



**SOCIAL IMPACT OF PROJECT IMPLEMENTATION FOR SUSTAINABILITY:
A CASE STUDY OF FLYOVER CONSTRUCTION WITHIN BAUCHI METROPOLIS**

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ABSTRACT

The study examined social impact assessment (SIA) of project implementation for sustainability a case study of flyover construction in Bauchi metropolis, Nigeria. A multi-stage sampling technique was employed in selecting 200 respondents for the study. Data were collected using structured questionnaires and analyzed using descriptive statistics and Tobit regression. The results showed that majority (72.0%) of respondents were married, within the economically active age bracket of 35–44 years (40.0%), and had operated in the affected area for more than 10 years (42.5%). The results of the regression analysis revealed that educational level ($P < 0.01$) and impact on business ($P < 0.03$) were the significant factors influencing vulnerability of the respondents to the effects of flyover construction. The study further revealed that economic challenges to effects of flyover were economic hardship (90.5%), loss of income (45.0%) and loss of business premises (31.0%). Similarly, the constraints to effective implementation of the project were inadequate financial compensation (66.0%), lack of alternative business premises (59.0%), and poor relocation arrangements (48.5%). The study concludes that flyover construction has social impact on livelihood restoration, stakeholder engagement, and compensation mechanisms and it is influenced by educational level and impact on business. In view of the constraints highlighted the study recommends the conduction of formal SIA, community engagement, timely and fair compensation, provision of alternative trading spaces, and capacity-building programs for affected business owners by the project implementation body.

Keywords: Social, Impact, Assessment, Sustainability, Implementation

INTRODUCTION

Infrastructure development constitutes a fundamental driver of urban transformation and economic growth in developing nations across the globe (Wang *et al.*, 2020). Large-scale construction projects, including flyovers and road networks, are increasingly being implemented to address congestion challenges and improve transportation efficiency in rapidly growing urban centres. The United Nations Sustainable Development Goals (SDGs), particularly Goal 9 (Industry, Innovation and Infrastructure) and Goal 11 (Sustainable Cities and Communities), recognise infrastructure investment as essential for achieving sustainable development outcomes (United Nations, 2020). However, the implementation of such infrastructure projects frequently generates complex social and economic consequences for nearby communities, particularly affecting vulnerable groups whose livelihoods depend heavily on location-specific customer access and trading environments (Wang *et al.*, 2020). Social Impact Assessment (SIA) has emerged globally as a tool for understanding and managing the social consequences of planned interventions, including infrastructure projects. Impact assessment is the process of analysing, monitoring, and managing the intended and unintended social consequences of planned interventions (Vanclay *et al.*, 2020). The conceptual foundations of SIA rest on the recognition that development initiatives generate both intended benefits and unintended consequences that extend beyond physical and economic dimensions to encompass community wellbeing, social cohesion, cultural values, and quality of life (Esteves *et al.*, 2021).

The significance of SIA in developing country cannot be overstated. Nations characterised by rapid urbanisation, institutional capacity constraints, and significant informality in economic activities face particular challenges in ensuring that infrastructure investments deliver equitable outcomes. Amaeshi and Idemudia (2020) observe that infrastructure projects in sub-Saharan Africa often proceed without adequate consideration of their social impacts, resulting in displacement, livelihood disruption,



and community opposition that undermine project objectives and developmental benefits. The World Bank (2021) emphasises that infrastructure investments must be designed and implemented with attention to social sustainability principles, including stakeholder engagement, impact mitigation, and benefit sharing, to ensure that they contribute positively to poverty reduction and inclusive development. Rapid urbanization in Nigeria has intensified the demand for transport infrastructure such as roads, bridges, and flyovers to ease congestion and stimulate economic activities. While such projects are expected to improve mobility and enhance long-term economic growth, however generate substantial short and medium-term social consequences for affected populations. Therefore, there is a strong need to examine not only the economic benefits of infrastructure projects but also their social implications in order to promote sustainable development. This study focuses on examining the social impact assessment (SIA) in project implementation for sustainability, using the flyover construction within Bauchi metropolis as a case study. The study is limited to selected areas within Bauchi metropolis where small-scale business owners are directly affected by the flyover construction project.

Infrastructure development is widely regarded as a catalyst for economic growth and urban mobility improvement in developing countries. In Nigeria, successive governments have invested heavily in transport infrastructure such as roads, bridges, and flyovers to address traffic congestion, enhance connectivity, and stimulate commercial activities. In line with national development priorities, several urban centres, including Bauchi metropolis, have witnessed the construction of flyovers aimed at improving traffic flow and reducing transportation bottlenecks. While these projects are expected to generate long-term economic benefits, emerging literature has shown that infrastructure development often produces significant short- and medium-term social consequences, particularly for vulnerable urban groups. Studies as Vanclay, (2020); Alomoto *et al.* 2022) emphasize that social impact assessment (SIA) is critical in identifying, predicting, and managing the social consequences of development projects to ensure sustainability and social equity. However, in many developing countries, including Nigeria, the practical integration of SIA into infrastructure planning remains weak, fragmented, or insufficiently localized (Akiyode & Khan, 2021; UNEP, 2021). There is limited empirical evidence on whether small-scale business owners in Bauchi metropolis are aware of SIA processes, whether they were consulted before or during project implementation, and how they perceive the fairness and inclusiveness of mitigation measures. Without such evidence, it becomes difficult to evaluate whether sustainability principles particularly social sustainability is being effectively integrated into urban infrastructure development, it is against this backdrop that the study was conducted.

The broad objective of the study is to examine the social impact assessment in project implementation for sustainability: a case study of the effect of fly over construction within the Bauchi metropolis. The specific objective were to;

- i. describe the socio-economic characteristics of respondents in Bauchi metropolis;
- ii. determine the factors influencing the vulnerability of the respondents towards the effect of the flyover construction;
- iii. identify the constraints militating against the integration of SIA and Stakeholders engagement in project implementation in Bauchi Metropolis

METHODOLOGY

The Study Area

The study was carried out in Bauchi Metropolis, Bauchi Local Government Area (LGA) of Bauchi State, Nigeria. It lies along 10° 17' East'. and Longitude 9° 47' North an altitude of 6902 meters above sea level. Bauchi Metropolis has a population of approximately 493,730 people based on the 2006 census. The population projection for 2022 is around 881,600. The projected population of Bauchi Metropolis by 2025 is approximately 724,000 people. For Bauchi State, the projected population is around 9,281,000, marking an 11.7% increase from the 2022 estimate. The main occupations of the people in Bauchi Metropolis include: Agriculture: farming and livestock production. Trade and Commerce: majority of the people are involved in small-scale businesses, trading goods and services. Craftsmanship: people are engaged in various crafts like blacksmithing, weaving, and pottery. The



estimated population around Wunti and Central Market where the fly over construction was located considering the market's significance and location was estimated to be 315000 people. They are densely populated areas with a high concentration of traders and residents. Consequently, rains start earlier in the southern part of the State, where rain is heaviest and lasts longer. Here the rains start in April with the highest record amount of 1,300 millimeters per annum. In contrast, the northern part of the state receives the rain late, usually around June or July and records the highest amount of 700 millimetres per annum. In the same vein, the weather experienced in the south and the north varies considerably. While it is humidly hot during the early part of the rainy season in the south, the hot, dry and dusty weather lingers up to the north. In addition to rainfall, Bauchi State is watered by a number of rivers. This includes the Gongola and Jama'are rivers. The major economic activities of the study area were mainly businesses comprised of small and medium enterprises, petty traders, input dealers, agro dealers, artisan, among others. (BSEEDS, 2016), (Bauchi State agricultural development program, BSADP, 2015).

Sampling Techniques and Sample Size

A referral sampling technique was used in selecting the respondents for this study. The target population comprised small-scale business owners operating within areas affected by the flyover construction in Bauchi metropolis. In the first stage, two major markets within the Bauchi metropolis. Wunti Market and Central Market were purposively selected. These markets were selected because they were major commercial centres located within the flyover construction corridor and were directly affected by the construction activities. The purposive selection was appropriate since the study specifically focused on areas experiencing direct social and economic impacts of the project. In the second stage, small-scale business owners within the selected markets were identified using the snowball sampling technique. Due to the absence of a formal sampling frame, business registration records, or cooperative associations that could provide a comprehensive list of affected operators, it was not possible to adopt simple random sampling. Initial respondents were identified through preliminary field visits and key informants within each market. These respondents subsequently referred other small-scale business owners who met the study criteria namely those operating within the affected area and experiencing direct or indirect effects of the flyover construction. The referral process continued until the required number of respondents was obtained. A total of 200 respondents were selected for the study, comprising 100 small-scale business owners from Wunti Market and 100 from Central Market. The equal allocation was done to ensure balanced representation of respondents from both markets and to allow for comparative analysis between the two study locations.

Method of Data Collection

Data for the study were collected through the administration of structured questionnaire. The questionnaire was structured into sections in line with the specific objectives of the study. A total of 200 questionnaires were distributed and retrieved which were further subjected to analysis.

Method of Data Analysis

Data collected were analysed using descriptive and inferential statistics. Descriptive statistics such as mean and frequency distribution were used to achieve objective i and iii. While Tobit regression was used in analyzing objective ii. The explicit form of the model is as follows;

Tobit regression model

Tobit regression model was used to determine the factors influencing the vulnerability of the respondents towards the effect of the flyover construction (Objective iii). The Tobit model is a statistical model proposed by James Tobin in 1958 (Alawode and Aderele 2021) to describe the relationship between a dependent variable (Y) and independent variables X_i . β_s are the coefficients determining the relationship between the independent variable and explanatory (dependent) variables. It is a model with a normally distributed error term U_i to capture random influences on the relationship. Tobit model can be specified empirically as;

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \dots + \beta_{12} X_{12} + U_i \quad \dots (1)$$

Where;

Y = the observed dependent variable



X_i = vector of factors influencing the vulnerabilities
 β = vector of unknown parameters to be estimated
 U = residuals that are independently and normally distributed with mean zero and a constant variable.

The model is specified as:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \dots + \beta_{12} X_{12} + U_i \quad \dots (2)$$

where;

Y = Vulnerability to the effects of fly over (1= Yes, 0 = No)

X_1 = Age of the Respondents (years)

X_2 = Marital status of the respondents (1= Married, 2= Single, 3= Divorced, 4= Widowed)

X_3 = Educational level (years of formal education)

X_4 = Major occupation (1= business, 0 if otherwise)

X_5 = Duration of Residence (years)

X_6 = Impact of flyover on living situation

X_7 = Impact on business (1= Yes, 0 = No)

X_8 = Experience displacement due to construction (years)

RESULTS AND DISCUSSION

Socio-Economic Characteristic of the Respondents

Marital Status and Educational Level of the Respondents

The results in Table 1 revealed that 40.0% of the respondents were within the age bracket of 35–44 years, followed by 28.0% who were 45 years and above, while 21.0% fell within 25–34 years. Similarly, the results indicated that only 9.0% of the respondents were between 18–24 years, whereas 2.0% were under 18 years. This shows that the majority of respondents were adults in their active and economically productive years, implying that they were matured enough to provide meaningful information on the social impact of the flyover construction within Bauchi metropolis.

In addition, the results depict that the concentration of respondents within the middle age group suggests a population with responsibilities such as household sustenance and business management, which may influence their perceptions of how the project affects their livelihoods. This aligns with the findings of Adepoju and Yusuf (2017): who noted that individuals in this age category are more likely to engage in economic activities and are sensitive to infrastructural changes in their environment. Furthermore, the result showed that the relatively small proportion of younger respondents under 24 years may be attributed to their lower involvement in business and household management around the project areas, thereby limiting their direct exposure to the social impacts of the flyover.

Table 2: Distribution of the Respondents According to Age, Marital Status and Educational Level (n = 200)

Variable	Frequency	Percentage
Age (years)		
Under 18	4	2.0
18-24	18	9.0
25-34	42	21.0
35-44	80	40.0
45 and above	56	28.0
Marital status		
Single	38	19.0
Married	144	72.0
Divorced	11	5.5
Widowed	7	3.5
Educational level		
No formal education	56	28.0
Primary education	33	16.5
Secondary education	57	28.5
Tertiary education	54	27.0

Source: Field Survey, 2025.



The result also showed that most (72.0%) of the respondents were married, while 19.0% were single, 5.5% divorced, and 3.5% widowed. This implies that most respondents had family responsibilities and dependents, which may influence their perception of the social impacts of the flyover construction within the study area. Married individuals are often more concerned about issues such as relocation, income stability, accessibility, and safety, since these directly affect their households. Similarly, the results indicated that the smaller proportion of divorced (5.5%) and widowed (3.5%) respondents may reflect the lower representation of such groups within the project-affected population. In addition, the results depict that the dominance of married respondents could also imply a higher level of stability and commitment to community activities, making their responses particularly relevant for social impact assessment. This finding agrees with the report of Oladeji (2019): who observed that married respondents often provide more reliable insights into community development projects because of their social and economic responsibilities.

The Table further depicted that 28.5% of the respondents attained secondary education, 27.0% had tertiary education, while 28.0% had no formal education, and 16.5% had only primary education. This distribution implies that a reasonable proportion of respondents were literate, which may enhance their ability to understand and evaluate the implications of the flyover construction in Bauchi metropolis. Similarly, the results indicated that the presence of respondents with higher education (secondary and tertiary) suggests that many of them could critically assess the social and economic effects of the project on their businesses and livelihoods. In addition, the results depicted that the sizeable proportion (28.0%) of respondents without formal education may face challenges in accessing official project information or engaging fully in consultations, relying instead on informal communication channels. This finding agrees with the submission of Adekunle (2019): who emphasized that education is a vital human capital that influences how individuals access information, participate in decision-making, and adapt to infrastructural developments in their communities. The mix of both literate and non-literate respondents in this study therefore provides a balanced perspective on the social impacts of the flyover project.

Respondents’ Primary Occupation and Years of Operation in the Affected Area

The result in Table 2 revealed that the primary occupation of the respondents and years of operation in the affected area in which 44.0% of the respondents were business owners, followed by 29.5% who were self-employed, 19.0% who were employees, and only 7.5% who were unemployed. This implies that the majority of the respondents were actively engaged in business or economic activities within the project area. Similarly, the results indicated that the dominance of business owners and self-employed respondents reflects the commercial nature of the Wunti and Central Market areas, where the flyover construction is located. This finding aligns with the report of Akinola and Yusuf (2020): who observed that small businesses and informal enterprises are often the most affected by urban infrastructure projects due to disruption of customer access and relocation challenges.

Table 3: Distribution of the Respondents According to Primary Occupation and Years of Operation in the Affected Area (n = 200)

Variable	Frequency	Percentage
Primary Occupation		
Business owner	88	44.0
Employee	38	19.0
Self-employed	59	29.5
Unemployed	15	7.5
Years of operation		
Less than 1 year	11	5.5
1-5 years	36	18.0
6-10 years	68	34.0
More than 10 years	85	42.5

Source: Field Survey, 2025.



In addition, the results depict that most respondents had been operating in the area for more than 10 years (42.5%): followed by 34.0% who had 6–10 years of experience. Only 18.0% and 5.5% of the respondents had operated for 1–5 years and less than one year, respectively. This suggests that the majority of respondents have long-term ties to the project area, making them more sensitive to changes in accessibility, customer flow, and business stability caused by the flyover construction. The result showed that this long duration of operation also implies that the respondents possess valuable insights into how the project has affected the social and economic dynamics of the community. This observation agrees with the findings of Adesina *et al.* (2018): who reported that longer years of business experience often strengthen respondents’ ability to assess the risks and opportunities associated with urban development projects.

Factors Influencing Vulnerability to the Effect of Flyover Construction

The results in Table 3 revealed the factors influencing the vulnerability of small-scale business owners to the flyover construction project. The results indicated that educational level ($P < 0.01$) and impact on business ($P < 0.01$) were significant respondents vulnerability to fly over construction in the study area, while all other variables (age, marital status, occupation, duration of residence, impact on living situation, and displacement experience) were not statistically significant. This suggests that education and the direct effect of the construction on business operations were the most critical determinants of vulnerability among the respondents. The results depict that the negative coefficient for educational level (-0.556) implies that respondents with higher levels of education were less vulnerable to the adverse impacts of the flyover construction. This may be because education enhances awareness, adaptability and the ability to diversify livelihood strategies. The result aligns with Hahn *et al.* (2009): who argued that education improves adaptive capacity and resilience by enabling individuals to access alternative income sources and navigate bureaucratic processes such as compensation claims.

Table 3: Factors Influencing Respondents Vulnerability of Small-Scale Business Owners to Fly Over Construction

Variables	B	S.E	Wald	Sig.
Age of the Respondents	-.173	.287	.365	.546
Marital status of the respondents	.550	.526	1.093	.296
Educational level	-.556	.227	6.014	.014**
Occupation	.175	.239	.533	.465
Duration of Residence	-.022	.317	.005	.945
Impact of flyover on living situation	.426	.308	1.914	.167
Impact on business	-.764	.353	4.693	.030
Experience displacement due to construction	-.258	.647	.159	.690
Constant	4.265	1.792	5.666	.017

Source: Field Survey, 2025.

Significant at 5%

Furthermore, the results indicated that the impact on business (-0.764) was also a significant determinant of vulnerability. The negative sign suggests that as the impact on business worsened, vulnerability increased substantially, confirming earlier findings in Table 10 where 57.5% of respondents reported moderate to severe disruption in their businesses. This demonstrates that business stability is central to the livelihoods of respondents, and any disruption directly translates into heightened vulnerability. This finding is consistent with Akinola and Yusuf (2020): who reported that small businesses are particularly sensitive to displacement and market access disruption caused by urban development projects. Conversely, the results showed that variables such as age, marital status, occupation, duration of residence, displacement experience, and impact on living situation were not statistically significant. Possible reasons include: age and marital status may not have influenced vulnerability directly because the impacts of the flyover were largely economic rather than demographic. Occupation and duration of residence might not have been significant because the majority of respondents were business operators with long-term ties to the area (Tables 2 and 8): leaving little variation to influence statistical outcomes. Also, displacement experience, despite being widespread (88.0% in Table 8): was not significant likely because nearly all respondents were affected,



creating limited variability for regression analysis. Impact on living situation (Table 9) was also not significant statistically, possibly because the economic disruption to businesses had a stronger effect on vulnerability than residential discomfort.

The implication of these findings is that social sustainability hinges strongly on protecting the economic base of small-scale business owners and building adaptive capacity through education. Where projects disrupt livelihoods without adequate safeguards, vulnerability increases, undermining long-term sustainability. Thus, prioritizing livelihood restoration and educational support during project implementation is critical for ensuring that infrastructure projects such as the flyover do not weaken but rather strengthen community resilience.

Constraints to Economic Effects of Flyover Construction

Table 4 revealed that the most (90.5%) of respondents reported that the flyover construction caused them economic challenges, while only 9.5% indicated otherwise. Similarly, the results indicated that the most frequently reported economic challenge was loss of income (45.0%) followed by loss of business premises (31.0%) difficulty in finding new shop/premises (16.5%) and increased expenses (7.5%). This shows that the project’s economic impacts were widespread and multi-dimensional, affecting both income streams and access to physical spaces for economic activity. In addition, the results depict that the predominance of income loss highlights the immediate and direct effect of the construction on small-scale business owners, whose livelihoods depend on stable customer flows and accessible business locations. The result showed that the loss of premises and difficulties in finding new shops further compounded vulnerability, as seen earlier in Table 8 where 41.0% of respondents experienced permanent displacement. This finding is consistent with Akinola and Yusuf (2020): who noted that urban infrastructure projects in Nigeria often impose substantial short-term hardships on informal and small-scale businesses by disrupting access to trading spaces and reducing income stability. Furthermore, the results indicated that increased expenses, although reported by fewer respondents (7.5%) reflect hidden costs such as higher rents in new locations, transportation to alternative premises, and the burden of relocating goods and assets. While less frequent, such costs can exacerbate financial strain, especially for already vulnerable business owners. The results implies that the economic challenges faced by respondents threaten the social and economic sustainability of the flyover project. If businesses lose income, struggle to secure new premises, or face rising costs without adequate compensation and support, the project risks eroding community acceptance and undermining its long-term sustainability goals.

Table 4: Distribution of the Respondents Based on of Economic Challenges

Variable	Frequency	Percentage
Construction causes economic challenges		
Yes	181	90.5
No	19	9.5
Types of economic challenges		
Loss of business premises	62	31.0
Loss of income	90	45.0
Difficulty finding new shop/premises	33	16.5
Increased expenses	15	7.5

Source: Field Survey, 2025.

Constraints to the Effects of Flyover Construction

The results in Table 5 revealed that the most frequently reported constraint towards mitigating the effects of the flyover construction was inadequate financial compensation (66.0%): followed by lack of alternative business premises (59.0%) and poor relocation or resettlement arrangements (48.5%). Similarly, the results indicated that 43.0% of respondents identified the high cost of securing new shops or premises as a major challenge, while 37.0% cited limited government support and engagement. Other constraints included loss of customer base (34.5%): weak community support and cohesion (25.5%): and psychological stress and uncertainty (19.0%). In addition, the results depict that inadequate financial compensation remains the most pressing concern, confirming earlier findings in



Table 5, where respondents overwhelmingly demanded better financial compensation. The result showed that this reflects dissatisfaction with the adequacy, timeliness, and fairness of payments, which are critical in cushioning the socio-economic disruptions caused by displacement. This aligns with Adekola and Lamond (2018): who reported that inadequate and poorly managed compensation packages are the most common sources of grievances in urban development projects in Nigeria.

Table 5: Distribution of the Respondents Based on Constraints to the Effects of Flyover Construction

Constraints	Frequency*	Percentage	Ranking
Inadequate financial compensation	132	66.0	1 st
Lack of alternative business premises	118	59.0	2 nd
Poor relocation/resettlement arrangements	97	48.5	3 rd
High cost of securing new shops/premises	86	43.0	4 th
Limited government support/engagement	74	37.0	5 th
Loss of customer base	69	34.5	6 th
Weak community support and cohesion	51	25.5	7 th
Psychological stress and uncertainty	38	19.0	8 th

Source: Field Survey, 2025.

Multiple responses recorded.

Furthermore, the results indicated that lack of alternative business premises and poor relocation arrangements demonstrate that many respondents were left without practical options to continue their economic activities. This situation exacerbated the loss of income (Table 14) and directly threatened livelihood sustainability. The difficulty in securing affordable new premises further highlights the market pressures created by sudden displacement, echoing the findings of Akinola and Yusuf (2020): who observed that small-scale business operators often face rising rents and reduced accessibility during infrastructure development projects. The results also showed that beyond material constraints, social and psychological dimensions played a role. Loss of customer base, weakened community support, and psychological stress reflect the breakdown of trust and stability within the community, consistent with Cernea's (1997) Impoverishment Risks and Reconstruction (IRR) model, which highlights social disarticulation and increased vulnerability as risks of development-induced displacement.

CONCLUSION AND RECOMMENDATION

The study concludes that flyover construction has social impact on livelihood restoration, stakeholder engagement, and compensation mechanisms. Also the vulnerability of the respondents to the effects of flyover construction in the study area is influenced by educational level and impact on business.

Based on the findings and conclusions of the study, the following recommendations were made;

- i. The Bauchi State Government, in collaboration with the Federal Ministry of Works and Housing, should develop and enforce a mandatory SIA framework that is localized to the socio-cultural and economic context of urban communities.
- ii. Project implementation agencies should adopt a transparent and participatory approach to compensation assessment.
- iii. Compensation amounts should reflect current market values of lost assets, lost income streams, and relocation costs.
- iv. Payments should be made in full and in a timely manner prior to displacement to reduce financial vulnerability.
- v. Local government authorities should partner with market associations and private sector stakeholders to identify or construct alternative trading spaces before the commencement of construction activities.
- vi. Affected business owners should be given priority access to these spaces at subsidized rates for a reasonable transition period of at least one years.



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