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Contractors' Perception of Factors Contributing to Road Project Delay

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Abstract Road construction projects play vital role in the socio-economic development of Ghana but one major challenge to road construction projects is delay. The purpose of this paper is to identify from contractors' point of view the factors that contribute to delay of road construction projects and the effects of delay. The study employed structured questionnaire survey. Respondents were selected using random sampling technique. The research study included 115 respondents, made up of 5 professionals each from 38 construction firms currently working in the region on different road projects. The results revealed six (6) major causes of delay namely; delay in honoring payment certificates, bad weather conditions, unfavourable site conditions, consultants initiated variations, delay in instructions from consultants and difficulty in accessing bank credit. The paper identifies extension of time, cost overrun, and damage to company's reputation as the main effects of road projects delay.

Keywords Road Project Delay, Contractors' Perception, Factors, Effects, Ghana

1. Introduction

The payback time of every project is very essential in project evaluation. This all important factor is usually affected by the project execution period, that is, the time taken to get the project ready for use [1]. Studies have revealed that construction projects all over the world face delay in their completion [2]. "Chong and Leong [3] said delay is one major setback to construction projects". It was argued that delay is prevalent, costly, complex and a risky problem that is often encountered on construction projects. If delay occurs during the construction of a project, it can be rectified by accelerating the pace of work on site or by offering the contractor extension of time. According to [4] a project is said to have been delayed if the completion time agreed by parties to a contract is exceeded. Agreeing to the earlier definition, "Gandhak and Sabihuddin [5] added that, delay can occur when work on site slows down without entirely stopping operations on site". It was argued that slowing down the pace of construction activities can result in time overrun which can also affect the delivery of project.

Project delay occurs during the construction execution phase [6]. The contractor and client either of them may be responsible for project delay but in some cases, they may not be the origin of this problem [7]. Contractors have legal responsibilities to complete projects on schedule but many items their efforts are interrupted by delay.

It was argued however by [5] that construction delay usually occurs when a client's financial power is stifled and is not able to make payment to the contractor on time. This usually happens when client's make extensive design changes without considering the cost impact of such changes. It was further underscored that, where there are funding problems; information delay, poor construction management practices, bureaucracy, compensation issues and disagreement between parties' delays may be inevitable.

2. Research Problem

Road infrastructure plays a vital role in Ghana's development. Road construction projects in the country are often delayed. Researchers have proven that construction projects all over the world face delay in their completion [2]. They are almost always accompanied by cost and time overruns. Construction project delays have unbearable effect on parties to the contract and can create confrontational relationships, distrust, litigation, arbitration, cash-flow problems, and a general feeling of apprehension between parties [8]. This gives bad impression to local and foreign investors in the construction industry [2]. Delays in road construction projects in the Western Region, affects the transportation of cocoa beans and other agricultural products to the ports and other parts of the country [9].

3. Aim

The purpose of this paper is to identify and rank from

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contractors' point of view the factors that contribute to delay of road construction projects and to identify the effects of delays.

4. Delay

Construction projects are full of risk and uncertainties. Delays can have negative economic consequences and can create bad image for a contractor. One of the indicators for measuring the efficiency of a contractor is time. Clients who are mindful of the benefits they are likely to recoup from their investments would not want to have anything to do with contractors who cannot meet project completion deadlines. According to [5] delay is the late delivery of construction projects later than the time stipulated by parties to a contract. Delay was defined by [16] as the overrun of time beyond planned schedule. Project delays can result in loss of revenue to clients and high overhead cost to contractors because of time extension. Construction project risk can be countless and may emerge from different sources. The origin of risk may include performance of parties to the contract, conditions on site, contractual relations, availability of resources for regular progress of construction activities on site, and involvement of other parties. Delays in construction can be categorised into two, namely; excusable and non-excusable. They can be caused by clients, their agents, contractors or suppliers, or neither of the parties [10]. Clients or their agents are the originators of excusable delays but non-excusable delays are caused by contractors [11].

Construction delays can be termed excusable or non-excusable depending on the terms and conditions of a contract [12]; [13] and [8]. Contractors have no control over excusable delays. Where such delays occur, entitlement within the contract gives contractors the opportunity to seek for extension of time to complete the work [13]. In addition to an extension of time, the contractor may also be entitled to recovery of cost related to the delay. In some instances the contractor would be entitled to both. Compensation of time extension or recovery of cost is given to the contractor because the occurrence of the delay may have been originated by the client or his agent [14]. On the other hand, non-excusable delays are foreseeable. They are events that the contractor has control over. The occurrence of such delays place limits on the contractor from asking for any extension of time or monetary compensation.

Concurrent delay is however, an amalgamation of two or more isolated causes happening at the same time [14]. It can be defined as separate delays to the critical path that occur at the same time [13]. This type of delay can be created by either the client or the contractor [15]. Both parties to the contract assume responsibility for such delay and cannot retrieve damages.

4.1. Basic Factors Accounting for Contractors Delay on Road Projects

There are a number of factors that account for delays on construction projects. The most fundamental ones contributing to delay of road construction projects in Ghana are: material shortages or scarcity, contractor or client financial problems, labour availability or shortage, plant or equipment shortage, and site control and management [17].

4.1.1. Material Shortage or Scarcity

Material shortages on site or in short supply can create a lot of problems on construction projects. Materials which are of high demand are likely to become scarce at a point in time on the market. This inadequacy in supply can create a lot of inconveniences for contractors which may eventually delay the project. Consistent supply of materials is imperative to the success of every project [18]. Unreliable suppliers and late delivery create material shortages on site [19]. "Aibinu and Odeyinka [20] stated that this can disrupt site activities". Missed or late deliveries can negatively impact on productivity and lead to project delay [21]. The ability of a supplier to deliver promptly should be one of the major criteria for selecting a supplier [22]. It was noted that missed and late deliveries often arise because of poor communication among team members [20]. Good communication among team members is key for project success [24].

4.1.2. Contractor or Client Financial Problems

The financial state of a contractor can be really bad and impact adversely on a project [17]. This problem of the contractor can be self in flinching or client related. A crippling financial state of a contractor means there is insufficient funds to continue construction works. Some contractors in Ghana have no cost control systems to track their cash flow. This often leads to overspending. Some have misplaced priorities, which mean that monies are not pushed to where they are needed. Delay in honouring payment by the client creates enormous financial difficulties for the contractor and it is a common problem in Ghana [25]. "Fugar and Agyakwah-Baah [45] pointed out delay in honouring payment by the client, low profit margins and insufficient capital or excessive debt as the causes of financial difficulties among contractors". However, [26] said contractors financial difficulties are due to poor financial control and management.

4.1.3. Labour Availability or Shortage

Every construction project needs a certain level of technical professionals, skilled, semi-skilled and unskilled labour. The need for such labour force is imperative for the success of construction projects. But it is often difficult finding labour with the requisite skill [27]. Labour shortage is a key component of project delay. The location of some projects makes it difficult to attract some skilled manpower. Labourers prefer living in places where living standards are low [55]. This is not only a problem peculiar to Ghana but the world at large. Demand for labour in the construction industry far outweighs supply [28].

4.1.4. Plant and Equipment Shortage

Modern day road construction operations are becoming extremely complex by day hence the need for mechanization of activities on site. Insufficient use of plant can retard progress on site and create delay. In today's construction, owning a plant is an advantage. But it is not everyone who has the luxury of owning one. Purchasing construction equipment is capital intensive. The initial capital injection makes it extremely difficult for contractors to venture into owning one [29]. The use of own plant or equipment helps to sustain progress because plant or equipment will always be available for use. According to [30] construction equipment and plants for leasing or hiring are inadequate to meet the ever increasing demand of contractors. Many contractors in Ghana hire plants and equipment and an extension of the hiring period for one contractor is often a bad news for another. Contractors who may not have the financial muscle to hire plant or equipment would suffer from equipment shortage which can impede progress.

4.1.5. Site Control and Management

Maintaining a construction site needs a lot of coordination from all players. A lack in this area can be detrimental to project success. Contractors have a singular responsibility in project delivery and that is to ensure that projects are completed and handed over to clients on time. On the contrary, effective site control and management is a challenge to some contractors. This problem persists because most contractors lack the requisite experience and managerial skill to manage the project team [31]. A poorly managed site affects operations. Poor site management has been outlined as a contributing factor to project delay [32].

5. Methodology

The methodology for the study was in two sections. In the first section, literature was broadly reviewed to identify the causes and effects of delays in construction projects. This extensive review led to the identification of thirty-two causes and nine effects of project delays. The list of causes and effects drawn were structured into a questionnaire. The causes and effects of delay were organised on a five point Likert Scale, where; 1 = strongly disagree, 2 = disagree, 3 = neutral, 4= agree and 5= strongly disagree. The first section of the questionnaire sought to solicit contractors' perception on the causes of delay whiles the second section was intended to solicit the effects of delay of road projects in the Western Region. Using the structured questionnaire generated, a survey of road contractors working in the Western Region was conducted to explore the perceptions of contractors on the causes and effects of road project delays.

The population of the study comprised of: foremen, quantity surveyors, civil engineers, site managers and project managers of all the firms currently working on various road construction projects in the Region. These people were selected because of the depth of knowledge they possess and their position. In all there are 38 road construction projects currently going in the Western Region under the supervision of Ghana Highway Authority. These projects are being handled by 38 different firms. The population therefore in the thirty-eight firms will be 38 x 5 = 190.

According to [33], to obtain a fair representation, a percentage of not less than half of the entire population must be considered. Hence, 60% of the entire population which is 115 was used as the sample. The sample for the study was selected using simple random sampling technique. This enabled the researcher to select the above mentioned professionals working on different road projects scattered over the Western Region. This was to ensure that all the different professionals had equal chances of being selected.

In all 115 questionnaires were distributed but 99 were returned representing 86% response rate.

6. Data Analysis

The causes and effects were all examined and the ranking of their attributes was done using the Relative Importance Index (RII). This helped to determine the proportionate contribution of each predictor in the formula and its incremental contribution when combined with other predictors [34]. The relative importance index formula by [35] was used to calculate the (RII) of the causes and effects. The relative importance index is given as:

$$\mathrm{RII} = \frac{1n_1 + 2n_2 + 3n_3 + 4n_4 + 5n_5}{5(n_1 + n_2 + n_3 + n_4 + n_5)}$$

Where:

n_1 = number of respondents who answered strongly disagree

n_2 = number of respondents who answered disagree

n_3 = number of respondents who answered neutral

n_4 = number of respondents who answered agree, and

n_5= number of respondents who answered strongly agree.

7. Results and Discussion

The perspectives of contractors on the 32 delay factors and 9 effects were analysed based on their relative importance index. The relative importance index and ranks of factors and effects of delay are presented in Tables 1 and 2 below.

7.1. Delay of Road Projects

Table 4.2 shows the results of causes of delay from contractors' perspective. Respondents ranked delay in honouring payment certificate as the most influential cause of delay with a relative importance index (RII) of 0.881. Delay in honouring payment certificate has become a common problem. Delay in payment surely affects the activities of the contractor [36]. When payment to the contractor is delayed, most construction activities cannot be carried out and may stifle the contractor's cash flow [25]. This result agrees with [38] and [39] who found that financial

problems are the main factors that cause delay in groundwater construction projects in Ghana. In Malaysia, financial difficulties have been identified as the first major factor causing delay in construction projects [37]. The result of this work agrees with [38] and [45] who identified delay in honouring payment as the most important cause of delay of construction projects both in Egypt and Ghana. Muhwezi et al., [40], however stated that projects are often delayed because of financial indiscipline and dishonesty on the part of contractors. The business failure rate of construction firms is higher and attributed this to inefficient construction financing [56]. "Laryea [57] said funding and access to credit by contractors are the two main indispensable problems affecting Ghanaian contractors". He argued that these problems appear to be connected to many other problems that Ghanaian contractors have to deal with in the day-to-day running of their firms.

Bad weather condition and unfavorable site conditions were ranked second with a relative importance index of 0.863. Bad weather condition may not actually be a factor but poor project management practices on the part of most contractors create the delays [36]. However, unfavourable site conditions can affect productivity and impact on project duration [41]. The fourth most crucial factor causing delay in road projects is consultant initiated variations with RII of 0.836. Many variations usually initiated by consultants sometimes digress from agreed and well-defined scope and schedule [42]. He further added that, variations that add on or change the scope of work done consequently affect the duration of project. Delay in consultant's instructions was ranked fifth with a relative importance index of 0.818. Delay in relaying variation instructions can have negative repercussion for a project especially if the project is at an advanced stage [43]. Baloyi and Bekker [6] claimed that the 2010 FIFA world cup stadia construction were delayed because of inefficient decisions that were made by consultants.

Respondents ranked difficulty in accessing bank credit as the sixth factor with a relative importance index of 0.808. This same factor was ranked fourth by [45] in their study. This shows the difficulties contactors go through in accessing bank credit. The least ranked factor by respondents was unskilled equipment operators.

7.2. Effects of Road Project Delay

Respondents identified extension of time as the most critical effect of delay with a relative importance index of (0.909). This result confirms the studies by [45] and [25]. According to [1], "extension of time is an event where extra time is requested in order to complete the project". A consequential delay which goes beyond the control of a contractor and affects regular progress of work on site, will offer a contractor an entitlement to claim for extension of time [46].

The second most essential effect of delay was cost overrun with a relative importance index of 0.887. Cost overrun of road projects in Ghana is an acceptable norm. It has become routine because projects are not well planned before they are initiated. Government often times may not be aware of the financial commitment but for political score initiate projects. Cost overrun is a situation where the actual cost of a project far outweighs the estimated cost, or money spent on a particular project exceeds estimated cost [47]. It was aver by Aibinu and Jagboro [48] that the most frequent effect of delay in construction projects is cost overrun. The position of cost overrun as ranked by this study is further supported by [25] who also ranked cost overrun the second most important effect of delay in the Malaysian construction industry.

Table 1. Relative Importance Index (RII) of factors contributing to delay of road projects

Factors Contributing to Delay	RII	Rank	Factors Contributing to Delay	RII	Rank
Delay in honoring payment certificates	0.881	1st	Delay by sub-contractors	0.463	17th
Bad weather conditions	0.863	2nd	Underestimation of time for completion by contractors	0.457	18th
Unfavourable Site conditions	0.863	2nd	Fluctuation of prices	0.418	19th
Consultant initiated variations	0.836	4th	Poor Site management	0.398	20th
Delay in instructions from consultants	0.818	5th	Discrepancy between design specification and standards	0.396	21st
Difficulty in accessing bank credit	0.808	6th	Late deliveries of materials	0.390	22nd
Breakdown of equipments	0.778	7th	Mistakes with soil investigations	0.388	23rd
Necessary variations	0.768	8th	Shortage of unskilled labour	0.380	24th
Shortage of skilled labour	0.766	9th	Poor Professional Management	0.345	25th
Shortage of materials	0.707	10th	Poor design	0.331	26th
Ground conditions encountered on site	0.594	11th	Insufficient communication between parties	0.313	27th
Poor supervision	0.582	12th	Construction methods	0.309	28th
Underestimation of cost of projects	0.562	13th	Legal disputes	0.297	29th
Financial indiscipline/dishonesty	0.531	14th	Lack of programme of Works	0.291	30th
Accidents during construction	0.501	15th	Public holidays	0.265	31th
Underestimation of complexity of projects	0.497	16th	Unskilled equipment operators	0.259	32nd

Respondents also believe that a company's reputation can be damaged if a firm cannot complete any project it is awarded on schedule. This factor was ranked third with a relative importance index of 0.804. It was postulated by Djordjevic and Djukic [49] that a "company's reputation is one of the most important intangible assets". A company's image is built from its overall performance [50]. A good reputation is very critical to the health of a company but a bad one is a serious threat to the existence of any business. Thus, delay in construction projects will ultimately affect the reputation of any company directly or indirectly [51].

Loss of productivity and efficiency during delay cannot be underestimated. This effect was ranked the fourth effect with a relative importance index of (0.786). The ultimate measure of labour efficiency is productivity [52]. According to [53], productivity and efficiency of a company's labour force would always be affected when projects delay. When reworks occur as a result of construction mistakes, the workload of labourers would increase and can influence their efficiency and productivity indirectly. Abandonment of project was however identified as the least effect of road project delay.

Table 2. Relative Importance Index of effects of delay

Construction Delay Effects	RII	Rank
Extension of Time (E.O.T)	0.909	1st
Cost overrun	0.887	2nd
Damage to company's reputation	0.804	3rd
Lost productivity and efficiency	0.786	4th
Rescheduling	0.669	5th
Claims	0.612	6th
Litigation	0.590	7th
Loss of profit by the contractor	0.495	8th
Abandonment of project	0.400	9th

8. Conclusions

The views of contractors working in the Western Region on the relative importance of the factors causing delays in road construction projects revealed that: delay in honoring payment certificates**,** bad weather conditions, unfavourable site conditions, consultant initiated variations, delay in instructions from consultants and difficulty in accessing bank credit are the most critical factors causing delay in road projects.

The study identified extension of time, cost overrun, damage to company's reputation, lost productivity and efficiency and rescheduling, claim and litigation as the major effects of road project delays.

Since delay in honouring payment certificate was seen as the most significant factor of delay by contractors, clients should ensure that funds are made available on time to contractors or adequate arrangements for the release of funds are concluded before projects start. This is because adequate finance is the core of every construction project. Clients should put measures in place to reduce the long administrative processes involved in honouring payments to contractors to instill efficiency into the payment system. They should comply with payment provisions within their contracts and such provisions should be duly enforced by parties. Interest on delay payment provisions within construction contracts must always be activated by contractors and their interest recovered in full to deter clients from persistent default.

Contractors and their key technical personnel should from time-to-time take courses in construction project management to improve upon their skills and to help them manage projects and risk effectively.

The flow of information is vital in construction project delivery. Therefore, consultants must ensure that there is prompt delivery of information to contractors to aid their decision making. As any delay in information delivery can affect the pace of work on site.

Adequate site investigations should be carried out both during feasibility study and conceptual design stage to avoid suspension of works during the construction phase to address design and site challenges.

Banking institutions in the country must find a way to remove some of the bottlenecks in their operations to make it easier for contractors to access credit to improve upon their performance.

REFERENCES

[1] Ssemwogerere, K., 2011, A case for acceleration rather than extension of time on construction projects in Uganda, Proc., 2nd International Conference on Construction and Project Management, Singapore, 192-195.

[2] Rashid, Y., Haq, S., Aslam, M. S., 2013, Effects of delay in construction projects of Punjab-Pakistan: an empirical study, Journal of Basic and Applied Scientific Research, 3(10), 87-96.

[3] Chong, H., and Leong, Y., 2012, Legal approach on assessment of contractors' entitlement to extension of time, African Journal of Business Management, 6(14), 4815-4823.

[4] Ramanathan, C., Narayanan, S., Idrus, A. B., 2012, Construction delays causing risks on time and cost – A critical review, Australasian Journal of Construction Economics and Building, 12(1), 37-57.

[5] Gandhak, P. S., and Sabihuddin, S., 2014, Stakeholders' perception of the causes and effect of construction delays on project delivery, International Journal of Modern Engineering Research (IJMER), 14(2), 153-161.

[6] Chan, D. W. M., and Kumaraswamy, M. M., 1997, A comparative study of causes of time overruns in Hong Kong construction projects, International Journal of Project Management, 15 (1): 55-63.

[7] Danuri, M. S. M., Othman, H., Abdul-Rahman, H., Lim, C. C., 2002, Application and assessment of extension of time claim: findings case studies conducted in Malaysia, Journal of

Design and Built Environment, 2(1), 15-29.

[8] Ahmed, S. M., Azhar, S., Kappagntula, P., Gollapudil, D., 2003, Delays in construction: A brief study of the Florida construction industry., Proc., 39th Annual ASC Conference, Clemson, South Carolina, 257-66.

[9] E. Opoku. (2012) Modern Ghana Group homepage on $150m Roads for Cocoa Regions. [Online]. Available: http://www.modernghana.com/sports/567646/1/150m-roads-for-cocoa-regions.html.

[10] Scott, S., 1993, Dealing with delay claims: a survey, International Journal of Project Management, 11(3), 143-153.

[11] Tumi, S. A. H., Omran, A. and Pakir, A. H. K., 2009, Causes of delay in construction industry in Libya, Proc., International Conference Administration and Business, Bucharest, Romania, 265-272.

[12] Ochoa, G., Melchor-Aguilar, D., Mondié, S., 2013, Critical parameters of integral delay systems, International Journal of Robust and Nonlinear Control, 25(7), 1094-1105.

[13] Trauner, J. T., Manginelli, W. A., Lowe, J. S., Nagata, M. F., Furniss, B. J., 2009, Construction delays, 2nd Edition, Understanding them clearly and delay analysis in construction analyzing them correctly, Elsevier Inc, London.

[14] Mubarak, S., 2005, "Construction Project Scheduling and Control" Pearson Prentice Hall, USA.

[15] Levy, S. M., 2006, "Project Management in Construction", McGraw-Hill, USA.

[16] Megha, D., and Rajiv, B., 2013, A methodology for ranking of causes of delay for residential construction projects in Indian context, International Journal of Emerging Technology and Advanced Engineering, 3(3), 396-404.

[17] Ali, A. S., Smith A., Pitt, M., Choon, C. H., 2010, Contractors' Perception of Factors Contributing to Project Delay: Case Studies of Commercial Projects in Klang Valley, Malaysia, Journal of Design and Built Environment, 7, 43–57.

[18] Dada, M., Petruzzi N. C. and Schwarz, L. B., 2007, A Newsvendor's Procurement Problem when Suppliers Are Unreliable, Manufacturing & Service Operations Management, 9(1), 9-32.

[19] Majid, M. Z., and McCaffer, R., 1998, Factors of Non-Excusable Delays That Influence Contractors Perception, Journal of Management in Engineering. 14(3), 42-49.

[20] Aibinu, A., and Odeyinka, H., 2006, Construction delays and their causative factors in Nigeria, Journal of Construction Engineering & Management, 132(7), 667-677.

[21] Ruiz-Torres, A. J., and Farzad, M., 2006, A supplier allocation model considering delivery failure, maintenance and supplier cycle costs, International Journal of Production Economics, 103(2), 755-766.

[22] Van der Rhee, B., Verma, R., Plaschka, G., 2009, Understanding trade-offs in the supplier selection process: The role of flexibility, delivery, and value-added services/support, International Journal of Production Economics, 120(1), 30-41.

[23] Muszynska, K., 2015, Communication management in project teams –Practices and patterns, Joint International Conference: Technology, Innovation and Industrial Management, Bari, Italy, 1359-1366.

[24] Aulich, T., 2013, The role of effective communication in the construction Industry: a guide for education and health clients, Australasian Journal of Construction Economics and Building, 13 (4), 92-101.

[25] Sambasivan, M., and Yau, W.S., 2007, Causes and effects of delays in Malaysian construction industry, International Journal of Project Management, 25, 517 -526.

[26] Liu, Z., 2010, Strategic Financial Management in Small and Medium-Sized Enterprises, International Journal of Business and Management, 5(2), 132-136.

[27] D. Bruce. and A. Dulipovici. (2001) CFIB homepage on Surveys on the Shortage of Qualified Labour. [Online]. Available: http://www.cfib.ca/research/reports/sql_e.pdf

[28] O. A. Ejohwomu, "Modeling the supply and demand for construction and building services skills in the black country", PhD. thesis, University of Wolverhampton, Wolverhampton, United Kingdom, Nov. 2007.

[29] Chang, C. L., Ogunlana, S. and Saeed, K., 1991, Construction Project Management: A system dynamics approach, Proc., International System Dynamics, Bangkok, Thailand, 27-30.

[30] Nwanyanwu, L. A., 2012, Hire Purchase Strategy of Physical Capital Investment and Financial Performance of Construction Companies: Illustrating from the Nigerian Stock Exchange, Interdisciplinary Journal of Research in Business, 2(4), 8-20.

[31] Kadir, M. R. A., Lee, W.P., Jaafar, M. S., Sapuan, S. M., Ali, A.A.A., 2005, Factors affecting construction labour productivity for Malaysian residential projects, Structural Survey, 23(1), 42-54.

[32] Elinwa, A. U., and Joshua, M., 2001, Time-overrun Factors in Nigerian Construction Industry, Journal of Construction Engineering and Management, 127(5), 419-425.

[33] P. J. Cobbinah, "Maintenance of Buildings of Public Institutions in Ghana. Case Study of Selected Institutions in the Ashanti Region of Ghana" M. Sc. thesis Kwame Nkrumah University of Science and Technology, Kumasi, Ghana, Oct. 2010.

[34] Johnson, J. W., and Lebreton, J. M., 2004, History and use of relative importance indices in Organizational Research, Organizational Research Methods, 7(3), 238-257.

[35] Tawil, N. M., Khoiry, M. A., Arshad, I., Hamzah, M. F., Jasri, N., Badaruzzaman, W.H.W., 2013, Factors contribute to delay project construction in Higher Learning Education Case Study UKM, Research Journal of Applied Sciences, Engineering and Technology, 5(11), 3112-3116.

[36] Chileshe, N., and Berko, P. D., 2010, Causes of project cost overruns within the Ghanaian road construction sector, Proc., 5th Built Environment Conference, Durban, South Africa, 18-20.

[37] Alaghbari, W., Kadir, M. R. A., Salim, A., Ernawati, 2007, The significant factors causing delay of building construction projects in Malaysia, Engineering, Construction and Architectural Management, 14 (2), 192-206.

[38] Aziz, R. F., 2013, Ranking of delay factors in construction

projects after Egyptian revolution, Alexandria Engineering Journal, 52, 387-406.

[39] Frimpong, Y., and Oluwoye, J., 2003, Significant factors causing delay and cost overruns in construction of groundwater projects in Ghana, Journal of Construction Research, 1 (2), 175-87.

[40] Muhwezi, L., Acai, J., Otim, G., 2014, An Assessment of the Factors Causing Delays on Building Construction Projects in Uganda, International Journal of Construction Engineering and Management, 3(1), 13-23.

[41] B.M. Awen-Naam, "Perception of climate change and adaptation: A case of peasants in the Builsa District of the Upper East Region of Ghana", M. Phil. thesis, Universitas Bergensis, Bergen, Norway, Spring 2011.

[42] Fisk, E. R., 1997, Construction project administration, 5th Edition, Prentice Hall, New Jersey.

[43] R. U., and Ranasighe, N. P. N. P., 2013, Causes of variation order in road construction project in Sri Lanka, ISRN Construction Engineering, 2013, 1-7.

[44] Baloyi L., and Bekker M., 2011, Causes of construction cost and time overrun "The 2010 FIFA World Cup stadia in South Africa", Acta Structilia Journal, 18(1), 51-67.

[45] Fugar, F. D. K., and Agyakwah-Baah, A. B., 2010, Delays in building construction projects in Ghana, Australasian Journal Construction Economics, 10 (1), 128-141.

[46] Othman, A. A., Torrance, J. V., Hamid, M. A., 2006, Factors influencing the construction time performance of public projects in Malaysia, Engineering, Construction and Architectural Management, 13(5), 481-501.

[47] R. Singh. (2009) Centre for Development Economics homepage on Delays and Cost Overruns in Infrastructure Projects: An enquiry into extents, causes and remedies. [Online]. Available: http://www.cdedse.org/pdf/work181.pdf

[48] Aibinu, A. A., and Jagboro, G.O., 2002, The effects of construction delays on project delivery in Nigerian construction industry, International Journal of Project Management, 20, 593-599.

[49] Djordjevic, B., and Djukic, S., 2008, The impact of downsizing on the corporate reputation, Economics and Organization, 5(1), 51-62.

[50] Ismail, F., Mustapa, M., Mustapa, F. D., 2006, Risk Factors of Contractor's Corporate Reputation, Proc., 5th IEEE International Conference on Cognitive Informatics, Beijing, China, 1-5.

[51] Murray, K., 2003, Managing the Single Greatest Risk Facing Business Today, Communication Management, 8, 142.

[52] Pekuri, A., Haapasalo, H., Herrala, M., 2011, Productivity and Performance Management – Managerial Practices in the Construction Industry, International Journal of Performance Measurement, 1, 39-58.

[53] Bramble, B. B., and Callahan, M. T., 2000, Construction Delay Claims Aspen Law and Business, New York.

[54] DuMond, J. M., Hirsch, B. T., Macpherson, D. A., 1999, Wage Differentials Across Labor Markets and Workers: Does Cost of Living Matter?, Appeared in Economic Inquiry,37(4), 577-598.

[55] Nesan, L. J., 2006, Project finance model for small contractors in USA, Australasian Journal Construction Economics, 6 (1), 25-41.

[56] Laryea, S., "Challenges and opportunities facing contractors in Ghana" in Proc. West Africa Built Environment Research (WABER) Conference, 2010, pp. 215-226.