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Factors Affecting Risk Management in Developing Countries

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***Abstract**: Developing countries construction projects are associated with various levels of risks. One of the common factors affecting risk management in developing countries is the lack of project management standards familiarity. The main purpose of this paper is to investigate the most significant factors affecting risk management in developing countries construction projects. The research approach starts with extensive review of literature to provide several factors list which was also thoroughly looked at to reach final factors list that has all the factors that may affect risk management in developing countries construction projects. A set of 12 main factors and their sub-factors were selected and a survey by questionnaire was conducted to identify the most effective factors among them all. Results were further analyzed using the Relative information index (RII) and the Analysis of variance (ANOVA). Results indicated that factors related to government instability are the most dominant in developing countries. However, there are many other factors not to be ignored that have a greater impact in risk management in construction projects of developing countries.*

1. INTRODUCTION

Risks are present in all parts of the construction work regardless of size, resources, funds etc. Since each construction project is unique and dynamic, the construction performance presumes several uncertainties about the complexity of the construction project (Chandra, 2015). Risk management suggests that risks should be distributed to minimize their harm since they cannot be completely eliminated, which would have been the easiest option (Szymański, 2017). To amplify the profitability perimeters of construction contracts, it is wise to assess and evaluate the

possible positive risk factors(Chandra, 2015). Identifying, classifying and assessing potential risk factors that may affect the functioning of projects is prudent. Therefore, the focus of this research is to identify the harmful characteristics of factors encountered along with the risk management of the progress of a project. A handful of researchers looked at the risk management procedure in a specific project phase, such as conceptual and feasible phase, construction phase and design phase, rather than from the point of view of the project life circle (Rostami & Oduoza, 2017).

Recognizing external and internal risks of construction projects is imperative in order to properly record unpredictable incidents of construction projects. Various risk recognition and further risk assessment processes reduce the pessimistic influence of risks and expand efficiency and productivity in business (Motiar Rahman & Kumaraswamy, 2002). Consequently, to articulate and manage key risks related to construction projects, this paper introduces the results of a thorough review of the literature and seeks to draw attention to the major factors affecting risk management in developing countries.

2. LITERATURE REVIEW

Projects and organizations are full of unpredictable situations in our daily life (Olsson, 2007) representing an obvious problem for the construction business (Vallabh Vidyanagar). The topic of construction risk management has been the subject of several research works. Some of the earliest researchers to structure construction risk tests was Chapman and Cooper (C. Chapman & Cooper, 1983). Their research resulted in a risk engineering approach that led to many useful risk management tooling techniques (Jarkas & Haupt, 2015). Risk management as defined is a risk recognition and assessment procedure, then applying methods to minimize it to a reasonable extent (Tohidi, 2011). After Edward and Bowen (Bowen, 1998)research on construction risk management issued in the early years of 1960-1970 to notice shortages and inconsistencies in understanding and conducting towards construction risks. The results suggest that social, financial, economic and political risk factors deserve more attention as far as research is concerned compared to other factors such as occupational health and safety and quality assurance.

(Al-Bahar & Crandall, 1990) conducted research and categorized risk factors in construction in 6 classes, one of which was financial risk. Financial risk suggests that a construction company may fail to meet its financial targets, so it is a potential for financial instability that could lead to

severe loss and uncertainty about its extent. The past / earlier author identified that inflation, improper cost plan, industry recession, cash flow availability could increase financial risks (Edwards & Bowen, 1998; El-Sayegh, 2008). (Ameyaw & Chan, 2015) recognized laws and regulations as a risk management factor in construction. Legal and regulatory risks are risks that the production targets of construction firms will be enforceable as they cannot meet the country's legal and regulatory standards. (Assaf & Al-Hejji, 2006; Barlish, De Marco, & Thaheem, 2013) observes that a delay in the construction project could result if this factor is not addressed. (Tadayon, Jaafar, & Nasri, 2012)in the Iranian Construction Risk Identification Assessment, notes that frequent changes in statutory regulations affect risk management in construction. (Zou, Zhang, & Wang, 2007) after conducting a survey in Chinese construction states that it takes a long time to obtain legal and regulatory approval, hence it is essential for project members to maintain good relations with government officials.

(Szymański, 2017) identifies natural and environmental risks as a threat to construction risk management, the previous / earlier author noted that natural risks are environmental risks and cannot be anticipated. Natural risks are a natural phenomenon that sometimes has a negative impact on people or the environment, examples of such are classified as meteorological and geological phenomena, under these two we have earthquakes, floods, landslides, wildfires, cyclone storms, etc. Air pollution, spread of diseases, land degradation, water pollution, natural disasters are a threat in Nigerian constructions(Akinbile, Ofuyatano, Oni, & Agboola, 2018).

(San Santoso, Ogunlana, & Minato, 2003) conducted a survey in Jakarta and recognized design issues as a factor affecting construction risk management. Design risk is the likelihood of a design being unsuccessful to meet a project's requirements. Included are designs that are unsound, inefficient, unstable or just not attaining customer standards(R. J. Chapman, 2001). Design is a stage which forms the backbone of the project(Szymański, 2017). Szymanski further states that at the design stage we have risks such as improper designer selection, the risk of overestimating the cost of the project. Giving design to unqualified planners and defective designs is a threat to risk management, states (Enshassi, Mohamed, & Abu Mosa, 2008)after conducting a survey in Palestine. (Wiguna & Scott, 2005) identified the owner's design change as one of the factors affecting the risk management of Indonesian construction. (Z. Wu, Nisar, Kapletia, & Prabhakar, 2017). Further research on the project success of the Chinese construction industry identified inadequate program scheduling, inadequate site information, as

factors affecting risk management in construction. Both(Sharaf & Abdelwahab, 2015)and(Mhatre, Thakkar, & Maiti, 2017) noted that design drawing errors are a serious threat to a project,(Mhatre et al., 2017) further identified poor construction plan, inappropriate design, and poor engineering as design risk factors.

After reviewing the literature on factors affecting risk management, the researcher identifies political risks as one of the major factors affecting risk management in construction(Matthee, 2011). The earlier / past researcher defines political risks as the risk that an investment's profit might suffer as a result of changes in policies or instability in the country. (Goh & Abdul-Rahman, 2013) Country economic instability, risk of inflation, risk of recession in industry and disagreements among funding parties, etc., are highly impacting factors identified by the previous / former author. (Sharaf & Abdelwahab, 2015)State that political changes, frequent change of government, protests for change of government and disputes between political parties are also factors to be recognized. Furthermore (Deng, Low, Li, & Zhao, 2014)and(Famiyeh, Amoatey, Adaku, & Agbenohevi, 2017) emphasize that the major risks at the top due to political differences and economy are currency infatuation, changes in tax rates, changes in security officials, workers strikes and fire risk. After a survey in Ghana (Famiyeh et al., 2017) identified government pressure, inspectors, government bureaucracy to obtain license conflicts as major factors affecting risk management under political risks. (Enshassi et al., 2008) conducted a survey in Palestine and found that frequent border closures as a political factor affect construction progress.

The findings revealed that safety risk falls under risk management factors(Hallowell & Gambatese, 2009). (Aminbakhsh, Gunduz, & Sonmez, 2013). Safety risks are defined as the likelihood that a person or machines under construction may be harmed if they are a person who may suffer adverse health effects if they are exposed to a certain hazard. (Hwang, Zhao, & Toh, 2014) also identified safety and health as a factor affecting construction risk management. More so after categorizing risks into major classes Safety and health were among them (Ghosh & Jintanapakanont, 2004), justifying how serious an issue this factor is following a survey in Malaysia (Goh & Abdul-Rahman, 2013)accidents were recognized as a major threat in Malaysian constructions. Older researcher on Palestine noted that workers were working in dangerous areas, putting their lives at great risk(Famiyeh et al., 2017) states that inadequate safety equipment for workers also put employees at enormous risk. Old author further notes that

construction accidents are usually caused by material and equipment failures,(San Santoso et al., 2003)further elaboration that construction equipment maintenance is the most significant. (Famiyeh et al., 2017) also stated that air pollution and pollution of water bodies pose a serious health risk and disease spread are very serious threats in the construction of Ghana.

After reviewing literature the author considered resource unavailability as a major factor affecting risk management, past authors like (Akinbile et al., 2018)further noted that it is a very important factor because of its global implications. John Spacey also gave an example of resources, as stated, including funding, skilled workers, time and anything else needed to support the process to a particular obligation. (Hwang et al., 2014) identified the human resource as a risk affecting construction projects. Moreover, following a survey conducted in Nigeria(Akinbile et al., 2018), insufficient resource availability was identified as a major risk. (El-Sayegh, 2008) conducted a survey on the construction sites of the UAE, the previous / earlier author recognized a shortage of materials and labor supply as a risk. In their survey in Indonesia, the same results were obtained in 2005 by(Wiguna& Scott, 2005), identifying the availability of labor, material and equipment as a problem suggesting that these are serious risks not to be ignored in construction. (Amoatey, Famiyeh, & Andoh, 2017). In Ghana it was found that there was a shortage of skilled labor in construction. (Mhatre et al., 2017) It came to the same conclusion that there was insufficient experience and skill in construction workers.

Technological risk is any potential for disruption of technology failures, the project, for example, information security, bad site communication, just to name a few (Nelkin, 1989). Change in technology also affects risk management in construction, (Dey, Tabucanon, & Ogunlana, 1994) also states that technology change is a risk in the life of the project. (Mhatre et al., 2017) notes that the shortage of required equipment that is technology is also a major risk in construction and can cause slow progress of the project. Social risks for a construction company include actions that affect their surrender(Johnson & Covello, 2012). There are other issues that may also be relevant to social risks, such as public health issues, which may have an impact on absenteeism and the morale of workers. If the construction company doesn't have a good understanding of the local power structure.(Famiyeh et al., 2017) identified the displacement of communities and high living costs, as well as the lack of community acceptance as a social risk following a survey in Ghana. (Mhatre et al., 2017) identifies the increase in material prices and the cost of studies as a social risk.

Table 1: Factors Affecting Risk Management in Construction

FACTORS	SUBFACTORS	REFERENCES
1.Financial risks	- Market inflation - Capital cost - Project funding problems - Inaccurate cost estimation - Price infatuation - An estimate of quantity of resources - Cash flow availability	(Ghosh & Jintanapakanont, 2004; Wiguna & Scott, 2005)
2.Legaland regulation risks	- Changes in law and regulations - Requirements and permit approval - Contract selection and administration - Delayed dispute resolution	(Chandra, 2015; Ghosh & Jintanapakanont, 2004)
3.Naturalrisks/ Acts of God	- Earthquakes - Weather - Ecological - Natural hazards	(Al-Bahar& Crandall, 1990)
4.Design risks	- Design change - Errors and omissions in design - Inadequate specifications	(Dosumu & Aigbavboa, 2017) (Mhatre et al., 2017) (Jarkas & Haupt, 2015) (R. J. Chapman, 2001)
5.Technological risks	- Change in technology - Lack of qualified equipment users - Shortage of required equipment	(Al-Bahar & Crandall, 1990; Mhatre et al., 2017)
6.Safety/Health risks	- Pollution - Fire outbreaks - Spread of diseases - Sanitation	(Aminbakhsh et al., 2013) (Hallowell & Gambatese, 2009) (Ringen, Seegal, & England, 1995)
7. Social risks	- Belief - Moral values - Morality - Social status - Culture	(Cernea, 2004) (Y. Wu, Deng, & Zhang, 2011) (Johnson & Covello, 2012) (Nelkin, 1989)
8. Political risks	- Change in government - Disagreements in funding parties - Civil wars - Corruption	(Akinbile et al., 2018)
9. Resource risks	- Availability of equipment - Availability of labor - Defective materials	(Akinbile et al., 2018)
10. Environmental	- Ecological	(Dione, Ruwanpura, &

FACTORS	SUBFACTORS	REFERENCES
risks	- Pollution	Hettiaratchi, 2005)
11.Human resource risks	- Availability of labor - Availability of skilled labor	(Gudienė, Banaitis, & Banaitienė, 2013; Windapo, 2016)

3. METHODOLOGY

The review of literature carried out assisted in having a finer comprehension and gathering of data of investigating factors affecting risk management in construction. It led to the identification of 11 main factors and their sub-factors. Adopted was a survey method to solidify the factors in this study. Several papers with past reliable information were reviewed. Data from the reviewed literature was to be gathered and compared to the other method the author used to collect information. An online questionnaire was developed; the author designed and distributed the questionnaire to get huge sample details for a comprehensive analysis and understanding.

The questionnaire consisted of 3 parts. First included the introduction and the study objectives. The second part had the basic profile of the respondent, including their work experience, job position, understanding of risk management in project and their education level. The third section was made to evaluate and grade factors according to their effect with respect the respondent's opinion. The respondents were asked to evaluate the risk factors on a five-point Likert scale, were {(5=strongly agree)(4=agree)(3=no opinion)(2=disagree)(1=strongly disagree)}. Amongst the respondents were project managers, contractors, architects, site engineers, consultants and site experts. Designing the questionnaire an expert's opinion was taken into consideration. A total of 100 survey questionnaires were set out to different people and countries. Only 70 people managed to complete the questionnaire both from the private and public sector of construction. Amongst the respondents were people from different developing countries such as Zimbabwe, Zambia, Cameroon, Nepal, China, Bangladesh ,South Africa ,Botswana, Tunisia only to name a few. Data was analyzed by using the Relative Importance Index (RII) and Analysis of Variance (ANOVA), these methods of analysis reduces biased results both as far as ranking of factors and the analyses of variance is concerned. ANOVA gives a fair estimation of variance between two groups which in this case is our private and public sector Relative Importance Index (RII) is carried out by using Microsoft excel software.

$$\text{RII} = \frac{\Sigma W}{AN} \qquad (1)$$

W = respondent's given weighting to each factor ranging from 1-5

A = highest weight

N = total number of respondents

The RII results ranges from 0-1.

3.1 Analysis of variance (ANOVA)

Analysis of variance is the gathering of statistical models and their estimation procedures, such as the difference among and between groups. Results below 0. 05 suggest that there is a significant difference between 2 groups however results above 0. 05 suggest that there is no significant variation between our chosen groups(reference). (ANOVA) is carried out by using SPSS version 23 software.

3.2 Hypothesis

H1: there was no difference between private and public sector construction projects in the perception of significance level of factors affecting risk management in developing countries.

4. RESULT

Table 2: Factor Rating by Relative Information Index (RII)

Factors affecting risk management	***Frequency of severity***					***Rating***	
	1	***2***	***3***	***4***	***5***	***RII***	***Rank***
Government instability	2	6	5	23	31	0.8200	1
Shortage or required equipment	4	7	2	24	31	0.8057	2
Inflation	3	4	7	33	22	0.7829	3
Lack of skilled labor	4	6	7	26	24	0.7771	4
Corruption	5	7	8	24	26	0.7686	5
Capital cost	4	9	8	20	26	0.7571	6
Culture	4	7	15	20	24	0.7514	7
Change in laws and regulations	3	9	8	30	17	0.7514	8
Error and omission in design	2	9	9	36	14	0.7457	9
Improper design selection	5	9	9	28	18	0.7286	10

Improper technology selection	5	9	13	22	20	0.7229	11
Unavailability of labor	9	9	7	20	22	0.7200	12
Change in technology	2	12	12	23	19	0.7171	13
Sanitation	4	10	11	34	11	0.7086	14
Contract selection and administration	2	12	22	18	16	0.6971	15
Delayed dispute resolution	5	10	16	23	15	0.6914	16
Inaccurate cost estimation	4	12	19	16	18	0.6914	17
Fluctuation of currency	11	6	14	21	17	0.6829	18
Recession in industry	3	15	18	19	15	0.6800	19
Change in government	5	10	22	23	9	0.6657	20
Moral values	2	6	36	19	5	0.6657	21
Improper cost plan	17	10	17	17	16	0.6543	22
Perception	4	12	26	16	11	0.6514	23
Weather	9	12	16	19	13	0.6486	24
Decrease in aesthetic level(client)	4	12	28	16	8	0.6343	25
Inadequate specification	3	10	35	15	6	0.6257	26
Disagreement in funding parties	6	16	23	15	10	0.6200	27
Ecology	7	4	42	11	5	0.6143	28
Social status	5	14	35	8	8	0.6000	29
Over estimating project cost	5	26	15	17	6	0.5857	30
Design change	10	25	11	16	7	0.5571	31
Pollution	7	30	14	12	7	0.5486	32
Requirement of permits and approval	15	22	12	12	8	0.5371	33
Fire outbreak	15	20	13	16	3	0.5343	34
Pollution	20	17	12	14	6	0.5314	35
Spread of diseases	9	34	10	12	5	0.5114	36
Defective material	15	29	4	16	6	0.5000	37
Natural hazards	28	13	8	8	13	0.5000	38
Civil wars	34	8	8	6	12	0.4657	39

The table above presents an analysis for factors affecting risk management in developing countries using the Relative importance index. The table shows the importance and the impact of the stated factors from the most important to the less important one.

Table 3: Analyses of Variance between Public and Private Sector (ANOVA)

		Sum of Squares	Df	Mean Square	F	Sig.
FR1	Between Groups	0.386	1	0.386	0.32	0.57
	Within Groups	81.1	68	1.193		
	Total	81.486	69			
FR2	Between Groups	7.243	1	7.243	4.15	0.05
	Within Groups	118.6	68	1.744		
	Total	125.843	69			
FR3	Between Groups	2.519	1	2.519	1.33	0.25
	Within Groups	128.467	68	1.889		
	Total	130.986	69			
FR4	Between Groups	1.458	1	1.458	1.06	0.31
	Within Groups	93.342	68	1.373		
	Total	94.8	69			
FR5	Between Groups	0.011	1	0.011	0.01	0.94
	Within Groups	111.775	68	1.644		
	Total	111.786	69			
FR6	Between Groups	1.071	1	1.071	0.73	0.4
	Within Groups	100.3	68	1.475		
	Total	101.371	69			
LR1	Between Groups	0.805	1	0.805	0.64	0. 43
	Within Groups	86.067	68	1.266		
	Total	86.871	69			
LR2	Between Groups	0.144	1	0.144	0.08	0. 78
	Within Groups	122.942	68	1.808		
	Total	123.086	69			
LR3	Between Groups	1.63	1	1.63	1.13	0. 29
	Within Groups	97.742	68	1.437		
	Total	99.371	69			
LR4	Between Groups	0.344	1	0.344	0.28	0. 6
	Within Groups	85.142	68	1.252		
	Total	85.486	69			
NE1	Between Groups	11.433	1	11.433	4.98	0. 03
	Within Groups	156.067	68	2.295		
	Total	167.5	69			
NE2	Between Groups	1.144	1	1.144	0.62	0. 43

		Sum of Squares	Df	Mean Square	F	Sig.
	Within Groups	125.842	68	1.851		
	Total	126.986	69			
NE3	Between Groups	6.001	1	6.001	6.73	0. 01
	Within Groups	60.642	68	0.892		
	Total	66.643	69			
NE4	Between Groups	0.005	1	0.005	0	0. 96
	Within Groups	118.867	68	1.748		
	Total	118.871	69			
DR1	Between Groups	0.305	1	0.305	0.21	0. 65
	Within Groups	99.767	68	1.467		
	Total	100.071	69			
DR2	Between Groups	0.043	1	0.043	0.03	0. 86
	Within Groups	90.6	68	1.332		
	Total	90.643	69			
DR3	Between Groups	2.976	1	2.976	2.85	0. 1
	Within Groups	70.967	68	1.044		
	Total	73.943	69			
DR4	Between Groups	0.686	1	0.686	0.44	0. 51
	Within Groups	105.1	68	1.546		
	Total	105.786	69			
DR5	Between Groups	0.576	1	0.576	0.62	0. 43
	Within Groups	63.267	68	0.93		
	Total	63.843	69			
DR6	Between Groups	0.076	1	0.076	0.07	0. 79
	Within Groups	71.767	68	1.055		
	Total	71.843	69			
TR1	Between Groups	0.144	1	0.144	0.09	0. 76
	Within Groups	104.442	68	1.536		
	Total	104.586	69			
TR2	Between Groups	0.011	1	0.011	0.01	0. 93
	Within Groups	102.975	68	1.514		
	Total	102.986	69			
TR3	Between Groups	1.144	1	1.144	0.78	0. 38
	Within Groups	99.942	68	1.47		
	Total	101.086	69			
TR4	Between Groups	1.001	1	1.001	0.67	0. 41
	Within Groups	100.942	68	1.484		
	Total	101.943	69			
SHR1	Between Groups	1.071	1	1.071	0.7	0. 41
	Within Groups	104.7	68	1.54		

		Sum of Squares	Df	Mean Square	F	Sig.
	Total	105.771	69			
SHR2	Between Groups	0.171	1	0.171	0.14	0. 71
	Within Groups	83.2	68	1.224		
	Total	83.371	69			
SHR3	Between Groups	0.305	1	0.305	0.22	0. 64
	Within Groups	93.067	68	1.369		
	Total	93.371	69			
PR4	Between Groups	0.576	1	0.576	0.44	0. 51
	Within Groups	88.567	68	1.302		
	Total	89.143	69			
PR1	Between Groups	1.376	1	1.376	1.11	0. 3
	Within Groups	84.067	68	1.236		
	Total	85.443	69			
PR2	Between Groups	1.458	1	1.458	1.07	0. 31
	Within Groups	92.842	68	1.365		
	Total	94.3	69			
PR3	Between Groups	0.001	1	0.001	0	0. 98
	Within Groups	167.442	68	2.462		
	Total	167.443	69			
PR4	Between Groups	0.233	1	0.233	0.2	0. 66
	Within Groups	80.067	68	1.177		
	Total	80.3	69			
RR1	Between Groups	0.096	1	0.096	0.06	0. 8
	Within Groups	105.175	68	1.547		
	Total	105.271	69			
RR2	Between Groups	0.058	1	0.058	0.03	0. 87
	Within Groups	136.742	68	2.011		
	Total	136.8	69			
RR3	Between Groups	0.096	1	0.096	0.06	0. 81
	Within Groups	115.175	68	1.694		
	Total	115.271	69			
SR1	Between Groups	0.043	1	0.043	0.06	0. 82
	Within Groups	53.4	68	0.785		
	Total	53.443	69			
SR2	Between Groups	4.43	1	4.43	3.19	0. 08
	Within Groups	94.442	68	1.389		
	Total	98.871	69			
SR3	Between Groups	0.805	1	0.805	0.66	0. 42
	Within Groups	82.567	68	1.214		
	Total	83.371	69			

		Sum of Squares	Df	Mean Square	F	Sig.
	Between Groups	0.233	1	0.233	0.22	0. 64
SR4	Within Groups	73.767	68	1.085		
	Total	74	69			

The table above presents an analysis of results for private and public sector of constructions in developing countries as far as factors affecting risk management are concerned. Here it is clearly shown that private and public sectors are affected the same way by the stated factors.

5. DISCUSSION

After the collection of our data using questionnaires data was analyzed. The RII method provided a non-biased ranking of our risk factors according to how people responded. The top 10 major factors in our ranking and also concretized by the review of literature are as follows.

Government instability was number one on our ranking using the RII method. Government instability is a key risk factor to consider because it is interlinked with many major risk factors that affect construction management in developing countries such as inflation, corruption, lack of equipment only to name a few. (Bekr, 2006) did a study in Iraq as a country which had an unstable government and noted that government instability leads to a lot of risks in a construction project since it affects time, cost, safety and quality of the project. In the research the previous author shows that government instability also affects the project's performance, hence making it hard for project managers to manage risks in the project's life circle.

In the data analysis done resource availability ranks second amongst all other risk factors affecting construction management in developing countries. (Sharaf & Abdelwahab, 2015) Resource availability also had a high rating in the stated authors study for risk factors for Egyptian constructions. (Akinbile et al., 2018)research paper also shows a high rating of resource availability as a risk factor in Nigerian. The author notes that this factor is amongst the top major factors, maybe due to its influence to the project's objectives if not well managed, hence(Zou et al., 2007)also supports the notion in construction projects. Market inflation holds the third position in the authors ranking using the RII method. Market inflation refers to the rise of prices of goods and services in the economy of a country over a period of time. (Sharaf & Abdelwahab, 2015) also rates this factor as one of the major risk factors affecting construction management, Sharaf further notes that when prices rise the currency buys less. We see this in construction

projects in developing countries like Zimbabwe that was highly affected by market inflation in 2008. The instability of currency leading to the price instability of goods and services was making it hard to plan, and manage projects within Zimbabwe. (Moyo & Crafford, 2010). Furthermore several authors recognize market inflation as a key risk affecting construction management in developing countries amongst them is (Wiguna & Scott, 2005) and (Goh & Abdul-Rahman, 2013).

On the fourth spot of the authors ranking using the RII method of analyzing there is the unavailability of skilled labor as a factor affecting risk management in construction projects in developing countries. This is also one of the major factors because it does not affect developing countries only. A study in an article published in 2015 by the General Contractors Of America also revealed that nearly 80% of American construction businesses are finding it hard to get skilled labor for their constructions businesses. (Tshele & Agumba, 2014)in the research paper shows how key this factor is in developing countries by providing a critical research in South African construction industry, the noted author further states that this shortage of skilled labor has prompted the South African government to be reactive. However, (Windapo, 2016) argues that there is shortage of skilled labor in developing countries with the high population of educated young unemployed people.

Several authors note that corruption is one of the major key risks in construction projects in developing countries. (Kenny, 2007)notes that corruption levels in developing countries affects risk management in construction projects to a greater extent since the impact of corruption goes way beyond bribery to low economic returns, poor projects results and low funding for maintenance. (Kenny, 2009). Corruption as a factor holds the fifth position in the author's analysis results.

Capital cost is a major factor affecting risk management in construction industry for developing countries. This is because most of the developing countries do not have enough funds to fund their desired construction projects. Hence, they depend mostly on foreign funders, this leads to a delay in project completion time and over spending in a project.

(Ofori, 2000)in a research about challenges of construction industry in developing countries states that developing country's local construction firms have no funds to sponsor privatized projects hence this imposed a huge risk to any started private project.

Culture also qualifies to be on top ten major factors affecting risk management in developing countries. This is because culture plays a vital role whenever there are a huge number of people like work places. Culture affects work days, dress codes ,gender equality, salaries, values, religion, only to name a few. (Kivrak, Ross, Arslan, Tuncan, & Dainty, 2009)

Change in laws and regulations as a result of trying new effective ways in developing countries have a greater impact on risk management in construction industries. This may be a result of change in government or any other major changes in the ruling party of a particular country hence it has a direct impact on construction business. (Chandra, 2015)Also recognizes this factor as a key factor affecting risk management in developing countries. Error and omission in design also qualifies to be in the top ten according to the RII rating. A design with errors is misleading and also a design with insufficient details is misleading hence this has a direct impact on many aspects of the project's life circle it also affects the financial side of the projects. There will be a lot of time wasting trying to solve and re-interpret the new designs hence delays are prone to happen in such cases.

Design change is recognized as a key factor with a high rating in its effect on risk management in construction for developing countries, several authors support this point(Akinbile et al., 2018). The change in design is time consuming and also costs a lot of money.

After carefully observing the data from the survey collected using questionnaires, most of the respondents were from the private sector with a difference of ten from the public sector. The author then used the Analysis of variance to analyze the data so as to get a none biased result of variance between the private and public sector. The results of the analysis were helpful as they proved that the private sector of developing countries is affected by the same factors with the public sector to a greater extent. Our analysis proves to be authentic since most of our compared results seem to be the same. The author concludes that private and public sector are affected in the same way by the most stated factors as far as risk management in construction of developing countries is concerned. However, there are three factors that vary in response according as suggested by the data, improper cost plan (FR2), natural hazards (NER1) and ecology (NER3).

6. Conclusion

Results of research show that the most significant factors affecting risk management in developing countries are government instability, lack of skilled labor and inflation. These factors have the highest percentage as shown by the relative information index in table 2 above. The most significant factors that affect risk management in construction are the ones that are common and noticeable in developing countries construction projects. Besides, we need to concentrate on top 10 major factors from RII method as major factors affecting risk management in most construction projects in developing countries. Moreover, ANOVA results in table 3 above show that no matter the nature of the project (public or private) risk factor affect these construction projects in the same level.

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