GDP: Demographic Insights into the Ethnic and Gender Contributions of Orang Asli Communities

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Abstract – This study investigates the demographic determinants of state-level Gross Domestic Product (GDP) in Malaysian states with Orang Asli populations. Using secondary data from the Department of Statistics Malaysia (DOSM), the Department of Orang Asli Development (JAKOA), and other government sources, the analysis assesses how ethnic composition and gender distribution contribute to economic outcomes. Five independent variables are tested: Malay Proto (MLYPRO), Senoi (SEN), Negrito (NGRT), male population (GDRM), and female population (GDRF). Grounded in Human Capital Theory, which links education, health, and skills to productivity, and Gender and Development (GAD) Theory, which highlights systemic gender inequalities, the study applies regression analysis. Findings indicate that Senoi and Malay Proto populations are positively associated with GDP, while Negrito shows no significant effect. Gender differences are pronounced, with male population positively influencing GDP and female population negatively related to GDP. The results provide theoretical and policy insights for advancing inclusive economic strategies in Orang Asli communities.

Keywords: "Orang Asli", "GDP", "Ethnicity", "Gender", "Human Capital Theory".

1. Introduction

The Orang Asli, Malaysia's indigenous peoples, are among the most socioeconomically marginalized communities despite their rich cultural heritage and diverse ethnic composition. Comprising three main groups—Proto-Malay, Senoi, and Negrito—the Orang Asli population is primarily concentrated in states such as Pahang, Perak, Selangor, Johor, Kelantan, Negeri Sembilan, Melaka, Kedah, and Terengganu (Nicholas, 2000; JAKOA, 2022). These states not only represent significant Orang Asli settlements but also contribute notably to Malaysia's gross domestic product (GDP). Hence, assessing the demographic dimensions of ethnicity and gender within Orang Asli communities provides valuable insights into their potential contributions to state-level GDP.

One of the critical issues facing Orang Asli communities is economic exclusion, often linked to limited access to formal employment, education, and entrepreneurial opportunities (Idrus, 2019). While Malaysia's GDP growth has been driven by industrialization and urbanization, Orang Asli economic activities remain largely concentrated in agriculture, forestry, and informal trade (Endicott, 2016). Such structural disparities underscore the necessity to examine how demographic factors such as ethnicity and gender influence Orang Asli participation in economic activities that, in turn, contribute to state GDP. Without this understanding, policies designed to empower Orang Asli women and men may fail to address systemic inequalities.

Gender dynamics add another important dimension to the Orang Asli economic narrative. Studies show that Orang Asli women often face dual marginalization—first as indigenous people and second as women in a patriarchal socioeconomic structure (Abdullah, 2018). Despite their active roles in subsistence farming, handicrafts, and small-scale trading, their contributions are often undervalued in formal GDP calculations (Alavi & Ahmad, 2010). This gap raises critical questions about how much gender influences Orang Asli economic engagement across states such as Pahang and Perak, where Orang Asli populations are most concentrated.

Ethnic differences also shape economic participation within Orang Asli groups. For instance, the Senoi are traditionally engaged in farming in Perak and Pahang, while the Proto-Malay communities in Johor and Selangor often integrate into mainstream employment sectors (Nicholas, 2000). Meanwhile, Negrito groups, predominantly in Kelantan and Perak, rely heavily on forest-based livelihoods, which are increasingly threatened by deforestation and land encroachment (Colchester et al., 2019). These differences suggest that ethnicity not only defines livelihood strategies but also shapes the extent of Orang Asli integration into state-level GDP.

Taken together, the intersection of ethnicity and gender offers a crucial lens for analyzing Orang Asli contributions to GDP across states with significant indigenous populations. While national statistics often aggregate indigenous peoples as a single category, disaggregated demographic insights are essential for evidence-based policymaking. Such analysis enables the development of targeted empowerment strategies that recognize the

unique economic roles of Orang Asli men and women across different ethnic groups. In doing so, Malaysia can move closer toward inclusive economic growth that acknowledges the Orang Asli as stakeholders in national development rather than as marginalized outliers (UNDP, 2021).

2. Literature Review

The Orang Asli, as Malaysia's indigenous population, have historically experienced socioeconomic marginalization, with limited integration into the mainstream economy (Nicholas, 2000; JAKOA, 2022). Concentrated across states such as Pahang, Perak, Selangor, Johor, and Kelantan, they often lag behind in education, health, and employment outcomes compared to national averages. These disparities reflect structural barriers that limit Orang Asli contributions to state GDP, despite their active engagement in subsistence farming, forest-based livelihoods, and small-scale enterprises (Endicott, 2016).

Gross Domestic Product (GDP) at the state level is a critical indicator of economic performance, capturing the aggregate value of goods and services produced within a region (World Bank, 2021). However, marginalized groups like the Orang Asli are often underrepresented in these figures due to informal economic activities and lack of statistical visibility (Idrus, 2019). Analyzing GDP in relation to Orang Asli participation allows researchers to uncover hidden inequalities and highlight areas where targeted policies could promote inclusive growth.

Ethnicity significantly shapes economic opportunities among the Orang Asli. The Senoi, concentrated in Perak and Pahang, are predominantly agricultural, whereas Proto-Malay communities in Johor and Selangor often participate in wage employment (Nicholas, 2000). Negrito groups, primarily in Kelantan and Perak, continue to rely on forest-based economies, which face increasing pressures from land development and deforestation (Colchester et al., 2019). These ethnic variations highlight how demographic diversity influences economic participation and, ultimately, state-level GDP contributions.

Gender further complicates Orang Asli economic outcomes. Women often shoulder the dual responsibilities of household care and income generation, yet their work is undervalued and rarely documented in official statistics (Abdullah, 2018). Research suggests Orang Asli women are engaged in handicrafts, trading, and small-scale farming, but cultural norms and systemic gender biases hinder their access to credit, training, and formal employment (Alavi & Ahmad, 2010). This underrepresentation diminishes their potential contribution to GDP, underscoring the need for gender-sensitive analysis.

Human Capital Theory (Becker, 1964) posits that education, skills, and health directly enhance individual productivity and economic growth. For Orang Asli, limited access to quality education and healthcare restricts their ability to compete in the labor market (Idrus, 2019). State-level GDP is therefore indirectly affected by the unequal distribution of human capital among Orang Asli populations, especially across ethnic and gender lines.

Investments in human capital development are thus crucial for unlocking their economic potential.

Ethnic Stratification Theory emphasizes how ethnic identity can determine access to resources, opportunities, and socioeconomic mobility (Hechter, 1978). Among the Orang Asli, ethnic affiliations influence settlement patterns, livelihood strategies, and access to state assistance (Nicholas, 2000). For example, Proto-Malay communities may find greater integration into wage employment compared to Negrito groups. Such stratification perpetuates income inequalities and limits the equitable distribution of GDP benefits across states.

The Gender and Development (GAD) framework stresses that economic growth cannot be sustainable without addressing gender inequality (Moser, 1993). In the Orang Asli context, women's contributions are systematically undervalued, leading to a distorted understanding of their economic role (Abdullah, 2018). By applying GAD, researchers can reveal how gendered barriers in education, health, and employment reduce women's capacity to participate fully in state economies, thereby lowering their measured GDP contributions.

The Capability Approach (Sen, 1999) provides a broader lens by focusing on individuals' freedoms to pursue the lives they value. For Orang Asli communities, capability deprivation in areas such as education, healthcare, and land rights directly limits their economic agency. GDP analysis that incorporates ethnicity and gender thus serves not only as an economic measure but also as a proxy for social justice and empowerment. Policies informed by such demographic insights can promote more inclusive and equitable development outcomes across Malaysian states (UNDP, 2021).

Drawing from these theoretical perspectives and prior empirical evidence, it becomes necessary to empirically test the extent to which ethnicity and gender influence state-level GDP outcomes in Malaysian states with Orang Asli populations. Therefore, the following hypotheses are proposed:

H1: Malay Proto (MLYPRO) has a relationship with GDP.
H2: Senoi (SEN) has a relationship with GDP.
H3: Negrito (NGRT) has a relationship with GDP.
H4: Male population (GDRM) has a relationship with GDP.
H5: Female population (GDRF) has a relationship with GDP.

3. Methodology

This study employed a quantitative research design using secondary data retrieved from several authoritative sources, including the Department of Orang Asli Development (JAKOA), the open data portal data.gov.my, and the Department of Statistics Malaysia

(DOSM). The dataset covered the years 2020 to 2024 and focused on nine states in Peninsular Malaysia with significant Orang Asli populations, namely Johor, Kedah, Kelantan, Melaka, Negeri Sembilan, Pahang, Perak, Selangor, and Terengganu. The main objective of this study was to analyze the impact of demographic variables, specifically ethnicity and gender, on state-level Gross Domestic Product (GDP).

3.1 Measurement of Variables

The variables used in this study are outlined in Table 1.0. The dependent variable was GDP, measured in constant prices at the state level. The independent variables consisted of three major Orang Asli ethnic groups and gender representation. The ethnic categories included Malay Proto (MLYPRO), Negrito (NGRT), and Senoi (SEN), measured by population size within each state. Gender was divided into male (GDRM) and female (GDRF), also measured by population size.

Table 1: Variables and Measurements

Acronym	**Variable Name**	**Measurement**
GDP	Gross Domestic Product	State-level GDP (RM million, constant prices)
MLYPRO	Malay Proto	Population size of Malay Proto Orang Asli
NGRT	Negrito	Population size of Negrito Orang Asli
SEN	Senoi	Population size of Senoi Orang Asli
GDRM	Gender Male	Population size of Orang Asli males
GDRF	Gender Female	Population size of Orang Asli females

3.2 Data Analysis Technique

Descriptive statistical analyses were first conducted to summarize the characteristics of the sample, highlighting the distribution of Orang Asli ethnic groups and gender composition across the nine states. To examine the relationships between the independent variables and the dependent variable (GDP), the study employed Ordinary Least Squares (OLS) regression. This method is suitable for estimating the effect of multiple predictors on a continuous dependent variable while controlling for the influence of other variables in the model.

3.3 Proposed Regression Model

The regression model for this study is specified as follows:

$$GDP = \alpha it + \beta 1MLYPROit + \beta 2NGRTOit + \beta 3SENit + \beta 4GDRMit + \beta 5GDRFit + \mu i$$

Where:

- GDP = Gross Domestic Product
- MLYPRO = Malay Proto
- NGRT = Negrito
- SEN = Senoi
- GDRM = Gender Male
- GDRF = Gender Female
- μi = Error term

4.0 Findings and Discussion

This section presents the findings from the empirical tests conducted using the methodology described earlier. The focus is on examining the relationship between the demographic composition of Orang Asli communities and the Gross Domestic Product (GDP) of selected Malaysian states from 2020 to 2024. Descriptive statistics are first provided for the dependent and independent variables, followed by an interpretation of the observed data distributions.

4.1 Descriptive Statistics

Table 4.1 reports the descriptive statistics for the dependent variable (GDP) and the independent variables representing Orang Asli ethnic groups (Malay Proto, Negrito, Senoi) and gender (Male and Female).

Table 2: Descriptive statistics of dependent variable and independent variables

Variable	**Mean**	**Median**	**Std. Dev.**	**Min**	**Max**
GDP (RM bilion)	97.08	51.50	110.20	23	432.10
Malay Proto (MLYPRO)	10109.51	1830	13669.30	12	44669
Negrito (NGRT)	767.64	36	1063.74	0	2950
Senoi (SEN)	12915.84	906	19501.42	28	58542
Male (GDRM, ln)	8.40	9.05	1.77	5.21	10.67
Female (GDRF)	11613.73	8200	13215.07	161	40838

Note: n = 45. GDP is Gross Domestic Product (RM billion); MLYPRO is Malay Proto population; NGRT is Negrito population; SEN is Senoi population; GDRM is Male population (log-transformed); GDRF is Female population.

The descriptive statistics indicate substantial variation in GDP across the nine states with Orang Asli populations, with values ranging from RM23 billion to RM432.1 billion. The high standard deviation (110.20) and skewness (2.14) reflect a concentration of economic activity in certain states, suggesting uneven regional development. For the independent variables, the Senoi group recorded the highest mean population (12,915.84) compared to Malay Proto (10,109.51) and Negrito (767.64). This highlights the dominance of Senoi communities in the Orang Asli demographic composition. Notably, the Negrito group exhibited a highly skewed distribution with a median of 36 but a maximum of 2,950, reflecting their small and unevenly distributed population. In terms of gender, Orang Asli females (mean = 11,613.73) outnumbered males, even when male population was logged to normalize the distribution. This suggests that female representation is a critical dimension in understanding the socio-economic role of Orang Asli communities. The overall data distributions point toward possible correlations between Orang Asli demographic characteristics and the economic performance of their respective states. These descriptive findings set the foundation for further econometric analysis using the Ordinary Least Squares (OLS) regression model.

Table 3: Pearson Correlation Matrix of the Research Variables

	GDP	**MLYPRO**	**NGRT**	**SEN**	**GDRM**	**GDRF**
GDP	1.0000					
MLYPRO	0.2248	1.0000				
NGRT	-0.2697	0.0063	1.0000			
SEN	-0.1058	0.2255	0.9026***	1.0000		
GDRM	0.2690	0.5844***	0.5819***	0.6768***	1.0000	
GDRF	0.0244	0.6638***	0.6998***	0.8783***	0.8077***	1.0000

*Note: n = 45. GDP is Gross Domestic Product (RM billion); MLYPRO is Malay Proto population; NGRT is Negrito population; SEN is Senoi population; GDRM is Male population (log-transformed); GDRF is Female population. *** indicates significance at the 1% level.*

The Pearson correlation matrix for the research variables is presented in Table 4.2. Based on the statistical significance level of 1%, several meaningful relationships emerge. GDP demonstrates a weak positive correlation with MLYPRO (r = 0.2248) and GDRM (r = 0.2690), suggesting that increases in Malay Proto and male Orang Asli populations are modestly associated with higher state-level GDP. However, GDP is negatively correlated with NGRT (r = -0.2697) and SEN (r = -0.1058), implying that higher representation of Negrito and Senoi populations is not directly linked to stronger economic outcomes in these states.

Among the independent variables, strong and significant correlations are observed. SEN is highly correlated with NGRT ($r = 0.9026$, $p < 0.01$) and GDRF ($r = 0.8783$, $p < 0.01$), reflecting demographic clustering of Senoi and female populations. Similarly, GDRM shows significant correlations with MLYPRO ($r = 0.5844$, $p < 0.01$), NGRT ($r = 0.5819$, $p < 0.01$), and SEN ($r = 0.6768$, $p < 0.01$). The strongest correlation is found between GDRF and SEN ($r = 0.8783$, $p < 0.01$), indicating a demographic dominance of females in Senoi communities.

Overall, the correlation coefficients fall within the range of -0.27 to 0.90. While some coefficients are relatively high (particularly between SEN and NGRT), they remain below the critical threshold of ±0.90 commonly used to detect multicollinearity. Thus, the results suggest that multicollinearity is unlikely to pose a serious problem in the subsequent OLS regression analysis.

Table 4: Regression Analysis of Ethnic and Gender Contributions to GDP in States with Orang Asli Communities

GDP (RM billion)	**Exp. Sign**	**Coeff.**	**Std. Error**	**P-value**
MLYPRO	+	0.168	0.083	0.051*
NGRT	±	-0.009	0.066	0.894
SEN	+	0.182	0.088	0.044**
GDRM	+	52.907	12.725	0.000***
GDRF	-	-0.356	0.174	0.047**
Constant		-251.998	90.613	0.008
Adj. R^2	0.4130			

*Note: n = 45. GDP is Gross Domestic Product (RM billion); MLYPRO is Malay Proto population; NGRT is Negrito population; SEN is Senoi population; GDRM is Male population (log-transformed); GDRF is Female population. * p < 0.10; ** p < 0.05; *** p < 0.01.*

As shown in Table 4.3, the OLS regression model explains 41.30% of the variation in state-level GDP (Adjusted $R^2 = 0.4130$). Among the independent variables, the Malay Proto (MLYPRO) group demonstrates a positive but marginally significant effect on GDP ($\beta = 0.168$, $p < 0.10$), suggesting that larger Proto-Malay populations may contribute modestly to economic activity in states inhabited by Orang Asli communities. This finding resonates with Human Capital Theory, which emphasizes that investments in education, skills, and community development enhance productivity (Becker, 1993). Although only marginally significant, the result underscores the potential of targeted empowerment programs for Proto-Malay communities to foster broader economic growth.

The Senoi group (SEN) shows a stronger and statistically significant relationship with GDP ($\beta = 0.182$, $p < 0.05$). As the largest Orang Asli subgroup in Malaysia, their contribution reflects the advantages of resource accessibility, land use, and agricultural participation (Nicholas, 2000). This finding aligns with Socioeconomic Empowerment Theory, which argues that the inclusion of marginalized groups in productive activities strengthens resilience and stimulates development (Alsop & Heinsohn, 2005). The evidence suggests that economic participation of larger subgroups like the Senoi generates measurable gains for state-level GDP.

By contrast, the Negrito (NGRT) population does not exhibit a significant relationship with GDP ($\beta = –0.009$, $p = 0.894$). This outcome may be explained by their relatively small population size and geographic concentration, which limits their measurable impact on macro-level economic outcomes. Although statistically insignificant, this result highlights the importance of subgroup disaggregation in Orang Asli policy planning, since smaller communities risk becoming economically invisible within aggregate datasets (Carey, 1976).

Gender dynamics also emerge as a critical determinant of GDP. The male population (GDRM) displays a strong and positive association with GDP ($\beta = 52.907$, $p < 0.01$). This reflects the continued reliance on male labor in sectors such as agriculture, construction, and industry, where Orang Asli men often dominate (World Bank, 2018). The finding is consistent with Human Capital Theory, as male labor participation rates structurally remain higher and more visible in state-level economic indicators (Khor & Lim, 2014).

Conversely, the female population (GDRF) is negatively and significantly associated with GDP ($\beta = –0.356$, $p < 0.05$). Interpreted through the lens of Gender and Development (GAD) Theory, this outcome underscores the systemic barriers that constrain Orang Asli women's economic participation, including limited access to education, wage employment, and land ownership (Mokhtar & Shamsudin, 2020). Rather than reflecting a lack of capacity, the negative coefficient signals structural inequalities that suppress women's economic contributions. This finding highlights the need for gender-sensitive interventions that empower Orang Asli women through entrepreneurship, training, and inclusive labor participation.

Taken together, the regression results reveal the demographic-economic interplay between Orang Asli ethnic composition, gender, and state GDP. While the Senoi and Proto-Malay populations emerge as positive contributors, the persistent gender gap highlights the enduring structural inequities faced by women. These findings collectively reinforce Human Capital Theory, Gender and Development Theory, and Socioeconomic Empowerment perspectives, underscoring the need for inclusive strategies that expand education, improve land access, and strengthen gender empowerment initiatives. Such approaches are essential for unlocking the full potential of Orang Asli communities in contributing to Malaysia's economic development.

5.0 Conclusion and Recommendations

The present study set out to investigate the correlations between economic growth, ethnic composition, and demographic characteristics, with the primary objective of understanding how these variables interact in shaping developmental outcomes. The Pearson correlation analysis revealed significant relationships, particularly between the indigenous groups, gender composition, and economic growth. These findings highlight the intricate interplay of cultural, social, and demographic factors in influencing national performance, extending beyond purely economic measures. By linking the results with theories of human capital and social stratification, the study demonstrates that ethnicity and gender remain important dimensions for economic analysis in a multicultural context such as Malaysia.

The results revealed that Senoi and Negrito communities, while showing close demographic and cultural linkages, demonstrated strong inter-correlations with gender categories. This suggests that indigenous group composition is highly relevant to understanding patterns of population participation and labor dynamics. The findings support the view that socio-demographic identities influence access to education, employment, and resources, which are critical determinants of human capital accumulation. From a theoretical standpoint, this contributes to the discourse on human capital theory by showing that structural factors tied to ethnicity and gender significantly affect developmental outcomes, thereby challenging the idea that skills and education alone are sufficient to explain variations in growth.

In terms of gender, the correlations indicated that both male and female populations were positively associated with ethnic categories, suggesting that gendered participation across groups is not uniform but deeply tied to ethnic identities. These findings reinforce gender and development theory, which emphasizes that gender disparities cannot be examined in isolation but are shaped by broader social and cultural dynamics. Thus, this study highlights the importance of addressing both ethnicity and gender concurrently in development policies, rather than treating them as separate dimensions.

Theoretically, the research advances the integration of human capital theory with social identity perspectives. It illustrates that economic growth is not only the result of aggregate capital accumulation but is also mediated by the cultural and demographic characteristics of the population. By evidencing significant associations between indigenous ethnic groups, gender distribution, and economic outcomes, the study underscores that social cohesion, inclusion, and equitable access to opportunities are essential for sustainable development. This contributes to existing scholarship by bridging economic and sociological approaches to understanding growth in multicultural societies.

Practically, the study provides several important recommendations. Policymakers should design targeted programs that enhance educational and economic opportunities for minority and indigenous groups, particularly the Senoi and Negrito communities, who remain vulnerable to structural marginalization. In addition, gender-sensitive policies should be prioritized to ensure balanced labor force participation and to address disparities in income and employment across male and female populations. This includes investments in women's education and entrepreneurship initiatives, which have been shown to generate multiplier effects on household welfare and community development.

From a methodological standpoint, this research contributes by demonstrating the utility of correlation analysis in unpacking the interrelationships among economic, ethnic, and demographic variables. While causality cannot be inferred, the identification of strong and significant associations provides a foundation for more advanced analyses such as regression and structural equation modeling. Future studies can build on this approach by incorporating longitudinal data, which would allow for the examination of how these relationships evolve over time in response to policy interventions and socio-economic shifts.

In terms of theoretical contributions, the study reinforces the relevance of human capital theory while highlighting its limitations when applied in multicultural contexts. By showing that ethnicity and gender exert significant influence on economic outcomes, the findings advocate for a more nuanced framework that integrates social stratification and identity-based perspectives. This contributes to broadening the scope of development theory by positioning demographic and cultural dimensions as central to understanding the drivers of growth.

Finally, the study provides a roadmap for future research by suggesting the integration of qualitative approaches to complement quantitative findings. In-depth interviews and ethnographic studies with members of indigenous and gendered groups could shed light on the lived experiences behind the observed statistical patterns. Such mixed-methods approaches would not only deepen theoretical understanding but also provide practical insights for inclusive and equitable policymaking. Ultimately, the contributions of this study lie in advancing both theoretical discourse and policy design, ensuring that economic growth is examined through the lenses of equity, identity, and social cohesion.

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