The impact of FUNDING sources on PROJECT COMPLETION timelines in road construction works. an analysis of DONOR funding as against GOVERNMENT funding

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ABSTRACT: **This study sought to assess the impact of funding sources on project completion of construction works in the road sector in Ghana. The study adopted the descriptive research design with Ghana Highways Authority as a case study. The population of the study included staff, contractors and consultants of the Ghana Highway Authority. A sample size of 100 respondents (representing approximately 5.9%) was selected using convenient sampling method. Data was collected using a questionnaire and analyzed using Statistical Package for Social Sciences. The study revealed that the main sources of funding for government road projects included annual budgets, oil fund revenue, cocoa export funds, and road fund secretariat. The study revealed the main sources of funds for donor road projects included; aids, grants and loans. It also revealed the main factors that prevent timely completion of road constructions projects at the Ghana Highway Authority included: slow funds disbursement, late payment for completed works, inaccurate estimates, design mistakes & changes, price fluctuations, poor technical performance, obsolete/unsuitable construction methods, and disregard for contract conditions. Conclusively, funding sources has positive impact on road project completion timelines. The study recommended adequate supervision to check quality of work done, ensure use of best methods and also contractors perform job according to the contract terms**

Keywords: Funding; Donor, Government, Project, Completion

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1. Introduction

Ghana Highway Authority is an outfit that was established by the GHA Decree 1974 and is responsible for the administration, development and maintenance of Ghana's trunk road network. These trunk roads are important to the development of the infrastructure in Ghana. They reduce travel cost for drivers and passengers and serve as important linkages for the various towns and cities. It invariably boosts business activities along these routes thereby putting money in the pockets of those in the communities as well as lowering the level of unemployment. It also helps in the carting of foodstuffs from the hinterlands into the business centres. It is of utmost importance that the roads in Ghana are properly maintained to ensure that benefits derived from these roads are always enjoyed. It must be noted that the qualifying bidder is the lowest responsive bidder that fulfils all the requirements and not necessarily price. This ensures that there is value for money as a properly executed road work has immeasurable benefits to the country. To secure a contractor to execute a project, the initial step is to identify a need. Based on the public procurement act, the engineers cost the project, come out with the engineers estimate and then set out with the mode of procurement. This is then sent to the Public Procurement Agency for a "No Objection" or to add new information before approval is given. Based on the approval, the tender document can now be prepared. An advert is placed in the dailies, interested and qualifying contractors are then invited to purchase and tender in their tender documents. The Contractors could be notified to express their interest if the procurement

method to be used is selective tendering or sole sourcing.

1.1 Statement Of The Problem

Road projects once awarded to a successful contractor, is expected to be completed within a stipulated time frame spelt out in the contract. On completion of a project by the contractor, an inspection and handing over certificate is awarded to the contractor, after inspection of the project is done to ensure there are no faults. The road is then taken over by the Government of Ghana. In practice however, there are frequent failures to meet project completion dates and these sometimes lead to the termination of contracts. Once this is done, the contractor is made to pay a fine in the form of liquidation against damages. Other times, these projects are not terminated however, they extend beyond the stipulated contract completion time. Hence there is the need to find out what accounts for this anomaly, and if this is correlated to the source of funding or not.

It is worth stating that there are various means of funding road projects in Ghana. There are the wholly funded Government of Ghana projects, the wholly funded Donor funded Projects and the Government of Ghana – Donor funded projects where there is a percentage financed by both parties, say 30% - 70% respectively. Sources of funding for Road projects include: Government of Ghana through Road Fund Secretariat, Cocoa Exports Fund, Annual Budget Estimates (Consolidated Fund), Oil Fund Revenues; and Donor Funds through loans and or grants. Over the years, it seems road projects which have been funded by the Donor community tend to be completed on schedule whereas those funded by the Government of Ghana fail to meet project completion time. This has serious implications on the road works completion time and even on the overall financing of the project for the Government of Ghana funded roads. An extension of the project completion time leads to more cost.

It is worth finding out whether these means of funding of road projects is of benefit to the contractor, and what the consequences of the alternate sources of funding are to project completion timelines. This study therefore sought to assess the impact of funding sources on project completion of construction works in Ghana. The study critically assesses how sources of funding; that is, donor and government of Ghana, affect the timely completion of construction works in the road sector.

1.2 Research Objectives

Generally, the study assesses the impact of funding sources on project completion of road construction works with reference to donor funding as against government of Ghana funding. But, specifically the objectives are

i. To identify the main sources of funds for projects in the roads sector.
ii. To identify the main factors that prevent timely completion of road construction projects in Ghana.
iii. To identify the causes of delay in accessing funds by the contractors.
iv. To assess the impact of sources of funding on projects completion timelines in road construction.

1.3 Significance Of The Study

The findings, conclusions and recommendations of this study make the study significant in diverse ways. First of all, the findings will provide empirical evidence for the Government of Ghana to know the implications of delay in disbursement of funds meant for road construction in Ghana including the economic cost that such delays create for contractors which may be transferred to the Government eventually.

The study provides contractors with empirical information on the causes of delay in funding disbursement as well as the main factors that cause delay in project completion and also some suggestions to reduce the impacts of such factors on their project.

Finally, the study will add to available literature on project management. In this regard, other researchers and students who will conduct future research into topics which are related to the study area can refer to the findings of this study in their literature review.

1.4 Scope And Limitation Of Study

The study analyses the impact of the sources of funding on project completion of road construction works in Ghana. The study focuses on two main sources of funding; donor funding and government funding. Furthermore, the study considers road construction works under the Ghana Highways Authority only. Hence, only contractors employed by the Ghana Highway Authority are included in this study. Furthermore, all other respondents of the questionnaires selected for this study are those also only employed by the Ghana Highway Authority; although, other

Government agencies such as Departments of Urban Roads and Feeder Roads, also employ contractors to construct roads. For this reason the findings of the study, and the conclusions thereof might have changed if the study had included contractors who are employed by these other agencies.

2. METHOD

2.1 Research Design

A research design may be defined as a blueprint for going about a research study. It is defined as the general approach that guides the researcher in the choice of research methods (Creswell, 2003). Three main research designs exist, namely quantitative, qualitative and mixed designs (Williams, 2007). This work employs the quantitative research design. The quantitative design employs questionnaire and surveys, or manipulates existing secondary data to generate statistical results for examining a phenomenon (Creswell, 2003). Apart from this study being quantitative, it is also descriptive in nature as it seeks to collect data which is pertaining to the research problem being studied.

2.2 Population

In the context of this study, the population is made up of staff, contractors, consultants and projects of the Ghana Highway Authority. The total number of staff, contractors, and consultants of the Ghana Highway Authority at the time of this study was about 1,700 across the country.

2.3 Sampling And Sample Size

The researcher aimed at using a sample size that was at least representative of the population. A sample size of 100 respondents representing 5.9% of the population (1700) was used for the study. A convenient sampling procedure was deemed as suitable to collect the data. Convenient sampling comprises gathering data from respondents in a population that are close or could easily be accessed and willing to be included in a study. Also, ten (10) completed and on-going projects from the ten regions of Ghana were used. This involves projects awarded from 2006 to date.

2.4 Data Collection Instruments

This research uses both primary and secondary data. Primary data was collected from respondents using a self-administered questionnaire. The self-administered questionnaire was the best option for achieving a high response rate (considering the fact that respondents could not have responded instantly. The questionnaire contained both closed and open-ended questions. For this research, the secondary data used is information collected from Ghana Highway Authority.

To ensure validity and reliability, a pilot study was conducted to ensure that the research instrument was valid and a reliability coefficient was computed using the Cronbach Alpha Coefficient. The results of the test gave 0.875 coefficient of reliability, which showed that the research instrument had a solid reliability (Saunders, Lewis, & Thornhill, 2007). Hence, the research instrument was considered suitable to be used for the final data collection. All 100 questionnaires distributed were duly completed and returned by the respondents.

2.5 Data Analysis

A five-point Likert-type scale (ranging from 5 strongly agree to 1 strongly disagree) was used in measuring the items on service quality and the related variables. A five-point Likert-type scale with a response of very low severity scoring one (1) mark, low severity scoring two (2) marks, medium severity scoring three (3) marks, high severity scoring four (4) marks and very high severity scoring five (5) marks was used. The data was scored and computed by adding the scores of ticked responses by the participants. The data gathered from the respondents were analyzed manually and electronically. The manual analysis was done by way of editing of the raw answers, coding and giving numerical figures for easy inputting into the computer. The electronic analysis was done using the Statistical Package for the Social Sciences (SPSS) version 17.0. The SPSS was used to generate frequencies, percentages, graphs, regression analysis and inferential analysis..

2.5.1 Regression Model

The study adopted a general simple regression model for the inferential analysis to assess the impact of sources of funding on projects completion timelines in road construction. The relationship between sources of funding and projects completion timelines in road construction was estimated using the following regression model:

$Y = \alpha + \beta_1 GS_1 + \beta_2 DS_2 + e$

Where:

i. Y is the dependent variable (project completion timelines);
ii. α is the intercept, β is the slope and e is the error term; and

The independent variables of the model: government funding sources (GS); and donor funding sources (DS).

3. DATA ANALYSIS

3.1 Main Sources Of Fund Projects In The Road Sector

This section of the analysis assessed the main sources of funds for projects in the road construction sector in the Ghana Highways Authority. 33% of the respondents stated that annual budget is the main source of funds for government funding of road construction, and 16% said that the main source of funds is oil revenues. Again, 25% of those who answered the questionnaires stated that cocoa export fund is the main source of funds, while 28% were of the view that it is the road fund secretariat. This showed that majority of the respondents believed that annual budgets estimates are the main sources of funds for government funded road projects. The results of this analysis supports prior research which found that the main sources of funding for road infrastructure projects include; annual budgets (Richecour & Heggie, 1995), oil fund revenue (Mensah, 2017), cocoa export funds (Amamoo, 2015), and road fund secretariat (Boamah, 2012). The survey also showed that 14% of the respondents asserted that the main source of funds for donor funding projects is Aids, 42% stated the main source is Grants, and 44% declared that the main source of funds for such projects is loans. The results showed that majority of the respondents believed that Loans are the main source funds for donor funded road construction projects. The results of the analysis support previous research which found that donor funding sources for road construction projects included loans and grants (Taiwo, 2011).

3.2 Factors That Prevent Timely Completion Of Road Projects

This section of the analysis sought to ascertain the factors which prevent timely completion of road construction projects under the auspices of the Ghana Highway Authority.

From the results obtained, 67% of respondents who were in the majority indicated that slow disbursement of funds as a factor has a very high severity on road constructions projects, whereas 33% said it has a high

severity. Late disbursement of funds for completed works had 65% respondents mentioning that it has a very high severity, 16% said it has high severity, 11% said medium severity, and 8% said very low severity. On inaccurate estimates, 38% of respondents said it had

Causes of delays	Government funded	Donor funded
Slow disbursement of funds	Yes	-
Faulty claims on part of contractors	Yes	-
Late submission of certificate of completion	Yes	-
Delays in getting IPCs signed	Yes	-
Inadequate budgetary allocation	Yes	-
Bureaucratic bottlenecks in inspection, measuring and processing	Yes	-
Slow processing by government agencies liaising with donors	-	Yes
Delay in approval of loan/grant agreement	-	Yes
Inability of government to fulfil its obligation for release of funds	-	Yes

high severity, 24% said it had very high severity, 23% mentioned medium severity, 8% asserted that it had low severity, and 7% said it had very low severity. Furthermore, 31% of respondents said that design mistakes and changes has a high severity, 24% said low said medium severity, 23% said low severity, 15% stated very high severity, and 7% were of the view that it had very low severity on road construction projects. Disregard for conditions under the contract by parties had 38% believing that it has high severity, 31% saying medium severity, 25% stating low severity, and 6% mentioning that is has very high severity on road construction projects. On price fluctuations as a factor that prevents timely completion of road construction projects, 45% of respondents stated that it had medium severity, 37% said it had high severity, and 18% declared that it had low severity.

The survey also showed that 33% of respondents believed that poor technical performance had medium severity on road construction projects, 27% held that it had low severity, 20% maintained that it is of very high severity, 13% upheld that it had high severity, and 7% opined that it very low severity on road construction projects. Finally, responses obtained indicated that 32% of respondents perceived that the use of obsolete or unsuitable construction methods had low severity on road construction projects, 26% perceived that it has high severity, 21% believed that it had medium severity, 13 said it had very low severity, and 8 mentioned that it had very high severity. This findings support previous

findings by Ali, Rahmat and Hassan (2008), Moungrous and Charoenngam (2003), Ogunsemi and Jagboro (2006), Vidalis and Najafi (2002), Wang (2010) who found that the main factors that prevent timely completion of road constructions projects included; slow disbursement of funds, late payment for completed works, inaccurate estimates, design mistakes and changes, price fluctuations, poor technical performance, obsolete or unsuitable construction methods, and disregard for conditions under the contract.

3.3 Causes Of Delays In Accessing Funds By Contractors

This section of the chapter provides results of the responses obtained on the causes of delays in accessing funds by contractors in the roads construction sector. In this section, respondents were asked to provide their own opinion of the causes of delays in accessing funds by contractors. The causes are categorised into those that pertain to government funded projects, and those that pertain to donor funded projects. The results of the responses are presented in Table 1 below.

Table 1: **Causes of delays in accessing funds by contractors**

The opinions of the respondents as shown in Table 4.4 indicate that the causes of delays in accessing funds by contractors for government funded road projects included; slow disbursement of funds; faulty claims on part of contractors, late submission of certificate of completion, delays in getting IPCs signed, inadequate budgetary allocation, bureaucratic bottlenecks in inspection, measuring and processing. On roads funded by donor agencies, respondents suggested that the causes of delays in contractors accessing funds included; slow processing by government agencies liaising with donors, delay in approval of loan/grant agreement, and inability of government to fulfil its obligation for release of funds.

Previous research by Ahmed, Azhar, Kappagntula and Gollapudil (2003), Alaghbari, Razali, Kadir, Salim and Ernawati (2007), Frimpong, Oluweye and Crawford (2003), Kumaraswamy and Chan (1998), and Mensah (2017) had found that the causes of delays in accessing funds by contractors included; slow disbursement of funds, faulty claims on part of contractors, late submission of certificate of completion, inadequate budgetary allocation, bureaucratic bottlenecks in inspection, measuring and processing, slow processing

by government agencies liaising with donors, and delay in approval of loan/grant agreement.

3.4 Impact Of Funding Sources On Projects Completion Timelines

The principal aim of this study was to assess the impact of funding sources on project completion timelines in road construction works. This section therefore, examines the impact of funding sources on project completion timelines. As indicated in the methodology, a simple regression model was used expressed as: $Y = \alpha + \beta_1 GS_1 + \beta_2 DS_2 + e$

Where: Y is the dependent variable (project completion timelines); α is the intercept, β is the slope and e is the error term; and the independent variables are thus, government funding sources (GS); and donor funding sources (DS). The results of the regression analysis are presented in Tables 2, 3, and 4.

Table 2: Summary of regression analysis

Multiple R	0.908
R Square	0.825
Adjusted R Square	0.649
Standard error	32.2
Observations	100

The regression results show in Table 2 a Multiple R of 0.908, R-Square of 0.825, and Adjusted R-Square of 0.649. These measure the relationship between the dependent variable (project completion timelines), and the independent variables (government sources, and donor sources). Nonetheless, the adjusted R-square provides a better measure of the relationship between the two variables and is adjusted with the number of independent variables in the model.

The adjusted R-square of the regression indicates that 0.649 (64.9%) of changes in project completion timelines in road constructions can be accounted for by source of funding for the project. This means that the both government and donor funding sources together account for 64.9% variations in project completion timelines in the road sector. The results also indicate that funding sources have a positive impact on project completion timelines in road constructions.

The coefficient of the relationship for government sources of funding was negative (-2.065) which indicates a negative relationship between government funding sources and project completion timelines. However, the p-value of 0.201 (20.1%) is more than 0.15 (15%) which indicates that the relationship is

insignificant. This means that government sources of funding have negatively insignificant relationship with project completion timelines in the roads construction sector. This result of this analysis counters the findings of Kaming, Olomolaiye, Holt and Harris (1997) and Mensah (2017) who found in their previous study that government sources of funding including current budgets significantly affected the completion of road construction projects.

The coefficient of the relationship for donor sources of funding and project completion timelines is positive (4.176) which indicates a positive relationship. The p-value of 0.025 (2.5%) indicates that donor sources of funding have a significantly positive relationship with project completion timelines in road constructions. This

present findings support previous research by Artidi and Chotibongs, (2005), and Latham (1994) who found that donor sources of funding impacted work in road construction projects. Their findings showed that where there were delays in release of funds for payment for work done by contractors in road construction projects, this created a great deal of unfairness to the contractor undertaking the project; affected sub-contractors greatly, and could result in extreme consequences to parties beneath them; and ultimately affecting completion timelines.

Table 3. ANOVA

	Df	SS	MS	F	Significance F
Regression	2	428	142	9.102	0.00112
Residual	99	235	156		
Total	104	663			

Table 4. Regression Output

	Coefficients	Std Error	t – Stat	P-value	Lower 95%	Upper 95%
Project completion timelines	351.92	18.390	19.100	6.110	311.92	390.86
Government sources	-2.065	1.664	1.241	0.201	-1.482	5.614
Donor sources	4.176	1.681	2.484	0.025	0.593	7.759

4.Summary Of Findings And Conclusion
4.1 Summary Of Findings

The study revealed that the road construction projects at the Ghana Highway Authority are either funded by government, donors or a combination of both. It was identified that the main sources of funding for government funded road construction projects included; annual budgets, oil fund revenue, cocoa export funds, and road fund secretariat. It also showed that the main sources of funds for donor funding road projects included; aids, grants, and loans.

The study also revealed that the main factors that prevent timely completion of road constructions projects at the Ghana Highway Authority included; slow disbursement of funds, late payment for completed works, inaccurate estimates, design mistakes and changes, price fluctuations, poor technical performance, obsolete or unsuitable construction methods, and disregard for conditions

under the contract.

Furthermore, the study has indicated that the factors that cause delays in accessing funds by contractors include: Slow disbursement of funds; Faulty claims on part of contractors; Late submission of certificate of completion; Delays in getting IPCs signed; Inadequate budgetary allocation; Bureaucratic bottlenecks in inspection, measuring and processing; Slow processing by government agencies liaising with donors; Delay in approval of loan/grant agreement; and inability of government to fulfil its obligation for release of funds. The study has also revealed that sources of funding for road construction projects accounts for 64.9% of changes in project completion timelines. This implies that funding sources has a positive impact on road project completion timelines. Nonetheless, the study found that whiles government sources of funding had a negatively insignificant relationship with project completion timelines, donor funding sources had a

significantly positive relationship with project completion timelines.

The findings also revealed that as a result of government's inability to pay contractors on time, they are forced to discount their Interim Payment Certificates (IPCs) with Finance and Discount houses in other that work on their projects can continue. It enables them continue work (so as not to be slapped with liquidation against damages for non-performance), pay their workers, service their machines since leaving these machines and bitumen idle at site will also be costly to them. The effect of this action by the contractors sometimes turns out to be dire.

4.2 Conclusion

From the summary of the research as provided above, some conclusion can be drawn from the analysis of the study's objectives. The study concludes that road construction projects at the Ghana Highways Authority are either financed by government or donor agencies or both. The sources of funds for government include annual budgets, oil fund revenue, cocoa export funds, and road fund secretariat. The sources of funds for donor funded projects include; aids, grants, and loans. Also, the main factors that prevent timely completion of road construction projects in Ghana include; slow disbursement of funds, late payment for completed works, inaccurate estimates, design mistakes and changes, price fluctuations, poor technical performance, obsolete or unsuitable construction methods, and disregard for conditions under the contract. The study further concludes that the factors that cause delays in accessing funds by contractors include: Slow disbursement of funds; Faulty claims on part of contractors; Late submission of certificate of completion; Bureaucratic bottlenecks in inspection, measuring and processing; Slow processing by government agencies liaising with donors; Delay in approval of loan/grant agreement; and inability of government to fulfil its obligation for release of funds, among others. Finally, the study concludes that funding sources has a positive impact on road project completion timelines. However, whiles government sources of funding had a negatively insignificant relationship with project completion timelines, donor funding sources had a significantly positive relationship with project completion timelines. The findings and conclusions of this present study supports those of Artidi and Chotibongs, (2005), Kaming, Olomolaiye, Holt and Harris (1997), Latham (1994), and Mensah (2017).

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