

FACTORS INFLUENCING SUCCESSFUL COMPLETION OF ROADS PROJECTS IN KENYA

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ABSTRACT

Various studies have revealed that globally, roads infrastructure contribute to economic growth and poverty reduction while an increased stock of road capital reduces the total cost of producing a given level of output in almost all industries and has a significant effect on the production sector's demand for labour, capital and materials. The present research aimed at studying the "Factors influencing Successful Completion of Roads Projects in Kenya". The objectives of the study were to establish the extent to which each of the independent variables, namely; management support, design specifications, contractor's capacity and supervision capacity influences successful completion of Roads Projects in Kenya. The research answered mainly the following questions; to what extent each of the variables, namely; management support, design specifications, contractor's capacity and supervision capacity influences successful completion of roads projects in Kenya. The study adopted a quantitative research approach based on survey conducted through questionnaires. It employed convenience sampling and the collected data was analyzed through correlation and percentages. The correlation tests showed the Pearson's coefficient for each variable was: management support 0.625, design specifications 0.836, contractor's capacity 0.567 while supervision capacity was 0.712. The major findings were that there was significant relationship between all the independent variables and the dependent variable. Design specifications statistically, however, had the most significant relationship with successful completion of roads projects in Kenya. The study concluded that the Ministry lacks the necessary human and financial capacity to implement projects in a timely manner. It recommends the need for the Ministry to review its strategies with a view to further enhancing commitment in the areas of management support, design specifications, contractor's capacity and supervision capacity.

Key Words: *successful completion, roads project, design specifications*

Introduction

Delays in project completion are a common problem in the construction industry not only with an immeasurable cost to society but also with debilitating effects on the contracting parties. The concept of delay in the substantial completion of construction projects is a global phenomenon. For instance, while evaluating the progress and reports of 28 highway projects constructed during the period 1996-1999 in Jordan, Battaineh (2006) observed that the average ratio of actual completion time to the planned contract duration is 160.5% for road works. Seboru (2006), further citing other scholars also states that the time frame for major road projects worldwide to reach construction start stage have been observed to range from 10-30 years.

A study by United Nations Commission for Trade and Development (UNCTAD), (2001) on African construction industry's turmoils and their implications for New Partnership for Africa's Development (NEPAD) identified costly project delays as a major problem and identifies poor project time, quality and cost performance as a major issue. There is, therefore, a need to address the unpredictability of the successful completion of roads projects in terms of delivery time, cost and to the standard of quality expected. The stakeholders need to do things differently and to rethink the process through which African construction industry continuously improves performance by questioning the current and emerging project delivery approaches.

According to Road Inventory and Condition (RIC) Survey of 2009, only 19% of the classified road networks are in good maintainable condition while 50% is fair and the remaining 31% is in poor condition requiring improvement through rehabilitation (ROK, December 2009). The poor conditions of the road networks leads to high vehicle operating costs and long transportation times. This further leads to high production costs, high prices of goods and services, uncompetitive exports and low productivity. Lack of finance to undertake road maintenance has in the past led to the deterioration of the existing road network in Kenya. There have been, however, major efforts to improve and raise the level of expenditure on roads to over 10% of the Gross Domestic Product (GDP).

The most widely used measures of construction success are time achieved, quality of product and cost at the completion of the project. The time element in construction means that a delay costs money and in case of bottlenecks, the delay can be extremely expensive. The quality achieved has a bearing on the life of the project while cost has a value for money element. Thus contracts must be designed to ensure that each contractual party is capable of performing the obligations set out. The desired output of any contractual arrangement is the successful completion of the given project. And yet during construction process, there are many unexpected events including controllable and uncontrollable factors that can adversely affect or hinder successful completion of projects and cause delay.

An examination of various documents prepared by the Ministry of Roads, the lead agency responsible for regulating, formulating and coordinating all policy and strategic matters as well as investment plans for the roads infrastructure subsector, indicated that a number of road projects in Kenya did not get completed within the initial set targets of time, quality and cost.

They were frequently completed with large cost overruns, extended time schedules and quality concerns. The study, therefore, was intended to investigate the factors influencing successful completion of roads projects in Kenya.

Objectives of the Study

The objectives of the study, derived from the independent variables as captured in the conceptual framework were to:

1. Determine if management support influences successful completion of roads projects in Kenya
2. Establish whether design specifications influence successful completion of roads projects in Kenya
3. Investigate if contractor's capacity influences successful completion of roads projects in Kenya
4. Determine if supervision capacity influences successful completion of roads projects in Kenya

Theoretical Framework

There are several theoretical models that explain the organization and its structure. These are mainly the classical organizational theory, neoclassical organization and the modern organizational theory. The classical organizational theory includes the scientific approach of Taylor which is based on principles of management, administrative theory of Henry Fayol and Weber's bureaucratic approach.

Weber's bureaucratic approach which considers the organization as part of the broad society based on principles such as structure, specialization, predictability/stability, rationality and democratic is seen here as the most relevant and practical model to this study. Weber listed several preconditions for the emergence of bureaucracy. These include the growth in space and population being administered, and the growth in complexity of administrative tasks being carried out and the existence of a monetary economy resulting in a need for a more efficient administrative system. Development of communication and technologies has made more efficient administration possible but also the democratization and rationalization of culture resulted in demands that the new system treats everybody equally (Weber, 1947).

Weber's ideal bureaucracy is characterized by hierarchical organization with delineated lines of authority in a fixed area of activity, action taken on the bases of unrecorded and written rules, bureaucratic officials needing expert training, rules implemented by neutral officials and carrier advancement depending on technical qualifications. In large organizations and under well defined conditions, organizational structure may be bureaucratic. The essential elements of a

bureaucratic organization are: the use of standard methods and procedures for performing work and high degree of control to ensure standard performance. Mintzberg (1981) identified two types of bureaucracies. They are standard and professional bureaucracies. The standard bureaucracy is based on efficient performance of routine work. Professional bureaucracy depends upon efficient performance of standardized but complex works that requires high levels of specialized skills. The structure of standard bureaucracy is based on functions, specialization and span of control. According to Luthens (1986), every organization structure contains both centralization and de-centralization. Modern organizational structures show a strong tendency towards decentralization.

While recognizing bureaucracy as the most efficient form of organization, and even indispensable for the modern state, Weber, however saw it's weakness as being rigid, impersonal, self-perpetuating and empire building, displacement of objectives, cost of controls, and anxiety to improve status (Hicks and Gullet, 1975). Following the above weaknesses of the bureaucratic theory, modern theories are preferred. In modern theory, an organization is defined as a designed and structured process in which individuals interact for objectives (Hicks and gullet, 1975). The contemporary approach to the organization is multi-disciplinary as many scientists from different fields have contributed to its development emphasizing on the dynamic nature of communication and importance of integrating the individual and organizational interests.

Modern understanding of the organization can be classified into the Systems approach, socio-technical theory and contingency or situational approach. The modern theories tend to be based on the concept that the organization is system which has to adapt to changes in its environment as opposed to the bureaucratic system which is seen to be rigid. The systems approach views organization as a system composed of interconnected and thus mutually dependent sub-systems. It looks at organization as a system with separate parts, where the integration depends on shared norms, values and beliefs. According to Albrecht (1983) and Bakke (1959), organizations as systems consist of three basic elements. Namely: components, linking processes and goals. The approach recognizes the dynamic nature of organizational environment.

The socio-technical systems approach is based on the premise that every organization consists of the people, the technical systems and the environment (Pasmore, 1988). People use tools, techniques and knowledge to produce goods and services valued by consumers. Therefore equilibrium among social system, technical and environment is necessary.

The situational approach is based on the belief that there cannot be universal guidelines suitable for all situations unlike in bureaucracy. Organizational systems are interrelated with the environment. The situational approach (Hellriegel and Slocum, 1973) suggest that different environment required different organizational relationships for an optimum effectiveness taking

into consideration social, legal, political, technical and economic factors. Notwithstanding the limitations of Weberian bureaucracy, the modern theories are an improvement to the same and compliment it by advocating for flexibility and adaptability to the organizational environment taking into consideration the people.

The factors that may influence the successful completion of projects are quite diverse. The specific variables considered for this study were management support, design specifications, contractor's capacity and supervision capacity. The variables were seen as possibly influencing the successful completion of roads projects in Kenya.

Successful completion of construction projects

According to Greer (1999), a project is successful if it satisfies all three legs of the triple constraint, namely, performance (specification), cost and time. Thomsett (2002) in an extensive examination of 20 failing projects over a period of 18 years expanded this criteria of success as: "satisfies stakeholder groups, meets functional requirements, meets quality expectations and requirements, within cost, within deadline, delivers sustained and actual benefits and provides the team with professional satisfaction and learning".

Although the causes for project success and failure have been the focus of numerous research studies, there has been no consensus on the issue. Pinto and Slevin (1987) argue that in spite of extensive research there has been limited convergence on the components and causes of project success.

The word success when applied to projects is very illusive. De Wit (1988) and many other researchers make a distinction between project success and project management success. For instance, they contend that project success is measured by comparing the project outcomes to the overall objectives of the project; whereas project management success tends to be measured against the traditional measures of performance, namely, cost, time and quality. Moreover, a further distinction is made between project success criteria and project success factors. In De Wit's (1988) view, success criteria refer to the measures by which success or failure of a project or business will be evaluated; whereas success factors are those inputs to the management system that lead directly or indirectly to the success of the project or business.

Cooke-Davies (2002) in a study of 136 European projects executed between 1994 and 2000 by a total of 23 organizations found that there was a strong correlation between schedule delay and cost escalation. However, cost escalation was not primarily caused by simply a schedule delay but due to a lack of a mature scope change process.

It was also found that delivering project success is more difficult than delivering project management success, because it predictably involves aspects which may be beyond the control

of the project team. With these second order controls, both goals and methods are prone to change; whereas project management success may be achieved by holding goals constant but changing practices to meet the predetermined goals. Cooke-Davies (2002) argues that the ultimate aim of an organization should be to introduce practices that allow the enterprise to resource fully a portfolio of projects that are rationally and dynamically matched to the corporate strategy and business objectives. This view is further enhanced by Sutton (2005b) who contends that projects are not dichotomous, it is not a matter of success or failure, but that there are degrees of success and failure. He identifies four distinct levels of success, each having its own discipline, tools and techniques. Thus, excellence at each level is critical for absolute success.

Organizational structure

According to Pugh, D. S. (1990), an organizational structure consists of activities such as task allocation, coordination and supervision, which are directed towards the achievement of organizational aims. It can also be considered as the viewing glass or perspective through which individuals see their organization and its environment (Jacobides, 2007).

Organizational Structure is the pattern or arrangement of jobs and groups of jobs within an organization. This pattern pertains to both reporting and operational relationships, provided they have some degree of permanence (Schlesinger, 2005).

Organizational structure is the explicit and implicit institutional rules and policies designed to provide a structure where various work roles and responsibilities are delegated, controlled and coordinated. Organizational structure also determines how information flows from level to level within the company. Thus organizational structure determines how the roles, power and responsibilities are assigned, controlled, and coordinated, and how information flows between the different levels of management (Sambrook, 2010).

The variables influencing an organization's successful delivery of services such as completion of construction projects are dynamic and are likely to be moderated by situational aspects such as nature and type of organizational structure. This study considered organizational structure as moderating both the independent and dependent variables.

Luthaus, F. (2002) defines organizational structure as the ability of an organization to divide labor and assign roles and responsibilities to individuals or groups in the organization as well as the process by which the organization attempts to coordinate its labour and groups. The study further identifies two types of organizational structure: First is the governing structure representing the ownership or legal guidance system relating to ultimate legal and social responsibility of the organization. The second type is the operating structure referring to how an organization transforms resources into goods and services for target purpose. The study posits

that in government organizations, the people of the country are the ultimate stake-holders of the governing structure.

The study also observes that in public organizations such as Ministry of Roads, where the idea of ownership is not as clearly defined as in the private sector, the problem of governance continues to become increasingly important in that public managers are frequently subjected to less rigid controls and likely to have greater incentives to satisfy their own interests at the expenses of the organizational goals. The study further states that the ineffective and lax institutional framework and enforcement mechanisms characterize developing nations and acts as a perfect recipe for mass public sector mismanagement. On the other hand the operating structure of an organization is the system of working relations arrived at to divide and coordinate the task of people and groups working towards a common purpose. The main thing at issue here is whether or not existing structure is supportive/ facilitative or inhibits capacity of organization to perform its work/hindering movement towards the mission and goals of the organization.

Dennis Lock (1989) provides four meanings of an organization: an amalgam of human and material resources combined as a distinct, separate and integrated entity; a structure or system of authority and responsibility relationships of an enterprise that is distinct, separate and integrated entity set up to achieve the groups objective; logical and systematic arrangement of duties and tasks between individuals and groups and the necessary allocation of authority and responsibilities in combination with the processes and materials resources to achieve common objectives. The study also identified six types of organizational structure: line organization depicting lines of responsibility and authority; line and staff structure confined to progressive companies; line and functional organization which is subdivision of organizations into main functions of similar types of activities ; committee organization which is a conjoint body of two or more persons selected to work together as a single integrated unit utilizing knowledge, skills and experiences of all advantages of having two heads then one; and finally a matrix organization which superimposes a more lateral over the traditional functional organization. The study further observes that the advantages of a functional organizational structure are flexibility, clear lines of responsibility and adaptable to switch highly skilled technical staff from one project to another.

The above study further shows that the principle of organizational structure demands that the number of sub-ordinates under a given supervisor should be limited to a maximum of eight and that the total number of relationships between an executive and his immediate sub-ordinate becomes excessive when the span of control reaches about seven. The study further postulates that the maximum recommended span of control is affected by capacity and abilities of executive; relative skills of the sub-ordinate; concentration level of the sub-ordinate on the work and the nature of work itself. The structure of Ministry of Roads is therefore likely to moderate its timely delivery of road works projects.

Government Policy

According to IPAR (1999), there exists lack of consensus about the goals of projects in Kenya. It is observed that a wide disparity exists in the development status of the people due to lack of equity in project policy systems. Allocation equity which is an elusive goal demands that resources should be shared fairly but in Kenya, the powerful elites tend to have undue influence on the allocation of project resources. An enormous gap exists between available resources and increasing demand for access to interventions. Policy formulation and implementation calls for hard choices and using the best information available to design strategies that maximize effectiveness and efficiency. Policy makers have to confront the reality of severe resource constraints.

Government has the ultimate responsibility to provide access to services and to ensure that public-private partnership does not alter the basic responsibility of government. According to Kelechi (2004), Policy making requires a strong legitimate institutional structure for decision making and policy enforcement. Kelechi further observes that policy formulation, among other things, requires a strong representative government which is seen as legitimate and relevant to the masses which will result in a strategy for domestic revenue mobilization through acceptable taxation policies that the citizen will be willing to comply with because they appreciate and relate to it. It also requires that policies be made on the basis of strategic options and choices be rooted in the states realistic efforts at internal resource mobilization. In Kenya, policy formulation process influences environmental exploitation, considerations of indigenous perspectives, creation of educational awareness, empowering of the beneficiaries, capacity building, considerations of consumer interest and local peoples' involvement in decision-making. All the above have either direct or indirect influence on the timely delivery of construction projects.

Summary of the literature review

The chapter started with an introduction and went on to look at predictor variables influencing the successful completion of construction projects. Since the variables influencing the organizations successful delivery of projects are seen to be quite diverse, the study reviewed specific ones which are management support, design specifications, contractor's capacity and supervision capacity. The chapter further looked at other key constructs and concepts that are relevant to the study such as successful completion of construction projects, organizational structure and policy.

Research Methodology

This study was carried out through a quantitative research approach based on survey conducted through questionnaires. It employed convenience sampling and the collected primary data was

analyzed through correlation and percentages. The sample size was arrived at using the sample size calculation which considered: a marginal error of five (5%) percent, a confidence level of ninety five (95%) percent and an expected response distribution of fifty (50%) percent to provide the largest sample. This, therefore, meant that with a target population of 413 (four hundred and thirteen) respondents comprising of the technical staff of the Ministry of Roads and her State Corporations it gave a sample size of 200 (two hundred).

The samples included management at middle and senior levels. The questionnaires were administered through drop and pick later method to the respondents. After collection, data was coded into the Statistical Package for Social Sciences (SPSS Version 17) for analysis.

Research Results

Out of a sample size of 200 respondents, 170 responses were obtained which represents an 85% response rate. According to Babbie (2002) any response of 50% and above is adequate for analysis thus 85% is even better. A construct composite reliability co-efficient (Cronbach alpha) of 0.6 or above, for all the constructs, is considered adequate and acceptable. The findings of the pilot test showed that management support, design specifications, contractor's capacity and supervision capacity had Cronbach's reliability alpha values of 0.700, 0.900, 0.824 and 0.900 respectively. This, therefore, indicated that the research tool was sufficiently reliable and valid and needed no amendment.

Management support and successful completion of construction projects

Reliability test was carried on the main data collected to test the goodness of data. After applying the Cronbach's Coefficient Alpha test on Management support, an alpha coefficient of 0.7 was reached. Scales in the questionnaire of 0.7 and above, the value commonly required for descriptive research, indicated satisfactory reliability (Vogt, 2007, Saunders Lewis and Thornhill, 2007, Christensen, Johnson and Turner, 2011). Based on these recommendations management support variable in the study questionnaire was concluded to have adequate internal consistency and was reliable for the study and its results could be used to generalize on population characteristics.

Distribution by response sets on management support

Table 4.1 shows the distribution of the response sets on the question items under management support.

Table 1: Management support in percentage

Question item	Strongly		Neutral	Disagree	Strongly disagree
	agree	Agree			
Supportive work conditions contribute to feeling of employee competence and sense of obligation towards organization	56.5	25.9	0.6	12.9	4.1
Organizational policies provides staff with opportunities for advancement and growth	47.1	17.6	0.0	35.3	0.0
Staff have high turn-over intentions which adversely affects commitment to organization	40.0	21.8	2.9	35.3	0.0
Mean	47.8	21.8	1.2	27.8	1.4

Table 1 on distribution of response sets on question items under management support showed 82.4 percent of the respondent agreed to the existence of supportive work conditions that leads to a feeling of competence and sense of obligation towards the organization. At the same time 64.7 percent of the respondents agreed that the organization's policies provide employees with opportunity for advancement and growth. In addition, 61.8 percent of the respondents disagreed that there is any high turn-over intentions among employees. On average, therefore, 69.6 percent agreed that management support influences timely completion of projects.

Design Specifications and successful completion of construction projects

After applying the Cronbach's Coefficient Alpha test on design specifications, an alpha coefficient of 0.9 was reached. This indicated satisfactory reliability as it was above the scale recommended by (Vogt, 2007, Saunders Lewis and Thornhill, 2007, Christensen, Johnson and Turner, 2011) of 0.7 and above. Based on these recommendations design specifications variable in the study questionnaire was concluded to have adequate internal consistency and was reliable for the study and its results could be used to generalize on population characteristics.

Distribution by response sets on design specifications

Table 2 shows the distribution by response sets on question items under design specifications

Table 2: Design specifications in percentage

Question item	Strongly agree	Agree	Neutral	Disagree	Strongly Disagree
Staff understanding and awareness of design standards contributes to recognition of existing barriers	29.4	56.5	0.0	7.6	6.5
The uniqueness of technical staff's contributes to the adherence to standards and contractual performance	78.2	13.5	0.0	4.1	4.1
Staff technical knowledge contributes to project their commitment to achieve project success.	87.1	11.8	0.0	1.2	0.0
Mean	64.9	27.3	0.0	4.3	3.5

Table 2 shows that 85.9 percent of the respondents agreed that the uniqueness of the organizations management techniques contributes to adherence to cooperation agreements and contractual performance. It also shows that 91.7 percent of the respondents agreed that the organization's culture contributes to project staff's team work to achieve project success. The table further shows that 98.9 percent of the respondents agreed that employees understanding and awareness of cultural differences contributes to recognition of existing barriers. The mean of all those respondents who agreed the Ministry has an organizational culture that impacts on its operations was 92.2 percent.

Contractor's Capacity and successful completion of construction projects

Distribution by response sets on contractor's capacity

Table 3 shows the distribution of response sets on question items under contractor's capacity.

Table 3: Distribution by response sets on contractor's capacity

	Strongly		Neutral	Disagree	Strongly disagree
	agree	Agree			
Engagement of contractors with the requisite work experience	7.1	83.5	0.0	9.4	0.0
Adequacy of contractor's equipment, financial and human resources	38.2	26.5	0.0	32.9	2.4
Adherence to agreed work schedules/plans and supply of construction materials	27.1	52.4	7.1	5.3	8.2
Project construction errors by contractors	62.4	20.6	0.0	12.4	4.7
Mean	33.7	45.7	1.8	15.0	3.8

Table 3 shows that 90.6 percent of the respondents agreed that the organization willingly shares strategic information with staff. 64.7 percent agreed that the organization's communication had clarity, focus and coherence. 79.5 percent of the respondents agreed to the statement that the organization's project meetings have consistency and regularity while 83.0 percent agreed that there is high use of digital communication by organization staff. The findings showed that overall 79.4 percent of the respondent agreed to the fact that organizational communication influences timely completion of projects.

Supervision capacity and successful completion of roads projects

Reliability test was carried out after the main data collection on the tool to test the goodness of data. After applying the Cronbach's Coefficient Alpha test on Supervision Capacity, an alpha coefficient of 0.900 was reached. Scales in the questionnaire of 0.7 and above, the value commonly required for descriptive research.

Distribution by response sets on supervision capacity

Table 4 shows distribution of response sets on question items under supervision capacity.

Table 4: Supervision capacity in percentage

Question item	Strongly			Strongly	
	agree	Agree	Neutral	Disagree	disagree
Adequate number of supervising engineering staff	41.8	44.1	0.0	8.2	5.9
Use work schedules and plans to monitor project implementation	62.4	17.6	9.4	8.8	1.8
Project teams concentration on key functions of project supervision	55.9	31.8	2.4	5.3	4.7
Staff adherence to organizational procedures	57.6	20.0	0.0	20.0	2.4
Mean	54.4	28.4	2.9	10.6	3.7

The Table 4 shows it had four question items to which 85.9 percent of the respondents agreed that the organizations' projects had adequate number of supervising engineering staff, 80 percent agreed that project teams used work schedules and plans to monitor project implementation, while 87.7 percent agreed that project teams concentrate on key functions of project supervision and 77.6 percent agreed that staff adheres to organizational procedures. It also shows only 30 percent agreed to the statement that projects have adequate human and financial resource allocations while 48.3 percent disagreed. Finally, the table shows 68.5 percent agreed that project teams have the necessary capabilities, knowledge, motivation and personality to effectively implement projects. The data showed the mean of all those who agreed that supervisory capacity influences the timely completion of projects was 58.8 percent.

Regression Analysis

The study undertook a regression analysis to establish the association between the independent variables with the dependent one. Table 5 shows the coefficients on the influence of the individual independent variables on the dependent variable. The Beta coefficients indicate the

extent to which Successful Completion changes due to a unit change in the independent variable. The positive Beta coefficients indicate that a unit change in the independent variable leads to a positive change in successful completion of projects a negative Beta coefficient indicates an inverse effect between the variables in that a unit change in the independent variable leads to a negative change in successful completion of projects.

Table 5: Regression Coefficients – Successful Completion of Roads Projects

Indicator	B	Std. Error	T	Sig.
(Constant)	7.971	1.183	6.738	0.000
Management Support	-0.038	0.034	-1.12	0.264
Design Specification	0.132	0.045	2.923	0.004
Supervision Capacity	-0.108	0.041	-2.668	0.008
Contractor`s Capacity	0.476	0.04	11.849	0.000

Table 5 presents the level of significance also called the p-value. This is the coefficient that is used to research questions and the significance of the independent variables. The p-value of management support, design specifications and contractor`s capacity are each zero. This means that these variables are significant in influencing positively the successful completion of roads projects. The other variable of supervision capacity has level of significance (p-value) greater than 0.05 which indicates that these independent variables are not significant in explaining successful completion of roads.

Table 6: Optimal Model

Indicator	B	Std. Error	t	Sig.
Constant	6.496	0.68	9.552	0.000
Management Support	0.165	0.032	5.162	0.000
Design and Specification	-0.104	0.041	-2.558	0.011
Contractor`s Capacity	0.472	0.038	12.325	0.000

Multiple Regression Analysis for the Successful Completion of Projects

A multiple regression analysis was conducted to investigate the joint causal relationship between the independent and dependent variables. Regression results in table 7 indicated that the goodness of fit for the regression of independent variables and Successful Completion of Projects is satisfactory. An R squared of (0.980) indicated that (98 percent) of the variances in the Successful Completion are explained by the variances in the factors determining successful completion.

The regression equation was as follows:

Successful Completion of roads projects (Y)

$$\begin{aligned}
 &= 7.971 - 0.038 \text{ Management support } (X_1) \\
 &+ 0.132 \text{ Design Specification } (X_2) \\
 &+ 0.476 \text{ Contractor's capacity } (X_3) \\
 &- 0.108 \text{ Supervision Capacity } (X_4)
 \end{aligned}$$

Table 7: Model Fit for Determinants of Successful Completion of Roads Projects

Model	R	R Squared	Adjusted R Squared	Std. Error of the Estimate
	.990	.980	.979	.62060

The four independent variables that were studied, explain 97.9 percent of their influence on successful completion of roads projects in Kenya. The other factors not studied in the research contribute 2.1 percent of the effects.

Table 8: ANOVA for the factors influencing successful completion of roads projects

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	3381.109	5	676.222	1755.763	.000
Residual	70.096	182	.385		
Total	3451.205	187			

ANOVA results are presented in Table 8. The results indicate that the overall model was significant, that is, the independent variables were good joint explanatory variables/factors influencing successful completion of roads projects ($F=1755.763$, P value =0.000).

Table 9: Model Fit - Government policy on Successful Completion of roads Projects

Indicator	R	R Square	Std. Error of the Estimate	
Coefficient	0.625	0.391	2.025	
(Constant)	8.928	0.467	19.133	0.000
Policies	0.497	0.040	12.284	0.000

Conclusions

This study was on factors influencing successful completion of roads projects in Kenya. The findings showed that there was a significant relationship between each of the four independent variables and timely completion of projects. Amongst all the independent variables, supervision capacity statistically was seen to have the most significant relationship with timely completion of projects. The findings on supervision capacity further supported early studies which state that financial difficulties are the major cause of suspension of works in construction projects leading to delay in the timely completion of projects. This study particularly showed that the Ministry lacks the necessary supervising engineering staff required to implement projects.

Government procedures for disbursement of funds are beauracritic and thus most projects once approved by parliament await a longer period before actual release of funds is undertaken though the current study disputes on availability of financial resources and equipments. Donor funding on the other side are smoothly disbursed and most cases the contractor receives the money within the scheduled period. Projects funded under Government – Donor partnerships also take slightly a long time for funds to be disbursed since the harmonisation of disbursement approcah between government and the donors eats into the projects time and thus contributing to delay of road projects.

Very few design changes are undertaken on construction of The International Trunk roads mostly funded by donors. This is probably due to the strict contracts of agreements and the cumbersome process involved in intiating the changes. Donor funded roads once approved are expected to be completed within the set design framework and contractors are expected to sign commitment towards adherence which are closely monitored and supervised. In some cases road designs are highly exposed to design changes due to community reactions to land ownership issues and existing human settlement complications. The settlement of these diputes usually leads to construction delays.

Recommendations

The organization to enhance its commitment to all the factors mentioned in this study, namely; management support, design specifications, contractor's capacity and supervision capacity. The organizations to provide top management support for both technical and operational staff in the field of programme activities. Specific emphasis here is placed on the need to accord supportive work conditions to projects supervising engineering staff.

The Kenya Vision 2030 recognizes the importance of development of infrastructure as critical to socio-economic transformation. The delays in release of funds especially due to Government bureaucracy affects the projects durations and costs. The study recommends that the Government through the concerned Ministry and Departments re-looks at the procedure/ process of remitting funds for construction with a view to reducing the time it takes to commence after approval has been granted.

In order to minimize high exposure to design changes during construction, due to community reactions to land ownership issues and existing human settlement complications (which in the end leads to construction delays), it is impotant for the government to ensure that road reserves are actually protected and human habitation is restricted even when there are no active constructions on site.

The study recommends that Construction Planning should try to identify contingency events and be prepared with plans, strategies and approaches for avoiding, coping or even exploiting them.

Also, effective implementation of project plans should be sustained in order to gear projects performance towards project results. Clients should strictly supervise construction projects to avoid giving room to laxity and non-compliance and non-conformance to plans by contractors.

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