to increase the economic capacity of the leading sectors, especially in developing areas and high poverty rates, by increasing the productivity of MSMEs through the use of efficient technology, economic cooperation in agglomeration areas and BUMDes, as well as optimizing the use of technology and digitalization. In addition, the tertiary sector needs to be developed to create new opportunities

The government is advised to suppress the open unemployment rate by creating jobs. The creation of new job opportunities for labor-intensive sectoral industries, MSMEs, new business incubation and relevant startups help alleviate poverty.

The government is also recommended to improve the quality of human resources (IPM) so that existing job opportunities can be captured properly. The free school program and updating the secondary school education curriculum according to industry needs is very appropriate to continue. In addition, there is an equally important strategy, namely efforts to improve health & education infrastructure, and maintain food price inflation so that the poor can still meet their nutritional needs.

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