COMMUNITY INTERVENTIONS IN CONSTRUCTION HEALTH AND SAFETY AND THE IMPLICATIONS: EVIDENCE FROM NIGERIA

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Abstract

Purpose — The reported study examined the involvement of communities—geographical or geopolitical units, which identifies culture, interest, and ethnicity—in construction health and safety (H&S) and the implications. This stems from the unexamined, hence poorly understood roles of many stakeholders in the construction H&S management and regulatory regime in Nigeria.

Design/methodology/approach — Interviews with contractors and key informants, and a survey of contractors were conducted. Descriptive and inferential statistics, and thematic analysis were employed.

Findings — There is evidence of community interventions: negotiating with contractors on H&S issues; strongly stipulating that H&S measures are adopted and implemented; enforcing H&S through both violent and non-violent means. These have no legal backing. There is a relationship between the locations of the projects, Urban Area and Rural Area, and six community intervention variables. The study also reveals that among the implications of community interventions in H&S are contractors contextualising H&S in these communities and tension between parties in construction projects. Again, there is a relationship between the location of the projects, and six of the implications including tension between communities and contractors and between contractors and clients.

Practical implications — In adequately addressing construction safety, health and environment issues in Nigeria, geographic location and socio-cultural consideration are pertinent, a point for policymakers, communities and contractors.

Originality/value — The study draws attention to the geographic location and socio-cultural explanations for the differences in H&S management, performance and attitudes of contractors in Nigeria. This is the first study that examines the involvement of communities in H&S and the implications.

Keywords: Community, collectivism, culture, environment, health and safety, Nigeria

Introduction

The health and safety (H&S) record of the construction industry in general is reported as poor in various studies (e.g. Health and Safety Executive (HSE) 2016; Idoro 2011; Windapo and Jegede 2013). In countries with adequate statistics, for example Great

Britain, the H&S record of the construction industry is among the highest when compared to other industries (HSE 2016).

Efforts towards improving H&S can come in many ways, for example, H&S regulation and compliance (Idoro 2011; Umeokafor 2017) and prevention of hazards through design. While this is not an exhaustive list, it shows the various parties that can be involved in H&S improvement. Idoro (2011) emphasises the imperativeness of creating awareness and a good understanding among stakeholders in the construction industry on the contributions of contractors in H&S improvement. The same argument can be replicated in terms of other stakeholders. Authors argue that in ensuring the success of projects, the different interests and expectations of stakeholders in construction should be met (Chan and Oppong in press). With this, stakeholders in the industry will have a good understanding of what parties contribute to improving H&S, the parties and the implications of the contribution or activities. There will also be a good understanding of the interests and expectations of stakeholders. Considering the poor H&S regulatory environment of developing countries (Famuyiwa et al. 2011; Idoro 2011), this premise is imperative and forms the basis of the current study.

Evidence confirms many stakeholders in construction H&S regulation in Nigeria. For example, Famuyiwa (2011) notes the contribution of local authorities in Lagos state in terms of government byelaws for the protection of workers and the influence of foreign companies in setting H&S standards for their local offices. Idoro (2011) identifies the self-contribution of the contractors in the adoption and administration of H&S legislation and highlights some implications of adopted H&S laws on H&S in Nigeria. In Umeokafor (2016), there is evidence of the contribution of the oil and gas industry, international client organisations and communities in construction H&S regulation. While these studies show significant efforts in H&S research in Nigeria (and the multiple stakeholders in H&S regulation), only Umeokafor (2016) provides evidence of the contribution of communities in H&S regulation. Umeokafor (2016) found that communities contribute to or stipulate and administer H&S standards but recommends further studies in this underexamined area. This narrows down the scope of the current study.

In the current study, the community is defined as geographical or geopolitical units (for example, town, cities or country), which identifies culture, interest and ethnicity (Rifkin 1986 in Nilsen 2006), and considered a stakeholder. The units can be very large and heterogeneous in terms of ethnicity, religion, among many income (Nilsen 2006).

There is evidence that community-based approaches or intervention in H&S have failed in some countries such as New Zeland (Coggan et al. 2000) but has recorded success in countries such as the US and Scandinavia (Forst et al. 2013; Klassen et al. 2000; Nilsen 2004, 2006). Among the reasons for this failure is the heterogeneous nature of geographic communities, which results in various interests, as Nilsen (2006) demonstrates. If this is the case, it can be argued that there is little or no case for the current study as the community within is geographically defined and heterogeneous.

However, there are counter arguments. First, although the community-based approach has failed in some heterogonous communities, this does not mean that it will be ineffective in Nigeria. Second, as will be seen in the literature review, communities

may be heterogeneous but share values and closer connection. Third, the role of the community in H&S in Nigeria is not a state-structured programme designed to involve the community; hence, it is worth examination. Fourth, above all, there are arguments elsewhere on the lack of understanding of the roles of some stakeholders in H&S including communities. Fifth, authors such as Kheni et al. (2010) argue that the lack of understanding of the social, political, institutional and cultural environments of developing countries remains a barrier to improving H&S. Deplorably, the foregoing area remains underexamined in terms of H&S (Kheni et al. 2010)

Drawing upon the premises established in this section, the overarching aim of this study is to advance the understanding of the influence of communities in H&S. The following objectives are set:

1. To establish and assess the extent of the roles of communities in H&S.
2. To explore and explain the implications of community interventions in H&S.
3. To determine the impact of the implications of community interventions in H&S.

Emphatically, the scope of the research is not limited to H&S but includes the construction activities-related environmental issues hence safety, health and the environment. This is because 'some laws relative to H&S are embedded within the country's environmental laws' (Dabup 2012 p37); environmental regulatory institutions oversee environmental safety in the Nigerian construction industry (Umeokafor and Isaac 2016).

Literature review

In improving H&S through a community-based approach, H&S regulators or the state design grassroots-based H&S improvement programmes. This involves the communities in the development and/or implementation of H&S programmes (Coggan et al. 2000; Nilsen 2006) and/or educating them on improving H&S (Forst et al. 2013). The rationale is that consulting communities in the development and/or implementation of H&S programmes highly increases the efficacy because the communities suggest workable approaches and take ownership of the programmes.

Selected previous studies on community roles in H&S

Studies report community-based approach or interventions in H&S. In the US, Forst et al. (2013) observe the improvement in H&S knowledge, hazard identification and sustainable H&S activities through the training of low wage and lowly literate Hispanic construction workers using a community-based research approach. In systematically reviewing 32 subject-related articles, Klassen et al. (2000) found indications that community-based approaches to injury prevention are effective in safety practices. According to Klassen et al. (2000), the successful safety programmes are tailored towards unique community characteristics such as socio-economic status or ethnicity and behaviour theories-underpinned multiple strategies.

There are, however, cases where community-based H&S programmes have failed but with explanations. For example, Coggan et al. (2000) and Nilsen (2006) report the failed H&S programmes in heterogeneous communities such as in New Zealand. In examining the theoretical underpinnings of the community-based approach to understand its under-performance in H&S programmes, Nilsen (2006) found that the classification or categorisation of community remains one of the explanations for the failed community-based H&S programmes. When the communities are very large and heterogeneous in terms of ethnicity, religion, income etc., research shows negative

implications for engagement and participation in programmes (Nilsen 2006). The ability of such a large community to have a community sense is lower. The success of H&S programmes in homogeneous communities in Scandinavian communities where social/cultural homogeneity was crucial (Nilsen 2004 and cf. 2006) supports this.

Nigeria in context

Nigeria has a total land area of about 923, 768 sq. KM and six Geopolitical Zones (GZs), North West, North East, North Central, South East, South South and South West. With a population of over 190 million people and over 250 ethnic groups, the diversity of Nigeria is emphasised. According to United States Embassy (2012), the main ethnic groups are Hausa and Fulani (29 per cent), Yoruba (21 per cent), Igbo (18 per cent), Ijaw (10 per cent), Kanuri (4 per cent), Ibibio (3.5 per cent) and Tiv (2.5 per cent). This diversity results in multiple cultures, languages and beliefs.

However, despite the diversity in culture, languages and beliefs, Hofstede (2001 and 2014) demonstrate that developing countries such as Nigeria are of the collectivism national cultural dimension. In this cultural dimension, there are close ties and a collective lifestyle and understanding to living (Darwish and Huber 2003; Hofstede 2014). This is a contrast of individualism, where the ties are loose (Darwish and Huber 2003; Hofstede 2014). According to Darwish and Huber (2003 p49), unlike in the individualistic societies, 'the collectivistic societies are characterised by the following: loyalty to the group ..., the belief that group decisions are superior to individual decisions, interdependence..., concern about the needs and interests of others'. The collectivism national culture dimension underpins the extended family life system. According to the findings of Hofstede (2001), West African countries, including Nigeria, have a low individualism index as against Western countries that have a higher level of individualism index.

Yusuf (1998) notes that the extended family, an indispensable aspect of the Nigerian social life, is highly influential on the community members; according to Hofstede (2014), there is unquestionable loyalty. Kheni et al (2010) found that the extended family system that underpins the collectivist cultural dimension influences H&S management. Family values are among the reasons for SMEs engaging in H&S management (Kheni et al. 2010).

In common with many developing countries, H&S in the Nigeria is poor and well covered in studies with explanations (for example, Diugwu et al. 2012; Idoro 2011 Famuyiwa et al. 2011; Windapo and Jegede 2013). Explanations for the poor state of H&S include the lack of enforceable H&S laws (Famuyiwa 2011). Indeed, the main H&S law covering factories is the Factories Act 2004 overseen by the Federal Ministry of Labour and Employment (Inspectorate Division). The Act is outdated and riddled with limitations. For example, a review of the Act shows that the maximum fine it specifies is equivalent to £2, the penalties are lenient. It does not cover construction sites and activities in its definition of premises resulting in construction contractors adopting H&S regulations from other countries (Diugwu 2012; Idoro 2011). The H&S regulatory system is dysfunctional and fragmented (Umeokafor 2016), an explanation for the multiple stakeholders in H&S regulation covered in the introductory section. Other H&S related laws that cover the construction industry include some environmental laws (Dabup 2012) and the Employee's Compensation Act 2010. This is where the National Environmental Standards and Regulations

Enforcement Agency oversees environmental safety issues such as carbon emission by heavy-duty vehicles, noise and disposal of waste.

Research methodology

In the study, interviews and a survey, pragmatic research paradigm, were adopted because they are adequate for addressing the research questions. The survey addressed objectives 1 and 3 and the interviews addressed objective 2. Alonso and Barredo (2013) demonstrate that mixed methods are able to offer rich insight into social phenomena because the multi-methods, for example interviews and survey, complement the strengths of each other through triangulation.

Data collection instruments

The interview guide was developed based on literature review, the opinions and experiences of the author and consultation with peers. This was then refined with the four-stage interview protocol refinement framework by Castillo-Montoya (2016). In the first stage, the interview questions were checked to ensure that they aligned with the research questions. The second stage involved ensuring that the interview questions elicited information but ensured conversation. The third step was getting feedback on the interview questions while the last stage was piloting the interview guide on the construction contractors. The interview questions were semi-structured. The interview guide focus areas are not limited to the involvement and contributions of communities to the regulation of construction H&S, and cultural attributes (for example close ties) in the communities and involvement in construction H&S.

For the survey, the questions were developed based on the results of the interviews. The first section identified the profile of the respondents. The second part examined the extent of community intervention in H&S, for example setting and enforcing H&S standards. For the third stage, the other questions covered the implications of community intervention in H&S, for example improved relationship between the community and contractor. The questions in all sections were in nominal scale, where 1 is for No and 2 for Yes, just like in section two. The respondents had to choose one of the two options on the questionnaires. The data derived from the scale were analysed with descriptive and inferential statistics.

The nominal scale was used for the following reasons. Firstly, the nature of the questions and analysis required that the survey entail dichotomous questions—questions with two possible answers. Secondly, the objectives or research questions of the study would be adequately addressed by dichotomous questions. Thirdly, following the findings of the interviews, it was felt that the dichotomous questions would adequately expand the interview and provide the nature of data needed.

Sampling and data collection

Purposeful and snowball sampling techniques were adopted in the study where 16 contractors and nine key informants took part in the interviews. Using snowball sampling, respondents of the first interview session suggested the type of people and participants with experience in projects where the community has been involved H&S (cf. Suri 2011). The criteria for the key informants are that they must have a

relationship with the contractors in projects where communities influence H&S. As a result, members of the communities, non-governmental organisations, consultants, academics and client organisations were interviewed. For the contractors, they must have been in projects where the communities were involved in H&S and willing to take part in the study. Some participants were from an on-going research project.

The data collection and analysis were conducted simultaneously. The interviews were face to face and telephonically and lasted between 53–69 minutes. Interviewees were sent introductory letters by hand and email covering how the data will be used, anonymity, among many, the option of withdrawing from the study. The responses of the interviewees were probed with the seven techniques by Easterby-Smith et al. (1991). These include repeating the questions when needed to realign the respondents and asking the interviewees to expand on points where needed. Adequate eye contact was maintained and expressing emotions avoided.

In the survey, purposeful and snowball sampling techniques were adopted because of the epistemological position of the study. This is where the scope of the research is limited to projects in which the community has been involved (Suri 2011) hence should inform the criteria for participation in the research. A preliminary study that shows a population of 400 contractors used in a previous study contributed to the sampling technique. Snowball sampling helps identify a population that is hard to identify, just as in the current study.

The criteria for participation in the interviews were applied in the survey, but the completed project must be within two years. Firstly, questionnaires were sent to personal contacts (who also participated in the pilot study) and interviewees and asked to identify potential respondents who have worked on projects where the communities have been involved in H&S. To avoid duplication, respondents were asked to provide the project name, location and completion date. From multi-respondent reported projects, one was selected. One hundred and fifteen questionnaires were distributed to professionals in contracting companies by hand (with the help of research assistants and colleagues) and via email. Seventy-six usable questionnaires were returned.

Data analysis

Interviews: A six-phase thematic analysis was adopted for the interviews (Braun and Clarke 2006), using NVivo for Mac. For the first phase, the transcripts were read many times so that the investigator was familiar and immersed in the data. This was followed by initial coding which involved looking for commonly used words and asking questions, for example, ‘what is happening here?, ‘What is missing here?’ (Braun and Clarke 2006). This coding process involved reading the sentences one after the other and constantly comparing the coded texts with one another (Braun and Clarke 2006). The coding process was data and theory-driven. The third phase involved arranging the codes into potential themes and hierarchies—child, parent and broad nodes. At this stage, some codes were combined (Braun and Clarke 2006). This stage made way for the fourth phase, reviewing the themes at two levels: Level 1, reading the text in each theme to ensure consistency; level 2, reading the entire data to validate the themes (Braun and Clarke 2006). The fifth phase of re-examining, defining and naming the themes was carried out, making way for the sixth phase—

producing the report. This involved using quotations and the summary of the data analysis outcome.

Notes of the ideas of the investigator during data collection and analysis and reflections on the various parts of the data and the methodology of the study (Baxter and Jack 2008) were taken. In improving the credibility and dependability of the study, in addition to the interview protocol refinement earlier noted elsewhere, peer debriefing and triangulation were adopted. 'How', 'what' and 'why' triangulations occurred are reported (Adami (2005). What was done? — Triangulation of persons (contractors and key informants), and analytical triangulation (constant comparison and computer-aided analysis) (Humble 2009) were adopted. This involved 'within group' analysis/comparison (for the contractors) and 'between group' analysis/comparison (for the contractors and key informants). The survey also triangulated the findings of the interviews. Why were the triangulations conducted? All the triangulations were conducted to improve the credibility and transferability of the findings. The analysis of the study was improved with method and analytical triangulations. How were the triangulations conducted? Comparing the views of the analytical groups, contractors, and key informants, to support, refute, illuminate, dissonant or even offer unique information, was an aspect of the triangulation (Sand and Roer-strier 2006). This was later expanded or clarified by the survey. The entire triangulation processes are in line with Sand and Roer-strier (2006).

The survey data were analysed using descriptive (frequency) and inferential statistics (Chi-square test) on Statistical Package for Social Science. Descriptive statistics summarises but also details the features of a large data, enabling simple interpretation. This provides the basic information needed to put the study into context. On the other hand, inferential statistics is a stronger method of analysis that enables conclusions and generalisation of the population with the sample. In other words, inferring from the sample what may be applicable to a larger population.

The units of analysis were rural area (RA) and urban area (UA). Authors, for example, Aluko (2010) and Peng et al. (2010) define UA differently, showing some level of subjectivity, underpinned by the various purposes of the studies and other criteria used. The scope of the current study promotes adopting the definition of UA as heterogeneous, dense, modernised and industrialised. The inclusion of modernisation and industrialisation in the definition of 'urban' stems from the position of authors such as Peng et al. (2010) that cities in the modern world are dependent on industrialisation, technology and capitalistic enterprise. 'The fundamental difference between urban and rural is that urban populations live in larger, denser and more heterogeneous cities as opposed to small, sparse, and less differentiated rural places' (Peng et al. 2010 p211). This differentiation also informs the inclusion of 'heterogeneous and dense' in the definition of urban in the current study.

Furthermore, the definitions of urban and rural were adopted because it ensures internal validity and using them is underpinned by the geographic location influence on construction H&S (Umeokafor 2017). The features of collectivism cultural dimension—close ties and a collective lifestyle, strong leadership, loyalty features and understanding to living (Hofstede 2014)—which also underpin the extended

lifestyle is likely to be more evident in RAs than in UAs. This underpins community influence in H&S.

The analysis drew strongly on the definition of UA and RA in this section and further research on the locations on the Internet, to ascribe the projects to the appropriate unit of analysis. This follows on from a question in the questionnaire, which asked respondents to note the location of the project and advise if it is considered a UA or RA.

Results

Description of the sample

In the survey, the respondents were 22 architects, 15 civil engineers, 10 builders, 11 H&S professionals, eight quantity surveyors and 10 project managers. They come from 25 small contractors, 38 medium scale contractors and 13 large contracting firms. Of the 76 projects, 41 were in RA and 35 in UA. All were in the Niger Delta area of Nigeria and consist of the following types of projects: buildings, roads, bridges, pipeline projects, water supply and offshore geotechnical engineering projects. This shows a geographic alignment to community involvement in H&S, which is consistent with the interviews. Importantly, the firms may not have a head office in the reported areas but have construction projects in the areas. By implication, some participating contractors are also based outside the Niger Delta.

The key informants in the interviews were three members of communities, two H&S consultants, two respondents from organisations whose regulatory activities (e.g. environmental issues) cut across the construction industry, and two academics who alongside their academic role have worked on projects where communities influenced H&S. The community members were three (two youth leaders and one elder) and were involved in H&S on projects. All had a direct or indirect association with contractors in the reported projects. In total, 101 respondents (in the interviews and survey) participated in the study.

In terms of the contractors, for the interview, there were four architects, one quantity surveyor, three H&S managers, three civil engineers, three project managers and five site engineers/managers. They come from small, medium and large contractors, multinational and indigenous firms. They all have at least eight years of construction industry experience. Importantly, the experiences of some respondents cut across more than one of the categories of contractors or construction sector. For example, one respondent has worked for an SME before setting up their own company and running it for years after which the respondent joined a large contractor.

The contributions of communities to the regulation of H&S

Many respondents suggested, stated or demonstrated that community influence on H&S on projects was mainly experienced in the Niger Delta area. A few attributed this to the exploitation of the Local content law by communities in the Niger Delta region due to the socio-economic issues. According to ‘section 3 subsection 2’ of the Nigerian Oil and Gas Industry Content Development Act 2010, in awarding contracts in the oil and gas sector, Nigerian contractors should receive preferential treatment. This includes in awards of services to Nigerian service companies.

There is evidence that the communities are involved in stipulating or setting and enforcing H&S standards and requirements, ensuring contractors are involved in H&S and contextualising it (Table 1).

Table 1: Community interventions in H&S

Themes	Evidence
• H&S standard and requirements definition	Contractors negotiate with the communities on H&S measures and procedures. Many respondents have experienced communities insisting that contractors adopt H&S standards and programs. Communities stipulate that contractors involve or employ local H&S consultants and/or officers. Communities insist that at least an H&S officer is on every construction site.
• Control and monitoring	Communities appoint local H&S representatives to work with contractors on their behalf. Communities demand to handle the H&S aspect of projects.
• Contextualising H&S	The community affairs, security, health, environment, safety, culture and norms are considered in H&S on the demand of the communities. Community cultures and norms are factored in H&S programs and training.
• Enforcing H&S	Community shut down firms, protesting contractors non-adherence to their requirements. Communities adopt diabolic means to disrupt construction. Sabotaging construction works through workers from locality. Disrupting construction by demolishing structure or parts of it. Influential and/or wealthy people negotiate or use political influence to ensure H&S in community. Reputation management—naming and shaming clients and contractors via the media

In fully addressing objective 1, the community interventions in Table 1 were assessed and presented in Table 2. The descriptive statistics in Table 2 shows that community interventions are emphasised in RA than in UA—the communities in RA are more involved in all but two factors, 'influential people in community negotiate/ensure H&S' and 'community culture and norms are factored in H&S programmes and training'. On face value, the difference tends not to be significant (Table 2).

Table 2: Survey results of community interventions in H&S

Interventions of communities in H&**S**	Yes			No			Chi Square	Asym P Sig (2-sided)
	UA	RA	Overall	UA	RA	Overall		
• **H&S standards and requirement definition**								
Negotiation with the communities on H&S measures	3	34	37	32	7	39	42.785	.000
Insisting that contractors adopt H&S measures	18	20	38	17	21	39	.053	.818*
Stipulating that contractors involve or employ local H&S consultants/officer.	14	16	30	21	25	46	.008	.931*
Insisting that H&S officer is on every construction site.	6	21	38	29	20	38	9.572	.002
• **Control and monitor**								
Communities appoint local H&S representatives to work the contractor on their behalf.	17	31	48	18	10	28	5.932	.015
Communities demand to handle the H&S aspect of projects.	24	28	52	11	13	24	.001	.979*
• **Contextualising H&S**								
Community demands that their culture and norms are factored in H&S programs and training.	25	20	45	10	21	31	4.010	.045

• **Enforcing H&S**								
Enforcement — Communities adopt diabolic means	3	6	9	32	35	67	.665	.415*
Sabotaging construction works through workers from locality.	7	17	24	28	24	52	4.026	.045
Disrupting construction by demolishing structure — enforcement.	10	21	31	25	20	45	4.010	.045
Influential people in community negotiate/ensure H&S.	13	12	25	22	29	51	.530	.466*
Naming and shaming clients and contractors via the media.	10	11	21	25	30	55	.029	.866*

Note: Significant at $p \leq .05$; UA = Urban Area; RA = Rural Area.

However, based on overall responses, the Pearson Chi-square test at a significance level of $\leq .05$ shows that there is no statistical association between the two locations, UA and RA, and six variables. These variables include 'Communities insist that contractors adopt H&S measures' and, 'Communities demand to handle the H&S aspect of projects' (Table 2). This means that a relationship exists between each of the remaining six variables (with no asterisk) in Table 2 (where the p-value is less or equal to .05) and RA and UA. Chi-square can only provide evidence of association or relationship and not the direction of the relationship or whether it is positive or negative. Hence, the only conclusion is that it is likely that the locations of the projects influence the six community interventions in H&S or they increase or decrease because of the locations. It is likely that the association holds in a larger population hence not by chance.

Implications of community interventions in H&S

Table 3 shows that all the respondents agree that there are positive and negative implications for community interventions in H&S.

Table 3: Summary: the implications of community intervention in H&S

Themes	Evidence
• Poor H&S standards	Communities demand to handle H&S means that poor or no H&S occurs. Contractors fail to engage in H&S because of financial demand from communities
• Corruption	Communities divert funds for H&S to private pockets Contractors succumb to community pressure, engaging in unethical practices.
• Positive outcome	Contractors engage in H&S because of community involvement in H&S. H&S awareness is highlighted in the community. Improved relationship between the community and contractor
• Tension between parties	Misunderstanding between contractor and client. Misunderstanding between contractor and community. Conflict between community members.
• Wrong attitudes towards H&S	Communities have a monetary motive for H&S; exploitation Communities view H&S as a medium for developing the community.
• Contextualising H&S regulation	Factoring in the community affairs, security, culture and norms in H&S. Community involvement in H&S Low output due to locals who may work in roles where they lack the competence.
• Increased cost & low output	Increase in construction cost because contractor overemploys just to accommodate the request of community

Following on from Table 3, corruption and the attitude of the community in hindering H&S were emphasised between both analytical groups. Conversely, it appears that contractors that do not always engage in H&S mostly succumb to the pressure from communities and engage in unethical practices (Table 3).

Evidence shows questionable motives of the communities in H&S. For example, one interviewee said:

> *'…these communities do not request for H&S because they have genuine concerns about it. No, they see it as a way of making money. Once they ask for anything under the guise of H&S or cooperate social responsibility, it is not taken lightly'*

While many respondents in both analytical groups support this, another respondent from a multinational triangulates it in terms of completeness and convergence:

> *The communities have a levy for H&S. Recently, I was working on a bid, my boss said I should separate the H&S fee paid to the community from what we allocate for 'workers' H&S'. The community insists and even mounts pressure for H&S, but they do not want us to do it ourselves.* (project manager/civil engineer).

While the quotations show corruption, exploitation, wrong motives for H&S, pretence and compromise, supporting the theme 'wrong attitude towards H&S', there is evidence that in some cases, indigenous contractors do otherwise. Based on the two quotes, it is tempting to logically conclude that the money collected by the communities for H&S is likely going to their private pockets. After all, the communities are not designers or contractors, so how will they manage H&S issues in the projects? If this is the case, just as one of the reviewers asked, 'why do we need community involvement in H&S construction projects?'

Some counter arguments also answer the question. First, while the interviewee stated that the communities view H&S as 'a way of making money', the money may still be used for H&S or (as Dabup (2012) shows) corporate social responsibility (CSR). Indeed, the money can be used to employ independent or local H&S consultants or representatives, as Table 1 shows. Secondly, it is possible that the H&S levy covers the implications of environmental disruptions by multinationals that Dabup (2012) reports, consistent with accounts of Obi (2008). Third, while it is possible that some funds for H&S may be diverted to private pockets, it is naive to conclude that everybody in the communities including leaders will do so. Besides, there are genuine efforts from the communities to support H&S. Based on these arguments and many other points in this paper, it is logical to conclude that the involvement of communities in H&S is still needed but with defined scope and responsibilities, as will be seen in the conclusion of this paper.

Equally important is the relationship between parties in construction projects (Table 3). A few respondents, indigenous but mainly small contractors, report a negative relationship between them and the communities and between them and clients. The response of one is noted, showing the dilemma contractors (especially SMEs) find themselves in:

> *If we agree to the demands of the communities to pay them for H&S, when the client sees no provisions for it, they mount pressure on the company to do that. As a result, the companies will not want to give the communities the money. They prefer to do it themselves but then problems arise. On one project, some of our boys were kidnapped because our company refused to give them the cash for safety. The communities insisted they would put the safety measures, like paying a certain amount to health organisations that will be on ground in case of incidents on site and providing Personal Protective Equipment.. Normally, communities take this money and refuse to do anything. That is why companies refuse to give them this money hence the tension between parties.*

This shows the level of insecurity of contractors, the likelihood that the cost of H&S and construction will be increased. In support, some respondents (manily multinationals and few indigenous) stated or indicated a similar tension between them and the communities, but it does not appear to be a key barrier as they were able to withstand or resolve any tension than those that do not always engage in H&S. This mainly results in loss to the organisation, monetarily, person power and expertise wise.

This supports the theme, increased cost, and shows exploitation and the possibility of lower H&S standards. Noteworthy, some contractors claimed not to withstand the pressure from the communities, resulting in compromising H&S and tension between parties. Table 4 addresses objective 3 and triangulates the findings in Table 3.

Table 4: Results of the survey on the implications of community intervention in H&S

Implications of community interventions in H&S	Yes		Overall	No		Overall	Chi square	Asym P Sig (2-sided)
	UA	RA		UA	RA			
Contractors fail to engage in H&S because of financial demand from communities	23	31	54	12	10	22	.899	.343*
Communities divert funds for H&S to private pocket	15	39	54	20	2	22	25.077	.000
Contractors succumb to community pressure, engaging in unethical practices.	5	33	38	30	8	38	33.101	.000
H&S awareness is highlighted in the community.	17	14	31	18	27	45	1.627	.202*
Improved relationship between the community and contractor	19	9	28	16	32	48	8.484	.004
Misunderstanding between contractor and client.	7	22	29	28	19	47	9.065	.003
Misunderstanding between contractor and community.	6	23	29	29	18	47	12.142	000
Conflict between community members	23	34	57	12	7	19	2.984	.084*
Communities have a monetary motive for H&S.	22	32	54	13	9	22	2.119	.146*
Communities view H&S as a medium for developing the community.	22	29	51	13	12	25	.530	.466*
Factoring in the community affairs, security of the community, culture and norms in H&S.	16	11	27	19	30	49	2.940	.086
Low output due to incompetent locals assuming roles.	15	15	30	20	26	46	.311	.577*
Increase in construction cost because contractor overemploys just to accommodate the request of community	13	22	35	22	19	41	2.073	.150*

Note: Significant at $p \leq .05$; UA = Urban Area; RA = Rural Area.

Of the 13 variables in Table 4, based on overall responses, the Pearson Chi-square test at a significance level of $\leq .05$ showed that there was no statistical association between UA and RA, on seven variables. This means that there is association between UA and RA and the remaining six variables (with no asterisk) in Table 4 (where the p-value is less or equal to .05). It is likely that the locations of the projects influence the six implications of community interventions or that they increase or decrease because of the locations.These factors are not limited to ‘improved relationship

between the community and contractor' and 'misunderstanding between contractor and client' (Table 4).

Discussion

Description of the sample

The profiles of the respondents show socio-economic, socio-cultural and professional backgrounds and strong experiences in H&S and the construction industry. In the interviews, some respondents drew on more than one point of experience. For example, two academics have also worked in projects that communities were involved, hence provided practitioners and academic perspectives and a combination of both. Respondents like this offer rich information in interviews. By implication, it is naive to consider the contribution of the respondents based on only their current designation. If this is the case it can be argued that points of experience of the interviewees are well above 25, the number of interviewees.

Community intervention in H&S

The literature review shows that communities are involved in H&S. This accords with the findings of the current study where there is evidence that community intervention in H&S mainly occurrs in the South South GZ. The South South is in the Niger Delta part of the Country, made up of many oil-producing states.

Importantly, in the current study, community intervention in H&S has no legal backing and is not a structured and planned H&S improvement programme implemented by the government. Nevertheless, a possible explanation for community intervention is the collectivism national culture dimension of Nigeria which literature shows as strong, for example, see Hofstede (2001 and 2014). This may have been exacerbated by the environmental disruptions by multinationals (Dabup 2012), which may make the communities closer. Further, one of the key explanations for the community intervention in H&S may be hinged on exploring the negative aspects of the financial pillar of H&S, a means of making money, and not to save money which companies tend to do, the positive aspect. This is based on the findings of the current study where the communities have wrong motives for engaging in H&S, an avenue for making money and community development. This means that the communities may make all sorts of demands to 'increase the items in the shopping basket' towards a higher 'revenue'.

Communities intervene in H&S in these ways because of the dysfunction and fragmented nature of H&S regulation in Nigeria, which is covered in the introduction and literature review. Just like the Editor of this journal points out, this is in contrast to the UK system where 'the contract is between contractor and employer (client), and its related issues (including H&S) are of no business to anyone else other than relevant (e.g. legislative) authorities'.

The theme 'enforce H&S' in Table 1 shows that the enforcement instruments are violence and non-violence-oriented. They are mainly coercive in nature except for the variable, 'influential and/or wealthy people negotiate or use political influence to ensure H&S in the community' which is a persuasive strategy. It ranks next to the lowest adopted enforcement strategy, 'Communities adopt diabolic means…' (Table 2). There are indications that punishment may be more effective, but this is at the risk of uncontrolled regulatory activities (see enforce H&S in Tables 1–2). Table 2 shows

that of all the enforcement techniques, 'naming and shaming clients and contractors' ranks the lowest overall. However, there is no statistical association between the responses in UA and RA. Studies show that the enforcement strategy, persuasion and cooperation, should be more effective (Hawkins 1990), but others argue for punishment (Pearce and Tombs 1990) or a combination of both (Seljak et al. 2000). They view that each of these is effective. In addressing this debate, Seljak et al. (2000) argue that the context of countries determine the appropriate enforcement strategy.

Critically, Table 2 shows that not all the communities engage in all the activities in each theme on equal measure. It shows that of the 12 community interventions in H&S, there is a relationship between each of the six variables with no asterisk (where the p-value is less or equal to .05) and RA and UA (Table 2). The meaning of this is covered in the results section. Also, some possible explanations for the relationship between RA and UA in terms of the six implications are already covered elsewhere in this paper, for example, the differences between them.

Studies, for example, Windapo and Jegede (2013), show that large contractors (who are mainly multinationals) have a better H&S management system and records. If this is the case, it is logical to wonder why the large contractors will have to negotiate with the communities in terms of adopting and designing H&S measures and procedures, as the study shows. This does not mean that the large contractors had no plans in place for engaging in H&S. Rather, an explanation can be that the communities may have a wrong motive for soliciting H&S, for example, money-making intentions in Table 4.

The findings show the likelihood of geographic locations influencing H&S in Nigeria, a point both consistent and inconsistent with Idoro (2011). A study of 42 contractors in Nigeria in 2006 with scopes of operation as multinational, national, regional and local, perform differently in terms of accident per worker rate but do not perform differently in terms of the other six parameters (Idoro 2011). The parameters are not limited to injuries recorded, injury per worker rate and accident per worker rate. Consequently, Idoro (2011 p167) concludes that 'the findings indicate that the scope of operation of the contractor is not reflected in their occupational H&S performance based on these parameters'. Idoro (2011) goes on to indicate that these contractors with the scope of operations as regional, local and multinational employ the same efforts in terms of H&S. These efforts include the provision of H&S facilities, incentives and compliance with H&S laws.

A possible explanation for the difference between the findings of the current study and Idoro (2011) may include that the exact scopes of operation of five regional and four local contractors in Idoro (2011) were not specified. Thus, it is difficult to distinguish the exact regions or localities in Nigeria, whether they cover Niger Delta region and how many that cover the area. Also, the data collection process in Idoro (2011) tends to have enabled contractors to report on various projects in the whole of 2006 and not on a particular project as the current study does. Also, H&S has emerged since 2006 when the reported study in Idoro (2011) was conducted.

Implications of community intervention in H&S

This includes corruption and wrong attitudes towards H&S (Tables 3 and 4). Here, that the communities view H&S as a money-making medium and divert H&S funds to private pockets may explain a lot of the community interventions in H&S in Tables 1–2. Corruption in H&S and the construction industry is consistent with the findings of Umeokafor (2017) and Teodorescu (2016). Indeed, a Chartered Institute of Building study in 2013 found that 48 per cent of the respondents view that corruption is commonplace in the UK construction industry (Teodorescu 2016). Umeokafor (2017) found that corruption ranks 2nd of the 20 barriers examined in Nigeria but with differences between the views of clients and consultants.

Counter arguments may stem from examining the possible excuses of the communities, their justifications for their actions. Drawing on common knowledge in Nigeria, the communities may argue that the premise in the preceding paragraph does not constitute corrupt practices because it is little compared to what people in the higher echelons of power do. This is more about the redefinition of corruption by Nigerians — 'The National Cake' — the perceived entitlement of every Nigerian to embezzle the national wealth. The communities can also argue that the Niger Delta is the major source of revenue in Nigeria, oil and gas; hence, all its proceeds are their right. Besides, they are unable to farm, fish and source clean water because of environmental destruction such as oil spill, as Dabup (2012) show. Dabup (2012) goes on to demonstrate that the Niger Delta communities view that they are marginalised and multinationals disregard them, failing to address the destruction of the environment and the improper laying of oil pipes which pose H&S risks to the community. These grievances result in tension between the communities and companies, consistent with the findings in Tables 3 and 4.

Studies found improvements in H&S due to community involvement, for example, Forst et al. (2013), Klassen et al. (2000). This is consistent with three of the 13 implications of community intervention in H&S (Tables 3-4). They are 'H&S awareness is highlighted in the community' and 'improved relationships between communities and contractors', 'factoring in community affairs, their security, culture and norms in H&S'. Also, it suggests that community intervention that is based on geographic community definition can also result in improvement of H&S. This is in contrast with the findings of Coggan et al. (2000) and Nilsen (2006), which found that H&S programmes failed because of the heterogeneous nature of the communities. Also, see Nielsen (2004) for the implications of the geographic community for H&S.

Possible explanations for the positive implications of community intervention in H&S are noted elsewhere in this paper where the collectivism national cultural dimension of Nigeria has the potential of supporting H&S. Also, community interventions in H&S are not based on structured H&S programme(s).

Conversely, the remaining 10 of the 13 variables in Table 4 are H&S constraining implications. Of the 10 implications, RA projects show higher values than UA projects in all but one variable, 'low output due to incompetent locals assuming roles'. Further, a relationship exists between four of the constraining implications of H&S (with no asterisk where the p-value $\leq$ to .05) and RA and UA. The meaning of this is covered in the results section.

Furthermore, other implications in Tables 3 and 4 such as the tension between communities and contractors are reported in Dabup (2012) where communities in Niger Delta clash with multinational oil companies for various reasons resulting in, among many, shutting down oil wells.

Conclusions

The study has established and assessed the contributions of communities in safety, health and the environment—the scope of the research—, explored and explained its implications and assessed the impact. It reveals 12 constraining and facilitating variables of community interventions in H&S, for example communities 'sabotage construction works through workers from locality'. Of the variables, there are relationships between six and the locations of the projects, UA and RA. Among the six variables are 'communities insisting that contractors adopt H&S measures', and 'communities stipulating that contractors involve local H&S consultants/officer'. Community intervention in H&S results in 13 H&S enhancing and constraining implications such as 'communities diverting funds for H&S to private pocket', and 'improved relationship between the community and contractor'. Of the 13 implications, there was a relationship between seven and UA and RA. Based on the findings of the study, it is logical to conclude that community intervention in H&S is dominant in a particular geographic location of Nigeria, South South GZ. By implication, in Nigeria, geographic locations are likely to determine H&S activities, performance and even attitudes.

The practical implications of the research include that in adequately addressing safety, health and environmental issues in Nigeria, the location of the projects and the ability of communities to influence the behaviours of contractors should be significantly considered in policymaking and allocation of funds for H&S, a point for policymakers and the entire construction industry. Typically, in terms of policymaking, the research implies that a 'one policy for RA and UA' system may be unrealistic or impracticable. Further implications include the need for the early consideration of the influence of the communities in the design, procurement and planning and approval stages. Above all, communities, policymakers, contractors, H&S personnel and academics are now aware of the ability of communities to influence H&S and the implications—a potential which can be prudently exploited. Scoping the study to the international community or readers, the study can be a contrasting standard for countries with H&S programmes that are successful. Although the evidence is from Nigeria, the study have implications for understanding community or social group involvement in H&S in developing countries. Kheni et al. (2010) demonstrate that developing countries have a lot in common in terms of the construction process, cultural environment, technology and even regulatory environment.

Based on all covered in this paper, practical recommendations are noted. Firstly, as literature review and the findings of the current study show the impact of geographic location on H&S, policymakers, principal/large contractors and academics should consider this in H&S-related activities. This could include accommodating the geographic differences in policies where, for example, there are RA-tailored H&S programmes. Secondly, as the findings of the study indicate that the collectivism cultural dimension is a primary factor for H&S and literature review supports this, it

is logical to recommend that policymakers give community leaders more responsibilities in protecting the contractors through controlling the activities of the communities. This may address or alleviate the exploitation of contractors, which result in corrupt activities and higher construction cost. While this may sound naive in terms of addressing corruption given its extent in Nigeria, a more transparent procurement framework which involves community leaders at the early stage may be helpful. The point here is that the ability of the community leaders to command respect and mobilise their subjects can be used to the advantage of H&S. Although the motives may be different, the community spirit is evident. Thirdly, policymakers should involve the communities in the development of H&S policies, for example through consultation, giving them a sense of belonging and ownership. Other roles may include officially allocating whistleblowing responsibilities to community leaders but with financial incentives.

Just like other studies, the current study has limitations. Firstly, the definition of community in the current study is geographic hence should inform the interpretation of the results. It is possible that if the definition of community is 'non-geographic' or include it, the findings of the study may be different. Hence, further studies are recommended in that regard. Secondly, separating communities into smaller units instead of grouping them into one unit despite the differences in languages, cultures, and belief may have produced different results. In contrast, it should be noted that these communities have a lot in common, collectivism cultural dimension, which is core in explaining community involvement in programmes including H&S. Further research is recommended on the relationship or impact of the scope of projects, for example, oil and gas and civil engineering, on the involvement of the communities in H&S.

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