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Community Stakeholder Structural Perception of Firms' Environmental Disclosure Level in Nigeria

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Abstract: Given the slow progress towards achieving Agenda 2030 and the environmentally sustainable development goals (SDGs), this study investigates the perception of communities' environmental disclosure activities of the firms operating in their domain. Data were surveyed through a closed-ended questionnaire from 157 community respondents from Nigeria's four most industrialised cities. The data were analysed using the Chi-square test for association and the confirmatory factor analysis. The results revealed that both firms' environmental activities, environmental reporting, and environmental reporting benefits collectively shape the communities' perception of the activities of firms on the environment. Furthermore, the study revealed no association between respondents' level of education and their perception of environmental disclosure of firms in their community. Implying that communities' knowledge of the environmental activities of firms is not dependent on their education level. These findings highlighted community stakeholders' concerns about the activities of companies within their environment and their awareness, feeding into the power of Ullmann's stakeholder framework. Such could be harnessed to improve firms' environmental footprints, hence the progress towards actualising the environmental SDGs.

Keywords: environment; sustainability; disclosure; community; Nigeria; SDGs; Agenda 2030

JEL Classification: L22

1. Introduction

This study examines the potential of the community as a stakeholder of firms to attenuate firms' environmental footprint. This is borne out of the global concern for a sustainable environment in recent times due to human activities that have degraded the environment with serious implications for climate change (Valanidis, 2019). The United Nations have championed the universal agitation through its declaration encapsulated in Agenda 2030, which seeks a sustainable environment that supports growth and development for future generations (Engert, Rauter & Baumgartner, 2016; Moses, Michael & Dabel-Moses, 2019). Progress towards the actualisation of SDGs has been slow, and experts have concerns about the likelihood of attaining the set goals (Arora, 2018). Despite being a signatory to the Paris climate accord, Nigeria has low environmental regulatory compliance, including adopting several environmental frameworks enacted locally and internationally (Moses et

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al., 2019). The extant regulations have been argued in literature to either be inadequate, not followed or unknown to the firms that should keep them (Blessing, 2015; Moses et al., 2019; Ogboru & Anga, 2015). The environment continues to suffer degradation due to poor business practices. Firms' increase in pollution, improper waste disposal, floods, ozone layer exhaustion, desertification, vitality emergencies, climatic risks, and soil, air, and water contamination have continued unabated (Ogunba, 2016; Osemeke, Adegbite & Adegbite, 2016).

Because institutional efforts have yet to yield desirable results, attention has been drawn to stakeholder influence in ensuring that firms act responsibly for environmental sustainability. A departure from the traditional business objectives of profit maximisation toward the stakeholders' approach means firms have to be more accountable to their environmental practices (Maama, Akande & Doorasamy, 2020; Odewole, Ishola, Oyesola & Festus, 2018). This has necessitated firms' requirement for improved environmental accounting disclosure to stakeholders (Bui, Moses & Houqe, 2020; Tauringana, 2019; Tauringana & Chithambo, 2015). Culminating to recent response by firms regarding environmental accountability, increased disclosure and inclusion of sustainability goals in their corporate strategy (Engert et al., 2016; Moses, Houqe & van Zijl, 2018; Moses et al., 2019). Studies exploring the role of stakeholders in environmental sustainability have found government (Guenther, Guenther, Schiemann & Weber, 2016), board independence and meetings (Aliyu, 2019), board committee (Odoemelam & Okafor, 2018), good corporate governance (Oyefara, 2013); cost of capital premium (Bui et al., 2020) to enhance firms environmental practices, especially in terms of disclosure. Meanwhile, empirical evidence suggests that firms that disclose their environmental activities benefit from improved performance (Bui et al., 2020; Ezeagba, Rachael & Chiamaka, 2017; Odewole et al., 2018). However, the extent to which communities in which firms operate have helped shape their environmental activities for the accomplishment of Agenda 2030 is not well known in the literature and worthy of empirical examination. Nevertheless, communities' influence will depend on their perception of firms' environmental actions. Hence, this study seeks to understand whether community stakeholders are aware of the environmental activities of firms operating in those domains.

To implement this objective, data were collected from four major industrialised states in Nigeria (Ajayi, 2007; Olanrewaju & Kalu, 2018) with the potential to emit high industrial pollution in contravention of Goal 12 SDG targets. Closed-ended questionnaires addressing relevant environmental issues were administered, with 157 responses returned. Data were analysed using Chi-Square tests of associations and Confirmatory Factor Analysis (CFA) that categorised the items into three related factors, environmental activities (EVA), environmental disclosure reporting (EDR), environmental disclosure benefits (EDB) in the first-order confirmatory factor analysis (CFA). The chi-square test of association between the level of education attained by members of the communities and knowledge of environmental activities disclosed by the firms indicated there was no significant association, implying that communities are aware of firms' environmental activities irrespective of their level of education. The CFA substantiated this result with the evidence to show a substantial correlation among the three factors extracted. On the one hand, these results imply that knowledge of the environment, irrespective of the level of education, will help mobilise solidarity for environmental sustainability and compel firms to act responsibly. On the other hand, the campaign for environmental consciousness will be less costly given that people are well informed.

This study contributes to the literature on environmental accounting and reporting by stimulating discussions on the place of communities in which firms operate concerning the environmental activities of those firms in Nigeria. This should drive disclosures in galvanising support for better

firms' environmental footprints. The study is significant in Nigeria in several ways. Nigeria is notorious for numerous environmental degradation activities ranging from oil spillages (Enahoro, 2009; Osemeke et al., 2016) to high emissions generated by being a high fossil fuel producer (Abdurafiu, 2017; Alege, 2017). These multitudes of environmental issues (Akinbami, Akinwumi & Salami, 1996; Moses et al., 2019) threaten the prospect of Nigeria achieving goal 12 of the SDG on the environment. Prior studies on the extent of environmental activities disclosure in Nigeria have shown a poor level of environmental reporting (Giwa, Nwaokocha & Odufuwa, 2017; Giwa, Sulaiman & Nwaokocha, 2017). Environmental disclosures are still relatively voluntary, and compliance is low, while penalties for contraventions are insignificant (Odewole et al., 2018. Furthermore, Nigeria is strategic to regional and world economies, and achieving sustainable environmental goals in agricultural and industrial activities would positively contribute to global environmental impact.

The rest of the article is organised as follows. Section 2 covers a review of prior studies on environmental accounting practices in Nigeria. The hypothesis development is discussed in section 3. Sections 4 and 5 document the method and results, while section 6 contains our concluding remarks.

2. Environmental Accounting in Nigeria

Environmental accounting is not new in Nigeria, yet not much progress has been made in protecting the environment (Ayoola, 2011; Moses et al., 2019). Societal transformation comes with a price with additional responsibilities to be socially and environmentally accountable (Uwuigbe, 2012). Policy-wise, substantial legislation exists at the national and state levels in Nigeria (Emeakponuzo & Udih, 2015), including signing international environmental sustainability treaties (Okpala, 2019). For example, the Environmental Impact Assessment Act 1992 Cap E12 LFN 2004 was promulgated to address the impact of negative projects on the environment and ensure that projects with negative environmental impacts are prevented from gaining approval (Ambituuni, Amezaga & Emeseh, 2014; Elenwo & Urho, 2017). Similarly, the National Environmental Standard and Regulation Enforcement (Establishment) Act 2007 was enacted with the mandate of environmental protection and the authority to punish offenders. Other prominent laws such as the National Oil Spill Detection and Response Agency (NOSDRA) Act 2009, Harmful Waste (Special Criminal Provisions) Act (Cap H1, LFN) 2004, the Nigerian Sustainable Banking Principles, among others, attempt to ensure that the goal of the sustainable environment is attained over time.

Moses et al. (2019) document several inadequacies resulting in the inefficiencies of Nigeria's environmental regulations, including the emergence of several environmental management reporting (EMR) codes. Notwithstanding, these regulations, with their accompanying powers to sanction offenders, have had minimal impact on protecting the environment due to poor implementation (Eneh, 2011) and their negligible liabilities for offenders. Poor compliance results from inappropriate sanctions and incoherent reporting requirements, weak enforcement, funding limitations, unrealistic financial penalties, and general implementation deficits. Despite being well-known over the years, these factors have remained impediments to effective environmental management practice in Nigeria (Ayoola, 2011; Egbunike, Emudainohwo, Gunardi, Kurniasari & Prihanto, 2018; Emeakponuzo & Udih, 2015). As a result, Nigeria is still confronting environmental problems resulting from the dumping of hazardous wastes, air, soil and water pollution, with reported several incidences of gas flaring and oil spillages (Ayoola, 2011; Elenwo & Urho, 2017). At the same time, businesses are abysmally under-reporting their environmental activities (Odoemelam & Okafor, 2018; Ofoegbu &

Megbuluba, 2016; Udo, 2019). The consequences of these environmental failures lie in the progress towards attaining Agenda 2030.

Studies on environmental accounting reporting in Nigeria (e.g. (Ijaiya & Joseph, 2014; Moses et al., 2019; Zabbey, Sam & Onyebuchi, 2017)) emphasised their inadequacies, especially that reporting is still largely voluntary (Ogunba, 2015). Other studies investigating the level of disclosure of environmental footprints of firms have shown gross under-reporting of environmental activities. For example, Udo (2019) reported that the ten listed oil and gas companies on the Nigerian Stock Exchange disclosed inadequate financial and non-financial environmental information in their annual reports at a minimum disclosure practice of 0.0283 and maximum of 0.2727; and an average disclosure score of 0.1167 as at December 2018. likewise, Odoemelam and Okafor (2018) investigated 86 listed firms and found a 20.5% level of disclosure threshold for environmental activities across the sampled firms. An earlier study by Ofoegbu and Megbuluba (2016) also found a 2.5% level of quality environmental disclosure compared to the Global Reporting Initiative and IS0 14301 environmental requirement. This low disclosure quality level (Uwuigbe & Jimoh, 2012) have been blamed on poor implementation of rules, inconsistencies in regulatory codes, inadequate sanctions and, lack of political will, lack of awareness about the rules, among others (Ayoola, 2011; Blessing, 2015; Egbunike et al., 2018; Eneh, 2011; Moses et al., 2019). Emeakponuzo and Udih (2015) found evidence to suggest that the regulations put in place have had a less significant impact on environmental accounting practices because enlightenment, enforcement, and compliance issues were not given proper attention. One arguable reason firms have not embraced environmental disclosure as expected could be due to insufficient understanding of how to account for environmental costs. Okafor, Okaro, and Egbunike (2013) found that firms lump all indirect costs under overhead costs and use mostly one absorption method that has no bearing on the reporting of environment costs.

Additionally, disclosure of environmental activities is beneficial for the performance of firms (Che-Ahmad, Osazuwa & Mgbame, 2015; Ezeagba et al., 2017; Odewole et al., 2018; Okafor et al., 2013), lending credence to the stakeholder theory. Although Otu, Okon, and Nnanna (2018) found an insignificant relationship between environmental accounting reporting and oil companies' performance in Nigeria, the authors advocated a mandatory reporting regime to compel businesses to report their environmental activities, especially where they have no incentive to do so.

Consequent to the foregoing, the attainment of Agenda 2030 and the SDGs on the environment may not be realistic in Nigeria unless drastic and immediate steps are taken. Adejumo and Adejumo (2014) identified meeting immediate human needs that have a high impact on the environment and corruption as significant impediments to achieving sustainable development through the then Millennium Development Goals, despite being a signatory to various environmental protection treaties. The authors' concerns become even more relevant within the SDGs era as those human and corruption issues still subsist. One factor that drives environmental accounting practices and enhances disclosure is board independence and board meetings (Aliyu, 2019). In addition, Odoemelam and Okafor (2018) demonstrate that board committees on environmental or sustainability issues also play a significant role in influencing environmental disclosures. These studies reinforce the findings of Oyefara (2013) that revealed a significant impact of good governance on the environmental sustainability of Lagos State, as evident in various urban forestry, beautification, and green Lagos project. This reported literature highlighted a few drivers of environmental accounting information disclosure, yet not much is known about the community stakeholders that formed this study's thrust.

2.1. Hypothesis Development

The power of stakeholders to influence firms' environmental practices, particularly disclosure of environmental activities, has been featured in literature. The three-dimensional framework of Ullmann has been used to explain the power of stakeholders in influencing the improved usage of the environment by firms. Maama et al. (2020)'s evidence of a positive relationship between Ngos' engagements and firms' environmental reporting practices lends credence to these claims. Although, an earlier study by Rodrigue, Cho, and Laine (2015) found that disclosure of environmental activities differs by the nature of stakeholder target, governments, media, environmental and non-governmental organisations (ENGOs) and social rating agencies. Garcés-Ayerbe, Rivera-Torres, and Murillo-Luna (2012) studied the relationship between managers' perceptions of stakeholders' pressure concerning environmental issues and the extent to which firms are proactive about environmental strategies and found that managers have a strong perception of stakeholders' environmental pressure in high polluting firms. Per Guenther et al. (2016) study, the relevance of government, public, media, employees, and customers in influencing carbon disclosure was highlighted using a sample of Global 500, S&P 500, and FTSE 350 from 2008 to 2011. Applying Tobit regression to 3,631 firm-year observations revealed that stakeholders influenced the firms' carbon disclosure and carbon performance. Lu and Abeysekera (2014) investigated the influence of stakeholders' power and corporate characteristics on social and environmental disclosures based on the social responsibility ranking. They constructed three indices of environmental disclosure around disclosure quantity, type and item quality and found a weak influence of stakeholders on the level of environmental disclosure.

Herremans, Nazari, and Mahmoudian (2016) documented the relationship between stakeholder relationships, engagement, and sustainability reporting and explained that diversity in sustainability reporting is dependent on the features and relationship with specific stakeholders. Given the correct perception, the level of disclosure of environmental activities will attract stakeholders' interests to influence firms to be more innovative in their environmental footprint, which should drive sustainability. Yin and Wang (2018) investigated the power of moderating effects of institutional investors as stakeholders of firms in driving environmental disclosure and environmental innovation. Their study found evidence to show that institutional investors occupy an essential role in moderating the relationship between environmental disclosure and environmental innovation. Similarly, Elijido-Ten, Kloot, and Clarkson (2010) examined whether stakeholders' expectations would influence the strategy of firms to intervene in environmental disclosure. Using interviews, they found stakeholders influential in persuading firms to disclose the nature of environmental activities they are involved in and explain how any degradation was remedied.

In other studies, Giacomini, Zola, Paredi, and Mazzoleni (2020), Pucheta-Martínez, Bel-Oms, and Rodrigues (2020) and Liesen, Hoepner, Patten, and Figge (2015), found varying degrees of stakeholders' influence in environmental activities disclosures. While the literature on environmental disclosures has emphasised the role of stakeholders except in an instance where such roles have been documented to be weak (see (Lu & Abeysekera, 2014), stakeholders considered in the extant literature include management, government, employees, media, customers, shareholders and social rating agencies. There appears to be limited attention to date regarding the influence of community stakeholders where the polluting firms are domiciled in the literature. Hence, this study attempts to explore the perception of communities on environmental disclosures of firms as such could be instrumental in influencing environmental sustainability. Therefore, the underneath hypothesis;

H_1: Community stakeholders highly perceive the environmental activities disclosure of firms in their domain.

3. Methodology

3.1. Research Design

The quantitative research design was adopted to analyse communities' perceptions of how firms operate their environmental disclosure. A priori expectation suggests that community perceptions will impact firms' environmental footprints that could influence the sustainability of the environment. This was done in a cross-sectional design considered appropriate for this study and had been found to yield reliable results (Menolascina, Bevilacqua, Ciminelli, Armenise & Mastronardi, 2008; Rindfleisch, Malter, Ganesan & Moorman, 2008). A multivariate analysis was implemented in AMOS to conduct a structural analysis of community perception of the firms' environmental disclosure that operates in their territory.

The choice of participants was determined by locations that are predominantly industrialised in Nigeria and the environmental sensitivity of firms with high consumer visibility and concentrated intense competition. Based on this, samples were drawn from four states of the Federation, namely, Bayelsa, Lagos, Ogun and Rivers. The structured questionnaire was utilised to retrieve information from the target stakeholders to avoid any bias. These procedures ensured that the validity and integrity of the research findings could be assured. Kumar (2019) documented that validity aims at ensuring that the correct procedures are applied in a research study to find the answers to a question. Thornhill, Saunders, and Lewis (2009) added that it is concerned with the integrity of the conclusions made from research findings.

For this study, the Likert scale research instrument used was adapted from Clarkson, Li, Richardson, and Vasvari (2008), Hackston and Milne (1996) and Williams and Pei (1999) and tested in a pilot study. The scales of community stakeholders' perceptions of environmental activity disclosure were measured using 12 questions coded in table 1 below.

Table 1. Community Stakeholder Perception Coding

S/No	Question coding	Abbreviation
1	Waste Reduction Activities	WRA
2	Waste Recycling	WRC
3	Zero Burning Pollution Policy	ZBPP
4	Environmental CSR Activities	ECA
5	Environmental CSR Stakeholders' Perception	ECSP
6	Environmental Disclosure, Cost Reduction and Financial Performance	EDCP
7	Corporate Performance and Stakeholders' Benefits	CPSB
8	Environmental Disclosure Challenges	EDC
9	Environmental Information Availability	EIA
10	Environmental Reporting Annual Report Content	ERAR
11	Non-Monetary Annual Environmental Reporting	NAER
12	comprehensive annual environmental reporting	CAER

Sources: Authors' construction from the questionnaire[1]

The questions are ranked with a 5-point Likert scale of 0 to 4, corresponding to "strongly disagree", "disagree", 'neutral", "agree", and "strongly agree", respectively. The perception evaluation scales were based on the firms' environmental activities, their level of reporting and the benefits of reporting

[1] see detailed questions in Appendix 1

the activities. Respondents were to select their business ratings, giving their observation of those businesses' environmental activities.

3.2. Sample and Data

The researcher adopted questionnaires to ascertain the perception of stakeholders on environmental disclosure of sampled individuals of companies in the host communities. The questionnaire was designed to obtain demographic data from the respondents with a section containing 12 questions bordering on the environmental activities of companies within their communities, their waste disposal methods, companies' activities within the environment and whether they felt the companies faced any challenges in making environmental accounting disclosure. The questions were designed to capture some of the contents of the SDG 2030 agenda on the environment, thereby allowing the community to test the perceptions in this regard. The questionnaire was administered to company community stakeholders who live in the companies' areas. The purposive randomised sampling method was used to allow perceived knowledgeable persons on the environmental activities of the firms to take part in the survey yet permit equal chances of selection of respondents (Taherdoost, 2016).

Four states in the Southern part of Nigeria were considered for this study. These states are Lagos, Ogun, Bayelsa and Rivers. This assisted the researcher to obtain information on stakeholders' perceptions of environmental disclosures by companies within states in Southern Nigeria. The choice of states was due to the extent of industrial activities in these states and environmentally sensitive companies which have high consumer visibility and operate in a climate of intense competition. Additionally, Lagos alone houses over 50% of Nigeria's industrial capacity and more than 90% of industrial headquarters, while Rivers is second to Lagos in industrial development (Ajayi, 2007; Olanrewaju & Kalu, 2018). Purposive sampling was used to select a sample size of 400. The survey was done online, with the questionnaire distributed randomly across the selected states. After several follow-ups telephonically, 157 responses were received, which were considered useful for this study.

Of the 157 respondents (see Table 2 below) that took part in the survey, 104 (66.2%) were male, and 53 (33.8%) were female. The sample analysis indicated that most of the respondents' age distribution ranged from 20 to 39 representing about 130 (82.8%) of the total responses. Regarding the states of residence of the respondents, 41 (26.1%), 48 (30.6%), 33 (21.0%) and 35 (22.3%) all hailed from the study area, Bayelsa, Lagos, Ogun and Rivers, respectively. The residents were assumed to have lived in those industrial areas all their lives and were presumed to have experienced the firm's activities and have considerable knowledge about them. The education distributions showed that 5 (3.2%) respondents only had a high school certificate, 12 (7.6%) with technical education, 86 (54.8%) with bachelor's degrees, 48 (30.6%) Master's degrees and 6 (3.8%) with Doctoral degrees. With most of the participants in the bachelor's degree range, well informed and engaged responses were expected as the respondents were presumed to have the requisite knowledge and abilities to make an insightful judgment of the happenings in their environments regarding the environmental activities of companies operating within their domains.

Table 2. Descriptive Details of Study Participants

Gender		
	Frequency	Percent
Female	53	33.8
Male	104	66.2
Total	157	100.0
Age		
	Frequency	Percent
20 - 29 years	40	25.5
30 - 39 years	90	57.3
40 - 49 years	24	15.3
50 - 59 years	2	1.3
60 and above	1	0.6
Total	157	100.0
State of residence		
	Frequency	Percent
Bayelsa	41	26.1
Lagos	48	30.6
Ogun	33	21.0
Rivers	35	22.3
Total	157	100.0
Highest education attained		
	Frequency	Percent
BSc	86	54.8
MSc	48	30.6
OND/HND	12	7.6
PhD	6	3.8
SENIOR SECONDARY SCHOOL CERTIFICATE	5	3.2
Total	157	100.0

3.3. Descriptive Results

Table 3 shows the descriptive statistics of the data observed in the survey. As indicated, 157 observations were obtained, giving the responses, and all were considered in the analysis showing the absence of missing data. The mean and the standard deviation in Table 2 showed that the respondents were well engaged in the questions, as the minimum mean value and standard deviation are 1.29 and 0.557, corresponding to WRC and CPSB, respectively. The median statistic suggested that respondents strongly disagreed that firms conducted their environmental activities and were neutral on environmental disclosure reporting undertakings. The data is normally distributed as both the skewness and the kurtosis are within the threshold of the + or – 2.5 recommended in the literature. The data overall has acceptable features for analysis for this study.

Table 3. Summary Statistics

	N	Mean	Std. Deviation	Median	Minimum	Maximum	Skewness	Kurtosis
	Statistic	Statistic	Statistic	Statistics	Statistic	Statistic	Statistic	Statistic
Waste Reduction Activities	157	1.84	1.253	1	0	4	0.207	-1.31
Waste Recycling	157	1.29	1.058	1	0	4	1.002	0.214
Zero Burning Pollution Policy	157	1.38	1.174	1	0	4	0.733	-0.553
Environmental CSR Activities	157	1.77	1.214	1	0	4	0.363	-1.238
Environmental CSR Stakeholders' Perception	157	2.57	1.133	3	0	4	-0.706	-0.545
Environmental Disclosure, Cost Reduction and Financial Performance	157	3.13	0.735	3	1	4	-1.002	1.667
Corporate Performance and Stakeholders' Benefits	157	3.32	0.557	3	1	4	-0.51	2.072
Environmental Disclosure Challenges	157	2.5	1.124	3	0	4	-0.789	-0.463
Environmental Information Availability	157	1.71	1.22	1	0	4	0.437	-1.019
Environmental Reporting Annual Report Content	157	1.76	1.287	1	0	4	0.249	-1.237
Non-Monetary Annual Environmental Reporting	157	2.29	1.134	2	0	4	-0.143	-1.062
comprehensive annual environmental reporting	157	2.19	1.127	2	0	4	-0.221	-1.056
Valid N (listwise)	157							

Source: Authors' Estimation

4. Results Analysis

The Pearson Chi-Square test was used to test associations between the respondents' educational profile and their perception of firms' environmental disclosure. The essence is to check the impact of educational attainments on community stakeholders' perception of environmental disclosure activities. Stakeholders requiring high-level education to have a reasonable awareness of firms' environmental activities in their domain may involve a considerable cost, especially with the country's literacy level. Although respondents' education levels skewed predominantly towards those with a bachelor's degree, evidence from Table 4 suggests that education level does not influence perception about the environment. The results show that there is no statistically significant association between the levels of education attained and the perception about environmental disclosure of firms in the community they live in. In other words, with or without education, this stakeholder group is aware of firms' environmental activities.

Table 4. Chi-Square Tests of Associations between Descriptive Variables

Association		Pearson Chi-Square			
		$\chi 2$		Contingency	P
	N	Estimate**	df	value	value
he * WRA	157	10.022	16	0.245	0.865
he * WRC	157	8.869	16	0.231	0.919
he * ZBPP	157	21.763	16	0.349	0.151
he * ECA	157	21.495	16	0.347	0.160
he * ECSP	157	20.133	16	0.337	0.214
he * EDCP	157	11.568	16	0.262	0.481
he * CPSB	157	2.826	16	0.133	0.997
he * EDC	157	14.134	16	0.287	0.589
he * EIA	157	16.525	16	0.309	0.417
he * ERAR	157	17.422	16	0.216	0.359
he * NAER	157	16.623	16	0.309	0.410
he * CAER	157	19.865	16	0.335	0.226

*Source: Authors' estimation; **Chi-square estimates were within the threshold of having expected counts less than 5, with the minimum expected counts in all cases ranging from 0.03 to 0.45.*

The confirmatory factor analysis (CFA)[1] was used to test the structural perception of community stakeholders of the environmental disclosure of firms in their province. The CFA permits the grouping of elements that reflect the latent factor, environmental perception (EPE), in this study and examines the goodness of fit of the data observed. The higher-order CFA enabled the model's best reliability and validity measures to be extracted and produced items that met the reliability threshold for the latent factors. This ensured that the reflective latent constructs were correctly identified, grouped and that the observed data appropriately fit into the latent factors. This is particularly significant as the observed data did not correlate with the sets of the reflective latent variables. As shown in Table 5, composite reliability was used for the internal consistency, higher above the threshold at 0.842. In terms of validity, given that the model has one common latent factor, discriminant validity was not a concern for the model. The average variance extracted showed 0.703 is above the required threshold and showed evidence of the convergent validity of the model.

[1] See appendices 2 & 4 for the exploratory factor analyses (EFA)

Table 5. Reliability and Validity Analysis

	CR	**AVE**	**MaxR(H)**
EPE	0.842	0.703	2.158

Source: Authors' estimation[1]

To begin the analysis, a set of global model fitness indices (see Figure 1) was used to assess the CFA models' fitness to the data collected (Byrne, 2016; Fan, Thompson & Wang, 1999). To measure the overall fitness of the model, the normalised chi-squared test (CMIN/DF), which is the chi-squared ($\chi 2$) value divided by the number of degrees of freedom (df), was employed. The result was 1.374, which falls within the required expectation of $\chi 2/df \leq 3$ for the overall model, fit consideration (see (Byrne, 2016; Hu & Bentler, 1999).

Following Hu and Bentler (1999), the comparative fit index (CFI) was selected to establish the overall fitness of the model been tested to the data. According to Hu and Bentler (1999), the results of the comparative fit indices were expected to be in the range of 0–1, with values from > 0.9 considered to be a good model fit and those ≥ 0.95 are said to indicate perfect model fit. The CFI of the model, as shown in Table 6, is 0.951, suggesting that the model is a good fit. The root means square error of approximation (RMSEA) is also used as a further robustness check on the model fitness since its most times considered the most important model fit index (Byrne, 2016; Diamantopoulos & Siguaw, 2013). This is because of its sensitivity to most of the model estimating parameters (Hooper et al., 2008). It indicates how well a model fits the population covariance and/or correlation matrix. The study RMSEA is 0.049 from Table 6, suggesting the model is fit as the values of RMSEA ≤ 0.05 indicate a good fit, and according to Katou and Budhwar (2010), values up to 0.08 are accepteble. Other measures of fitness considered are the SRMR and the Pclose, which also had excellent fitness indicators compared to their thresholds. The indicators from the model fit measurement indices in total suggested a very good fit as, according to Fields and Atiku (2015), good model fitness can be assumed with at least four good indices. In the case of our study, all the indices are found to satisfy the fitness criteria.

The result of the perception of community firms' stakeholders of firms' environmental disclosure is shown in the CFA model in Figure 1. The oval shapes in the figure represent the latent variables: environmental activities (EVA), environmental disclosure reporting (EDR), environmental disclosure benefits (EDB) and environmental perception (EPE), whereas the rectangular shapes stand for the observed variables. The CFI result in Figure 1 indicates that over 95% of the variance of the model proposed was explained by the data collected hence, the statistical validity of the model. The second-order CFA was most appropriate for the model fitting as the three latent factors of environmental activities, environmental disclosure reporting, and environmental disclosure benefits were correlated.

[1] Master validity tool (Gaskin, James, & Lim, 2019) with thresholds from Hu and Bentler (1999)

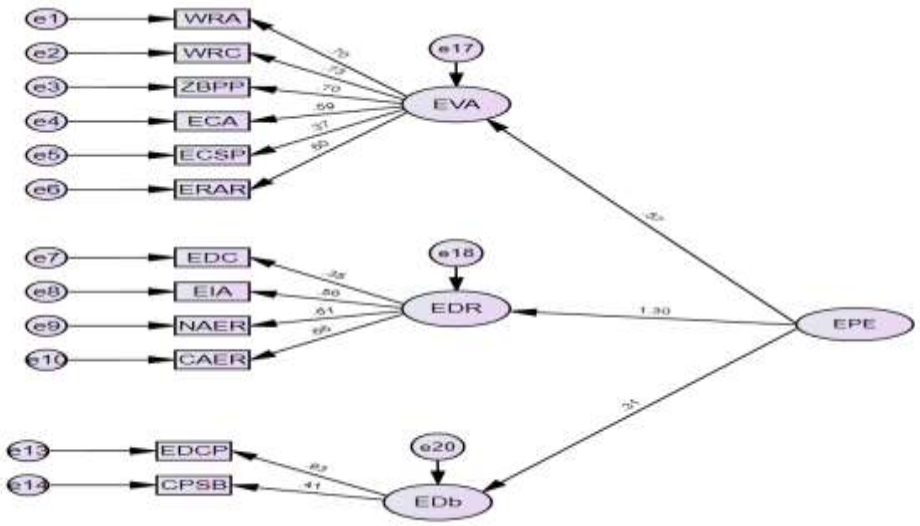

Figure 1. Confirmatory Factor for Covariance Structure Analysis

Model fit indices[1]: CMIN/D 1.374, CFI 0.951, SRMR 0.062, RMSEA 0.049, and PClose 0.499.

Empirical evidence from the first order CFA result revealed that the factor loadings (FL) overall ranged from 0.35 to 0.93 (EVA: $0.37 \leq FL \leq 0.73$; EDR: $0.35 \leq FL \leq 0.66$; EDB: $0.41 \leq FL \leq 0.93$). The factor loadings indicate the proportion of each latent variable explained by the items used, corresponding to their contributions to determining the latent constructs. The probability values of the factor loadings are significant at < 0.001 (see Appendix 4), indicative that each of EVA, EDR and EDB are explained by each of their items and are outcome factors of community perception of firms' environmental activities and their disclosures' cognisance. The results indicate that items within EVA, EDR and EDB are correlated and moved together, which in turn correlated to explain the overall perception of the environmental activities of the companies.

Having ascertained the validity and reliability of the data, we tested the hypothesis for community perception of firms' environmental disclosure using the one-sample t-test in Table 6. The median represents the test value of the t-test for the variables involved. The test associated with EVA is significant ($t = 29.97$, $p = 0.000$), suggesting that the mean score of environmental activities disclosure is significantly larger than its median. Thus, implying a high perception of firms' environmental activities disclosure by the community in which they operate. Similar results were obtained for EDR which is significant ($t = 34.49$, $p = 0.000$) and EDB ($t = 75.13$, $p = 0.000$) signifying high perception community stakeholders of firms of environmental reporting disclosure and environmental disclosure benefits. Therefore, the hypothesis is confirmed, indicating community awareness of the environmental activities of firms operating within their domain.

[1] The model fit measures estimated with AMOS plugin by (Gaskin & Lim, 2016), see Hu and Bentler (1999) for the cut-off criteria.

Table 6. The One-Sample *T*-Test for Community Perception of Firms' Environmental Disclosure

Variable	Median	t-values	df	P-values	Mean Difference	95% CI	
						Lower	Upper
Environmental activities (EVA)	10	26.969	156	0.000	10.62	9.8461	11.4023
Environmental disclosure reporting (EDR)	8	34.487	156	0.000	8.70	8.2023	9.1990
Environmental disclosure benefits (EDB)	6	75.134	156	0.000	6.46	6.2888	6.6284

The perception of communities regarding the environmental activities of firms and how well they are disclosed is fundamental to ensuring environmental sustainability for all. The analysis revealed no statistically significant association between the respondents' level of education attained and the perception of environmental disclosure of firms in the community they live in. Implying the community possesses high knowledge of the environmental activities of firms irrespective of the level of their education. This is a plus to the campaign towards more sustainable usage of the environment by firms. Given the power of stakeholders in the empirical literature, see (Cormier, Gordon & Magnan, 2004; Guenther et al., 2016; Pucheta-Martínez et al., 2020), among others, the community will provide a formidable force for persuading firms to act responsibly on issues of the environment. This becomes more advantageous since the awareness is already present and no cost is required for sensitisation; mobilising solidarity for the environmental sustainability of firms' actions becomes even easier. Movement for environmental consciousness will be less costly given that people are already well informed. Community engagement will be key in addressing oil spillage, soil erosion, massive logging of forests resulting in the loss of wildlife and displacement of native community members that Perry and Singh (2011) documented that developing economies are still faced with. This could be leveraged in Nigeria, where the disclosure by firms of their environmental activities is still at an elementary level (Disu & Gray, 1998; Enahoro, 2009) despite the level of environmental degradation committed by firms. Specifically, Nigeria is presently faced with environmental problems resulting from dumping hazardous wastes, air, soil, and water pollution.

The latent factors such as environmental activities, environmental disclosure reporting, and environmental disclosure benefits in the first-order confirmatory factor analysis revealed how substantially correlated the items in the factors were. Consequently, the items explained the latent variable and are crucial elements that require attention when addressing environmental activities that could contribute to the sustainability of the environment. This is following studies by Hackston and Milne (1996), Williams and Pei (1999) and Clarkson et al. (2008), which highlighted environmental activities (EVA), environmental disclosure reporting (EDR), environmental disclosure benefits (EDB) as critical activities to be considered in addressing environmental activities. The latent variable in the second-order CFA structurally shapes the overall perception of the environmental activities of firms by the community. Implying that both the firms' environmental activities, the reporting and the benefits from the reporting commove to inform community perception and do not function in isolation. The perception of community stakeholders of firms is based on their holistic view of those disclosure variables in judging how well environmental activities of companies within the areas they live in are being treated. This position is substantiated by the test of significance done with the one-sample t-test.

Overall, the study's findings further highlighted community stakeholders' concerns about the activities of companies within their environment and their awareness. This feeds into the stakeholder power of Ullmann's framework, which could be harnessed to increase demand from stakeholders for companies to be more responsible as it relates to their activities impact on the environment. Especially as the achievement of the environmental sustainability component of the SDG 2030 is adjudged to be far-fetched while nearly half of the timeline has been expended.

5. Conclusion

This study explored the structural perception of firms' community stakeholders in Nigeria of their environmental activities and disclosure. This is germane because the community as a pressure group and stakeholder of the firms could help moderate the environmental footprints of the firms towards a more sustainable direction which could only be achieved if they are aware of it. Extant literature exploring the influence of stakeholders on the environmental behaviour of firms has considered board independence and meetings (Aliyu, 2019), board committee (Odoemelam & Okafor, 2018), management perception (Garcés-Ayerbe et al., 2012), including the influence of corporate governance (Oyefara, 2013), among others. No study has accounted for the place of a community as a stakeholder of firms on related environmental issues.

The stakeholder theory forms the bedrock for analysing the data collected from the four most industrialised states in Nigeria used in testing the community's perception of which firms operate on their environmental disclosure. The chi-Square tests of associations between descriptive variables helped test if there were any statistical differences between the level of education of the community and their awareness of the firms' environmental activities. At the same time, the structural perception was analysed with confirmatory factor analysis (CFA) and the one-sample test.

The findings revealed that the firm's environmental activities, reporting, and benefits collectively shaped the communities' perceptions of the activities of firms on the environment. The level of community formal education was inconsequential for their awareness of the environmental activities of the firms in their area. In this context, the conclusion was that Nigerian industrial communities have a high level of consciousness of the environmental footprints of firms that operate within their communities. The results reinforce the stakeholder theory, and the potential powers stakeholders can wield in ensuring that firms comply with environmental activities (Cormier et al., 2004; Guenther et al., 2016; Pucheta-Martínez et al., 2020).

This result is particularly relevant for the drive towards a more responsible usage of the environment by firms, as community solidarity could be galvanised to improve firms' environmental footprints resulting in progress towards the SDG2030 environmental agenda. The recommendation is that such goodwill is harnessed by concerned stakeholders such as NGOs and relevant government agencies to enhance environmental sustainability for the future of all. It is particularly pertinent for actualising the SDG goal in an environment that has experienced several setbacks. The empirical response rate limits this study to permit generalisation of the results and consequently recommends a broader engagement of studies in this area. This study only considered the potential of the community as a stakeholder of firms in reducing the firm's environmental footprint towards the attainment of SDA on the environment. Future research will need to explore the possible impact, including harmonising the role with other stakeholders in building a framework for ensuring firms are environmentally more responsive.

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Appendices

Appendix 1. Questionnaire

S/no	Questions	SD	D	N	A	SA
1	Activities that reduce waste are encouraged by Companies in your community					
2	Companies located in your community recycle waste					
3	Companies in your community have a zero burning policy and cause no form of pollution					
4	Companies in your community carry out Corporate Social Responsibility activities targeted at the environment such as; Cleaning of gutters, Repair of damaged roads, beautification of the environment					
5	Corporate social responsibility activities by companies result in enhanced stakeholder perception of companies					
6	The disclosure of environmental information by companies could help to reduce costs and improve financial performance					
7	Improved corporate performance is beneficial to stakeholders					
8	Organisations may face challenges in making environmental disclosures					
9	Environmental information for companies located within your environment are available					
10	Environmental reports of companies are usually in the annual reports of companies					
11	Environmental information contained in the annual reports is mainly non-monetary					
12	Companies should produce comprehensive environmental reports yearly separate from annual financial reports					

Appendix 2: Pattern Matrix

	Factors		
Cronbach alpha	0.782	0.625	0.534
WRA	0.473		
WRC	0.492		
ZBPP	0.734		
ECA	0.511		
ECSP	0.627		
ERAR	0.380		
EDC		0.369	
EIA		0.508	
NAER		0.638	
CAER		0.739	
EDCP			0.629
CPSB			0.594

Extraction Method: Maximum Likelihood.
Rotation Method: Promax with Kaiser Normalization.
Rotation converged in 7 iterations.
Factors explained 54.433% of the total variance
Kaiser-Meyer-Olkin Measure of Sampling Adequacy: 0.809

Apendix 3

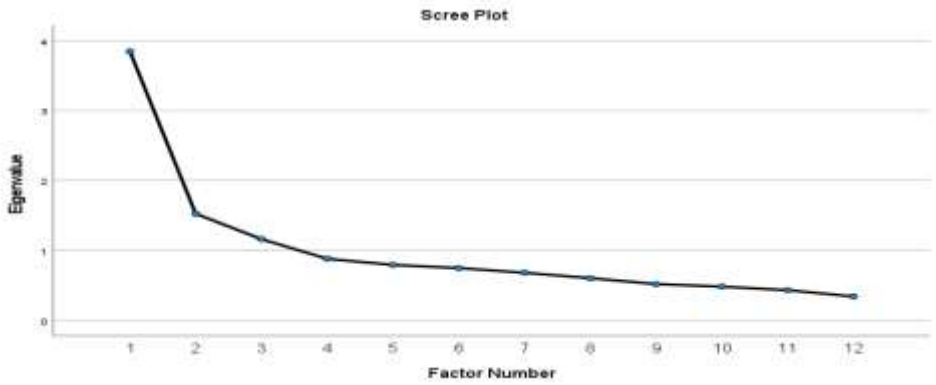

Figure. Scree plot

Apendix 4.

Table. Confirmatory Factor analysis

Predictor	**Outcome**	**Factor loadings**	**Latent variable**
Environmental activities (EVA)	Waste Reduction Activities (WRA)	.695	EVA
Environmental activities (EVA)	Waste Recycling (WRC)	.727 ***	
Environmental activities (EVA)	Zero Burning Pollution Policy (ZBPP)	.699 ***	
Environmental activities (EVA)	Environmental CSR Activities (ECA)	.588 ***	
Environmental activities (EVA)	Environmental CSR Stakeholders Perception (ECSP)	.373 ***	
Environmental activities (EVA)	Environmental Reporting Annual Report Content (ERAR)	.601 ***	
Environmental disclosure reporting (EDR)	Environmental Disclosure Challenges (EDC)	.350	EDR
Environmental disclosure reporting (EDR)	Environmental Information Availability (EIA)	.560 ***	
Environmental disclosure reporting (EDR)	Non-Monetary Annual Environmental Reporting (NAER)	.611 ***	
Environmental disclosure reporting (EDR)	comprehensive annual environmental reporting (CAER)	.656 ***	
Environmental disclosure benefits (EDB)	Environmental Disclosure, Cost Reduction and Financial Performance (EDCP)	.926	EDB
Environmental disclosure benefits (EDB)	Corporate Performance and Stakeholders' Benefits (CPSB)	.409*	

*Source: Authors' Estimation (Gaskin and Lim; 2018)**;** Significance of Estimates: *** p < 0.01 ** p < 0.05 **