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Corporate Social Responsibility and Environmental Sustainability: Evidence from Dangote Cement Company, Gboko

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ABSTRACT
Dangote Cement Company Plc, Gboko had claimed to have invested substantially in CSR, however, the lived reality within its host community and its environs presents a starkly contradictory picture as the community has continued to experience severe environmental pollution, including the overflow of harmful wastewater into local streams pervasive dust emissions from the factory, which directly lead to adverse health impacts such as prevalent skin problems and destruction of agricultural crops and economic trees. It is against this backdrop that this study was carried out to examine the effect of Dangote Cement Company's Corporate Social Responsibility on Environmental Sustainability in Gboko, Benue State. The study adopted the survey research design and the convenient and purposive sampling techniques were used in selecting a sample of 400 respondents from Gboko LGA who participated in the study. The study used observation, interview and questionnaire methods to collect data which was analyzed using regression and triangulation methods. The study established that Environmental Protection Initiatives and Community Environmental Development Programmes have statistically significant positive effects on environmental sustainability in Mbayion Community, Gboko, Benue State. The study concluded that strengthening environmental management strategies like environmental protection initiatives and community environmental development programmes would significantly improve environmental sustainability in Mbayion Community. The study therefore recommends that the management of Dangote Cement Company Plc, Gboko should embark on Environmental Protection Initiatives to protect its host community from pollution and environmental degradation, and constantly engage in Community Environmental Development Programmes to address the menace of environmental pollution in the host community.
Keywords: Community Environmental Development Programme, Corporate Social Responsibility, Environmental Protection Initiatives, Environmental Sustainability.

I. INTRODUCTION

In the modern business world, success is no longer defined by profits alone. The most admired companies are those that create value not just for shareholders but for employees, customers, communities and the planet. The question for today's business leaders is no longer whether to engage in Corporate Social Responsibility (CSR), but how to make it central to business strategy. CSR has evolved far beyond its origins in corporate philanthropy and charitable giving. What once began as a discretionary activity of supporting community projects or sponsoring social causes has matured into a core business function that shapes reputation, innovation, and competitiveness (Porter & Kramer, 2006).

Many business corporations have realized that being socially responsible has the potential to be a safe pathway to balance the challenges and opportunities of globalization which they are experiencing and as a result, the institutionalization of CSR has become a necessity (Carroll, 2015). The modern business environment has shifted from a sole focus on profit maximization to a broader consideration of its impact on society and the environment (Elkington, 1998). This paradigm shift has given rise to the concept of Corporate Social Responsibility (CSR).

For businesses operating in African and emerging markets like Nigeria, this shift carries profound implications. Rising stakeholder expectations, regulatory pressure, climate risks and social inequality are forcing organizations to rethink how CSR is designed, implemented and reported. According to Mohammed (2024) corporations are expected to play a dual role: generating profit while also addressing significant socio-economic and environmental challenges; noting that CSR for Nigerian businesses is a means of securing a "social license to operate" and building trust with diverse stakeholders, from employees to host communities.

The cement industry is one of the most resource-intensive sectors, with operations that have a profound impact on the environment. Cement production is a major contributor to global greenhouse gas emissions, air pollution (particulate

matter, NOx, SO2), and the depletion of natural resources (Ighalo & Adeniyi, 2019). In Nigeria, these environmental concerns are compounded by a history of weak regulatory enforcement and a close proximity of industrial sites to residential areas (Tse-Kucha et al., 2023). This has led to documented cases of environmental degradation, including soil and water contamination, and a rise in health issues like respiratory ailments among residents (Ighalo & Adeniyi, 2019; ICIR, 2024).

Dangote Cement Plc is a major player in the Nigerian and African cement industry. Its plant in Gboko, Benue State, is one of its oldest and most significant production facilities. While the company has contributed to economic development in the region, it also faces increasing scrutiny from the public, government, and international bodies regarding its environmental performance. Its operations have been associated with environmental challenges faced by the host community.

Despite the company's claims of substantial investments in CSR and a comprehensive framework of 7 Sustainability Pillars aligned with global SDGs, the lived reality within its host community presents a starkly contradictory picture. Specifically, the community experiences severe environmental pollution, including the overflow of harmful wastewater into local streams pervasive dust emissions from the factory, which directly lead to adverse health impacts such as prevalent skin problems among residents and destruction of agricultural crops and economic trees.

Empirically, there is limited, locally specific evidence on whether and how CSR activities undertaken by Dangote Cement Plc in Gboko mitigate the plant's environmental impacts. It is against this background that this study was undertaken with the main objective to examine the effect of Corporate Social Responsibility on environmental sustainability in Mbayion Community, the host community to Dangote Cement Plc, Gboko, Benue State. The study also sought to achieve the following objectives; 1). Examine the effect of environmental protection initiatives on environmental sustainability in Mbayion Community, Gboko, Benue State and 2). Investigate the effect of community environmental development programmes on environmental sustainability in Mbayion Community, Gboko, Benue State.

The study adopted the following research questions 1). How do Environmental Protection Initiatives affect environmental sustainability in Mbayion Community, Gboko, Benue State and 2). In what way can Community Environmental Development Programmes affect environmental sustainability in Mbayion Community, Gboko, Benue State?

II. LITERATURE REVIEW

Concept of Corporate Social Responsibility

UNESCO (2025) defines Corporate Social Responsibility as the responsibility of enterprises for their impacts on society. It is a business model that helps companies be socially accountable to themselves, their stakeholders, and the public. According to UNESCO, CSR involves practices and policies undertaken by corporations intended to have a positive influence on the world, going beyond legal obligations and profit maximization.

According to Velte (2021) CSR refers to activities that aim to seek excellence in the company, paying special attention to people and their working conditions, as well as to the quality of its production processes with the incorporation of the three facets of sustainable development: economic, social and environmental, which favors the consolidation of the company, promotes its economic success and allies its future projection.

Similarly, Rhou and Singal (2020) see CSR essentially as a concept whereby companies voluntarily decide to contribute to a better society and a cleaner environment. It is based on the idea that the overall performance of a company should be evaluated in terms of its combined contribution to the economic prosperity, environmental quality and social well-being of the society in which it operates.

Concept of Environmental Sustainability

The concept of environmental sustainability emerged in 1987, when the World Commission on Environment and Development created the concept of "sustainable development" which means actions that "meet the needs of present generations without compromising the needs of future generations." (Hicks-Webster & Lahneman, 2022).

According to Kaswan et al., (2019), environmental sustainability stands as a fundamental tenet within the broader concept of sustainability. It asserts that meeting our needs should not endanger the environment's quality, emphasizing the necessity to preserve ecosystems for the benefit of future generations.

Environmental Protection Initiatives

Singh and Chauhan (2023) conceive environmental protection as a range of practices and strategies aimed at safeguarding natural resources and ecosystems, mitigating the impacts of human activity, and promoting sustainable development.

In the same vein, Harding (2016) see environmental protection as the practice of protecting the natural environment by individuals, organizations and governments, with the intention of conserving natural resources and the existing

natural environment and, where possible, to repair damage and reverse trends.

Community Environmental Development Programmes

According to UNESCO (2016), Community Development Programmes (CDPs) are participatory processes empowering local people to collectively identify problems, build skills (like literacy), and take action for sustainable improvement, foster self-reliance in health, education, and culture, ensuring development aligns with community needs and cultural contexts.

Similarly, the Australian Institute of Family Studies [AIFA] (2023) define community environmental development programme as a collaborative initiative where community members and professionals work together to improve their local environment and promote sustainable practices through community-led processes, asset assessment, strategic planning, and implementation of projects. It focuses on empowering communities to identify environmental issues, build local capacity and implement solutions that foster a healthy, resilient and sustainable relationship with their natural surroundings.

III. EMPIRICAL REVIEW

Environmental Protection Initiatives and Environmental Sustainability

Adistia et al (2025) examined environmental conservation and sustainability: Waste management, renewable energy awareness, and environmental protection programs. The study employed a qualitative descriptive approach and data were collected through field observation, document analysis, and literature-based evaluation to capture environmental conditions, ecological characteristics, and sustainability practices within the study area. Secondary data were also obtained from peer-reviewed journals, official environmental reports, and sustainability policy documents to strengthen analytical interpretation. The collected data were analyzed using thematic analysis to identify patterns related to environmental management strategies, public awareness, and conservation outcomes. The findings indicated that effective waste management plays a critical role in reducing pollution, supporting ecosystem stability, and mitigating environmental risks in sensitive coastal areas. Renewable energy awareness was identified as a key social and institutional driver that influences behavioral change, technological acceptance, and sustainability-oriented decision-making. Environmental protection programmes function as structural instruments that align conservation goals with regulatory frameworks and long-term resource management. The study highlighted that sustainability outcomes are strengthened when operational practices, awareness based initiatives, and policy instruments are integrated within a coherent environmental governance framework. The study failed to indicate the area it was conducted, however, the result emphasized the importance of environmental protection initiatives in environmental sustainability.

Li-Wei et al (2024) examined impact of environmental protection, economic development, social responsibility and governance on the sustainable development of enterprises. The research model proposes four hypotheses and focuses on analyzing the significant relationships between them. The study used a questionnaire survey to survey N = 230 consumers about their thoughts on green products for the sustainable development of enterprises. The study applied structural equation model to the whole data analysis. The research identified green products as crucial success factors for business sustainability. The findings revealed that companies offering environmentally friendly products in the market can: (1) enhance their corporate social responsibility and (2) contribute to sustainable development. The results demonstrated several positive correlations: environmental protection is positively linked to governance, economic development is positively correlated with governance, social responsibility is positively associated with governance, and governance, in turn, is positively related to corporate sustainable development. This study highlighted the importance of environmental protection on sustainability.

John-Adegbesan and Nwaorgu (2021) assessed environmental protection for sustainable development in Nigeria. Data for the study were drawn from published materials and Key Informant Interview (KII). The interviewees were made up of environmental activists and members of civil society organizations. Data for the study were analyzed through content analysis, with attention to logical sequence of data. The study found that even though Nigeria parades a good number of environmental protection laws and policies, the challenge remains that there is little or no conscious effort at development, let alone sustainable development. The study concluded that it is only in a healthy and clean environment that true development and consequently, sustainable development can be achieved; an unhealthy environment will lead to almost every vice and hamper economic growth and social development. The study recommended, among other things, the need for collective action towards sustainable development. This study did not indicate the

population and sample size used; however, it has highlighted the importance of environmental protection initiatives in achieving sustainable development.

Mohammad and Peter (2024) conducted a study on sustainable development and environment conservation: a comparative study on protecting environmental human rights. The study was a content analysis-based research conducted to assess the legislative policy framework for preserving the environment during the establishment of government development projects. The technique employed in this study primarily relied on doctrinal and pure legal research to achieve the study's objectives. An integrated comprehensive literature review was carried out and the analysis incorporated materials from primary and secondary sources in the field of law to gain a deeper understanding of the laws on the balance between development and the protection of environmental human rights. The study used analytical, critical, explanatory, and descriptive methodologies utilizing a critical analysis technique to evaluate and make assessments regarding the constraints of legal systems in implementing regional and global legal frameworks pertaining to sustainable development and environmental protection. The study found that Bangladesh has implemented numerous initiatives to strike a balance between economic development and environmental protection, the economy has been substantially stimulated by the rapid industrialization; however, it has also resulted in severe environmental degradation, particularly water pollution, which has a detrimental impact on human health and ecosystems. Moreover, legal loopholes, institutional vulnerabilities, and a lack of enforcement of Environmental Impact Assessments (EIA) have all contributed to the inadequacy of the implementation of these laws environmental protection laws. Besides, the depletion of forest resources persists in spite of policies that advocate for participatory forest management and social forestry which was primarily attributable to inadequate policy implementation, a centralized decision-making process, and a feeble institutional framework. The study concluded that the strict application of sustainable development principles such as the polluter pays principle, public engagement, and precaution, can ensure that development not only meets the current requirements of the community but also safeguards the environment for future generations. This study emphasized the need for laws and regulations that can help protect the environment against pollution and degradation.

Community Environmental Development Programme and Environmental Sustainability

Wapwera et al., (2022) examined the impact of environmental education and awareness on the effective management of solid wastes among residents of Jos-Bukuru metropolis, Plateau State, Nigeria with a view to making recommendations on environmental awareness and education for the area. A structured questionnaire was used to obtain data from 400 respondents, selected through a systematic random sampling technique from six zones namely; Fari-gada, Angwan-Rukuba, Tudun Wada, Rantya, Rayfield and Bukuru in the Jos-Bukuru metropolis. The data obtained from the questionnaire were analyzed using spearman's rank correlation (rho) and analysis of variance (F-ratio) statistical techniques. The results obtained showed that there was a provision for a policy on environmental awareness and its effects on people's attitudes to solid waste management. Also, there was no relationship between attitude and solid waste management practice in Jos Metropolis and there was a low level of influence of environmental awareness and education on people's attitudes towards solid waste management in Jos Metropolis, Nigeria. Based on these results, the study recommended the development and implementation of a policy on environmental awareness on solid waste management in Jos metropolis, constant awareness creation to ensure solid waste management practice is maintained for sustainability and continuous campaign to ensure regular updates for sustainability. This study highlighted the important role of community environmental development programme – environmental education and awareness in sustainable solid waste management.

Uzoma et al., (2025) examined the effect of environmental awareness programmes on waste disposal practices in secondary schools. The research targeted secondary school students and teachers. 200 participants comprising 150 students and 50 teachers were selected through stratified random sampling to guarantee inclusion of all gender, class and school type (public/private) categories. Primary data was sourced through a structured questionnaire which will be sent via Google Form. The collected data was analyzed through descriptive statistics such as mean, standard deviation, and percentages. The results showed that teachers and students have considerable awareness of environmental issues, thanks to the awareness programmes, school clubs, and sensitization programs. The programs targeted students' waste reduction, reuse, and recycling capabilities, and reinforced a sense of responsibility and peer pressure. There was a positive correlation between participation in environmental

programmes and the proper waste disposal, which underscores the importance of environmental programmes in fostering sustainable practices in schools. The study recommended that waste management practices should be aligned with the developed organizational policies; adequate environmental programmes with the organizational policies of the institutions; the usage of the classroom should also be aligned with the integration of the practices of sustainability in the daily practices of the classroom and the institutions as well as the non-governmental agencies should assist the schools with the proper resource management through the provision of targeted training, provision of the recycling facilities, and constant sensitization strategies. This study, though failed to indicate the area it was conducted, it underscored the importance of environmental development programmes in waste management and recycling, especially among school children.

Mina at al. (2024) carried out a study on communities for environmental protection: fostering responsibility and sustainability. The research method used was normative or doctrinal research. The study revealed that community participation represents a critical component in a participatory approach, as it holds the most significant potential for successful environmental management. Communities play a crucial role in decision-making, program implementation, and fostering sustainable change across various domains, including environmental, social, and economic aspects. The study concluded that the core of community participation in environmental protection lies in fostering awareness and encouraging proactive measures to preserve the natural environment. This participation encompasses building consciousness, promoting independence, empowering individuals, fostering collaboration, enhancing leadership skills, ensuring effective oversight, and integrating local cultural values. Community-driven initiatives, such as environmental education programs, clean-up campaigns, and resource management efforts, encourage a sense of ownership and accountability. This study, though, did not indicate the area it was conducted, the population and sample used; it emphasized the importance of community driven initiatives in environment sustainability which aligns with the objectives of the study.

Ahmad (2025) assessed community-based approaches to environmental sustainability. This systematic review examined the theoretical foundations, empirical evidence, and practical implications of community-based approaches to environmental sustainability through a social science lens. The study conducted a systematic search of peer-reviewed literature published between 1990 and 2024 via the following electronic databases: Web of Science, Scopus, JSTOR, and Google Scholar. These databases were selected to ensure comprehensive coverage across relevant social science disciplines, including environmental sociology, human geography, political ecology, environmental psychology, and ecological economics. The search strategy utilized a combination of keywords and Boolean operators related to community-based approaches and environmental sustainability. The findings indicated that community-based environmental approaches have shifted from primarily institutional analyses toward more integrated frameworks that address power dynamics, knowledge systems, and equity considerations. The study concluded that community-based approaches offer valuable pathways for environmental sustainability but require context-sensitive design, attention to power dynamics, and multilevel institutional support. This study provides a more nuanced understanding of when, where and how community-based approaches can effectively address environmental challenges in diverse social-ecological contexts.

IV. THEORETICAL FRAMEWORK

The theory underpinning this study is the Stakeholder Theory propounded by Freeman (1984) which posits that organizations have obligations not only to their shareholders but also to a wide range of stakeholders who are affected by their operations. These stakeholders include employees, customers, suppliers, host communities, the government, and the natural environment. The theory emphasizes that long-term corporate success depends on the organization's ability to balance and address the interests of all these groups.

In the context of this study, the Stakeholder Theory provides the foundational basis for examining the effect of Dangote Cement Company's Corporate Social Responsibility on environmental sustainability in Gboko**.** The theory suggests that by engaging in CSR practices such as reducing pollution, managing waste responsibly, rehabilitating mining sites, and investing in community development, Dangote Cement is fulfilling its moral and ethical obligations to key stakeholders, particularly the host community and the environment.

Furthermore, the theory underpins the argument that environmental sustainability is not just a regulatory or philanthropic activity but a strategic necessity to maintaining positive relationships with stakeholders. When the company demonstrates environmental responsibility, it earns social legitimacy, enhances corporate reputation, and fosters trust among community members and regulators. This, in turn, contributes to the

company's long-term stability, operational efficiency, and social license to operate.

Therefore, the Stakeholder Theory explains the link between CSR practices and environmental sustainability by asserting that businesses that consider the needs and expectations of their stakeholders, especially those affected by environmental impacts, are more likely to achieve sustainable outcomes and maintain harmonious community relations.

V. METHODOLOGY

The study adopted the survey research design and used the population of Gboko Local Government Area, Benue State which according to the figures published by World Population Review 2025 was estimated at 524,436. The total sample size used by the study was 400 which was determined using the Taro Yamane formular and the convenient and purposive sampling techniques were used in selecting the respondents from Gboko LGA who participated in the study. The study used both qualitative and quantitative data which were collected through observation, interview and questionnaire. The researcher visited the host community to interact with the residents and observe some of the environmental issues facing the community; interviewed five (5) key informants who include the Kindred Head, Councilor Representing the Council Ward, The Igbo Community Chairman/APC Youth Coordinator, Eldest member of the Host Community and Community Representative. The researcher also distributed questionnaires to respondents both online (Google form) and offline (hard copy). The data was analyzed using multiple linear regression and triangulation methods. The regression equation for predicting environmental sustainability is as given below:

ES = -0.419 + 0.139(EPI) + 0.039(CEDP)

VI. RESULTS AND DISCUSSION

This study examined the effect of Dangote Cement Company's corporate social responsibility (CSR) practices on environmental sustainability in Mbayion Community, Gboko, Benue State. A total of 386 valid questionnaires were retrieved from a total sample of 400 copies administered. Data collected were analyzed using IBM SPSS Statistics. The analysis is presented in line with the objectives, research questions, and hypotheses of the study. A multiple linear regression analysis was used to test the two null hypotheses of the study. All statistical decisions are made at the 0.05 level of significance.

Scale of Measurement: Responses were measured on a five-point Likert scale: 1 = Strongly Disagree (SD), 2 = Disagree (D), 3 = Neutral (N), 4 = Agree (A), 5 = Strongly Agree (SA). For interpretation of mean scores, the following decision criteria were adopted: 1.00–1.49 = Strongly Disagree; 1.50–2.49 = Disagree; 2.50–3.49 = Neutral; 3.50–4.49 = Agree; 4.50–5.00 = Strongly Agree.

Item-Level Descriptive Statistics

Table 1 presents the descriptive statistics of the survey items. The statistics include mean, standard deviation, minimum, and maximum scores, alongside an interpretive remark based on the adopted Likert scale decision criteria.

Table 1: Item-Level Descriptive Statistics for All Survey Items (N = 386)

Section	Item	Mean	Std. Dev.	Min	Max	Remark
Section A: Environmental Protection Initiatives (EPI)	EPI1 – Measures to control air pollution	1.76	0.877	1	4	**Disagree**
	EPI2 – Modern technology to reduce dust emissions	1.99	1.033	1	5	**Disagree**
	EPI3 – Waste management compliance with regulations	2.09	0.793	1	5	**Disagree**
	EPI4 – Investment in technologies to minimize pollution	1.73	0.951	1	5	**Disagree**

	EPI5 – Environmental protection improved air, water & aquatic life	1.57	0.887	1	5	**Disagree**
Section B: Community Environmental Dev. Programmes (CEDP)	CEDP1 – Provision of clean water (boreholes)	1.43	0.747	1	5	**Strongly Disagree**
	CEDP2 – Tree planting and land restoration	1.47	0.776	1	5	**Strongly Disagree**
	CEDP3 – Community environmental awareness programmes	1.65	0.802	1	4	**Disagree**
	CEDP4 – Health interventions for breathing issues	1.68	0.988	1	5	**Disagree**
	CEDP5 – Collaboration to address water/air pollution	1.74	1.034	1	5	**Disagree**

Environmental Protection Initiatives (EPI): The mean scores for EPI items ranged from 1.57 (EPI5) to 2.09 (EPI3), all falling within the Disagree range (1.50–2.49). This indicates that the majority of respondents disagreed that Dangote Cement Company has effectively implemented environmental protection initiatives in Mbayion Community. The highest mean, EPI3 (M = 2.09, SD = 0.793), relates to waste management compliance, suggesting this is the relatively more acknowledged practice, albeit still rated negatively. The lowest mean, EPI5 (M = 1.57, SD = 0.887), concerning improvement of air, water, and aquatic life, indicates that residents perceive minimal improvement in environmental quality as a result of the company's protection efforts. This result was affirmed by the responses from interview as out of the five key informants interviewed, only the Kindred Head who confirmed that the company has contacted him over their plan to repair the community's dam, rehabilitate the community's Healthcare Centre and drill borehole. The rest lamented the company's lackadaisical attitude towards environmental issues in the community. Moreover, during observation cement dust pollution was conspicuous and made breathing around the factory environment difficult. Interaction with some farmers whose farms were located directly opposite the factory revealed how the cement dust has affected their crops. They showed some of the economic tress (mangoes) that have died due to excessive cement dust; some have stopped producing fruits due to the effect of the cement dust. The company disposes factory waste indiscriminately at the back of the factory, very close to the Makurdi-Gboko Highway. Residents were seen scavenging in the cement dust to bring out irons and other reusable materials to go and sell. This cement dust and particles are taken away by breeze and rain water and thereby contaminating the local streams and general environment. In addition, years of extraction/blasting of limestone has caused serious degradation of a
vast portion of land.

Community Environmental Development Programmes (CEDP): CEDP item means ranged from 1.43 (CEDP1) to 1.74 (CEDP5). CEDP1 (M = 1.43, SD = 0.747) and CEDP2 (M = 1.47, SD = 0.776) fall within the Strongly Disagree range, indicating respondents strongly rejected the notion that the company provides clean water sources or supports tree planting and land restoration. The remaining CEDP items fall in the Disagree range. These results collectively signal a near-complete perception of absence of community environmental

development programmes by Dangote Cement in the study community. this result was corroborated by the responses received during interview where one of the key informants (the Kindred Head) confirmed that there was no single environmental development programme implemented by the company since it commenced operations in the community. He confirmed that some group of farmers who farm vegetables around the community's major stream had launched a complaint over the damage of their vegetables by chemical flowing from the factory and the company was contacted and they agreed to compensate the farmers. He also lamented that the chemical pollution of their water bodies has made the water unsafe for cooking and even bathing; adding that the water does not foam during washing and bathing due to the effect of chemicals. In addition, the eldest member of the host community also bewailed that the company has been blind to the plight of the host community. In the same vein, the other interviewees also confirmed that the company has not implemented any environmental development programme in the community since it started operations. Observation showed no visible environmental development programme, no tree planted by the company, the host community was filled with factory and general waste; there was no single borehole constructed for the community to provide portable water. The community faces perennial water scarcity and their main source of water is the village dam (located about 600 metres away from the factory) which dries up during dry season and usually get polluted by contaminated water flowing from the factory during raining season. During dry season, residents dig small wells within the dried areas of the dam to scoop water which they claim is cleaner for drinking. They take turns (spending an average of six hours) to access this water which was still not clean and hygienic. It was also observed that residents were fetching water from an unhygienic source (a channel that flows from the factory to a nearby road, about 200meters away from the plant. Due to this problem of water scarcity, many residents resorted to buying and storing water in storage tanks.

Composite Score Descriptive Statistics

Table 2: Descriptive Statistics of Composite Construct Scores (N = 386)

Construct	N	Mean	Std. Dev.	Min	Max	Skewness	Interpretation
EPI – Environmental Protection Initiatives	386	1.83	0.716	1.00	4.80	1.297	Below average – respondents disagree
CEDP – Community Environmental Dev. Programmes	386	1.60	0.709	1.00	4.80	1.575	Below average – respondents disagree

Table 3: Regression Analysis of Environmental Protection Initiatives and Environmental Sustainability

Variable	B	Beta (β)	t-value	p-value
Constant	0.277	-	3.925	0.000
Environmental Protection Initiatives	1.170	0.857	32.578	0.000

Model Summary

R	R^2	Adjusted R^2	F-value	Sig.
0.857	0.734	0.734	1061.310	0.000

Dependent Variable: Environmental Sustainability

Decision

Since $p = 0.000 < 0.05$, the null hypothesis (Ho_1) is rejected.

Interpretation

The regression analysis shows that Environmental Protection Initiatives significantly affect Environmental Sustainability in Mbayion Community. The model explains 73.4% of the variation in environmental sustainability ($R^2 = 0.734$). The standardized beta coefficient (β =

0.857) indicates a strong positive effect of environmental protection initiatives on environmental sustainability. Specifically, a one-unit increase in environmental protection initiatives is predicted to increase environmental sustainability by 1.170 units. The F-statistic (1061.310, $p < 0.05$) confirms that the model is statistically significant. Therefore, environmental protection initiatives constitute an important determinant of environmental sustainability in the study area. This result aligned with the study conducted by Adistia et al (2026) who emphasized that environmental protection programmes function as structural instruments that align conservation goals with regulatory frameworks and long-term resource management. It also agreed with the result of study carried out by Li-Wei et al (2024) which confirmed that environmental protection is positively linked to governance, economic development is positively correlated with governance, and governance, in turn, is positively related to corporate sustainable development.

Table 4: Regression Analysis of Community Environmental Development Programmes and Environmental Sustainability

Variable	B	Beta (β)	t-value	p-value
Constant	0.869	-	9.958	0.000
CEDP	0.968	0.703	19.360	0.000

Model Summary

R	R^2	Adjusted R^2	F-value	Sig.
0.703	0.494	0.493	374.793	0.000

Decision

Since $p = 0.000 < 0.05$, Ho_2 is rejected.

Interpretation

The findings indicate that Community Environmental Development Programmes significantly influence Environmental Sustainability in Mbayion Community. The model explains 49.4% of the variance in environmental sustainability. The positive beta coefficient ($\beta = 0.703$) demonstrates that community environmental development programmes positively contribute to sustainability outcomes. The implication is that strengthening community-driven environmental initiatives can significantly improve environmental conditions and sustainability in the community. The result of this study agreed with the study conducted by Wapwera et al (2022) which highlighted the need for constant awareness creation to ensure solid waste management practice is maintained for sustainability and continuous campaign to ensure regular updates for sustainability. Similarly, the study aligned with results of study by Uzoma et al (2025) which confirmed the positive correlation between participation in environmental programmes and the proper waste disposal, which underscore the importance of environmental development programmes in fostering sustainable practices.

Table 5: Summary of Hypotheses Testing

Hypothesis	β	R^2	t-value	F-value	p-value	Decision
Ho_1: EPI → ES	0.857	0.734	32.578	1061.310	0.000	Rejected
Ho_2: CEDP → ES	0.703	0.494	19.360	374.793	0.000	Rejected

VII. CONCLUSION AND RECOMMENDATIONS

The study established that all the two dimensions of environmental sustainability management - Environmental Protection Initiatives and Community Environmental Development Programmes, have statistically significant positive effects on environmental sustainability in Mbayion Community, Gboko, Benue State. Among the predictors, Environmental Protection Initiatives emerged as the strongest contributor ($\beta = 0.857$; $R^2 = 0.734$) followed by Community Environmental Development Programmes ($\beta = 0.703$; $R^2 = 0.494$). These findings suggest that strengthening these environmental management strategies would significantly improve environmental sustainability in Mbayion Community.

The study therefore recommends that the management of Dangote Cement Company Plc, Gboko should embark on Environmental Protection Initiatives such as reducing the use of coal to generate energy, stop indiscriminate disposal of factory waste and chemicals, embark on tree planting and land restoration activities to protect its host community from pollution and environmental degradation. The study also recommends that the management of the company should engage in Community Environmental Development

Programmes such as organizing regular environmental awareness campaigns, clean-up programmes, establish local recycling loops to address the menace of environmental pollution in the host community.

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