



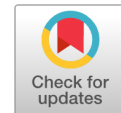
Women's Political and Economic Participation: Implications for the Gender Development Index in Java

Elsye Elviana and Deden Dinar Iskandar*,

Department of Economics and Development Studies, Universitas Diponegoro, Semarang, Indonesia

*Corresponding Email: deden_dinar@live.undip.ac.id

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Abstract

Inclusive and gender-equitable development is a key objective of Sustainable Development Goal 5 (SDG 5). Despite being the center of Indonesia's economic growth, gender disparities persist across districts and municipalities in Java. This study examines the influence of women's participation in parliament and the labor market on the Gender Development Index (GDI) in Java during 2017–2023. Women's participation is measured by Women's Parliamentary Representation (KPP) and Women as Professionals (PTP). Maternal Mortality Rate (MMR) and the proportion of women aged 25 and above with at least upper secondary education (PEND) represent health and education dimensions, while Gross Regional Domestic Product (GRDP) serves as a control variable. Using panel data with a Fixed Effect Model, the results show that KPP, PTP, and MMR have no significant effect on GDI, while PEND and GRDP have significant positive effects, highlighting the importance of education and regional economic capacity in supporting gender development.

Keywords: Gender Development Index, Women's Participation, Parliament, and Professional Workers

JEL Classification: J16, O15, and C22

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Introduction

Sustainable development requires equal participation of men and women in all aspects of life. According to [World Bank \(2023\)](#) data, women constitute nearly half of the global population, accounting for 49.7 percent. With such a proportion, inclusive and sustainable development is unattainable without women's equal participation in all development processes. Nevertheless, women continue to face structural barriers that hinder their full participation, ranging from social discrimination and economic

constraints to limited political representation. The United Nations Development Programme (UNDP, 2023) further emphasizes that no country has yet achieved full gender equality, highlighting the global and persistent nature of gender disparities.

One of the most comprehensive international responses to gender equality is the adoption of the Sustainable Development Goals (SDGs) in 2015, with gender equality designated as Goal 5. In Indonesia, commitments to women’s empowerment and gender equality had already been integrated into the national development agenda prior to the SDGs, most notably with the establishment of the Ministry of Women’s Empowerment and Child Protection (KPPPA) in 1978. This commitment was further reinforced through Presidential Instruction No. 9/2000 on Gender Mainstreaming in National Development. However, the effectiveness of these policies remains uneven at the subnational level, leading to persistent gender gaps across regions.

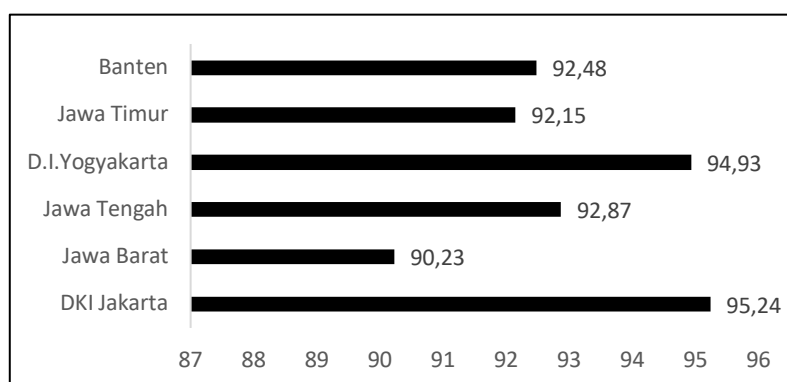


Figure 1. Gender Development Index in Java Provinces, 2023
Source: Statistics Indonesia (BPS), 2023

Although Indonesia’s national Gender Development Index (GDI) reached 91.85 percent in 2023 (BPS, 2023a), interregional disparities remain visible, particularly in Java. DKI Jakarta and Yogyakarta recorded the highest GDIs, while West Java ranked the lowest at 90.23. This inequality is reflected in women’s limited participation in both the labor market and the political sphere. In West Java, for instance, the gender gap in labor force participation is the widest nationally, with male participation at 84.63 percent compared to only 47.98 percent for women. This disparity is strongly influenced by cultural and social norms that perceive men as primary breadwinners and women as responsible for domestic roles (Saefulloh et al., 2023; Septiawan & Wijaya, 2019).

Such gendered perceptions not only restrict women’s access to employment but also narrow their opportunities to engage in public decision-making. Nationally, women’s representation in parliament stands at only 22.14 percent (BPS, 2023b), still far below the 30 percent quota mandated as an affirmative action policy. Low representation limits the enactment of gender-sensitive legislation, despite evidence showing that female legislators are more likely to champion issues such as gender equality, reproductive rights, and social welfare (Lestari, 2024). Similarly, in the economic sphere, the 2022 IDX report revealed that only 15 percent of executive leadership positions in IDX200 companies were held by women, and as of 2019, only eight women served as CEOs. These patterns suggest that while the number of professional women has increased, access to strategic leadership roles remains highly restricted.

Gender-responsive development is closely related to women's ability to participate in economic activities, particularly in the labor market. When women have equal access to health services and educational opportunities, they are more likely to develop the human capital necessary to engage in productive employment and contribute to economic development (Gakhar, 2024). Conversely, persistent gender disparities in these fundamental capabilities may limit women's access to decent work and hinder broader gender development outcomes. Gender-responsive development is therefore not solely dependent on women's involvement in politics and the labor market but also on the fulfilment of fundamental capabilities such as health and education.

In terms of health, maternal mortality rates (MMR) in Java demonstrate stark disparities: DKI Jakarta recorded the lowest rate at 48 per 100,000 live births, whereas West Java (187), Central Java (183), and East Java (184) reported the highest. Beyond reflecting health system performance, MMR serves as a critical indicator of structural gender inequality in access to reproductive health services and maternal care. Since the Gender Development Index (GDI) incorporates life expectancy as a core dimension, high maternal mortality directly reduces women's longevity and may indirectly constrain their educational attainment and economic participation, thereby widening gender development gaps. In education, the proportion of women aged 25 and above with at least upper secondary education varies widely, from 58.38 percent in Jakarta to just 23.21 percent in Central Java. These disparities highlight persistent structural barriers in health and education access, which constrain women's social mobility and perpetuate cycles of gender inequality across the island.

Table 1. GRDP at Constant Prices in Java Provinces, 2020-2023 (Billion Rupiah)

Province	2020	2021	2022	2023
DKI Jakarta	1,792,291.09	1,856,000.70	1,953,488.99	2,050,472.97
Jawa Barat	1,453,380.72	1,507,746.39	1,589,984.93	1,669,421.49
Jawa Tengah	965,227.27	997,321.13	1,050,278.09	1,102,473.58
D.I. Yogyakarta	101,698.52	107,372.56	112,901.32	118,625.54
Jawa Timur	1,611,392.55	1,668,754.36	1,757,874.90	1,844,808.68
Banten	441,148.58	460,952.79	484,129.42	507,425.74

Source: Statistics Indonesia (BPS)

Moreover, regional disparities in Gross Regional Domestic Product (GRDP) further illustrate the uneven economic capacity to support gender-responsive policies (see Table 1). While Jakarta consistently records the highest GRDP, Yogyakarta represents the smallest provincial economy in Java. These differences reflect structural economic variations that influence fiscal capacity. Higher GRDP regions tend to possess more diversified economies and greater fiscal resources, yet such advantages do not automatically translate into equitable development outcomes for women. Without gender-sensitive policies, women remain at risk of being marginalized from formal labour opportunities and broader improvements in well-being.

Given these complexities, gender inequality in Indonesia is both multidimensional and persistent. Empirical studies on GDI at the regency and municipality level, particularly in Java, remain limited despite the island's pronounced gender disparities. This study seeks to fill this gap by focusing on women's participation in politics and the labor market, as captured by two indicators from the Gender Empowerment Index (GEI): women's representation in parliament and

women's employment as professionals. Additional indicators, maternal mortality, women's educational attainment at the upper secondary level, and GRDP are incorporated to capture the broader structural dimensions of health, education, and economic capacity that shape gender development. By examining these relationships at the subnational level, this study provides a more nuanced understanding of how political representation, labor participation, and structural capabilities interact in shaping gender development outcomes. The findings are expected to contribute empirical evidence that supports more targeted and gender-responsive development policies in Indonesia.

Literature Review

Women's Parliamentary Representation (KPP)

Women's presence in parliament is expected to strengthen gender-responsive policymaking. Previous studies suggest that higher female representation tends to improve outcomes in education, health, and social welfare (Sarangi et al., 2023). Empirical evidence also indicates that women legislators can influence broader development outcomes, including economic activity, infrastructure provision, and corruption control, thereby contributing to improved governance and public goods provision (Baskaran et al., 2024). Nevertheless, the relationship between women's representation and policy outcomes remains debated. While some scholars argue that the presence of women in parliament enhances the substantive representation of women's interests due to shared experiences and perspectives, other emphasize that descriptive representation does not always translate into substantive policy change (Pitkin, 1967). Institutional constraints, limited political power, and structural marginalization may reduce women's parliamentary participation to symbolic representation and constraining their impact on legislative agendas (Itzkovitch-Malka, 2024).

Women as Professionals (PTP)

Female professionals contribute to narrowing the gender wage gap and enhancing women's bargaining power in the labor market (Lin & Wollni, 2024). Yet, structural barriers such as the glass ceiling and inadequate childcare support continue to hinder women's career advancement (International Labour Organization, 2023; Kişi, 2019). As a result, the impact of professional participation on gender equality remains uneven.

Maternal Mortality Rate (MMR)

Maternal mortality reflects inequalities in women's access to healthcare, reproductive rights, and decision-making power, as high MMR is frequently associated with limited reproductive autonomy and weak health systems (Chirowa et al., 2013). Beyond its role as a survival indicator, empirical evidence demonstrates that declines in maternal mortality are linked to higher female labour force participation and greater investment in women's education and human capital, partly through improvements in life expectancy and the associated economic incentives for long-term skill accumulation (Bhalotra & Gomes, 2022; Wang & Torbica, 2024). By reducing the health risk surrounding childbirth, lower maternal mortality expands women's capacity to pursue education and participate in economic activities. In this sense, MMR reflects structural

constraints affecting women's health, human capital accumulation, and economic participation, which are key dimensions shaping gender development outcomes as captured in the Gender Development Index (GDI).

Educational Attainment (PEND)

Education is central to empowering women through improved skills, labor mobility, and economic independence. [Conover et al. \(2022\)](#) highlight that higher education levels increase women's access to formal employment and reduce wage disparities. In Indonesia, secondary and tertiary education significantly enhance women's participation in the labor force and decision-making ([Susilo et al., 2024](#)).

Gross Regional Domestic Product (GRDP)

Regional economic capacity supports gender development by expanding public services and creating inclusive labor opportunities. [Wakarmamu & Indrayono \(2019\)](#) show that fiscal strength enables greater investment in health, education, and infrastructure. Although GRDP growth does not automatically ensure gender equality, it provides the structural foundation for more inclusive policies.

Research Method

This study employs a panel data design with districts and municipalities in Java Island as the units of analysis, covering 118 regions over the period 2017–2023. Bangkalan District was excluded from the sample due to incomplete data for one of the required variables. The study relies on secondary data obtained from official sources, including publications of Statistics Indonesia (BPS), the Ministry of Health, the Ministry of Women's Empowerment and Child Protection (KemenPPPA), the Legal Documentation and Information Network (JDIH), and the Ministry of State Secretariat. The dependent variable is the Gender Development Index (GDI), while the independent variables consist of Women's Parliamentary Representation (KPP), Women as Professionals (PTP), Maternal Mortality Rate (MMR), and the percentage of women aged 25 years and above with at least upper secondary education (PEND). Gross Regional Domestic Product (GRDP) at constant prices is included as a control variable to reflect the real economic capacity of each region.

The variables are measured using operational definitions consistent with prior studies and official statistical standards. Women's parliamentary representation (KPP) is defined as the proportion of legislative seats occupied by women, which is expected to strengthen gender-responsive policies. Women as professionals (PTP) is measured by the share of female workers in professional and skilled occupations, reflecting women's bargaining power in the labor market. Maternal Mortality Rate (MMR) is measured per 100,000 live births and reflects structural disparities in health access. The percentage of women aged 25 and above with upper secondary education (PEND) captures educational attainment as a capability-enhancing factor. Meanwhile, GRDP at constant prices represents the real economic output of a region and its fiscal capacity to support inclusive development. These mechanisms are aligned with [Sen's \(1999\)](#) capability approach, which views development as an expansion of substantive freedoms in political, economic, and social dimensions.

Data were analyzed using panel regression with the Ordinary Least Squares (OLS) method under a Fixed Effect Model specification. The use of FEM is motivated by its ability to control for unobserved regional heterogeneity, particularly time-invariant characteristics such as institutional quality, socio-cultural norms, and geographical conditions that may influence gender development outcomes. In panel data analysis, ignoring such unobserved factors may lead to biased and inconsistent estimates due to omitted variable bias (Baltagi, 2021; Wooldridge, 2010).

The Fixed Effect Model addresses this issue by allowing each cross-sectional unit to have its own intercept (μ_i), thereby capturing all unobserved, time invariant characteristics. By focusing on within-region variation over time, FEM effectively removes the influence of these unobserved factors, especially when they are correlated with the explanatory variables (Wooldridge, 2010). This makes FEM particularly suitable for regional economic studies where heterogeneity across districts is substantial.

Empirically, the use of FEM is widely supported in studies examining gender, human development, and labor outcomes. For example, Mansha et al. (2022) employed a fixed effect model to analyze the impact of gender inequality on human development across Asian countries. Similarly, Ajaj & Nasrulddin (2024) applied FEM in examining women's economic empowerment and found it to be the most appropriate specification. In the context of labor and gender, Belke & Bolat (2016) and Putri & Anas (2026) also utilized fixed effect models to investigate female labor participation and productivity. These studies confirm that FEM is effective in capturing cross-regional heterogeneity and producing consistent estimates in panel data settings.

Estimation was conducted using Stata 17 software. To address differences in data scale, several variables were transformed into natural logarithms, except KPP, PTP, and PEND, which are expressed in percentages and therefore not log-transformed to avoid distortions. The econometric model is specified as follows.

$$\ln GDI_{it} = \beta_0 + \beta_1 KPP_{it} + \beta_2 PTP_{it} + \beta_3 \ln MMR_{it} + \beta_4 PEND_{it} + \beta_5 \ln GRDP_{it} + \mu_i + \varepsilon_{it} \tag{1}$$

where i denotes the cross-sectional unit (district/municipality), t denotes the time period, μ_i represents the fixed effect capturing time-invariant characteristics of each region, and ε_{it} is the error term. Based on this specification and the underlying theoretical framework, the study hypothesizes that women's representation in parliament, women as professionals, educational attainment, and GRDP positively affect GDI, while maternal mortality negatively affects GDI across districts and municipalities in Java.

Results

The selection of the most appropriate panel regression model was conducted by comparing three main approaches, namely the Common Effect Model (CEM), Fixed Effect Model (FEM), and Random Effect Model (REM). This process involved a series of statistical tests, namely the Chow test and the Hausman test (Savitri et al., 2019).

Table 2. Chow Test and Hausman Test

Chow Test		Hausman test			
Test Summary	Prob.	Test Statistic	Value	df	P-value
F(117, 703) = 620.67	0.0000	Sargan-Hansen	215.851	Chi-sq (5)	0.0000

The Chow test showed a p-value < 0.05, indicating that the Fixed Effect Model was more suitable than the Common Effect Model (see Table 2). The initial Hausman test was invalid due to a non-positive definite variance-covariance matrix; therefore, the Sargan-Hansen test was employed, yielding a p-value of 0.0000. Based on these results, the Fixed Effect Model was selected as the best model for this study. To ensure that the regression model met the classical assumptions, several diagnostic tests were performed, including tests for autocorrelation, heteroskedasticity, and multicollinearity (Basuki, 2017).

Table 3. Multicollinearity Test

Variable	KPP	PTP	Ln_MMR	PEND	Ln_GRDP
KPP	1.0000				
PTP	0.1430	1.0000			
Ln_MMR	-0.1533	0.0447	1.0000		
PEND	0.2106	0.2028	-0.2449	1.0000	
Ln_GRDP	0.1783	-0.1418	-0.1789	0.3217	1.0000

Table 3 shows that all pairs of independent variables had correlation coefficients below 0.90. The highest correlation was observed between PEND and Ln_GRDP at 0.3217, which remains within the acceptable threshold, suggesting that the regression model is free from multicollinearity issues.

Table 4. Autocorrelation Test and Heteroscedasticity Test

Autocorrelation Test		Heteroscedasticity Test	
Test Summary	Prob > F	chi-sq (1)	Prob > chi2
F(1, 117) = 132.822	0.0000	96.39	0.0000

Table 4 reports the probability values from the autocorrelation and heteroskedasticity tests, both of which are lower than the 0.05 significance level. This indicates that the Fixed Effect Model experiences autocorrelation and heteroskedasticity. Therefore, Robust Standard Errors clustered by individual identity (cluster-robust standard errors) were applied. This approach allows for consistent standard error estimation even in the presence of heteroskedasticity and/or autocorrelation in the error term (Wooldridge, 2012).

Table 5. FEM Regression Results with Clustered Robust Standard Error

Dependent Variable	Independent variable	Coefficient	Prob. t-statistic	Prob. F-statistic	Adj-R ²
GDI	KPP	0.0000508	0.460	0.0000	0.4944
	PTP	-0.000025	0.481		
	Ln_MMR	-0.0000536	0.756		
	PEND	0.0001894	0.001		
	Ln_GRDP	0.0394477	0.000		

Based on the estimation of the Fixed Effect Model with clustered robust standard errors, the regression equation is as follows:

$$GDI_{it} = 4.099334 + 0.0000508KPP_{it} - 0.000025PTP_{it} - 0.0000536\ln MMR_{it} + 0.0001894PEND_{it} + 0.0394477\ln GRDP_{it} + \varepsilon_{it} \quad (2)$$

The F-statistic probability of 0.0000 indicates that, simultaneously, all independent variables in the model have a statistically significant effect on the Gender Development Index (GDI) at the 5 percent level. Meanwhile, the adjusted R^2 of 0.4944 shows that approximately 49.44 percent of the variation in GDI across districts/municipalities in Java during 2017–2023 is explained by the independent variables, while the remainder is influenced by other factors outside the model.

The t-test results demonstrate that Women’s Parliamentary Representation (KPP), Women as Professionals (PTP), and Maternal Mortality Rate ($\ln MMR$) have probability values greater than 0.05 and thus do not exert a statistically significant effect on GDI. In contrast, the proportion of women aged 25 and above with at least upper secondary education (PEND) and Gross Regional Domestic Product ($\ln GRDP$) show probability values below 0.05, meaning they significantly influence GDI at the 5 percent level. These findings highlight the key role of education and regional economic capacity in driving gender development at the subnational level.

The insignificant effect of KPP suggests that women’s representation in local parliaments has not yet translated into substantive contributions to GDI improvements in Java between 2017 and 2023. Theoretically, this finding is consistent with [Pitkin’s \(1967\)](#) distinction between descriptive and substantive representation, which suggests that the numerical presence of women in political institutions does not necessarily translate into substantive policy influence. Although the 30 percent quota is mandated under Law No. 10/2008, women’s actual representation remains only 22.14 percent nationally and even lower in several districts/municipalities in Java ([Damayanti et al., 2024](#)). More importantly, representation without substantive power results in policies that are largely gender-blind. Data from the [Ministry of State Secretariat \(2025\)](#) show that, out of 201 enacted laws in 2023 and 440 in 2024, only a few explicitly included gender considerations. Weak implementation of Gender Responsive Budgeting (GRB), with allocations for the Ministry of Women’s Empowerment and Child Protection declining from IDR 248.1 billion in 2018 to only IDR 17.8 billion in 2021 ([Budget Center, DPR RI, 2021](#)), further limits the effectiveness of gender-sensitive policies.

Similarly, the insignificant effect of PTP indicates that women’s participation as professionals has not yet contributed substantively to gender development in Java. Although professional employment is often seen as a marker of gender equality and women’s empowerment ([Cameron, 2023](#); [Widiastuti et al., 2024](#)), structural barriers persist. Many women still face the glass ceiling and glass cliff, limiting their access to leadership positions with substantive decision-making power ([Kişi, 2019](#)). This pattern is consistent with labour market segmentation theory, which suggests that the labour market is divided into segments with unequal opportunities for wages, mobility, and authority, where women are often concentrated in positions with more limited career advancement and weaker institutional protection ([Reich et al., 1973](#)). Evidence from the [International Labour Organization \(2023\)](#) shows that only 62.6 percent of surveyed female employees received paid maternity leave, with disparities between permanent workers (66.9%) and contract workers (58.9%). Moreover, Indonesia’s allocation for early childhood education and childcare remains extremely low at 0.04 percent of GDP, compared to the OECD average of 0.7 percent ([World Bank, 2022](#)). This lack of

support infrastructure forces many women to leave the labor market, constraining their independent income and economic mobility.

The insignificance of MMR may be attributed to relatively small interregional differences, which indicate a more uniform distribution of maternal health services across provinces. In addition, MMR is expressed per 100,000 live births, making the indicator prone to fluctuations in regions with low birth counts and thereby weakening its statistical significance. From the perspective of human capital theory, improvements in health outcomes enhance individuals' productivity and long-term development capacity. However, improvements in maternal health primarily ensure women's survival and well-being, while their broader contribution to gender development tends to emerge gradually and indirectly. Within the GDI framework, the health dimension is mainly represented by life expectancy, whereas reductions in maternal mortality largely reflect minimum survival conditions rather than expanded capabilities that directly support women's educational attainment or labor market participation. Consequently, the influence of maternal mortality on gender development is more likely to occur over a longer period and in conjunction with broader improvements in quality of life, access to education, and women's participation in public life.

By contrast, PEND exerts a positive and significant effect on GDI. A one percent increase in women aged 25 and above with at least upper secondary education is estimated to raise GDI by 0.0001894 points, *ceteris paribus*. Education expands women's opportunities for formal and higher-quality employment, reduces dependence on informal work, and narrows the gender wage gap (Suharyono & Digdowiseiso, 2021; Susilo et al., 2024). Data from the National Civil Service Agency (2024) show that of over 2 million female civil servants, more than 1.2 million hold bachelor's degrees and over 47,000 hold diploma IV degrees, exceeding their male counterparts. Most of these women occupy higher civil service ranks (Group III and IV), which typically require advanced education and carry greater responsibility. Likewise, Statistics Indonesia (2023) reports that average wages for university graduates reach IDR 32,581 per hour, compared to IDR 17,432–19,256 for senior high school graduates. These findings demonstrate that higher educational attainment not only broadens women's access to decent work but also strengthens economic independence and decision-making capacity, ultimately enhancing GDI.

Finally, lnGRDP exerts a positive and significant effect on GDI at the 5 percent level, with a coefficient of 0.0394. This indicates that a one percent increase in GRDP at constant prices raises GDI by approximately 0.0394 points, *ceteris paribus*. Empirically, higher GRDP reflects greater production capacity and fiscal space, enabling governments to expand public spending on social sectors such as education, health, and gender-inclusive infrastructure (Wakarmamu & Indrayono, 2019). It also signals economic diversification, which creates broader formal employment opportunities for women. These results are consistent with Masud (2022), who shows that public investment and government expenditure significantly drive regional economic growth. Therefore, the significance of GRDP underscores its role as a structural foundation for policies and programs that promote gender equality.

Conclusions

This study aims to assess whether women's participation in political and economic spheres translates into improved gender development outcomes, while accounting for structural factors such as health, education, and regional economic capacity at the subnational level in Java.

The findings reveal that women's representation in parliament, women as professionals, and the maternal mortality rate do not significantly affect the GDI. These results indicate that formal participation alone is insufficient to generate substantive improvements in gender development, suggesting the presence of structural constraints that limit the transformation of participation into effective agency. In contrast, women's educational attainment and regional economic capacity are found to have a positive and significant impact on GDI, highlighting the central role of capability-enhancing factors in shaping gender development outcomes. Thus, this study demonstrates that improvements in human capital and economic conditions are more decisive than formal indicators of participation in explaining variations in GDI.

However, this study has several limitations. First, the analysis is limited to districts and municipalities in Java, which may restrict the generalizability of the findings to the other regions in Indonesia. Second, the use of quantitative panel data does not fully capture deeper social, cultural, and institutional dynamics. Third, the indicators used may not reflect the quality of women's participation, which could explain the insignificant results.

Overall, this study highlights a gap between formal participation and substantive gender outcomes, implying that policies aimed at improving gender development should not only increase representation but also strengthen education, economic capacity, and the broader enabling environment that allows women's participation to translate into meaningful empowerment.

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