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Validating Factors Affecting a National Safety Incentives Policy for the Construction Industry in Developing Countries

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ABSTRACT

A national safety incentive policy is a mix of policy instruments and strategies outlining the rules, templates, and standard procedures for designing and implementing safety incentives within a country. Through a Delphi study, this study assesses critical factors affecting the development of a national safety incentives policy for the construction industry in developing countries using Nigeria as a case study. A qualitative technique was adopted using the Delphi technique to select a representative sample of expert panellists for the study. The Delphi findings indicate fifteen (15) identified factors affecting the development of a national safety incentives policy in Nigeria. Of these fifteen (15) identified factors, six (6) had a very high impact (VHI: 9.00–10.00), four (6) had a high impact (HI: 7.00–8.99), and the remaining three (3) factors recorded a medium impact (MI: 5.00–6.99). The study's key findings reveal that the leading critical factors affecting developing countries, including Nigeria, in developing a national safety incentives policy include weak institutional framework, occupational safety and health agency's corrupt practices, stakeholders' absence in policy development, insufficient government budget for occupational safety and health agency, ineffective H&S code of practice, absence of national safety incentive vision, political influence on occupational safety and health enforcement agency, inadequate regulatory framework, ineffective occupational safety and health policy enforcement, and ineffective occupational safety and health policies. This study concluded by calling for a standalone national safety incentive policy that will holistically support the implementation of safety incentives within the construction industry.

Keywords: Construction, Delphi study, Governance, Safety incentives, Health and safety, Policy

INTRODUCTION

Employees' and employers' commitment towards improving workplace safety behaviour and performance is one of the most significant challenges facing the construction industry in developing countries (Ogunde et al., 2017; Ogundipe et al., 2018; Ahmed et al., 2021). According to Ahmed and Faheem (2021), the need to improve safety behaviour as a strategy of total

safety management has become dominant in developing countries. However, construction organisations use various motivations, particularly safety incentives, to align employees with performance goals such as safety, quality, cost, and productivity (Alfandi and Alkahsawneh, 2014; Ogwueleka, 2015; Ogundipe et al., 2023a). The application of safety incentives has transformed various operations of the construction industry. Goodrum and Gangwar (2004), Zulkefli et al. (2014) and Ogundipe et al. (2023b) noted that the safety incentives concept is rooted in the demands to align employees with organisation performance-related goals, improve workplace safety behaviour, and share risk between clients and contractors. This is because the incentive concept is often based on various motivation theories explaining what drives human behaviour and why people need change over time (Hilmarsson & Rikhardsson, 2011). Gerhart (2017) maintained that safety incentives promote safe behaviours that can reduce destructive behaviours that could hinder attaining projects, clients, and organisational goals and improve workers' performance. Safety incentives allow organisations to use financial or non-financial payments to motivate workers outside their wages in line with their set standards for individuals or groups of workers to enhance their performance (Tongo, 2011; Zulkefli et al., 2014). Hence, safety incentives drive workers beyond their actual performance due to extrinsic and intrinsic rewards (Hilmarsson and Rikhardsson, 2011; Oloke et al., 2017).

Choi et al. (2012) observed that despite the Hong Kong government's intervention and introduction of safety incentives (pay-for-safety schemes) in public works construction contracts, there are still notable challenges due to ineffective policy implementation and administrative processes. Equally, in Iran, Ghasemi et al. (2015) attributed critical factors affecting national safety incentive policy (NSIP) to the lack of policy development, conflicting government policies, and lack of annual review and evaluation of safety incentive policy. The Tanzania government's pay and incentive policy also allows organisations to operate unified and transparent incentive schemes, facilitate appropriate rewards and sanctions towards acceptable performance standards, and plan and control employees' wages, but most organisations' management lacks commitment and inadequate communication in implementing incentive policies (Kiguhe, 2013). Nonetheless, Dambisya and Dambisya (2007) maintained that the incentive policies are often applicable in developing Eastern and Southern African countries comprising financial and non-financial incentives to improve employee training and career path development, social needs support, workplace conditions, access to health care, and financial-related salary enhancement and allowances.

Unfortunately, the position of safety incentives in developing countries shows its impact is limited due to ineffective or non-availability of health and safety policies, weak enforcement frameworks, lack of safety incentives regulations and policies, budgetary allocation planning, and limited resources (Eyiah et al., 2019; Boadu et al., 2020; Boadu et al., 2021; Ogundipe et al., 2023c). Armstrong and Taylor (2014) and Ahmed and Faheem (2021) posited that policies and legislation are necessary to sustain employees' commitment to workplace safety practices and improve performance and productivity. Furthermore, Wilde (2011) and Jiang et al. (2019) highlighted that

factors such as policies guiding goal setting and performance indicators affect the construction industry's design of safety incentive schemes in developing countries. Thus, the safety incentive policy allows construction organisations to improve H&S performance by focusing on proactive approaches rather than reactive measures (Laitinen et al., 2013; Haas and Yorio, 2016). Kheni and Braimah (2014) and Boadu et al. (2021) attributed the critical factors affecting the Ghanaian construction industry to the non-availability of comprehensive health and safety policies to address safety incentive design and implementation. The non-availability in Ghana translates into the absence of a national safety incentive vision, weak institutional framework, the political influence of the OSH enforcement agency, ineffective logistics for the OSH agency, the OSH enforcement personnel skills shortage, and ineffective H&S code of practice (Kheni and Braimah, 2014; Boadu et al., 2021). Likewise, Iipinge (2009) asserted that developing NSIP in developing countries is often affected by inadequate regulatory frameworks, the absence of stakeholders in policy development organisations' management authority, decisions, and the allocation of available resources. According to Ditlopo et al. (2013), incentive policy implementation in the Republic of South Africa has been limited due to bad governance, inadequate regulatory framework, inadequate resources to meet the policy pre-conditions, inaccurate public sector human resource database, and inaccurate and incomplete documentation from enforcement agencies.

Hence, it is essential to address the gap in knowledge of the critical factors affecting the NSIP development, which could significantly influence the effective design and implementation of safety incentives in the Nigerian construction industry. This study examines expert opinions on critical factors affecting the development of a national safety incentive policy in the construction industry in developing countries, using Nigeria as a case study to enrich its application among construction organisations within the Nigerian construction industry. Therefore, this study intends to provide answers to the following research Delphi forecasted questions:

- Will a national safety incentives policy ever be developed for the Nigerian construction industry?
- What is the likely timeframe for adopting safety incentive schemes within the Nigerian construction industry?
- Does the lack of a national safety incentive policy for construction organisations affect the Nigerian construction industry's effective H&S practices and employee motivation drives?
- What are the critical factors affecting the NSIP development in the Nigerian construction industry?

METHODOLOGY

This study adopted the Delphi approach in validating critical factors affecting the NSIP development in the construction industry in developing countries, using expert panellists in Nigeria as a case study. According to Nasa et al. (2021), the Delphi method is a structured technique developed through interaction, forecasting, and communication within a group of experts dealing

with a complex research problem. Ikuabe et al. (2023) noted that the Delphi technique allows researchers to explore philosophical and qualitative stances in deducing a constructive perspective in research. Mahamadu et al. (2019) and Ikuabe et al. (2023) described the Delphi technique as the formation of distinctive knowledge and understanding of the world emanating from experiences and contemplation of those experiences. The Delphi process is based on the anonymous views of experts pooling experiences and intelligence to improve individual judgment views on a research problem (Ameyaw et al., 2016; Ikuabe et al., 2023).

To begin with, an extant literature review was conducted to identify critical factors affecting the NSIP development in developing countries before the Delphi iteration. Given this, expert opinions on the identified critical factors were validated through the Delphi technique. However, in determining representative sample size for a Delphi study, existing literature suggests that no general rule applies to sample choice selection (Howell and Kemp, 2005; Ameyaw et al., 2016). Nonetheless, the selection criteria adopted in this study include expert panellists meeting a minimum of bachelor's degree academic qualifications in the built environment disciplines (Giel and Issa, 2016; Evans and Farrell, 2021); have a minimum of five years of working experience (Chan et al., 2001; Ikuabe et al., 2023). Likewise, the selected expert panellists demonstrate theoretical knowledge and practical experiences of safety incentives and H&S practices from academics and professional practice (Aigbavboa, 2014; Evans and Farrell, 2021; Ogunbayo et al., 2023). Thus, twenty-five experts were invited via e-mails to participate in the Delphi study, and a copy of their curriculum vitae was requested. Twenty-one met the required selection criteria, but fifteen experts completed and returned the first round of the Delphi questionnaire within the set time frame and were involved in the entire Delphi study process.

Likewise, the expert panellists' consensus at each round of the Delphi process was based on the relative impact index (RII) in validating critical factors affecting the NSIP development in the construction industry. The expert panellists' decision to reach a consensus is based on a 10-point impact scale in which 1 to 2 represents no impact (NI), 3–4 represents low impact (LI), 5–6 represents medium impact (MI), 7–8 represents high impact (HI), and 9–10 represents very high impact (VHI). This involves the determination of Median (M), mean ($\overline{x}$), standard deviation (σ x), and interquartile deviation (IQD) to calculate and analyse each round of the Delphi process for reaching consensus in this study:

- Weak consensus - median $\leq$ 6.99, mean $\leq$5.99, and IQD $\geq$ 2.1$\leq$3 and $\leq$ 59% (5.99).
- Good consensus - median 7-8.99, mean 6-7.99, IQD $\geq$ 1.1$\leq$2 and $\geq$60%$\leq$79% (6-7.99); and
- Strong consensus - median 9-10, mean 8-10, IQD $\leq$1 and $\geq$80% (8-10).

However, the reliability and interrelatedness of the data obtained were checked using Cronbach's alpha test, which returned 0.761 to determine the validity and reliability of the Delphi data collection instrument (Tavakol and

Dennick, 2011; Taber, 2018). Likewise, as Rousseaux and Gad (2013) noted, the Mann-Whitney U test was used to compare the perceptions of the expert panellists in academic and professional practices in validating the identified critical factors.

RESULTS

Respondents Demographic Information

The demographic information of the fifteen expert panellists involved in the Delphi process (see Table 1). The study findings show that the experts' highest academic qualifications, 46.66% (7) with doctorate degrees and 53.66% (8) with master's degrees, completed the Delphi study process in the first and second rounds. The panellist's designations in the construction industry include 46.66% (7) lecturers in the public and private HEI and 53.66% (8) construction industry professionals with designations such as contractors 20.00%, consultants 13.33%, government agencies 13.33% and director of physical planning 6.66% (comprising architect, builders, engineers, and quantity surveyors). The study findings further indicate that nine had 10–15 years of experience, four had 16–20 years of experience, one had 21–25 years of experience, and only one expert panel member had 6–10 years of experience. The demographic information set minimum criteria upon which panellists were drawn for the Delphi study met a minimum of 5 points criteria for inclusion of experts and were deemed fit for the study.

Table 1. Respodent's demographic information.

Demographic information	Frequency (n = 15)	Percentage (%)
Highest academic qualification		
Doctor of Philosophy (Ph.D.)	7	46.66%
Master of Science degree	8	53.66%
Total	15	100%
Designation		
Lecturers	7	46.66%
Consultants	2	13.33%
Government agency	2	13.33%
Contractors	3	20.00%
Director of Physical Planning	1	6.67%
Total	15	100%
Years of experience		
1–5	-	-
6–10	1	6.66%
11–15	9	60.00%
16–20	4	26.66%
21–25	1	6.67%
Above 25 years	-	-
Total	15	100%
Professional Affiliations		
Nigerian Institute of Architects	4	26.66%
Nigerian Institute of Building	6	40.00%
Nigerian Institute Of Engineers	3	20.00%
Nigerian Institute of Quality Surveyors	2	13.34%
Total	15	100%

Respondent's Perception of the Delphi Forecasted Questions

The findings indicate that there is 100% agreement between the experts that the Nigerian national safety incentives policy will be developed for the construction industry (see Table 2). Likewise, the findings revealed that 40% of the experts agreed that it would take 6 – 10 years for a national safety incentives policy to be developed in Nigeria, 33.33% agreed it would take 11 – 15 years, 13.33% agreed that it would take 16 – 20 years, 13.33% agreed that it would take 0 – 5 years and none of the experts consent if it would take beyond 20 years before a national safety incentives policy will be developed in Nigeria (see Table 2). The findings indicate that 73% of the experts strongly agreed, compared to 27% who agreed, that the lack of a national safety incentives policy affects the effective H&S practices and employee motivation drives in the Nigerian construction industry. The experts' consensus on this question indicates that NSIP development can drive employee motivation and improve effective H&S practices in the Nigerian construction industry (see Table 2).

Table 2. Respondents perceptions on the Delphi forecasted questions.

Respondent demographic information	Frequency (n = 15)	Percentage (%)
Will a national safety incentives policy ever be developed for the Nigerian construction industry?	Yes 15	100%
	No -	-
	Total	100%
What is the likely timeframe for adopting safety incentive schemes within the Nigerian construction industry?	0 – 5 years	13.33%
	6 – 10 years	40%
	11 – 15 years	33.33%
	16 – 20 years	13.33%
	Total	100%
Does the lack of a national safety incentive policy for construction organisations affect the Nigerian construction industry's effective H&S practices and employee motivation drives?	Strongly agreed	73%
	Agreed	27%
	Total	100%

Delphi Study Round One Result

Round one of thept Delphi iterations sought to determine the consensus of the panellists and validate the identified critical factors affecting the NSIP development. Ten (10) of the fifteen (15) identified variables were validated as critical factors affecting the NSIP development in Nigeria. Four (4) of the factors had a very high impact (VHI: 9.00–10.00), which are: *weak institutional framework, OSH agency's corrupt practices, stakeholders' absence in policy development, ineffective H&S code of practice, and political influence OSH enforcement agency*, while six (6) variables had a high impact (HI: 7.00–8.99), which are: *insufficient government budget for OSH agency, inadequate regulatory framework, ineffective OSH policy enforcement, absence of national safety incentive vision, the insufficient government budget for OSH agency and ineffective OHS policies*, and the remaining five (5) variables recorded a medium impact (MI: 5.00–6.99), which are: *absence of continuity in governance, conflicting government policies, ineffective logistics for the OSH agency, OSH enforcement personnel skills shortage and bad governance*.

Delphi Study Round Two Result

The outcome of the second round of the Delphi study establishes consensus among the panellists in validating the identified critical factors affecting the NSIP development (see Table 3). Twelve (12) of the fifteen (15) identified variables were validated as critical factors affecting the NSIP development in Nigeria. Six (6) of the factors had a very high impact (VHI: 9.00–10.00), which are: *weak institutional framework, OSH agency's corrupt practices, stakeholders' absence in policy development, Absence of national safety incentive vision, insufficient government budget for OSH agency, ineffective H&S code of practice, and political influence OSH enforcement agency,* while six (6) variables had a high impact (HI: 7.00–8.99), which are: *insufficient government budget for OSH agency, inadequate regulatory framework, ineffective OSH policy enforcement, ineffective OHS policies*, *absence of continuity in governance, and conflicting government policies,* and the remaining three (3) variables recorded a medium impact (MI: 5.00–6.99), which are: *ineffective logistics for the OSH agency, OSH enforcement personnel skills shortage and bad governance*. Furthermore, the Mann–Whitney U test was conducted to determine the significant difference in the experts' opinions between the two expert panellist groups (academic and industry professional practice designations). According to Pallant (2005), a p-value > 0.05 indicates a not statistical difference in group opinion; in contrast, a p-value $\leq$ 0.05 indicates an imbalance or statistical difference in the group opinion. Two of the fifteen variables, namely, the OSH agency's corrupt practices 0.014 p-values $\leq$ 0.05 and ineffective logistics for the OSH agency 0.032 p-value $\leq$ 0.05 indicate a statistical difference in the experts' opinions from the fifteen identified critical factors affecting the NSIP development (see Table 3). Hence, the study findings from the Delphi study's second round indicated no variability in the experts' opinions in academic and industry professional practice.

Table 3. Delphi second-round outcome.

Barriers to Safety Incentives Design	Median (M)	Mean ($\bar{x}$)	Ranking	SD (σx)	IQD	Mann-Whitney	
						Z	*P-value*
Weak institutional framework	9	8.73	1	0.96	1.00	−0.42	0.673
OSH agency's corrupt practices	9	8.67	2	0.82	0.50	−2.15	0.032
Stakeholders' absence in policy development	9	8.53	3	0.99	1.00	−1.32	0.186
Absence of a national safety incentive vision	9	8.47	4	0.99	1.00	−0.06	0.952
Insufficient government budget for OSH agency	8	8.40	5	0.91	1.00	−1.15	0.250
Ineffective H&S code of practice	9	8.40	6	1.06	1.00	−1.56	0.118
Political Influence OSH enforcement agency	9	8.33	7	1.18	1.00	−1.90	0.057

(Continued)

Table 3. Continued

Barriers to Safety Incentives Design	Median (M)	Mean ($\bar{x}$)	Ranking	SD (σx)	IQD	Mann-Whitney	
						Z	*P- value*
Inadequate regulatory framework	8	8.27	8	1.03	1.00	−0.72	0.469
Ineffective OSH policy enforcement	8	8.20	9	1.15	1.00	−0.96	0.336
Ineffective OHS policies	8	8.13	10	1.13	1.00	−0.78	0.437
Absence of continuity in governance	8	8.00	11	1.41	1.00	−0.12	0.902
Conflicting government policies	8	8.00	11	0.76	1.00	0.000	1.000
Ineffective logistics for the OSH agency	5	5.13	13	2.59	4.50	2.46	0.014
OSH enforcement personnel skills shortage	6	5.47	14	2.95	5.00	−0.41	0.683
Bad governance	5	4.93	15	2.66	5.00	0.82	0.411

A strong consensus was reached for twelve (12) factors with the IQD scores $\leq$ 1.00. Thus, the twelve (12) validated factors critically affected the development of a national safety incentives policy in the Nigerian construction industry. The study finding is consistent with Wilde (2011) and Jiang et al. (2019), who affirmed that factors such as policies guiding goal setting and performance indicators affect the construction industry in developing countries to design and implement safety incentives effectively. The six (6) factors with very high impact values (VHI: 9:00–10.00) align with Kheni and Braimah (2014) and Boadu et al. (2021), who attributed the critical factors affecting the national safety incentive policy construction industry to the non-availability-of-comprehensive-health and safety policies to address safety incentive design and implementation. The study findings on the six (6) factors that had had a high impact (HI: 7.00–8.99) agree with Ditlopo et al. (2013), who noted that bad governance, inadequate regulatory framework, and inadequate resources to meet the policy pre-conditions critically affect incentive policy development and implementation. Likewise, the study findings support Ghasemi et al. (2015) submission that a lack of policy development, conflicting government policies, and a lack of annual review and evaluation of safety incentive policy are critical factors affecting national safety incentive policy development and implementation.

CONCLUSION

The study adopted the Delphi technique to validate critical factors affecting NSIP development in developing countries, using Nigeria as a case study. Fifteen expert panellists were drawn from academic and professional practice in the Nigerian construction industry. The study expert panellists strongly agreed that a national safety incentives policy should be developed for the Nigerian construction industry, with likely timeframes of 6 – 10 years to this time. A strong consensus was reached, establishing that the lack of a national safety incentive policy critically affects effective H&S practices and

employee motivation drives in the Nigerian construction industry. Likewise, a strong consensus was reached using the Delphi technique, validating twelve of the fifteen identified factors that critically affect the development of a national safety incentives policy in the Nigerian construction industry. Hence, the study recommends that in developing a national safety incentives policy for the Nigerian construction industry, construction stakeholders should guide against the following factors: weak institutional framework, occupational safety and health agency's corrupt practices, stakeholders' absence in policy development, insufficient government budget allocation for occupational H&S agency, ineffective H&S code of practice, absence of national safety incentive vision, political influence on occupational safety and health enforcement agency, inadequate regulatory framework, ineffective occupational safety and health policy enforcement, and ineffective occupational safety and health policies. This study concluded by calling for a standalone national safety incentive policy that will holistically support the implementation of safety incentives within the construction industry, considering the identified critical factors. The study is limited to selected professionals who are architects, builders, engineers, and quantity surveyors with academic and professional practice experience in Southwestern Nigeria. Hence, further study could adopt a mixed method (qualitative and quantitative) to compare the findings from this study using a larger sample size of stakeholders in the Nigerian construction industry.

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