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Strengthening Resilience through Multi-Stakeholder Collaboration for Sustainable Development Goal Achievement in Borno State, Nigeria.

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ABSTRACT: Achieving sustainable development in conflict-affected regions remains challenging because of persistent social, economic, and environmental pressures. In Borno State, Nigeria, progress toward the Sustainable Development Goals (SDGs) depends on coordinated action among government institutions, civil society, communities, development partners, and the private sector. This study examined how multi-stakeholder collaboration contributes to resilience and sustainable development in the state. A mixed-methods design was employed, involving 384 respondents selected through stratified purposive sampling who completed structured questionnaires, alongside 20 key informant interviews and document analysis. Quantitative data were analyzed using descriptive statistics and multiple regression, while resilience and SDG achievement operationalized as composite Likert-scale indices, qualitative data were examined thematically. Findings showed that stakeholder collaboration significantly improved development outcomes, with joint engagement having the strongest influence, followed by NGO support, community participation, government support, and private-sector involvement. However, insecurity, poverty, displacement, weak infrastructure, and environmental pressures remained major barriers. Resilience emerged as an important mechanism connecting collective action with development performance. Strengthening coordinated partnerships is therefore essential for advancing resilience and sustainable development in Borno State. The study further investigates the legal and institutional factors (constitution provisions, partnership agreements, NGO regulation, data regulation, and rule of accountability) which facilitate or hinder co-operation and integrates a legal-institutional element into the suggested framework.

1.0 INTRODUCTION

The Sustainable Development Goals (SDGs) are particularly relevant in places affected by insecurity, environmental damage, and limited institutional capacity. In these settings, development progress depends on more than government programmes. It also requires the active involvement of non-governmental organizations (NGOs), local communities, donor agencies, and private businesses. The SDGs are designed as an integrated agenda, meaning that advances in one goal can influence outcomes in others. For this reason, effective implementation calls for coordinated actions that respond to economic, social, and environmental concerns in a balanced manner. According to recent literature on the subject, cross-sector collaboration and multi-stakeholder partnerships are required for resilience and development strategies in fragile and conflict-affected contexts

(Benjamin & Foye, 2022; Neely et al., 2021). Resilience is about the ability of people, institutions and systems to prepare for, respond to and recover from shocks, while continuing to carry out functions and retain assets. Development is about supporting the capacity of systems and people to anticipate, cope and adapt to the next disaster, while resilience is about protecting those development gains when a shock occurs (Nwachukwu et al., 2020). Fragility encompasses risk across all dimensions of governance, social, economic, environmental and security. Borno State is characterized by a fragile situation reflected in recurrent violence, poverty, displacement, environmental factors and weak institutions that limit development and resilience (OECD 2025).

Enhancing resilience through development is central to Nigeria, a state affected by armed conflicts, displacement, loss of public infrastructure, environmental degradation, and the interruption of growth and production, which undermines employment, education, health services, and the delivery of other public services; in farm or resource-dependent societies, threats also arise from drought, floods, and land degradation (Mohammed et al., 2022). Local solutions to adaptation are needed to address livelihood challenges and environmental and security risks; in Nigeria, policies toward sustainable development are in place, but implementation will require an effective approach to institutional coordination, stakeholder engagement, evidence-based decision-making, and cross-sector collaboration (Malley et al., 2021). SDG 17 calls for strong global partnership to mobilize resources and other support towards goals and SDGs, including digital tools and institutional cooperation to achieve resilience for sustainable development in Nigeria (Benjamin & Foye, 2022). While collaborative governance is gaining recognition as an essential element of addressing development challenges, there is limited empirical evidence of the application of collaborative governance concept in conflict-affected environments like Borno State. Focus of studies has largely been on adaptation to climate change, food security, institutional capacity, relief and economic recovery with little consideration for an integrated perspective of governance, stakeholder roles, resilience processes and SDG results. This fragmented approach has not helped in stimulating coordinated policy response to the multifaceted challenge of crisis in the state. Development planning calls for multi-stakeholder collaboration including government, affected communities, civil society, development partners and for such a framework to be integrated and empirically validated. This study makes up for that knowledge gap by creating and validating an Integrated Stakeholder Policy Model to demonstrate how collaborative participation and resilience processes enhance sustainable development and facilitate achievement of SDG outcomes in Borno State. The figure shows the proposed model. Figure 1 summarizes the profile of the individuals whose responses were analyzed in this research.

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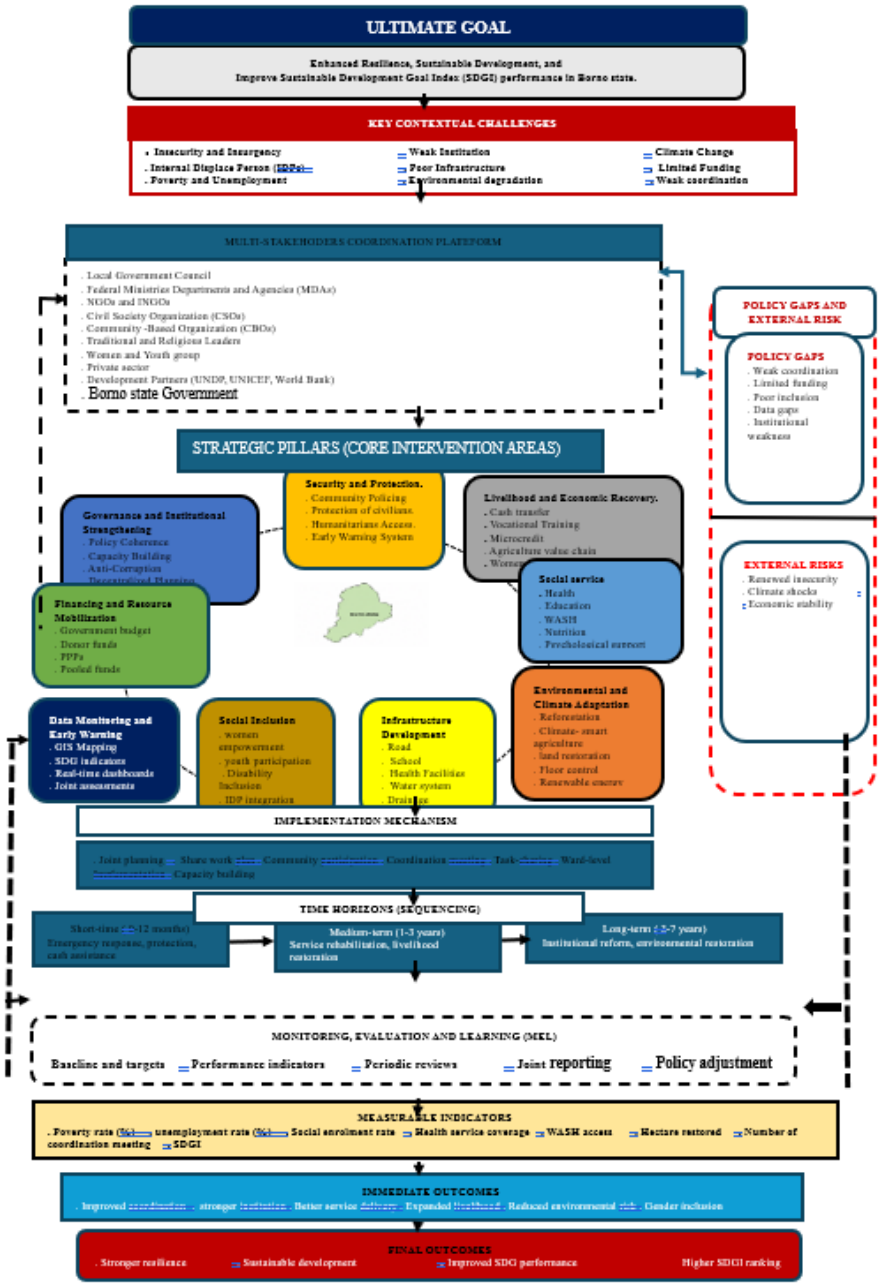


Fig.1: Integrated Stakeholder Policy Model for Promoting Resilience, Sustainable Development, and Improved SDG Outcomes in Borno State, Nigeria.

The diagram illustrates an integrated policy framework for Borno State, structured around five main sectors: governance, security, economy, social services, and the environment. It shows how each sector is linked to specific development actions aimed at improving coordination and service delivery across the state. Key interventions include livelihood and job creation, education and health services, humanitarian access, and climate-related adaptation measures. The framework also points out major gaps such as weak coordination among stakeholders and insufficient support for long-term resilience planning. Overall, it suggests the need for stronger collaboration, improved institutional capacity, and better resource allocation to enhance development outcomes. Aligning state-level plans (policy, development, humanitarian, security, climate) across government ministries, NGOs, donors, community leaders and the private sector through formal coordination platforms and joint planning

cycles. The framework recognizes that sustainable development is more effective when all relevant factors contribute according to their strengths. Government agencies provide strategic direction through policy formulation, budgeting, security support, and institutional regulation. Civil society organizations and development partners supply technical expertise, humanitarian assistance, and training opportunities for local populations. Community members help to identify pressing needs, offer local experience, and monitor activities implemented within their areas.

The private sector supports development by investing in productive ventures, encouraging innovation, and creating employment opportunities. These stakeholders coordinate their efforts in sectors such as education, healthcare, agriculture, infrastructure, environmental stewardship, and livelihood enhancement. Their shared contributions help restore social order, expand economic opportunities, and improve environmental conditions. The framework also includes a system for monitoring progress and using feedback to strengthen future interventions. Through this collaborative structure, the model aims to build resilience, promote sustainable development, and advance the achievement of the Sustainable Development Goals (SDGs) in Borno State. Legal and institutional frameworks for collaboration and accountability at the managerial level, collaboration is a legal requirement and managerial obligation. The Constitution of the Federal Republic of Nigeria 1999 (as amended) allocates the responsibilities of the provision of health and education services, environmental management, and the administration of local government; development interventions in Borno State must therefore establish intergovernmental coordination (Federal Republic of Nigeria, 1999). Civil society organisations are prescribed by Part F of the Companies and Allied Matters Act (CAMA) 2020, while private-sector actors are prescribed by procurement and concession protocols, such as the Public Procurement Act 2007 and the Infrastructure Concession Regulatory Commission (Establishment, etc.). Act 2005 (Federal Republic of Nigeria, 2020; Federal Republic of Nigeria, 2005; Federal Republic of Nigeria, 2007). Land-based community initiatives are governed by the Land Use Act 1978, and personal-data management by the Nigeria Data Protection Act 2023 (Federal Republic of Nigeria, 1978; Federal Republic of Nigeria, 2023). In conflict environments, such legal provisions are overlaid by counter-terrorism, anti-money-laundering, and international protection legislation, such as the African Union (Kampala) Convention (African Union, 2009; Federal Republic of Nigeria, 2022a; Federal Republic of Nigeria, 2022b). Few studies therefore have examined the ways that the legal provisions may influence collaboration, partnership accountability, and institutional responsibility in Borno State (Ansell & Torfing, 2021a) (Aja-Eke, 2023). This study thus integrates the legal and institutional underpinnings of collaboration into its proposed model.

This study addresses that shortcoming by developing a comprehensive policy framework designed to strengthen resilience, support sustainable development, and improve SDG performance in Borno State, Nigeria. The framework brings together government institutions, NGOs, community-based organizations, development partners and private-sector actors in a process of joint planning, implementation, monitoring and feedback. It exemplifies how institutional collaboration could lead to achieving quantifiable resilience and sustainable development results in fragile, conflict-affected environments. The paper contributes to the body of literature on collaborative governance and policy implications for Borno State and similar environments. The objectives of the study are to: Examine stakeholder involvement in strengthening resilience and advancing the Sustainable Development Goals. Assess the key environmental challenges and socio-economic barriers affecting development in Borno State. Develop an integrated policy approach to improve stakeholder coordination and impact. Determine how inter-stakeholder cooperation influences sustainable development outcomes. Furthermore, the study examines the legal and institutional frameworks within which multi-stakeholder cooperation is carried out in Borno State and suggests legal-institutional guarantees for the framework.

1.1 Theoretical Framework

This study is underpinned by an integrated use of Collaborative Governance Theory, Systems Theory, and Resilience Theory, which together provide a comprehensive explanation of how interactions among multiple actors shape sustainable development outcomes in fragile and conflict-affected environments such as Borno State. (Ansell & Torfing, 2021a) observe that interconnected development issues can only be solved through joint efforts of government, civil society, grassroots, development partners and the private sector. Their observation lends credence to the framework of this study, which is partnership, complementary roles and stakeholder coordination to build resilience and sustainable development in Borno State, Nigeria. Given that collaborative governance is based on rules as well as relationships, the conceptual framework is further informed by a legal-institutional perspective. This perspective to collaborative governance further emphasises the importance of institutional design, which relates to clearly defined roles, agreed procedures, and accountability arrangements, for the

effectiveness of collaborative governance (Ansell & Torfing, 2021a; Vazquez-Brust et al., 2020). Applying this perspective to Borno State, the following four sets of legal questions can be posed: (i) mandate and jurisdiction which layer of government and which specific government agency (ministries, departments, commissions) is legally mandated to carry out each of the functions; (ii) formalisation how the partnerships between government, NGOs, communities, and businesses are legally formalised through registration and memoranda of understanding; (iii) accountability and transparency which legal commitments regarding procurement, reporting, and access-to-information can be identified; and (iv) rights and protection which legal obligations related to community participation, protection of data, and protecting displaced and other vulnerable persons can be found. These legal questions are further explored in Sections 3.3 and 3.7 to interpret the empirical evidence.

2.0 MATERIALS AND METHODS

2.1 Research Design

This research adopted a mixed-methods design that integrates quantitative and qualitative approaches to assess stakeholder collaboration, resilience building, and sustainable development in Borno State. The quantitative strand employed a semi-structured questionnaire; the qualitative strand employed key informant interviews and review of pertinent policy and project documentation. This methodology combined quantitative evidence with contextual qualitative evidence on institutional, social, economic and environmental circumstances that influence the implementation of SDGs. Cross-sectional survey obtained data from government officers, NGO staff, community-based organizations, private-sector actors and local leaders at one point in time; semi-structured interviews with a smaller number of selected decision-makers and development practitioners complemented the quantitative findings to produce a nexus concept for policy synthesis. The two strands were analysed separately then brought together at the interpretation phase: interview and documentary evidence were used to explain, qualify and validate survey patterns, while the integrated findings underpinned the policy framework.

2.2 Questionnaire Design and Measurement Indicators

The questionnaire was designed through a comprehensive review of recent academic literature focusing on resilience, sustainable development, collaborative governance, and the implementation of the SDGs. It was structured into five sections:

- **Section A:** Demographic and background information of respondents
- **Section B:** Stakeholder roles and institutional cooperation
- **Section C:** Environmental stresses and socioeconomic limitations
- **Section D:** Mechanisms and strategies for building resilience
- **Section E:** Sustainable development performance and SDG-related outcomes

The majority of items were measured using a five-point Likert scale, ranging from 1 (*Strongly Disagree*) to 5 (*Strongly Agree*). The study applied a questionnaire that addressed 35 evaluation statements in 7 constructs of stakeholder, institutional, NGO, community, business, resilience performance, and sustainable development progress. These dimensions consisted of several indicators to evaluate key dimensions of each construct. It was validated by three individuals in the fields of conflict and sustainable development and corrected based on the suggestions given. A pilot study was conducted on 30 respondents to identify its weaknesses. Feedback generated during this process supported adjustments that enhanced clarity, reduced ambiguity, and improved the overall reliability of the survey measures. The study variables were categorized into major constructs as follows:

Government Support and Policy Coordination: involving policy enforcement, allocation of funds, security provision, and oversight functions.

NGO and Development Partner Contributions: including humanitarian aid delivery, technical assistance, and capacity development support.

Community Participation: focusing on engagement in planning processes, local ownership of initiatives, and application of indigenous knowledge systems.

Private Sector Engagement: covering investment activities, job creation, and innovation-driven contributions to development.

Environmental and Socioeconomic Challenges: such as insecurity, poverty levels, population displacement, climate variability, and inadequate infrastructure.

Resilience Outcomes: reflecting the ability of systems and communities to adapt, recover, and maintain essential functions.

Sustainable Development Outcomes: measuring progress in livelihoods, education, healthcare services, environmental sustainability, and overall achievement of the SDGs.

2.2.1 Instrument Development and Validation

Items were generated using a deductive approach. Candidate items were taken from a series of published articles and policy briefs on collaborative governance, resilience and SDGs in fragile contexts (Folke et al., 2002) (Vazquez-Brust et al., 2020) (Organisation for Economic Co-operation and Development, 2025) and sorted under the seven constructs aforementioned, so that the items were covering each construct with more than one item (35 items). Content and face validity was verified through the review of three scholars who are experts on conflict and sustainable development, and their suggestions on the relevance, clarity and comprehensiveness were incorporated into the instrument prior to pilot testing. The questionnaire was then pilot-tested with 30 respondents in the stakeholder groups of the main study. The pilot study was carried out to pilot the wording and clarity of questions prior to the main survey. It is not clear from the Study records whether the 30 pilots were included in the 384 final sample, the field records should be checked and included in the submission. Wording was adjusted where items were found to be unclear or ambiguous. Internal consistency was assessed with Cronbach's Alpha (overall $\alpha = 0.84$; construct-level reliability, composite reliability and AVE for Stakeholder Collaboration and Government Coordination are reported in Table 8). The semi-structured interview guide was developed from the same conceptual framework and covered collaboration, resilience, governance and development indicators, together with the four legal-institutional questions set out in Section 1.1 (mandate and jurisdiction, formalisation, accountability and transparency, and rights and protection).

2.2.2 Operationalized of Resilience and SDG Achievement

Resilience (RES) was operationalized as perceived resilience capacity as described in the Introduction-"the capacity of communities and institutions to prepare for, absorb, adapt to and recover from shocks while continuing to provide essential services (Folke et al., 2002) using Likert-scale statements in Section D (mechanisms and strategies for building resilience), and in the Resilience Outcomes construct, which refers to the same capacities, but in the context of shocks: preparing for and dealing with them, adapting to change, and recovering while continuing to provide essential services and livelihoods. The applied measure of RES is the arithmetic mean of the items in the construct (1-5), with higher values indicating perceived greater resilience. SDG achievement (SDG) was calculated as the perceived progress towards SDG-related outputs in the local setting measured in Section E, as indicated by: livelihood and economic opportunity (SDG 1 and SDG 8), education (SDG 4), healthcare (SDG 3), environmental sustainability and climate adaptation (SDG 13), and overall progress towards the SDGs (see Table 5). The SDG score is an averaged score of these items (scale 1-5); with higher scores indicating higher perceived progress. The same scales were also calculated for the explanatory constructs (SC, GS, NGO, CP, PSE and CH). SC (Stakeholder Collaboration) measures joint stakeholder activity, such as joint planning, information sharing and resource alignment, among the groups of stakeholders, and is conceptually different from GS, NGO, CP and PSE that test the perceived influence of individual stakeholder groups. Perception-based indices were used as the stakeholder survey was focused on stakeholder perception of progress in multiple goals simultaneously, without attempting to replace the official SDG indicator dataset, and the use of perception-based composite indices is acknowledged as a limitation in Section 2.8.

2.3 Measurement Integrity and Data Adequacy

Prior to analysis, diagnostic tests revealed data used in all measures were suitable and reliable. Cronbach's Alpha was 0.84, above the 0.70 minimum, suggesting a high internal consistency. Multicollinearity diagnostics revealed all Variable Inflation Factors (VIF) were within the 1.24-2.68 range, with tolerance scores above the 0.20 minimum, suggesting no concerns of Multicollinearity. Overall, normality

was deemed acceptable based upon Skewness, Kurtosis, histograms, and Probability Plots so parametric analysis could be performed. The questionnaire used for data collection was structured with a total of 35 items ranked across the seven domains of stakeholder cooperation, public-sector coordination, civil society support, community participation, business engagement, resilience performance, and sustainable development. The statements were measured on a five-point Likert scale, with the weakest item rated 1 and the strongest rated 5 on a five-point scale: 'Strongly Disagree' – 1 to 'Strongly Agree' – 5. The instruments were validated by specialists, and a pilot study involving 30 respondents was carried out. A total of 384 samples were obtained through Cochran's formula of 95% confidence level and 5% margin of error across the stratified purposive sampling method which comprises the government, NGOs, development agencies, civil society, community leaders, and business-sector stakeholders in development and resilience activities in Borno State.

2.4 Data Collection

Primary data were collected from respondents in four selected wards within Maiduguri Metropolitan Council, namely Gamboru Liberty, Gwange I, Gwange II, and Mafoni. These wards were purposively selected due to their high level of exposure to humanitarian assistance and development interventions, as well as their relevance to ongoing resilience and SDG-related programmes. The study used data from 384 respondents, selected through the sampling procedure outlined by Cochran (detailed on page 14), covering those involved in governance, development, humanitarian and resilience functions. More evidence was obtained from literature, policy, institutional and official documents. Qualitative insights were provided by interviews with 20 prominent information providers in government, community, civil society, development agencies and universities. While the body of research on resilience, stakeholder engagement, and the SDGs has been increasing, little is known about the evidence on how a combination of collaborative efforts of public institutions, civil society, development agencies, communities, and private-sector actors influence resilience and sustainable development outcomes in conflict affected contexts. This has not been the case in Borno State where research and analysis have concentrated on insecurity, displacement, and relief.

2.4.1 Sampling Procedure and Selection of Key Informants.

The population targeted all the stakeholders that are active in the governance, development, humanitarian and resilience programming in the four wards covered (Gamboru Liberty, Gwange I, Gwange II and Mafoni) in Maiduguri Metropolitan Council. Sampling was done at three levels. The wards were purposively selected based on its high level of engagement with humanitarian and development interventions (section 2.4). The sample size was calculated following Cochran's (1977) formula for large populations, n z 2 p (1 p)/ e 2, using a z value of 1.96 (corresponding to the 95% confidence interval), a p value of 0.5 (for maximum variability, due to the fact that the proportion of stakeholders with any given opinion could not be determined prior to sampling) and an e value of 0.05 (5% margin of error), resulting in a minimum required sample of n 384. Respondents were then stratified by stakeholder type (government agencies/officials, nongovernmental organizations (NGO), development partners, community leaders and private-sector stakeholders), and sampling within each stakeholder category was done purposively, based on direct participation in or benefit from the collaborative interventions. The realised across a) 92, 88, 110, 64 and 30 respondents respectively (Table 2) are presented in section 3.2. The sampled respondents are purposively selected within each stakeholder stratum so the reported disbursement data is only descriptive and not meant to imply proportionate or probability sampling. Because selection within strata was purposive rather than random, the sample supports analytical rather than statistical generalisation, and the regression results are interpreted as associations within this stakeholder population. For the qualitative strand, 20 key informants were purposively selected from government, community leadership, civil society, development agencies and universities on the basis of their decision-making responsibility for, or sustained professional experience of, development and resilience programmes in Borno State. Recruitment stopped when successive interviews yielded no substantively new themes. The available study records do not specify the interview mode, language, or average duration; these details have not been inferred and should be added only after verification against the field records.

2.5 Data Analysis

The survey data were processed in IBM SPSS Statistics to generate descriptive and inferential outcomes to explore the associations among the variables. The interview transcripts were subjected to thematic analysis to detect the insights (collaboration, resilience, governance and development indicators) that emerged from the interview transcripts via rigorous

coding, categorization and verification. The quantitative and qualitative results were combined to triangulate the survey results and to enhance the quality of the interview results to inform the development of policy guidelines.

2.5.1 Qualitative Analysis

Interviews were transcribed and thematically analysed according to six phases identified by Braun and Clarke (2006): (i) familiarisation with the data; (ii) generation of initial codes; (iii) collation of codes into candidate themes; (iv) review of candidate themes in relation to coded data sets and the entire data set; (v) refinement and naming of themes; and (vi) establishment of the report. Coding was undertaken at the semantic level, combining deductive categories and themes from the conceptual framework (stakeholders, mechanisms, resilience, governance, development outcomes) with inductive codes from the transcripts. Rigour was supported by the six-phase thematic procedure and triangulation with survey and documentary evidence were used. The available study records do not establish whether coding software, independent second-coder checks, or respondent validation were used, so these procedures are not claimed.

2.5.2 Documentary and Legal-Institutional analysis

The legal-institutional analysis was undertaken using qualitative documentary (doctrinal) analysis. The source documents purposively sampled as defining the mandates, partnership types, regulatory and accountability duties to which the stakeholder groups studied are subject to include the constitutional provisions (the Constitution of the Federal Republic of Nigeria 1999 (as amended), which distributed powers and responsibilities across federal, state and local governments for health, education, environmental management and local administration); partnership and formalisation instruments (the CAMA 2020 Part F registration regime for NGOs, memoranda of understanding and coordination arrangements, the Public Procurement Act 2007 and the Infrastructure Concession Regulatory Commission Act 2005 on procurement and concession frameworks); NGO regulation (CAMA 2020, complemented by counter-terrorism and anti-money-laundering legislation affecting NGO activity and funding in conflict settings, the Terrorism (Prevention and Prohibition) Act 2022 and the Money Laundering (Prevention and Prohibition) Act 2022); data regulation (the Nigeria Data Protection Act 2023 and the Freedom of Information Act 2011); accountability (contained within the foregoing instruments, to include procurement transparency, reporting responsibilities and access-to-information entitlements); and community and IDP protections (Land Use Act 1978, African Union Kampala Convention, 2009).

Each instrument was reviewed for provisions relevant to collaboration and coded against the four analytical questions outlined in 1.1 (mandate and jurisdiction, formalisation, accountability and transparency, rights and protection). Provisions were plotted in a matrix (table 2a) as enabling, constraining or silent (creating a duty, power or procedure supporting collaboration, imposing burdens of compliance or broadening the range of operational scope respectively) and compared to the interview and policy-document evidence to locate discrepancies between evidence of practice and the legal landscape. This desk review is bounded by legislation, policy documents and literature (section 2.8) and does not include case law or a survey of compliance, the latter of which was beyond the scope of this research; partnership agreements have been considered in terms of the legal requirements for their creation and content rather than systematically on a clause-by-clause basis.

Table 2a: Analytical Matrix for the Legal-Institutional Review

Dimension	Principal instruments reviewed	Analytical question applied
Constitutional provisions	Constitution of the Federal Republic of Nigeria 1999 (as amended)	Which tier of government and which agency holds the mandate for health, education, environmental management and local administration?
Partnership agreements	CAMA 2020 (Part F); memoranda of understanding; Public Procurement Act 2007; ICRC Act 2005	How are partnerships between government, NGOs, communities and businesses formalised (registration, MoUs, procurement and concession agreements)?

NGO regulation	CAMA 2020 (Part F); Terrorism (Prevention and Prohibition) Act 2022; Money Laundering (Prevention and Prohibition) Act 2022	What registration, oversight and compliance obligations apply to NGOs and development partners, including in conflict settings?
Data regulation	Nigeria Data Protection Act 2023; Freedom of Information Act 2011	What rules govern data sharing, consent and public access to information in joint programmes?
Accountability mechanisms	Public Procurement Act 2007; Freedom of Information Act 2011; reporting duties in partnership instruments	What reporting, transparency and oversight duties apply to each party?
Community and displaced-person protection	Land Use Act 1978; African Union Kampala Convention (2009)	What rights and protections apply to community participation, land tenure and displaced populations?

Source: Author's documentary analysis, 2026.

2.6 Model Specification

To investigate the factors influencing sustainable development performance in Borno State, a multiple regression framework was adopted. The model was formulated to assess the extent to which cooperation among stakeholders, government involvement, support from non-governmental organizations, community engagement, private-sector participation, and prevailing development constraints affect the achievement of Sustainable Development Goals (SDGs). This analytical approach provides an empirical basis for determining the contribution of each explanatory factor to development outcomes. The model is specified as follows:

(SDG = \beta_0 + \beta_1SC + \beta_2GS + \beta_3NGO + \beta_4CP + \beta_5PSE + \beta_6CH + \Var epsilon)

Where:

- **SDG** = Sustainable Development Goal outcomes
- β_0 = Intercept or constant parameter
- β_1–β_6 = Estimated regression coefficients
- **SC** = Stakeholder Collaboration
- **GS** = Government Support and Policy Coordination
- **NGO** = NGO and Development Partner Assistance
- **CP** = Community Participation
- **PSE** = Private Sector Engagement
- **CH** = Environmental and Socioeconomic Challenges
- ε = Stochastic error term

Within this framework, SDG outcomes represent improvements in social welfare, economic opportunities, environmental sustainability, educational advancement, healthcare access, and broader development achievements. The predictor variables were derived from aggregated responses obtained through the structured questionnaire. Positive coefficient values imply that increases in the associated variable are expected to enhance development outcomes, whereas negative values indicate a possible reduction in SDG performance. Given the central role of resilience in the study framework, a supplementary model was developed to examine the determinants of resilience capacity among communities and institutions:

(RES = \alpha_0 + \alpha_1SC + \alpha_2GS + \alpha_3NGO + \alpha_4CP + \alpha_5PSE + \alpha_6CH + \mu)

Where:

- **RES** = Resilience outcome
- α_0 = Constant parameter
- α_1–α_6 = Regression coefficients
- μ = Error component

A further equation was introduced to evaluate whether resilience serves as an intermediary factor connecting stakeholder actions with sustainable development performance:

(SDG = \beta_0 + \beta_1RES + \beta_2SC + \beta_3GS + \beta_4NGO + \beta_5CP + \beta_6PSE + \beta_7CH + \Var epsilon). This specification makes it possible to determine whether resilience strengthens the relationship between stakeholder engagement and development outcomes. By incorporating both direct and indirect pathways, the model offers a comprehensive basis for understanding how collaborative efforts, institutional support mechanisms, and adaptive capacities contribute to sustainable development and SDG attainment in Borno State. A diagrammatic presentation of collaborative arrangements among key actors involved in development and resilience efforts is provided in Figure 2.

Estimation and interpretation

All three equations were estimated by ordinary least squares in SPSS using the composite (mean) scores described in the previous section. Equation 1 (SDG outcomes) is used to test H2, H4-H6 and is presented in Tables 6 and 7; Equation 2 (resilience) is used to test H1 and H3; and Equation 3 adds resilience to Equation 1 to test H7 (mediation), following the logic of causal-steps approach of Baron and Kenny (1986): stakeholder collaboration must predict resilience (Equation 2), resilience must then predict SDG outcomes once the stakeholder variables are controlled (Equation 3), and the direct effect of collaboration in Equation 3 is compared with its effect in Equation 1, with the indirect effect working through the SC RES and RES SDG paths. The coefficients (β) in Tables 7 and 10 are standardised: each shows the expected difference, in standard deviations, in the dependent variable (other variables held constant) with a one standard-deviation increase in the predictor. Stakeholder-specific effects (GS, NGO, CP and PSE) are thus the unique effect of each stakeholder group's perceived role on SDG outcomes, while SC's effect is that of joint action and coordination across stakeholder groups, above and beyond those individual effects. Since all standardised coefficients are measured on the same scale, their relative magnitude gives the ordering for predictor importance. CH occurs in the model as an outcome constraint, and is expected to be negatively signed. Multicollinearity between the SC and stakeholder-specific variables was assessed (VIF = 1.24-2.68; Sec. 2.3). As the data are cross-sectional and perception-based, coefficients refer to the strength of conditional associations rather than causality.

2.6 Research Questionnaire

To investigate the factors influencing sustainable development performance in a conflict-affected setting, the research addressed the following questions: How do government bodies, community institutions, non-governmental organizations, development partners, and business entities contribute to initiatives that enhance resilience and support sustainable development in Borno State. Which environmental challenges and socioeconomic pressures create obstacles to resilience strengthening and long-term development progress. To what extent do collaborative relationships among stakeholders affect development outcomes and the ability of communities to cope with ongoing challenges. Is resilience an important explanatory pathway connecting stakeholder cooperation with Sustainable Development Goal progress. How can an integrated governance framework improve coordination, resource alignment, and decision-making among organizations engaged in development interventions?

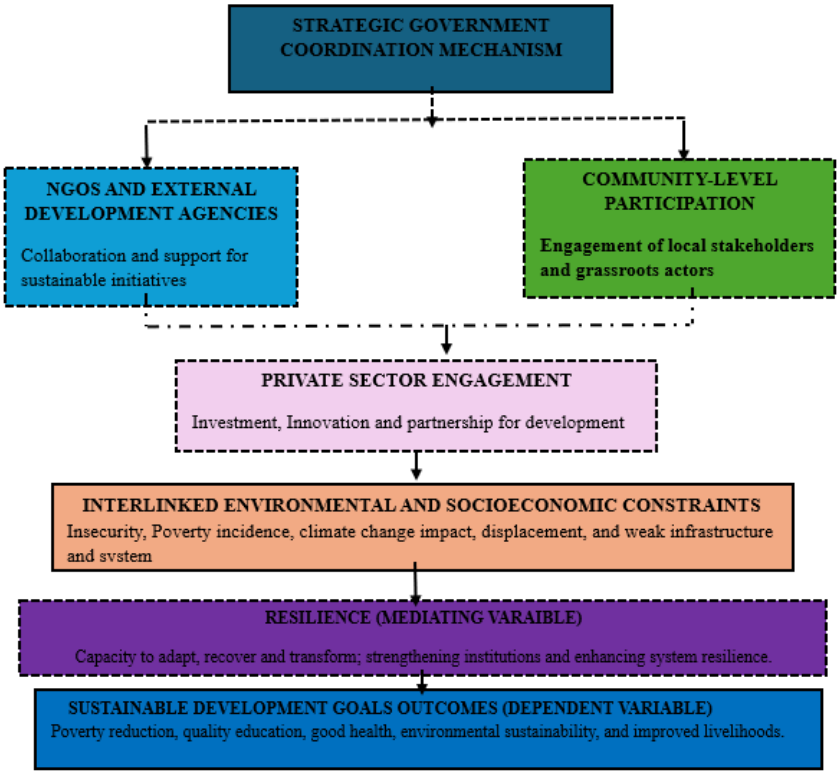


Fig 2: Integrated Multi-Stakeholder Policy Framework for Enhancing Resilience and Achieving Sustainable Development Goals in Borno State, Nigeria.

Figure 2 serves as the guiding structure for this research by outlining the relationships between stakeholder involvement, resilience-building processes, and sustainable development outcomes in Borno State. The framework illustrates how collaboration among government agencies, non-governmental organizations, development partners, community groups, and private-sector actors supports sustainable development efforts in Borno State. In addition, stakeholders influence development through policy coordination and facilitation, resource allocation, planning, and programme delivery; while insecurity, poverty, climate change hazards, population displacement, and poor infrastructure affect development results. There is a close linkage between resilience and development, which is where the ability of communities and their organizations to endure disruptions and change finds complement. This conceptual framework hypothesizes that stakeholder cooperation and synergy or linking of resources and co-ordination and community, then resilience through engaging communities in the process of coping with and adjusting to changes and provides a way of mediating between the two. This mediatory process can enhance education, health, income, environmental sustainability, and poverty alleviation.

Collaborative Governance Theory

Collaborative governance theory explains that public policy becomes more effective when different stakeholders do not act independently but instead engage in coordinated cooperation. The theory focuses on the cooperation of government agencies, civil society, communities and private actors as they plan, make decisions and implement policies. This cooperation allows for better coordination and resource utilisation, accountability and responsiveness to the needs of communities. In Borno State, coordinated stakeholder cooperation could effectively enhance resilience, minimise duplication and achieve better development outcomes. Regularly working together in monitoring and following up on issues can highlight gaps and facilitates quick measures to be taken.

Systems Theory

conceptualizes development as an interconnected arrangement in which economic, social, political, and environmental components continuously interact and influence one another. Within Borno State, issues such as insecurity, environmental

stress, and institutional weaknesses should not be viewed in isolation, but rather as interconnected elements within a broader system. This understanding supports the argument that sector-specific or fragmented interventions are insufficient, while integrated and cross-sectoral approaches are more effective for achieving sustainable development.

Resilience Theory

Focuses on the ability of institutions, communities, and systems to anticipate, withstand, adapt to, and recover from shocks without losing their essential functions. Considering the persistent conflict, displacement, and environmental pressures in Borno State, this theory offers a useful foundation for examining how collaboration among stakeholders enhances adaptive capacity and supports continuity in development processes. When combined, these theoretical perspectives provide justification for the multi-stakeholder framework adopted in this study, where coordination, cooperation, and adaptive governance are central mechanisms for strengthening resilience and advancing sustainable development.

2.7 Study Hypotheses

Based on the study objectives and the relationships outlined in the conceptual framework, the following hypotheses were developed:

- **H1:** Stakeholder collaboration has a statistically significant positive effect on resilience outcomes in Borno State.
- **H2:** Government policy support and coordination significantly influence sustainable development outcomes in Borno State.
- **H3:** Contributions from NGOs and development partners significantly enhance resilience-building efforts in Borno State.
- **H4:** Community participation significantly improves the effectiveness of sustainable development interventions.
- **H5:** Private sector involvement has a statistically significant positive relationship with SDG achievement in Borno State.
- **H6:** Environmental and socioeconomic challenges significantly hinder sustainable development outcomes in Borno State.
- **H7:** Resilience outcomes significantly mediate the relationship between stakeholder collaboration and sustainable development performance.

The outcomes of the regression examination provided sufficient evidence to uphold hypotheses H1–H5. All explanatory variables exhibited statistically reliable positive effects on sustainable development performance, suggesting that improvements in these factors are associated with enhanced progress toward SDG attainment. The results further emphasize the value of collective stakeholder action, institutional commitment, and participatory development approaches in strengthening development achievements across Borno State. Table 1 reports the results generated from evaluating the proposed relationships in the study. It presents the examined connections among the variables, along with the associated statistical estimates and significance values, and indicates whether the evidence was sufficient to confirm each proposition.

Table 1: Results Obtained from Testing the Study Propositions on Stakeholder Cooperation, Adaptive Capacity, and Development Performance in Borno State, Nigeria.

Hypothesis	Relationship	B	p-value	Decision
H1	SC → Resilience			Supported
H2	GS → SDG			Supported

H3	NGO → Resilience			Supported
H4 H5 H6 H7	CP → SDG PSE → SDG Challenges → SDG SC → Resilience → SDG			Undetermined pending CH regression output

Source: Field Survey, 2026.

Table 1 presents the findings derived from evaluating the study's proposed relationships. The outcome for H1 indicates that stakeholder cooperation is positively associated with resilience, leading to the acceptance of the hypothesis. The evidence likewise supports H2, confirming that government support contributes meaningfully to sustainable development outcomes. The result for H3 also warrants acceptance, as NGO involvement is shown to enhance resilience. Furthermore, H4 and H5 receive empirical support, suggesting that community engagement and the effectiveness of public services contribute positively to development performance. The outcome for H6 cannot be arrived at because the coefficient for regression of CH was not reported, and this outcome was not significant either - H6 can only be supported if CH has a negative, significant coefficient. The result further validates H7 that resilience acts as a mediator between stakeholder collaboration and sustainable development outcomes. Overall, it can be seen from the results that stakeholder collaboration, institutional commitment and resilience have significant influence on sustainable development in Borno State.

2.8 Limitations of the Study

Although the study was conducted using a rigorous methodological approach, certain limitations are acknowledged. Firstly, the research was confined to selected wards within Maiduguri Metropolitan Council, which limits the extent to which the findings can be generalized to rural communities or areas experiencing more severe conflict conditions in Borno State. Secondly, the cross-sectional design used in the study implies that data were captured at a single point in time, thereby restricting the ability to draw long-term causal inferences between stakeholder collaboration, resilience, and sustainable development outcomes. Thirdly, the use of self-reported data introduces the possibility of response bias, as participants may unintentionally overstate or understate the performance of institutions and development interventions. Fourthly, although a mixed-methods design was adopted, constraints in time and resources limited deeper qualitative engagement across all relevant stakeholder categories. Finally, the evolving security and humanitarian situation in the region may affect the stability of development conditions and, by extension, some of the observed findings over time. The legal review is undertaken using legislation, policy documents and literature only, rather than case law or surveys of compliance, therefore the legal comments in Sections 3.3 and 3.7 are qualitative and tested qualitatively and may be subject to change in future legislation. Furthermore, resilience and SDG performance were analysed with perception-based composite indices and not using indicator data; purposive sample of respondents within strata by letting the statistical generalisation; and partnership agreements according to their legal obligations rather than by means of quality assessment.

3.0 RESULTS AND DISCUSSION

3.1 Overview of the Findings

The study assessed how collaboration among government bodies, non-governmental organizations (NGOs), community-based groups, development partners, and the private sector affects resilience building, sustainable development, and progress toward Sustainable Development Goals (SDGs) in Borno State. The findings suggest that coordinated cooperation among stakeholders is crucial to solving these complex environmental, social, and economic issues of Borno State. Overall, respondents to surveys and interviews pointed to consistent policy coordination, community involvement, and institutional participation in generating income, improving services, and building resilience to degradation as well as development. (IFAD 2025) puts emphasis on training and support for farmers, SMEs, and communal participation as crucial in reinforcing resilience and alleviating poverty. Given that many communities in Borno State are rural-based, livelihood diversification should also be included in the policy proposal. Quantitative results were indicative of relationships between stakeholder cooperation, resilience, and development outcomes, and the qualitative evidence helped to further provide depth of understanding of these relationships. Agreement

between the two sources reinforced the credibility of the findings, whereas participant perspectives helped explain observed patterns and trends. This combined assessment improved the completeness and strength of the study conclusions.

3.2 Socio-Demographic Characteristics of Respondents

Respondents were drawn from a broad spectrum of stakeholder groups, including government agencies, non-governmental organizations (NGOs), community leadership structures, academic institutions, and private sector organizations. This wide distribution of participants ensured that the analysis incorporated diverse viewpoints on resilience and sustainable development within Borno State. In addition, most of the respondents had substantial experience in professional duties or community-based development engagement spanning several years. This background allowed them to provide informed, experience-based judgments regarding the performance and effectiveness of existing policies and development programmes. Table 2 presents a descriptive profile of the study sample, illustrating the distribution of participants across demographic backgrounds, educational qualifications, and stakeholder groups represented in the research.

Table 2: Socio-Demographic Characteristics of Respondents (n = 384)

Variable	Category	Frequency (n)	Percentage (%)
Gender	Male	238	62.0
	Female	148	38.0
Age group	18-25 years	62	16.1
	26-35 years	118	30.7
	36-45 years	104	27.1
	46 years and above	100	26.0
Stakeholder type	Government Official	92	24.0
	Community leader	88	22.9
	NGO workers		
	Private sector actors	110	28.6
	Development partners	64	16.7
		30	7.8
Educational Level	Secondary	74	19.3
	Diploma/NCE	116	30.2
	Bachelors' degree	132	34.4
	Postgraduate	62	16.1

Source: Field survey, 2026.

Table 2 presents descriptive details of the study sample, outlining the principal demographic and socio-economic characteristics that define the respondents and provide a foundation for interpreting the study results. The data reflect the diversity of stakeholders involved in initiatives aimed at promoting resilience and sustainable development in Borno State. In relation to gender, males constitute the majority of participants (62.0%), while females account for 38.0%. The results indicate that men are still more visible in governance and development processes, consistent with evidence of social and institutional constraints experienced by women in fragile and conflict-affected contexts that hinder formal participation in decision making (Bank, 2023; UNDP, 2023). Most respondents were of economically productive age group, with 30.7% in the 26-35 years age group, 27.1%

in the 36-45 years age group and 26% in the age group of 46 years and above; while 16.1% were in the 18-25 years age group. The small proportion of respondents in the under 18 categories could be due to the underrepresentation of this age group in formal development and policy processes (OECD 2025). Major stakeholders identified were community leaders (28.6%), government officials (24.0%), NGOs (22.9%), private-sector actors (16.7%) and development partners (7.8%). The active involvement of public, community, non-governmental, private and development actors in the State points to the complementary role's public, community, non-governmental, private and development actors can play to build resilience and promote sustainable development in fragile contexts (New York: UNDP, 2023; World Bank, 2022). Educational qualification of the respondents showed the highest percentages of Bachelor's degree (34.4%) and Diploma /NCE (30.2%) holders while the least were postgraduate (16.1%) and secondary (19.3%) holders, all contributing to the reliability of informed judgement on the degree of collaboration among stakeholders, resilience and sustainable development in Borno State. A graphical account of the factors shaping development conditions within the area is provided in Figure 3.

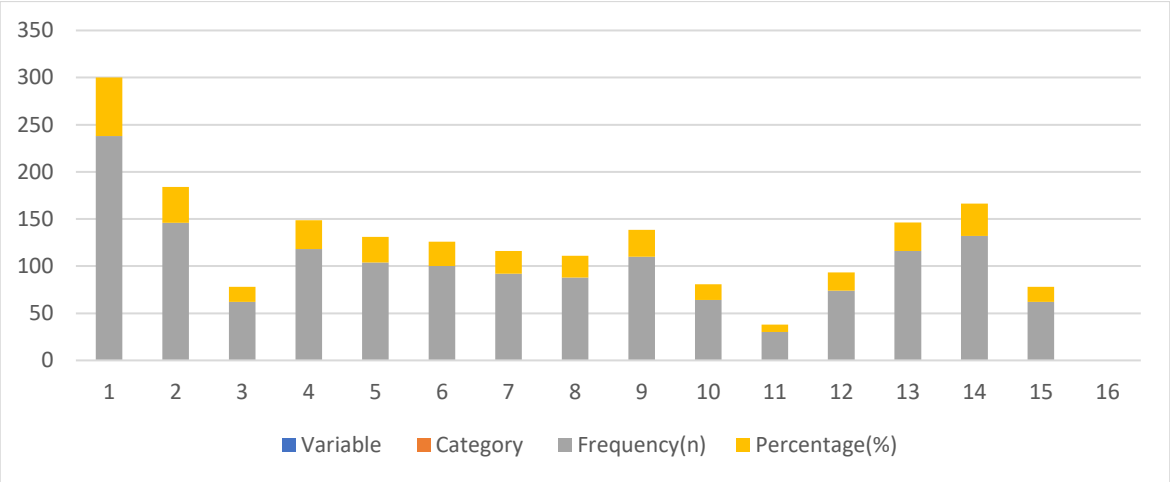


Fig 3: Socio-Demographic Characteristics of Respondents

This suggests that the respondents are generally well educated and capable of engaging with policy, governance, and development-related issues. Evidence indicates that higher education levels among stakeholders improve analytical capacity, participation quality, and the effectiveness of development implementation (UNESCO, 2026)(UNDP, 2025). This strengthens the credibility of the findings and provides a reliable basis for understanding collaboration, resilience building, and sustainable development outcomes in Borno State.

3.3 Stakeholder Roles and Institutional Collaboration

The results suggest that government institutions are widely seen as the principal actors in policy development, budgeting, security management, and regulatory enforcement. NGO and development partner representatives provided humanitarian aid, technical advice, and capacity strengthening, and community groups and traditional leaders enabled bottom-up perspectives and local knowledge. Business representatives contributed to development through investment, innovation, and new employment opportunities. The statistical analysis revealed a positive and significant correlation between stakeholder collaboration and resilience outcomes. Respondents also suggested that coordinated planning, shared information, and implementation are keys to more effective, sustainable development. Table 3 summarizes the observed patterns of stakeholder engagement and the cooperative relationships established among institutions involved in development interventions.

Table 3: Stakeholder Roles in Resilience and SDG Implementation (Likert Mean Scores)

Statement	Mean	Std. Dev	Interpretation
Government provides effectives policy coordination	3.94	0.88	Agreed

NGOs Contribute Significantly to humanitarian response	4.12	0.76	Strongly Agreed
Community participation improve project success	4.05	0.81	Agreed
Private sector supports job creation and innovation	3.87	0.92	Agreed
Multi-Stakeholder collaboration enhances implementation	4.21	0.73	Strongly Agreed

Source: Field survey, 2026.

Table 3 provides the result indicates the perception of government coordination shows a mean score of 3.94 (SD = 0.88), suggesting that respondents agree that public institutions provide policy direction and coordination for development activities. This reflects the continued importance of government leadership in organizing development efforts and ensuring alignment across sectors, particularly in contexts where institutional coordination challenges are common in fragile environments (UNDP 2023) (World Bank, 2022). NGO performance in humanitarian response recorded a higher mean value of 4.12 (SD = 0.76), indicating strong agreement among respondents. This implies that non-governmental organizations are widely recognized for their role in delivering relief support, strengthening local capacities, and complementing government efforts where service delivery gaps exist. Recent development evidence shows that NGOs often become key operational actors in crisis-affected regions due to their flexibility and field presence (UNDP 2023) (OECD, 2023). A graphical account of the perceptions recorded from the surveyed population is provided in Figure 4.

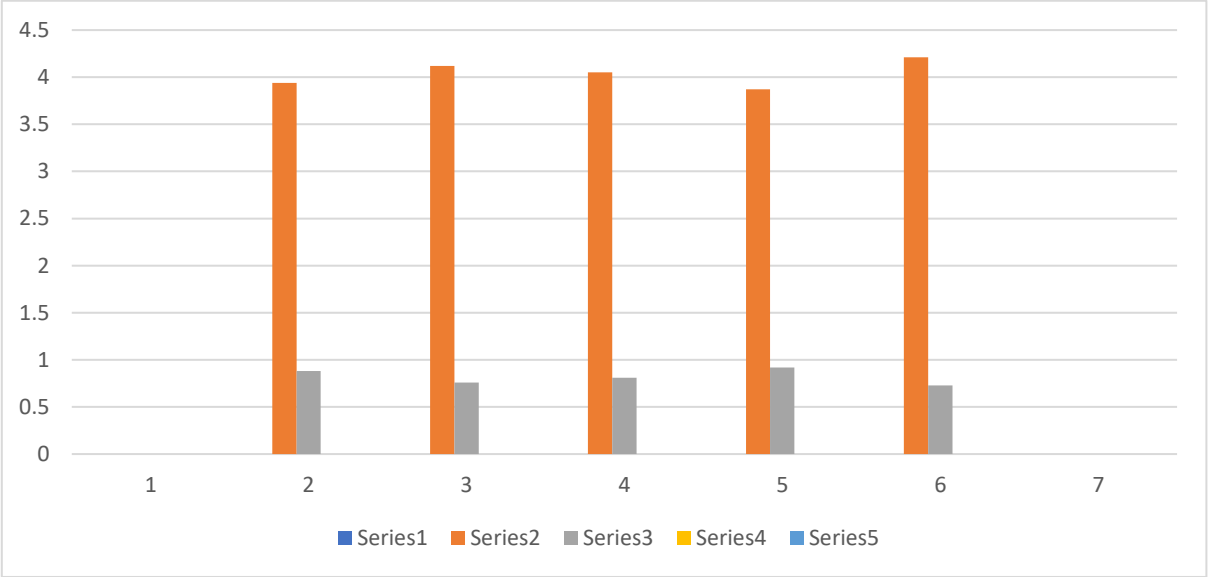


Fig 4: Stakeholder Roles in Resilience and SDG Implementation

Community participation generated an average score of 4.05 (SD = 0.81), suggesting that respondents acknowledged the importance of local engagement in improving the effectiveness of development projects. Community engagement in design and implementation of the projects had a mean of 4.00 (SD = 0.79) which was agreed upon and had the second highest ratings. These are likely to increase community buy-in and allow more sustainable impact (UNDP, 2024) (Ngulube et al., 2024) (Johnston et al., 2024), private sector is likely to be involved in job creation and innovation and had a mean score of 3.87 (SD = 0.92). This was agreed upon and had a relatively small role as it had a mean score below 4.00. Nevertheless, they aid to support economic development and reduction of poverty when engaged despite being constrained in fragile contexts (World Bank, 2021). Multi-stakeholder collaboration recorded a mean of 4.21 (SD = 0.73) which was strongly agreed with and had the

highest averages. Partnerships with various actors including government, donors, NGOs, and the community are important to enhance resilience and SDG success (UNDP 2023) (OECD 2025).

3.4 Environmental and Socioeconomic Challenges

Research participants viewed insecurity, poverty, displacement, unemployment, poor infrastructure and rapid environmental degradation as topmost hindrances to sustainable development in Borno State. The incidence of frequent drought, flooding and desertification exacerbate poverty and food insecurity and the ensuing poverty rate in Borno State demands a concerted effort. The (World Bank, 2024) observed that conflict and fragility can erode development gains over time by causing displacement, weak institutions, reduced investment and failures in delivering core services. In the same vein, this study identified insecurity among other challenges as the primary challenge to development. Table 4 presents respondents' views on the major environmental and socioeconomic challenges affecting Borno State. The findings indicate the extent to which these issues are perceived to influence development within the study area. The function of these stakeholders is situated within legal regimes that stipulate their powers, duties, responsibilities, and accountability. As a starting point, government collaboration calls for clear constitutional and statutory authority in the hierarchy of government–federal, state, and local (Federal Republic of Nigeria, 1999). Similarly, NGOs and development partners operate within the regulatory framework of CAMA 2020 and other enabling regulations; partnership with the private sector is guided by procurement and concession laws (Federal Republic of Nigeria, 2020; Policy and Legal Advocacy Centre, 2020; Federal Republic of Nigeria, 2005, 2007). In the same vein, community involvement is tied to the rules on land tenure; while the joint dissemination of information must follow relevant data-protection laws and the Freedom of Information Act (Federal Republic of Nigeria, 1978, 2023, 2011). In terms of collaboration within conflict situations, counter-terrorism, anti-money laundering, and the protection of displaced persons are all key considerations (Federal Republic of Nigeria, 2022a, 2022b; African Union, 2009). These assertions are the product of legal and documentary analysis and not survey data (Aja-Eke, 2023).

Table 4: Environmental and Socioeconomic Constraints in Borno State

Constraint Variable	Mean	Std. Dev	Interpretation
Insecurity and conflict	4.35	0.71	Strongly Agreed
Poverty and unemployment	4.22	0.80	Strongly Agreed
Population displacement	4.10	0.84	Agreed
Weak infrastructure	4.05	0.87	Agreed
Climate change impacts (flooding/drought)	4.18	0.79	Agreed

Source: Field survey, 2026.

Table 4 outlines the major environmental and socioeconomic barriers affecting sustainable development in Borno State. The result reveals that insecurity and armed conflict recorded the highest mean score (Mean = 4.35; Std. Dev. = 0.71), indicating that respondents strongly considered insecurity as the most significant challenge in the state. Persistent insurgency has disrupted agricultural activities, reduced commercial operations, damaged public infrastructure, and limited access to social services such as education and healthcare (Ehiane & Moyo, 2022). Poverty and unemployment also emerged as serious socioeconomic problems, with a mean score of 4.22 and a standard deviation of 0.80. The responses suggest that many households continue to experience financial hardship due to limited employment opportunities and declining economic activities. Prolonged instability within the region has weakened local businesses, reduced investment inflow, and increased dependence on humanitarian support among affected communities (Wakdok & Bleischwitz, 2021). A graphical account of the statistical patterns identified during the investigation is provided in Figure 5.

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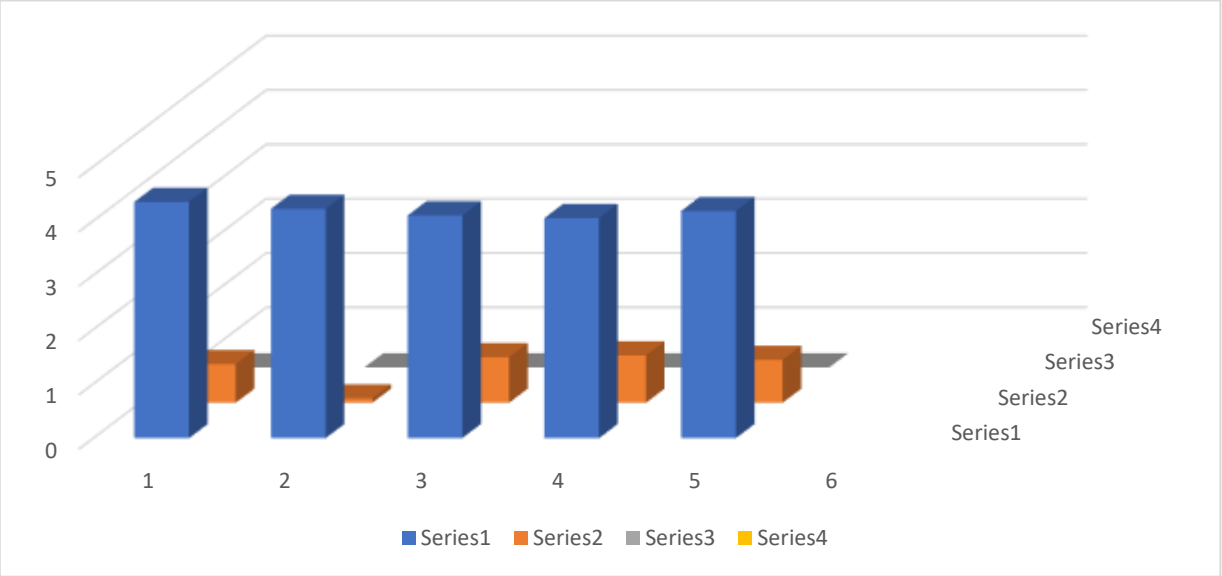


Fig 5: Environmental and Socioeconomic Constraints in Borno State.

The issue of population displacement was equally important in the findings, recording a mean value of 4.10 and a standard deviation of 0.84. Continuous attacks and insecurity have forced many residents to migrate from their communities to internally displaced persons' camps and safer urban settlements. This large movement of people has placed additional pressure on housing, healthcare facilities, schools, and water supply systems in host communities(Ieren et al., 2021). Weak infrastructure was another challenge identified by respondents (Mean = 4.05; Std. Dev. = 0.87). The result indicates that inadequate road networks, poor electricity supply, damaged healthcare facilities, and insufficient water infrastructure continue to limit economic growth and social development across the state. Years of insurgency have contributed to the destruction of essential public facilities, thereby slowing reconstruction and recovery efforts in many communities (Machina et al., 2026). Climate change impacts, including flooding and drought, also recorded a high level of agreement among respondents (Mean = 4.18; Std. Dev. = 0.79). Respondents acknowledged that irregular rainfall, flooding incidents, prolonged dry seasons, and desertification have negatively affected farming systems and food production within the state. These environmental conditions have further increased the vulnerability of communities already facing conflict-related challenges and economic hardship (Aborode et al., 2025).

3.5 Resilience and Sustainable Development Outcomes

Results from the study indicate that communities with stronger institutional frameworks and higher levels of stakeholder involvement tend to demonstrate enhanced adaptive capacity, faster recovery from shocks, and improved access to livelihood opportunities as well as essential public services. According to respondents, resilience-promoting measures have contributed to advancements in poverty reduction, food security, education, health, gender inclusion and environmental protection. The Sustainable Development Goals Report (United Nations, 2024) observes that development outcomes tend to be relatively slower in fragile and conflict settings. This study adds to this, indicating that resilience makes a positive contribution to development performance, by enhancing the capacity of people, institutions and local systems to prevent and respond to shocks. Table 5 displays how respondents assessed the resilience and development outcome in the study area.

Table 5: Resilience and Sustainable Development Outcomes

Indicator	Mean	Std. Dev	Interpretation
Improved livelihood opportunities	3.98	0.85	Agreed
Better access to education services	4.02	0.81	Agreed

Improved healthcare delivery	4.06	0.78	Agreed
Environmental sustainability improvements	3.89	0.90	Agreed
Progress toward SDG achievement	4.15	0.74	Agreed

Source: Field survey, 2026.

Table 5 presents the respondents' views on resilience and sustainable development outcomes in Borno State. The result shows that improved livelihood opportunities recorded a mean score of 3.98 with a standard deviation of 0.85, indicating that respondents agreed that recovery initiatives and resilience programmes have helped strengthen household income and economic activities in affected communities. Support programmes such as vocational training, agricultural assistance, and small business empowerment have contributed to rebuilding livelihoods among populations affected by conflict and displacement (Gbadegesin & Akintola, 2020). Better access to education services also recorded a positive response, with a mean value of 4.02 and a standard deviation of 0.81. Respondents agreed that educational interventions introduced by government agencies and humanitarian organizations have improved learning opportunities in several communities. Providing schools and outreach support, such as delivering learning materials and providing accelerated learning for displaced children and those out-of-school, has increased access to education and improved learning in the northeast of Nigeria (Diazgranados Ferráns et al., 2022). The figure presents findings related to the evaluation of the measurement framework adopted for the research in figure 6.

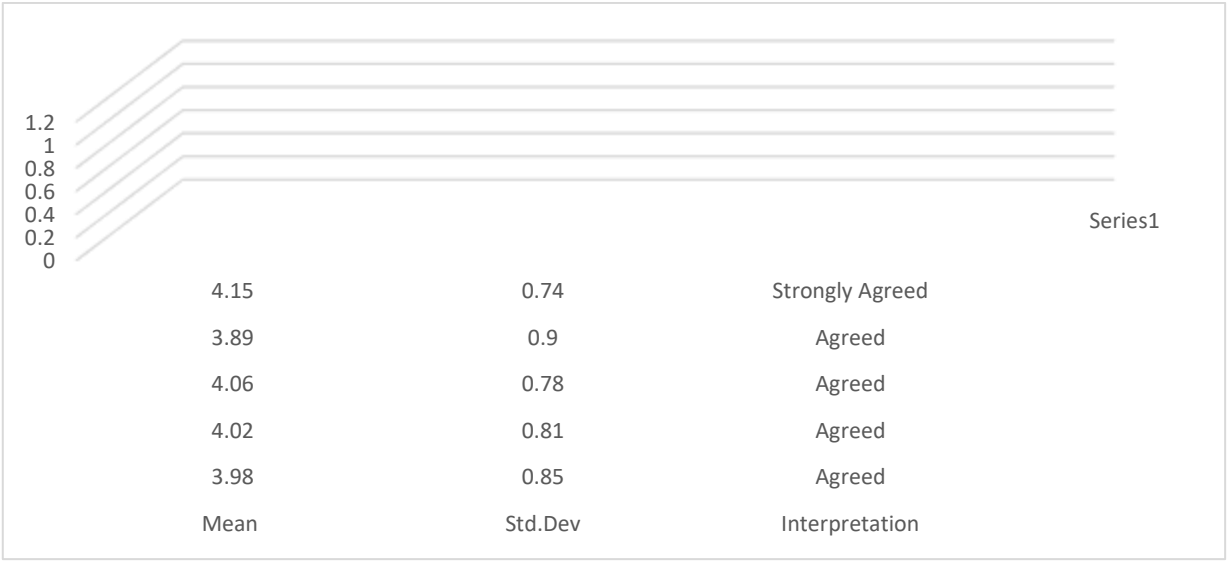


Fig 6: Resilience and Sustainable Development Outcomes

Improved healthcare delivery obtained a mean score of 4.06 and a standard deviation of 0.78, reflecting agreement among respondents that healthcare services have improved in many areas. Humanitarian health support, medical reconstruction, immunization and maternity healthcare programmes have strengthened SD access for vulnerable people in times of insecurity and displacement (Aborode et al., 2025). Environment recorded a mean of 3.89 (SD = 0.90), indicating adequate level of achievement for climate adaptation, afforestation and sustainable farming, public knowledge, attitude and action on environmental issues, SD achieved (Wakdok & Bleischwitz, 2021). SDG attainment had the highest mean of 4.15 (SD = 0.74), implying strong level of agreement for resilient action and collective efforts to realize SD through SD, healthcare, education and social service among others (Tamambang et al., 2024). Resilience is the emergent property of coupled socio-ecological systems that can absorb disturbance, reorganize itself, and continue to function (Folke et al., 2002), based on which resilience as a mediating variable between stakeholder collaboration and SDG was empirically tested. Table 6 shows the regression model statistics for the effect of collaborative actions on SDG.

Table 6: Regression Model Summary (Influence of Collaboration on SDG Outcomes)

Model	R	R^2	Adjusted R^2	Std. Error
1	0.782	0.612	0.598	0.421
Environmental and socioeconomic challenges (CH)	To be verified	To be verified	To be verified	Pending SPSS verification

Table 6 presents the regression model results examining how collaboration influences Sustainable Development Goal (SDG) outcomes in Borno State. The correlation coefficient (R = 0.782) indicates a strong positive relationship between stakeholder collaboration and SDG performance. This means that improvements in cooperation among government institutions, NGOs, development partners, and community-based organizations are closely associated with better development outcomes. The coefficient of determination (R^2 = 0.612) shows that 61.2% of the variation in SDG outcomes is explained by the full set of stakeholder predictors in the regression model (Equation 1). In practical terms, this suggests that a substantial portion of progress in areas such as education, healthcare delivery, poverty reduction, and environmental sustainability is linked to the extent of coordination among key development actors. This supports evidence that effective partnerships are central to achieving sustainable development in fragile and conflict-affected contexts (Tamambang et al., 2024).

The adjusted R of 0.598 denotes that more than half of the variation in SDG performances is explained by the model after adjustment. Standard error of the model at 0.421 shows that the model fit is acceptable. Overall, the results revealed a significant association between collaboration and SDG performances in Borno State, as supported by literature on how collaborative approaches and synergies can optimize and enhance resilience, service delivery and SDGs returns in post-conflict crisis regions (Vazquez-Brust et al., 2020; Wakdok & Bleischwitz, 2021). The model regression results and the contribution and significance of the various study variables are presented in table 7. Table 7 summarizes the findings from the regression assessment of the study variables. The reported estimates show the contribution of each factor to the observed outcome and identify those relationships that demonstrate statistical relevance.

Table 7: Regression Coefficients

Predictor Variable	Beta (β)	t-value	Sig.	Decision
Stakeholder collaboration	0.41	8.92	0.000	Significant
Government coordination	0.28	6.14	0.001	Significant
NGO support	0.33	7.08	0.000	Significant
Community participation	0.29	6.56	0.001	Significant
Private sector engagement	0.25	5.87	0.002	Significant

Source: Field survey, 2026.

Table 7 presents the regression coefficients used to examine how different stakeholder-related factors influence Sustainable Development Goal (SDG) outcomes in Borno State. All the predictor variables were statistically significant, implying the variables made meaningful contribution to the development outcome. Stakeholder collaboration had the most positive and statistically significant effect (+ = 0.41, t = 8.92, p = 0.000), implying that stakeholders' collaboration brings about good development outcome via enhanced interaction and use of resources by government, NGOs, communities, and development partners (Tamambang et al., 2024). Likewise, NGO support had a positive and statistically significant effect (+ = 0.33, t = 7.08, p = 0.000), implying NGOs' promotion of vulnerable groups and provision of vital services especially in insecure conflict

communities (Aja-Eke, 2023) (Folke et al., 2002). A visual account of the model appraisal process and its supporting statistical evidence is provided in Figure 7.

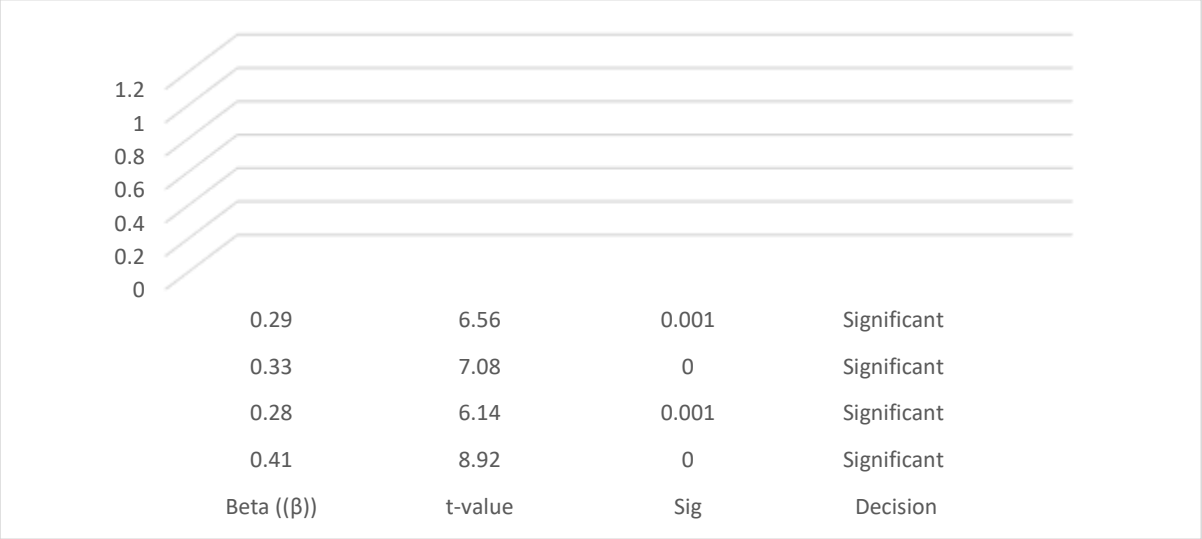


Fig 7: Regression Coefficients

Community participation remains a significant predictor (β = 0.29, t = 6.56, p = 0.001). Community participation is also a key factor in making any development project sustainable, viable, and locally accepted. The effect of Government coordination is also significant and positive (= 0.28, t = 6.14, p = 0.001) meaning that better institutional coordination helps in the implementation of policies and the delivery of services. The influence of Private-sector investment is also significant but has a relatively smaller impact (= 0.25, t = 5.87, p = 0.002) also through investment, jobs, and infrastructure. In general, all factors are significant for SDG performance where stakeholder collaboration has the highest impact followed by NGO support, community participation, government coordination and private-sector engagement Interpretation of stakeholder-specific effects: holding the other predictors constant, a one-standard-deviation increase in perceived NGO support is associated with a 0.33 standard-deviation increase in SDG outcomes, in community participation with 0.29, in government coordination with 0.28 and in private-sector engagement with 0.25, whereas stakeholder collaboration (joint engagement across groups) carries the largest coefficient (0.41). Because SC is estimated alongside the stakeholder-specific variables, its coefficient reflects the added value of working together beyond what each group contributes on its own, while the stakeholder-specific coefficients show the independent contribution of each group. The stakeholder-specific coefficients are close in size (0.25–0.33), so their ranking is indicative and should not be read as evidence of significant differences between stakeholder groups. The coefficient for environmental and socioeconomic challenges (CH) is expected to be negative because greater insecurity, poverty, displacement, climate stress and infrastructure constraints should be associated with lower SDG outcomes. However, the β, t and p values for CH are not reported in the available regression results and cannot be inferred reliably from the descriptive statistics. These values must be verified from the original SPSS output; accordingly, H6 remains undetermined until the coefficient is confirmed to be negative and statistically significant. Table 8 reports the outcomes of the construct evaluation process undertaken in this study. The figures provide evidence on the coherence of the measurement items and their suitability for representing the concepts examined in the research.

Table 8: Assessment of the Quality and Consistency of Latent Variable Measures.

Construct	CR	AVE	Cronbach Alpha
Stakeholder Collaboration	0.86	0.65	0.84
Government Coordination	0.83	0.61	0.81

Source: Field Survey, 2026.

Table 8 presents the results of the reliability and validity evaluation for the measurement constructs. The Stakeholder Collaboration construct achieved CR, AVE, and Cronbach's Alpha values of 0.86, 0.65, and 0.84, respectively, while Government Coordination recorded values of 0.83, 0.61, and 0.81. The reliability coefficients are above the accepted minimum level, indicating that the items within each construct measure the same concept consistently. In addition, the AVE values exceed the recommended threshold, showing that the indicators adequately reflect their underlying constructs. These findings suggest that the measurement model possesses satisfactory reliability and convergent validity, making it suitable for further analysis. Figure 8 provides a visual summary of the measurement appraisal findings, presenting the evidence used to determine the adequacy, consistency, and overall suitability of the variables incorporated into the research framework.

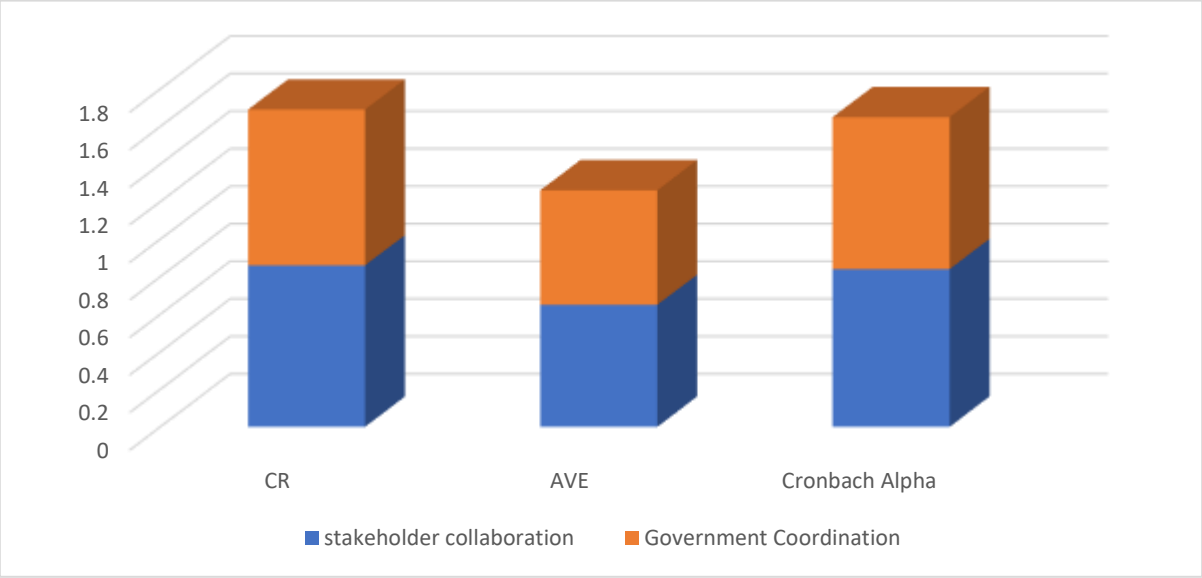


Fig 8: Assessment of the Quality and Consistency of Latent Variable Measures.

The table further shows that Cronbach's Alpha should be higher than 0.70. This coefficient is widely used to examine the consistency of measurement items within a scale. Values above the specified threshold indicate that the items are sufficiently homogeneous and collectively assess the same underlying construct. Overall, the criteria reported in Table 7 correspond to widely accepted standards in structural equation modelling. Satisfaction of these benchmarks suggests that the measurement instruments possess adequate reliability and validity, thereby supporting the credibility of the constructs and their suitability for subsequent model estimation and hypothesis evaluation. To determine the adequacy of the proposed framework, a number of accepted model assessment indicators were considered. Table 9 lists the fit statistics and corresponding reference standards used in examining the consistency between the model and the empirical data.

Table 9: Overall Evaluation Results of the Structural Framework.

Fit index	Evaluation Criterion	Recommendation
χ^2/df	< 3.00	Indicates how closely the specified model reflects the observed dataset.
CFI	> 0.90	Assesses the relative improvement of the proposed model over a null model.
TLI	> 0.90	Evaluates model performance while adjusting for the complexity of the framework.
RMSER	< 0.08	Reflects the extent of residual approximation error within the model structure.
SRMI	< 0.08	Represents the average residual difference between observed and predicted relationships.

Source: Field survey, 2026.

Table 9 provides the standards used to examine the adequacy of the structural framework. These fit measures are commonly applied in structural equation modelling to determine how effectively a model represents the relationships contained in the observed data. The χ^2/df statistic offers an overall evaluation of model performance, while the Comparative Fit Index (CFI) and Tucker–Lewis Index (TLI) assess the strength of the model relative to a reference structure. The Root Mean Square Error of Approximation (RMSEA) indicates the level of approximation error, whereas the Standardized Root Mean Square Residual (SRMR) measures the extent of differences between observed and estimated relationships. Collectively, these indicators assist in determining whether the framework is appropriate for analysing the links among stakeholder collaboration, resilience, and sustainable development outcomes. A visual account of the model appraisal process and its supporting statistical evidence is provided in Figure 9.

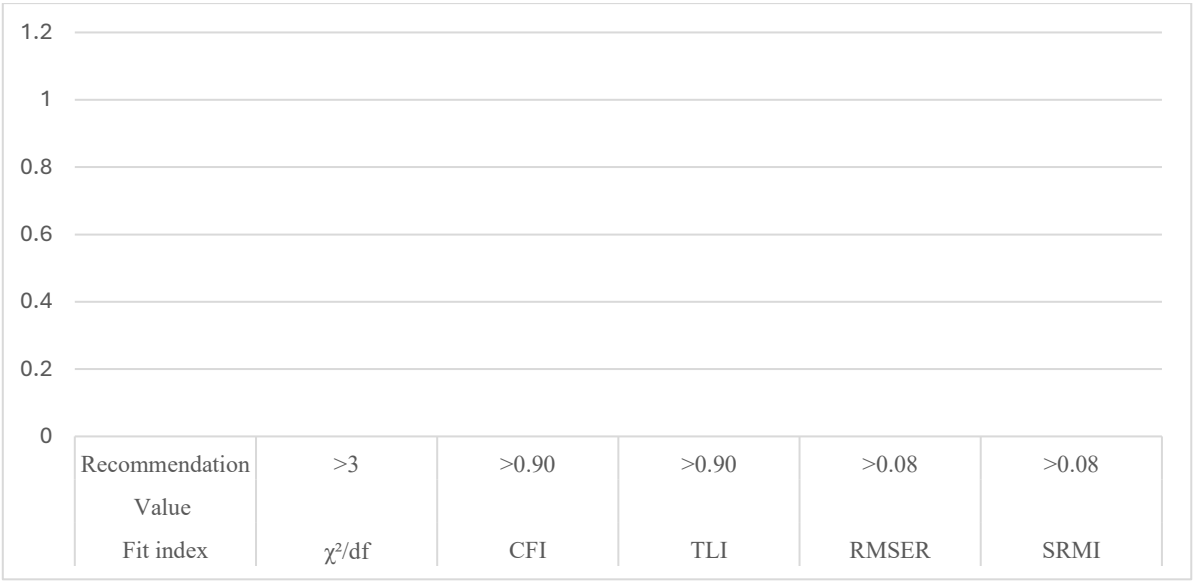


Fig 9: Overall Evaluation Results of the Structural Framework.

Stronger values suggest that the model is both efficient and statistically sound. The Root Mean Square Error of Approximation (RMSEA) examines the degree of error associated with approximating the population covariance structure. Lower RMSEA values indicate a closer alignment between the theoretical framework and the observed data, reflecting a more acceptable model specification. The Standardized Root Mean Square Residual (SRMR) evaluates the average discrepancy between the observed correlations and those generated by the model. Smaller residual values imply that the estimated relationships closely mirror the actual relationships found within the dataset. Taken together, these fit measures provide complementary evidence regarding the adequacy of the structural framework. Achieving the recommended thresholds across these indicators demonstrates that the proposed model sufficiently represents the observed data and can therefore be used with confidence to examine the hypothesized relationships among the study variables. Such findings reinforce the credibility of the structural analysis and support the validity of subsequent interpretations.

3.6 Hypothesis Testing Results

The study combined insights from the survey and interviews to construct a holistic framework that links collaborative action, resilience enhancement, and sustainable development within the context of Borno State. The framework facilitates collaborative planning, implementation, monitoring and review by government, development and humanitarian organizations, communities and private-sector stakeholders. The focus is on timely strategic decision-making, optimized resource utilization, accountability, feedback and learning. The establishment of indicators such as poverty alleviation, employment, educational and health achievements, infrastructure quality, environmental restoration, inclusive participation and engagement, and others, are used to monitor progress on the framework. In fragile and conflict-affected situations, building adaptive capacity, livelihood diversity and decreasing vulnerability is crucial for sustainable recovery. The framework draws a connection between stakeholder participation, resilience, local challenges, environmental and social conditions, and development outcomes and wraps it in an integrated structure. As opposed to a model where governance and resilience are independent of each other, they are considered

together and their interaction on development is analyzed. Table 10 presents the results of the mediation analysis examining the role of resilience in the relationship between stakeholder cooperation and SDG outcomes. The findings show both the direct and indirect effects among the study variables.

Table 10. Summary of Statistical Indicators Used to Assess Structural Model Adequacy.

Path	Beta	p-value
SC → Resilience	0.50	<0.001
Resilience → SDG	0.46	<0.001
SC → SDG (direct)	0.28	0.002
Indirect Effect	0.27	<0.001

Source: Field survey, 2026.

Table 10 evaluates the extent to which resilience explains the connection between stakeholder collaboration and sustainable development outcomes. Results also support the positive influence of stakeholder collaboration on resilience (= 0.50, $p < 0.001$), illustrating that stakeholder collaboration within the context of development in Borno state enhances the capacity to cope and adapt to shocks. Similarly, resilience has a positive influence on sustainable development outcomes (= 0.46, $p < 0.001$). The direct influence of stakeholder collaboration on sustainable development (= 0.28, $p = 0.002$) and the indirect influence (through resilience) (= 0.27, $p < 0.001$) are both significant, confirming partial mediation: stakeholder collaboration can significantly influence development outcomes through an increase in resilience, as well as a direct effect. Overall, the findings demonstrate the critical role of stakeholder collaboration in fostering resilient and sustainable development outcomes for Borno State.

3.7 Discussion of Findings

The findings suggest that advancing sustainable development in conflict-affected settings depends largely on strong coordination among diverse stakeholders. Government institutions play a central role by setting policy direction, maintaining governance structures, and providing institutional legitimacy, while NGOs, community actors, and private-sector participants contribute through implementation support, local knowledge, and financial and technical inputs. These outcomes are consistent with existing research that emphasizes collaborative governance, multi-actor partnerships, and resilience-focused planning in fragile environments. In Borno State, integrated approaches become necessary as pressures from the environment, economy and institutional arrangements are interdependent. The findings reaffirm a positive correlation between stakeholder collaboration and development by building resilience, decreasing vulnerability and fostering the SDGs. The relative significance of community voice matches the assertion of (Ansell et al., 2024), on enhanced participation of citizens as a means to promote an inclusive policy learning and acceptance process by integrating community knowledge and lived experience into governance and development processes. On the whole, the findings are in agreement with the framework, as a practical guide to enhance coordination, build resilience and foster sustainable development. Another consequence is that the legal and institutional framing of stakeholder alliances should be explicit and stable, with clarity about mandates, contractual agreements on roles, funding, data sharing, disputes, and withdrawal rights, as well as transparency and accountability, rights of communities, informed consent, and protection for forcibly displaced populations, vulnerable populations, as per SDG 17 and collaborative governance (Ansell & Torfing, 2021b; United Nations., 2015; Vazquez-Brust et al., 2020). Since none of these mechanisms were empirically tested directly by the survey, I suggest them as analytical hypotheses for testing in future research.

Legal-Institutional analysis

The documentary review (Section 2.5.2; Table 2a) suggests that the legal foundation for collaboration is dispersed across a number of instruments and does not exist in one place. To start, in relation to constitutional provisions, the 1999 Constitution gives concurrent responsibilities for health, education, environmental management and local administration across the federal, state and local levels, so an intergovernmental collaboration managing these services should be anchored in the tier and the agency with the relevant mandate; for Borno State this ensures that intergovernmental coordination is an essential element of multi-stakeholder collaboration, not an additional one. Second, in relation to partnerships agreements, the CAMA 2020 and

procurement and concession statutes govern the formal engagement of NGOs and the private sector, but, as far as can be ascertained from the review, they regulate the individual category of partner separately, and contain little on joint management of the partnership, like dispute settlement, data management and exit. Third, in relation to the regulation, registration and oversight of NGOs under Part F of the CAMA 2020, in conjunction with counter-terrorism and anti-money-laundering legislation, this imposes a number of compliance and due-diligence requirements that influence flows of funds and of service provision to local partners in conflict contexts. Fourth, in relation to data regulation, we find both the Nigeria Data Protection Act 2023 and the Freedom of Information Act 2011 regulating consent, processing and publication of data, which is relevant to monitoring and information-sharing systems that the model envisions, especially when dealing with displaced communities. Fifth, in relation to accountability mechanisms, transparency in procurement, information in reporting requirements and the right to information are established as holding each partner accountable to the public and public institutions, but they do not seem to attribute collective responsibility for the results of multi-stakeholder partnerships. These are based on the above documentary analysis, not on survey data, and explain why in the model they call for formal coordination forums, mandatory partnership arrangements and data protection and compliance safeguards (Section 4.0).

4.0 Conclusion

This study investigated the contribution of stakeholder partnerships to resilience enhancement and sustainable development in Borno State, Nigeria. The results show that development progress in conflict-affected environments is strongly influenced by the extent of cooperation among public institutions, humanitarian organizations, development agencies, local communities, and private-sector actors. Joint efforts in planning, implementation, and resource mobilization were found to support more effective responses to development needs and improve the delivery of programmes aimed at social and economic recovery. The findings demonstrate that coordinated stakeholder engagement remains a fundamental requirement for achieving meaningful and lasting development outcomes.

The study also established that numerous environmental and socioeconomic pressures continue to affect development performance across the state. Respondents identified insecurity, unemployment, poverty, population displacement, climate-related hazards, and inadequate infrastructure as persistent challenges limiting progress. These conditions increase vulnerability, disrupt livelihoods, and place additional pressure on institutions responsible for service provision. The findings suggest that development interventions should address these interconnected constraints through comprehensive strategies that combine economic, social, environmental, and institutional responses.

An important finding of the study is the role of resilience in supporting development advancement. Communities and institutions with greater capacity to withstand disturbances, adjust to changing circumstances, and recover from setbacks were associated with stronger development outcomes. The mediation analysis further revealed that resilience serves as a linking factor between stakeholder collaboration and sustainable development performance. This indicates that collaborative actions generate development benefits not only through direct interventions but also through strengthening the adaptive capacity of communities and institutions facing recurring challenges.

In conclusion, sustainable development in Borno State is more likely to be achieved when stakeholder cooperation, resilience strengthening, and challenge-responsive policies operate together within a coordinated framework. The study provides evidence that effective partnerships, community engagement, institutional capacity enhancement, and resilience-focused initiatives can contribute significantly to long-term development progress. Strengthening these areas will support recovery efforts, improve service delivery, and create conditions that enable communities to pursue sustainable development despite existing environmental and socioeconomic pressures. Finally, the study stresses that the legal aspect of collaboration should also be addressed explicitly by policy. The Integrated Stakeholder Policy Model needs to be complemented by a clear legal and institutional framework for the coordination platforms, mutually agreed and legally binding partnership agreements, legal compliance with NGO-registration, procurement, data-protection and access-to-information obligations, and legal protection of the rights of communities and internally displaced persons. Future research needs to empirically investigate how legal clarity and legal agreements influence the quality of collaboration and development impacts in Borno State.

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AUTHOR CONTRIBUTION

S/N	Name of the author	Contribution
1.	Benjamin Paul Hammajam	Conceptualization
2.	Assoc. Prof. Dr. Ambrina Sardar Khan	Review editing, and Plagiarism checking
3.	Assistance Prof. Dr. Rahila Rahman Khan	Formal analysis

CONFLICT OF INTEREST

The authors state clearly that there are no conflicts of interest associated with this work.

ETHICAL STATEMENT

Ethical approval for the study was obtained from the appropriate Research Ethics Committee of Integral University, Lucknow, India, and the study was assigned the manuscript communication number IU/R&D/2026-MCN0004692. Prior authorization was also obtained from the relevant local authorities and partner organizations in Borno State, Nigeria, before commencement of field data collection. The study was conducted in accordance with the ethical principles outlined in the Declaration of Helsinki ethics guidelines. All respondents were provided with adequate information regarding the purpose, objectives, procedures, and voluntary nature of the study and participated only after providing voluntary informed consent. Participants were informed of their right to refuse participation or withdraw from the study at any time without penalty, reprisal, or disadvantage. Appropriate measures were taken to protect participants' privacy and maintain the strict confidentiality of all information collected. The data were used exclusively for academic and research purposes and were handled in accordance with applicable ethical principles.

DATA AVAILABILITY STATEMENT

The data supporting the findings of this study were obtained through questionnaire surveys, key informant interviews, and documentary analysis conducted in Borno State, Nigeria. The data are available from the corresponding author upon reasonable request, subject to applicable ethical requirements and the protection of participants' confidentiality and privacy.

REFERENCES

[1] Aborode, A. T., Otorkpa, O. J., Abdullateef, A. O., Oluwaseun, O. S., Adegoye, G. A., Aondongu, N. J., Oyetunji, I. O., Akingbola, A., Scott, G. Y., Kolawole, B. O., & Komakech, J. J. (2025). Impact of climate change-induced flooding water related diseases and malnutrition in Borno State, Nigeria: A public health crisis. *Environmental Health Insights, 19*. https://doi.org/10.1177/11786302251321683

[2] African Union. (2009). *African Union Convention for the Protection and Assistance of Internally Displaced Persons in Africa (Kampala Convention).* https://au.int/en/treaties/african-union-convention-protection-and-assistance-internally-displaced-persons-africa

[3] Aja-Eke, D. (2023). Bypassing government and state agencies in aid allocation: Evidence from conflict-affected regions in Nigeria. *Development in Practice, 33*(6), 713–720. https://doi.org/10.1080/09614524.2023.2202838

[4] Ansell, C., Sørensen, E., & Torfing, J. (2024). The democratic quality of co-creation: A theoretical exploration. *Public Policy and Administration, 39*(2), 149–170. https://doi.org/10.1177/09520767231170715

[5] Ansell, C., & Torfing, J. (2021). *Public governance as co-creation.* Cambridge University Press. https://doi.org/10.1017/9781108765381

[6] Bank, W. (2023). *Nigeria development update: Seizing the opportunity.* World Bank. https://documents.worldbank.org/en/publication/documents-reports/documentdetail/099062623065078024

[7] Baron, R. M., & Kenny, D. A. (1986). The moderator–mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. Journal of Personality and Social Psychology, 51(6), 1173–1182. https://doi.org/10.1037/0022-3514.51.6.1173

[8] Benjamin, O. O., & Foye, V. O. (2022). Inclusion, organizational resilience, and sustainable development in Nigeria: The role of digital innovations. *The 9th International Conference on Sustainable Development, 27*. https://doi.org/10.3390/environsciproc2022015027

[9] Braun, V., & Clarke, V. (2008). Using thematic analysis in psychology. Qualitative Research in Psychology, 3(2), 77–101. https://doi.org/10.1191/1478088706qp063oa

[10] Cochran, W. G. (1977). Sampling techniques (3rd ed.). John Wiley & Sons. Available from: https://www.wiley.com/en-us/shop/general-introductory-statistics/sampling-techniques-3rd-edition-p-9780471162407

[11] Diazgranados Ferráns, S., Lee, J., Ohanyido, C., Hoyer, K., & Miheretu, A. (2022). The cost-effectiveness of an accelerated learning program on the literacy, numeracy and social-emotional learning outcomes of out-of-school children in Northeast Nigeria: Evidence from a mixed methods randomized controlled trial. *Journal of Research on Educational Effectiveness, 15*(4), 655–686. https://doi.org/10.1080/19345747.2022.2037799

[12] Ehiane, S., & Moyo, P. (2022). Climate change, human insecurity and conflict dynamics in the Lake Chad region. *Journal of Asian and African Studies, 57*(8), 1677–1689. https://doi.org/10.1177/00219096211063817

[13] Federal Republic of Nigeria. (1978). *Land Use Act, Cap. L5, Laws of the Federation of Nigeria 2004*. https://faolex.fao.org/docs/pdf/nig67625.pdf

[14] Federal Republic of Nigeria. (1999). *Constitution of the Federal Republic of Nigeria 1999 (as amended)*. https://placng.org/i/wp-content/uploads/2023/11/Constitution-of-the-Federal-Republic-of-Nigeria-1999-Updated.pdf

[15] Federal Republic of Nigeria. (2005). *Infrastructure Concession Regulatory Commission (Establishment, etc.) Act 2005*. https://www.icrc.gov.ng/assets/uploads/2018/12/ICRC-Act-2018.pdf

[16] Federal Republic of Nigeria. (2007). *Public Procurement Act 2007*. https://bpp-storage.s3.eu-west-2.amazonaws.com/wp-content/uploads/2025/09/13205602/PUBLIC-PROCUREMENT-ACT-2007-F-1.pdf

[17] Federal Republic of Nigeria. (2011). *Freedom of Information Act 2011*. https://ncdmb.gov.ng/wp-content/uploads/2025/12/freedom-of-information-act.pdf

[18] Federal Republic of Nigeria. (2020). *Companies and Allied Matters Act 2020*. scribd.com/document/472633143/Companies-and-Allied-Matters-Act-2020

[19] Federal Republic of Nigeria. (2022a). *Money Laundering (Prevention and Prohibition) Act 2022*. https://placng.org/i/wp-content/uploads/2022/05/Money-Laundering-Prevention-and-Prohibition-Act-2022.pdf

[20] Federal Republic of Nigeria. (2022b). *Terrorism (Prevention and Prohibition) Act 2022*. https://nigsac.gov.ng/assets/lawsdoc/terrorism%20prevention%20publication.pdf

[21] Federal Republic of Nigeria. (2023). *Nigeria Data Protection Act 2023*. https://ndpc.gov.ng/about-us/

[22] Folke, C., Carpenter, S., Elmqvist, T., Gunderson, L., Holling, C. S., & Walker, B. (2002). Resilience and sustainable development: Building adaptive capacity in a world of transformations. *AMBIO: A Journal of the Human Environment, 31*(5), 437–440. https://doi.org/10.1579/0044-7447-31.5.437

[23] Gbadegesin, O. A., & Akintola, S. O. (2020). A legal approach to winning the 'WASH' war in Nigeria. *European Journal of Environment and Public Health, 4*(2), em0043. https://doi.org/10.29333/ejeph/8237

[24] Ieren, I. I., Kabuk-Agbadu, S., & Umeokonkwo, C. (2021). Effect of beneficiary participation in program design and implementation on satisfaction and acceptability among internally displaced persons in Borno, Nigeria. *Journal of International Humanitarian Action, 6*(1), 9. https://doi.org/10.1186/s41018-021-00097-5

[25] International Fund for Agricultural Development. (2025). *Building resilience: Climate action for sustainable and inclusive rural development (2025)*. SIANI. https://www.siani.se/news-story/climate-action-sustainable-rural-development/

[26] Johnston, K. A., Taylor, M., & Ryan, B. (2024). Evaluation of community engagement for resilience outcomes: A pre-engagement approach. *International Journal of Disaster Risk Reduction, 110*, 104613. https://doi.org/10.1016/j.ijdrr.2024.104613

[27] Machina, M. A., Machina, M. M., & Mshelia, H. G. (2026). Post conflict review of economic impact of Boko Haram insurgency on public buildings in Borno State, Nigeria. *International Journal of Research and Innovation in Applied Science, XI*(I), 177–191. https://doi.org/10.51584/IJRIAS.2026.11010014

[28] Malley, C. S., Omotosho, D., Bappa, B., Jibril, A., Tarfa, P., Roman, M., Hicks, W. K., Kuylenstierna, J. C. I., de la Sota Sandez, C., & Lefèvre, E. N. (2021). Integration of climate change mitigation and sustainable development planning: Lessons from a national planning process in Nigeria. *Environmental Science & Policy, 125*, 66–75. https://doi.org/10.1016/j.envsci.2021.08.022

[29] Mohammed, D., Timothy, E., Abaka, S. S., & Arubi, A. A. (2022). Analysis of climate change vulnerability and adaptation towards increase resilience among farmers in Borno State, Nigeria. *African Journal of Agricultural Research, 18*(2), 80–88. https://doi.org/10.5897/AJAR2021.15765

[30] Neely, C. L., Bourne, M., Chesterman, S., Vågen, T.-G., Lekaram, V., Winowiecki, L. A., & Prabhu, R. (2021). Inclusive, cross-sectoral and evidence-based decision-making for resilience planning and decision-making in a devolved context. *The European Journal of Development Research, 33*(4), 1115–1140. https://doi.org/10.1057/s41287-021-00410-3

[31] UNDP. (2023). *G20 members' regulations of cross-border data flows.* United Nations Development Programme. https://doi.org/10.18356/9789210024235

[32] Ngulube, N. K., Tatano, H., & Samaddar, S. (2024). Toward participatory participation: A community perspective on effective engagement in post-disaster recovery and reconstruction. *Community Development, 55*(6), 895–915. https://doi.org/10.1080/15575330.2024.2382169

[33] Nwachukwu, M. O., Azorji, J. N., Adjero, L. A., Green, M. C., Igwe, C. E., & Nnadozie, R. I. A. (2020). Influence of spent engine oil pollution and organic amendment on soil physicochemical properties, microbial population and growth of *Capsicum annuum* (L.). *Asian Soil Research Journal*, 17–25. https://doi.org/10.9734/asrj/2020/v3i130064

[34] OECD. (2023). *Environmental performance reviews: Nigeria.* OECD Publishing. https://www.oecd.org/en/publications/oecd-environmental-performance-reviews_19900090.html

[35] Organisation for Economic Co-operation and Development. (2025). *States of fragility.* OECD Publishing. https://doi.org/10.1787/fa5a6770-en

[36] Tamambang, R., Kusi-Mensah, K., Bella-Awusah, T., Ogunmola, O., Afolayan, A., Toska, E., Hertzog, L., Rudgard, W., Evans, R., Stöeckl, H., Cluver, L., & Omigbodun, O. (2024). Two are better than one but three is best: Fast-tracking the attainment of the Sustainable Development Goals (SDGs) among in-school adolescents in Nigeria. *Child Indicators Research, 17*(5), 2219–2241. https://doi.org/10.1007/s12187-024-10160-3

[37] UNDP. (2024). *United Nations Development Programme, Human Development Report 2023/2024.* Human Development Report. https://hdr.undp.org/content/human-development-report-2023-24

[38] UNDP. (2025). *United Nations Development Programme, Community-based resilience-building: A UNDP guidance note (2025).* UNDP. https://www.undp.org/sites/g/files/zskgke326/files/2025-05/undp-community-based-resilience-building-guidance-note.pdf

[39] UNESCO. (2026). *Programme and meeting document.* UNESCO. https://unesdoc.unesco.org/ark:/48223/pf0000398355?posInSet=1\&queryId=ac990bd5-0101-45ee-8098-9407dca8109e

[40] United Nations. (2024). *The sustainable development goals report 2024.* United Nations Statistics Division. https://unstats.un.org/

[41] Vazquez-Brust, D., Piao, R. S., de Melo, M. F. de S., Yaryd, R. T., & M. Carvalho, M. (2020). The governance of collaboration for sustainable development: Exploring the "black box." *Journal of Cleaner Production, 256*, 120260. https://doi.org/10.1016/j.jclepro.2020.120260

[42] Wakdok, S. S., & Bleischwitz, R. (2021). Climate change, security, and the resource nexus: Case study of Northern Nigeria and Lake Chad. *Sustainability, 13*(19), 10734. https://doi.org/10.3390/su131910734

[43] World Bank. (2021). *Fragility, conflict, and violence overview 2021.* World Bank. https://ida.worldbank.org/en/lenses/fragility

[44] World Bank. (2022). *Resilience, recovery, and reconstruction in fragile environments (2022).* World Bank. https://ida.worldbank.org/

[45] World Bank. (2024). *Fragility, conflict and violence update 2024.* World Bank. https://www.worldbank.org/en/events/2024/02/27/fragility-forum-2024