ASSESSING THE KNOWLEDGE AND AWARENESS LEVEL OF BUILT ENVIRNMENT PROFESSTIONALS IN NIGERIA

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Abstract

Nigeria is a developing country with active construction activities. The built environment and buildings in particular are major contributors of carbon emissions leading to climate change. Furthermore, there is limited data in the Sub-Saharan region on the subject of climate change and buildings. Also, Nigeria's carbon emission data from buildings remains unknown. This study focuses on the awareness and knowledge of design professionals on the subject of climate change and buildings, in order to promote the sustainability of the built environment. A questionnaire survey and face-to-face interviews were carried out between May and September, 2013 provided the data for this study. A total of 283 participants were involved across the three identified climatic regions in Nigeria. Findings suggest that (1) there is low level of knowledge on the relationship between climate change and buildings. (2) Knowledge and information amongst the built environment professionals in Nigeria on climate and buildings have statistical significance relationship. (3) Participants are interested in knowing more on the subject of climate and buildings. This study suggests and recommends that, assessing the knowledge, information and interest of stakeholders is a key factor for promoting sustainable practices and its applications by these practitioners.

Keywords: climate change, built environment, Nigeria, sustainable buildings.

1. Introduction

Like many developing countries, Nigeria has an active construction sector. Construction activities in the developing countries have been on the increase in the last decade (Arif et al, 2009; Mu'azu, 2011). Buildings constitute the major aspects of the built environment (Otegbulu et al, 2011) and buildings have also been identified as the major contributors of ghg causing the effects of climate change globally (Altomonte, 2008; Berrang-Ford et al, 2011; Janda, 2011). While residential buildings are the most carbon emitters in this regard (UNEP, 2009; Architecture 2030, 2012). Furthermore, currently in Nigeria there is a housing deficitof about 40 million houses (Ademiluyi, 2010; Ogu and Ogbuozobe, 2011).Inaction is therefore not a desirable option for the construction sector in Nigeria.

Although, the construction sector has been noted as a major contributor to climate change, yet it has also been observed to have huge potentials for the mitigation and adaptation to the challenges of climate change (IPCC, 2007; Alkadiri et al, 2012; Jagger et al, 2013). These premises further motivate the investigations in this study.

Achieving sustainability through this sector includes; early building design strategies, sustainable construction and collaborations amongst the built environment professionals (Coley and Lemon, 2006; Janda, 2010; Ebohon, 2011; Alkadiri et al, 2012). However, the design of new buildings is central to achieving sustainability in the built environment Roberts (2008); Robert and Kummert (2011) cited in Allu et al. (2013). This has been argued further by the study of Conejos et al. (2013) who opined that the use of strategic design tools for new buildings would reduce carbon emissions. While Butt (2010) opined that all activities within the built environment must be tied to sustainability. The opinions expressed in this section are therefore, necessary for any strategic action to be employed in order to ensure the sustainability of the built environment.

Deciding on any strategic action for the built environment also requires the involvement of the built environment professionals as stakeholders. According to Sherman and Ford (2013) it is important for research on the built environment to access the knowledge, views and interest of professionals in order to promote effective collaborations and implementations on the subject research. This study looks at how the built environment professionals and especially the design professionals in Nigeria are able to design out negative design features that contribute to climate change. Thus, promoting the production of sustainable new buildings to fill the present housing deficit and at the same time enhance the sustainability of the built environment in Nigeria.

Firstly, a concurrent embedded strategy was employed as follows: (1) the literature reviews provided; the study context, the secondary data and the underpinning concept for the development of a framework. Primary data were derived from both quantitative and qualitative methods; questionnaire survey and face-to-face interviews were the investigation tools. Secondly, data analysis, descriptive interpretations and statistical tests revealed the research findings. Finally, a framework is developed to promote collaborative initiative for

sustainable detain guide and recommendations are also suggested for practitioners and for future research areas.

2. Literature review

2.1 Climate change and buildings

Two way relationships between climate change and buildings have been established. Buildings are the main sources and emitters of carbon causing climate change (UNEP, 2009; Janda, 2011), contributing about 50% of the global carbon emissions (Robert and Kumbert, 2011). Following these assertions it is inferable to suggest that finding solutions from buildings is solving half the problems associated with climate change. Similarly, alsobuildings have been noted to be the vulnerable to the impacts of climate change (UN Habitat, 2007; William et al, 2012). Studies have also noted that the magnitude and type of climate change impacts on the environment usually depends on the location (Perez, 2009; Dudley et al, 2010). Thus, these scenarios are the background premises for this investigative study.

The arguments therein, on the relationship between climate change and buildings are threefold. Firstly, is for buildings to be sustainable (Altomonte, 2008; Radhi, 2009; Bond, 2011). Secondly, is to ensure that stakeholders who are also practitioners are knowledgeable and committed to ensuring that buildings are sustainable (Beak, 2011; Bond, 2011; Zubairu, 2012; Ebohon et al, 2013). Thirdly, is to access and improve the ability of practitioners to engage and apply sustainable professional practices (Emuzie et al, 2013). However, in the developing countries of the Sub-Saharan Africa, the sustainability of buildings has not been mainstreamed into its active building sector (Twumasi, 2005; Onyekuru and Marchant, 2012). This study looks at the Nigerian context and discusses the implications of its findings.

2.2 The study context

Nigeria located in West Africa of the sub-Saharan African. The country has an annual population growth of 3 per cent with the current population at178million; Nigeria is also the sixth most populated nation and the most populated African country making Nigeria (UNDP, 2010; National Population Commission, 2012; World Gazetteer, 2014). Nigeria's population probably explains its huge yearly housing deficit highlighted in the introduction. Also the housing sector in the Sub-Saharan Africa consumes more than 90% of all energy use (Earth Trends, 2005).No known current data for Nigeria has been established and this only confirms the assertions of (Laryea, 2011; De Wilde and Coley 2012) who noted the lack of research activities on climate change and buildings in the West African region. Hence, this study is a contribution to knowledge borne out of necessity.

Climate change is evident in Nigeria and its impacts are on the increase. This statement has a bearing with the quotation below:

> *"Climate change is already having an impact in Nigeria. Weather-related disasters have become more frequent in the past four decades and the trend continues".*

(National Adaptation Strategy and Plan of Action on Climate Change for Nigeria (NASPA-CCN), 2012, p.1)

The quotation above also shows that Nigeria has not been an exemption to the challenges of climate being experienced globally and that the trend is on-going. Nigeria has six geo-political regions and the country lays between 4°N and 14°N and between 3°E and 15°Eas shown in Figure 1. Nigeria is divided into 36 states for administrative purposes. There are also three climatic regions; Highland Climate region (HCR), Tropical Savannah Climate region (TSC) and the Tropical Rainforest Climate region (TRC).

Figure 1 Map of Nigeria showing location latitudes and longitudes
Source: http://www.infoplease.com/atlas/country/nigeria.html (Accessed 2/3/2012).

These latitudinal and longitudinal divide also has a bearing on the differences on the Nigerian climate (Paehler, 2007) and the impacts of climate change across the regions (Obioha, 2008; Odjubo, 2010; Sayne, 2011). Despite the evidences and impacts of climate change in Nigeria, there are opinions expressed that indicate that little have been done by the government to tackle climate change problems (Ademiluyi, 2010; Sayne, 2011; Pat-Mbano et al, 2011; Onyekuru and Marchant, 2012). Furthermore, the reasons for these inactivity are associated with; high level poverty, limited technical expertise, insufficient funds, other competing problems (electricity and water supply), limited information, lack of political will and data (Sayne, 2011; Onyekuru and Marchant, 2012; Ogbo et al, 2013). In the ensuring of changing the status quo and the seemly unending challenges of climate change, it is necessary to start solution seeking initiative by beginning with research studies. Thereafter, findings can be used to argue for and proffer solutions.

In the overall, the discussions and observations therein suggest that there are evidences of climate and that, the impacts of climate are not the same across all regions in Nigeria. These observations suggest that findings from the Nigerian context would be applicable to other contexts with a similar scenario.

3. Research methodology

3.1 Research Design

The study was targeted at the built environment professionals and therefore, a purposive sampling technique was used to select the research participants across the three climatic regions in Nigeria.

A survey methodology was adapted for this study. The main objective for this study is; 'to assess the knowledge, information and interest of built environment professionals on climate change and buildings.' The research question is; what knowledge, information and interest do the design professionals have and how these reflect on their practices?' Literature review provided the underpinning theoretical premise for the study, as well as the main sources of secondary data. Questionnaires survey and face-to-face interviews provided the sources of the study's primary data.

3.2 Methods and data collection

Self-filled questionnaire were distributed to the selected design professionals. The questionnaire was designed with a four-point Likert scale; strongly agreed, agreed, disagree and strongly disagree. Participants gave their opinions on the following questions;

- Iam well knowledgeable on the relationship between climate change and buildings
- There is adequate information on climate change and buildings in Nigeria
- I am interested in knowing more about climate change and residential buildings

Also, in order to verify and validate the theoretical construct which suggests that, there are evidences and impacts of climate change across the different regions of Nigeria. The following questions were also asked;

- Erosion is the most threatening impact of climate change in my region
- Drought/desertification is the most threatening impact of climate change in my region
- Flooding is the most threatening impact of climate change in my region
- Windstorm is the most threatening impact of climate change in my region
- Temperature increase is the most threatening impact of climate change in my region

The interviews involved the following built environment professionals; Architects, Builders, Engineers and Planners. All interviews lasted between 20 to 30 minutes and the following questions were asked:

- Do you think the built environment professionals have adequate knowledge and information on climate change and buildings? If no, what are your suggestions for improvement?
- What are in your opinion the main impacts of climate change on residential buildings in your climate region?
- Are you interested in knowing more about climate change and buildings

Table 1 shows how the 36 states are distributed in the climatic regions and the states covered by the research survey.

Table 1 showing climate types, states and survey coverage areas

Climate type	States	Survey locations
Tropical savannah	Benue, Federal Capital, Kogi, Kwara, Nasarawa, Niger, Plateau,	Federal Capital, Nasarawa,
	Adamawa, Borno, Bauchi, Gombe, Taraba and Yobe,	Taraba, Gombe,
	Jigawa, Kaduna, Kano, Katsina, Kebbi, Sokoto, Zamfara	Kano, Kaduna,
Tropical rainforest (Monsoon)	Abia, Akwa-Ibom, Anambra, Enugu, Imo,	Akwa-Ibom, Imo
	Bayelsa, , Delta, Ebonyi, Edo and Rivers	Delta and Edo
	Ekiti, Lagos, Ogun, Ondo, Osun, Oyo	Lagos and Ondo
Highland climate (Alpine)	No entire state falls in this category 1. Taraba= MambilaPlateau areas. 2.Cross-Rivers= Obudu Mountains areas 3.Plateau state=Jos Plateau areas	-Jos Plateau, -Mambila Plateau and -Obudu Mountains areas

Source: Researcher's field survey, 2013

3.3 Data analysis

The Statistical Package for the Social Sciences (SPSS) software was used both the descriptive and the statistical Test analyses carried out. Results are presented in Tabular and Bar Charts. A total of 315 questionnaires were administered in three sets of 105 to each of the three climatic regions in Nigeria. Only 283 were correctly filled and collated, the regional response rate as 97%, 85% and 88% for the HCR, TSC and the TRC regions respectively, while the overall response rate is therefore 87%. These details are presented in Table 2.

Table 2 Response rate for quantitative survey

Climate Type	Number of questionnaire distributed	Number of questionnaire returned	Percentage of response
Tropical rainforest	105	92	87%
Tropical savannah	105	89	84%
Highland	105	103	97%

Total /Overall response rate	315	283	89%

Source: Researcher's field survey, 2013

The interviews involved the selected professions (Architects, Builders, Engineers and Planners) who practitioners in the academics, private and the public service and the breakdown of these practitioners are presented in Table 3.

Table 3 interviewees' character and coverage across climate types and zones

Climate type	**Number of participants**	**Practice location (state)**	**Profession Architects(A)Builders(B) Engineers(E) Planners (P)**	**Practice type (Academics=A, Private=P, Public=U)**			**Years of experience**	**Gender (Female=F, Male=M)**	
								F	M
Tropical rain forest	10	Delta, Lagos and Enugu states	A=4,B=3, E=3,P=3	A=4	P=2	U=4	10-30	3=30%	7=70%
Tropical savannah	10	Federal Capital (Abuja), Gombe and kano states	A=3,B=4, E=3,P=3	A=3	P=3	U=4	10-30	1=10%	9=90%
Highland	10	Plateau, Adamawa&Cross Rivers	A=3,B=3 E=3,P=4	A=4	P=3	P=3	10-30	3=30%	7=70%

Source: Author's arrangement, 2013

Table 3 shows that a total of 30 interviewees were interviewed and the spread across the climatic region with each region having 10 interviewees.

4. Findings from questionnaire survey

According to Sherman and Ford (2013) and Lorenzoni et al. (2007) who in their different studies on the built environment and climate change suggested that investigations are necessary on the participants' knowledge, information and interest on the subject. Tables 4, 5 and 6 present the findings of these design professionals who from the three climate regions.

Table 5 shows that only 88%, 71% and 81% of the participants from the HCR, TSC and TRC respectively are not in agreement that they are well knowledgeable on the relationship between climate change and buildings. On the other end 11%, 29% and 16% of the participants are well are knowledgeable. This is an indication that the level of awareness on this subject is quite low.

Table 5 knowledge

I am well knowledgeable on the relationship between climate change and buildings

REGION			Frequency	Percent	Valid Percent	Cumulative Percent
Highland (Alpine)	Valid	Strongly Disagree	1	1.0	1.0	1.0
		Disagree	89	87.3	87.3	88.2
		Agreed	10	9.8	9.8	98.0
		Strongly Agreed	2	2.0	2.0	100.0
		Total	102	100.0	100.0	
Tropical Savannah	Valid	Disagree	63	70.8	70.8	70.8
		Agreed	22	24.7	24.7	95.5
		Strongly Agreed	4	4.5	4.5	100.0
		Total	89	100.0	100.0	
Tropical Rainforest	Valid	Strongly Disagree	55	59.8	59.8	59.8
		Disagree	22	23.9	23.9	83.7
		Agreed	11	12.0	12.0	95.7
		Strongly Agreed	4	4.3	4.3	100.0
		Total	92	100.0	100.0	

In Table 6 the results revealed that: 71%, 76% and 66% from the HCR, TSC and TRC participants do not agree that there is adequate information on the subject of climate change and buildings in Nigeria. While the remaining; 29%, 24% and 34% are in agreement with the statement on information.

Table 6 Information

There is adequate information on climate change and buildings in Nigeria

REGION			Frequency	Percent	Valid Percent	Cumulative Percent
Highland (Alpine)	Valid	Strongly Disagree	5	4.9	4.9	4.9
		Disagree	68	66.7	66.7	71.6
		Agreed	21	20.6	20.6	92.2
		Strongly Agreed	8	7.8	7.8	100.0
		Total	102	100.0	100.0	
Tropical Savannah	Valid	Strongly Disagree	7	7.9	7.9	7.9

		Disagree	62	69.7	69.7	77.5
		Agreed	14	15.7	15.7	93.3
		Strongly Agreed	6	6.7	6.7	100.0
		Total	89	100.0	100.0	
Tropical Rainforest	Valid	Strongly Disagree	35	38.0	38.0	38.0
		Disagree	26	28.3	28.3	66.3
		Agreed	11	12.0	12.0	78.3
		Strongly Agreed	20	21.7	21.7	100.0
		Total	92	100.0	100.0	

Table 7 I am interested in knowing more about climate change and residential buildings

I am interested in knowing more about climate change and residential buildings

REGION			Frequency	Percent	Valid Percent	Cumulative Percent
Highland (Alpine)	Valid	Disagree	3	2.9	2.9	2.9
		Agreed	67	65.7	65.7	68.6
		Strongly Agreed	32	31.4	31.4	100.0
		Total	102	100.0	100.0	
Tropical Savannah	Valid	Agreed	48	53.9	53.9	53.9
		Strongly Agreed	41	46.1	46.1	100.0
		Total	89	100.0	100.0	
Tropical Rainforest	Valid	Disagree	2	2.2	2.2	2.2
		Agreed	4	4.3	4.3	6.5
		Strongly Agreed	86	93.5	93.5	100.0
		Total	92	100.0	100.0	

The results from Table 7 on the interest of the participants on climate change and buildings shows that there is an overwhelming interest on the subject as follows; in the HCR 96% of participants are interested. 100% of the participants are interested in the subject and 97% of the participants from the TRC are also interested.

Table 8 Spearman's correlation for knowledge (v1), information (v2) and interest (3) according to regions

Correlations

REGION				V6	V7	V8
Highland (Alpine)	Spearman's rho	V1	Correlation Coefficient	1.000	.249*	.463**

			Sig. (2-tailed)	.	.012	.000
			N	102	102	102
			Correlation Coefficient	.249*	1.000	.630**
		V2	Sig. (2-tailed)	.012	.	.000
			N	102	102	102
			Correlation Coefficient	.463**	.630**	1.000
		V3	Sig. (2-tailed)	.000	.000	.
			N	102	102	102
			Correlation Coefficient	1.000	.789**	.690**
		V1	Sig. (2-tailed)	.	.000	.000
			N	89	89	89
			Correlation Coefficient	.789**	1.000	.599**
Tropical Savannah	Spearman's rho	V2	Sig. (2-tailed)	.000	.	.000
			N	89	89	89
			Correlation Coefficient	.690**	.599**	1.000
		V3	Sig. (2-tailed)	.000	.000	.
			N	89	89	89
			Correlation Coefficient	1.000	.862**	.209*
		V1	Sig. (2-tailed)	.	.000	.045
			N	92	92	92
			Correlation Coefficient	.862**	1.000	.297**
Tropical Rainforest	Spearman's rho	V2	Sig. (2-tailed)	.000	.	.004
			N	92	92	92
			Correlation Coefficient	.209*	.297**	1.000
		V3	Sig. (2-tailed)	.045	.004	.
			N	92	92	92

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

The Spearman's Rank Order Correlation Test provided the study with the strength and direction of relationship between variables v1, v2 and v3. 95% is the assumed confidence level, with 0.05 levels of confidence and at 0.000 significance (p) level.

The result of the correlation test on Table 8 shows the following:

HCR - a correlation coefficient (r) of 0.249, 0.463, 0.630 and significance (p) at 0.012, 0.000 and 0.000 for v1 verses v2, v1 verses v3 and v2 verses v3. There is a positive but weak relationship (at 0.249) for v1 and v2, but a strong correlation relationship between the variables (v1 and v3, v2 and v3) with 0.463 and 0.630 values.

TSC region - r = 0.789 with p at 0.000 for variables v1 and v2, r of 0.690 with p at 0.000 for variables v1 and v3, also r of 0.862 with p at 0.000 for variables v2 and v3. The results revealed that all variables have positive and significantly strong relationships.

TRC region - r = 0.862 with p at 0.000 for variables v1 verses v2, r = 0.209 with p at 0.000 for variable v1 versus v3, r = 0.297 with p at 0.000 for variable v2 and v3. This result also shows a positive and significant level of relationship between all variables.

The overall results from Table 8 suggest statistical significant relationship amongst all variables. Although, the limited information and knowledge level on climate change in Nigeria, participants are very interested in the subject, which suggest a huge potential for future improvement. Earlier assertions from literature review are thus, validated.

All participants also strongly agree across all climate regions that they have observed the impacts of climate change on buildings. Participants were asked to indicate which of the five variables (erosion, draught, flooding, windstorm and temperature increase) in their experiences is the most threatening impacts in their climatic region. The results obtained are presented in Tables 9, 10, 11, 12 and 13.

From Table 9 the results shows that 39%, 78% and 99% participants from HCR, TSC and TRC regions respectively are in agreement that erosion is the most threating impacts of climate change in their region. These results show that although all regions are affected, the HCR is the least affected while the TRC region is the most affected.

Drought/ desertification as shown in Table 10 have the following agreement result: HCR has 3% agreement, TSC has 54% agreement and the TRC region has 0% agreement. This result for the TSC shows that drought/ desertification is evident in the region however, it is noted that because the questionnaire cuts across different states, the agreement were mainly from the north eastern states covered.

Table 11 revealed that flooding is an impact that also affects all the regions with 99%, 86% and 99% for HCR, TSC and TRC climatic regions respectively. In the case of windstorm the findings from Table 12 are; 34%, 69% and 34% for the HCR, TSC and TRC respectively. The HCR region seems to experience more of the windstorm effect than the other two regions where the impact of windstorm is less than average.

Temperature increase is the main climate change impact that is being felt regardless of the region as was indicated by the 99% agreement level from all three regions. In general the results from Tables 9 to 13show that except for temperature increase, there are differences on the type and level impacts felt at the different climatic regions in Nigeria.

Table 9 Erosion (v9)

Erosion is the most threatening impact of climate change in my region

REGION			Frequency	Percent	Valid Percent	Cumulative Percent
Highland (Alpine)	Valid	Disagree	62	60.8	60.8	60.8
		Agreed	33	32.4	32.4	93.1
		Strongly Agreed	7	6.9	6.9	100.0
		Total	102	100.0	100.0	
Tropical Savannah	Valid	Disagree	20	22.5	22.5	22.5
		Agreed	39	43.8	43.8	66.3
		Strongly Agreed	30	33.7	33.7	100.0
		Total	89	100.0	100.0	
Tropical Rainforest	Valid	Agreed	3	3.3	3.3	3.3
		Strongly Agreed	89	96.7	96.7	100.0
		Total	92	100.0	100.0	

Table 10 Drought/desertification

Drought/desertification is the most threatening impact of climate change in my region

REGION			Frequency	Percent	Valid Percent	Cumulative Percent
Highland (Alpine)	Valid	Strongly Disagree	8	7.8	7.8	7.8
		Disagree	91	89.2	89.2	97.1
		Agreed	3	2.9	2.9	100.0
		Total	102	100.0	100.0	
Tropical Savannah	Valid	Disagree	41	46.1	46.1	46.1
		Agreed	27	30.3	30.3	76.4
		Strongly Agreed	21	23.6	23.6	100.0
		Total	89	100.0	100.0	
Tropical Rainforest	Valid	Strongly Disagree	91	98.9	98.9	98.9

		Disagree	1	1.1	1.1	100.0
		Total	92	100.0	100.0	

Table 11 Flooding

Flooding is the most threatening impact of climate change in my region

REGION			Frequency	Percent	Valid Percent	Cumulative Percent
Highland (Alpine)	Valid	Disagree	1	1.0	1.0	1.0
		Agreed	32	31.4	31.4	32.4
		Strongly Agreed	69	67.6	67.6	100.0
		Total	102	100.0	100.0	
Tropical Savannah	Valid	Disagree	12	13.5	13.5	13.5
		Agreed	38	42.7	42.7	56.2
		Strongly Agreed	39	43.8	43.8	100.0
		Total	89	100.0	100.0	
Tropical Rainforest	Valid	Disagree	1	1.1	1.1	1.1
		Agreed	2	2.2	2.2	3.3
		Strongly Agreed	89	96.7	96.7	100.0
		Total	92	100.0	100.0	

Table 12 Windstorm

Windstorm is the most threatening impact of climate change in my region

REGION			Frequency	Percent	Valid Percent	Cumulative Percent
Highland (Alpine)	Valid	Strongly Disagree	9	8.8	8.8	8.8
		Disagree	58	56.9	56.9	65.7
		Agreed	23	22.5	22.5	88.2
		Strongly Agreed	12	11.8	11.8	100.0
		Total	102	100.0	100.0	
Tropical Savannah	Valid	Strongly Disagree	4	4.5	4.5	4.5
		Disagree	24	27.0	27.0	31.5
		Agreed	20	22.5	22.5	53.9
		Strongly Agreed	41	46.1	46.1	100.0

		Total	89	100.0	100.0	
Tropical Rainforest	Valid	Strongly Disagree	1	1.1	1.1	1.1
		Disagree	60	65.2	65.2	66.3
		Agreed	29	31.5	31.5	97.8
		Strongly Agreed	2	2.2	2.2	100.0
		Total	92	100.0	100.0	

Table 13 Temperature increase

Temperature increase is the most threatening impact of climate change in my region

REGION			Frequency	Percent	Valid Percent	Cumulative Percent
Highland (Alpine)	Valid	Disagree	1	1.0	1.0	1.0
		Agreed	29	28.4	28.4	29.4
		Strongly Agreed	72	70.6	70.6	100.0
		Total	102	100.0	100.0	
Tropical Savannah	Valid	Disagree	1	1.1	1.1	1.1
		Agreed	26	29.2	29.2	30.3
		Strongly Agreed	62	69.7	69.7	100.0
		Total	89	100.0	100.0	
Tropical Rainforest	Valid	Agreed	18	19.6	19.6	19.6
		Strongly Agreed	74	80.4	80.4	100.0
		Total	92	100.0	100.0	

5. Findings from face-to-face interviews

Like the quantitative findings all 30 interviewees agreed that they do not believe that there is adequate knowledge of climate change and buildings amongst the built environment professionals in Nigeria. In the same manner the interviewees also overwhelmingly agreed that climate change is happening but at different levels of impacts across the three regions. Some selected verbatim responses are presented

5.1 Responses on knowledge, information and interests

"Definitely I would say no to your question but I also do know that every professional needs to be interested in the current happening of climate change. As it is the negative impacts of

climate change is now evident everywhere and affecting everyone, so we have to be interested in knowing and acquiring more information on climate change and buildings."

"I am not even aware that climate change is also caused by buildings, I actually thought it is mainly caused by industrial waste, like gas flaring and other industrial fumes."

"Knowledge may be relative but I am of the opinion that there is very low level of knowledge and especially on information because when I am interested on information it is very costly to obtain it, due to the erratic electricity supply in Nigeria….But I am interested in knowing more in order to keep myself relevant to the current happenings in regards to my professional practice and humanity."

From the selected narrative it is obvious that these professionals may not have all the knowledge necessary but are futuristic in the opinions and therefore are interested to change the status quo, in order to improve on the professional practices.

5.2 Responses on the evidence of climate change impacts

…"We here have been experiencing an increase in flooding occurrences in some communities of Gombe State and desert encroachment in the Borno and Yobe States areas although we are all within the same savannah of Nigeria."

"…temperature increase is a definitely obvious, because in the last two years the cold harmattan winds of Jos is no longer the same, we do not feel it much again and even the two or months that the harmattan usually last now barely last a month. So the climate is changing I must say."

Just like the above responses, other interviewees' opinions are expressed in a similar manner across all the three climatic regions. These natives also agree with the findings from the questionnaire survey carried out.

6. Conclusions

In all three regions opinions expressed are similar on awareness level and evidence of climate change for all surveys. However, there are no agreements on particular climatic impacts across the three regions and even in the TSC region opinions were divided on the choice of draught as the most threatening impact for the regions. The study has established that the level the level of awareness on climate change and buildings amongst the built environment professionals does not match the impacts of climate change and so therefore there is gap and most definitely, there future of new buildings and climate change is hanging on the balance. However, the professionals seem open and willing to take up the changelings of acquiring additional practices in order to improve their future practices. Effective collaborations are therefore, necessary to engage these professionals in continuous development trainings through their professional bodies. This is achievable in organised conferences, workshops and seminars.

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