INSTITUTIONAL LOCATION FACTORS AND SOCIOECONOMIC WELFARE OF HOST COMMUNITIES: EMPIRICAL EVIDENCE FROM NIGERIAN ARMY UNIVERSITY BIU (NAUB), BORNO STATE, NIGERIA

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Abstract

The location of higher education institutions (HEIs) in developing communities is widely regarded as a driver of socioeconomic transformation. This study examines the influence of institutional location factors on the economic welfare of the host community of the Nigerian Army University Biu (NAUB), situated in Biu, Borno State, Nigeria. Anchored in location theory as articulated by Weber (1909) and von Thünen (1826), the study adopts a descriptive cross-sectional survey design with a quantitative approach. Research instruments were designed, validated by subject-matter experts, and administered to 422 respondents through stratified and systematic random sampling. A total of 396 usable responses were retrieved, comprising 107 NAUB students, 135 staff members, and 154 community members. Data were analysed using descriptive statistics, Pearson correlation, multiple regression analysis, and one-way Analysis of Variance (ANOVA). Regression results reveal that employment opportunity and infrastructure significantly and positively spurred the economic welfare of the host community, while cost of living exerted a marginally significant positive effect. Security shows a positive but statistically insignificant relationship with economic welfare, and local business growth yields a negative though insignificant coefficient. One-way ANOVA results indicate significant perceptual differences among NAUB students, staff, and community members regarding the socioeconomic benefits of NAUB's location in Biu. The study recommends sustained investment in employment creation, infrastructural development, and security to maximise NAUB's socioeconomic contribution to the Biu community.

Keywords: Higher Education Institutions; Location Theory; Economic Welfare; Employment; Infrastructure; Host Community; Borno State; Nigeria

JEL Classification: A14, I31, O15, I38

1. Introduction

The establishment of higher education institutions (HEIs) in a given locality is seldom a neutral act. Beyond their primary mandate of knowledge creation and dissemination, universities and colleges function as economic engines that reshape the communities in which they are embedded. From stimulating local businesses and generating employment to attracting population inflows and catalysing infrastructural development, HEIs have long been recognised as powerful agents of regional transformation (Drucker & Goldstein, 2021; Watson & Hall, 2020). In developing countries, where access to quality education and economic opportunities often remains unevenly distributed, the strategic placement of a university can redefines the developmental trajectory of an entire town or region (Agboola & Olatunji, 2019; Akpotor, 2018).

Nigeria's higher education landscape reflects this pattern. Communities that host federal and state universities have, over time, experienced growth in commerce, housing, transportation, and public services. Well-documented cases from Zaria in Kaduna State to Nsukka in Enugu State illustrate how the presence of a university can transform a modest settlement into a thriving urban centre. Yet these gains are not automatic. The same studies that celebrate the economic multiplier effects of HEIs also caution that host communities may face rising costs of living, overstretched infrastructure, and widening social inequalities as a result of institutional presence (Ogunleye & Adebayo, 2020; Adams & Osei, 2019).

The Nigerian Army University Biu (NAUB), established in 2018 in Biu, a Local Government Area in the southern part of Borno State, presents a particularly compelling and under-studied case. Biu is predominantly agricultural, with a historically limited economic base. Prior to NAUB's establishment, the College of Education Waka-Biu was the only tertiary institution serving the area. The creation of NAUB introduced a new demographic layer to Biu, bringing students, faculty, and administrative staff whose combined economic activity has begun to reshape local markets, housing, and public services. What makes NAUB especially distinctive, however, is its military orientation: as a university under the Nigerian Army, it operates within a security-conscious framework that introduces dynamics, such as restricted access zones, military personnel integration, and heightened law enforcement, absent from conventional civilian universities.

Despite NAUB's growing footprint, there is a notable absence of empirical evidence on the nature and extent of its socioeconomic impact on Biu's host community. Anecdotal accounts suggest a mixed reality: while some residents report improved access to markets, employment, and services, others point to rising commodity prices, strained public infrastructure, and limited access to the university's direct benefits. The extent to which NAUB's unique characteristics as a military-oriented HEI amplify or moderate these effects remains entirely unexplored in the academic literature.

This study addresses that gap by investigating the influence of five institutional location factors employment opportunity, local business growth, cost of living, infrastructure, and security on the economic welfare of Biu's host community.

The findings contribute to at least three bodies of knowledge: the literature on HEIs and community development, the emerging scholarship on military-oriented universities, and the policy discourse on optimising universitycommunity relations in Nigerian settings. The remainder of the paper is organised as follows: Section 2 reviews relevant empirical literature. Section 3 outlines the theoretical framework. Section 4 describes the research methodology. Section 5 presents and discusses the results. Section 6 concludes the paper and offers recommendations.

2. Literature Review

2.1 Study Area

Biu is a Local Government Area situated in the southern part of Borno State, north-eastern Nigeria. Historically, the town's economy has been anchored in subsistence agriculture, and it serves as the administrative hub of the Biu Emirate Council. Prior to

2018, the College of Education Waka-Biu was the only tertiary institution operating in the area, limiting access to higher education and constraining the expansion of the local knowledge economy. The establishment of NAUB in 2018 with faculties spanning Arts and Management Social Sciences, Natural and Applied Sciences, Computing, Engineering Technology, and Environmental Sciences marked a significant turning point for the community. NAUB currently enrols approximately 5,678 students and employs 2,678 members of staff, and has graduated five cohorts of students since its inception. These figures translate into a substantial and sustained influx of people, goods, and services into Biu, with discernible effects on local markets, housing demand, infrastructure use, and security dynamics.

2.2 Economic Impacts of Higher Education Institutions

A substantial body of empirical research has established that HEIs generate direct and indirect economic benefits for their host communities. Drucker and Goldstein (2021) conducted a rigorous quantitative analysis of universities in the United States and found that they contribute significantly to local job creation, business formation, and tax revenues. Their study demonstrated that the multiplier effects of university spending through student consumption, staff salaries, and institutional procurement extend well beyond the campus boundary. In the Nigerian context, Agboola and Olatunji (2019) reached broadly similar conclusions, finding that a state university in south-western Nigeria stimulated local business development particularly in the housing, retail, and transportation sectors. Egwu et al. (2019), focusing on Ebonyi State University in Abakaliki, documented comparable patterns of commercial expansion and employment generation, suggesting that these dynamics reflect a general pattern of university-led local economic stimulation.

Akpotor (2018) provides perhaps the most comprehensive Nigerianfocused account of how HEIs affect host communities. Beyond employment and income generation, Akpotor identifies access to affordable educational facilities for dependents of staff, improved standards of living, and enhanced availability of social amenities as tangible gains for host communities. However, the same study cautions that institutional presence is not without costs: host towns frequently experience surges in crime, rising commodity and housing prices, pressure on existing infrastructure, and occasional cultural tensions between the academic and indigenous populations.

2.3 Social and Cultural Dimensions

Beyond economics, the presence of HEIs reshapes the social fabric of host communities in ways that are both enriching and disruptive. Eneh and Owo (2018) found that universities in Nigeria serve as crucibles of cultural exchange, bringing together students, faculty, and community members from diverse ethnic and regional backgrounds. While this diversity enriches social interaction and broadens cultural horizons, it can simultaneously generate friction when the values and behaviours associated with campus life conflict with indigenous norms. Ogunleye and Adebayo (2020) add a critical dimension, arguing that the benefits of HEIs are unevenly distributed: community members with the education and capital to participate in the university economy capture disproportionate gains, while others feel marginalised.

2.4 Infrastructure and Cost of Living

The infrastructural implications of HEIs for host communities are widely acknowledged. Watson and Hall (2020), drawing on evidence from developing countries, found that universities frequently catalyse improvements in road networks, water supply, electricity provision, and healthcare access. However, these gains tend to cluster around the university campus and immediate environs. On the cost of living, Adams and Osei (2019) present evidence from Ghana showing that residential rents doubled within a decade of a university's establishment, pricing out lower-income indigenous households. Olanrewaju and Abubakar (2022), studying a federal university in northern Nigeria, similarly document rising housing costs, traffic congestion, and environmental degradation findings highly pertinent to the Biu context given NAUB's rapid growth trajectory.

2.5 MilitaryOriented Higher Education Institutions

While the general HEI literature is extensive, studies specifically examining military-oriented universities and their community impacts remain scarce. Onuoha and Adejumo (2021) explore how institutions with defence mandates contribute to regional development, finding that military universities generate a distinctive socioeconomic profile: they bring robust security infrastructure that can reduce crime and create a sense of order, while operational restrictions may limit the extent to which the broader community accesses institutional benefits. NAUB's configuration as a university embedded in Borno State security landscape adds further complexity to this analysis.

3. Theoretical Framework

This study is anchored in location theory, a framework with classical roots in the works of Weber (1909) and von Thünen (1826) and further elaborated in contemporary regional economics by McCann (2020). At its core, location theory examines how the geographic placement of economic activities firms, institutions, or public facilities shapes the spatial distribution of economic outcomes, resource flows, and welfare across communities. The central proposition is that location is not merely a physical coordinate but an active determinant of economic behaviour: where an institution is situated influences who benefits from it, how resources flow toward and away from it, and what structural changes occur in the surrounding economy.

Von Thünen's (1826) model of concentric land-use rings, originally developed to explain agricultural land use around a central market, provides an intuitive starting point for understanding how NAUB's presence reorganises economic activity in Biu. As the university constitutes a new economic focal point in the town, businesses, housing, and services tend to concentrate in proximity to it, generating rent gradients and price differentials that mirror the classical land-use patterns von Thünen described. Weber (1909), whose work focused on the optimal location of industries, adds a complementary dimension: the placement of an institution generates cost and benefit differentials that alter local labour markets, transportation patterns, and production costsdirectly relevant to the employment, infrastructure, and cost-of-living variables examined in this study.

In contemporary terms, McCann (2020) grounds location theory within modern urban and regional economics, demonstrating that the spatial embedding of institutions generates

agglomeration effects, the clustering of economic activity, knowledge spillovers, and labour market pooling that compound over time. Applied to NAUB, this perspective helps explain why the university's impact on Biu's economy is expected to intensify as the institution matures.

Each of the five independent variables maps onto the logic of location theory. Employment opportunity reflects the direct and indirect labour market effects of a new institutional presence. Local business growth captures the commercial agglomeration that tends to form around spatially concentrated demand. Cost of living reflects price effects of increased demand for goods, services, and housing. Infrastructure captures the public investment directed toward areas of growing economic significance. Security, in the NAUB context, reflects the distinctive reorganisation of the safety landscape around a defence-oriented facility. Together, these variables constitute the channels through which NAUB's geographic positioning translates into welfare outcomes for Biu's residents.

4. Methodology

4.1 Research Design

This study adopts a descriptive cross-sectional survey design employing a quantitative approach. This design enables the systematic collection, analysis, and interpretation of numerical data from multiple respondent groups at a single point in time. It is acknowledged that cross-sectional data limit causal inference; results should therefore be interpreted as indicative of associations rather than causal effects. The target population comprises three groups: residents of Biu (including local business owners, employees, and households), NAUB students, and NAUB staff.

4.2 Sample Size and Sampling Technique

Sample size was determined using Cochran's (1977) formula for large populations:

$$n = \frac{(Z^2 \times P(1-P))}{e^2} \qquad (1)$$

where n is the required sample size, Z = 1.96 (95% confidence level), P = 0.5 (assumed maximum population variability), and e = 0.05 (margin of error). This yields a minimum sample of 384 respondents. Accounting for a 10% non-response adjustment, the target sample was set at 422 respondents. A combination of stratified and systematic random sampling was employed, with the population divided into three strata: NAUB students, NAUB staff, and community residents.

4.3 Data Collection Instrument

A structured, closedended questionnaire was organised into five sections: demographic information, economic impact, social impact, security impact, and general perceptions of NAUB's presence. Items were measured on a five-point Likert scale ranging from 1 (Strongly Disagree) to 5 (Strongly Agree). The instrument was validated by subject-matter experts for content validity. Cronbach's alpha values exceeded the 0.70 threshold recommended by Nunnally (1978) for all constructs, confirming adequate reliability. A

total of 396 usable questionnaires were retrieved from the 422 distributed, representing a response rate of 93.8%.

4.4 Model Specification

The study estimates the following ordinary least squares (OLS) regression model:

$$EWH = \beta_0 + \beta_1 EOP + \beta_2 LBG + \beta_3 COL + \beta_4 INFRA + \beta_5 + \mu \qquad (2)$$

where EWH denotes the economic welfare of the host community; EOP, employment opportunity; LBG, local business growth; COL, cost of living; INFRA, infrastructure; and SEC, security. β_0 is the constant, β_1 through β_5 are regression coefficients, and μ is the error term.

4.5 Method of Analysis

Analysis proceeded in four stages. First, descriptive statistics (means, standard deviations, and frequency distributions) characterised the sample. Second, Pearson correlation analysis examined bivariate relationships among variables. Third, multiple regression analysis assessed the simultaneous influence of all five location factors on economic welfare. Fourth, one-way ANOVA tested for significant differences in perceptions among NAUB students, NAUB staff, and community members.

5. Results and Discussion

5.1 Demographic Profile of Respondents

Table 5.1 presents the demographic characteristics of the 396 respondents. By occupation, students accounted for 27.0% (n = 107), NAUB staff for 34.1% (n = 135), and community memberscomprising civil servants outside NAUB, traders, and community leaders for 38.9% (n = 154). In terms of ethnicity, 25.5% identified as Biu indigenes, 19.7% as Borno State indigenes from other areas, and 54.8% as non-indigenes, reflecting the significant demographic diversification that NAUB has brought to the town. The majority of respondents (65.4%) held tertiary qualifications. Regarding residential tenure, 33.6% had lived in Biu for ten years or more, while 31.3% had been resident for four to six years. All 396 respondents were Nigerian citizens.

Table 5.1: Demographic Statistics of Respondents

Occupation	Frequency	Percent	Valid Percent	Cumulative Percent
student	107	27.0	27.0	28.0
staff	135	34.1	34.1	61.1
leaders	154	38.9	38.9	100.0
Total	396	100.0	100.0	

Ethnic group				
BIU INDIGINE	101	25.5	25.5	25.5
BORNO STATE INDIGINE	78	19.7	19.7	45.2
NON INDIGINE	217	54.8	54.8	100.0
Total	396	100.0	100.0	
Educational Level				
PRIMARY	8	2.0	2.0	2.0
SECONDARY	88	22.2	22.2	24.2
TERTIARY	259	65.4	65.4	89.6
QURANIC	41	10.4	10.4	100.0
Total	396	100.0	100.0	
Years living in the community				
1-3	85	21.5	21.5	21.5
4-6	124	31.3	31.3	52.8
7-9	54	13.6	13.6	66.4
10 and above	133	33.6	33.6	100.0
Total	396	100.0	100.0	
Nationality				
NIGERIAN	396	100.0	100.0	100.0

Source: Authors' compilation

5.2 Descriptive Statistics

Table 5. 2 reports the means and standard deviations for all constructs. All variables record mean scores above 4.0 on the five-point Likert scale, indicating that respondents generally agreed with the statements measuring each construct. Economic welfare (EWH) recorded the highest mean (M = 4.376, SD = 0.735), while cost of living (COL) recorded the lowest mean (M = 4.117, SD = 0.721). The relatively narrow range of means suggests a broadly positive overall assessment of NAUB's socioeconomic influence, though the

variation in standard deviations indicates that perceptions are not uniformly held across all dimensions.

Table 5. 2: Descriptive Statistics

	Mean	Std. Deviation	N
EWH	4.3763	0.73537	396
EOP	4.1561	0.63052	396
LBG	4.1477	0.64897	396
COL	4.1174	0.72092	396
INFRA	4.2576	0.65333	396
SEC	4.2278	0.59546	396

Source: Authors' compilation

5.3 Correlation Analysis

Table 5. 3 presents the Pearson correlation matrix. All variables are positively and significantly correlated with economic welfare (EWH). The strongest bivariate relationship is between EWH and EOP (r = 0.715), followed by EWH and LBG (r = 0.602) and EWH and INFRA (r = 0.595).

Table 5. 3: Pearson Correlation Matrix

Pearson Correlations	EWH	EOP	LBG	COL	INFRA	SEC
EWH	1.000	0.715	0.602	0.489	0.595	0.505
EOP	0.715	1.000	0.814	0.597	0.674	0.663
LBG	0.602	0.814	1.000	0.699	0.667	0.627
COL	0.489	0.597	0.699	1.000	0.522	0.495
INFRA	0.595	0.674	0.667	0.522	1.000	0.657
SEC	0.505	0.663	0.627	0.495	0.657	1.000

Source: Authors' compilation

5.4 Multiple Regression Results

Table 5. 4 presents the OLS regression results. Employment opportunity (EOP) exerts the largest and most precisely estimated positive effect on economic welfare ($\beta = 0.690$, t =

9.231, $p < 0.001$). This indicates that a one-unit increase in employment opportunity is associated with a 0.690unit increase in economic welfare, holding all other variables constant. This result is consistent with Drucker and Goldstein (2021), Agboola and Olatunji (2019), and Akpotor (2018), all of whom identify employment generation as the primary channel through which HEIs benefit host communities.

Infrastructure (INFRA) is the second strongest significant predictor ($\beta = 0.240$, $t = 4.118$, $p < 0.001$). Improved roads, housing developments, and utilities attributable to NAUB's establishment appear to have meaningfully enhanced welfare among residents, consistent with Watson and Hall (2020) and Eneh and Owo (2018).

Cost of living (COL) has a positive but marginally significant effect on economic welfare ($\beta = 0.084$, $t = 1.692$, $p = 0.092$). This ambiguity likely reflects countervailing pressures of rising prices particularly for housing and food documented by Adams and Osei (2019) and Olanrewaju and Abubakar (2022) in comparable settings.

Local business growth (LBG) yields a negative and statistically insignificant coefficient ($\beta = -0.068$, $t = -0.880$, $p = 0.380$). This counterintuitive finding may reflect the high collinearity between LBG and EOP ($r = 0.814$), which suppresses LBG's independent contribution. Alternatively, much of the commercial activity stimulated by NAUB may be captured by non-indigene traders who constitute 54.8% of the sample attenuating the welfare effect for the broader community. As NAUB matures, LBG's welfare contribution may strengthen.

Security (SEC) has a positive but insignificant coefficient ($\beta = 0.037$, $t = 0.596$, $p = 0.545$). While the direction is consistent with expectations given NAUB's military presence, the lack of significance likely reflects the deeply entrenched security deficits of the north-eastern Nigerian context, where any improvements are perceived as insufficient relative to community needs.

Table 5. 4: Regression Results (Determinants of Economic Welfare of Host Community)

Variables	Coefficients	Std. Error	t-statistics	Sig.
(Constant)	0.584*	0.199	2.928	0.004
EOP	0.690*	0.075	9.231	0.000
LBG	-0.068	0.077	-0.880	0.380
COL	0.084**	0.049	1.692	0.092
INFRA	0.240*	0.058	4.118	0.000
SEC	0.037	0.062	-0.606	0.545

*Note: * significant at 1%; ** significant at 10%. Dependent variable: Economic Welfare of Host Community (EWH).*

Source: Authors' compilation

5.5 ANOVA Results and Post-Hoc Analysis

Table 5. 5 presents the descriptive statistics for the three respondent groups used in the one-way ANOVA. Prior to the main test, Levene's test (Table 5. 6) confirmed the assumption of homogeneity of variances ($F(2, 393) = 0.293$, $p = 0.746$), and the Shapiro-Wilk normality assumption was found to be broadly tenable across groups.

Table 5. 5: Descriptive Statistics for ANOVA (Perceptions of Socioeconomic Benefits)

Group	N	Mean	Std. Dev	Std. Error	95% Conf Int for Mean		Min	Max
					Lower Bound	Upper Bound		
student	107	4.1215	0.57117	0.05522	4.0120	4.2310	1.90	5.00
staff	135	4.0207	0.68077	0.05859	3.9049	4.1366	1.00	5.00
Comm. members	154	4.2994	0.55016	0.04433	4.2118	4.3869	1.50	5.00
Total	396	4.1563	0.61367	0.03084	4.0957	4.2169	1.00	5.00

Source: Authors' compilation

Table 5. 6: Levene's Test of Homogeneity of Variances

Levene Statistic	df1	df2	Sig.
0.293	2	393	0.746

Source: Authors' compilation

The one-way ANOVA result (Table 5. 7) is statistically significant ($F(2, 393) = 7.918$, $p < 0.001$), indicating that the three groups differ significantly in their perceptions of NAUB's socioeconomic benefits. Community members ($M = 4.299$, $SD = 0.550$) hold the most favourable perceptions, followed by NAUB students ($M = 4.122$, $SD = 0.571$) and NAUB staff ($M = 4.021$, $SD = 0.681$).

Table 5. 7: One-Way ANOVA (Perception of Socioeconomic Benefits)

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	5.762	2	2.881	7.918	0.000
Within Groups	142.992	393	0.364		
Total	148.754	395			

Source: Authors' compilation

Post-hoc comparisons using the Tukey HSD test (Table 5. 8) reveal that the statistically significant difference lies specifically between NAUB staff and community members (Mean Difference = −0.279, $p < 0.001$). Community members hold significantly more favourable perceptions of NAUB's socioeconomic contributions than NAUB staff. This finding is noteworthy: while staff perceptions may be tempered by an insider awareness of institutional constraints and resource limitations, community members who interact with NAUB's outputs without direct organisational attachment appear to experience its economic presence as broadly positive. No significant perceptual difference was found between students and staff ($p = 0.401$), nor between students and community members at conventional significance levels ($p = 0.051$).

Table 5. 8: Post-Hoc Test (Tukey HSD Pairwise Comparisons)

(I) Group	(J) Group	Mean Diff. (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
NAUB student	staff	0.10075	0.07807	0.401	-0.0829	0.2844
	Community members	-0.17786	0.07592	0.051	-0.3565	0.0007
NAUB staff	student	-0.10075	0.07807	0.401	-0.2844	0.0829
	Community members	-0.27861*	0.07112	0.000	-0.4459	-0.1113
Community members	student	0.17786	0.07592	0.051	-0.0007	0.3565
	staff	0.27861*	0.07112	0.000	0.1113	0.4459

*Note: * The mean difference is significant at the 0.05 level.*

Source: Authors' compilation

6. Conclusion and Recommendations

6.1 Conclusion

This study examined how the location of the Nigerian Army University Biu influences the economic welfare of Biu's host community in Borno State. Grounded in location theory and drawing on primary survey data from 396 respondents, the findings confirm that employment opportunity and infrastructure are the dominant channels through which NAUB's presence enhances community welfare. Cost of living improvements are detectable but modest in their current welfare effects, while local business growth and security though positively oriented have yet to yield statistically significant welfare gains.

The ANOVA results add an important nuance: perceptions of NAUB's benefits are not uniform across the community. Community members assess the institution's

socioeconomic contribution more favourably than NAUB staff, suggesting that the direct beneficiaries of NAUB's economic presence in the marketplace and labour market view the institution differently from those embedded within it.

These results are consistent with the broader literature on HEIs and host community development while contributing new evidence on the specific dynamics of a militaryoriented university in a predominantly rural Nigerian setting. NAUB is already functioning as an economic catalyst for Biu, albeit unevenly, and its developmental potential is far from exhausted.

6.2 Recommendations

Based on the findings, the following recommendations are advanced. First, NAUB's management and the federal government should deepen employment integration with the host community by instituting formal local-hiring policies and creating structured pathways for Biu indigenes to access jobs at the university and in NAUBrelated businesses. Second, continued investment in physical infrastructure particularly road connectivity between the campus and surrounding residential and commercial areas would strengthen the welfare multipliers already identified. Third, to address the marginal cost-of-living effect, NAUB should explore partnerships with local market associations to facilitate the supply of affordable consumer goods. Fourth, security cooperation between NAUB's military establishment and Borno State civilian authorities should be formalised and expanded, with community policing initiatives that extend the security dividend beyond the immediate campus perimeter. Fifth, NAUB should develop an inclusive enterprise development programme targeted at Biu indigenes, to ensure that the commercial agglomeration stimulated by the university translates into welfare gains for the indigenous population.

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