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DEVELOPING A CONCEPTUAL MODEL FOR ANTECEDENTS OF RESISTANCE TO CHANGE TOWARDS SUSTAINABLE CONSTRUCTION PRACTICES

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ABSTRACT

This study developed a conceptual model of antecedents of resistance to change behaviours among construction professionals and contractors towards sustainable construction practices in Nigeria. Survey data gathered through a questionnaire were analysed with the aid of Statistical Package for the Social Science (SPSS) Software. Pearson Product Moment Correlation (r) and correlation significance test results revealed that human (r=0.973; p<.05), industry (r=0.996; p<.05), environment (r=0.984; p<.05), and policy (r=0.932; p<.05) factors were very strongly positively associated with resistance to change behaviours. Subsequently, a conceptual model of antecedents of resistance to change behaviours towards sustainable construction practices in Nigeria was empirically established. The correlation coefficient of determination result revealed that the direct effects of the conceptual model accounted for 94.67% of the variance in human factors, 99.20% of the variance in industry factors, 96.83% of the variance in environment factors, and 86.86% of the variance in policy factors. This suggested that professionals and contractors' responses to change and resistance to change behaviours are accounting for a substantial proportion of the variance in any effort towards implementation of sustainable construction practices in Nigeria. Furthermore, this study highlighted the importance of multi-dimensionality of resistance to change and suggested that construction stakeholders should take note of these factors instead of general assumption where people tend to make judgments, based on observable behaviours. Finally, it recommended for rejuvenation of construction industry policies and integration of these factors that trigger behavioural resistance by the professionals and contractors in the sustainable construction practices policy intervention in Nigeria.

Contribution/Originality: This study contributed to the emerging literature on rethinking the resistance to change behaviours of construction stakeholders from different perspectives, and particularly sustainable construction practices in Nigeria through empirical evidence based on conceptual model. It also provided theoretical support to antecedents of resistance to change behaviour towards sustainable construction practices.

1. INTRODUCTION

In the last half century, human efforts towards maintaining balance in the ecosystem has yielded minimal results. Addressing these challenges requires a new strategy that will create economically and ecologically

sustainable products and services (York, Vedula, & Lenox, 2018). As an emerging guiding paradigm, sustainability is made to create a new kind of built environment that meets the needs of human in the present without compromising the ability of future generation to meet their own needs (World Commission on Environment and Development, 1987). Experiences of sustainable construction have equally shown that both a social and a technical change are required (Albino & Berardi, 2012). Van Hal and Van Bueren (2011) agreed that sustainable urban development requires change of both physical and social systems of built environment. However, in spite of numerous legislative and social pressures to increase the resource-friendliness of the built environment, many construction organisations and stakeholders continue to operate in a business-as-usual manner, thereby failing to realise the potential advantages of taking a proactive approach to sustainable construction practices (Venegas & Pearce, 2000). Many studies have also affirmed that construction practices have generally refused to change or rather change at a very slow pace regardless of numerous changes that have swept across the construction management practices (Bonanomi, Paganin, & Talamo, 2016; Erdogan, Anumba, Bouchlaghem, & Nielsen, 2005; Wong, Whelan, & Holdsworth, 2018). The reason is not farfetched. The construction industry is a unique organisation that requires special strategy in its operation and practice. Thus, a high rate of resistance to change (Harich, Bangerter, & Durlacher, 2012) which is the tendency for a system to continue its current behaviour despite the application of force to change that behaviour (Harich, 2010).

In the construction industry and practice however, this problem is very pronounced and a key to sustainable construction implementation (Ametepey, Aigbavboa, & Ansah, 2015; Pham, Kim, & Luu, 2020; Powmya & Abidin, 2014). Harich. et al. (2012) challenged the essence of human system resistance to changes from an unsustainable to a sustainable behaviour. Thus, successful implementation of new processes for procuring, contracting, and managing sustainable construction project itself, requires a concerted change management effort for owners of architectural, engineering, and construction industry (Erdogan et al., 2005; Lines., Sullivan, Smithwick, & Mischung, 2015). Ametepey et al. (2015) indicated that construction industry has been operated in a particular traditional style for a long period of time, and it is very difficult to change especially with respect to construction methods and the use of materials. Consequently, resistance to change is recognised as a key barrier to implementation of sustainable construction practices (Al Amri & Marey-Pérez, 2020; Djokoto, Dadzie, & Ohemeng-Ababio, 2014; Olowosile, Oke, & Aigbavboa, 2019; Wong et al., 2018). For example, Alomari, Gambatese, and Anderson (2017) found that resistant culture in construction firms is one of the shortcomings of using Building Information Modelling (BIM). In addition, loath to implementing sustainable construction practices by the construction stakeholders is usually demonstrated at different levels of individual practices (Hammond, Savage, Gajendran, & Maund, 2019).

Although it is generally believed that about 70% of all change initiatives fail (Burnes & Jackson, 2011; Hughes, 2011) construction industry is traditionally known to have been resisting sustainable construction change initiatives. Institutionally, it is a static organisation (Chan, 2018) yet there is limited knowledge about the antecedents of resistance to innovative changes in construction workplace (Amarantou, Kazakopoulou, Chatzoudes, & Chatzoglou, 2018). More worrisomely, construction activities exert multiple effects on environment, economy and society vis-á-vis its implications to sustainable development. Therefore, understanding factors that provoke resistance to change in construction industry practices and their relationships with resistance behaviours can help explain why construction organisations do not promote such changes that can lead to sustainable construction. This is because, Forsell and Åström (2012) noted that resistance to change has affective, cognitive and behavioural components that create a psychological resistance to making a change in a particular situation. Furthermore, resistance to change is an essential factor to be considered in any change process, since proper management of resistance is key to change success of failure (Masunda, 2015).

Despite these facts, studies in this context have been peripheral and limited (Amarantou et al., 2018; Bresnen, Goussevskaia, & Swan, 2005; Esezobor, 2016; Harich, 2010; Pham et al., 2020; Pieterse, Caniels, & Homan, 2012).

Pieterse et al. (2012) opined that non-aligned interaction between professional discourses can be a sources of resistance to change itself. Pieterse et al. (2012) then suggested that resistance to change studies should consider different professional cultures in cross-functional project teams. According to Dessein, Soini, Fairclough, and Horlings (2015) culture is a key factor in the adaptation and learning of new practices. In addition, a cultural change is important for driving propagation of sustainable practices (Brooks, Waring, Mulder, & Richerson, 2018). On this premise, this study is aimed at developing a conceptual model of antecedents of resistance to change behaviours towards sustainable construction practices with a view to establishing factors that promote or inhibit changes towards sustainable construction practices in Nigeria. It takes a holistic view of resistance to change and resistance behaviours from the perspectives of professionals and contractors in the construction industry.

2. LITERATURE REVIEW AND THEORETICAL FRAMEWORK

The concept of resistance to change is understood to mean "any phenomenon that hinders the process at its beginning or its development, aiming to keep the current situation" (Manuela & Clara, 2003). Existing literature suggested that resistance to change is a multi-dimensional concept or construct that goes beyond the deliberate individual behaviour and which contains degree of individual response that are often complex and contradictory (Rafferty & Jimmieson, 2017; Smollan, 2011) . However, studies on resistance to change have been accentuated more on three dimensions of individual level or human aspect of resistance to change as: cognitive, effective, and behavioural (Bouckenooghe, 2010; Chung, Su, & Su, 2012; Erwin & Garman, 2009; Forsell & Åström, 2012; Jain, Asrani, & Jain, 2018; Oreg, 2003; Pakdel, 2016; Schalk & Timmerman, 2016; Smollan, 2011; Thakur & Srivastava, 2018). García-Cabrera and García-Barba Hernández (2014) presented the three components of resistance to change as resistant thought, resistant feeling, and resistant behaviour. Whereas behavioural dimension arises when the forces of resistance are applied against the forces of change (Hadavinejad, Khaef Elahi, & Alizadeh Sani, 2010) or action responses against the change (Lines. et al., 2015) affective dimension entails individual's failure due to decline of existing situation, emotional attachment about the change, fear of probable loss and imprecise future (Hadavinejad et al., 2010). On the other hand, cognitive dimension represents how change is perceived by the individuals that they are reluctant to initiate it Hadavinejad et al. (2010). In this case, behavioural dimension is the actual manifestation of resistance in the form of observable conduct, deeds, and events; while affective and cognitive dimensions represent the sources or reasons for resistance to change (Fiedler, 2010; Lines, Sullivan, & Smithwick, 2014; Smollan, 2011). Therefore, a holistic view of the concept of resistance to change as regard to implementation of sustainable construction practices is the focus of this study.

2.1. Resistance to Change Behaviours

Resistance to change is generally seen as a behavioural phenomenon (Forsell & Åström, 2012). Ho and Chui (2001) argued that people have a vested interest in maintaining maladaptive behaviour until there is good reason to believe that the substitute behaviour will be equally satisfying or anxiety reducing. On this note, Ho and Chui (2001) postulated six principles upon which resistance to change can be manifested to include: resistance is reflected in behaviour; resistance is counter therapeutic; resistance is goal-directed; resistance typically involves indiscriminate avoidance of pain; resistance can take shape in a variety of behaviours; and resistance may or may not be observed, depending upon whether the behaviour occurs in public or private. Thus, in every organisation, it is common to see employees exhibiting certain behavioural reactions in respect to changes introduced into the organisational working processes.

Resistive behaviours could be expressed in different forms (Hultman, 2006; Smollan, 2011; Yılmaz & Kılıçoğlu, 2013). Forsell and Åström (2012) stated that it can be seen through body language, writing, gesture, etc. Hultman (2006) summarised it into active and passive forms. According to Hultman (2006) active resistance takes the form of being critical, finding fault, ridiculing, appealing to fear, using facts selectively, blaming/accusing, sabotaging,

intimidating/threatening, manipulating, blocking, undermining, starting rumours and arguing. Whereas passive resistance comprises conscious actions, such as agreeing verbally but not following through, failing to implement change, procrastinating, feigning ignorance, withholding information and standing by and doing nothing. A study by Smollan (2011) found that resistance behaviours take the following forms: Cognitive, affective, and behavioural-intentional, active/passive, overt/covert, visible/invisible, rational/irrational, and conscious/unconscious-deliberate/not deliberate. Prasad and Prasad (2000) summarised resistance behaviours into a fourfold typology: open confrontation, subtle subversion, employee withdrawal and disengagement, and ambiguous accommodations to authority.

In the construction industry, these behaviours can be exhibited by the client, contractors, professionals and other workers alike; whether skilled or unskilled, managers or operatives. However, Zhang, Luo, Zhang, and Zhao (2019) stated that behaviour of employees is bound to affect the implementation of the organisation's green practices. Sequel to this, Lines et al. (2015) listed and defined common resistive behaviours that can be found among employees within the architecture, engineering and construction industry as follows: Reluctant compliance; delaying; lack of transparency; restricting education; obstructing and subverting; spreading the negative word; termination; reversion; misguided application; forcing the change; and external influence. Resistance to change can be manifested at individual, group (Karabal (2017) network or organisational level (Zhao, van Geffen, Angehrn, Leliaert, & Yang, 2005). On the individual level, resistance behaviours are usually complaints, mistakes, anger, indifference, withdrawal, absenteeism to work due to health reasons and stubbornness. At the organisational level, resistance is work accidents, increase in compensation claims of employees, increasing absenteeism, sabotage, increase in expenditures due to health and decreasing productivity (Karabal, 2017).

2.2. Antecedents of Resistance to Change Behaviours

Parenthetically, resistance to change does not customarily ensued. Many socio-physical factors are responsible for resistance to change initiatives (Amarantou et al., 2018; Fadzil, Mohamad, & Hassan, 2017; Karaxha, 2019; Swarnalatha, 2014). Werkman (2009) agreed that there is no single cause of resistance to change. Fadzil et al. (2017) criticised overemphasis on human aspect of resistance to change while relegating other critical aspects of resistance to change. According to Fadzil et al. (2017), since resistance to change correlates with individual thinking and behaviour, assessing resistance to change on human aspect only will lead to dissimilarities in results. Ulus and Hatipoglu (2016) argued that resistance to change is one of the human aspect of sustainability implementation process. In view of these, available literatures have identified factors for resistance to change to include lack of awareness and participation (Schweiger, Stouten, & Bleijenbergh, 2018); inefficient processes and fragmented supply chains, social/cultural, scarce interoperability between software and tools, lack of government involvement, and high investment requirements (Bonanomi et al., 2016) lack of demand for sustainable products (Ametepey et al., 2015); ontological security, trust, inertia, lack of knowledge, and acceptance of routine (Angonese & Lavarda, 2014); and decoupling (Ametepey et al., 2015; Angonese & Lavarda, 2014). According to Yılmaz and Kılıçoğlu (2013) some common reasons for resistance to change within organisations include interference with need fulfilment, selective perception, habit, inconvenience or loss of freedom, economic implications, security in the past, fear of the unknown, threats to power or influence, knowledge and skill obsolescence, organisational structure and limited resources.

However, Angonese and Lavarda (2014) avowed that these factors are awakened when the change process begins, and can only stop the change when they gather enough force. Some other studies have focused on the behavioural resistance to change (Fiedler, 2010; Lines. et al., 2015; Macrì, Tagliaventi, & Bertolotti, 2002; Oreg, 2003; Van Marrewijk, 2018); psychological, perception and attitudinal factors (Bovey & Hede, 2001; Pieterse et al., 2012); organisational factors (Erdogan et al., 2005; Rosenberg & Mosca, 2011; Stonehouse, 2013); and other non-human factors that can result from the resistance to change (Langstrand & Elg, 2012).

Despite the plethora of studies on factors that influence resistance to change in workplace (Amarantou et al., 2018; Cronin & McGuiness, 2014; Fadzil et al., 2017; Khan, Raza, & Mujtaba, 2016; Ybema, Thomas, & Hardy, 2016), there is dearth of empirical studies in the construction workplace context. Wang, Lim, and Kamardeen (2013) acknowledged that little emphasis has been placed to investigate how different factors collectively direct the implementation of change management in construction. Meanwhile, Amarantou et al. (2018) found that resistance to change is indirectly and directly influenced by four main factors (employee-management relationship, personality traits, employee participation in the decision-making process, and job security). Ybema et al. (2016) revealed that the causes of resistance to change are based on three views of resistance to change and they include: employee intransigence, senior management defensiveness, and changes that threaten employees' interest, working conditions and identities. Khan et al. (2016) found poor communication, culture, status quo, time, cost of change process, and others as the determinants of resistance to organisational change. These findings were corroborated by Masunda (2015). However, Fadzil et al. (2017) divided the causes of resistance to change into three taxonomies as: individual related (e.g. disposition toward change, fear of unknown, workload, trust issue); change programme related (e.g. implementation speed, extent of change, uncertainty of change, poor planning); and institutional related (e.g. history, norm, culture incongruence, management support) resistance. Samah (2015) then summarised the antecedents of resistance to change under individual factors, social factors and organisational factors.

This study therefore, looks beyond behavioural, affective and cognitive resistance to change where the perceptual views and individual reactions only are considered. It seeks to develop a conceptual model of the aggregate factors responsible for resistance to change behaviours by construction stakeholders for sustainable construction practices. In view of this, this study postulates that resistance to change factors are associated with construction stakeholders' resistive behaviours for sustainable construction practices. These relationships are depicted in the hypothetical model shown in Figure 1.

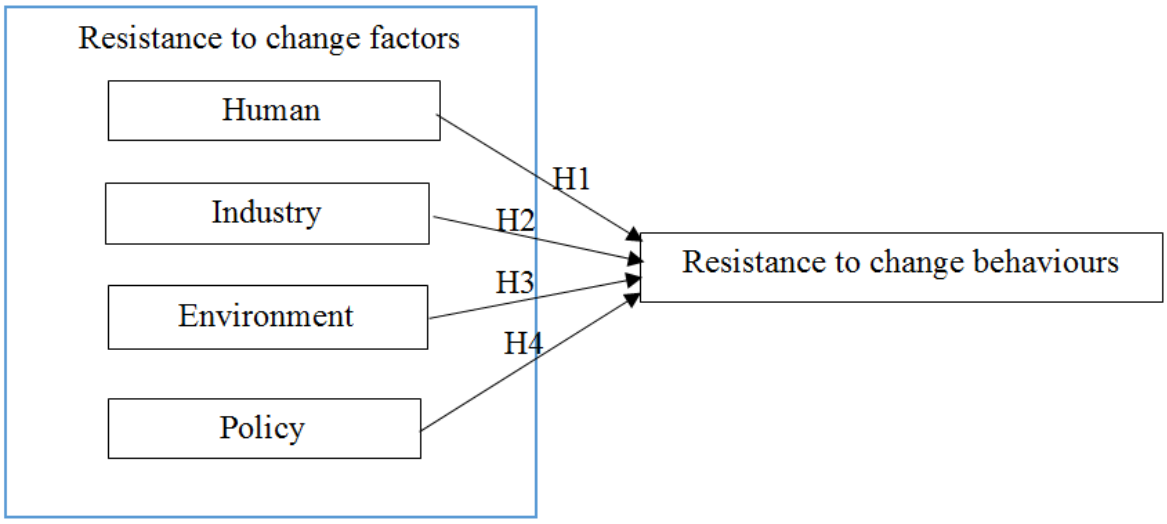

Figure-1. Hypothetical model of antecedents of resistance to change behaviours towards sustainable construction practices.

Figure 1 gives rise to four null hypotheses.

1. There is significant relationship between human resistive factors and construction stakeholders' resistive behaviours for sustainable construction practices.
2. There is significant relationship between industry resistive factors and construction stakeholders' resistive behaviours for sustainable construction practices.
3. There is significant relationship between environment resistive factors and construction stakeholders' resistive behaviours for sustainable construction practices.

4. There is significant relationship between policy resistive factors and construction stakeholders' resistive behaviours for sustainable construction practices.

3. METHODOLOGY

This study employed a survey research approach with the use of structured questionnaires administered to construction professionals and contractors in the South-East, Nigeria. Apart from the demographic information of the respondents, the questionnaire was designed to measure factors that actuated resistance to change to sustainable construction practices, and how the factors are related to the resistance to change behaviours in Nigeria. The main questionnaire consists of two parts. Part 1 contained 56 variables extracted from the literature. These variables were grouped into four major constructs to reduce bulkiness. In a like manner, part 2 contained 21 variables depicting the resistance to change behaviours likely to be manifested by the respondents due to resistance. The respondents were asked to rate the level of influence of each of these variables on their resistance to change to sustainable construction practices and the level of responses by the respondents in terms of resistive reactions on a 5-point Likert Scale. Where 1 = Very low, 2 = Low, 3 = Moderate, 4 = High, 5 = Very high.

However, contents of the questionnaire were tested for consistency. A research instrument is said to be reliable if it has Cronbach's Alpha coefficient (α) $\geq$ 0.60 to 0.95 (Singh, 2017; Taherdoost, 2016; Tavakol & Dennick, 2011). Whereas Streiner (2003) recommends that a maximum alpha value of 0.90; Tavakol and Dennick (2011) suggest that a low value of alpha could be due to a low number of questions, poor interrelatedness between items or heterogeneous constructs, while a very high alpha (> 0.90) may due to redundancy of some items because they are testing the same question in a different way. Although, the number of scale items influence the amount of inconsistency (Vaske, Beaman, & Sponarski, 2017) the closer Cronbach's Alpha coefficient is to 1.0 the greater the internal consistency of the items in the scale (Gliem & Gliem, 2003). In this study, the reliability of the questionnaire was tested using split-half method (Cronbach's Alpha), as a more feasible method for testing consistency (Bajpai & Bajpai, 2014; Mohajan, 2017; Ritter, 2010; Singh, 2017; Taherdoost, 2016; Tavakol & Dennick, 2011).

Before the distribution of the questionnaires, the locations and contacts of the potential respondents were identified, and their consent/permission was sought and obtained. In the course of that, the objectives of the study were relayed; those who refused to grant permission were excluded from the survey. The initial familiarisation made the actual field survey easier because the respondents were already aware of what was expected of them.

Meanwhile, a total of 329 copies of questionnaires being the sample size from the population of 1717 respondents comprising 728 professionals and 989 contractors were randomly and proportionately distributed to the two groups of the respondents. The sample size is based on the Cochran (1977) iterative and final correction formulas. A total of 288 questionnaires from 127 professionals and 161 contractors and which represent about 87.54% were returned and found useful for analysis.

The data generated from questionnaire survey were subjected to descriptive and quantitative analyses. The reliability test, Mean Score Index (MSI) and Standard Deviation were computed through the use of SPSS software. MSI values were used to rank the factors both for general ranking and group ranking. To establish the strength of the relationships between change resistance factors and resistance to change behaviours towards sustainable construction practices, Pearson's Product-moment Correlation Coefficient(r) was computed. This was also done through the use of SPSS software. The value of r ranges from -1 for perfect negative correlation to + 1 for perfect positive correlation. To further determine whether the correlation is statistically significant or not, correlation significant test was conducted with the use of test statistic (t – test). The test is a two-tailed, non-directional test. The degree of freedom (df) (n – 2) is used at 5% significant level. The mean values of both variables were used to get their correlation. To ascertain the amount of variability in the resistance to change attributed to the influence of

each of these factors, the Coefficient of Determination (R^2) was computed. This is the square of the Correlation Coefficient (r).

Decision: Reject H_0 if $t_{calculated} > t_{critical}$ at df (n -2) and at 5% (.05) significance level otherwise accept H_0 and conclude.

To ensure reliability of the result, the Margin of Error (ME) was computed at 95% Confidence Interval (C.I) within which the result would be acceptable. Usually, the critical value is expressed as a t-statistic. Thus, the t statistic has 328 degrees of freedom and a cumulative probability equal to 0.975. From the t-Distribution, the critical value was found to be 1.96. Therefore, this result is reliable and acceptable within the Margin of Error of ±4.8592% at the 95% confidence level. This is in line with Data Star (2008) which suggested that an acceptable margin of error used by survey researchers falls between 4% and 8% at the 95% confidence level. The results of the analysis are presented in section 4.

4. RESULT AND DISCUSSION

4.1. Analysis of Antecedents of Resistance to Change Behaviours

Table-1. Result of the MSI, standard deviation and ranking of factors responsible for resistance to change behaviours.

S/N	Resistance to Change Factors	N	MSI	Std. Deviation	Overall Ranking	Group Rank
Human Factors (Cronbach's Alpha = .726)						
1	End-user/client perception	288	4.56	.599	4	
2	Perception that it is bad business	288	4.35	.651	15	
3	Lingering resentment	288	4.41	.596	14	
4	Lack of confidence	288	4.49	.657	8	
5	Loss of face and reputation	288	4.09	.682	18	
6	Insufficient stakeholder drive	288	4.47	.596	10	
7	The fear of potential embarrassment	288	4.45	.661	12	
8	Threats to existing balance of power,	288	4.32	.680	16	
9	Intergroup conflicts that inhibit cooperation	288	4.47	.708	10	2
10	Degree of tolerance and formalisation	288	4.49	.636	8	
11	Job security	288	4.24	.716	17	
12	Previous experience	288	4.52	.624	6	
13	Scepticism about the need for change	288	4.59	.618	3	
14	Limited knowledge and awareness	288	5.00	.059	1	
15	Trust/distrust about the change	288	4.61	.598	2	
16	Level of stress and anxiety involve	288	4.43	.562	13	
17	Work values	288	4.51	.547	7	
18	Curiosity of difference	288	4.56	.616	4	
	Average		4.48			
Industry Factors (Cronbach's Alpha = .861)						
1	Unstable investment requirements	288	4.42	.522	4	
2	Construction cycles	288	3.91	.698	16	
3	Fragmented construction market procurement	288	4.29	.735	10	
4	Additional cost of change	288	5.00	.059	1	
5	Changing work profile and inflexibility	288	4.28	.678	12	
6	Lack of industry familiarity with new construction techniques	288	4.37	.720	7	
7	Demanding and tight project schedule	288	4.31	.745	9	
8	Inefficient processes and fragmented supply chains	288	4.37	.720	7	3
9	Complexity and expensive systems of construction project	288	4.62	.634	2	
10	Legacy of sunk costs	288	4.05	.752	14	

11	Site-based nature of construction project	288	4.02	.686	15	
12	Lack of time to implement or learn a new a new technology or process	288	4.29	.655	10	
13	A reward system that reinforces old ways of doing things	288	4.21	.636	13	
14	Additional design and construction requirements	288	4.39	.705	6	
15	Lack of skilled management and supervising team	288	4.40	.707	5	
16	Skills and labour supply problems	288	4.47	.521	3	
Average			4.34			
Environment Factors (Cronbach's Alpha = .786)						
1	Health and safety implications	288	4.49	.657	3	
2	Transport infrastructure and equipment availability	288	3.85	.693	13	
3	Limited resources	288	4.36	.719	5	
4	Selective information processing	288	3.90	.697	12	
5	Increased workload	288	3.96	.780	11	
6	Lack of project team support	288	4.25	.668	9	4
7	The prevailing economic condition	288	5.00	.059	1	
8	Existing competitors	288	4.14	.657	10	
9	Existing trends or traditions	288	4.26	.683	8	
10	Work environment and society	288	4.36	.723	5	
11	Demand fluctuations	288	4.28	.742	7	
12	Incompatibility of change process and organisational culture	288	5.00	.059	1	
13	Impact on environment	288	4.38	.718	4	
Average			4.33			
Policy Factors (Cronbach's Alpha = .745)						
1	Standardisation and scalability	288	4.43	.725	6	
2	Government commitment	288	4.86	.346	2	
3	Heavy investment in previous decisions and courses of action	288	4.76	.446	3	
4	Professional ethics and practices	288	4.40	.707	7	
5	Problem of reallocation of resources	288	4.29	.656	8	1
6	The weakness of the proposed changes	288	4.67	.471	4	
7	Bureaucratic inertia	288	4.09	.669	9	
8	Laws and regulations	288	5.00	.059	1	
9	Operational strategy	288	4.55	.588	5	
	Average		4.56			

Table 1 presented the result of the analysis of means score indexes, standard deviations and consistency test of factors responsible for resistance to change behaviours towards sustainable construction practices in Nigeria. The result of Table 1 showed that the Cronbach's Alpha (α) values for all the four major antecedents of resistance to change behaviours towards sustainable construction practices are >0.6. In this instance, human factors have a Cronbach's Alpha of .726; industry factors have a Cronbach's Alpha of .861; environment factors have a Cronbach's Alpha of .786; whereas policy factors have a Cronbach's Alpha of .745. Thus, research instruments are reliable, so they can be used as instrument for data collection. It also implied that in measurement model analysis, test of construct reliability and internal consistency have been satisfied.

However, the average mean score indexes of the four major factors responsible for resistance to change as identified in this study are as follows: Human (4.48), Industry (4.34), Environment (4.33), and Policy (4.56). It can be deduced from the average mean scores that these factors have very high tendency to influence or trigger resistance behaviours in the bid towards sustainable construction practices in Nigeria. It further shows that they have high potentials in determining the behaviours of construction professionals and contractors to resist any change towards sustainable construction practices.

In terms of human factors, the five most prominent sub-factors include limited knowledge and awareness (5.00), trust/distrust about the change (4.61), scepticism about the need for change (4.59), end-user/client perception (4.56), and curiosity of difference (4.56). In the industry related factors, additional cost of change (5.00), complexity and expensive systems of construction project (4.62), skills and labour supply problems (4.47), unstable investment requirements (4.42) and lack of skilled management and supervising team (4.40) are top five ranked sub-factors. In the case of environment factors, the five highest ranked sub-factors include the prevailing economic condition (5.00), incompatibility of change process and organisational culture (5.00), health and safety implications (4.49), impact on environment (4.38), and limited resources (4.36). However, policy main factors have the following as the top five ranking sub-factors leading to construction professionals and contactors' resistance behaviours; laws and regulations (5.00), government commitment (4.86), heavy investment in previous decisions and courses of action (4.76), the weakness of the proposed changes (4.67), and operational strategy (4.55). From Table 1, the mean values of these factors ranged from (3.90-5.00), which shows that all the factors have to a varying extent high influence on the resistance to change behaviours exhibited by the construction professionals and contractors when some changes leading to sustainable construction are being introduced to construction processes. Overall, the result pointed to the importance of these factors when any change initiatives that can lead to sustainable construction practices are being considered in Nigeria.

4.2. Analysis of Resistance to Change Behaviours

Table-2. Result of the MSI, standard deviation and ranking of resistance to change behaviours manifested by the respondents.

S/N	Resistance to Change Behaviours (Cronbach's Alpha = .892)	N	MSI	Std. Deviation	Overall Ranking
1	Spreading the negative word	288	4.21	.636	14
2	Delaying	288	4.47	.596	4
3	Complaining	288	4.49	.683	3
4	Increase in compensation claims	288	3.91	.698	19
5	Increasing absenteeism	288	4.39	.654	10
6	Forcing the change	288	4.40	.622	8
7	Misguided application	288	4.60	.639	1
8	Restricting education	288	4.36	.643	11
9	Obstructing, subverting and sabotaging	288	4.34	.729	12
10	Decreasing productivity	288	4.08	.814	17
11	Increase in expenditures	288	4.41	.641	7
12	Lack of transparency	288	4.18	.865	15
13	Reluctant compliance	288	4.60	.665	1
14	Termination	288	3.60	.874	21
15	Reversion	288	4.43	.695	5
16	External influence	288	4.40	.702	8
17	Increase in errors and mistakes	288	4.31	.800	13
18	Expressing indifference	288	4.05	.748	18
19	Withdrawal	288	4.12	.811	16
20	Stubbornness	288	3.89	.721	20
21	Anger	288	4.43	.543	5
	Average		4.27		

Table 2 presented the results of the reliability test, MSI, standard deviation and ranking of resistance to change behaviours manifested by the respondents in the course of resisting changes towards sustainable construction practices. Although the result of Table 3 depicted that all the behavioural variables listed for the study are frequently manifested by the construction stakeholders at different levels and contexts (range = 4.60 - 3.60). The six most commonly manifested resistive behaviours exhibited by the construction professionals and contractors were reluctant compliance (4.60), misguided application (4.60), complaining (4.49), delaying (4.47), reversion (4.43),

and anger (4.43). The average MSI (4.27) also showed that the overall resistance behaviours are more frequently displayed the professionals and contractors when changes towards sustainable construction practices are introduced. By implication, the result shows that the construction stakeholders usually respond to changes introduced in the course of their duty in one way or the other in a bid to circumvent or neutralise the change. Similarly, the reliability test result revealed that the Cronbach's Alpha (α) values for the items of resistance to change behaviours exhibited by the construction professionals and contractors is 0.892 which is >0.6. Thus, research instrument is reliable and can be used for data collection. It also satisfied the measurement model analysis, test of construct reliability and internal consistency.

4.3. Test of Hypothesis

To further validate the forgoing results, the hypotheses earlier list are tested. The result of the analysis is presented in Tables 3 -6.

Table-3. Correlation between human factors and resistance to change behaviours.

Correlation Coefficient (r)	Nature of Association	T - test value	$T_{critica}$ $_{(5,0.05)}$	R^2	*P - value*	Decision
0.973	Very strong positive correlation	7.301	3.182	0.9467 (94.67%)	.005	Reject H_0

Table 3 showed the results of correlation analysis between human factors and resistance to change behaviours towards sustainable construction practices. The result revealed that human factors are very strongly and positively correlated with resistance to change behaviours with a Correlation Coefficient (r) of 0.973. This indicated that human factors as presented in Table 3 are very strongly associated with resistance to change behaviours. It implied that factors related to human attributes of construction stakeholders are associated with the extent to which construction stakeholders manifest certain behaviours that can resist changes towards sustainable construction practices. This is attested by the value of the coefficient of determination (R^2 = 0.9406) which suggested that about 94.67% of resistance to change behaviours of construction professionals and contractors can be explained by the human attributes in an effort towards sustainable construction practices.

However, when the correlation was tested for significance at 5% significance level (α = .05), the result revealed that $t_{calculated}$ (7.301) is greater than $t_{critical}$ (3.182). Thus, since $t_{calculated}$ (7.301) > $t_{critical}$ (3.182), H_0 is rejected and the study concluded that there is significant relationship between human factors and resistance to change behaviours towards sustainable construction practices. Thus, the result of hypothesis one suggested that human factors could significantly trigger resistance to change behaviours towards sustainable construction practices in Nigeria. This result is further substantiated by the *p-value* (.005) score which is less than α = .05. This is in conformity with the degree of variability in the resistance to change behaviours manifested by the construction professionals and contractors attributed to human factors.

Table-4. Correlation between industry factors and resistance to change behaviours.

Correlation Coefficient (r)	Nature of Association	T - test value	$T_{critical}$ $_{(5,.05)}$	R^2	*P - value*	Decision
0.996	Strong positive correlation	19.307	3.182	0.9920 (99.20%)	.000	Reject H_0

Table 4 showed the results of correlation analysis between industry factors and resistance to change behaviours towards sustainable construction practices. Like in Table 3, it indicated that industry factors are correlated very strongly and positively with resistance to change behaviours, with a Correlation Coefficient (r) of 0.996. It then implied that industry factors are very strongly associated with resistance to change behaviours. This further implied that factors related to the nature of the construction industry are associated with the extent to which

construction stakeholders manifest certain behaviours that can resist changes towards sustainable construction practices. This is verified by the value of the coefficient of determination (R^2 = 0.9920) which suggested that about 99.20% of resistance to change behaviours of construction professionals and contractors can be explained by the nature of the industry factors in an effort towards sustainable construction practices.

However, when the correlation was tested for significance at 5% significance level (α = .05), the result revealed that $t_{calculated}$ (19.307) is greater than $t_{critical}$ (3.182). Thus, since $t_{calculated}$ (19.307) > $t_{critical}$ (3.182), H_0 is rejected and the study concluded that there is significant relationship between industry factors and resistance to change behaviours towards sustainable construction practices. This further suggested that industry factors could significantly cause resistance to change behaviours towards sustainable construction practices in Nigeria as per hypothesis two. This result is also validated by the *p-value* (.000) score which is less than α = .05. Likewise, this is in conformity with the degree of variability in the resistance to change behaviours manifested by the construction professionals and contractors associated to industry factors.

Table-5. Correlation between environment factors and resistance to change behaviours.

Correlation Coefficient (r)	Nature of Association	T - test value	$T_{critical}$ (5,.05)	R^2	*P - value*	Decision
0.984	Strong positive correlation	9.566	3.182	0.9683 (96.83%)	.002	Reject H_0

Table 5 showed the results of correlation analysis between environment factors and resistance to change behaviours towards sustainable construction practices. Like in the preceding tests, the result revealed that environment factors are correlated very strongly and positively with resistance to change behaviours, with a Correlation Coefficient (r) of 0.984. This infers that environment factors are very largely associated with resistance to change behaviours. This further denotes that factors related to work environment (social, economic, internal, external, organisational, etc.) are associated with the extent to which construction stakeholders manifest certain behaviours that can amount to resisting changes towards sustainable construction practices. This is confirmed by the value of the coefficient of determination (R^2 = 0.9683) which suggested that about 96.83% of resistance to change behaviours of construction professionals and contractors can be explained by the work environment in an effort towards sustainable construction practices.

A t-statistic test conducted to ascertain the significance of this association on the correlation coefficient at 5% significance level (α = .05) revealed that $t_{calculated}$ (9.566) is greater than the $t_{critical}$ (3.182). Therefore, since $t_{calculated}$ (9.566) > $t_{critical}$ (3.182), H_0 is rejected. This study then concluded that there is significant association between environment factors and resistance to change behaviours towards sustainable construction practices in Nigeria. The result further suggested that environment factors could significantly lead to resistance to change behaviours towards sustainable construction practices in Nigeria. This position is also supported by the *p-value* (. 002) score which is less than α = .05, and it equally conformed with the degree of variability in the resistance to change behaviours manifested by the construction professionals and contractors and caused by environment factors.

Table-6. Correlation between policy factors and resistance to change behaviours.

Correlation Coefficient (r)	Nature of Association	T - test value	$T_{critical}$ (5,0.05)	R^2	*P - value*	Decision
0.932	Very strong positive correlation	4.454	3.182	0.8686 (86.86%)	.021	Reject H_0

Table 6 showed the results of correlation analysis between policy factors and resistance to change behaviours towards sustainable construction practices. The result revealed that policy factors are also very strongly and positively correlated with resistance to change behaviours, with a Correlation Coefficient (r) of 0.932. Similarly, the

result indicated that policy factors are also very largely associated with resistance to change behaviours. Implicitly, it showed that factors related to policy making or guideline are associated with the extent to which construction stakeholders manifest certain behaviours that can result to change resistance towards sustainable construction practices. This is substantiated by the value of the coefficient of determination (R^2 = 0.8686) which suggested that about 86.86% of resistance to change behaviours of construction professionals and contractors can be explained by the policy related factors in an effort towards sustainable construction practices in Nigeria.

Further test to determine the significance of this association, revealed the existence of a significant association between policy related factors and resistance to change behaviours towards sustainable construction practices in Nigeria at 5% significance level (α = .05). Expectedly, the $t_{calculated}$ (4.454) is greater than the $t_{critical}$ (3.182). Hence, since $t_{calculated}$ (4.454) > $t_{critical}$ (3.182), H_0 is rejected. This study therefore adduced that there is significant association between policy factors and resistance to change behaviours towards sustainable construction practices in Nigeria. This also suggested that policy related factors could significantly cause resistance to change behaviours towards sustainable construction practices in Nigeria. This position is supported by the *p-value* (.021) score which is less than α = .05. In addition, it affirmed the degree of variability in the resistance to change behaviours manifested by the construction professionals and contractors and caused by policy related factors.

As indicated in Tables 3-6, resistance to change behaviours towards sustainable construction practices by the construction stakeholders are significantly positively associated with all the major resistance to change factors in Table 1, thereby rejecting hypotheses 1, 2, 3, and 4. This subsequently gives rise to establishing an empirically conceptual model of factors leading to resistance to change behaviours towards sustainable construction practices in Nigeria as presented in Figure 2.

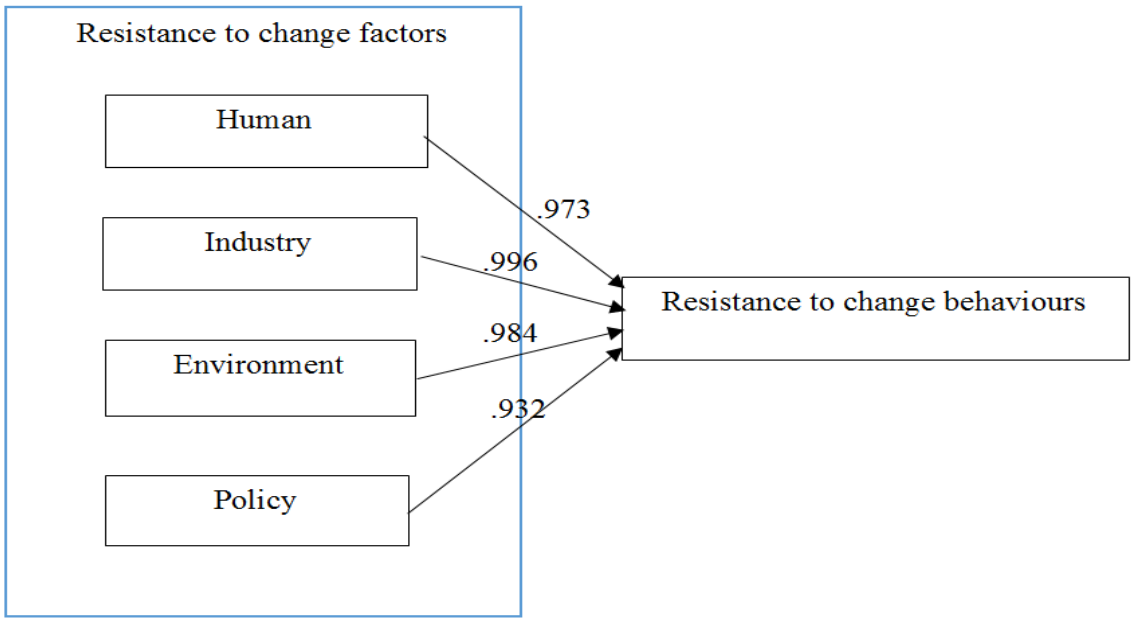

Figure-2. Conceptual model of antecedents of resistance to change behaviours towards sustainable construction practices.

According to the conceptual model, the response to the changes in the construction practices due to introduction of sustainable construction changes (principles) is associated with the behavioural reactions or expression manifested by the construction professionals and contractors towards the change. All the four factors, human (r=0.973; p<.05), industry (r=0.996; p<.05), environment (r=0.984; p<.05), and policy (r=0.932; p<.05) reflected very strong positive relationships with resistance to change behaviours, thereby refuting hypotheses 1, 2, 3, and 4. Comparatively, industry factors (r=0.996; p<.05) displayed stronger correlation with resistance to change behaviours than other factors.

Primarily, this study has revealed that each of the identified antecedents of resistance to change plays important role in determining resistive behaviour a construction stakeholder could manifest in responding to a change leading to sustainable construction practices when he/she is not comfortable with the change. The study suggested that multiple factors come to play when changes are to be resisted, but depended on the context and circumstances surrounding the change initiatives. In essence, it implied that these multiple factors that influence the construction stakeholders' resistance to change behaviours need to be taken into consideration when efforts are being made to introduce any change that would bring about sustainable construction practices in the normal course of construction process in Nigeria. For instance, when the professionals or contractors have a limited knowledge and awareness about the sustainable construction change and its consequences, naturally, there would be tendency of being sceptical about the change because of fear of the unknown. This could result to resisting such change whether beneficial or otherwise. Likewise, when there is perceived additional cost due to new change mostly as the case in the sustainable construction projects, or when the prevailing economy of the country or construction organisation is in bad shape, the tendency of resisting any change in the existing process or practice would be high as confirmed by this study. Incompatibility of change process and organisational culture and absence of enabling laws and regulations could equally trigger resistive behaviours on the part of construction practitioners.

Importantly, the test of significance of the relationships between the resistance to change factors and resistive behaviours in this study has highlighted the importance of these factors that trigger decisions of or cause the construction professionals and contractors to resist changes that would lead to sustainable construction practices. The high correlation coefficients for each of the four main factors suggested that these factors have great association with resistance to change behaviours and the coefficient of determination suggested further that a greater percent of resistance to change behaviours manifested by the construction practitioners in the course of implementing sustainable construction practices in Nigeria are being controlled by these factors. As indicated in the conceptual model, any change towards sustainable construction practices such as new policy, innovation, training, etc. should be related to the construction practitioners' behavioural, cognitive and effective reactions towards such change. This therefore, implied that shortcomings in personal characteristics, weakness of the industry characteristics, socio-economic and cultural factors, and weak policy framework trigger the practitioners to oppose any change that can lead to sustainable construction practices. Whereas, strong policy framework through regulations, laws and government commitment; adequate knowledge, awareness and trust about sustainable change; reduced cost of change with less complex and expensive systems of construction; and compatible change process with organisational culture in addition to favourable economic working environment would impede resistance to change and diminish the manifestation of such behaviours that are inimical to sustainable construction practices in Nigeria; thus, promoting positive behaviours.

The overall result suggested that construction professionals and contractor cannot ordinarily resist changes leading to sustainable construction practices, however, resistance to change is stimulated by some causes and manifested through behavioural responses as established in this study. It underscored the fact that when a change is introduced in a system, there might be a reciprocate initial behavioural resistance to such change as suggested by social exchange theory. This result is also in line with the principle of cause and effect as espoused by Aristotle, but rooted in Kurt Lewin's concept of three steps organisational change model of unfreezing, moving and freezing of group standards. This study affirmed the multi-dimensionality of resistance to change which recognises the interplay of many factors leading to resistance to change and manifested in the behaviours of people and supported the results of Rafferty and Jimmieson (2017) and Smollan (2011). It complemented (Langstrand & Elg, 2012) who recognised physical environmental resistance other than human factors that can result from decisions and intensions to resist changes; Ametepey et al. (2015); Angonese and Lavarda (2014) and Bonanomi et al. (2016) which recognised organisational factors; and that of Schweiger et al. (2018) who proposed a participatory strategy and increase awareness about change that would inhibits resistance to change.

5. CONCLUSION AND RECOMMENDATION

In today's changing and challenging business environment, the need to adopt sustainable construction practices at all levels of construction practice has become glaring, yet construction industry especially in the developing countries still lags behind other industrial economic sectors in terms of innovative changes. The sustainable construction which supposed to offer the desired sustainable development, economically, socially and environmentally has become a subject of debate for decades; and also engulfed with many challenges, one of which is the culture of resistance to change. The end therefore, seems not to be near. To this effect, this study has established that resistance to change behaviours manifested by the construction professionals and contractors towards implementation of sustainable construction changes is strongly related to human, industry, environment and policy factors affecting the construction practices generally, and which trigger such resistances.

Since resistance to change behaviours towards sustainable construction practices are informed by human, industry, environment and policy factors, it is pertinent that construction stakeholders consider these factors while initiating any change towards sustainable construction practices. The study further argues that ignoring these factors could be lethal to the implementation of sustainable construction practices in Nigeria. As indicated in this research, this can be done by focusing on professionals and contractors training to increase their knowledge and awareness about the change and its consequences, instituting legal and regulatory framework, government commitment, adequate cost information about the change, compatibility of change process and organisational culture, and favourable economic environment for thriving construction businesses.

Consequently, the study has made case for practical, theoretical and policy implications. Critical examination of this study findings reveals that the direct effects of the conceptual model accounted for 94.67% of the variance in human factors, 99.20% of the variance in industry factors, 96.83% of the variance in environment factors, and 86.86% of the variance in policy factors. These results suggest that professionals and contractors' responses to change and resistance to change behaviours are accounting for a substantial proportion of the variance in any effort towards implementation of sustainable construction practices in Nigeria. As such, it seems reasonable to conclude that construction industry and relevant stakeholders may garner considerable benefits by focusing on policy framework through regulations, laws and government commitment; increased knowledge, awareness and trust about sustainable change by professionals and contractors; cost of sustainable construction practices complex; and compatibility of sustainable construction practices change process with organisational culture in addition to favourable economic working environment. In particular, this study suggested that a potentially important pathway to sustainable construction practices arises from the positive behavioural responses displayed by professionals and contractors against resistance to change.

Furthermore, this study highlighted the importance of multi-dimensionality of resistance to change and suggested that construction stakeholders should take note of these factors, instead of general assumption where people tend to make judgments, perhaps quite naturally, based on observable behaviour. Looking beneath the surface of construction professionals and contractors' behaviour will reveal insights that responses to change are complex, and depend on many possible factors in the human (individual)-industry-environment-policy relationships and contexts.

This study provided a theoretical support for human factors, industry factors, environment factors and policy factors as antecedents of resistance to change behaviour towards sustainable construction practices. Consequently, empirical evidence obtained based on conceptual model is believed to have contributed to the emerging literature on rethinking the resistance behaviours of construction stakeholders from different perspectives, particularly as regards to sustainable construction practices in Nigeria.

Finally, the importance of workable policy and legislative frameworks and total government commitment towards implementation of sustainable construction practices in Nigeria has been canvassed in this study. This study therefore calls for rejuvenation of these policies and integration of these factors that trigger behavioural

resistance by the professionals and contractors in the sustainable construction practices intervention changes in Nigeria.

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