

The Effect of Partially Engineered Road and Its Economic Impact in the Construction Industry in Upper West Region, Ghana.

Samuel Osae¹ Edward Nana-Addy² Timothy Adu Gyamfi¹ Martin Mensah³
King Solomon Akorli¹

¹ Faculty of Built and Natural Environment Department of Building Technology, Koforidua Technical University

² Department of Building Technology, Faculty of Built Environment & Applied Science Sunyani Technical University, Ghana

³ Mphil Construction Technology, Department of construction and Wood Technology, University of Education, Winneba-Ghana Post office box KS 13314 Kumasi. Ghana.

Corresponding Author: Samuel Osae

ABSTRACT: The road transport is significant in Ghana's economy as it is the most widely available form of transport, the improvement of road networks in rural community may provide positive impacts to economics and social growth as well as increased international competitiveness. The study seeks to assess the effect of partially engineered road and its economic impact to people in upper west region. The study utilised quantitative and qualitative research approach, sample size of 116 participants consisting of 66 community members, 35 registered contractors and 15 district works department officers was included in the study. Purposive and convenience sampling techniques were resorted to, questionnaires and interview guide was used to elicit the views of respondents. Descriptive statistics and the relative importance index (RII) was employed. Study established that disputes between contractors and stakeholders was the major cause of uncompleted partially engineered roads in the districts, follow by client attitude towards payments, supervision during construction, lack of adherence to regulatory requirements and lack of technical capacity. The study further reveals, that the good state of partially engineered road will impact positively on business in the communities such as Agriculture, forestry and fishing, Healthcare provision, Education, Information and communication, Accommodation and food service, Wholesale and retail trade and Construction works. The study recommended that one of the key factors to enhance completion of partially engineered road is that clients should make prompt payment to work done by contractors to avoid them huge financial burdens. This study contributes to knowledge in area of rural road construction to the economic benefit of rural community members.

KEYWORD: Partially engineered road, road construction, economic impact, construction industry, upper west region, business.

Date Of Submission: 22-11-2018

Date Of Acceptance: 08-12-2018

I. INTRODUCTION

The construction industry plays a major role in the development and achievement of any societal goals and sustained access to roads, as critical in improving living standards of people (Benamghar&Limi, 2011). In many developing countries, major construction activities account for about 80% of the total capital assets, 10 % of their GDP, and more than 50% of the wealth invested in fixed assets (Ofori, 2006). According to Arrows (2010), productivity, welfare, and security of both rural and urban people are greatly influenced by the level of road infrastructure developing. Road construction, perhaps, is an important element of the construction industry for the economies of developing countries. Roads contribute to economic growth and poverty reduction (Bagrecha&Bais, (2017). As noted by Seboru (2015), road infrastructure impacts on overall economic growth, agricultural growth, urban growth, urban poverty reduction, and rural poverty reduction.

According to Banaman (2015), the construction industry in Ghana contributed 8.6% of GDP in 2006, and 10.1% in 2008. Construction activities grew by 15% in 2007 and 14% in 2008. Evidently, the construction industry contributes to the National socio-economic development through the provision of employment opportunities at skilled and non-skilled levels (Ahadzie, 2009). Road infrastructure plays a vital role to the development of Ghana's economy. Gidisu (2009) also highlighted the importance of the road sector in Ghana by observing that the road transport is significant in Ghana's economy as it is the most widely available form of transport in Ghana; it links all major cities, towns, villages; it also links agricultural production areas with local, regional and national markets, and carries in excess of 97% of all passenger and freight traffic. Citing Anapolsky (2002), Hayat and Amaratunga (2011) reckoned that improvement of road networks in particular may provide positive impacts to the community due to better trade, communication and economic and social growth as well as increased international competitiveness. In Africa, although the use of roads dominates the transport sector, carrying 80% to 90% of passenger and freight traffic in most African countries, the condition of these roads remains very poor by international standards (World Bank, 2011). In order to respond to this challenge, the World Bank report of 2011 proposes that the African road sector has passed through a wide ranging policy reforms, with most countries embarking on creation of independent source of funding for road maintenance based on road-user charges (Byaruhanga&Basheka, 2017). Bagaka and Kobia (2010) however, assert that the reforms have not fully improved the performance of roads in Africa. There are cases of partially engineered road infrastructure projects. The problem of uncompleted partially engineered road infrastructure projects, is not only affecting the road construction projects but also the construction industry (Meyer, Witt, Kashiwagi&Kashiwagi, 2010). Numerous studies have outlined several factors which account for uncompleted partially engineered road construction all over the world. According to Alfakhri, Ismail, Khoiry, Arhad, and Irtema (2017), the road construction industry encounters many challenges including incompetent contractors, cost overruns, time extension, dispute, loss of profit, breaches of contract, poor quality of work and company bad reputation. Over the years, road condition survey data in Ghana depicts that about 40 to 50% of the country's entire roads are in poor condition (Chileshe&Berko, 2010). The majority of road construction projects in the country are often partially engineered within the initial set targets of time. Uncompleted Partially engineered roads 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. Although the Upper West Region of Ghana can boast of some good road network, many of the road construction projects in the Jirapa and Lawra District are partially engineered.

The result of this is strain in the economic activities in the district through the transportation of goods and services. If it is well managed, the road construction industry can have a positive impact on a country's economic growth and development processes. Despite previous studies focusing on road construction projects in the Ghana, none has focused on the effect of partially engineered road and its economic impact in the construction industry. The researchers are therefore motivated to fill this knowledge gap. The aim of the study is to assess the effect of partially engineered road and its economic impact in the construction industry. The study is conducted to achieved these objectives, to examine the causes of uncompleted partially engineered roads and the economic impact of partially engineered roads in the Upper West Region.

II. LITERATURE REVIEW

2.1 Road Infrastructure

Road infrastructure is a crucial driving force for economic growth in any country and sustained access to roads is essential to improve living standards (Benamghar&Limi, 2011). According to Arrows (2010) productivity, welfare, and security of both rural and urban people are greatly influenced by the level of road infrastructure development in any country. Production costs, employment creation, markets access, and investment depend on the quality of infrastructure, especially road transport (Wasike, 2001). Globally more governments are placing greater emphasis on the development of infrastructure projects (Orr & Kennedy, 2008). The demand for global infrastructure spending has been projected between \$40 trillion and \$50 trillion over the next two decades. Unlike the United States, studies in countries spanning the entire range of economic development have also revealed positive improvements in infrastructure development (Benamghar&Limi, 2011). European Union estimates up to \$2.7 trillion shall be required through 2020 to meet the current goals for new infrastructure spending (Deustche Bank, 2012).

In Africa, although use of roads dominates the transport sector, carrying 80% to 90% of passenger and freight traffic in most countries, the condition of these roads remains very poor by international standards (World Bank, 2011). The World Bank report of 2011 indicates that Africa has the lowest spatial density of roads than any other region of the world, only 204 km of roads per 1000 km² of land area, with only one-quarter paved, while the world average is 944 km/1000 km², with over half paved (Bagaka&Kobia, 2010). The spatial density of Sub-Saharan Africa's roads is less than 30 percent of that of South Asia, where half of the roads are paved, and only 6 percent of that of North America, where two-thirds are paved (Barasa, 2014).

2.2 Partially Engineered Road Construction Project

Feeder roads (FR) is one of the categories of roads in Ghana that connects rural communities and farmlands to promotes economic development of the area. The Department of Feeder Roads (DFR) is organisation mandated to oversee feeder roads in Ghana (Auditor-General, 2010, Ministry of Roads and Highways, 2012). DFR has categories its feeder roads into three kinds, specifically: engineered, partially engineered and un-engineered feeder roads. Engineered feeder roads are feeder roads that have been upgraded from earth surface to gravel or bitumen surface and provided with drainage structures such as culverts, ditches and drains (picture 2). Partially engineered feeder roads are those earth surface that have been upgraded by blading and with provision of channels and culverts (picture 1). Un-engineered feeder roads are farm paths that lead to villages and have not been involved in any engineering work (picture 3). (Auditor-General, 2010). According to Lebo & Schelling, (2001) assessment on design and rural transport infrastructure found that nearly 900 million people, greater than 12% of the world's population, who stay in rural communities in developing countries do not have constant, all season access to stable main road networks. 300 million of this do not have motorized access. Feeder Road (2014) reported that road condition as at 2013 reveals that 30% of road are in good condition, 38% of road condition are fair whiles 32% of road are in poor condition. Again, the report highlighted that road network by surface type as at 2013 stood at 4% for bituminous surface, representing 1,927.78 km, 65% for gravel surface representing 27,231.20 km, and earth surface stood at 31% representing 12,886.20 km. Finally, the report reveals that road network by engineering class stood at 62% for engineer road representing 25,930.65 km, 15% for partially engineered road representing 6,206.72 km, and 23% for un-engineered road representing 9,934.42 km. Feeder roads in their fair and poor state are often challenging to use particularly during the rainy season. The poor condition of most feeder roads are likely to result in, foodstuffs getting stuck and rotten on farmlands, high vehicle operating costs, high transportation costs, and high prices of foodstuffs in the country. Furthermore, some Members of Parliament (MPs) have constantly grumbled of the poor condition of roads in their communities and constituencies, which are vital for transportation of foodstuffs to market areas (Auditor-General, 2010).

Picture 1: Partially-Engineered Feeder Road



Source: Audit Service field inspection (Pong-Gaa road, Northern Region, 2008)



Picture 2: Engineered Road

Source: Audit Service field inspection (Bediako-Kasapin-Adiembra road, BrongAhafo Region, 2008)



Picture 3: Un-Engineered Feeder Road

Source: Western Regional Office (DFR) feasibility studies (SekyereObuasiJn – SekyereObuasi road, Western Region, 2012)

A project in its basic definition is a temporary endeavor undertaken by people who work cooperatively together to create a unique product or service within an established time frame and within established budget to produce identifiable deliverables (Zulu &Chileshe, 2008). Karim and Marosszeky (2009) mention that the projects are dynamic and carried out in changing environments needing monitoring and control actions. Project success has been defined by the criteria of time, budget and deliverables (Laudo, & Laudon, 2010). According to Lock, (2007), a project is only successful if it comes on schedule, on budget, it achieves the deliverables originally set for it and it is accepted and used by the clients for whom the project was intended. A study, of Rural Transportation and the Distribution of Public Facilities in Nigeria: A Case of Edu Local Government (Aderamo&Magaji, 2010) scrutinized the part played by road transport in the delivery of public facilities in a rural setting in Nigeria. Indication from the studies revealed how motorable roads in rural areas in Nigeria, were generally of unpaved surface, narrow width, and circuitous orientation and with loow-quality bridges (Ogunsanya, 1987 and Filani, 1993 cited in Aderamo&Magaji, 2010). Roads of such nature were virtually unbearable to use during the raining season when vehicles become trapped in mud or when the upgraded bridges become swept away by flood. In evaluating the road quality in the study area (Aderamo&Magaji, 2010), indices used were road surface condition, road width, number of bends, number of bridges and roads' ability to be used. The study shown that only two roads representing 5% of the forty roads studied were tarred while thirty-eight roads representing 95% were not tarred. Similarly, only two roads representing 5% were of two lanes while thirty-eight roads representing 95% were single-lane roads. The number of bridges investigated reveals that, only two roads had bridges widespread enough to allows two vehicles at a time while thirty-eight roads had bridges wide enough to take only a vehicle.

2.3 Causes of Uncompleted Roads Construction Projects

Construction projects require unique design knowledge, skills and experience. Lack of professional expertise, shortage of full understanding of scientific and technical requirements and improper decisions and overlooking specialists and stakeholder's consultation during the decision making process (Kerzner, 2006) obstruct the development of Mega Construction Projects (MCPs) in developing countries. These challenges were clearly noticed in Toshka project, a water infrastructure development in Egypt as not all technical requirements have been taken into full consideration and the different studies conducted over the years related to the project have not been discussed openly and in public. Examples of the technical failure include: Rationale behind Human Development challenges. The ability to attract, retain and develop talented employees is a key feature of successful business. People are an organization's most valuable assets and this is especially true in relatively low-tech, labor-intensive industries such as construction (Loosemore et al., 2003).

Rao and Culas (2014) conclude that poor project planning and planning, delays in on-site transfers and delays in the work of subcontractors are the three most critical factors that the contractor causes, which has an impact on project performance. Factors that occurred too late when changing and approving design documents. The survey found that 51% of the delays were caused by customers, followed by 36% of contractors and 13% of consultants.

Bekoe et al (2013) researched on the performance of local contractors on government projects in Ghana where she found that most local contractors do not have the technical capacity to undertake projects and recommended on the funding mechanisms used in financing these projects. Wambui, Ombui, and Kagiri (2015)

researched on the factors affecting completion of road construction projects which included project managers' competence, project technology, project funds and project equipments as the main factors affecting completion of road construction projects in Nairobi city.

In a study by Alinaitwe et al. (2007), a number of factors that are influenced by the clients and can affect the progress of work were found to include; design changes, stoppages due to disputes between contractors with owners, stoppages because of insolvency, lack of adherence to regulatory requirements, and inspection delays. Cho (2009) asserts that important characteristics like the effects of relevant political, legal and economic systems, market conditions, importance for the project to be completed on time, form of and the division of responsibilities and liabilities, specific location, weather and environmental concerns, level of technological advancement, project life span, value of a project, and quality of a project are all left out. Competence in human resources is a standardized requirement for an individual to properly perform a specific job. Cuban (2001) observed that there are many ways to define and measure the adequacy of staff competency, capacity and the effectiveness of agencies tasked with the construction projects. The effectiveness of the project team tasked with road construction project administration depends to a large extent on the project staff capacity relative to the demands placed upon them. To be effective, road construction projects need to have sufficient and capable staff with the appropriate mix of skills and expertise, the motivation and will to act, and the incentives and resources necessary to achieve their mandate. Kent (2011) postulates that the ability of a project's staff to meet demands for its services depends on both its numbers and the skills and expertise staff members bring to the job. A project team needs to have at least the minimum necessary mix of skills and expertise and a sufficient number of staff with appropriate skills relative to the scale of its responsibility.

2.4 Economic Impact of Partially Engineered Roads

Rural infrastructure, for many years, has been a major development priority playing a vital part in rural development (World Bank, 1994). In Ghana, an improvement of road systems for many communities means an improved access to jobs, educational and health facilities and a facilitation of domestic trade, whether to a nearby community or a country sharing borders (Ghana National Commission for UNESCO, 2009). Accessible feeder road enables the movements of people, goods and services to promote socio-economic development, especially agriculture. Improved rural road travel reliability also increases the access to social services and employment opportunities (Ministry of Roads and Highways, 2012). A unique character of numerous rural communities in Ghana is the awful condition of roads, several studies by researchers have revealed that this appalling condition of roads in rural areas in a large extent slows down development (Okoko, 2011) this has coupled access to both private and public infrastructures in health, and education, agricultural extension services, banking and credit facilities, (Okoko, 2011).

Among the many benefits of road construction in rural areas is the provision of rural infrastructure, offering cost-efficient access to both markets for agricultural output and for modern input. Uncompleted Partially engineered roads pose a great challenge to rural development efforts resulting in low productivity, low income and a fall in the standard of living of rural residents (Aderamo&Magaji, 2010). In the study of Jacoby (2000) he costed the income achievements from road projects using the association between farm profits and distance to markets to calculate the revenue realized from road projects. Additionally, he used the method of determining the relationship between household consumption expenses and the distance to markets to assess the benefits of rural roads. This research proposed that providing sufficient road access to markets would present considerable profits (Jacoby, 2000). The writer acknowledged that though rural road construction was not the only approach to easing poverty, it undoubtedly had its benefits comprising low-cost transport to and for agricultural markets and improved access to many other facilities and a more assortment of consumer goods (Jacoby, 2000). Poku-Boansi, Ekekpe and Bonney's (2010) study on the role of transportation in combating maternal mortality in the Gushegu district of Ghana, the study posited, that road infrastructure and transportation system influenced the ability of the poor to access health facilities, which was similar to Usman and Sulyman's (2013) study. The study found that there is relationship between rural transportation and efforts in achieving a reduction in maternal mortality in Ghana (Poku-Boansi, Ekekpe, & Bonney, 2010). This study ascertained, among other things, that the poor state of transport infrastructure had negatively affected the ability of pregnant women to seek healthcare in the recognize health institutions. They relied on traditional birth attendants who lacked the requisite skills and equipment to deal with complications.

III. METHODOLOGY

3.1 Research Design

The study utilised quantitative and qualitative research approach. The study design adopted is a descriptive design, which according to Grimes and Schulz (2002) is concerned with and designed only to describe the existing distribution of variables, without regard to causal or other hypotheses. The study was descriptive because ultimately, it aimed at describing into detail, the challenges of partially engineered road and

its economic impact in the construction industry. The type of descriptive study design used was a case study, which refers to an in-depth study of a particular situation or phenomenon rather than a sweeping statistical survey (Patton, 2002). The type of case study adopted is the critical instance case study, which refers to the examination of one or more areas of unique interest with little applicability to generalisation, or to call into question a highly generalised or universal assertion (Baxter & Jack, 2008).

3.2 Study Population and sample size.

In this study, the study population included members of the community in Jirapa and Lawra district in the Upper West Region, as well as contractors, and district works department officers (DWDO) in charge of road construction projects in the districts. A pre-determined sample size of 116 participants consisting of 66 community members, 35 registered contractors and 15 DWDO was included in the study.

3.3 Sampling Procedure

The study employed both the purposive and convenience non-probability sampling techniques in the selection of the respondents for the study. The study adopted purposive sampling to select the community members. Purposive sampling according to Babbie (2007) refers to a non-random sampling technique in which the sample units are selected because they match pre-defined criteria. Jirapa and Lawra district were selected because from observation of the researchers, the districts had more partially engineered roads. In sampling of the contractors and DWDO's, the convenience sampling method was used. This sampling method, according to Lavrakas (2008), is a type of nonprobability sampling in which people are sampled because they are "convenient" sources of data for researchers. However, this nonprobability sampling does not involve known nonzero probabilities of selection (Lavrakas, 2008). Questionnaires were administered to community members and contractors. Interview guide was used to elicit the views of DWDO on the subject matter. The completed questionnaires were cleaned, coded and subsequently entered into the statistical analysis software called the Statistical Product and Service Solutions (SPSS) Version 21 for the analysis to be done. The data was statistically analysed using descriptive statistics, such as frequencies and percentages. The Relative Importance Index (RII) was employed. According to Johnson and LeBreton (2004), RII aids in finding the contribution a particular variable makes to the prediction of a criterion variable both by itself and in combination with other predictor variables. In the calculation of the Relative Importance Index (RII), the formula below was used:

$$RII = \frac{\sum W}{A * N}$$

Where:

W = weighting given to each statement by the respondents and ranges from 1 to 5;

A = Higher response integer (5); and

N = total number of respondents.

The total weighting of each statement of the Likert scale was computed using the Statistical Product and Service Solutions (SPSS) Version 21 before manually calculating for the RII values. The RII values were then ranked to determine the key factors causing uncompleted roads construction projects in the Jirapa and Lawra districts in the Upper West Region of Ghana.

IV. RESULTS AND DISCUSSIONS

4.1 Demographic Characteristics of Respondents

This section describes the demographic characteristics of contractors and community members. Table 1 below presents the demographic characteristics of the contractors. This captures gender, age category, highest level of education, marital status, number of years working the construction industry and current affiliated industry, and employment status. The results showed that majority of the contractors interviewed were males (68.6%), whilst 31.4% were females, which indicate the level of dominance of males in the construction industry in the country. It was also found that most of them (42.9%) were between the ages of 26 to 35 years. In terms of level of education, more than half of the respondents (57.1%) were degree holders, whereas only 1 (2.9%) respondent had SHS education. It was also found that the majority of them (85.7%) were married. Table 1 further shows the contractors had adequate experience in the construction industry. As noted in the table, most of the respondents (40%) had more than 10 years working experience in the construction industry, whereas 65.7% had 6 to 15 years working experience in their current firm. The study also found that the majority of the respondents (65.7%) were permanent full time employees, whilst 34.3% were contract staffs.

Table 1: Demographic Characteristics of Contractors (N = 35)

Variables	Frequency	Percentage (%)
Gender		
Male	24	68.6
Female	11	31.4
Age		
18-25 years	1	2.9
26-35 years	15	42.9
36-45 years	12	34.3
46-55 years	7	20
Educational level		
SHS	1	2.9
Diploma	10	28.6
Degree	20	57.1
Masters	4	11.4
Marital status		
Single	4	11.4
Separated	1	2.9
Married	30	85.7

Source: Researchers' Fieldwork (2018)

Table 1 Cont'd

Variables	Frequency	Percentage (%)
Years of working in construction industry		
1 year	1	2.9
2-5 years	8	22.9
6-10 years	12	34.3
11-15 years	7	20
16-20 years	7	20
Years of working in current construction industry		
1 year	4	11.4
2-5 years	8	22.9
6-10 years	18	51.4
11-15 years	5	14.3
Employment status		
Contract staff	12	34.3
Permanent full time staff	23	65.7

Source: Researchers' Fieldwork (2018)

Table 2 below shows results of the demographic characteristics of the community members interviewed. It captures respondents' gender, age category, highest educational level, marital status, number of years living in the community, and employment status. It was found that majority of the respondents (78.8%) were males. Most of the respondents (48.5%) were between 26 to 35 years. About 43.9% of the respondents had Degree, 18.2% had Diploma, whilst 28.8% had SHS education. Majority of them were married, representing 69% of the total sample. The study also showed that majority of the respondents (65.2%) had lived in the community for more than 20 years. It was also found that 61 respondents representing 84.8% were employed, whilst 15.2% were unemployed.

Table 2: Demographic Characteristics of Community Members (N = 66)

Variables	Frequency	Percentage (%)
Gender		
Male	52	78.8
Female	14	21.2
Age		
18-25 years	15	22.7
26-35 years	36	54.5
36-45 years	5	7.6
46-55 years	10	15.2
Educational level		
SHS	19	28.8
Diploma	12	18.2
Degree	29	43.9
Masters	6	9.1
Marital status		
Single	22	33.3
Married	44	66.7

Years of living in the community		
1-5 years	17	25.8
6-10 years	2	3.0
16-20 years	4	6.1
Above 20 years	43	65.2
Employment status		
Employed	56	84.8
Unemployed	10	15.2

Source: Researchers' Fieldwork (2018)

4.2 Causes of Uncompleted Partially Engineered Roads Construction Projects

The first objective of the study sought to examine the causes of uncompleted partially engineered roads projects in the Upper West Region. Table 3 shows the results of the causes of uncompleted partially engineered roads construction projects from contractors' perspective. The causes of uncompleted partially engineered roads projects were measured using a 5-point Likert scale. The collected data was analyzed by the Relative Importance Index (RII) method with the help of which a decimal figure for each factor was obtained. The overall top five causes of uncompleted partially engineered roads construction projects were disputes between contractors and stakeholders (RII = 0.8514), client attitude towards payments (RII = 0.8), supervision during construction (RII = 0.7943), lack of adherence to regulatory equipment (RII = 0.7943), and lack of technical capacity (RII = 0.7829). As noted in the table, the least contributing factor to partially engineered roads projects is top management support throughout the project (RII = 0.5486).

Table 3: Relative Importance Index for Causes of Uncompleted Partially Engineered Roads

Statements	N	RII	Rank
Disputes between contractors and stakeholders	35	0.8514	1 st
Client attitude towards payments –consultancy fees, interim certificates etc.	35	0.8000	2 nd
Supervision during construction is critical to ensure quality products and timely delivery of project.	35	0.7943	3 rd
Lack of adherence to regulatory requirements	35	0.7943	4 th
Lack of technical capacity	35	0.7829	5 th
Delays in the work of subcontractors	35	0.7771	6 th

Source: Researchers' Fieldwork (2018)

Table 3 Cont'd

Statements	N	RII	Rank
Environmental concerns – specific location, weather etc.	35	0.7657	7 th
Failure at the conceptual planning and design stages may lead to significant problems in successive stages of the project.	35	0.7600	8 th
Relationship with project team members	35	0.7429	9 th
Work breakdown structure	35	0.7314	10 th
Project organization structure	34	0.7235	11 th
Local community obstructions	34	0.7235	12 th
Availability of resources- human, financial, raw materials	35	0.7200	13 th
Improper decisions and overlooking specialists consultation	35	0.7029	14 th
Effective planning and scheduling	34	0.6941	15 th
Functional manager's incompetency	35	0.6629	16 th
Effective use of technology	34	0.5647	17 th
Top management support throughout the project life	35	0.5486	18 th

Source: Researchers' Fieldwork (2018)

Results from the study revealed that the major causes of uncompleted partially engineered roads construction projects include disputes between contractors and stakeholders (RII = 0.8514), client attitude towards payments (RII = 0.8), supervision during construction (RII = 0.7943), lack of adherence to regulatory equipment's (RII = 0.7943), and lack of technical capacity (RII = 0.7829). Similarly, these causes of uncompleted partially engineered roads construction projects were also identified by the DWDO's.

However, one DWDO voicing his concerns on disputes between contractors and stakeholders asserted that:

"...the role of stakeholders is very important in the execution of the projects. They are able to direct the contractors to go according to the proposed timeline and schedules for completion of the projects. However, they cannot set rules and regulations to the contractors. They can only serve as advisers to the contractors. In this sense, good interpersonal relationship between these parties will result in smooth operations on the part of the contractors"

This assertion depicts the importance of settling disputes between contractors and stakeholders in the districts in order to curb the problem of uncompleted partially engineered roads. Several empirical studies have also come up with similar conclusions. Alinaitwe et al. (2007), for instance, found a number of factors that influence uncompleted partially engineered roads include; design changes, stoppages due to disputes between contractors with owners, stoppages because of insolvency, lack of adherence to regulatory requirements, and inspection delays. Supporting this assertion, Kerzner (2006) argued that improper decisions and overlooking specialists and stakeholder’s consultation during the decision making process obstruct the completion of road construction projects. Bekoe (2013) found that most local contractors in Ghana do not have the technical capacity to undertake projects. In addition, Georgieva (2012) reported that lack of professional expertise, shortage of full understanding of scientific and technical requirements. Wambui, Ombui, and Kagiri (2015) identified project managers’ competence, project technology, project funds and project equipment as the main factors affecting completion of road construction projects in Nairobi city. There are many ways to define and measure the adequacy of staff competency, capacity and the effectiveness of agencies tasked with the construction projects (Cuban, 2001). The effectiveness of the project team tasked with road construction project administration depends to a large extent on the project staff capacity relative to the demands placed upon them. To be effective, road construction projects need to have sufficient and capable staff with the appropriate mix of skills and expertise, the motivation and will to act, and the incentives and resources necessary to achieve their mandate. Kent (2011) postulates that the ability of a project’s staff to meet demands for its services depends on both its numbers and the skills and expertise staff members bring to the job.

4.3 Economic Impact of Partially Engineered Roads

Respondents were asked to indicate whether partially engineered roads have impact on economic development of the district. According to the results, most of the contractors (57.1%) said yes, whereas 54.9% of the community members said yes (Table 4).

Table 4: Respondents who think Partially Engineered Roads Positively affect Economic Development

Variable	Contractors		Community members	
	Frequency	Percentage (%)	Frequency	Percentage (%)
Yes	20	57.1	39	54.9
No	15	42.9	21	29.6
Missing values	-	-	5	8.5
Total	35	100.0	71	100.0

Source: Researchers’ Fieldwork (2018)

Figure 1 illustrates the percentage of community members who own businesses in the community. The results showed that 37 respondents representing 56.1% said they own a business in the community, whilst 29 (43.9%) said they do not.

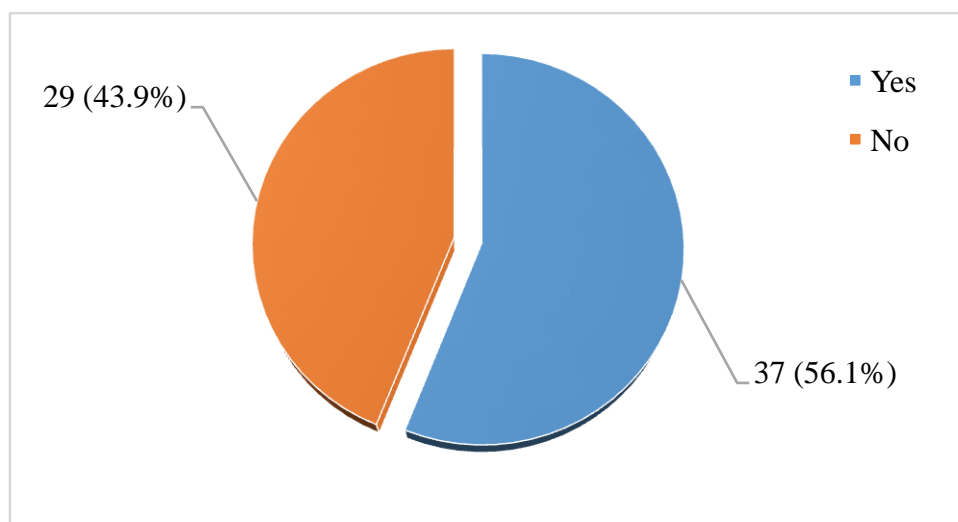


Figure 1: Ownership of Business in the Community

Source: Researchers’ Fieldwork (2018)

Table 5 below depicts the responses from the respondents on the perceived impact of partially engineered roads on businesses in the community. As noted in the table, there were similar responses from the perspective of the contractors and that of the community members in terms of how partially engineered roads affect business operations in the districts. Whereas seven businesses were revealed by the respondents to be impacted economically by partially engineered road, each of the seven businesses were rated above 84% by community members and above 60% by the contractors. Supporting this finding, DWDO members posited that:

“it’s true to say that partially engineered road construction projects in the district has enhance on the economic development of the communities. Looking at agriculture, for instance, most of the people in the districts are into this sector. It helps farmers to transport their farm goods from one town to the other for marketing...”

Table 5: Perceived Impact of Partially Engineered Roads on Economic Development

Variable	Contractors (N=35)		Community (N=66)	
	Positive f (%)	Negative f (%)	Positive f (%)	Negative f (%)
Agriculture, forestry and fishing	25(71.4)	8(22.9)	63(95.5)	3(4.5)
Manufacturing	20(50.6)	13(49.4)	40(60.0)	26(39.4)
Water supply, sewerage, waste management	22(54.7)	12(45.3)	54(81.8)	12(18.2)
Construction works	20(60.6)	13(39.4)	58(87.9)	8(12.1)
Wholesale and retail trade	18(62.9)	16(37.1)	57(86.4)	9(13.6)
Accommodation and food service	24(72.7)	9(27.3)	59(89.4)	7(10.6)
Information and communication	18(64.5)	15(35.5)	61(92.4)	5(7.6)
Financial and insurance	13(38.2)	21(61.8)	33(50)	33(50)
Education	23(67.6)	10(29.4)	56(84.8)	10(15.2)
Healthcare provision	23(67.6)	11(32.4)	60(90.9)	6(9.1)
Arts, entertainment and recreation	18(54.5)	15(45.5)	43(65.2)	23(34.8)

Source: Researchers’ Fieldwork (2018)

The results reveals that majority, 95.5% of the community members and 75.4% of contractors responded that agriculture, forestry and fishing business are positively impacted by partially engineered road. Again, the study shows that majority, 90% of the community members and 67.6% of contractors responded that healthcare business are positively impacted by partially engineered road. Moreover, the study indicated that more respondents 89.4% of the community members and 72.7% of contractors are of the view that accommodation and food services business are impacted positively by partially engineered road. Further results of the study reveals that majority, 84.8% of the community members and 67.6% of contractors responded that education business are positively impacted by partially engineered road. These results are in accordance with results from other studies. Jacoby (2000), for instance, suggested that providing extensive road access to markets would present substantial profits. The author admitted that although rural road construction was not the only approach to alleviating poverty, it certainly had its benefits including cheaper transport to and from agricultural markets and better access to many other facilities and a greater variety of consumer goods (Jacoby, 2000). In another study, Poku-Boansi, Ekekpe and Bonney’s (2010) and Usman and Sulyman’s (2013) showed that road infrastructure and transportation system influenced the ability of the poor to access health facilities. This current study discovered, that the good state of partially engineered road will impact positively on business in the communities and community members will be able to transport their farm produce like millet, maize, vegetables, fish, and animal product such as cows, goats, sheep’s etc. to the market. Sick and pregnant women have easy access to recognize health institutions. Rather than relying on traditional birth attendants who required the necessary skills and equipment to pact with problems. Teachers and students have easy access to schools where they needed to take transport.

V. CONCLUSION

Theoretically, this study has provided several explanations into the effect of partially engineered roads and its economic impact in the construction industry in the Upper West Region of Ghana. It was evident from

the study that, disputes between contractors and stakeholders was the major cause of uncompleted partially engineered roads in the districts. This requires good coordination between contractors and stakeholders in the district. In addition, client attitude towards payments, supervision during construction, Lack of adherence to regulatory requirements, Lack of technical capacity, Delays in the work of subcontractors and Environmental concerns – specific location, weather etc affect timely completion of partially engineered road projects. The study also concludes that partially engineered roads indeed influence economic development at Jirapa and Lawra Districts in the Upper West Region. The study reveals, that the good state of partially engineered road will impact positively on business in the communities such as Agriculture, forestry and fishing, Healthcare provision, Education, Information and communication, Accommodation and food service, Wholesale and retail trade and Construction works. To some large extent, the good state of partially engineered road will influence business in the communities and community members will be able to transport their farm produce like millet, maize, vegetables, fish, and animal product such as cows, goats, sheep's etc. to the market. Sick and pregnant women have easy access to recognize health institutions. Rather than relying on traditional birth attendants who required the necessary skills and equipment to pact with problems. On education, it will be easy for teachers and students who take transport to schools to reach their schools on time. The study recommended that clients should make prompt payment to work done by contractors to avoid them huge financial burdens. Future study should be conducted on this subject matter in other districts in the Upper West Region. This will help broaden the scope of knowledge on the effect of partially engineered roads constructions projects in the country.

REFERENCES

- [1]. Aderamo, A. J., &Magaji, S. A. (2010). Rural Transportation and the Distribution of Public Facilities in Nigeria: A Case of Edu Local Government Area of Kwara State. *Journal of Human Ecology* , 29 (3), 171-179.
- [2]. Alfakhri, A. Y.Y., Ismail, A. B. and Khoiry, M. A., Arhad, I. &Irtema, H. I. M (2017). A conceptual Model of Delay Factors Affecting Road Construction Project in Libya. *Journal of Engineering Science*
- [3]. Alinaitwe, H., Apolot, R. &Tindiwensi, D. (2013). Investigation into the Causes of Delays and Cost Overruns in Uganda's Public Sector Construction Projects. *Journal of Construction in Developing Countries*, 18, 33-47.
- [4]. Arrows, S. (2010). Horizontal Policies in Public Procurement. *Journal of Public Procurement*, 10, 149-186.
- [5]. Babbie, (2007). *Qualitative research sampling*
- [6]. Bagaka, O. &Kobia, M. (2010). Enhancing Trust and Accountability in Government. CAPAM African Regional Conference, Abuja, 18 May 2010.
- [7]. Bagrecha, K. and Bais, A. (2017). Study on Delay Construction Project in India. *International Journal of Engineering Research and Technology*: 4 pp 6-10.
- [8]. Barasa, H. (2014). Procurement Practices Affecting Effective Public Projects Implementation in Kenya; A Case Study of Kenya Civil Aviation Authority. *European Journal of Business and Management*, 6, 49
- [9]. Baxter, P., & Jack, S. (2008). *Qualitative Case Study Methodology: Study Design and Implementation for Novice Researchers*. The Qualitative Report, 13(4), 544-559. Retrieved from <https://nsuworks.nova.edu/tqr/vol13/iss4/2>
- [10]. Benamghar, L. &Limi, A. (2011). Efficiency in Public Procurement in Rural Road Projects in Nepal. *World Bank Policy Research Working Paper No. 5736*. <https://doi.org/10.1596/1813-9450-5736>
- [11]. Bekoe, R. Fianko Quartey, E. Dumolga, A. (2013) Assessing The Performance of Local Contractors On Government Projects In The Akuapem North Municipal Assembly Akropong-Akuapem Eastern Region – *Ghana European Journal of business management* Vol 5, No 8 (2013)
- [12]. Chileshe N. and Berkor D.P. 2010 Causes of project cost overruns within the Ghanaian road construction sector 2010 Conference: The 5th Built Environment Conference, Association of Schools of Southern Africa (ASOCSA) Durban, South Africa Volume: 1
- [13]. Department of Feeder Road Seminar On Development in The Provision of Rural Access in Ghana. (2014) file:///C:/Users/user/Documents/Aidoo-GhanaFeederRoads-Ghana-2014-Rural+Access+Ghana+PPT-AFCAP-v140529.pdf
- [14]. Deutsche Bank (2012). https://annualreport.deutschebank.com/2012/ar/servicepages/downloads/files/dbfy2012_entire.pdf
- [15]. Ghana National Commission for UNESCO. (2009). *Transport: Bedrock for Economic Development*. 193-198.
- [16]. Gidisu, J. (2009) "Introductory Remarks by Hon. Joe Gidisu, Minister of Roads and Highways", Transport and Sector Conference on Ghana's Oil and Gas Industry' 15 – 16th July 2009, AICC, Accra, Ghana
- [17]. Government of Ghana . (2014). Ministry of Roads and Highways. Retrieved November 10, 2014 from Official Portal: Government of Ghana : <http://www.ghana.gov.gh/index.php/2012-02-08-08-18-09/ministries/267-ministryof-roads-and-highways>.
- [18]. Grimes, A & Schulz, M.D. (2002). Descriptive studies: what they can and cannot do. *The Lancet*. Volume 359, No. 9301, p145–149
- [19]. Hayat, E and Amaratunga, RDG (2011). Road reconstruction in post - disaster recovery; the challenges and obstacles. Conference University of Salford Manchester
- [20]. Jacoby, H.G. (2000) Access to Markets and the Benefits of Rural Roads. *Journal of Economic* vol. 110, issue 465 pg. 713-737
- [21]. Johnson, J.W. & LeBreton, J.M. (2004). History and Use of Relative Importance Indices in Organizational Research. *Organizational Research Methods*, 7, 238-257.
- [22]. Karim K. & Marosszeky M., (2009). Process monitoring for process re-engineering - using key performance indicators, International conference on construction process reengineering, CPR 99, Sydney UNSW 12-13 July, Building Research Center
- [23]. Kerzner, H. (2009). *Project Management a Systems Approach to Planning, Scheduling, and controlling the definition* John Wiley & Sons, Inc. New Jersey
- [24]. Laudon, K. and Laudon, J. (2010) *Management Information Systems: International Edition*, 11/E Pearson Higher Education
- [25]. Lebo, J., & Schelling, D. (2001). Design and Appraisal of Rural Transport Infrastructure: Ensuring Basic Access for Rural Communities. *World Bank Technical Paper* (496).
- [26]. Lock, D. (2007). *Project Management Ninth Edition*. Gower Publishing Limited Gower House England
- [27]. Lavrakas, P.J. (2008). *Encyclopedia of Survey Research Methods* SAGE Publications Ltd
- [28]. Loosmore, M., Dainty, A. and Lingard, H. (2003). *Human Resource Management in Construction Projects*, Spon Press, London.
- [29]. Meyer, R. and De Wit, B. (2010) *Strategy: Process, Content, Context an international perspective 4th. Edition* (2010) by Cengage Learning EMEA

- [30]. Meyer, J., Witt, S., Kashiwagi, J. and Kashiwagi, D. (2010). 'General Services Administration Streamlines the Procurement of Construction Services', Proceedings seventh annual acquisition research symposium Volume II, Naval Postgraduate School, Monterey, California, pp. 609-625, (May 12-13, 2010).
- [31]. Ministry of Roads and Highways. (2012). Pilot Program Based Budget (PBB) for 2013-2015. Budget, Ministry of Roads and Highways.
- [32]. Ofori, G. (2006) Productivity of the Construction Industry. Research Brief 2005/2003 Department of Building, School of Design and Environment, National University of Singapore, Singapore
- [33]. Okoko, E. (2011). Rural Transportation and Rural Development: The Instance of Akwapim South District in Ghana. International Journal of Economic Development and Investment , 2 (3), 10-24.
- [34]. Orr, J. & Kennedy, R. (2008). Highlights of Recent Trends in Global Infrastructure: New Players and Revised Game Rules. Transnational Corporations, 17, 95
- [35]. Patton, M. G. (2002). Qualitative research and evaluation methods. 3rd Sage Publications; Thousand Oaks, CA
- [36]. Poku-boansi, M., Ekekpe, E. and Bonney, A. A. (2010) Combating Maternal Mortality in the Gushegu District of Ghana: The Role of Rural Transportation: Journal of Sustainable Development in Africa volume 12, no.5,
- [37]. Rao, P. B. & Culas, J. (2014). Causes of Delays in Construction Projects: A Case Study International Journal of Current Research.
- [38]. Seboru, M. A. (2015) An Investigation into Factors Causing Delays in Road Construction Projects in Kenya American Journal of Civil Engineering; 3(3): 51-63
- [39]. Usman, B. A., & Sulyman, A. O. (2013). Transport and Access to Rural Health Centres in Ilorin East Local Government Area, Kwara State, Nigeria. University of Ilorin, Department of Geography and Environmental Management
- [40]. Wambui, N. D., Ombui, K. and Kagiri, A. (2015). Factors Affecting Completion of Road Construction Projects in Nairobi City County: Case Study of Kenya Urban Roads Authority (KURA) International Journal of Scientific and Research Publications, Volume 5, Issue 11,
- [41]. Wasike, W.S. (2001). Road Infrastructure Policies in Kenya: Historical Trends and Current Challenges. Kenya Institute for Public Policy Analysis Working Paper No.1, Nairobi
- [42]. World Development Report 1994 : Infrastructure for Development
- [43]. World Bank (2011). Comparative Analysis of Public Finance Management Reforms. World Bank, Washington DC.
- [44]. Zulu, S. and Chileshe, N. (2008), the Impact of Service Quality on Project Performance: a Case Study of Building Maintenance Services in Zambia, in Proc. Of the 3rd Built Environment Conference, Association of Schools of Schools of Construction of Southern Africa, Cape Town, South Africa

Samuel Osae "The Effect of Partially Engineered Road and It Economics Imparts In The Construction Industry in Upper West Region Ghana." American Journal of Engineering Research (AJER), vol.7,no.12,2018,pp.01-12