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Economic Assessment of the Decade of Gas Initiative and the Petroleum Industry Act in Nigeria's Natural Gas Sector

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Abstract

This research examines the impact of Nigeria's Decade of Gas initiative and the Petroleum Industry Act (PIA) on the country's natural gas industry and its progress toward achieving the Sustainable Development Goals. Utilizing a mixed-methods approach, we examine how these policies affect energy accessibility, economic development, and social welfare. Our quantitative analysis, based on a survey of 500 participants, reveals a notable positive correlation between access to natural gas and household economic outcomes, with 62–75% of participants reporting improvements in their income, business efficiency, and access to cooking gas. Insights from qualitative interviews and focus groups further illustrate that the use of gas has empowered women and increased the productivity of small and medium-sized enterprises (SMEs) by lowering operational expenses. However, our findings also emphasise substantial implementation challenges, particularly the ongoing infrastructure deficiencies and regional inequalities that disproportionately impact rural and neglected communities. The study concludes that while policies regarding natural gas hold the potential to foster sustainable development and support Nigeria's poverty alleviation efforts, their full impact can only be achieved through fair and inclusive implementation that addresses infrastructural hurdles and guarantees widespread access across all regions.

Keywords: Natural gas, Petroleum Industry Act, Sustainable Development, Policy Impacts, Nigeria.

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1.0 Introduction

Nigeria, rich in extensive natural gas reserves estimated to exceed 200 trillion cubic feet, possesses one of the largest deposits on the African continent and ranks among the top in the world (International Energy Agency [IEA], 2022). Despite this wealth, the country struggles with energy shortages, economic instability, and environmental issues (Abdullahi, Obansa, & Magaji, 2024). The Nigerian government has recognised natural gas as a vital resource that can drive industrial growth, enhance energy accessibility, and promote sustainable development. In this regard, the proclamation of the "Decade of Gas" (2021–2030) stands as an essential policy initiative aimed at leveraging natural gas as a transitional fuel to diversify the economy, lessen reliance on crude oil, and encourage inclusive progress (Ministry of Petroleum Resources, 2021).

Supporting this agenda is the passage of the Petroleum Industry Act (PIA) in 2021, which introduced significant reforms to Nigeria's oil and gas industry. The PIA aims to establish a transparent governance framework, attract investment from both foreign and domestic sources, and ensure equitable revenue distribution to local communities (Ogbonna & Ebong, 2022). Collectively, the Decade of Gas initiative and the PIA are positioned as transformative policy tools aimed at repositioning the natural gas sector as a catalyst for sustainable energy and socioeconomic advancement. Their alignment with Nigeria’s objectives under the United Nations Sustainable Development Goals (SDGs), particularly in achieving affordable and clean energy (SDG 7) and economic development (SDG 8), underscores their strategic importance (United Nations, 2023).

Both domestic needs and global energy transitions have shaped the policy trajectory towards natural gas. On one hand, Nigeria faces an urgent need to provide dependable and affordable energy to its citizens, with over 40% still lacking access to electricity (World Bank, 2023). On the other hand, the global transition towards decarbonization requires resource-rich nations to adopt cleaner energy alternatives to coal and crude oil (Magaji, Musa, & Ismail, 2025), while also investing in renewable energy development (Ejiogu, 2023). Hence, Nigeria's Decade of Gas and the PIA present a combined route for reconciling energy security, environmental sustainability, and economic competitiveness.

Nonetheless, the success of these policies hinges on surmounting long-standing infrastructural, regulatory, and market-related challenges. Historically, Nigeria’s natural gas sector has been hindered by insufficient pipeline infrastructure, limited domestic market development, and inconsistencies in policy (Akinpelu, 2021). Moreover, the nation faces challenges such as gas flaring, security threats in oil-rich areas (Sabiu & Magaji, 2024), and funding deficits that compromise the successful implementation of oil development initiatives (Magaji, Musa, & Dogo, 2023). Failure to tackle these systemic obstacles may result in the ambitious objectives of the Decade of Gas and the PIA remaining unfulfilled.

In this context, this research examines the policy implications of the Decade of Gas and the Petroleum Industry Act on Nigeria’s natural gas sector and its role in fostering sustainable development. By evaluating their effects on energy accessibility, industrial development, and environmental outcomes, the research aims to determine whether these policy measures can indeed facilitate a shift toward sustainable economic growth. The outcomes are anticipated to enrich policy discussions regarding the significance of natural gas in attaining Nigeria’s long-term development goals and in managing the global energy transition.

2.0 Literature Review and Theoretical Framework

2.1 Conceptual Definition

2.1.1 Petroleum Industry Act

The Petroleum Industry Act (PIA), enacted in 2021, signifies one of the most substantial reforms in Nigeria's oil and gas industry since the country gained independence. The Act aims to establish a comprehensive legal and regulatory framework that encompasses governance, fiscal arrangements, community relations, and environmental sustainability (Ogbonna & Ebong, 2022). By simplifying operations through the establishment of regulatory authorities such as the Nigerian Upstream Petroleum Regulatory Commission (NUPRC) and the Nigerian Midstream and Downstream Petroleum Regulatory Authority (NMDPRA), the PIA aims to enhance transparency, attract investments, and ensure equitable revenue distribution to local communities (PwC Nigeria, 2021). However, despite being generally viewed as a move toward reorienting Nigeria's energy landscape, challenges persist in its execution, especially in striking a balance between the interests of investors, the welfare of communities, and environmental protections (Akinyemi, 2022).

2.1.2 Natural Gas

Natural gas has become a vital component of Nigeria's energy mix, offering both national and international opportunities. With verified reserves surpassing 200 trillion cubic feet, natural gas is viewed as a transitional fuel that can reduce dependence on crude oil while offering cleaner and more reliable energy (International Energy Agency [IEA], 2022). On the domestic front, natural gas presents an opportunity to enhance electricity accessibility, promote industrialisation, and reduce gas flaring by developing local markets and infrastructure (Akinpelu, 2021). On the international stage, Nigeria's liquefied natural gas (LNG) exports play a crucial role in boosting foreign exchange revenue and contributing to global energy stability (Magaji, Abubakar, & Temitope, 2022). Nevertheless, factors such as underutilization, inadequate infrastructure, and inconsistent policies continue to hinder Nigeria's capacity to fully capitalise on its natural gas resources (Ejiogu, 2023).

2.1.3 Sustainable Development

Sustainable development is defined as development that fulfils current needs without compromising the ability of future generations to satisfy their requirements (World Commission on Environment and Development [WCED], 1987). It incorporates economic advancement, social inclusion, and environmental preservation, highlighting a balanced approach to development (Gabdo & Magaji, 2025). In Nigeria, sustainable development is increasingly linked to energy policy, as access to affordable, reliable, and clean energy is crucial for alleviating poverty, fostering industrial progression, and mitigating climate change (United Nations, 2023). When effectively utilised within frameworks such as the Decade of Gas and the PIA, natural gas can act as a transitional resource to renewable energy by ensuring energy security, lowering carbon emissions compared to coal and oil (Nazifi, Magaji, & Amase, 2022), and facilitating economic diversification (Ejiogu, 2023). However, pursuing sustainable development necessitates addressing challenges related to governance, infrastructure, and equity in resource management (Suleiman, Magaji, & Musa, 2025).

2.2 Theoretical Review

2.2.1 Resource-Based Development Theory

The Resource-Based View (RBV) posits that a sustainable competitive advantage is attained when organisations or nations effectively leverage their distinctive resources and capabilities. In Nigeria's context, natural gas is a key strategic resource that, if effectively exploited through supportive policies such as the Petroleum Industry Act (PIA) and the Decade of Gas initiative, has the potential to promote economic diversification, industrialisation, and sustainable development (Barney, 1991). The RBV posits that merely having substantial natural gas reserves is not enough; instead, the management of these resources, the development of infrastructure, and the establishment of sound governance are critical in determining whether these resources contribute to enduring economic growth (Wernerfelt, 1984). Therefore, this theory is particularly pertinent, as it highlights the necessity for institutional reforms, technological advancements, and practical policy implementation in transforming natural gas from a dormant asset into a driving force for sustainable development in Nigeria.

2.3 Empirical Review

Ezekiel and Uzonwanne (2022) employed a panel data regression method to explore the economic impacts of the Nigerian Gas Master Plan across the six geopolitical zones. Their findings indicated that states with greater domestic gas consumption demonstrated improved manufacturing performance and reduced urban youth unemployment. However, the North-East and North-West regions continued to lag, primarily due to ongoing infrastructural deficits and security issues.

In a similar study, Onwuka and Chukwuma (2021) employed spatial regression techniques to examine the relationships between natural gas supply, electricity access, and the growth of small and medium-sized enterprises (SMEs). Their results showed that access to piped natural gas significantly lowered operational costs for SMEs, particularly in Lagos and Ogun States. Consequently, the authors advocated for the creation of a national SME-Gas integration framework to maximise this developmental synergy.

Recent research has highlighted the potential of natural gas to address economic disparities, particularly in regions with limited access to energy. For example, Muhammed and Eze (2023) employed geospatial econometric methods to examine the impact of proximity to gas infrastructure on entrepreneurship in 20 Nigerian cities. Their findings revealed that communities situated within a five-kilometre range of a gas distribution facility had 30% more microenterprises compared to those farther away. They emphasised the need to decentralise gas infrastructure to mitigate regional disparities.

In a related investigation, Bello and Musa (2024) analysed household energy preferences using microdata from the 2022 Nigeria Living Standards Survey (NLSS). By employing a probit model, they evaluated welfare outcomes for households utilising gas. The study found that gas users had an 18% higher likelihood of owning productive assets, a 25% greater chance of accessing credit, and demonstrated increased labour force participation, particularly among women.

Tanko and Oduwole (2025) employed a combination of qualitative and quantitative methodologies to assess the impact of the Nigeria Gas Expansion Programme (NGEP) in Abuja and Lagos. Insights from focus group discussions and stakeholder interviews suggested that the adoption of gas led to increased household incomes, reduced cooking times, and enhanced business scalability. Nevertheless, the research also pointed out disparities, as access to gas infrastructure was predominantly concentrated in wealthy urban areas.

Finally, Ibrahim and Sani (2024) investigated the indirect economic effects of gas-powered rural electrification projects in Kaduna and Niger States. Using a longitudinal approach, they discovered that electrified regions experienced a 12% rise in school enrollment, a 9% reduction in youth migration, and a 15% increase in local businesses over three years. Their research proposed that integrating gas-powered mini-grids into Nigeria's broader National Electrification Strategy could promote inclusivity and bolster rural development.

2.4 Gaps in the Literature

Although existing research provides important insights into the economic and social impacts of natural gas usage in Nigeria, notable gaps remain in the literature. A majority of previous studies have been geographically focused, concentrating on specific regions such as Lagos, Ogun, Abuja, or selected northern states (Onwuka & Chukwuma, 2021; Tanko & Oduwole, 2025; Ibrahim & Sani, 2024), which restricts their applicability across the nation’s six geopolitical zones. In addition, much of the literature tends to focus on either business-level outcomes like SME advancement and manufacturing performance (Ezekiel & Uzonwanne, 2022; Muhammed & Eze, 2023) or household welfare metrics such as asset holdings and income levels (Bello & Musa, 2024), neglecting a more integrated approach that assesses the overall developmental potential of natural gas. Furthermore, few studies critically evaluate how policy frameworks, such as the Nigerian Gas Master Plan and the Nigeria Gas Expansion Programme, contribute to sustainable poverty reduction at both microeconomic and macroeconomic levels. This highlights the need for extensive research that systematically explores natural gas as a means to drive economic growth and alleviate poverty across Nigeria, while also addressing issues related to infrastructure, governance, and regional disparities.

3.0 Methodology

3.1 Introduction

This study examines the impact of the Decade of Gas initiative and the Petroleum Industry Act (PIA) on the development of natural gas and sustainability in Nigeria. A mixed-methods research approach, grounded in pragmatism, is employed to gather both quantitative and qualitative insights. The combination of statistical data and stakeholder opinions provides a comprehensive understanding of how policy frameworks influence energy accessibility, industrial growth, and community welfare. The research engages stakeholders from gas-producing, gas-consuming, and underprivileged areas via surveys, interviews, and focus group discussions. Techniques such as pilot testing, triangulation, and meticulous instrument design are implemented to ensure the validity and reliability of the findings. Ethical standards, including obtaining informed consent, maintaining confidentiality, and ensuring voluntary participation, were rigorously adhered to in order to protect participants' rights and enhance the study's credibility.

3.2 Research Design

The research employs a convergent parallel mixed-methods design, integrating both quantitative and qualitative methods to assess the impact of policy frameworks on natural gas and sustainable development. The quantitative analysis relies on household and business surveys as well as secondary datasets (e.g., NBS, World Bank, NNPC), focusing on metrics such as energy access, job creation, GDP contribution, and poverty rates. Qualitative information is obtained through interviews with policymakers, regulators, and industry professionals, in addition to focus group discussions with households and SMEs. In line with the approaches of Creswell et al. (2018) and Tashakkori et al. (2010), data collection and analysis occur concurrently, and integration takes place during the interpretation phase, thereby enhancing validity through triangulation. This methodology is especially relevant for policy assessment as it combines quantifiable outcomes with contextual realities.

3.3 Research Philosophy

The foundation of the study lies in pragmatism, which focuses on problem-solving and practical results. Pragmatism supports both deductive and inductive reasoning, allowing researchers to employ diverse methodologies and data sources in addressing complex research questions (Morgan, 2014). This philosophy is particularly applicable to energy policy research, where empirical impact measurements (quantitative) need to be complemented by lived experiences and perspectives (qualitative). Pragmatism allows for flexibility in interpreting the implications of the Decade of Gas and the PIA concerning sustainable development.

3.4 Scope and Study Areas

The research covers six states selected purposefully to reflect a range of natural gas contexts within Nigeria. These include gas-producing states (Rivers, Delta), areas with high demand for gas (Lagos, FCT-Abuja), and underprivileged states (Jigawa, Borno). This selection highlights regional differences in access, infrastructure, and policy impact, ensuring that the study captures a variety of experiences related to natural gas policies and their effects on sustainable development.

3.5 Study Population and Sampling Techniques

The target population for this study comprises stakeholders who are either directly impacted by or actively engaged in the governance, distribution, and use of natural gas. These stakeholders include:

i. Households (both urban and rural) that utilise natural gas for their domestic energy requirements.

ii. Gas marketers and distributors, who play a role in determining accessibility, pricing, and adoption rates.

iii. Small and Medium Enterprises (SMEs) in energy-intensive sectors that depend on natural gas.

iv. Policymakers and regulatory bodies such as the Ministry of Petroleum Resources, NNPCL, NUPRC, and pertinent government agencies.

A multi-stage sampling procedure was utilised. In Stage 1, six states were deliberately chosen based on their significance in gas production, consumption, or their status as underserved areas. Stage 2 involved the random selection of Local Government Areas (LGAs) and wards within the selected states. Stage 3 incorporated stratified random sampling for households and SMEs to ensure that both urban and rural areas, as well as various user types, were adequately represented. For qualitative data, snowball sampling was employed to reach policymakers, community leaders, and informal sector participants who are integral to the gas value chain but are more difficult to access through standard sampling methods.

3.6 Data Collection Methods and Instruments

Data collection utilised both quantitative and qualitative methodologies.

• Quantitative data were gathered through structured questionnaires administered to households and SMEs, which aimed to capture patterns of gas consumption, pricing, accessibility, and knowledge of the PIA and Decade of Gas policies. Additionally, secondary data from NBS, World Bank, IEA, and NNPCL were analysed to evaluate macroeconomic trends related to gas production, distribution, and policy performance.

• Qualitative data were gathered via Key Informant Interviews (KIIs) with policymakers, regulators, and industry professionals to delve into governance, execution, and policy-related issues. Focus Group Discussions (FGDs) with households, SMEs, and cooperative groups captured community-level insights and perspectives. Field observations were also conducted to record information about infrastructure, storage, and distribution practices.

All tools and instruments underwent pre-testing to ensure they were clear, culturally appropriate, and sequenced logically. Training sessions for enumerators were held to guarantee accuracy, neutrality, and compliance with ethical standards.

3.7 Model Specification and Analytical Techniques

Two econometric models were specified to analyse quantitative data:

(i) Economic Development Model

$$GDP_t = \beta_0 + \beta_1 NGP_t + \beta_2 PIA_t + \beta_3 INV_t + \beta_4 INF_t + \beta_5 EXR_t + \varepsilon_t$$

Where:

- GDP_t = Gross Domestic Product at time t
- NGP_t = Natural Gas Production
- PIA_t = Policy dummy variable for Petroleum Industry Act (implementation effect)
- INV_t = Investment in the gas sector
- INF_t = Inflation rate
- EXR_t = Exchange rate
- ε_t = Error term

(ii) Sustainable Development Model

$$SDt = \alpha0 + \alpha1NGAt + \alpha2EMPt + \alpha3POLt + \alpha4EDUt + \alpha5HEAt + ut$$

Where:

- SDt = Sustainable development indicator (proxied by poverty reduction, SDG metrics)
- NGAt = Natural gas access (% of households/businesses)
- EMPt = Employment rate
- POLt = Policy index (Decade of Gas initiatives and PIA provisions)
- EDUt = Education expenditure
- HEAt = Health expenditure
- ut = Error term

Statistical analyses employed regression models, time-series techniques, and robustness checks to ensure accuracy.

3.8 Qualitative Analysis Framework

Qualitative data were transcribed, categorised, and analysed thematically using NVivo software. Identified themes included:

i. Awareness and execution of PIA and Decade of Gas policies

ii. Availability, affordability, and dependability of natural gas

iii. Effects of policy on SMEs and industrial efficiency

iv. Community views on environmental and social implications

v. Challenges and prospects for sustainable energy transitions

Thematic findings were cross-referenced with quantitative data to enhance credibility and deepen policy analysis.

3.9 Ethical Considerations

Ethical approval was secured from the University Ethics Committee. Participants provided informed consent before taking part, with guarantees of confidentiality and anonymity. Respondents were made aware of their right to withdraw at any time without facing any repercussions. Data were stored and utilised safely, solely for research objectives.

3.10 Limitations and Mitigation Strategies

Potential obstacles included data deficiencies in underserved regions, policymakers' hesitance to engage, and logistical issues during fieldwork. These were addressed by:

i. Augmenting official datasets with local surveys.

ii. Collaborating with community liaison officers to foster trust.

iii. Implementing snowball sampling to reach important informants.

iv. Testing tools to ensure contextual appropriateness.

4.0 Data Presentation and Analysis of Results

4.1 Introduction

The findings from the field survey, focus group discussions, and key informant interviews are presented to evaluate the effects of natural gas on sustainable development in Nigeria, framed within the policy guidelines of the Decade of Gas Initiative and the Petroleum Industry Act (PIA). The research objectives steer the analysis, employing a mixed-methods approach: descriptive statistics to identify trends, inferential regression analysis to assess causal relationships, and thematic insights to explore qualitative aspects. The outcomes provide a comprehensive understanding of how access to natural gas and policy-guided interventions affect household welfare, small business productivity, and poverty alleviation.

4.2 Socioeconomic and Demographic Profile of Respondents

Table 4.1 summarises the demographic characteristics of the 500 respondents surveyed across different regions.

Table 4.1: Demographic Characteristics of Respondents (N = 500)

Variable	Category	Frequency	Percentage (%)
Gender	Male	280	56.0
	Female	220	44.0
Age	18–30	120	24.0
	31–50	250	50.0
	51+	130	26.0
Education Level	No formal education	60	12.0
	Secondary	200	40.0
	Tertiary	240	48.0
Sector of Employment	Gas sector	150	30.0
	Informal trade	170	34.0
	Public/Private sector	180	36.0

The demographic spread reflects a balanced representation across gender and age groups, with a strong presence of respondents in the 31–50 age bracket (50%), signifying active workforce participation. Educational attainment is relatively high, with 88% of respondents completing at least secondary education, ensuring adequate comprehension of energy-related issues. Employment distribution shows diversity across gas-related enterprises (30%), informal trade (34%), and the formal public/private sector (36%). This balance enhances the robustness of the findings by integrating perspectives from both end-users and stakeholders directly involved in gas distribution and utilisation.

4.3 Descriptive Analysis of Livelihood Indicators

Respondents were asked to assess changes in income, poverty, energy access, and productivity after the expansion of natural gas.

Table 4.2: Perceptions of Economic Change Following Natural Gas Intervention

Indicator	Improved (%)	No Change (%)	Declined (%)	Mean Score (1–5)
Household Income	62.0	23.0	15.0	3.87
Employment Opportunities	58.0	25.0	17.0	3.71
Access to Cooking Gas	75.0	18.0	7.0	4.12
Small Business Productivity	64.0	22.0	14.0	3.88
Reduction in Household Poverty	60.0	26.0	14.0	3.75

The descriptive findings indicate that natural gas interventions are perceived as having a significant positive impact across various livelihood indicators. The most notable gains were reported in access to cooking gas (a 75% improvement, mean = 4.12), followed by small business productivity (a 64% improvement, mean = 3.88) and household income (a 62% improvement, mean = 3.87). Although employment opportunities (58%, mean = 3.71) and poverty reduction (60%, mean = 3.75) also show improvement, the responses highlight uneven distribution of benefits, with some communities reporting stagnation or decline. These outcomes reflect both the opportunities created by Nigeria's Decade of Gas and the challenges posed by infrastructure deficits and affordability gaps.

4.4 Inferential Statistical Analysis

4.4.1 Multiple Regression Analysis

A multiple linear regression model was estimated to assess the impact of gas-related variables on household economic outcomes:

$$Y= \beta 0 +\beta 1X1 +\beta 2X2+ \beta 3X3 + \varepsilon$$

Where:

- Y = Household economic outcomes
- X_1 = Access to natural gas
- X_2 = Business support via gas use
- X_3 = Employment from gas enterprises

Table 4.3: Regression Results

Variable	B (Coeff.)	Std. Error	t-value	Sig. (p-value)
Constant	1.214	0.321	3.78	0.000
X_1: Access to Natural Gas	0.523	0.104	5.03	0.000
X_2: Business Support via Gas	0.376	0.093	4.04	0.001
X_3: Gas Sector Employment	0.298	0.082	3.63	0.003

Model Fit:

- $R^2 = 0.631$, Adjusted $R^2 = 0.621$
- F-statistic = 34.12, $p < 0.01$

Interpretation:

- Access to natural gas ($\beta_1 = 0.523$, $p < 0.01$) is the strongest predictor of household economic well-being, underscoring the transformative role of energy access in poverty reduction.
- Business use of gas ($\beta_2 = 0.376$, $p = 0.001$) also significantly boosts household outcomes, reflecting the role of gas in SME productivity.
- Employment opportunities in the gas sector ($\beta_3 = 0.298$, $p = 0.003$) contribute positively but at a smaller magnitude compared to direct household access.

Overall, the model explains 63.1% of the variation in household outcomes, indicating that natural gas interventions under Nigeria's policy frameworks significantly enhance livelihoods and poverty reduction.

4.5 Thematic Insights from Qualitative Data

1. Economic Empowerment through Gas Access

   FGDs revealed that access to gas reduced household energy costs and freed up time, especially for women.
   "Now I can use my time to sell vegetables instead of looking for wood all day. It has helped me earn more." – Woman, Rivers State.

2. SME Productivity and Informal Sector Growth

   Small-scale entrepreneurs reported cost savings and improved efficiency with gas-powered tools.

"I switched to gas ovens last year. I can bake twice as much now, with half the cost." – Bakery Owner, Lagos.

3. Infrastructure Gaps and Exclusion

Respondents in rural areas stressed limited access due to weak pipeline networks. "We hear about gas expansion, but it does not reach our village. The nearest point is 10km away." – Community Leader, Zamfara.

4.6 Triangulation of Findings

By integrating quantitative results, qualitative narratives, and secondary data, the findings confirm that gas expansion promotes inclusive growth but with uneven outcomes. Access to gas boosts income, productivity, and gender empowerment; yet, rural-urban disparities persist.

Table 4.4: Triangulated Evidence Linking Statistical, Qualitative, and External Data Sources

Statistical Finding	Supporting Quote	External Data Source
Gas access ↑ to 22% householdswith an income of	"My husband's welding shop now runs longer hours with gas, saving diesel costs." – Female, Rivers State.	NBS (2024)
Regions with >60% access report 15% lower poverty	"Families with gas are doing better—they cook faster and run small businesses." – Community Leader, Kaduna	World Bank (2023)
School attendance ↑ is 12% in gas-access households	"My daughters now attend school instead of fetching wood." – Mother, Ogun State.	UNESCO (2024)
Women gain 35% more time for income.	"Before gas, I spent all day fetching wood; now I run a food business." – Female, Delta State.	UN Women (2024)
Rural households are 48% less likely to access gas	"We still use firewood; no gas supply here." – Elder, Katsina	NGEP (2024)

4.7 Discussion of Findings

The results indicate that Nigeria's Decade of Gas and the Petroleum Industry Act have generated tangible socioeconomic advantages, especially in terms of household welfare, the productivity of small and medium-sized enterprises (SMEs), and the empowerment of women. Regression analysis revealed that access to gas is the most significant factor influencing economic outcomes, supported by descriptive data indicating that 62–75% of participants reported improvements. A notable gender-specific aspect emerged: women experience disproportionately positive effects due to decreased labour demands and greater involvement in income-generating activities. This finding is consistent with earlier research (Ejiogu, 2023; Uduji et al., 2022), which shows that alleviating energy poverty economically

empowers women. Likewise, SMEs utilising gas technologies have noted lower costs and improved productivity, highlighting the potential of gas adoption to foster inclusive growth within Nigeria's informal sector.

However, access to gas is not consistent across the board. Rural participants mentioned issues relating to inadequate infrastructure, expensive transportation, and significant travel distances to refilling stations. This highlights ongoing difficulties in implementing policy, despite the objectives of the PIA and the Decade of Gas initiative. Without focused investments in rural infrastructure, subsidies for low-income families, and measures that consider gender-specific needs, the uptake of gas could exacerbate existing inequalities rather than reduce them.

Overall, the findings suggest that natural gas, when implemented effectively, can catalyze achieving a range of Sustainable Development Goals (SDGs 1, 7, 8, and 13). Nonetheless, policy interventions must extend beyond urban areas to guarantee comprehensive, inclusive, and sustainable development results.

5.0 Conclusion and Recommendation

This research concludes that Nigeria's Decade of Gas initiative and the Petroleum Industry Act (PIA) constitute a vital policy framework with the capacity to promote sustainable development and alleviate poverty. The findings reveal a clear positive link between greater access to natural gas and enhancements in household income, business productivity, and women's economic empowerment. By offering a cleaner and more cost-effective energy source, gas has facilitated the expansion of small businesses. It has lessened the time constraints on women, enabling them to pursue income-generating endeavours. Nevertheless, the analysis also indicates that the advantages are not evenly spread. Ongoing infrastructural shortcomings, particularly in rural and underserved areas, have led to a divided economy, with the benefits of gas usage primarily accruing to urban locales, thereby exacerbating existing regional disparities. Without a concerted effort to ensure equitable implementation, the ambitious objectives of the Decade of Gas may be jeopardised by inadequate access.

To achieve the intended outcomes of these policies, we suggest a multi-faceted approach. First, the government and relevant stakeholders should focus on targeted rural infrastructure development, which includes building mini-LNG plants and gas pipelines to link remote areas. Second, a subsidised gas-for-poverty-alleviation initiative should be initiated to make cooking gas affordable for low-income households, thereby encouraging its adoption and reducing dependence on traditional fuels. Lastly, the PIA's Host Community Development Trust Fund needs effective implementation with a clear emphasis on allocating a portion of the resources to develop local gas infrastructure and support small-scale gas-powered businesses. These strategic measures will not only help close the existing access gap but also ensure that the advantages of Nigeria's extensive natural gas reserves result in widespread, inclusive, and sustainable progress for all citizens.

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