THE NATURE AND EFFECTS OF SUBCONTRACTING ON THE PERFORMANCE OF BUILDING PROJECTS IN SOUTH-SOUTH ZONE OF NIGERIA

Antony Okwogume Ujene, Emmanuel Achuenu and Okon Eta Abakadang
University of Uyo, Nigeria
and
University of Jos, Nigeria

ABSTRACT

Due to the complex nature of construction projects, it is impracticable for an organisation to develop expertise in all trades and disciplines involved in the construction process. Thus the use of subcontracting is a necessity for the attainment of successful projects. The aim of the study is to investigate the level of use of subcontracting in building project delivery with the view of enhancing project performance in South-South zone of Nigeria. The objectives of the study include identifying the trades mostly executed by subcontractors, determining the effect of subcontractor's performance on building projects executed and to determine the factors that affect the performance of subcontractors. Data for the study was collected through the use of 280 structured questionnaires, administered on a sample of project participants including, clients, contractors and consultants. Data collected were analysed using percentage, mean item score and Kruskal Wallis Rank test. The study identified that there is a very high level of use of subcontracting in the zone and roofing, plumbing and electrical installation are the work item mostly subcontracted. It was also identified that subcontracting has the most significant effect on quality than cost and time. Delay in progress payment, effectiveness of client's representative team and misunderstanding of client's requirement were identified as the factors that mostly affect the performance of subcontractors and projects. As a means of improving project performance, the study recommends that, quality requirement, clear definition of client requirements and scope of work should be well articulated and defined during the time of engagement. There should be adequate project team to monitor the subcontractors and there should be prompt valuation and payment of sub contractual jobs.

Keywords: Subcontractor, Subcontracting, Contract, Performance, Building, Construction, Projects

INTRODUCTION

Construction projects according to Ravi (1999) and Fagbenle and Makinde (2010) involve various trades, it is very common for the main contractors to engage subcontractors for most, if not all, of the trades, especially for those trades which require special skills and are specialized in nature and the likes, since it is practically almost impossible for an organization to develop expertise in all areas thereby necessitating the use of subcontractors.

Pagnani (1989) defines subcontracting as a legal – economic relationship between two agents in which the characteristic criteria are substitution and subordination. Another definition was given by Hinze and Tracy (1994), it stated that the subcontractors are specialty contractors who are hired to perform specific tasks on a project, while Arditi and Chotibhongs (2005) sees a subcontractor as a construction firm that contracts with a general contractor to perform some aspect of the general contractor's work. Subcontracting in the construction industry has greatly increased in recent years owing to recent structural transformation in construction sector in many developing countries (Julio and Francisco, 2002).

The performance of parties to the projects is critical to the success of any construction project as they are responsible for the conversion of the client's brief to practical reality. Project performance can be assessed under four fundamental aspects of performance, namely construction cost, construction time, construction quality and sustainable development (Hong and David, 2003).

Considering the nature of the construction industry and the challenges of project delivery in terms of cost, time, and quality, this study notes as very critical, issues peculiar to construction problems such as, delays, budget overruns, low quality work, large number of claims and litigations, suffering of workmanship and the requirement of more and more supervision from the general contractor which result largely from not selecting the best subcontractor to execute specialized or other parts of the construction.

The provision and rehabilitation of infrastructure such as roads, schools, hospitals, bridges and other basic facilities has recently been the focus of the Niger Delta ministry which covers a substantial part of the south-south zone of Nigeria. It is common

knowledge in the construction sector of the area that the provision of classroom blocks, housing estate and rehabilitation of existing infrastructures are awarded to resource persons who may have little or no capacity of undertaking these jobs. As such, executions of these projects are sublet to subcontractors without regard of the crucial role they play towards the success of the project (Hsieh, 1998). The consequences of the wrong use of subcontractors according to Kumaraswany and Matthew (2000) include, schedule delays, budget overruns, low quality work, time overrun, large number of claims, poor communication and method of selecting and paying subcontractors for a particular work. The need to solve some of these problems necessitated this study which aims at investigating the level and result of use of subcontractors in building project delivery with a view to enhancing the performance of project delivery in south-south geo-political zone of Nigeria. The specific objectives are: to identify the work items that are mostly subcontracted in building projects in the zone; to determine the effect of subcontractors' performance on the over building project performance in the zone and to determine factors that affects the performance of subcontractors in south-south zone of Nigeria.

Review of relevant issues

This section contains a review of various literature materials on subcontracting on building projects and the concept of subcontractors and projects performance.

Subcontracting in Building Projects

According to Julio and Francisco (2002), subcontractors are specialist agents in the execution of specific job, supplying manpower, besides materials, equipment, tools or designs. Subcontractors are agents of the production system; they are responsible for the execution of specific part of the work. The classification of subcontractors focuses on the type of activities they perform (Shimizu and Cardoso, 2002). Subcontractors are construction 'job shops', they perform construction work that requires skilled labour from one or at most a few specific trades (Tommelern and Ballard, 1997). Julio and Francisco (2002) stated

that it is common for 80-90% of building project work to be performed by subcontractors in the United State of America.
Subcontracting has developed at an extremely fast pace since the mid-nineteen-sixties due to the tendency for firms to become increasingly multinational in character (Hinze and Tracey, 1994). Subcontracting has been present as an organizational alternative for some economic activities (BeerdSworth, 1988). Due to advancement of technology, size and scale of construction project, firms are decentralizing their jobs more and more, allowing subcontracting to become a basic part of the work organization (Julio and Francisco, 2002). According to Kale and Ardit (2001) unstable demands and seasonality cause construction firms to split projects into autonomous units and to rely on subcontractors to undertake some of the work packages. Ng, Skitmore and Chung (2003) also noted that by subletting some work items risk are transferred by the main contractors to the subcontractors.

Pagnani (1989) views subcontracting as a legal-economic relationship between two aspects, in which the characteristic criteria are substitution and subordination. The substitution criterion means that the subcontractor executes the operation with technical and financial risk, instead of the job assignor, the subordination criterion means the subcontractor most follow direction, given by the contractor. Similarly, Ravi (1999) opined that subcontracting should be based on a commercial contract that lays down the terms and conditions of the work between two organizations. The activities of both the subcontractor and the main contractor should be governed by the condition of contract rather than the mutual well being of both organizations.
The challenges of subcontracting building project as summarized by Ravi (1999) are –

(1) Relationship between main contractor and subcontractor is based on mistrust rather than trust.
(2) In most cases, it is a win-lose or lose-win or lose-lose relationship.
(3) Objectives of both organization are different
(4) Relationships could be based on short-term gains rather than long term commitments.

Sub-contracting as a phenomenon is not unique to the construction industry. Indeed, practice in the construction industry seems to be following in the footsteps of many other non-contraction businesses. The general pressures for sub-contracting include the following:

(1) Non-wage costs of employment, such as training, pension rights, redundancy payments and sick pay.
(2) The increasingly diverse skill base required for the growth in complexity.
(3) The rising expectations of workers and a concomitant shift to freelancing.
(4) The choice every firm faces between diversifying and contracting out.
(5) The perceived threat posed by trade unionization of permanently employed labour.
(6) Off-setting the risks associated with responsibility by transferring them.
(7) The need to employ specialists of proven reliability and repute.

The specific pressures for sub-contracting in construction combine in such a way as to make the idea of a general contractor (employing directly all of the labour) a thing of the past.
The factors affecting a contractor's decision to employ permanently or to sub-let are numerous, but are rarely directly considered as specific choices over whether to sub-let. The nature of construction dictates that sites are geographically dispersed, meaning that some workers will be better placed for some sites than for others. Since an itinerant workforce is a thing of the past, the traveling time to the site from home will mean that employers are more inclined to employ local workers. Associated with the general pressure to specialize, mentioned above, is the fact that different types of project call for different types of skill. The pattern of required skill combinations is different for each project. Combined with the geographical constraints, it clearly makes little sense for contractors to keep permanently employed craftsmen in all of the necessary trade within each region of activity. This situation is tempered when the skill needed is specific to the firm itself such as many middle-management roles,

because in this situation the training overhead is high. Therefore, it is more economical to employ such specialists permanently, even if they are not fully utilized. Like any other production procession, subcontracting typically starts when an organization realizes that it needs a particular set of skills or product that are not available within the organization and as readily available in the market place (Ravi, 1999).

In Nigeria construction industry, subcontractors could be nominated or domestic subcontractors. These conditions allow the appointment of subcontractors to execute works when prime cost sum are included in the contract bill for that section of work.

Ogunsanmi and Bamisile (1997) identified thirteen factors that can influence contractors'/subcontractors selection in Nigeria. Four additional factors among the identified criteria are: Size of project, aesthetics, provision of added services like finance and high management skill. Fagbenle and Makinde (2010) in its study found out that the five most important factors considered by clients and contractors in selecting subcontractors are: subcontractors' past experience in terms of size and type of projects completed; subcontractors' management resource in terms of formal and informal training; other related issues in terms of nature of contract and time of the year (weather), past relationships with the clients/contractors (past performance) and project facilitation in terms on labour/plant resources. The study concluded that greatest premiums should be attached to some of these factors for improved construction productivity. However, the studies did not investigate the effects of subcontracting on project success as is the focus of this study.

The Concept of Performance in Construction

Hong and David (2003) opined that contractor performance is critical to the successful performance of any construction project and the term "performance" as regard to construction projects denotes effectiveness in the construction processes and the finish product of a construction project.

Performance as defined by Hong and David (2003) embraces construction cost, construction time, construction quality and sustainable development, while project and contractor performance has been the subject of much research. Ojo (2009) identified eight important factors affecting clients' choice for a delivery method as speed, price certainty, flexibility, quality

standard, complexity, risk allocation, price competition and single point of responsibility. Skitmore and Hatugh (1997) observed that, if limited capital budget is the prime consideration of the client, quality is likely to be restricted in the form of a reduced specification and project duration will be the optimum in terms of construction cost rather than client choice. Ojo (2009) researched into the needs of clients for building projects and concluded that both public and private clients have the same need in Nigeria.

Project with usually short contract periods tend to incur some form of penalty, (Ashworth and Hogg, 2007) by this stand point of view, trades or work section of building project characterized by short contract period will tend to increase project cost in order to mitigate the risk posed by such penalty. Project duration is critical to the success of a project in some situations if not met could lead to vital failure in meeting the client's objectives. In his opinion, Sidwell (1984) opined that construction duration is a function of cost, size and complexity of the project.

Fagbenle and Makinde (2010) also noted that it is also commonly agreed among researchers that client needs are generally in terms of time, cost and quality and usually, project success is measured on these terms. Nicholas (2006) noted that the aim of any project manager is at achieving project within predefined time, cost and quality constraints. These three (3) factors play significant roles in achieving project objectives; this is also true for subcontractors since about 80-90% of building projects are procured through subcontracting. However, the major difficulty in the measurement of the performance of building project and subcontractors in south-south of Nigeria is that there are no lay down method for selecting and managing subcontractor projects procured in the area.

The Study Area

The South-South geo-political zone is one of the six officially grouped geopolitical zones based on linguistic affinity, contiguity and cultural affiliation for ease of administration. The south-south geopolitical zone of Nigeria coincides approximately to the Niger-Delta area of the country (Omofonmwan and Odia, 2009).

The South-South geo-political zone which is identified with sandy deltaic coastal plain of the Guinea coast is made up of six out of

the nine in the Niger Delta zone namely; Akwa Ibom, Bayelsa, Cross River,Delta, Edo, and Rivers. Most of the states have low-lying flat landscape predominated with coastal plain sediment which are marine, deltaic, estuarine, lagoon and Fluvial – lacustrine material (Ujene and Achuenu, 2006).

According to Ekpo et al. (2009) the six states that make up the South-South Geo-political Zone of Nigeria have a total of 185 Local Government Areas. This region has a population of about 21million people (National Population Commission 2007). Ekpo et al. (2009) in its study noted that there are about 40 different ethnic groups, speaking about 250 dialects spread across 5000 communities and covering a land mass of about 80,000 square kilometers. The emphasis of improving cost management in the south-south zone is consequent upon the resent increased tempo in construction activities as a result of the federal government and private sector response to the zones agitation for sustainable development through the creation of Niger Delta Ministry in recognition of the immense contribution of the region to the economic sustainability of the country.

RESEARCH METHODOLOGY

The study adopted a survey research design involving the administration of structured questionnaire on purposely selected population. The study population consist of key participants in the construction industry namely architects, builders, quantity surveyors, services engineers, civil engineer foremen and clerk of work. A total of two hundred and eighty (280) respondents were involved in the study. The questionnaires consist of 3 sections: A, B and Section C. Section A elicits information on the background of the respondent. Section B elicits information of the characteristics/network of the project undertaken by respondent, while Section C, elicits information on the level of use of subcontractors in project, contractors frequency of list of subcontractor in projects, the performance of subcontractor on time, cost and quality the effect of main contractor's services and subcontractors services on the performance of building projects and the factors affecting, the performance of subcontractors. A total of 18 factors were identified from previous studies as factors effecting subcontractors' performance.

The respondents were asked to rank their perception on the related issues of the study using a five point Linkert Scale rated 1-5.
Very high effect (5), High effect (4), Moderate effect (3), Little effect (2) and No effect(1)
To allow measurement of the effect of factors, a five point scale was adapted from Nkado and Mbachu (2002). The five point rating scale for the levels of influence ranged from No effect (1) to very high effect (5). The numbering values calculated by the above were then differently classified as can be seen in fig 1, because a single point or number changing from 1-5 in questions does not symbolize each verbal scaling expression in the evaluation phase, since the results are obtained as decimal numbers instead of integers, a specific scale became necessary. Therefore the 5 scale expression was defined by the interval of 0.8. This was then used to determine the level of significance of the factors with 3.4 as a cut-off for high significance.

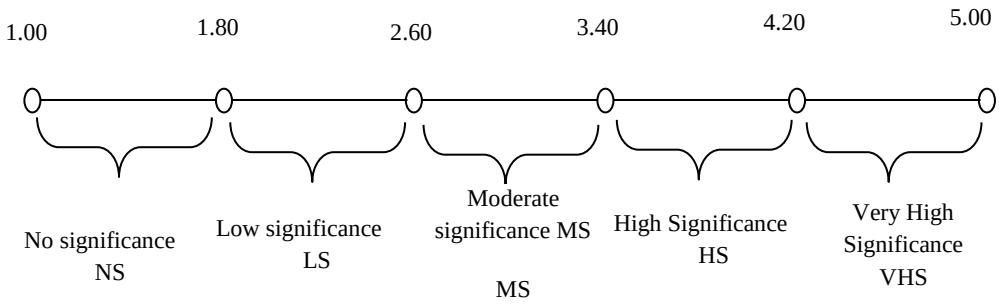

Figure 1: *Evaluation Scale for level of significance*
Adapted from: Kazaz, Manisali and Ulubeyli (2008).

The ranking of the factors that significantly affect the dynamics of costs is determined based on the influence index and the mean item score which was calculated by the following equation:

$$II = \sum_{i=1}^{5}(R_{Pi}\, R_i)/n \quad ,(\ 1 \leq II \leq 5\ ) \text{.....eqn (1)}$$

(Where II= Influence Index, R_{Pi} = Rating point i(range from 1-5),

R_i = response to rating point, i) and n = total responses = summation of Ri from1-5

Results and Discussions

In order to obtain stakeholders perception concerning the nature and effect of subcontracting on project performance, 216 questionnaires were purposively distributed as shown in table 1

Table 1: *Distribution of Respondents Used in the Study*

Profession in respondent organization	Frequency	Percentage (%)
Architects	30	10.71
Project Managers	18	6.43
Clerks of work	6	2.14
Builders	64	22.86
Civil Engineers	12	4.29
Contractors	84	30.00
Quantity Surveyors	18	6.43
Clients	48	17.14
Total	280	100

The result indicate that majority of the respondents were actually those who have adequate dealings with the subcontractors, especially the major contractors and builders and client who represented 70% of the total respondents.

Level of Use of Subcontracting

In order to investigate the level of use of subcontracting in project delivery respondents were asked to rate their perception of level of use of subcontractors using a five point scale from very high (5) to not at all (1), the result is presented in table 2

Table 2: *Level of use of subcontractor in the Area*

Level of use	Frequency	Percentage (%)
Very High	113	40.36
High	87	31.07
Moderate	50	17.86
Fair	30	10.71
Not all	0	0
Total	280	100

Table 2 shows that majority of the respondents perceive that the level of use of subcontractors in project delivery is high. This therefore calls for concern in ensuring that their contribution to the success of the project is guaranteed.

Evaluation of Work Items Frequently Executed by Subcontractors

In order to investigate the item of works mostly subcontracted in the area, the respondents were asked to rank 14 work items identified in the order of frequency of sublet. The result is shown in table 3.

Table 3: *Work Items frequently executed by subcontractors*

Work Items	Mean Score	Rank	Remarks
Roofing	4.722	1st	VHS
Plumbing Installation	4.702	2nd	VHS
Electrical Installation	4.694	3rd	VHS

Metal work	4.361	4th	VHS
Glazing	4.250	5th	VHS
Painting	4.083	6th	HS
Carpentry Work	3.972	7th	HS
Tilling /Floor finishing	3.972	7th	HS
Landscaping	3.538	9th	HS
Plastering/Wall finishing	3.077	10th	HS
Concrete Work	3.028	11th	MS
Block Work	2.778	12th	MS
Excavation and Earthwork	2.454	13th	MS
Demolition Work	1.972	14th	LS

Table 3 shows that 5 items of work have very high significance, with regards to frequency of sublet, while 5 items of work also have high significance. The result shows that roof work is the work item mostly subcontracted, followed by plumbing work and electrical work. The very high frequency of sublet of these items is attributable to high level of specialization required in measuring and installation in the work items at the construction stage.

Effect of the Subcontracting on the Overall Performance of Projects

In order to investigate the influence of the subcontracted items on the overall performance of projects, respondent were asked to rank the influence of the subcontracted work items on the three major performance criteria namely; time, cost and quality. The result of the evaluation is presented in table 4. This was then used to evaluate the variation of the effect among the 3 performance criteria using Kruskal Wallis test, the result of which is presented in table 5

Table 4: *Effect of the Subcontracted Work Items on Project Performance Indices*

Work Items	Influence Index on cost	Rank	Influence Index on Time	Rank	Influence Index on Quality	Rank
Masonry Work	3.85	3	3.55	3	4.16	1
Glazing	3.26	14	3.34	12	4.13	2
Demolition Work	3.61	5	3.64	1	4.02	3
Metal work	3.45	10	3.34	12	4.00	4
Concrete Work	3.87	2	3.52	4	3.97	5
Tilling /Floor finishing	3.53	9	3.41	9	3.92	6
Carpentry Work	3.97	1	3.50	5	3.87	7
Electrical Installation	3.53	9	3.47	7	3.80	8
Plumbing Installation	3.58	6	3.43	8	3.71	9
Plastering/Wall finishing	3.30	13	3.38	10	3.61	10
Painting	3.42	11	3.33	13	3.57	11
Landscaping	3.30	13	3.29	14	3.51	12
Excavation and Earthwork	3.57	7	3.59	2	3.46	13
Roofing	3.64	4	3.48	6	3.07	14

Table 5: *Result of Kruskal Wallis Test*

	group	N	Mean Rank	mean score
perf	cost	14	20.46	3.573
	time	14	14.25	3.448
	quality	14	29.79	3.771
	Total	42		

	IIvalue- cal.	table value
Chi-Square	11.383	5.991
df	2	2
Asymp. Sig.	.003	

The result of the Kruskal Wallis test presented in table 5 shows that the calculated chi-square value of 11.383 which is greater than the table values of 5.991 implies that there is a significant difference in the influence of subcontracting on the various project performance criteria. The p-value (assymp. sig.) of 0.003 which is less than 0.05 confirms the variation of the effects of subcontracting on the various performance criteria. The result indicates that the effect of subcontracting cannot be said to be same on cost, time and quality performance of projects.
Table 5 shows that subcontractors have more negative influence on quality, followed by cost and lastly by time. The result is an indication that those who supervise the subcontractors put less priority on quality and more priority on cost and time, thereby compromising quality because of trying to save time and probably cost on the short run.

Factors affecting subcontractor's performance

In order to evaluate the factors affecting the performance of the subcontractors, 18 factors were identified from literature. The respondents were then asked to rank the influence of the factors on cost, time and quality performance of the subcontractors. The result is presented in table 6 and 7

Table 6: *Factors affecting subcontractor's performance*

factors influencing performance	Influence Index on cost	Rank	Influence Index on Time	Rank	Influence Index on Quality	Rank	mean index	Rank
Delay of progress payments	4.222	5	4.583	1	4.556	1	4.45	1
Misunderstanding of clients requirement	4.556	1	4.361	2	4.389	2	4.44	2
Commercial consideration	4.500	2	4.361	2	4.111	9	4.32	3
Scope of work	4.167	9	4.343	4	4.306	4	4.27	4
Lack of co-ordination between the co-workers	4.333	4	4.222	5	4.250	6	4.27	5
Effectiveness of construction management team	4.389	3	4.056	8	4.250	6	4.23	6

Loose specification	4.194	7	4.111	7	4.306	4	4.20	7
Effectiveness of client's representative team	3.917	14	4.200	6	4.314	3	4.14	8
Client or main contractor own experience of similar work	4.111	10	4.028	10	4.250	6	4.13	9
Using incorrect information or out of date information	4.222	5	4.056	8	3.944	11	4.07	10
Experience of parties to the contract	3.972	12	3.944	12	4.083	10	4.00	11
Environmental factors (community relation)	4.056	11	4.000	11	3.750	13	3.94	12
Highly competitions plate	3.944	13	3.571	15	3.788	12	3.77	13
Advice from specialist advisor	3.861	15	3.667	13	3.750	13	3.76	15
Political consideration	4.194	7	3.583	14	3.514	16	3.76	14
Politics	3.611	16	3.472	16	3.667	15	3.58	16
Culture	2.972	17	3.056	17	3.000	17	3.01	17
Religion	2.694	18	2.472	18	2.833	18	2.67	18

Table 7: *Kruskal Wallis result for factors*

	IIvalue- cal.	table value
Chi-Square	.417	5.991
df	2	2
Asymp. Sig.	.817	

The result of the Kruskal Wallis test presented in table 7 shows that the calculated chi-square value of 0.417 which is less than the table values of 5.991 implies that there is no significant difference in the influence of the factors on the various project performance criteria. The p-value (assymp. sig.) of 0.817 which is greater than 0.05, confirms the agreements of the effects of the factors on the various performance criteria. Based on the result that the effects of the factors do not differ significantly among the performance criteria, a mean index value was computed as in table 6. The

result shows that factors that, delay of progress payments for work executed by sub-contractor ranked first among the factors that affect sub contractor's performance. Other factors ranked in the order of severity are misunderstanding of client's requirement, commercial consideration, scope of work, lack of coordination between co-workers, effectiveness of construction management team, experience of clients and other parties to the contract effectiveness of client's representative team. Culture and religion ranked last among after some other factors as shown in table 6. This result indicates that in order to enhance subcontractors' contribution to project performance, the first seven factors which ranked very significantly should be given priority attention by project participants at every stage of the production process.

CONCLUSION AND RECOMMENDATION

This study examined the effect of subcontracting on the performance of building project in south-south geo-political zone of Nigeria. The study found out that the level of use of subcontracting in project execution is very high. The findings of this study reveals that the items of work mostly subcontracted are those requiring high level of expertise namely roofing, plumbing installation, electrical installation, metal work and glazing.

The effect of subcontracting system as presented by the findings of this study reveals that subcontractor contribution to project performance vary significantly among the three main criteria of cost, time and quality, with quality being the worst affected in preference to time and cost. The study also noted that delay of progress payment for work executed by subcontractor, misunderstanding of client's requirement, commercial consideration, scope of work, lack of coordination between co-workers, effectiveness of construction management team are the most significant factors which almost equally affect all the performance criteria investigated. The study therefore recommends that in as much as there is high patronage of subcontractors, quality requirement should be well articulated and defined from the time of engagement.

The study also recommends that in addition to clear definition of client requirements, scope of work and adequate selection of

project team, there should be prompt valuation and payment for item of works given to sub-contractors to encourage better project performance.

REFERENCES

Arditi, D. and Chotibhongs, R (2005). Issues in subcontracting practice, *Journal of Construction Engineering and Management*, ASCE, 131(8): 866-876

Ashworth, A. and Hogg, K., (2007) *Willis's Practice and Procedure for Quantity Surveyor*,Blackwell Publishing Ltd, Oxford, UK

Beardworth, A.D., Keil, E.T., Bresnen M. and Bryma, A. (1988) Management Transience and Subcontracting:The Case of Construction Site, *Journal of Management Studies*, 26: 345 – 361.

Bennett, J. and Ferry, D. (1990). "Specialist Contractors: A Review of Issues Raised by their New Role in Building". *Construction Management and Economics*, 8: 259 -263.

Ekpo, I.V., Ibok, P.S., Eminimoh, E.J., Jacob, E.,and Udo-Ekpo, V.P.(2009). Universal Basic Education and Socio-Economic Prospects Of The Girl-Child In South-South Nigeria, *Report of Research Financed by Education Research Network for West and Central Africa (ERNWACA) With project support from UEMOA regional Centre of Excellence and the Ministry of Foreign Affairs of the Netherlands*

Fagbenle, O I. and Makinde, F. A. (2010). Factors influencing construction clients'/contractors' choice of subcontractors in Nigeria. The Construction, Building and Real Estate Research Conference of the Royal Institution of Chartered Surveyors Held at Dauphine Université, Paris, 2-3 September.

Hinze, J. and Tracey, A. (1994). "The Contractor-Subcontractor Relationship: The Subcontractor's View". *Journal of Construction Engineering and Management*, ASCE, 120 (2), 274-287.

Hong, X. and David, P. (2003). Factors influencing contractor performance. An international investigation: *A journal of*

Engineering construction and Architectural Management 10(5): 322-332.

Hsieh, T.Y(1998). Impact of subcontracting on site productivity: lessons learned from Taiwan, *Journal of Construction Engineering and Management*, ASCE, 124 (2): 91-100.

Julion, Y. S. and Francisco, F. C. (2002). Subcontracting and cooperation Network in Building Construction: A Literature Review.

Kale, S. and Ardit, D. (2001) General Contractors' Relationships with Subcontractors: A Strategic Asset, *Construction Management and Economics*, 19: 541-549.

Kazaz, A., Manisali, E. and Ulubeyli, S. (2008) Effect of Basic Motivational Factors on Construction Workforce Productivity in Turkey, *Journal of Civil Engineering and Management*, 14(2): 95-106

Kumaraswamy, M.M. and Matthews, J.D. (2000). "Improved subcontractor selection employing partnering principles". *Journal of Management in Engineering*, 16 (3): 47-56.

Ng, S.T., Skitmore, M. and Chung, W.F. (2003). Ten Basic Factors to Identify Suitable Subcontractors for Construction Projects, CIB TG 23 International conference, Hong Kong.

Nicholas, J. M. (2006). *Project Management for Business and Technology; Principle and Practice*. 2nd ed., New Delhi: Prentice Hall of India Private Limited.

Nkado, R. N. and Mbachu, J. I. C. (2002). Causes of, and solutions to client dissatisfaction in the South African Building Industry: The Clients Perspectives, 1st CIB W107 International Conference, Stellenbosch, South Africa, 11-13 October, *CIB W107 1st International Conference: Creating a Sustainable Construction Industry in Developing Countries*, October: pp 349-357

Ogunsanmi, O.E. and Bamisile A. (1997) Factors Affecting the Selection of Project Procurement Methods, *Builders' Magazine*, 12(1): 11-15.

Ojo, S.O. (2009). An identification of Client's Needs for Building Projects: A Nigerian Study, *Ife Journal of Environmental Design and Management*, O.A.U., Ile-Ife, Nigeria, 2(1): 20-30

Omofonmwa, S. I. and Odia, L. O. (2009). Oil Exploitation and Conflict in the Niger-

Delta Region of Nigeria. *Journal of Human Ecology,* 26(1): 25-30

Pagnani, E.M. (1989). *A subcontratação na pequena e média empresa.* Sao Paulo: UNICAMP Press.

Ravi, R. (1999). Building partners through sub-contracting and out sourcing. In: Abakadang, O.E. (2011). The Nature and Effects of Subcontracting on the Performance of Building Projects in Uyo, Akwa Ibom State, Unpublished B.Sc Project Department of Building, University of Uyo, Nigeria.

Sidwell, A.C. (1984). The Measurement of Success of Various Organizational Forms for Construction Projects. *Proceedings of 4th International Symposium on Organization and Management of Construction*, CIB WGS, 1: 283-289.

Skitmore, R.M and Hatugh, ST, (1997). 'Forecast models for actual construction time and cost', *Building and Environment*, 38 (8): 1075-1083.

Tommelein, I.D. and Ballard, G. (1997). "Coordinating Specialists". *Technical Report No. 97-98* Construction Engineering and Management Program, Civil and Environmental Engineering Department, University of California, Berkeley, CA.

Shimizu, J. and Cardoso, F. (2002). Subcontracting and Cooperation Network in Building Constructions, A Literature Review. Proceedings IGLC, Gramado, Brazil

Ujene, A.O. and Achuenu, E (2006): Stress among Building Construction Craftsmen in Some Cities of the South-South Zone of Nigeria, *Journal of Environmental Design*. 2 (01): 73-90