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Gender-Based Regional Planning in Poverty Alleviation in the Strategic Area of Subosukawonosraten, Central Java

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Abstract

This study aims to examine the effects of women's parliamentary representation, the Gender Development Index (GDI), regional gross domestic product (GDP) per capita, and female labor force participation on poverty reduction in the Subosukawonosraten strategic region of Central Java. The study hypothesizes that all independent variables negatively influence poverty. The research employs a quantitative approach using panel data from seven districts/cities over the period 2012–2024. A Random Effect Model (REM) regression is applied after conducting model selection tests, including the Breusch–Pagan LM, Chow, and Hausman tests. The data are obtained from official statistical publications, and variables include poverty rate, women's representation, GDI, GDP per capita, and female labor participation. The results indicate that women's parliamentary representation (coefficient = −1.047; p = 0.001) and GDP per capita (coefficient = −1.312; p = 0.000) have a significant negative effect on poverty, confirming their critical role in poverty alleviation. In contrast, GDI and female labor force participation show no statistically significant direct effects, suggesting their influence may be indirect or mediated by other factors. These findings imply that strengthening women's political participation and promoting regional economic growth are effective strategies for reducing poverty. Policymakers should integrate gender-inclusive governance with economic development programs. Future research is recommended to incorporate mediating variables and mixed-method approaches to better capture the complex dynamics of gender and poverty.

INTRODUCTION

Poverty remains a persistent and complex issue in economic development, particularly in developing countries such as Indonesia. Despite continuous policy interventions aimed at reducing poverty, disparities across regions and social groups continue to pose significant challenges. From a theoretical perspective, poverty is no longer viewed solely as a consequence of low income but as a multidimensional phenomenon influenced by economic, social, political, and institutional factors. Traditional growth-centered approaches are increasingly considered insufficient to fully explain poverty dynamics. Consequently, more comprehensive frameworks, including gender-based perspectives, have gained prominence in analyzing and addressing poverty in a more inclusive and sustainable manner.

In the Indonesian context, poverty exhibits strong regional characteristics. Central Java Province represents one of the regions contributing significantly to the national poverty rate. Within this province, the Subosukawonosraten area—comprising Surakarta City and six surrounding regencies—has been designated as a strategic development region aimed at promoting economic growth and regional equity. This region is characterized by a heterogeneous structure in terms of economic capacity, demographic composition, and spatial development patterns. While it plays a vital role in regional economic connectivity, poverty levels across districts and cities within

Subosukawonosraten remain uneven. Such disparities indicate differences in economic performance, human development, and access to resources. Moreover, gender-related factors, such as women's participation in the labor market and political representation, are increasingly recognized as critical determinants in shaping poverty outcomes.

Recent empirical studies have examined the relationship between gender, economic development, and poverty reduction. Fitriani et al. (2025) found that women's representation in political institutions significantly contributes to poverty reduction by promoting more inclusive and welfare-oriented policies. Similarly, Dahlum et al. (2022) highlighted that women's political empowerment is positively associated with economic growth, which in turn enhances societal welfare. In the regional economic context, Manalu et al. (2024) demonstrated that higher regional gross domestic product (GDP) per capita significantly reduces poverty levels across Indonesian regions. These findings suggest that economic growth remains a fundamental driver of poverty alleviation, although it must be complemented by inclusive institutional frameworks.

However, the empirical evidence regarding gender development indicators and female labor force participation remains mixed. Sari and Arif (2022) indicated that improvements in the Gender Development Index (GDI) positively influence economic growth, yet their direct impact on poverty reduction is less evident. This implies that gender equality in human development may not automatically translate into reduced poverty without effective transmission mechanisms. Furthermore, Rogayah (2021) noted that female labor force participation in developing countries is often concentrated in low-productivity and informal sectors, limiting its capacity to significantly reduce poverty. These findings underline the importance of not only increasing women's participation in the workforce but also improving the quality and productivity of their employment.

Although prior studies have contributed valuable insights, several limitations remain. Many studies tend to analyze the determinants of poverty in isolation, without integrating political, economic, and social dimensions into a unified analytical framework. Additionally, limited research has focused specifically on strategic regional areas such as Subosukawonosraten using longitudinal panel data. Given its unique characteristics—combining urban and rural dynamics—this region offers an important case for understanding the complexity of poverty from a regional planning perspective. Another limitation lies in the insufficient integration of gender perspectives within regional economic analyses, which may overlook critical aspects of inclusive development.

Based on these limitations, a significant research gap can be identified. There is a lack of comprehensive empirical studies that simultaneously examine women's political representation, gender development, regional economic performance, and female labor force participation in influencing poverty within a regional context. Furthermore, few studies have employed panel data econometric approaches to capture the dynamic relationships among these variables over time. Addressing this gap is essential to provide a more holistic understanding of poverty determinants and to inform more effective policy interventions.

Therefore, this study aims to investigate the effects of women's representation in parliament, the Gender Development Index (GDI), GDP per capita, and female labor force participation on poverty levels in the Subosukawonosraten region over the period 2012–2024. Specifically, this research seeks to analyze both the partial and simultaneous impacts of these variables on poverty and to identify the most influential factors contributing to poverty reduction. The novelty of this study lies in its integrated approach, combining gender perspectives with regional economic analysis within a panel data framework. In addition, the focus on a strategic and

heterogeneous region provides a unique contribution to the literature on regional development and poverty.

This research is expected to contribute both theoretically and practically. From a theoretical standpoint, it enriches the existing literature by offering a multidimensional analysis of poverty that incorporates gender and regional development perspectives. From a policy perspective, the findings are expected to provide evidence-based insights for local governments in designing more inclusive and gender-responsive development strategies. Ultimately, integrating economic growth, gender empowerment, and regional planning is crucial to achieving sustainable poverty reduction and reducing socio-economic inequalities.

METHODS

This study employs a quantitative research design within a positivist paradigm to examine the causal relationships between gender-related variables, regional economic performance, and poverty. The use of a quantitative approach is considered appropriate for answering the research questions, as it allows for objective measurement, statistical testing, and generalization of findings across the study area. Specifically, the study utilizes a panel data regression model to capture both cross-sectional and time-series variations, enabling a more comprehensive analysis of poverty dynamics in the Subosukawonosraten region over the period 2012–2024. The population of this study consists of all administrative regions within the Subosukawonosraten area in Central Java, Indonesia. The sample includes seven districts/cities, namely Surakarta, Boyolali, Sukoharjo, Karanganyar, Wonogiri, Sragen, and Klaten. A census sampling technique is applied, meaning that all units within the population are included in the analysis. This approach ensures that the sample is fully representative of the study area and eliminates sampling bias. The selected period of 2012–2024 is chosen based on data availability and its relevance in capturing recent trends in regional development, gender indicators, and poverty conditions.

The data used in this study are secondary data obtained from official and credible sources, primarily the Indonesian Central Bureau of Statistics (BPS) and other relevant government publications. The dataset includes annual observations for each district/city, forming a balanced panel structure. The variables analyzed consist of the poverty rate (measured by the number of people living below the poverty line), women's representation in parliament (measured as the percentage of female members in local legislative councils), the Gender Development Index (GDI), GDP per capita at constant prices, and female labor force participation rate. These variables are selected based on theoretical relevance and empirical evidence from prior studies. All data are recorded in consistent units and scales to ensure comparability across regions and time. Data collection is conducted through documentation techniques by compiling published statistical reports and official databases. Since the study relies entirely on secondary data, no primary data collection instruments such as questionnaires or interviews are used.

However, careful data validation and cross-checking procedures are implemented to ensure accuracy and consistency. The operational definitions of variables are clearly specified to avoid ambiguity and to facilitate replication. For example, poverty is defined according to the national poverty line standard set by BPS, while GDP per capita is measured using constant prices to eliminate inflation effects. The data analysis technique involves several stages to ensure the robustness of the results. First, descriptive statistical analysis is conducted to examine the basic characteristics and distribution of the data. Second, preliminary diagnostic tests are performed, including Pearson correlation analysis to assess the relationships among variables and Variance

Inflation Factor (VIF) testing to detect potential multicollinearity. These steps are necessary to confirm that the data meet the assumptions required for regression analysis. Next, panel data regression analysis is applied to estimate the relationship between independent variables and poverty. Three alternative models are considered: Pooled Ordinary Least Squares (Pooled OLS), Fixed Effect Model (FEM), and Random Effect Model (REM).

Model selection is carried out systematically using standard specification tests. The Breusch–Pagan Lagrange Multiplier test is used to determine whether the Random Effect Model is preferable to Pooled OLS. The Chow test is conducted to compare the Fixed Effect Model with Pooled OLS, while the Hausman test is used to choose between the Fixed Effect Model and the Random Effect Model. The final model is selected based on statistical criteria to ensure the most appropriate and efficient estimation. All statistical analyses are performed using econometric software, and the procedures followed are clearly structured to allow replication by other researchers. The study ensures that all variables are consistently measured and that the analytical steps are logically ordered, from data preparation to model estimation and interpretation. Overall, the methodology is designed to provide reliable and valid empirical evidence regarding the role of gender and economic factors in poverty reduction within a regional context.

RESULTS AND DISCUSSION

Preliminary Tests

Table 1. Pearson Correlation Results

Variable	Parliament	GDI	GRDP	FLFP
Parliament	1.000			
GDI	.444	1.000		
	(.000)			
GRDP	.264	.486	1.000	
	(.012)	(.000)		
FLFP	.177	−.393	−.260	1.000
	(.093)	(.000)	(.013)	

Source: Author's calculation (2026)

The Pearson correlation results indicate varying relationships among variables. Women's parliamentary representation shows a moderate and significant positive correlation with the Gender Development Index (GDI), $r = .444$; $p = .000$. Meanwhile, female labor force participation (FLFP) has a weak and insignificant correlation with parliamentary representation, $r = .177$; $p = .093$. A significant moderate negative correlation is found between GDI and FLFP, $r = -.393$; $p = .000$, suggesting an inverse association between these two variables.

Table 2. Variance Inflation Factor (VIF) Results

Variable	VIF	1/VIF
GDI	1.94	.515
Parliament	1.54	.649
FLFP	1.47	.681
GRDP	1.33	.749
Mean VIF	1.57	

Source: Author's calculation (2026)

The VIF results show relatively low values for all independent variables, with a mean VIF of 1.57, which is well below the common threshold of 5 or 10. This indicates the absence of multicollinearity issues, ensuring that each variable contributes unique information to the regression model and that the estimation results are reliable.

Panel Model Specification Tests

Table 3. Breusch–Pagan Lagrangian Multiplier Test

Item	Variance	Std. Dev.
Poverty	1,220.77	34.93
εit	186.11	13.64
μi	217.54	14.74
chibar²(01)	181.86	
Prob > chibar²	.000	

Source: Author's calculation (2026)

The Breusch–Pagan LM test yields chibar² = 181.86 with p = .000, indicating that the Random Effect Model (REM) is preferred over the pooled OLS model.

Table 4. Chow Test Results

F-statistic	df1	df2	Prob > F
25.60	6	8	.000

Source: Author's calculation (2026)

The Chow test result, F(6, 8) = 25.60; p = .000, indicates that the Fixed Effect Model (FEM) is more appropriate than pooled OLS.

Table 5. Hausman Test Results

Variable	FE	RE	Difference	Std. Error
Parliament	−.9605	−1.0476	.0870	.0506
GDI	−4.3404	−1.7005	−2.6398	2.3628
GRDP	−1.0790	−1.3128	.2334	.2734
FLFP	1.0554	.8508	.2046	.1718
χ²	8.81			
Prob > χ²	.066			

Source: Author's calculation (2026)

The Hausman test yields χ^2 = 8.81; p = .066, indicating no significant difference between FEM and REM estimators. Therefore, the Random Effect Model is selected as the most efficient model for this study.

Regression Results

Table 6. Regression Estimation Results (REM)

Variable	Coef.	Std. Err.	t	P-value	95% CI
Parliament	−1.047	.311	3.37	.001***	[−1.657, −.437]
GDI	−1.700	2.212	.77	.442	[−6.037, 2.636]
GRDP	−1.312	.306	4.28	.000***	[−1.913, −.712]
FLFP	.850	.528	1.61	.108	[−.185, 1.887]
Constant	269.30	203.90	1.32	.187	[−130.40, 669.12]

Note: significant at 1% level
Source: Author's calculation (2026)

The regression results indicate that women's parliamentary representation has a significant negative effect on poverty, $t = 3.37$; $p = .001$, suggesting that increasing women's representation contributes to poverty reduction. Similarly, GRDP per capita shows a significant negative effect, $t = 4.28$; $p = .000$, confirming that economic growth plays a crucial role in reducing poverty. In contrast, GDI and FLFP do not exhibit statistically significant effects, indicating that their direct influence on poverty is not empirically supported in this model.

DISCUSSION

1. Women's Parliamentary Representation and Poverty

The findings demonstrate that women's representation in parliament significantly reduces poverty levels. This result supports previous studies suggesting that women policymakers tend to prioritize social welfare, education, and healthcare policies (Fitriani et al., 2025). The negative coefficient indicates that increasing female political participation enhances the inclusiveness of public policies, particularly those targeting vulnerable populations. This finding is consistent with the theory of political representation, which argues that the presence of women in decision-making institutions ensures that gender-specific issues are addressed more effectively. From a regional planning perspective, this result highlights the importance of strengthening women's political roles in local governance. Increasing women's representation in legislative bodies can lead to more responsive and inclusive development policies, particularly in addressing multidimensional poverty.

2. Gender Development Index and Poverty

The results show that the Gender Development Index does not have a statistically significant effect on poverty, although the coefficient is negative. This suggests that improvements in gender equality do not automatically translate into immediate poverty reduction. This finding contrasts with prior research indicating that gender equality contributes to economic growth and indirectly reduces poverty (Sari & Arif, 2022). One possible explanation is that the impact of gender equality may operate through indirect channels, such as education, employment quality, or institutional capacity, rather than directly affecting poverty levels. Therefore, policies aimed at improving gender equality should be integrated with broader economic and social programs to achieve more substantial impacts.

3. GRDP per Capita and Poverty

The significant negative effect of GRDP per capita confirms that economic growth is a key determinant of poverty reduction. This finding aligns with classical and neoclassical growth theories, which emphasize the role of income expansion in improving welfare (Mankiw, 2016). It is also consistent with empirical evidence showing that higher regional income levels reduce poverty rates (Manalu et al., 2024). In the context of regional development, this result suggests that policies promoting economic growth—such as infrastructure development, investment promotion, and sectoral diversification—are essential for reducing poverty. However, it is important to ensure that economic growth is inclusive and benefits all segments of society.

4. Female Labor Force Participation and Poverty

The findings indicate that female labor force participation does not have a significant effect on poverty, although the coefficient is positive. This suggests that higher participation rates do not necessarily lead to poverty reduction, possibly due to the prevalence of low-quality or informal employment among women. This result supports the argument that employment quality matters more than employment quantity. As highlighted by previous studies (Fitriani et al., 2025), women's participation in low-paying or informal jobs may not significantly improve household welfare. Therefore, policies should focus on improving job quality, increasing access to formal employment, and ensuring fair wages. From a regional planning perspective, this implies that empowering women economically requires more than increasing participation rates. It involves enhancing skills, providing access to productive resources, and creating inclusive labor markets.

CONCLUSION

This study concludes that gender-based regional planning plays a significant role in poverty reduction, particularly through women's political representation and regional economic performance. The empirical findings indicate that women's representation in parliament has a statistically significant negative effect on poverty, suggesting that greater female participation in political decision-making contributes to more inclusive and welfare-oriented policies. Similarly, GRDP per capita is found to significantly reduce poverty, confirming that regional economic growth remains a key driver of improving societal welfare. In contrast, the Gender Development Index (GDI) and female labor force participation (FLFP) do not show a direct and significant effect on poverty, indicating that gender equality and participation alone are insufficient without supportive structural and economic conditions.

These findings contribute to the existing body of knowledge by providing empirical evidence that political empowerment of women and economic capacity at the regional level are more निर्णant factors in poverty alleviation than gender indicators in isolation. This study extends prior research by integrating gender representation variables into a regional economic framework using panel data analysis, particularly in the context of the Subosukawonosraten strategic region. It highlights that gender-sensitive policies must go beyond symbolic equality measures and focus on institutional influence and economic integration.

However, this study has several limitations. First, it relies solely on quantitative secondary data, which may not fully capture the complexity of gender dynamics and policy implementation at the local level. Second, the analysis is limited to macro-level indicators, thereby overlooking micro-level factors such as household behavior, job quality, and informal sector dynamics. Third, the study is geographically confined to the Subosukawonosraten region, which may limit the generalizability of the findings to other regions with different socio-economic characteristics.

Based on these limitations, several recommendations can be proposed for future research. Further studies are encouraged to incorporate qualitative approaches to better understand the mechanisms through which women's political representation influences poverty reduction.

Additionally, future research should consider including mediating or moderating variables, such as education levels, access to financial services, or quality of employment, to provide a more comprehensive explanation of the relationship between gender and poverty. Expanding the scope of research to other regions or conducting comparative studies across provinces would also enhance the robustness and generalizability of findings. Finally, future research could explore dynamic panel models or mixed-method approaches to capture both short-term and long-term effects of gender-based development policies on poverty alleviation.

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