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Agricultural Production: Implication For Building A Transformational And Sustainable Economy Resilience In Nigeria

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Abstract: ***This paper aims to provide an overview of the main findings and conclusions of the research study.***

The Sub-Saharan Africa (SSA) area, including Nigeria, has seen significant challenges in terms of growth and development following the independence of its countries in the late 1950s and early 1960s. As a result of their susceptibility to worldwide geopolitical tensions and external shocks, which have a negative impact on growth patterns and long-term viability. The economies that heavily rely on agriculture for their sustenance have experienced heightened susceptibility to a worldwide economic downturn. The present study aimed to examine the association between resilience and agriculture in Nigeria from 1981 to 2022. The Autoregressive Distributed Lag (ARDL) bound test approach to cointegration, together with CUSUM and CUSUMSQ stability tests, were employed with other diagnostic tests to analyses the data. The methodology employed in this study was predicated on the assumption that the unit root tests provided evidence of the variables being stationary at the first difference, specifically at the I(1) level of integration. Two criteria are considered: the percentage contribution of the agriculture sector to gross domestic product (GDP) and its contribution to resilience. The study incorporated three distinct shock factors, namely armed conflicts, natural catastrophes, and terrorist attacks, to serve as indicators of resilience. The measurement of resilience encompasses both individual indicators and factor analysis indices. Consequently, an investigation was conducted to examine the extent to which agriculture has contributed to structural transformation and resilience in Nigeria. The concerns pertaining to transformative sustainability and resilience were addressed through the utilization of two models. The initial model examined the relationship between agricultural output, industrial output, and employment rate as independent variables, and Gross Domestic Product as the dependent variable in order to investigate the concept of transformational sustainability. The second model investigated the resilience component, specifically the capacity to withstand and recover from adverse events. The study focused on internally displaced persons (IDPs) who have experienced different forms of violence, natural disasters, armed conflicts, and terrorism-related shocks. The dependent variable was the impact of these shocks on the IDPs, while explanatory variables included agricultural production, human capital development, governance, and health services. The analysis utilized data extracted from the CBN Statistical Bulletin spanning the period from 1981 to 2022. The findings revealed a significant correlation between the Gross Domestic Product (GDP) and agricultural output, as well as a similar pattern observed for the measures of resilience and agricultural productivity. The results also indicated that natural disasters, armed conflict, and shocks related to terrorism had a detrimental effect on both structural transformation and economic growth. Therefore, based on the results of this study, it is recommended that the government develop policies aimed at enhancing agricultural productivity and fostering resilience in Nigeria in order to facilitate transformative economic growth.

Keyword: Economic Growth, Agricultural Production, Resilience, Sustainability, ARDL.

JEL classification codes: QO, QO1, O13, P32

I. INTRODUCTION

This paper provides an overview of the research topic by offering a concise depiction of the economic landscape in Nigeria and the broader Sub-Saharan Africa region. In Unit 2, the current literature pertaining to the interrelated concepts of structural transformation, resilience, and agriculture is briefly examined, followed by a concise overview of the potential linkages between these notions. Section 3 provides a concise theoretical framework for investigating these linkages, encompassing the methodology, model specification, and a practical model for assessing the connections between shocks, resilience variables, and other indications of structural alteration. Additionally, the paper presents the data and assessment methodologies. Section 4 presents an analysis of the empirical findings, while Section 5 provides a theoretical interpretation of the paper's deductions and implications for strategic considerations.

Sub-Saharan African economies, including Nigeria's, have experienced substantial downturns and challenges subsequent to their attainment of independence in 1960, primarily due to recurrent economic crises. The adverse impact on agricultural-dependent economies has been attributed to a range of factors, including incursions on farmland by farmer herders, an increase in banditry in the Northwest and North Central regions, insurrection in the Northeast, intense separatist movements in the Southeast, as well as gang conflicts in the Southwest and South-South zones. The protracted struggle between farmers and herders, extrajudicial killings, and communal clashes have exacerbated security and socioeconomic challenges in both war-torn regions and other areas across the nation (Odozi & Uwaifo, 2022). The severity of these violent acts has escalated, resulting in an increased number of fatalities and occurrences, hence intensifying concerns regarding national security.

The present study investigates the impact of agricultural production on the economic resilience and shock absorption capacity of the Nigerian economy. This study investigates the capacity of agriculture to foster a paradigm-shifting and environmentally viable economy. This study examines the resilience in Nigeria by employing two structural transformative measures: the proportion of agriculture's contribution to the Gross Domestic Product (GDP) and the agricultural sector's contribution to the resilience indicator. In this research, the resilience indicator is defined as the loans provided to address economic shocks during a specific time frame. The study also considers several elements such as conflicts among herdsmen, armed banditry, terrorist attacks, natural disasters, violence, and governance that influence agricultural output and resilience, as well as factors that undermine it.

Based on the findings of the study, it is evident that characteristics associated with resilience have a greater impact on impeding the process of structural transformation, as opposed to natural disasters or shocks stemming from acts of terrorism. This observation suggests that the occurrence of violence frequently leads to the destruction of agricultural activities in these regions, resulting in more severe negative consequences for other sectors of the economy. The atypical growth trajectory observed in Sub-Saharan Africa (SSA), with a particular focus on Nigeria, over the past two decades has raised doubts regarding the validity of the notion that structural change entails the redistribution of economic activity and production inputs. Can it be asserted with accuracy that transitioning from low-productivity to high-productivity activities will result in an increase in the total productivity of the economy?

According to the World Bank (2022), the Sub-Saharan Africa (SSA) region saw the most significant growth in agricultural production, with an average annual rise of 4.3 percent between the years 2000 and 2018, surpassing all other regions worldwide. Based on data provided by the National Bureau of Statistics, Nigeria had a decline in its agricultural gross domestic product (GDP) from 5568554.89 NGN million in the fourth quarter of 2022 to 3844845.21 NGN million in the first quarter of 2023. This phenomenon could potentially be ascribed to the persistent series of shocks experienced by the nation throughout the past decade.

The concept of economic transformation encompasses a pair of interconnected developmental processes. The initial process involves structural change, which entails the reallocation of labour and resources from sectors characterized by low productivity, such as subsistence agriculture, to sectors characterized by high productivity, such as industry and modern services. The second factor pertains to the acceleration of productivity development across different sectors. Therefore, it may be argued that economic transformation plays a crucial role in enhancing living standards, fostering resilience, and promoting self-sufficiency. The initiation and acceleration of the transformation process might occur when the primary sector of the economy, such as agriculture, undergoes an increase in production. The majority of the population in sub-Saharan African countries relies on agriculture and the broader agri-food industry as the main source of work and income. Therefore, the enhancement of agricultural productivity growth, which refers to the progressive increase in the proportion of agricultural output to inputs through time, continues to be a significant issue that African countries, particularly those facing many disruptive factors like Nigeria, need to tackle.

Based on Nextier's (2022) findings, it is evident that the Nigerian government has allocated a substantial sum of ₦8 trillion towards security provisions throughout the course of the past six years, commencing in 2021. However, despite this significant investment, the anticipated outcomes have not been realized. In order to achieve economic transformation, a comprehensive approach is employed, which acknowledges the interconnectedness of various factors such as agricultural growth, downstream value chains, non-farm sectors, education, governance, health, and infrastructure. The concerns pertaining to transformative sustainability and resilience were addressed through the utilization of two models. The initial model employed agricultural output, industrial output, and employment rate as independent variables, whereas Gross Domestic Product was considered as the dependent variable for the purpose of investigating transformative sustainability. The second model investigated the resilience component by analyzing the relationship between the dependent variable, Internally Displaced Persons (IDP), and the explanatory variables of agricultural output, human capital development, and governance. Therefore, the research objective and hypothesis are formulated as follows:

Research Objectives: This study aims to assess the degree to which agricultural output in Nigeria contributes to the development of resilience and facilitates economic growth.

The research hypothesis under investigation is as follows:

Hypothesis 1: The absence of a substantial correlation exists between agricultural production and economic growth in Nigeria.

H_{02}: The study finds no statistically significant correlation between resilience and agricultural production in Nigeria.

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The following section will discuss the second part of the topic.

Literature Review Conceptual Framework

Resilience encompasses the ability to effectively manage and rebound from adverse events or disruptions. The capacity to safeguard the populace by mitigating the first effects of a disturbance and then reinstating the system, occasionally resulting in improved levels of welfare. Additionally, it encompasses the implementation of an efficient agricultural system, enhanced disaster preparedness measures, and appropriate water management strategies.

The Positive Peace Index (PPI) serves as a metric for assessing the ability to effectively address ecological hazards. This metric assesses the prevailing attitudes, institutions, and structures within a certain society.

Violence refers to a behavioral manifestation characterized by the utilization of physical force with the intention of causing harm, destruction, or fatality to an individual or entity. Additionally, it encompasses the intensity of emotion or the magnitude of a catastrophic natural phenomenon. Violence, as defined by Wikipedia, refers to the utilization of physical force with the intention of inflicting harm against individuals, animals, or property, resulting in various detrimental outcomes such as suffering, injury, death, damage, or destruction.

Numerous scholarly investigations have been conducted throughout the years to examine violent conflicts in diverse economies, encompassing Latin America, Asia, and African economies. The majority of these research have indicated a detrimental effect of conflict on several aspects such as education, health, individuals, and households. The index of political violence is determined through the computation of ten distinct categories of episodes pertaining to violence, which are seen to occur on a nationwide scale. Higher values of the index reflect a correspondingly elevated level of political violence, while lower values suggest a lower incidence of such violence. According to the Conflict Watchlist for the year 2023, Nigeria is identified as a country in Africa that has a high level of violence and is plagued by several wars. Based on the findings of ACLED (2022), there was a 9% rise in political violent incidents, leading to an estimated 3,900 casualties arising from acts of violence directed towards civilians. This figure represents a slight down from the previous year's nationwide count of over 4,000 fatalities (ACLED, 2021). In the year 2022, the Islamic State West Africa Province (ISWAP) persisted in its operational activities and exerted control over geographical areas situated in the North East region and spanning across the Lake Chad Basin. Similarly, Ansaru, a militant Islamist group, has reportedly been operational in the North West region, where numerous bandit factions persistently carry out lethal raids, abductions for monetary gain, and various other forms of violent criminal behavior. In the month of January 2022, a significant number of citizens, over 200 individuals, fell victim to acts of aggression perpetrated by a group of individuals identified as designated bandits, who are commonly referred to as 'terrorists', within the confines of Zamfara state. The southern states of Nigeria were also included. In the year 2022, a significant number of incidents involving cult militias were encountered, with the total count exceeding 150. These occurrences led to the unfortunate loss of around 230 lives, as reported. In the southeastern region, a distinct insurgency was initiated by the Indigenous People of Biafra (IPOB), led by Nnamdi Kanu, who was apprehended in June 2021 and has since been held in custody. It is important to highlight that the government has made efforts to prevent the escalation of violence across the nation. However, the emergence of self-defense militias, the increasing militarization of local communities, and the prevalence of human rights violations committed by security forces have resulted in the alienation of the local population. Consequently, these factors have made the population susceptible to recruitment by militant or criminal organizations, exacerbating the existing governance and socio-economic challenges in the country.

The occurrence of natural catastrophes in Nigeria can be attributed to the phenomenon of climate change, resulting in significant human casualties and property damage. Natural disasters can arise from various factors such as flooding, landslides, bug infestation, and oil spillage, among others (Google Search, 2023). Consequently, these events can result in significant human and financial consequences.

According to data provided by the World Bank Group (2021), an analysis of natural hazard occurrences from 1980 to 2020 reveals various forms of hazards. These include drought, which accounted for 1 occurrence, representing 0.62% of the total; flood, with 54 occurrences, accounting for 33.33%; epidemic, with 65 occurrences, representing 40.12%; landslip, with 3 occurrences, accounting for 1.85%; extreme temperature, with 2 occurrences, representing 1.23%; storm, with 5 occurrences, accounting fo The adverse effects of these natural disasters on the human population have been substantial, presenting a notable challenge to the endeavors aimed at addressing the increasing requirements of the most susceptible communities. The floods that occurred in Nigeria in 2022 had a significant impact on several regions within the country.

As per the findings of Oguntola (2022), a total of 1.4 million individuals were subjected to displacement, while the unfortunate loss of life amounted to 612 individuals. Additionally, around 2,400 persons suffered injuries as a result of the aforementioned incident. In total, almost 200,000 residential properties experienced either entire or partial destruction, while 332,327 hectares of land were negatively impacted. The occurrence of floods in Nigeria, Niger, Chad, and the adjacent regions can be attributed to a combination of factors, including intense precipitation, climate change, and the discharge of water from the Lagdo Dam in neighbouring Cameroon.

Furthermore, a multitude of confrontations in diverse manifestations have been documented throughout history. According to Olayoku (2014), a significant proportion of documented occurrences between 1991 and 2005 were linked to cattle grazing, specifically amounting to 35%. Additionally, the Nigerian watch project database suggests that land conflicts were responsible for 12% (2846) of the recorded instances of violent deaths in Nigeria. It is noteworthy to mention that in the month of January 2022, a significant number of more than 200 citizens were subjected to attacks in Zamfara state. The catalogues of violent attacks are extensive.

According to Onyenere and Odozi (2018), there has been a substantial spike in violent conflict in the last 15 years, particularly in Northern Nigeria. This increase can be attributed to various factors, including the insurgency of Boko Haram in 2009, the continuous struggle between Fulani herders and farmers, and the emergence of Islamist bandits. Nevertheless, subsequent to the attainment of independence in 1960, sporadic instances of violent confrontations have arisen within various communities throughout the country. The researchers conduct an analysis to determine the potential impact of conflict exposure in Nigeria on the wellbeing of households. This analysis utilizes a longitudinal dataset consisting of four waves of panel data spanning the years 2010 to 2018. Six welfare measures were employed in the study, including wages, household income, per capita income, poverty incidence, poverty gap, and poverty severity.

In addition, we adopt a fixed-effect approach, leveraging the panel structure of our dataset, and incorporate controls for various variables that may influence household welfare. This is done to mitigate any biases in the estimated effects. The findings of our study present compelling evidence supporting a negative correlation between the degree of war exposure in the immediate preceding period and the present level of household income. Furthermore, our research reveals that previous instances of conflict in Nigeria contribute to an escalation in the prevalence of poverty, the extent of poverty, and the severity of poverty.

They argue that a reciprocal relationship exists between ecological deterioration, societal resilience, and conflict. Consequently, the degradation of resources precipitates conflict, thereby exacerbating the degradation of these resources. The findings of the study also indicate that the severity of a shock can potentially lead to alterations in the internal structure of a system. A system subjected to a low-intensity shock may exhibit a response that does not include any alteration in its internal configuration, in contrast to a system impacted by a high-intensity shock.

Shocks refer to abrupt and significant inputs that are introduced to a system. When these inputs reach a certain magnitude, they have the potential to overpower the internal structures of the system, resulting in a subsequent alteration. The efficacy of the resulting system is contingent upon the system's resilience and the magnitude of shock forces exerted against it. The COVID-19 pandemic had a profound impact on society as it introduced a novel factor, namely the fear of contagion, which significantly altered the behaviour of individuals, groups, and companies. Consequently, this had far-reaching consequences on the economic, political, and healthcare systems of various countries.

In 2022, Nigeria was placed 135th in terms of its capacity to respond to ecological threats, as shown by the Positive Peace Index (PPI). Additionally, the Global Peace Index (GPI) ranked Nigeria at 143rd place. The Internal migration Monitoring Committee (IDMC) (2023) reported that the primary cause of internal migration in 2022 was attributed to natural disasters, namely an unprecedented surge in floods occurring between the months of June and November. The floods in 2022 led to nearly 2.4 million displacements, making it the largest recorded total for disaster-induced displacement in sub-Saharan Africa. Fifty percent of the displacements were documented in the Southern State of Bayelsa, located in the Niger River Delta region. The states of Anambra and Kogi saw significant impacts as well. The displacement camps located in the northeastern state of Bornu were inundated with floodwaters, compelling a significant number of individuals who were already displaced due to conflict and violence to evacuate once more. The floods resulted in significant damage to several elements of the transport network, including roads, bridges, and other essential infrastructure.

A total of 676,000 hectares of agricultural land were rendered nonviable, resulting in adverse consequences for crucial crops and exacerbating the issue of food insecurity. By the conclusion of the year 2022, a substantial number of residences remained either severely damaged or completely demolished, resulting in a significant population of approximately 857,000 individuals residing in a state of displacement. There was a notable rise compared to the figure of 107,000 documented at the conclusion of 2021. Moreover, it is worth noting that a total of around 148,000 instances of internal displacement were seen in the year 2022, with a direct correlation to conflict and acts of violence. The phenomenon of internal displacement in Nigeria is a consequence of a wide range of intricate and interconnected factors, encompassing recurrent floods and prolonged episodes of violence. In the year 2022, a significant proportion of displacement events were linked to natural disasters, including the country experiencing the most severe floods of the decade over the period from June to November. The floods resulted in a staggering number of displacements, surpassing 2.4 million individuals, so becoming the highest recorded statistic for disaster-induced displacements in the sub-Saharan African region during the year 2022. The floods impeded humanitarian access by the destruction of transportation routes, such as roads, bridges, and infrastructure. A total of 676,000 hectares of agricultural land was rendered nonviable, resulting in adverse impacts on crucial crops and exacerbating the prevailing state of insecurity. By the conclusion of 2022, the number of individuals residing in displacement experienced a substantial rise, reaching around 854,000, in stark contrast to the 107,000 individuals documented at the conclusion of 2021. In the year 2022, a total of around 148,000 instances of internal displacement were observed, primarily attributed to war and acts of violence. By the conclusion of the year 2022, the nation of Nigeria accommodated a population of 3.6 million internally displaced persons (IDPs), with a significant proportion of 1.9 million individuals residing in a condition of prolonged displacement within the north-eastern region of Borno. In regions characterized by precarious security conditions, the provision of humanitarian assistance is impeded, consequently rendering internally displaced persons (IDPs) unable to access crucial relief. Consequently, their vulnerability is heightened, including challenges like as food shortages, limited availability of healthcare and essential services. Consequently, this exposes them to various hazards, including instances of gender-based violence (IDMC, 2023).

Notwithstanding the obstacles encountered, the gross domestic product (GDP) experienced a growth rate of 2.31% in real terms during the initial quarter of 2023. The growth rate experienced a decrease from 3.11% in the first quarter of 2023 to 3.52% in the fourth quarter of 2022, as reported by the

National Bureau of Statistics (2023). In contrast, the measurement of the Governance Index involves the assessment of the whole administrative expense, which is further divided into recurrent and capital administrative expenditures (Ejuvbekpokpo, 2012). In order to conduct a comprehensive analysis, the study also examines the phenomenon of internally displaced persons as agents of shock that undermine resilience, alongside conflict, violence, and natural disasters, within the framework of the descriptive analysis.

Agricultural productivity has a significant role in driving economic growth in Nigeria and the sub-Saharan African region. The growth pattern observed over the previous two decades has prompted inquiries on the capacity of the agricultural sector to effectively facilitate structural transformation. Economic diversification refers to the process of reallocating economic activity and factors of production from low-productivity sectors to higher productivity sectors, resulting in an overall increase in productivity within the nation. During the period from 2000 to 2018, the agricultural sector in Sub-Saharan Africa (SSA) had noteworthy advancements. Based on the findings of the World Bank (2020), it can be observed that Sub-Saharan Africa (SSA) experienced the most substantial growth in agricultural production among all global regions during the period from 2000 to 2018, with an average annual growth rate of 4.3 percent. Nevertheless, the non-agricultural sectors had even more substantial growth, leading to a fall in the agricultural sector's contribution to the Gross Domestic Product (GDP). Therefore, we want to investigate the capacity of agriculture to promote resilience in Nigeria.

II. REVIEW OF EMPIRICAL LITERATURE

In their research on the relationship between agricultural diversification and economic resilience in Zambia, Chonabayashi et al. (2020) employed the ordinary least squares (OLS) regression method alongside a skew-normal regression technique. This strategy takes into consideration the impact of drought and flood shocks, while also allowing for the assessment of the effects on mean, variance, and skewness. The findings of their study demonstrated that enhancing agricultural productivity has the potential to enhance resilience, while implementing agricultural diversification strategies can contribute to mitigating adverse economic shocks.

Akiwumi and Onyekwena (2022) conducted a study utilizing the United Nations Conference on Trade and Development's (UNCTAD) new Product Capacities Index (PCI). Their findings indicate the presence of significant gaps and restrictions within the economy as a result of the disruptive effects caused by the Covid-19 epidemic. According to the results obtained from the overall composition index, Nigeria achieved a score of 21.65 in 2018, which was assessed before to the onset of the COVID-19 pandemic. This score positioned Nigeria at the 185th rank globally and the 44th rank within the African continent. It is suggested that governmental interventions and national development strategies should prioritize the cultivation of indigenous production capacities. This approach would facilitate structural transformation and promote economic diversification.

In contrast, Lawal (2020) conducted a study aimed at examining the resilience of food systems in Nigeria. The author employed a five-step framework, consisting of "Resilience of what," "Resilience to what," "Resilience for what," "Resilience capabilities," and "Resilience enhancing attributes." Additionally, a survey questionnaire was administered to farmers, employing both subjective and objective evaluation methods. The results of their study indicate a necessity to enhance the engagement of stakeholders, particularly the government, in supporting farmers to effectively utilize the advantages of resilience in Nigeria.

The methodology employed in this study will be discussed in the following section.

III. SOURCES OF DATA

The study utilized annual time series data from 1981 through 2022 to gather information on major macroeconomic indicators in the Nigerian economy. The indicators encompassed in this study are Gross Domestic Product (GDP) at constant basic prices, agricultural production, employment, education, health and social services, governance, and loans granted, which serve as a proxy for measuring resilience. The data utilized in this study were sourced from the Central Bank of Nigeria (CBN) Statistical Bulletin for the year 2022.

IV. SPECIFICATION OF THE MODEL

Drawing upon the theoretical literature and building upon the research conducted by Danish and Qazi (2009), this study uses the subsequent models for analysis.

Model 1: This study aims to examine the statistical significance of the relationship between agricultural production and economic growth in Nigeria.

$$GDP = F(AGR, EMP, RES, EDU, HSS) - - - - - - - - - (1)$$

Hence eqn. (1) is respecified as:

$$GDP_t = \beta_0 + \beta_1 AGR + \beta_2 EMP + \beta_3 RES + \beta_4 EDU + \beta_5 HSS + \varepsilon_t - - - - - - (2)$$

Where:

GDP = Real Gross Domestic Product

AGR gricultural Production

EMP = Employment

RES = Resilience (proxy by loans granted)

EDU = Education

HSS = Health and Social Services

GOV = Governance

$\varepsilon_t = errow\ term$.

Study 11: Evaluating the Statistical Significance of the Association between Resilience and Agricultural Production in Nigeria. In this study, we use loans provided as the dependent variable, which serves as a surrogate for resilience. The explanatory factors include human capital development, which is proxied by education, health services, governance, and employment. However, the analysis of other variables that could potentially impact resilience in Nigeria, such as conflict, health, and natural disasters, was limited to descriptive analysis due to data constraints. Therefore, we define model 11 in the following manner:

$$RES = F(AGR, EMP, EDU, HSS, GOV) - - - - - - - - - (3)$$

$$RES_t = \psi_0 + \psi_1 AGR + \psi_2\ EMP + \psi_3 EDU + \psi_4 HSS + \psi_5 GOV + \varepsilon_t - - - -(4)$$

The series are expressed in their natural log form and the parameters in equations (2) and (4) are to meet the a priori expectations of;

$$\beta_1, - - -,\ \beta_5 > 0 \text{ and } \psi_1, - - -, \psi_5 > 0$$

V. METHODOLOGY FOR ESTIMATION

The Autoregressive Distributed Lag (ARDL) strategy to cointegration, as outlined by Pesaran, Shin, and Smith (2001), is employed in our study. The selection of this particular model is based on the efficacy of the Autoregressive Distributed Lag (ARDL) method, which remains effective regardless of the order of integration. Whether the variables are stationary at their original values or at their first differences, this model yields conclusive outcomes. Additionally, the model incorporates an adequate number of lags, encompassing the lagged values of the dependent variables, as well as the current and lagged values of the regressors as explanatory factors. The present model employs a combination of endogenous and exogenous variables. Consequently, the stationarity test accurately identifies whether the variables are integrated at levels or order one, denoted as I(0) series for level stationary variables and I(1) for differenced stationary variables.

Laurenceson and Chai (1998) argue that the ARDL approach provides a more accurate estimation of the long-run coefficient and offers more reliable diagnostic tests for the estimated equation. The utilization of a smaller sample size, as observed in our study with only 41 observations, renders it a superior and more effective metric. The utilization of the ARDL technique yields an impartial long-term estimation for our model. Based on the outcome of the boundaries test, in the event of cointegration between the variables, it is necessary to establish both the short-run model, known as the Autoregressive Distributed Lag (ARDL) model, and the long-run model, which can be either the Vector Error Correction Model (VECM) or the Error Correction Model (ECM). However, in cases when the variables do not exhibit cointegration, it is necessary to employ the short-run model known as the Autoregressive Distributed Lag (ARDL) model. In such instances, there is no requirement to estimate a Vector Error Correction (VEC) model. Next, we proceed to provide further details regarding the model. Specifically, the ARDL model presented in equation 1 is generalized in the following manner.

$$GDP_t = GDP_{oi} + \textstyle\sum_{l=1}^{p} \varepsilon i\ Yt - 1 + \sum_{i=1}^{q} \beta i X t - 1 + \varepsilon it \text{ ------(5)}$$

ρ = lagged values of the dependent variable

q= lagged values of the independent variables or the regressors.

Where, GDP_t is a vector and the variables in (X_t-$_1$) are allowed to be purely I(O) or I(1) or cointegrated. β and ∂ are coefficients, γ is the constant; and Y_t results of the bounds test specify no cointegration,

In Autoregressive models the independent variables are all lagged dependent variables. Thus, we express equation (5) as;

$$GDP_t = \alpha GDP_{t-1} + \textstyle\sum_{i=1}^{q} \delta Y_{t-i} + \sum_{i=1}^{q} \beta_1 X_{t-1} + \beta_2 \Delta X_{t-2} + \beta_p \Delta X_{t-p} + \varepsilon_{it} \text{ --(6)}$$

According to equation (6), the variable GDP_(t-1) represents the Gross Domestic Product (GDP) from one period prior, whereas GDP_(t-2) represents the GDP from two periods prior. The process of specifying the limits test for cointegration involves conducting two separate cointegration tests. In the first model, the dependent variable is the logarithm of GDP, while in the second model, the dependent variable is the logarithm of RES. Therefore, in this study, we designate resilience as the dependent variable, with agricultural production, human capital development, governance, health, and education serving as the explanatory variables. Therefore, the second autoregressive distributed lag (ARDL) model for equation (3) is specified as follows:

$$RES_t = RES_i + \textstyle\sum_{l=1}^{p} \varepsilon i\ Yt - 1 + \sum_{i=1}^{q} \beta i X t - 1 + \varepsilon it \text{ ---(6)}$$

$$RES_t = \alpha RES_{t-1} + \textstyle\sum_{i=1}^{p} \delta Y_{t-i} + \sum_{i=1}^{q} \beta_1 X_{t-1} + \beta_2 \Delta X_{t-2} + \beta_p \Delta X_{t-p} + \varepsilon_{it} \text{ ---(7)}$$

Where:

Where:

Δ = 1st difference of a variable

L indicates the expression of the data set in natural logarithms

β_0 is a constant

ρ = lagged values of the dependent variables

β_1 -------- β_5 represent the short-run coefficients (error correction dynamic)

Ψ_1---------- Ψ_5 represent the long-run relationship

i is the time trend while ε_t is the white noise error.

The implementation of the ARDL technique necessitates the incorporation of two stages. Initially, the cointegration (long-term relationship) between the variables is assessed by calculating the F-statistic to evaluate the significance of the lagged values of the variables. Pesaran, Shin, and Smith (1999) suggest that there exist two distinct sets of critical values that are suitable for varying numbers of variables. In this study, either an intercept term, a trend term, or both are incorporated into the models, as all the variables considered exhibit integrated of order one (I(1)). When examining the associations between variables, if the F-statistic exceeds the critical value threshold for a specific level of significance, it can be inferred that there exists a genuine long-term link with the dependent variable, rather than a coincidental or false one. Similarly, if the F-statistic is lower than the critical value at the lower bound, it can be inferred that there is no long-term level association with the dependent variable. Nevertheless, when the value falls inside the range defined by the lower and higher boundaries, the outcome remains indeterminate.

After detecting the presence of cointegration among the variables and conducting the estimation of the long-term model, we then go on to analyzing the dynamics of the short-term model, as depicted in equation (8). Additional investigations into the link between the variables in both the long run and the short run, with a focus on error correction, could be conducted.

$$\Delta(GDP_t) = \beta_0 + \beta_1 GDP_{t-1} + \beta_2 AGR_{t-1} + \beta_3 RES_{t-1} + \beta_4 EDU_{t-1} + \beta_5 HSS_{t-1} + \sum_{i=1}^{P} \beta_{1i} \Delta(GDP_{t-1}) + \sum_{i=0}^{P} \beta_{2i} \Delta(AGR_{t-1}) + \sum_{i=0}^{P} \beta_{3i} \Delta(RES_{t-1}) + \sum_{i=0}^{P} \beta_{4i} \Delta(EDU_{t-1}) + \sum_{i=0}^{P} \beta_{5i} \Delta(HSS_{t-1}) + \varphi ect_{t-1} + \varepsilon_t \quad \text{---(8)}$$

Where Δ is the first difference operator, β_0 is the drift component, and u_t is the white noise residual.

$$\Delta(RES_t) = \psi_0 + \psi_1 RES_{t-1} + \psi_2 AGR_{t-1} + \psi_3 EPM_{t-1} + \psi_4 EDU_{t-1} + \psi_5 HSS_{t-1} + + \psi_6 GOV_{t-1} + \sum_{i=1}^{P} \beta_{1i} \Delta(RES_{t-1}) + \sum_{i=0}^{P} \beta_{2i} \Delta(AGR_{t-1}) + \sum_{i=0}^{P} \beta_{3i} \Delta(EPM_{t-1}) + \sum_{i=0}^{P} \beta_{4i} \Delta(EDU_{t-1}) + \sum_{i=0}^{P} \beta_{5i} \Delta(HSS_{t-1}) + \sum_{i=0}^{P} \beta_{6i} \Delta(GOV_{t-1}) \varphi ecm_{t-1} + \varepsilon_t \quad \text{--(9)}$$

The parameter β represents the pace of adjustment, while ECM denotes the residual derived from the estimation of equations (8) and (9). The utilization of co-integration analysis and the Error Correction Model (ECM) is employed to ascertain the long-term associations between variables and define the short-term dynamics.

The objective of this study is to conduct a stability test in order to assess the stability of the subject under investigation. The Stability test is conducted using the cumulative sum (CUSUM) and cumulative sum of squares (CUSUMQ) of the recursive residual test for structural stability, as first developed by Brown et al. (1975) and commonly referred to as the cumulative sum of squares. The plots of the CUSUM and CUSUMQ statistics indicate that the regression equations appear to exhibit stability, since neither the CUSUM nor the CUSUMSQ test statistics exceed the critical values corresponding to the 5% level of significance. Therefore, based on the evidence shown in figures 1 and 2, we are unable to reject the null hypothesis regarding stability. Based on the statistical models at a significance level of 5%, it can be concluded that both the CUSUM and CUSUMQ models exhibit stability over time. This is evident as the observed bound falls within the range defined by the upper and lower limits. Thus, it may be inferred that, when considering a critical value of 5 percent, both CUSUM and CUSUMQ exhibit positive values.

VI. FINDINGS AND CONCLUSIONS

DESCRIPTIVE STATISTICS

	GDP	AGR	RES	HSS	GOV	EDU	EPM
Mean	38589.57	8712.341	3425019.	103.9693	3845.727	166.7324	47.16322
Median	28701.91	6420.810	934605.0	77.18000	1291.165	72.15000	44.52458
Maximum	74639.47	19091.07	12997004	637.0500	25266.18	1321.110	122.7300
Minimum	16048.31	2303.510	25154.90	1.450000	807.0800	1.400000	35.20511
Std. Dev.	20854.25	5849.636	4046370.	153.8388	6570.864	341.5332	15.09994
Skewness	0.527309	0.461089	0.831695	2.271249	2.349079	2.805780	3.453778
Kurtosis	1.639858	1.652898	2.270996	7.286304	7.023435	9.591447	16.90547
Jarque-Bera	5.183857	4.663920	5.772048	68.26169	66.95625	131.1394	421.8839
Probability	0.074876	0.097105	0.055798	0.000000	0.000000	0.000000	0.000000
Sum	1620762.	365918.3	1.44E+08	4366.710	161520.5	7002.760	1980.855
Sum Sq. Dev.	1.78E+10	1.40E+09	6.71E+14	970321.2	1.77E+09	4782441.	9348.339
Observations	42	42	42	42	42	42	42

Source: Author's Computation

Table 1: Descriptive Statistics

According to the data presented in Table 1, the mean values for the variables are as follows: GDP is 38589.57, AGR is 8712.341, EDU is 166.7324, and EPM is 47.16322. These mean values represent the average values for each individual variable. The median provides information about the central tendency of the variables, indicating the mean values. Conversely, the maximum and minimum values provide information about the upper and lower extremes of these variables. The standard deviation is a statistical measure that quantifies the extent of dispersion or variability observed in a dataset relative to its mean. The provided information indicates the extent to which each variable deviates from the sample mean. The data indicates that the variable representing the government sector (GOV) exhibits the largest standard deviation, while the variable representing the energy and power sector (EPM) demonstrates the lowest standard deviation. The standard deviation of a series provides insight into the potential presence of outliers or volatility. Upon examining the measure of skewness to assess normality, it becomes evident that a skewness score of 0 indicates normal skewness. Therefore, it can be stated that the variables have a normal distribution. The measure of kurtosis provides information regarding the degree of peakedness or flatness exhibited by the distribution of the series. The kurtosis values of GDP, AGR, and RES are all below 3.0, indicating a platykurtic distribution. This suggests that the series will have a reduced concentration of values below the sample mean. The values of HSS, GOV, EDU, and EPM are more than 3.0, indicating a leptokurtic distribution. The Jarque-Bera statistic quantifies the disparity between the skewness and kurtosis of each variable and those of a normally distributed variable. The probability values corresponding to each of them are presented below. The null hypothesis posited by the Jarque-Bera test is that the underlying distribution of the data follows a normal distribution. Based on the data presented in the table, it is evident that the P-value obtained from the Jaque-Bera test for normalcy for each variable provides substantial support for the 1% level of significance. Consequently, the assumption of normality cannot be refuted.

The concept of skewness is utilized to quantify the extent of asymmetry present in a given series. A distribution is considered to be symmetric around the mean when it exhibits normal skewness, with a skewness value of 0. Positive skewness indicates that the distribution exhibits a longer right tail, with values that exceed the sample mean. Negative skewness indicates that the distribution will exhibit a longer left tail, characterized by a greater number of lower values relative to the sample mean. According to the data presented in Table 1, it can be observed that all the variables displayed a regular skewness pattern, as indicated by their positive skewness values exceeding zero. The outcome of the unit root test is presented. Table 2 below presents the outcomes of the stationarity test performed on each variable described in the model, utilizing the Augmented Dickey-Fuller (ADF) unit root test.

Variables	ADF @ Levels	ADF Critical value @ First Difference	1%	**5%**	**10%**	**Prob Value**	Order of Stationarity
LAGR	-0.805305	-6.211775	-3.600987	-2.935001	-2.606857	0.00000	I(1)**
LEDU	-2.952948	-7.228158	-3.605593	-2.936942	-2.606857	0.00000	I(1)**
LEPM	-2.159570	-7.826212	-3.605593	-2.936942	-2.606857	0.00000	I(1)**
LGDP	-0.900299	-4.031792	-3.605593	-2.936942	-2.606857	0.0032	I(1)**
LGOV	0.521403	-6.260741	-3.605593	-2.936942	-2.606857	0.0000	I(1)**
LHSS	-0.577305	-11.06128	-3.605593	-2.936942	-2.606857	0.0000	I(1)**
LRES	-1.141189	-4.759543	-3.605593	-2.936942	-2.606857	0.0004	I(1)**

*Source: Author's computation NB: * and ** = 1% and 5% level of significance respectively.*

Table 2: Unit Root Test Result

The findings presented in Table 2 demonstrate that all variables exhibit stationarity after being differenced once. The investigation of their long-term compatibility can be inferred.

Vector Autoregression Estimates

Sample (adjusted): 1983 2022
Included observations: 40 after adjustments

Standard errors in ( ) & t-statistics in [ ]

	AGR	EDU	EPM	GDP	GOV	HSS	RES
AGR(-1)	0.190836	1.460573	-4.302199	-1.793573	20.99742	11.96787	17.49126
	(0.22234)	(6.06227)	(7.79564)	(1.34955)	(16.5313)	(15.3205)	(13.9254)
	[0.85832]	[0.24093]	[-0.55187]	[-1.32901]	[1.27016]	[0.78117]	[1.25607]
AGR(-2)	0.173129	10.20260	8.035810	1.647038	3.764634	0.124098	10.86642
	(0.23789)	(6.48634)	(8.34097)	(1.44396)	(17.6878)	(16.3922)	(14.8995)
	[0.72777]	[1.57294]	[0.96341]	[1.14064]	[0.21284]	[0.00757]	[0.72931]
EDU(-1)	-0.009116	0.995343	0.527484	-0.154291	-0.429078	1.913654	-0.105929
	(0.00812)	(0.22151)	(0.28485)	(0.04931)	(0.60405)	(0.55981)	(0.50883)
	[-1.12204]	[4.49336]	[1.85178]	[-3.12885]	[-0.71033]	[3.41841]	[-0.20818]
EDU(-2)	0.004504	0.113732	-0.436034	0.152482	-0.535756	-0.598244	-0.196426
	(0.00820)	(0.22366)	(0.28762)	(0.04979)	(0.60992)	(0.56524)	(0.51377)
	[0.54907]	[0.50849]	[-1.51602]	[3.06242]	[-0.87841]	[-1.05838]	[-0.38232]
EPM(-1)	0.006532	0.021612	0.363477	0.056635	0.482047	-0.278576	-0.071617
	(0.00576)	(0.15710)	(0.20202)	(0.03497)	(0.42841)	(0.39703)	(0.36088)
	[1.13362]	[0.13756]	[1.79918]	[1.61936]	[1.12520]	[-0.70165]	[-0.19845]
EPM(-2)	-0.005679	-0.138314	-0.234361	-0.035307	0.329748	-0.155062	-0.523630
	(0.00559)	(0.15235)	(0.19591)	(0.03391)	(0.41544)	(0.38501)	(0.34995)
	[-1.01641]	[-0.90788]	[-1.19628]	[-1.04104]	[0.79373]	[-0.40275]	[-1.49629]
GDP(-1)	0.098711	0.434563	1.468691	1.146399	-1.884128	-1.986706	1.125553
	(0.03531)	(0.96279)	(1.23807)	(0.21433)	(2.62545)	(2.43314)	(2.21158)
	[2.79552]	[0.45136]	[1.18627]	[5.34874]	[-0.71764]	[-0.81652]	[0.50894]
GDP(-2)	-0.074855	-0.572882	-2.109279	-0.298909	2.353744	1.650478	-2.706948
	(0.02946)	(0.80330)	(1.03298)	(0.17883)	(2.19053)	(2.03008)	(1.84522)
	[-2.54079]	[-0.71316]	[-2.04194]	[-1.67151]	[1.07451]	[0.81301]	[-1.46701]
GOV(-1)	0.001666	-0.054207	0.021552	0.023850	0.578166	0.470450	-0.214149
	(0.00289)	(0.07870)	(0.10120)	(0.01752)	(0.21460)	(0.19888)	(0.18077)
	[0.57733]	[-0.68880]	[0.21297]	[1.36139]	[2.69415]	[2.36547]	[-1.18464]
GOV(-2)	-0.002148	0.000940	0.071074	-0.011286	-0.087708	-0.419104	0.151785
	(0.00286)	(0.07811)	(0.10045)	(0.01739)	(0.21301)	(0.19741)	(0.17943)
	[-0.74981]	[0.01203]	[0.70756]	[-0.64899]	[-0.41175]	[-2.12302]	[0.84592]
HSS(-1)	0.005478	-0.164200	-0.128660	0.034988	0.239575	-0.254735	0.218461
	(0.00316)	(0.08620)	(0.11085)	(0.01919)	(0.23507)	(0.21785)	(0.19801)
	[1.73255]	[-1.90480]	[-1.16065]	[1.82325]	[1.01917]	[-1.16930]	[1.10326]
HSS(-2)	0.003239	0.015258	0.011431	-0.030990	0.351520	0.438281	-0.031864
	(0.00309)	(0.08420)	(0.10828)	(0.01874)	(0.22961)	(0.21280)	(0.19342)
	[1.04898]	[0.18121]	[0.10557]	[-1.65324]	[1.53091]	[2.05962]	[-0.16474]
RES(-1)	0.000931	-0.119906	0.027147	0.030278	-0.467998	0.109007	0.770356
	(0.00358)	(0.09748)	(0.12535)	(0.02170)	(0.26582)	(0.24635)	(0.22392)
	[0.26047]	[-1.23006]	[0.21656]	[1.39527]	[-1.76058]	[0.44249]	[3.44036]
RES(-2)	0.001421	-0.045552	0.016036	0.005138	-0.105871	-0.136325	-0.124832
	(0.00393)	(0.10727)	(0.13794)	(0.02388)	(0.29252)	(0.27110)	(0.24641)
	[0.36131]	[-0.42464]	[0.11625]	[0.21514]	[-0.36192]	[-0.50287]	[-0.50660]
C	-0.464801	7.991603	9.922992	0.920192	9.018070	9.868282	30.97937
	(0.21498)	(5.86162)	(7.53762)	(1.30489)	(15.9842)	(14.8134)	(13.4645)
	[-2.16209]	[1.36338]	[1.31646]	[0.70519]	[0.56419]	[0.66617]	[2.30082]
R-squared	0.994318	0.983780	0.724788	0.998351	0.928991	0.980842	0.988207
Adj. R-squared	0.991136	0.974698	0.570670	0.997428	0.889225	0.970113	0.981602
Sum sq. resids	0.000508	0.377864	0.624840	0.018726	2.809841	2.413300	1.993787
S.E. equation	0.004509	0.122941	0.158094	0.027369	0.335252	0.310696	0.282403
F-statistic	312.5025	108.3109	4.702801	1081.148	23.36186	91.42359	149.6295
Log likelihood	168.7104	36.48447	26.42525	96.57689	-3.642509	-0.599858	3.219326
Akaike AIC	-7.685522	-1.074224	-0.571262	-4.078844	0.932125	0.779993	0.589034
Schwarz SC	-7.052192	-0.440894	0.062067	-3.445515	1.565455	1.413323	1.222363
Mean dependent	-0.251248	1.073124	3.828277	10.44568	7.555286	3.579679	13.72555
S.D. dependent	0.047893	0.772888	0.241279	0.539616	1.007281	1.797203	2.082025

Determinant resid covariance (dof adj.)	5.44E-16
Determinant resid covariance	2.03E-17
Log likelihood	371.4587
Akaike information criterion	-13.32294
Schwarz criterion	-8.889628
Number of coefficients	105

Table 3: Lag Order Selection Criteria

Table 3 presents the regression results for the unconstrained Vector Auto Regression estimation. The sample period is adjusted from 1983 to 2022, and it includes a total of 40 observations after the adjustment. The second section of

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the regression output comprises six columns, each corresponding to the estimation of the endogenous variable. with light of the Akaike information criterion (AIC) and the Schwarz criterion (SC), and with reference to the table displaying the estimated values of the vector autoregressive (VAR) system. The Akaike information criterion (AIC) value is calculated to be -13.32294, while the Schwarz Bayesian information criterion (BIC) value is -8.889628. We select the criterion that yields the minimized value, specifically the least value. Therefore, the Schwarz criterion is selected as the most suitable choice for this model due to its property of favoring lower values, which indicate better model fit. Nevertheless, our analysis includes a lag structure ranging from 0 to 3, and we have at our disposal six different information criteria to aid in the selection process. In selecting the criterion for the table, we opt for the one denoted by asterisks and possessing the lowest numerical value. The Hannan-Quinn (HQ) information criteria is denoted by an asterisk at lag 3, with the lowest value observed within this range being -14.28437. Therefore, it can be concluded that lag 3 is the most suitable lag to select for the model.

VAR Lag Order Selection Criteria
Endogenous variables: AGR EDU EPM GDP GOV HSS RES
Exogenous variables: C
Date: 09/03/23 Time: 06:46
Sample: 1981 2022
Included observations: 39

Lag	LogL	LR	FPE	AIC	SC	HQ
0	60.71074	NA	1.50e-10	-2.754397	-2.455809	-2.647266
1	321.8739	415.1825	2.95e-15	-13.63456	-11.24586*	-12.77751
2	380.0439	71.59379	2.36e-15	-14.10482	-9.625995	-12.49785
3	478.5042	85.83722*	3.98e-16*	-16.64124*	-10.07231	-14.28437*

* indicates lag order selected by the criterion
LR: sequential modified LR test statistic (each test at 5% level)
FPE: Final prediction error
AIC: Akaike information criterion
SC: Schwarz information criterion
HQ: Hannan-Quinn information criterion

Table 4

Dependent Variable: GDP
Method: ARDL
Sample (adjusted): 1984 2022
Included observations: 39 after adjustments
Maximum dependent lags: 1 (Automatic selection)
Model selection method: Akaike info criterion (AIC)
Dynamic regressors (3 lags, automatic): RES EDU HSS AGR
Fixed regressors: C
Number of models evaluated: 256
Selected Model: ARDL(1, 3, 2, 3, 0)

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
GDP(-1)	0.518347	0.181346	2.858338	0.0085
RES	1.990572	1.629931	1.221262	0.2334
RES(-1)	14.32958	9.577425	1.496183	0.1471
RES(-2)	-27.63529	12.27004	-2.252257	0.0333
RES(-3)	-63.13072	11.18420	-5.644636	0.0000
EDU	5.56E-06	7.39E-05	0.075225	0.9406
EDU(-1)	8.43E-05	8.46E-05	0.997226	0.3282
EDU(-2)	0.000189	7.90E-05	2.396069	0.0244
HSS	-10.67583	7.762041	-1.375390	0.1812
HSS(-1)	3.448872	3.820273	0.902782	0.3753
HSS(-2)	71.70341	19.25785	3.723335	0.0010
HSS(-3)	34.26972	12.18097	2.813382	0.0094
AGR	0.369818	4.519332	0.081830	0.9354
C	1576.972	581.3104	2.712789	0.0119

R-squared	0.997573	Mean dependent var	9197.921
Adjusted R-squared	0.996312	S.D. dependent var	5790.659
S.E. of regression	351.6842	Akaike info criterion	14.83661
Sum squared resid	3092044.	Schwarz criterion	15.43378
Log likelihood	-275.3138	Hannan-Quinn criter.	15.05087
F-statistic	790.5609	Durbin-Watson stat	1.667155
Prob(F-statistic)	0.000000		

**Note: p-values and any subsequent tests do not account for model selection*

Table 5: MODEL 1: GDP = f(AGR, RES, EDU, HSS)

ARDL(DEPLAGS=1, REGLAGS=3) GDP RES EDU HSS AGR @

Estimation Equation:
=========================
GDP = C(1)*GDP(-1) + C(2)*RES + C(3)*RES(-1) + C(4)*RES(-2) + C(5)*RES(-3) + C(6)*EDU + C(7)*EDU(-1) + C(8)*EDU(-2) + C(9)*HSS + C(10)*HSS(-1) + C(11)*HSS(-2) + C(12)*HSS(-3) + C(13)*AGR + C(14)

Substituted Coefficients:
=========================
GDP = 0.518347438222*GDP(-1) + 1.99057236938*RES + 14.3295826803*RES(-1) - 27.6352864563*RES(-2) - 63.1307221759*RES(-3) + 5.5603681752e-06*EDU + 8.43178448274e-05*EDU(-1) + 0.000189315294489*EDU(-2) - 10.6758301442*HSS + 3.44887222421*HSS(-1) + 71.7034103704*HSS(-2) + 34.2697223787*HSS(-3) + 0.369817925985*AGR + 1576.97219621

Cointegrating Equation:
D(GDP) = 1576.972196211184 - 0.481652561778*GDP(-1) -74.445853582421*RES(-1) + 0.000279193507*EDU(-1) + 98.746174828978*HSS(-1) + 0.369817925982*AGR** + 1.990572369381*D(RES) + 90.766008632102*D(RES(-1)) + 63.130722175777*D(RES(-2)) + 0.000005560368*D(EDU) -0.000189315294*D(EDU(-1)) -10.675830144235*D(HSS) -105.973132749009*(GDP - (-154.56339173*RES(-1) + 0.00057966*EDU(-1) + 205.01536308*HSS(-1) + 0.76781057*AGR(-1) + 3274.08659551) -34.269722378667*D(HSS(-2)))

Dependent Variable: RES
Method: ARDL

Sample (adjusted): 1984 2022
Included observations: 39 after adjustments
Maximum dependent lags: 1 (Automatic selection)
Model selection method: Akaike info criterion (AIC)
Dynamic regressors (3 lags, automatic): AGR EDU EPM GOV HSS
Fixed regressors: C
Number of models evaluated: 1024

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Selected Model: ARDL(1, 1, 1, 0, 3, 3)

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
RES(-1)	0.290963	0.160808	1.809380	0.0829
AGR	8.935274	8.465558	1.055485	0.3017
AGR(-1)	12.86709	8.850969	1.453749	0.1590
EDU	0.137534	0.498329	0.275990	0.7849
EDU(-1)	-1.104998	0.530393	-2.083357	0.0480
EPM	0.812686	0.224197	3.624875	0.0014
GOV	-0.391386	0.124525	-3.143029	0.0044
GOV(-1)	0.017221	0.201462	0.085479	0.9326
GOV(-2)	-0.497618	0.359568	-1.383934	0.1791
GOV(-3)	0.641887	0.274113	2.341687	0.0278
HSS	-0.208744	0.292815	-0.712887	0.4828
HSS(-1)	0.667459	0.236588	2.821182	0.0095
HSS(-2)	0.093487	0.126632	0.738258	0.4675
HSS(-3)	0.287896	0.106256	2.709454	0.0122
C	12.20673	4.716444	2.588122	0.0161

R-squared	0.993374	Mean dependent var	13.80826
Adjusted R-squared	0.989509	S.D. dependent var	2.041580
S.E. of regression	0.209111	Akaike info criterion	-0.008185
Sum squared resid	1.049453	Schwarz criterion	0.631647
Log likelihood	15.15960	Hannan-Quinn criter.	0.221381
F-statistic	257.0096	Durbin-Watson stat	1.850215
Prob(F-statistic)	0.000000		

**Note: p-values and any subsequent tests do not account for model selection*

Table 6: Ardl Equation Model 2

Estimation Command:

=========================

ARDL(DEPLAGS=1, REGLAGS=3) RES AGR EDU EPM GOV HSS @

Estimation Equation:

=========================

RES = C(1)*RES(-1) + C(2)*AGR + C(3)*AGR(-1) + C(4)*EDU + C(5)*EDU(-1) + C(6)*EPM + C(7)*GOV + C(8)*GOV(-1) + C(9)*GOV(-2) + C(10)*GOV(-3) + C(11)*HSS + C(12)*HSS(-1) + C(13)*HSS(-2) + C(14)*HSS(-3) + C(15)

Substituted Coefficients:

=========================

RES = 0.29096266768*RES(-1) + 8.93527358942*AGR + 12.8670870503*AGR(-1) + 0.137533653953*EDU - 1.10499820828*EDU(-1) + 0.812685501226*EPM - 0.391386222865*GOV + 0.01722071443*GOV(-1) - 0.497618100683*GOV(-2) + 0.641886658257*GOV(-3) - 0.208744233878*HSS + 0.66745890111*HSS(-1) + 0.0934872089028*HSS(-2) + 0.287896286929*HSS(-3) + 12.2067295987

Cointegrating Equation:

D(RES) = 12.206729598537 -0.709037332315*RES(-1) + 21.802360639474*AGR(-1) -0.967464554323*EDU(-1) + 0.812685501225*EPM** -0.229896950859*GOV(-1) + 0.840098163064*HSS(-1) + 8.935273589266*D(AGR) + 0.137533653955*D(EDU) -0.391386222864*D(GOV) - 0.144268557574*D(GOV(-1)) -0.641886658256*D(GOV(-2)) -0.208744233878*D(HSS) -0.381383495833*(RES - (30.74924217*AGR(-1) -1.36447619*EDU(-1) + 1.14618154*EPM(-1) -0.32423815*GOV(-1) + 1.18484334*HSS(-1) + 17.21591945) - 0.287896286930*D(HSS(-2))

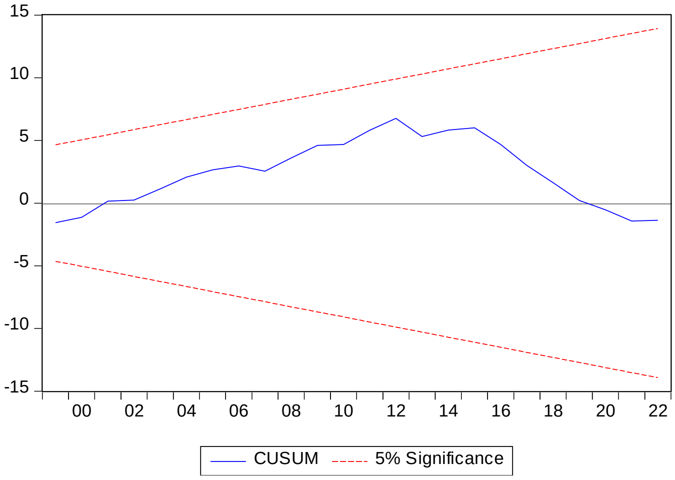

Figure 1: CUSUM TEST

The Blue line lies within the 5% critical line, so the model is stable.

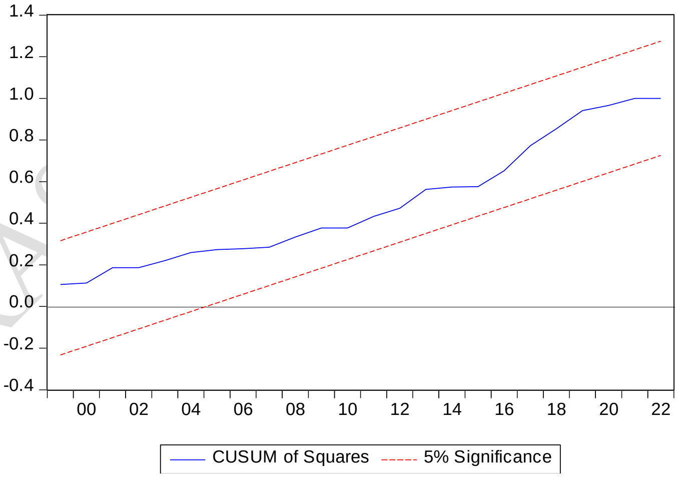

Figure 2: CUSUM SUM OF SQUARE TEST

This also lies within the red line or 5% critical line to prove that the model is stable.

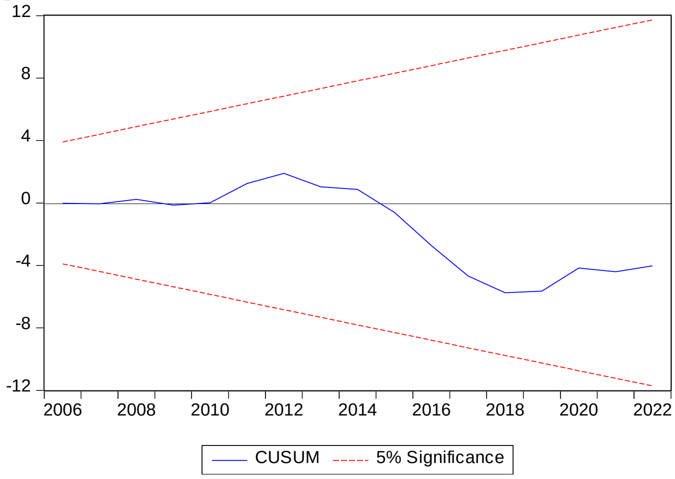

Figure 3: Plot of Cumulative Sum of Recursive Residuals

The Autoregressive Distributed Lag (ARDL) Bound Test Approach is a widely used method in econometrics for analyzing cointegration. The bound test technique to cointegration aims to ascertain the presence of a long-term relationship between the variables inside the model. Therefore,

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we conduct hypothesis tests to assess the null hypothesis that the coefficients in the calculated models are equal to zero. The F-Statistic value obtained from the bound test and the critical value boundaries, as indicated by the result generated by E-views 10, are displayed in Table 4.6.

F-Bounds Test		Null Hypothesis: No levels relationship		
Test Statistic	Value	Signif.	I(0)	I(1)
F-statistic	5.502690	10%	2.75	3.79
K	5	5%	3.12	4.25
		2.5%	3.49	4.67
		1%	3.93	5.23

Source: Author's computation obtained from E-views 10

Table 7: ARDL Bounds Test Result

The ARDL bounds F test results, as presented in Table 7, provide evidence supporting the existence of a long-term relationship between gross domestic product (GDP) and resilience in Nigeria during the specified period. In the first model, GDP is considered the dependent variable, while in the second model, resilience serves as the dependent variable. The presence of a co-integrating relationship among the time series in the level form can be inferred based on the estimated F statistic of 5.502690, which exceeds the upper critical values at the 1%, 5%, and 10% significance levels. This inference is made without considering whether the time series are integrated of order zero (I(0)) or order one (I(1)). Therefore, based on the F test statistic above the critical upper limits value I(1), we can reject the Null hypothesis of no cointegration at the 1%, 5%, and 10% levels of significance.

Dependent Variable: RES
Method: ARDL
Sample (adjusted): 1985 2022
Included observations: 38 after adjustments
Maximum dependent lags: 1 (Automatic selection)
Model selection method: Akaike info criterion (AIC)
Dynamic regressors (4 lags, automatic): AGR EMP EDU HSS GOV
Fixed regressors: C
Number of models evaluated: 3125
Selected Model: ARDL(1, 4, 0, 2, 4, 4)

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
RES(-1)	1.121845	0.298380	3.759789	0.0016
AGR	-171.5435	421.6363	-0.406852	0.6892
AGR(-1)	-677.2336	712.0255	-0.951137	0.3549
AGR(-2)	508.1174	407.0924	1.248162	0.2289
AGR(-3)	-971.9254	380.5170	-2.554223	0.0205
AGR(-4)	424.0134	319.8168	1.325801	0.2024
EMP	7603.714	8394.737	0.905771	0.3777
EDU	-131262.4	38587.58	-3.401673	0.0034
EDU(-1)	-72855.24	34783.08	-2.094560	0.0515
EDU(-2)	57642.51	48996.05	1.176473	0.2556
HSS	124408.4	52301.35	2.378685	0.0294
HSS(-1)	43234.54	28178.84	1.534291	0.1434
HSS(-2)	-57610.14	56195.31	-1.025177	0.3196
HSS(-3)	80857.85	57519.34	1.405751	0.1778
HSS(-4)	-63646.37	32781.46	-1.941535	0.0690
GOV	3767.482	1136.448	3.315138	0.0041
GOV(-1)	-2597.488	1462.935	-1.775532	0.0937
GOV(-2)	-1118.451	1325.838	-0.843581	0.4106
GOV(-3)	9214.401	1838.633	5.011551	0.0001
GOV(-4)	1908.962	1429.401	1.335498	0.1993
C	-7935363.	1785595.	-4.444101	0.0004

R-squared	0.989997	Mean dependent var	3782156.
Adjusted R-squared	0.978229	S.D. dependent var	4094842.
S.E. of regression	604188.3	Akaike info criterion	29.76205
Sum squared resid	6.21E+12	Schwarz criterion	30.66703
Log likelihood	-544.4789	Hannan-Quinn criter.	30.08404
F-statistic	84.12702	Durbin-Watson stat	2.356423
Prob(F-statistic)	0.000000		

*Note: p-values and any subsequent tests do not account for model selection

Table 8: MODEL 2: RES = f (AGR, HSS, EDU, GOV, EPM)

Estimation Command:
=========================
ARDL(DEPLAGS=1) RES AGR EMP EDU HSS GOV @

Estimation Equation:
=========================
RES = C(1)*RES(-1) + C(2)*AGR + C(3)*AGR(-1) + C(4)*AGR(-2) + C(5)*AGR(-3) + C(6)*AGR(-4) + C(7)*EMP + C(8)*EDU + C(9)*EDU(-1) + C(10)*EDU(-2) + C(11)*HSS + C(12)*HSS(-1) + C(13)*HSS(-2) + C(14)*HSS(-3) + C(15)*HSS(-4) + C(16)*GOV + C(17)*GOV(-1) + C(18)*GOV(-2) + C(19)*GOV(-3) + C(20)*GOV(-4) + C(21)

Substituted Coefficients:
=========================
RES = 1.12184542731*RES(-1) - 171.543507872*AGR - 677.233628331*AGR(-1) + 508.117369984*AGR(-2) - 971.92541105*AGR(-3) + 424.013394615*AGR(-4) + 7603.71375333*EMP - 131262.358856*EDU - 72855.2400357*EDU(-1) + 57642.5133763*EDU(-2) + 124408.418325*HSS + 43234.5435309*HSS(-1) - 57610.1366893*HSS(-2) + 80857.84681*HSS(-3) - 63646.3677286*HSS(-4) + 3767.4819625*GOV - 2597.48788129*GOV(-1) - 1118.45137057*GOV(-2) + 9214.40136263*GOV(-3) + 1908.96239585*GOV(-4) - 7935363.47059

Cointegrating Equation:
D(RES) = -7935363.470578494500 + 0.121845427308*RES(-1) -888.571782646905*AGR(-1) + 7603.713753318742*EMP** -146475.085515320770*EDU(-1) + 127244.304247206210*HSS(-1) + 11174.906469087404*GOV(-1) - 171.543507873820*D(AGR) + 39.794646450274*D(AGR(-1)) + 547.912016434848*D(AGR(-2)) - 424.013394614011*D(AGR(-3)) - 131262.358855746720*D(EDU) - 57642.513375600116*D(EDU(-1)) + 124408.418323956100*D(HSS) + 40398.657607558773*D(HSS(-1)) -

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17211.479080883306*D(HSS(-2)) + 63646.367728311976*D(HSS(-3)) + 3767.481962484571*D(GOV) - 10004.912387887362*D(GOV(-1)) - 11123.363758457925*(RES - (7292.61493240*AGR(-1) - 62404.58851130*EMP(-1) + 1202138.55167166*EDU(-1) - 1044309.22896012*HSS(-1) -91713.79440105*GOV(-1) + 65126477.42067922) -1908.962395854778*D(GOV(-3)))

Dependent Variable: RES
Method: Least Squares (Gauss-Newton / Marquardt steps)

Sample (adjusted): 1985 2022
Included observations: 38 after adjustments
RES = C(1)*RES(-1) + C(2)*AGR + C(3)*AGR(-1) + C(4)*AGR(-2) + C(5)
*AGR(-3) + C(6)*AGR(-4) + C(7)*EMP + C(8)*EDU + C(9)*EDU(-1) + C(10)*EDU(-2) + C(11)*HSS + C(12)*HSS(-1) + C(13)*HSS(-2) + C(14)
*HSS(-3) + C(15)*HSS(-4) + C(16)*GOV + C(17)*GOV(-1) + C(18)*GOV(
-2) + C(19)*GOV(-3) + C(20)*GOV(-4) + C(21)

	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	1.121845	0.298380	3.759789	0.0016
C(2)	-171.5435	421.6363	-0.406852	0.6892
C(3)	-677.2336	712.0255	-0.951137	0.3549
C(4)	508.1174	407.0924	1.248162	0.2289
C(5)	-971.9254	380.5170	-2.554223	0.0205
C(6)	424.0134	319.8168	1.325801	0.2024
C(7)	7603.714	8394.737	0.905771	0.3777
C(8)	-131262.4	38587.58	-3.401673	0.0034
C(9)	-72855.24	34783.08	-2.094560	0.0515
C(10)	57642.51	48996.05	1.176473	0.2556
C(11)	124408.4	52301.35	2.378685	0.0294
C(12)	43234.54	28178.84	1.534291	0.1434
C(13)	-57610.14	56195.31	-1.025177	0.3196
C(14)	80857.85	57519.34	1.405751	0.1778
C(15)	-63646.37	32781.46	-1.941535	0.0690
C(16)	3767.482	1136.448	3.315138	0.0041
C(17)	-2597.488	1462.935	-1.775532	0.0937
C(18)	-1118.451	1325.838	-0.843581	0.4106
C(19)	9214.401	1838.633	5.011551	0.0001
C(20)	1908.962	1429.401	1.335498	0.1993
C(21)	-7935363.	1785595.	-4.444101	0.0004

R-squared	0.989997	Mean dependent var	3782156.
Adjusted R-squared	0.978229	S.D. dependent var	4094842.
S.E. of regression	604188.3	Akaike info criterion	29.76205
Sum squared resid	6.21E+12	Schwarz criterion	30.66703
Log likelihood	-544.4789	Hannan-Quinn criter.	30.08404
F-statistic	84.12702	Durbin-Watson stat	2.356423
Prob(F-statistic)	0.000000		

Table 9

State	LG As Accessed	R42 total (July 2022)		R43 total (November 2022)		Status	Population difference	Percentage difference
		IDP Population	IDP Population (%)	IDP Population	IDP Population (%)			
Adamawa	21	232,996	9%	223,910	9%	Decrease	-9,086	-3.9 %
Bauchi	20	67,230	3%	64,727	3%	Decrease	-2,503	-3.7 %
Borno	26	1,865,715	76%	1,820,179	77%	Decrease	-45,536	-2.4 %
Gombe	11	48,524	2%	47,977	2%	Decrease	-547	-1.1 %
Taraba	16	77,450	3%	52,123	2%	Decrease	-25,327	-32.7 %
Yobe	17	163,275	7%	166,745	7%	Increase	+3,470	+2.1 %
Grand Total	111	2,455.190	100%	2,375,661	100%	Decrease	-79,529	-3.2 %

Source: International Organization for Migration. https://dtm.iom.int/nigeria

Table 10: Internally Displaced Persons in some States in Nigeria

Based on the data presented in Table 10, a comparative analysis of displacement figures reveals that a total of 2,455,190 individuals hailing from 111 local government areas within the states of Adamawa, Bauchi, Borno, Gombe, Taraba, and Yobe experienced displacement in the month of July, 2022. This figure is in contrast to the total number of 2,375,661 individuals who were displaced during the month of November in the same year. The figure represents a marginal decline of 3.2%. In essence, providing sufficient attention to the unit could potentially offer some assistance.

Dependent Variable: GDP
Method: Least Squares
Date: 08/12/23 Time: 13:53
Sample (adjusted): 1981 2021
Included observations: 41 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
AGR	2.957519	0.204546	14.45898	0.0000
EPM	-11.15803	23.60780	-0.472642	0.6395
EDU	-7.593396	3.688403	-2.058722	0.0472
HSS	4.417218	5.506416	0.802195	0.4280
GOV	0.385223	0.190069	2.026753	0.0506
RES	0.000833	0.000215	3.868741	0.0005
C	9751.081	1626.362	5.995641	0.0000

R-squared	0.992528	Mean dependent var	39053.96
Adjusted R-squared	0.991209	S.D. dependent var	20892.30
S.E. of regression	1958.888	Akaike info criterion	18.15239
Sum squared resid	1.30E+08	Schwarz criterion	18.44495
Log likelihood	-365.1241	Hannan-Quinn criter.	18.25893
F-statistic	752.6696	Durbin-Watson stat	0.647154
Prob(F-statistic)	0.000000		

Included observations: 41 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
AGR	2.957519	0.204546	14.45898	0.0000
EPM	-11.15803	23.60780	-0.472642	0.6395
EDU	-7.593396	3.688403	-2.058722	0.0472
HSS	4.417218	5.506416	0.802195	0.4280
GOV	0.385223	0.190069	2.026753	0.0506
RES	0.000833	0.000215	3.868741	0.0005
C	9751.081	1626.362	5.995641	0.0000

R-squared	0.992528	Mean dependent var	39053.96
Adjusted R-squared	0.991209	S.D. dependent var	20892.30
S.E. of regression	1958.888	Akaike info criterion	18.15239
Sum squared resid	1.30E+08	Schwarz criterion	18.44495
Log likelihood	-365.1241	Hannan-Quinn criter.	18.25893
F-statistic	752.6696	Durbin-Watson stat	0.647154
Prob(F-statistic)	0.000000		

Table 11: Ols Result

Table 11 shows the long run adjustment estimates in explaining economic growth. The error correction term is negative and significant, implying that any exogenous shock in one of the variables will lead to convergence towards the equilibrium.

Dependent Variable: AGR
Method: ARDL
Sample (adjusted): 1984 2021
Included observations: 38 after adjustments
Maximum dependent lags: 1 (Automatic selection)
Model selection method: Akaike info criterion (AIC)
Dynamic regressors (4 lags, automatic): GDP RES EDU HSS
Fixed regressors: C
Number of models evaluated: 625
Selected Model: ARDL(1, 1, 3, 3, 3)
Note: final equation sample is larger than selection sample

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
AGR(-1)	-0.010532	0.177605	-0.059303	0.9532
GDP	0.237353	0.066941	3.545715	0.0018
GDP(-1)	-0.066892	0.063675	-1.050516	0.3049
RES	-0.000176	7.68E-05	-2.286887	0.0322
RES(-1)	-6.80E-05	7.33E-05	-0.927544	0.3637
RES(-2)	8.74E-05	7.15E-05	1.222685	0.2344
RES(-3)	0.000195	9.79E-05	1.995451	0.0585
EDU	-2.597665	1.849099	-1.404827	0.1740
EDU(-1)	7.832577	7.446837	1.051799	0.3043
EDU(-2)	-9.895322	9.629753	-1.027578	0.3153
EDU(-3)	-64.01337	10.44774	-6.127007	0.0000
HSS	-5.999496	5.946532	-1.008907	0.3240
HSS(-1)	-7.533102	4.526927	-1.664065	0.1103
HSS(-2)	58.24965	16.06670	3.625488	0.0015
HSS(-3)	60.16338	11.15557	5.393123	0.0000
C	-126.8641	744.5605	-0.170388	0.8663

R-squared	0.998870	Mean dependent var	9379.353
Adjusted R-squared	0.998100	S.D. dependent var	5754.955
S.E. of regression	250.8600	Akaike info criterion	14.18323
Sum squared resid	1384476.	Schwarz criterion	14.87274
Log likelihood	-253.4813	Hannan-Quinn criter.	14.42855
F-statistic	1296.703	Durbin-Watson stat	1.926999
Prob(F-statistic)	0.000000		

**Note: p-values and any subsequent tests do not account for model selection*

Table 12: Ardl Result

ARDL(DEPLAGS=1) AGR GDP RES EDU HSS @
Estimation Equation:
=========================
AGR = C(1)*AGR(-1) + C(2)*GDP + C(3)*GDP(-1) + C(4)*RES + C(5)*RES(-1) + C(6)*RES(-2) + C(7)*RES(-3) + C(8)*EDU + C(9)*EDU(-1) + C(10)*EDU(-2) + C(11)*EDU(-3) + C(12)*HSS + C(13)*HSS(-1) + C(14)*HSS(-2) + C(15)*HSS(-3) + C(16)

Substituted Coefficients:
=========================
AGR = -0.0105324866659*AGR(-1) + 0.237353241197*GDP - 0.066891565808*GDP(-1) - 0.000175655714097*RES - 6.80300091581e-05*RES(-1) + 8.73822633279e-05*RES(-2) + 0.000195351885835*RES(-3) - 2.59766526123*EDU + 7.8325768171*EDU(-1) - 9.89532243131*EDU(-2) - 64.0133697292*EDU(-3) - 5.99949557048*HSS - 7.5331023641*HSS(-1) + 58.2496478*HSS(-2) + 60.163384395*HSS(-3) - 126.864054318

Cointegrating Equation:
D(AGR) = -126.864054316753 -1.010532486666*AGR(-1) + 0.170461675389*GDP(-1) + 0.000039048426*RES(-1) - 68.673780604472*EDU(-1) + 104.880434260250*HSS(-1) + 0.237353241198*D(GDP) -0.000175655714*D(RES) - 0.000282734149*D(RES(-1)) -0.000195351886*D(RES(-2)) - 2.597665261237*D(EDU) + 73.908692160274*D(EDU(-1)) + 64.013369729062*D(EDU(-2)) -5.999495570427*D(HSS) - 118.413032194768*(AGR - (0.16868500*GDP(-1) + 0.00003864*RES(-1) -67.95801373*EDU(-1) + 103.78729595*HSS(-1) -125.54178712) - 60.163384394921*D(HSS(-2)))

VII. SUMMARY OF FINDINGS, CONCLUSION, AND RECOMMENDATION

Upon examining the ramifications of agricultural output on the development of a resilient and sustainable economy in Nigeria from 1881 to 2022, it has been ascertained that there are some policy recommendations that may be made.

Based on the findings of the analysis, it is recommended that the government should enhance its policies aimed at fostering resilience. This might involve augmenting the allocation of loans to states and closely overseeing their implementation to ensure the effective enforcement of resilience measures, so facilitating the recovery of the host community to its previous state.

Education exerts a significant role, as indicated by its negative coefficient and high pro value of 0.000. The potential outcomes of teaching individuals may not be maximized due to the presence of additional demands that must be addressed.

The negative association of agricultural production is indicated by the minus sign and a significant positive value of 0.9532. Thus, the combined explanatory factors for the two models accounted for 99.9% of the variation in the dependent variable, as indicated by an R-square value of 0.998870 and an adjusted R-square value of 0.998100.

This suggests that the magnitude of the movement had a significant impact on agricultural production. This phenomenon provides additional support for the upward trend in food costs, as well as the significant inflation rate reaching double digits. In light of this observation, it is recommended that the government implement policies aimed at enhancing agricultural productivity and involving the workforce in economically viable activities centered around agriculture.

REFERENCES

[1] Armed Conflict Location and Event Data ACLED (2022) Project (ACLED) Conflict Watchlist (2023). ACLED acledata.com

[2] Adesoji Adelaja, Justin George, Louise Fox, Keith Fuglie and Thomas Jayne (2021). Shocks, Resilience and Structural Transformation in Sub-Saharan Africa. Department of Agricultural, Food and Resource Economics, Michigan State University, 204 Morrill Hall of Agriculture. https://creativecommons.org/licenses/by /4.0/.

[3] Akiwumi, P. and Onyekwena, C. (2022). Building Socio-economic resilience in Nigeria by fostering productive capacities. UNCTAD https://unctad.org>news>blog.bul

[4] Andrea Carboni (2023). Armed Conflict Location and Event Data Project (ACLED) Conflict Watchlist (2023). ACLED acledata.com

[5] Chonabayashi, S., Jithitikulcha, T. and Qu, Y. (2020). "Does agricultural diversification build economic resilience to drought and flood? Evidence from poor households in Zambia" African Journal of Agricultural and Resource Economics. Volume15 Number 1 pages 65-80. https://www.researchgate.net/publication

[6] Danish, A. and Qazi, M. (2009). Institutions and Economic Growth: A Cross Country Evidence. Munich Personal RePEc Archive MPRA https://mpra.ub.uni-muenchen.de>

[7] Ejuvbekpokpo, S. (2012). Cost of governance on economic development in Nigeria. Global Journal of Management and Business Research, Vol. 12 Issue 13. Online ISSN 2249-4588 & Print ISSN: 0975-5853.

[8] Google Search (2023). www.google.com Retrieved 2023-08-01.

[9] Internal Displacement Monitoring Committee (IDMC) (2023)

[10] Institute for Economics & Peace (2022). Ecological Threat Report. Analyzing Ecological Threats, Resilience and Peace. Sydney. https://visionofhumanity.org/ resources

[11] (IDMC, 2023). Overview Google https://www.internal.displacement.org

[12] Kaufmann, D., Kraay, A., and Zoido Lobaton, Pablo, (1999). Governance Matters. Polivy Research Working Papers. International Monetary Fund. https://www.imf.org>kauf

[13] Kaufmann, D and Aart Kraay. (2006). Aggregate and Individual Governance Indicators https://ideas.repec.org> wbrwps

[14] Lawal, A. (2020). "Food system resilience in Nigeria: farmers perspective". UNL Digital Commons University of Nebraska, Lincoln. https://digitalcommons.unl.edu/ natresdiss/328

[15] Laurenceson, J. and Chai, J. C. H. (1998). Financial Reform and Economic Developmemt in China. https://www.researchgate.net>3762

[16] Odizi, J. C. and R. Uwaifo. Oyelere (2022). Violent Conflict Exposure in Nigeria and Household Welfare: What can we learn from Panel data? Agnes Scott College, Atlanta, Ga and IZA, Bonn Germany.

[17] Ogunkola Tunde (2022) in Wikipedia (2022). Nigeria Floods en.m.wikipedia.org

[18] Olayoku, A. P. (2014). Trends and Patterns of cattle grazing and rural violence in Nigeria (2006 - 2014). IFRA Nigeria working papers series, Cited in; Odizi, J. C. and R. Uwaifo. Oyelere (2022). Violent Conflict Exposure in Nigeria and Household Welfare: What can we learn from Panel data? Agnes Scott College, Atlanta, Ga and IZA, Bonn Germany.

[19] Oyelere, R. U. and Odozi, J. C. (2018). Violent Conflict Exposure in Nigeria and Economic Welfare. https://www.iza.org>publications

[20] Olayoku, A. P. (2014). Trends and Patterns of cattle grazing and rural violence in Nigeria (2006 - 2014). IFRA Nigeria working papers series, Cited in; Odizi, J. C. and R. Uwaifo. Oyelere (2022). Violent Conflict Exposure in Nigeria and Household Welfare: What can we learn from Panel data? Agnes Scott College, Atlanta, Ga and IZA, Bonn Germany.

[21] Pesaran, M. H., Shin, Y. and Smith, R. (1999). Pooled mean group estimation of dynamic heterogeneous panels. Journal of the American Statistical Association. 94:623-34.

[22] Pesaran, M. H., Shin, Y. and Smith, R. (1999). Pooled mean group estimation of dynamic heterogeneous panels. Journal of the American Statistical Association. 94:623-34.

[23] Pesaran, M. Shin, Y., & Smith, R. (2001). Bounds testing approaches to the analysis of level relationship, Journal of Applied Econometrics, doi: 10.1002/jae.616

[24] Wikipedia (2022). Nigeria Floods. https://en.m.wikipedia.org>wiki

[25] Wikipedia (2022). Violence. https://en.m.wikipedia.org> wiki

[26] World Bank Group (2021). Climate Change Knowledge Portal for Development Practitioners and Policy Makers. www.https://edgeportal.worldbank.org