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**CSR INITIATIVES AND SUSTAINABILITY RESILIENCE IN
NIGERIA'S OIL AND GAS INDUSTRY: A PLS-SEM APPROACH FROM
LOCAL COMMUNITIES' PERSPECTIVE**

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Abstract

Despite its potential for economic growth and sustainable development, Nigeria faces social challenges including poverty, environmental degradation, and economic decline. In 2023, it ranked 146th out of 166 on the SDG index, with a poverty headcount of \$2.15/day. Over the past two decades, Nigerian oil and gas companies have faced sustainability criticism, emphasizing the importance of CSR initiatives for triple bottom line sustainability. This study examines how the CSR initiatives of Nigerian energy companies impact the sustainability and resilience of the Niger Delta region. By using an explorative research design guided by positivism philosophy, 460 survey responses were collected from Niger Delta community members via Google Form and analyzed using PLS-SEM since the research framework of the CSR and COM-R model comprises five primary dimensions each. The study discovered that CSR initiatives have a significant impact on sustainability and resilience in the Niger Delta. This underscores that integrating socially responsible initiatives not only enhances the ethical standing of these businesses but also generates

high strategic value, bolstering their sustainability and resilience. The research recommendations include reassessing CSR initiatives, increasing community engagement, and collaborating with regulatory bodies. This will foster community cohesion, adaptability, and voluntary compliance with industry standards and social norms within the community. The research's descriptive value lies in its empirical demonstration of the connection between CSR and sustainability resilience. Firms can use these findings to enhance their CSR efforts and improve sustainability and resilience in future business practices. The research acknowledges potential biases in data collection stemming from unequal online access among the members of Niger Delta communities, resulting in a partial representation of the diverse range of respondent behaviours across the continent, as various cultural, economic, and social factors can influence their survey responses.

Keywords: CSR Initiative, Niger Delta, Oil and Gas Companies, Sustainability Resilience, Triple Bottom Line

1. Introduction

Nigeria, a dominant force in Africa due to its abundant resources, has played a significant role in the global oil industry since its discovery in 1954 in Oloibiri, Niger Delta (Kanyako, 2020). Despite its potential for economic prowess and sustainable development, Nigeria faces substantial challenges, including poverty, environmental degradation, and deteriorating economic conditions. For instance, Nigeria ranks 146 out of 166 on the SDG index, with a poverty headcount of \$2.15/day in 2023 (World Bank, 2023). Alarmingly, Nigeria has experienced over 4 million deaths from 2017 to the present, with 23% of deaths among adults, 26% among children, and over 40% among the elderly attributed to various causes of oil spills (Pona et al., 2021). This is mainly due to corrosion (50%), sabotage by restive youths (28%), and operational mishaps during oil production activities (21%), with a minimal 1% from engineering drills and machine inefficiencies (Ndubuisi-Okolo, Anekwe, & Ekwochi, 2020). Unsustainable environmental practices in Nigeria are linked to 85 out of 102 categories of diseases and injuries in the Niger Delta, according to the World Health Organization, (2018). While serving as the backbone of the economy, contributing over 75% of investment revenue and inflow, activities including banditry, corruption, and oil extraction contribute to over 80% of the depletion in natural resources, national wealth, and income, leading to significant environmental harm like banditry due to hunger. This situation underscores the urgency of implementing sustainable resilience strategies to address the country's reliance on oil and the resulting environmental issues, including air pollution, which could burden future generations.

For over two decades, Nigerian oil and gas companies have faced significant sustainability criticism due to their social repercussions, highlighting the critical

role of corporate social responsibility (CSR) as a dimension of triple bottom line sustainability. This fosters transparency and positive societal impacts, supporting the long-term sustainability development goals (SDGs) of these firms (Onuoha & Nkwor, 2021). CSR shapes not only corporate relationships but also reduces conflicts and enhances stakeholders' loyalty and support, as companies significantly contribute to environmental and community causes (Yadav, Bhudhiraja, & Gupta, 2021). According to Angela et al., (2021) and Babajide et al., (2021), mining operations in Niger Delta have negatively affected the livelihoods of farmers and fishermen through pipeline vandalism, resulting in adverse impacts on the companies' sales and sustainability. As a result, the concept of sustainability resilience is gaining traction as a replacement for "CSR initiatives" in policymaking and political discourse. This is true as CSR focuses need to be sustainable within the community context. For example, Babajide et al., (2023) note the need for oil and gas companies to understand how communities respond and adapt to their environmental, economic, and societal changes, using concepts like marginalization, vulnerability, and resilience as key frameworks. Resilience, within the context of adaptive capacity, focuses on a system's ability to adjust, moderate effects, and cope with disruptions (Koliou et al., 2022). Systems characterized by diversity, potential for change, and connectivity, such as feedback and flexibility, exhibit good adaptive capacity, allowing them to respond effectively to both internal and external disturbances.

There is a growing call for CSR practices and sustainability among researchers, driven by the increasing demand for ethical corporate behavior. Kwarto et al., (2022) emphasize the crucial role of a robust oil and gas industry in economic strength, while Ezejiofor and Emeneka (2022) advocate for the public disclosure of CSR and sustainability reports to enhance understanding of the industry's social responsibility and its impact on sustainability. Muruviwa, Akpan, and Nekhwevha (2020) posit that CSR strategies are efficacious in fostering community development through collaborative engagement with stakeholders. Igwe and Nwadiakor (2015) acknowledge the benefits associated with CSR in terms of enhancing national and international visibility and garnering government support. Kumar, Gupta, and Das (2022) observe that CSR practices in India prioritize sustainable development and societal welfare. Ismail et al., (2015) highlight CSR's role in assessing its social, economic, and environmental impacts on communities. While these studies provide valuable insights into CSR practice on community welfare, they lack critical exploration within the context of community resilience, which is crucial for sustainable action, efficacy, adaptation, and the SDGs index in

Nigeria. The study explores how CSR initiatives impact the sustainability resilience of the Niger Delta region. The specific objectives include:

- i. Evaluate the effectiveness of the CSR initiatives and sustainability resilience strategies adopted by Nigerian oil and gas firms in the Niger Delta region,
- ii. Analyse the influence of Carrol's CSR pyramid on the various aspects of sustainability resilience in Nigeria,
- iii. Propose actionable plans that can foster the efficacy of sustainability practices among the Niger Delta community's populace.

The study holds significance in Nigeria's present-day context for several reasons. Despite residing below the poverty line of \$2.56 SDG (Klarman et al., 2017), resilience encompasses vital aspects of a prosperous community future, including recovery and growth through adaptation and sustainability measures. McCrea et al. (2014) emphasized this concept, stating that sustainable resilience is crucial for assessing and fostering community capacity to uphold well-being in the face of challenges, including adversity, climate change, and risk. Despite recent empirical evidence indicating that asset ownership (physical, social, and natural) and governmental intervention contribute to community well-being in terms of food security (Manlosa et al., 2019), there is a scarcity of studies on CSR within the SDG index. Additionally, Adu et al., (2017) found that mining and farming communities are particularly vulnerable to the effects of global warming and weather instability, leading to challenges in food production and water supply, which in turn have negative impacts on health and economic well-being. This is evident in Nigeria, where issues such as killings and kidnappings prevail due to hunger and poverty. Lastly, the research serves as a valuable reference for global academic researchers in accounting, marketing, and other management-related disciplines who wish to explore similar or related topics in their current or future research. Thus, the practical value of this study lies in the guidance it provides to stakeholders on making informed decisions when faced with various situations.

2. Review of Literature

Pyramid in CSR Initiative: Conceptual Clarification

CSR has a rich and varied history, spanning centuries and cultures, reflecting the deep integration of societal concerns with business practices (Uduji et al., 2021; Ogunode & Adegbe, 2020). The evolution of this concept has been marked by significant milestones and shifts in perspective, culminating in its current

prominence. Despite its contemporary significance, the origins of CSR can be traced back to various points in history, with some indications suggesting its presence as early as the 1930s and 1940s. Notable scholarly works including J. M. Clark's "Social Control of Business," Chester Barnard's "The Function of the Executive," and Theodore Krepes' "Measurement of Social Performance in Business" hinted at the early inklings of CSR (Silva-Junior et al., 2023, 2020). However, CSR gained formal recognition and began to take shape in the mid-20th century (Nalband & Kelabi, 2014; Saleh, 2022). This is evident in the groundbreaking book by Howard R. Bowen, "Social Responsibilities of the Businessman," published in 1953, which marked a significant starting point for formal literature on CSR. Keith Davis emerged as a prominent figure during this era, contributing extensively to defining CSR (Joncourt et al., 2019; Masoud, 2017). His perspective, focusing on the interplay between social responsibility and business influence, gained widespread acceptance and laid the foundation for subsequent discussions. Carroll (1991) support this notion by talked about how corporations have a social obligation to the legal, ethical, economic, and discretionary (philanthropic) organizations in society at large. Because of its widely acknowledged application, the aforementioned definition has been applied in business and society (Carroll, 2015). Businesses ought to answer for their impact on local communities and the surroundings in which they operate. Carroll, (1991) introduced CSR framework, outlining four key dimensions: economic, legal, ethical, and philanthropic responsibilities. He argued that companies must understand and fulfil these fundamental CSR obligations. Stakeholders, according to Carroll, are individuals or groups with whom companies share bonds of responsibility or dependence. In contrast, Dusuki, (2008) emphasized the economic role of businesses, asserting that their primary function is to provide goods and services to society while maintaining responsible principles. Carroll's (2015) CSR pyramid represents the spectrum of societal expectations regarding corporate responsibilities, encompassing legal, economic, philanthropic, and ethical dimensions. Carroll, (2015) emphasized that the economic dimension is foundational, supporting the other dimensions. In this model, companies are expected to fulfil market requirements, prioritizing profit while also addressing societal responsibilities. Profit is deemed the primary concern, followed by other responsibilities.

Pyramid in Sustainability Resilience: Conceptual Clarification

Amidst its increasingly important for businesses globally, community sustainability is a newly discussed theme in management literature. This concept gained traction in the 1980s due to corporate scandals and environmental degradation, leading to the adoption of the triple bottom line approach (Enuoh, 2015; Mogaji et al., 2021). This approach urges companies to uphold ethical standards and engage with communities. Although investing in sustainability may incur costs, many companies view it as an investment in their reputation, which can yield significant financial benefits. In Nigeria, sustainability awareness was initially low in the early 20th century, with firms prioritizing profit without considering social or environmental impacts (Amran et al., 2015; Amuyou et al., 2016). However, globalization and economic expansion have led to an increased focus on sustainability, especially among multinational firms with significant economic influence. This shift in focus reflects changing societal expectations following financial crises in developed countries.

Lim, (2022) coined community resilience (COM-R) as the collective capacity of a community to respond to change. This discusses how community members deliberately cultivate their ability, which enables them to influence and adapt to change, thereby shaping the future trajectory of their community. Resilience depicts the adaptive capacity of individuals to navigate changes in their socio-economic and environmental ecosystems, which are in a constant state of flux. Social capital is highlighted as a crucial element in developing COM-R, as it facilitates community cohesion and resilience-building efforts (Aman et al., 2023). Resilient communities are characterized as proactive and self-sufficient, empowering their members to impact local life (Kwarto et al., 2022). To thrive in changing environments, communities require capital investments to enhance their resilience. According to Asuah and Ankoye, (2016), communities possess various forms of capital that contribute to their productivity, stability, and resilience against external shocks. Rose and Krausmann, (2013) identifies three types of capital—social, environmental, and economic—that are essential for maintaining community cohesion and resilience. These forms of capital are crucial for understanding resilience at the community level. Steiner and Markantoni, (2014) propose that the dimensions of COM-R include social capital, information and communication, networked resource economic development, and community competence. However, the subsystems of resilience encompass economic, ecological, governance, civil society, and physical infrastructure (Xu, Marinova, & Guo, 2015). This emphasizes the significance of ecological and physical infrastructure,

even though Walton et al., (2017) argue that community adaptation, collective efficacy, and community action are crucial dimensions for adapting to future changes. These dimensions are seen as key components for building resilience in real-world applications, as highlighted by Magis, (2010).

Theoretical Framework

The research is anchored on Bronfenbrenner's bioecological theory, used by Boon et al., (2016) to measure intervention effectiveness in enhancing community resilience. This framework focuses on individual characteristics including economic, social, infrastructure, institutional, and community capitals that foster resilience among community members (Cutter et al., 2008). Stewart et al., (2009) support this, suggesting that communities lacking these indicators are not secure against natural disasters. Resilience, from a socioecological perspective, entails adaptive capacity, where communities proactively transform and adapt for growth, preservation, mitigation, relief, and reorganization (Mayunga, 2007). This approach encourages community members to develop effective actions to mitigate problems, as argued by Norris et al., (2021), who state that community resilience theory encompasses capacities and strategies for recovery preparedness.

According to Triple bottom line theory coined as sustainable livelihood framework, communities possess various assets supporting their livelihoods, including financial, human, physical, natural, and social resources that can be acquired, developed, improved, or passed down through generations. McCrea et al., (2014) identified seven valuable community resources: cultural, social, political, intellectual, financial, natural, and built capital, which can enhance community resilience and well-being. Steiner and Atterton, (2015) argue that rural businesses contribute to community resilience. Therefore, if a company's strategy includes CSR in community development, it directly impacts community resilience.

Stakeholder theory, as discussed by Freeman, (2010) and expanded in strategic management, suggests that stakeholders are individuals or groups affected by or influencing the organization's objectives. This implies that a company's operations affect the community. This suggests that companies engage in CSR to meet moral, ethical, and societal obligations to stakeholders, while also strategically advancing the company's objectives for the benefit of local communities (Freeman & Dmytriiev, 2017). Managing stakeholders is associated with positive financial outcomes, although this perspective alone is not sufficient to fully support stakeholder theory (Russo & Perrini, 2010). Freeman et al., (2010) emphasize that

a firm's effective management of stakeholder demands and expectations which are crucial to its overall social performance. Establishing positive relationships with local communities as stakeholders can provide a competitive advantage, setting apart companies that respect stakeholder requests. Similarly, Kivits et al., (2021) highlight a normative approach to stakeholders, focusing on moral behavior narratives and philosophical principles guiding stakeholder engagement and corporate management. This perspective emphasizes recognizing stakeholders as individuals or groups with legitimate interests in both the procedural and substantive aspects of corporate activities. However, the decision-making process regarding stakeholder relationships in Nigeria's oil and gas industry is complex, often involving a delicate balance between the interests of the firm and stakeholders. This can result in trade-offs and moral dilemmas when allocating benefits and burdens among individuals (Theodoulidis et al., 2017). Moreover, firms exercising power and self-interest may clash with traditional morality, which emphasizes responding to stakeholders with legitimacy. As such, organizations must adhere to societal norms and boundaries, rooted in the social contract between corporations and society (Kumar & Singh, 2022), to ensure their CSR initiatives and sustainability resilience are effective and well-received by local communities.

Empirical Review and Hypotheses Development

The scholarly literature underscores the multifaceted CSR's impact on various aspects of society. Ismail et al., (2015) highlighted the positive effects of CSR on education programs, while Brew et al., (2015) found that CSR activities were linked to education, health, livelihood, and community aid in Ghana. Degie and Kebede, (2019) emphasized CSR's role in enhancing community capabilities and well-being, serving as a crucial link between local communities and the government. Sarmila et al., (2015) demonstrated the economic welfare benefits of CSR projects, such as providing income sources, employment opportunities, and asset financing. Similarly, Al-Zyoud, (2017) emphasized the philanthropic and ethical influence of CSR on sustainable development. Kim et al., (2019) argued that businesses utilizing natural resources have a responsibility to enhance community capacity and resilience. Gibson and Klinck, (2005) stressed the role of markets in driving industry and supporting sector development, highlighting the importance of society's ability to negotiate these changes. Buikstra et al., (2010) noted the relationship between community development and social impact assessments, providing insights into community quality and assets for successful adaptation to major changes. Rudito, (2014) argued that practicing CSR through community development leads to positive changes in sustainability, economic aspects,

community well-being, and enhances resilience. Moreover, Soetanto et al., (2017) highlighted the importance of social responsibility in safeguarding-built environments during floods and other changes, emphasizing the need for collective community action.

Table 1: Pyramid of CSR and COM-R Model

Construct (s)	Pyramid (s)	Reference
CSR Initiative	Economic, Legal, Ethic, and Philanthropic Index	Carroll (1979)
Sustainability Resilience	Community Adaptability, Efficacy and Action	Magis (2010)

Source: Researcher (2024)

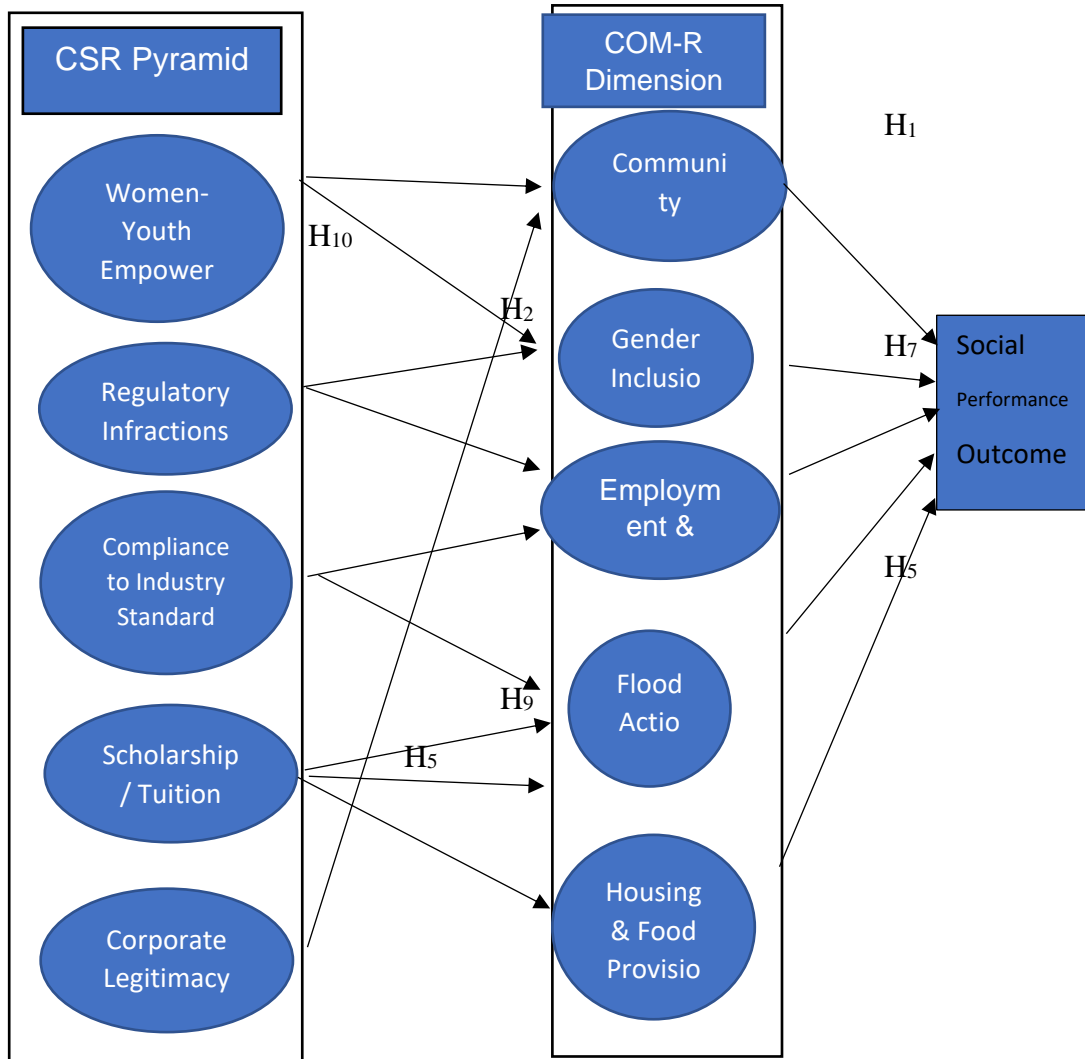


Figure 1: Hypothesis Development (Author, 2024)

Despite the acknowledged benefits of CSR activities, none of these studies assess CSR with resilience pyramids within Niger Delta. Oryani et al., (2022) call for scrutiny regarding their long-term sustainability in Niger Delta realm. This is necessary as today's Nigeria security dynamics criticize whether short-term

charitable projects genuinely address the root causes of societal challenges or merely serve as transient remedies. Therefore, the CSR and COM-R model dimension is proposed based on the below proxies as shown in Table 1:

The proposed hypotheses aim to operationalize and test the relationship between the CSR and COM-R dimension based on the conceptual framework presented, focusing on Niger Delta community. This is essential to assess the efficacy of CSR initiatives and resilience landscape in addressing societal and sustainability challenges in the Niger Delta. This helps to determine if these initiatives are genuinely addressing root causes or merely providing short-term solutions. By testing these hypotheses, researchers can contribute valuable insights into the development of more impactful CSR strategies that promote long-term community development and resilience, benefiting not only the Niger Delta but also other communities facing similar challenges worldwide.

3. Methodology

The research employed online survey to collect insights from Niger Delta community members, aiming to capture a comprehensive range of perspectives and facilitate a thorough understanding of the subject. This approach is justified by its ability to reach a large sample size and its cost-effectiveness, particularly when studying widely dispersed populations like Nigerians (Wu et al., 2022). Additionally, it provides a platform to explore sensitive topics, ensuring the acquisition of reliable and unbiased responses (Andrade, 2020). To this end, the researcher developed a questionnaire comprising a series of questions with predefined response options and incorporated an assessment scale, enabling respondents to express their preferences. As demonstrated by Geldsetzer, (2020), this method allows researchers to rate responses using a five-point Likert scale, ranging from "Strongly Support (SS)" rated as 5, "Support (S)" rated as 4, "Neutral (N)" rated as 3, "Oppose (O)" rated as 2, to " Strongly Oppose (SO)" rated as 1. This approach is ideal for accommodating a large number of participants while facilitating diverse and quantifiable data collection.

The research focused on the host communities in the Niger Delta region. This comprises around 70 oil and gas companies, with 18 classified as Major Oil Companies (MOCs), employing approximately 10,000 individuals (Uwadiae-Oyegun, 2023). In contrast, the Niger Delta host communities are estimated to have a population of about 28.8 million people, with a nearly equal gender distribution of 49.5% male and 50.5% female, as of 2006. These communities also include 3462

community leaders, according to the Uwadiae-Oyegun, (2023). The decision to focus on these respondents was based on their relevance to the research topic, as they are considered to have essential information due to their interactions within the shared environment of the oil industry and the host communities. Their geographical alignment in the Niger Delta region and their shared business activities also justify their inclusion in the study. The study used “Taro Yamane Sample Frame Model” based on 5% confidence interval level to determine the sample size of 520 communities’ members to partake in the research. This is considered ideal for avoiding bias, streamlining the research process, and saving time compared to investigating every element in the population (Clements, 2020).

$$n = N/1+ N (e)^2 \dots\dots\dots i$$

Where:

‘n’ represents the sample size selected from the target population.

‘N’ stands for the finite target population.

‘e’ indicates level of significance (or limit of tolerable error i.e. 5% for humanities research like this).

Therefore,

$$\begin{aligned} n &= 28.81m/1+ 28.81m (0.05)^2 \\ n &= 400 \text{ respondents} \\ n &= 400 \text{ respondents} + \text{tolerable errors @30\%} \\ n &= 400 + (30\% **400) \\ n &= 520 \text{ respondents} \end{aligned}$$

Structural Equation Modeling (SEM) based on Partial Least Squares (PLS) is deemed appropriate for analyzing the effect of this study moderating variable, as suggested by Sarstedt et al., (2023). This is necessary since the research framework of CSR and COM-R model comprises six primary dimensions: community adaptability, efficacy and action, legal and ethical, economic, and philanthropic, which are developed by composite indices measured as a second-order reflective construct. PLS-SEM is ideal as it allows for the simultaneous analysis of multiple structural equations, accommodating numerous dependent and independent variables. It is particularly useful for examining direct and indirect impacts, including the presence of mediating variables. Moreover, PLS-SEM facilitates the evaluation of the reliability and validity of study constructs by calculating statistical tools such as mean, median, adjusted regression (R²), and correlation statistics of

the variables. Finally, PLS-SEM does not require data normality and can handle large sample sizes, making it a suitable choice for this study.

4. Analysis and Result Presentation

The study generated 460 electronic responses via Google Form from members of host communities in the Niger Delta, representing 88.4% of the estimated sample size. Additionally, more than 40 responses were not generated, while they are still needed to reach the estimated sample size. Therefore, this study's analysis and results are based on the 460 responses received, using the partial least squares equation supported by structural equation modeling.

4.1 PLS-SEM Outer model

Individual item reliability assesses the consistency of an item's score with its underlying construct. Standardized loadings (λ), representing the correlation between an indicator and its corresponding latent variable, are used for evaluation. A loading exceeding 0.707 indicates satisfactory individual item reliability (Carmines & Zeller, 1979). In this study, all loadings surpassed 0.776, demonstrating strong individual item reliability (see Table 1, bolded values). Construct reliability, also known as internal consistency, examines whether multiple indicators consistently measure the same construct. Two common metrics are utilized: Cronbach's alpha (Castro & Roldán, 2013) and composite reliability (ρ_c) (Hair et al., 2014). Nunnally and Bernstein, (1994) suggest a threshold of 0.7 for both, indicating acceptable reliability, especially for exploratory research. All constructs in this study exceeded 0.6, confirming internal consistency (see Table 4).

Table 3: Loadings and Cross Loadings for the Measurement Model

Item	Community Cohesion	Compliance to Industry Standard	Corporate Legitimacy	Employment and Insurance	Flood Action	Gender Inclusion	Housing and Food Provision	Regulatory Infractions	Scholarship and Tuition Funding	Woman and Youth Empowerment
Q1	0.813	0.495	0.100	0.445	0.081	0.279	0.383	0.541	0.139	0.085
Q2	0.962	0.495	0.025	0.562	0.069	0.179	0.267	0.407	0.535	0.169
Q19	0.850	0.495	0.252	0.242	0.121	0.401	0.337	0.254	0.385	0.269
Q20	0.928	0.495	0.391	0.074	0.109	0.013	0.381	0.072	0.352	0.517
Q1	0.013	0.895	0.222	0.207	0.389	0.340	0.370	0.437	0.517	0.173
Q2	0.223	0.848	0.219	0.374	0.219	0.452	0.342	0.294	0.489	0.580
Q4	0.105	0.819	0.118	0.160	0.521	0.091	0.288	0.064	0.199	0.086
Q5	0.375	0.904	0.375	0.341	0.071	0.478	0.252	0.427	0.369	0.625
Q8	0.399	0.746	0.424	0.479	0.124	0.465	0.328	0.432	0.400	0.639

Q1	0.215	0.359	0.978	0.513	0.355	0.281	0.354	0.292	0.279	0.248
Q2	0.215	0.359	0.776	0.259	0.219	0.219	0.314	0.223	0.198	0.291
Q3	0.185	0.364	0.865	0.316	0.486	0.203	0.473	0.169	0.297	0.133
Q13	0.116	0.326	0.830	0.214	0.658	0.143	0.290	0.083	0.252	0.056
Q2	0.443	0.336	0.429	0.911	0.137	0.682	0.318	0.485	0.420	0.530
Q13	0.416	0.364	0.403	0.874	0.201	0.534	0.375	0.426	0.425	0.494
Q17	0.288	0.350	0.310	0.915	0.322	0.425	0.320	0.255	0.291	0.287
Q19	0.262	0.286	0.194	0.869	0.443	0.195	0.279	0.145	0.286	0.148
Q8	0.262	0.286	0.194	0.369	0.843	0.118	0.247	0.451	0.582	0.164
Q9	0.550	0.134	0.038	0.476	0.893	0.238	0.328	0.166	0.191	0.798
Q15	0.037	0.341	0.447	0.380	0.934	0.381	0.280	0.585	0.134	0.213
Q20	0.442	0.131	0.378	0.585	0.853	0.105	0.020	0.363	0.341	0.317

Q2	0.215	0.054	0.121	0.454	0.193	0.824	0.198	0.313	0.120	0.380
Q7	0.421	0.145	0.209	0.593	0.206	0.870	0.333	0.124	0.412	0.506
Q16	0.504	0.364	0.094	0.261	0.321	0.854	0.560	0.271	0.200	0.062
Q18	0.344	0.234	0.347	0.538	0.313	0.881	0.280	0.166	0.498	0.632
Q2	0.579	0.113	0.105	0.476	0.129	0.305	0.870	0.585	0.320	0.210
Q8	0.017	0.231	0.289	0.383	0.113	0.470	0.856	0.343	0.395	0.099
Q9	0.128	0.278	0.117	0.203	0.610	0.135	0.923	0.466	0.421	0.041
Q14	0.296	0.220	0.221	0.234	0.097	0.106	0.851	0.051	0.055	0.408
Q1	0.128	0.278	0.058	0.281	0.127	0.149	0.237	0.947	0.421	0.668
Q2	0.359	0.472	0.568	0.333	0.372	0.310	0.408	0.893	0.366	0.338
Q6	0.177	0.496	0.252	0.206	0.342	0.150	0.275	0.876	0.241	0.152
Q8	0.008	0.428	0.077	0.162	0.448	0.080	0.243	0.817	0.170	0.005

Q1	0.407	0.332	0.429	0.371	0.090	0.487	0.307	0.384	0.930	0.483
Q2	0.385	0.398	0.374	0.379	0.296	0.605	0.370	0.480	0.917	0.437
Q7	0.385	0.398	0.374	0.321	0.148	0.054	0.332	0.017	0.874	0.280
Q20	0.250	0.019	0.328	0.350	0.410	0.354	0.599	0.476	0.848	0.275
Q1	0.203	0.055	0.328	0.036	0.424	0.308	0.527	0.382	0.348	0.923
Q2	0.235	0.102	0.328	0.470	0.097	0.575	0.127	0.038	0.348	0.862
Q10	0.275	0.032	0.328	0.350	0.469	0.354	0.474	0.177	0.348	0.831
Q11	0.103	0.380	0.182	0.249	0.186	0.107	0.433	0.166	0.193	0.846
Q12	0.161	0.392	0.182	0.210	0.329	0.156	0.435	0.187	0.193	0.837

Convergent validity evaluates the degree to which indicators truly measure the intended construct. Average Variance Extracted (AVE) is employed to assess this. AVE reflects the proportion of variance in a construct explained by its indicators, compared to measurement error. According to Fornell and Larcker (1981), AVE values exceeding 0.5 indicate that at least 50% of the variance is explained by the construct (Hair et al., 2014). This study fulfils this requirement (see Table 4). However, discriminant validity assesses the distinctiveness of constructs from each other. Two approaches are employed: The Fornell-Larcker Approach which compares the square root of AVE for each construct with its correlations with other constructs. The square root of AVE should be greater than all inter-construct correlations. In this study, all constructs meet this criterion (see Table 4). The Cross-Loading Analysis which examines whether items load higher on their intended construct compared to other constructs. It involves comparing correlations between construct scores and standardized item data. Table 4 demonstrates that this requirement is also satisfied in this study. Evaluating these criteria helps to ensure a robust measurement model in their PLS-based research, establishing a solid foundation for further analysis and interpretation.

Table 4: Composite Reliability (ρ_c), Convergent and Discriminant Validity Coefficients

	ρ_c	A	AVE	CC	CIS	CL	EI	FA	GI	HFP	RI	STF	WY E
Community Cohesion (CC)	0.825	0.765	0.675	0.822									
Compliance to Industry Standard (CIS)	0.727	0.709	0.635	0.754	0.797								
Corporate Legitimacy (CL)	0.742	0.674	0.517	0.646	0.794	0.719							
Employment and Insurance (EI)	0.841	0.818	0.788	0.813	0.748	0.643	0.888						
Flood Action (FA)	0.777	0.736	0.678	0.251	0.673	0.303	0.375	0.823					
Gender Inclusion (GI)	0.796	0.752	0.594	0.732	0.730	0.624	0.541	0.319	0.771				

Housing and Food Provision (HFP)	0.891	0.802	0.760	0.774	0.692	0.612	0.844	0.607	0.692	0.872			
Regulatory Infractions (RI)	0.770	0.720	0.650	0.624	0.720	0.514	0.807	0.343	0.763	0.831	0.806		
Scholarship and Tuition Funding (STF)	0.718	0.694	0.583	0.791	0.784	0.561	0.817	0.449	0.682	0.815	0.664	0.764	
Woman and Youth Empowerment (WYE)	0.741	0.685	0.652	0.524	0.710	0.699	0.792	0.202	0.749	0.720	0.701	0.734	0.808

Note. The square root of the variance shared by the constructs and their measurements is shown by the diagonal components (bold) (AVE). The correlations between constructs are considered off-diagonal elements. Diagonal elements need to be bigger than off-diagonal elements in order to maintain discriminant validity.

4.2: PLS-SEM Inner model

To predict the ability of endogenous constructs (variables influenced by other variables in the model) to ascertain the postulated links within the model, the path coefficients (β) and significance level (@) was assessed. Standardized path coefficients (β) indicate the strength and direction of the relationships between constructs. Following Chin, (1998), coefficients with absolute values less than 0.2 suggest negligible influence. Conversely, values exceeding 0.2, ideally surpassing 0.3, provide stronger evidence for a significant relationship. To assess statistical significance, researcher employed bootstrapping (460 resamples) to obtain standard deviations and t-statistics (Hair et al., 2011; Henseler et al., 2009). This allows us to evaluate the strength and reliability of the proposed links (Castro & Roldán, 2013). The specific path coefficients and their confidence intervals will be presented in detail within Table 3.

Also, the predictive strength (R-squared) was reported. The R-squared (R^2) value reflects the proportion of variance in the dependent latent variables (variables explained by other variables) accounted for by the model. Higher R^2 values indicate greater predictive power. While specific thresholds vary, values greater than or equal to 0.1 for individual paths are generally considered acceptable (Gallardo-Vázquez & Sánchez-Hernández, 2014). Overall Model Fit (R-squared) explanatory power of the model is assessed by the aggregate R^2 value for all endogenous constructs. Hair et al., (2014) suggest interpreting R^2 values as substantial (≥ 0.75), moderate (0.50 - 0.75), or weak (0.25 - 0.50) based on their magnitude. As depicted in Figure 1, the model's R^2 values fall within the range of 0.1 to 0.95, signifying varying degrees of predictive power across the endogenous constructs. These criteria helps to assess the inner model's structure and effectiveness in capturing the relationships between the variables of interest.

Table 5: Hypotheses Testing

H	B	Standard Deviation	t Statistics	Accepted
Ho5	0.233*	0.055	4.248	Yes
Ho6	1.092*	0.118	9.294	Yes
Ho10	0.608*	0.046	13.307	Yes
Ho9	0.398*	0.068	5.872	Yes
Ho4	0.621*	0.052	11.868	Yes
Ho3	0.527*	0.054	9.724	Yes
Ho7	-0.484*	0.162	2.988	Yes
Ho8	0.474*	0.075	6.344	Yes
Ho1	0.377*	0.044	8.637	Yes
Ho2	0.375*	0.056	6.720	Yes

Note: $t(0.05, 4999) = 1.645158499$, * $p < 0.05$

Lastly, endogenous constructs are evaluated for predictive significance using a reflective measurement model (Roldán & Sánchez-Franco, 2012) and the Stone-Giesser test or Cross-validated redundancy index (Q^2) (Wang et al., 2015). Consequently, it refers to determining the predictive usefulness of the inner model (Hair et al., 2014). This test shows how effectively the model and its estimate parameter reproduce the observed values. For endogenous reflective constructs, the cross-validated redundancy measure (Q^2) is employed (Castro & Roldán, 2013). Whereas a Q^2 less than 0 indicates that the model is deficient, a Q^2 more than 0 indicates that the model has predictive value (Hair et al., 2014). Given that a positive Q^2 value is attained, it was realized that the constructions' predictions are significant (see Figure 2). According to Vázquez and Sánchez (2013), one must take into account all consequences, both direct and indirect. Table 4 illustrates these impacts.

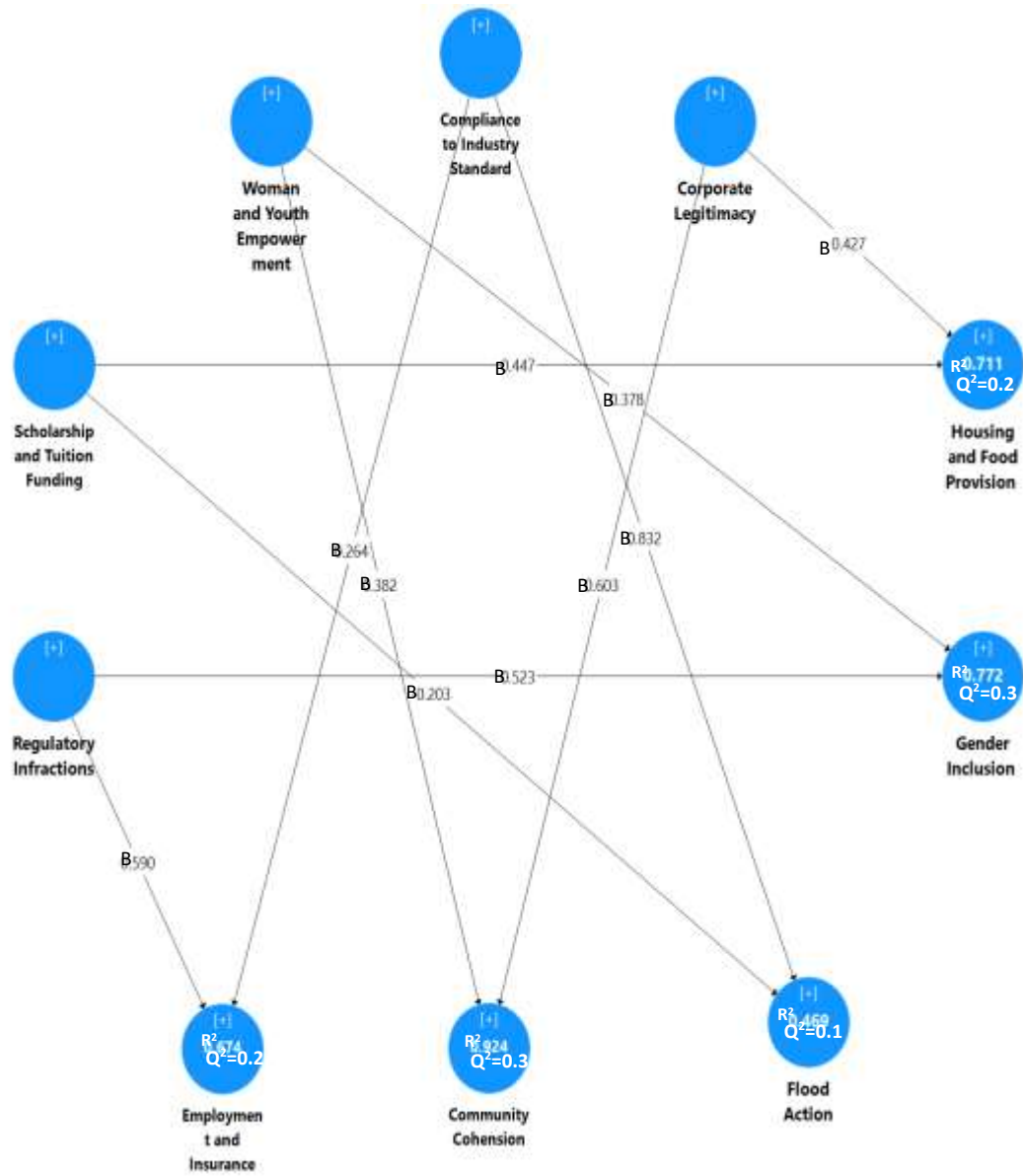


Figure 2: Result of Hypotheses Testing

Table 4: Full effects (Direct and Indirect).

Relationship Constructs	Between	β	Standard Deviation	<i>t</i> Statistics
Compliance to Industry Standard - > Employment and Insurance		0.233*	0.055	4.248
Compliance to Industry Standard - > Flood Action		1.092*	0.118	9.294
Corporate Legitimacy -> Community Cohesion		0.608*	0.046	13.307
Corporate Legitimacy -> Housing and Food Provision		0.398*	0.068	5.872
Regulatory Infractions -> Employment and Insurance		0.621*	0.052	11.868
Regulatory Infractions -> Gender Inclusion		0.527*	0.054	9.724
Scholarship and Tuition Funding - > Flood Action		0.484*	0.162	2.988
Scholarship and Tuition Funding - > Housing and Food Provision		0.474*	0.075	6.344
Woman and Youth Empowerment - > Community Cohesion		0.377*	0.044	8.637
Woman and Youth Empowerment - > Gender Inclusion		0.375*	0.056	6.720

Note: $t(0.05, 4999) = 1.645158499$, * $p < 0.05$

All of the relationships developed in the study model were validated by these findings. It is evident that CSR programs have a significant impact on the sustainability resilience of the oil and gas businesses operating in the Niger Delta area of Nigeria. According to previous research (Usman, & Amran, 2015), the study can also see that there are direct effects of CSR activities factors on sustainability resilience (see Table 4). However, since the β value establish the evidence of such causation, the study must reject all of the null hypothesis (H_{01} to H_{10}). Moreover, the null hypotheses must be rejected also since its significant level is sufficient and adequate, indicating that the CSR initiatives' variables directly impact the various aspects of sustainability resilience in Niger Delta.

4.3 Findings' Discussion and Result Implication

CSR represents the commitment and responsibility of a company to use natural resources in a way that enhances the quality of life, provides economic benefits, and promotes the well-being of workers, communities, and the nation. In Nigeria, natural resource management, like oil and gas operations, is a key source of government revenue and development policies aimed at bringing about economic, social, and environmental improvements. This industry needs to strengthen society, encourage community action, and build community capacity to address various challenges and changes, including those related to exploration and refining. Nigeria Energy Company's CSR initiatives must aim to sustain the well-being of surrounding communities and contribute to their well-being. Therefore, the implementation of CSR initiative by oil and gas companies has had a positive and significant impact on sustainability resilience in Niger Delta. This study's results conform to previous findings by Yadav et al., (2021) and Wang et al., (2015) that CSR investments enhance individual capacity and promote collaboration among community members. Magis, (2010) and Hanaysha, (2020) also supports this, suggesting that changes brought about by company activities leveraging natural resources improve society's capacity to achieve resilience through community action. As a result, CSR investments can enhance community capacity and cooperation, leading to community endurance and resilience.

The study's findings offer significant insights across multiple dimensions. The research contributes empirically and theoretically by deepening the understanding of how CSR impacts sustainability resilience, particularly from local community perspectives. The usage of Partial Least Squares Structural Equation Modelling (PLS-SEM) as an analytical framework enhances the methodological repertoire in the marketing and accounting field. Moreover, the findings enrich theoretical

discussions on CSR and sustainability by emphasizing the importance of community perspectives. Industrially, the results suggest that effective CSR initiatives can enhance sustainability resilience, guiding companies to align their strategies with local community needs. Community engagement is highlighted as crucial, suggesting companies prioritize building strong relationships with local stakeholders. From a policy standpoint, the research underscores the need for regulatory frameworks that support meaningful CSR initiatives in the oil and gas sector, aiding policymakers in developing incentivizing policies. On a managerial level, the study emphasizes integrating CSR into overall business strategy to enhance reputation, build stronger community relationships, and improve long-term sustainability and resilience. In overall, the study's implications are significant for academia, industry, policymakers, and managers, emphasizing CSR's role in promoting sustainability resilience in Nigeria's oil and gas industry

5. Conclusion and Recommendations

Over the past two decades, Nigerian oil and gas companies have faced significant scrutiny for their sustainability practices in the Niger Delta region. CSR has emerged as a crucial aspect of their sustainability efforts, aiming to promote transparency and positive societal impacts in line with the global sustainable development goals. The research motion that integrating socially responsible initiatives not only enhances the ethical standing of these businesses but also generates high strategic value, bolstering their sustainability and resilience. In light of these findings, it is imperative for oil and gas companies to review and enhance their CSR programs to better meet the needs of Niger Delta communities. This should involve a reassessment of initiatives including women-youth empowerment, regulatory compliance, scholarship-tuition funding, and corporate legitimacy. Furthermore, increased engagement with local communities is essential to tailor CSR efforts that have a more significant impact on community cohesion, gender equality, employment rates, flood response, and provision of housing and food. By collaborating closely with regulatory bodies, firms can ensure compliance with industry standards which is also critical. This collaborative approach can enhance CSR initiatives, thereby improving their impact on communities and ultimately enhancing sustainability resilience. Finally, regular monitoring and evaluation of CSR initiatives are necessary to gauge effectiveness and make necessary adjustments to enhance their future impact.

5.1 Research Contribution, Limitation, Further Areas

The research descriptive value stand by its empirical and reliable demonstration of the connection between CSR and COM-R model in the Niger Delta region. From a practical standpoint, as CSR initiatives directly affect the sustainability resilience of companies, firms can use the study's findings to enhance their CSR efforts based on the analyzed initiative factors and leverage the synergies between them and sustainability resilience factors. However, the research is limits by relying on the PLS-SEM assumptions including linearity, multivariate normality, and correct model specification. By failure to meet these assumptions, a biased or misleading results can set in. Moreover, the research does not consider changes in the strategies of oil and gas companies over time which could potentially impact the effectiveness of CSR initiatives and their effects on communities. Despite these limitations, the research is highly relevant to the oil and gas sector and addresses the gap identified in existing literature. However, further research should focus on the exploration of the role of stakeholder engagement in enhancing the impact of CSR initiatives. Stakeholder engagement is critical for ensuring that CSR programs are aligned with the needs and expectations of local communities. Further research can investigate the best practices for engaging with stakeholders, including local communities, government agencies, and non-governmental organizations, to maximize the positive impact of CSR initiatives. Additionally, there is a need for research that examines the long-term sustainability of CSR initiatives in the oil and gas industry in Nigeria. Many CSR programs are short-term and focused on immediate community needs. However, sustainable development requires long-term planning and commitment. Finally, further research can explore strategies for ensuring the continuity and sustainability of CSR initiatives over time, including the development of partnerships with local organizations and the integration of CSR into companies' core business strategies. Through this, better exploration of CSR long-term impact on community and environment can be achieve.

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