European Journal of Business and Management
ISSN 2222-1905 (Paper) ISSN 2222-2839 (Online)
Vol.8, No.33, 2016

Role of Supplier Appraisal on the Performance of Projects Funded by Constituency Development Fund in Kenya

Samuel Muli[1*] Prof. Henry Bwisa[2] Prof. John Kihoro[3]
1.Procurement & Logistics Department, Jomo Kenyatta University of Agriculture & Technology, P.O. Box 62,000-00200, Nairobi Kenya
2.School of Entrepreneurship, Procurement and Management, Jomo Kenyatta University of Agriculture & Technology, P.O. Box 62,000-00200, Nairobi Kenya
3.School of Business and Economics, Cooperative University of Kenya, P.O. Box P.O Box 24814-00502 Karen-Nairobi, Kenya

Abstract
The enactment of Constituency Development Fund Act in the year 2003 was seen a breakthrough in facilitating the development of Kenyan constituencies by having a share of the national government revenue been channeled directly to the constituencies. However, there have been several cases of wastage of the CDF money through malpractices in the tendering process which have been leading to stalled, abandoned and quality issues being raised for the on-going and completed projects. Several studies have been done in relation to use CDF in different constituencies in Kenya for which procurement in the constituencies has been put on the spot. However, no specific study has been specifically geared towards the role supplier appraisal plays in determining the success or failure of projects funded by Constituency Development. This backdrop formed the research question "what is the role of supplier appraisal on the performance of projects funded by Constituency Development Fund? The study adopted cross-sectional research design where the target population was all the projects funded by CDF in Machakos County constituencies. The study used stratified random sampling and the sample size was 450 projects. Questionnaires were used for collection of primary data. Qualitative and quantitative data was coded and entered in Statistical Package for Social Sciences (SPSS) for analysis. Descriptive statistics were generated. To test the relationship between supplier appraisal and performance of projects funded by CDF, correlation analysis was undertaken where there was a positive correlation. To test the significance of the model and test of hypothesis, logistic regression was used where the results showed that, the projects where Supplier Appraisal had been done were 4.8 times more likely to succeed than those where supplier appraisal hadn't been done. The study recommended that, from the national perspective there should be approved list of contractors/suppliers for various inputs/services which would eliminate the dilemma of non-performance and the need for appraisal at the grass roots which would take a lot of time and resources.
Key words: Supplier Appraisal, Constituency Development Fund, Performance of Projects

1. Introduction

The Kenyan public procurement system has evolved from a largely crude unregulated system to a highly regulated system (PPOA, 2009). Despite the progress made, the Kenyan procurement system still faces a myriad of challenges. World Bank Report (2009) mentioned that the average project funds absorption rate was below 10% per annum which was associated to a constrained procurement process.

In reference to CDF status report (2009), tendering and procurement procedures have become conduits through which some suppliers, contractors, Members of Parliament and their political allies fleece hundreds of millions of shillings from the constituency kitties through procurement processes. Common malpractices range from establishing ghost and briefcase companies which are awarded procurement tenders un-procedurally and use the opportunity to inflate prices of goods and services.

Further Citizen's Constituency Development Fund Report Card for Machakos county constituencies (2012), taxpayers' money had been wasted due to badly built complete and incomplete projects. These statistics are asserted by Rutere (2009) who revealed that procurement is a cause of stalling of CDF projects (cited in Malala, 2011).

Considering some of these studies and taking into considering that procurement is a process, studies and reports have generally not addressed the specifics of procurement that affect the performance of projects funded by CDF. This gap created the need to undertake a study to examine the role of supplier appraisal on the performance of projects funded by constituency development fund in Kenya. A survey was carried out across Machakos county constituencies where Constituency Development project committee members were involved.

2. General objective

To examine the role of supplier appraisal on the performance of projects funded by constituency development fund in Kenya

2.1 Research hypothesis

H_0. Supplier appraisal has no significant role on the performance of projects funded by Constituency Development Fund in Kenya.

2.2 Scope of the Study

The study surveyed Machakos county constituencies (sub-counties) as this is one of the counties with constituencies that had been reported with misuse of tax payer's money through badly implemented and abandoned projects. This was substantiated by Citizen's Constituency Development Fund Report Card for the period between 2008-2012 for which three constituencies in Machakos County had a cumulative 78% waste of CDF kitty through scrupulous procurement deals.

3. Literature Review

3.1. Introduction

This chapter presents the theoretical and conceptual framework of the study.

3.2 Theoretical framework

Theoretical framework is an explanation about the phenomenon based on conceptual analysis, previous studies and theories that exist in the literature (Camp, 2001). For this study, Grey Systems theory was explored to give a basic understanding of the phenomenon.

3.3. Grey Systems Theory

Grey system theory was first coined by (Deng, 1982) with the need to address strategic choices in uncertain circumstances where information could be scanty. The idea of this theory is completely different from probability and fuzzy mathematics theories, which addresses a problem using certain sample size, known probability distribution and membership function (Deing, 1989).

In real world of business and other fields most decision problems are in grey form due to uncertainty and scanty information (Karmakar & Mujumdar, 2008). Under such circumstances decision still needs to be made. Grey theory provides a useful platform for decision making problem under such uncertainties (Karmakar& Mujumdar, 2006). It could be difficult to successfully maintain the performance of a firm without considering a suitable set of available suppliers. Quality of materials, consumables, services and sub-components are very critical to the success of any business entity and thus a firm has to considerably appraise the available set of supplier's in-order to select the most optimal supplier. The challenge is, supplier selection consists of uncertainties which may not be solved by fuzzy or probability theory. Probability theory based models require high volume of data, which may not be available for supplier appraisal. Furthermore supplier appraisal problem could arise as a result of presence of recognitive uncertainty due to decision maker subjective judgment thus grey system theory provides a sufficient basis to handle both recognitive and stochastic uncertainty.

Sufficient evaluation criteria can help procuring entities to reduce the risks and uncertainties associated with suppliers. For firms to succeed in today's fast changing technology-based consumer red ocean market is to innovate, which cannot be possible without getting the most optimal suppliers (Kanagaraj *et al.,* 2014) Evaluation criteria is very critical in-order to reduce the operational costs by selecting the most optimal supplier (Wang *et al*., 2009). Though grey theory gives a mathematical framework for selection of optimal supplier, it uses quality, delivery, risk factor, quality standards, logistics service and sustainability as some of the aspects that background check needs to be undertaken as part of supplier appraisal exercise (Muhammad *et al.,* 2012).

3.4. Conceptual Framework

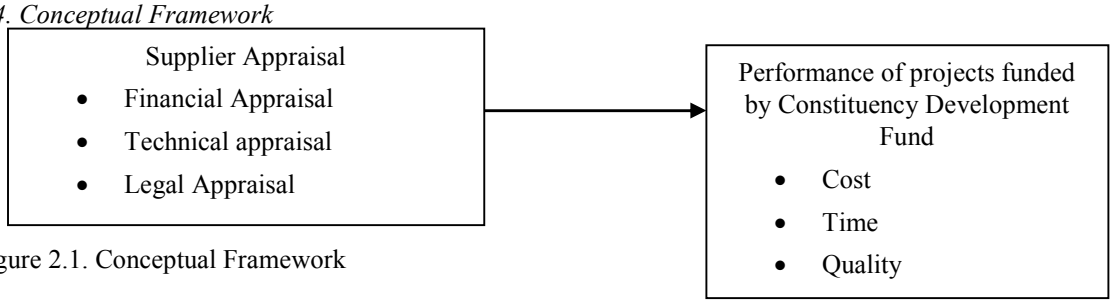

Figure 2.1. Conceptual Framework

3.5. Supplier appraisal

Jessop and Compton (2006) describe supplier appraisal as the assessment of a potential supplier's capability to meet delivery schedules, control quality, meet quantity requirements, price, and other terms and conditions to be entrenched in a contract. They further suggest that supplier appraisal is carried out in the pre-contractual phase as a best procurement practice as it helps to give a sense of certainty on supplier's ability to perform.

PPOA (2009) equitably refers supplier appraisal to prequalification of suppliers where prequalification should be done against a pre-set criteria and in various ways; bidders first bid to prove their qualification and are then short-listed for tendering; Qualification as part of the bidding; where bidders are presenting documentary evidence in their bids but in such cases, the evaluation of the qualification of the bidders is done separately (technical and financial evaluations); Post-Qualification: where bidders presents statements, of qualification as required by the bidding documents on their qualification and these statements are verified by the procuring entity after evaluation and recommendation of the contract award but before the contract is awarded.

Procuring entity has a responsibility to clearly state any qualification criteria in the pre-qualification to ensure that bidders provide documentary evidence to certify their qualifications. Before awarding a contract to a bidder, the Procuring Entity needs to ascertain that the bidder is qualified. (PPOA, 2009). As part of the appraisal process the procuring entity needs to ascertain that the supplier has the necessary qualifications, experience, capability, resources, equipment, legal capacity to enter into a contract for the procurement, not insolvent, in receivership, bankrupt or in the process of being wound up, is not subject of legal proceedings and is not debarred from participating in procurement proceedings. Further if a supplier submits false, inaccurate or incomplete information about his qualifications he should be automatically disqualified (PPOA, 2009)

Different scholars have proposed several aspects that need to be looked into in the supplier appraisal exercise. Lysons and Farrington (2006) argue that, what to appraise is subject to the requirements of the particular procuring entity but as much as it is possible all appraisals should evaluate potential supplier's human resources, quality systems, finance, production capacity and facilities, organizational structure, Information Technology, environmental and Ethical considerations. Monczka *et al.,* (2005) divided the ways to appraise suppliers into quantitative and qualitative. For quantitative appraisal these include delivery performance, quality performance and cost reduction. For qualitative appraisal they include suppliers' problem resolution ability, technical ability, ongoing process reporting, corrective actions response, supplier cost-reduction ideas.

Tahriri *et al.,* (2008) narrated that, the categorical method rates suppliers on several criteria which are then combined into a single score. He further noted that the categorical model is a simple, the quickest, easiest and less costly to use. Borrowing from the literature to build the grey system theory, Muhammad *et al.,* (2012), developed a supplier appraisal criteria which include quality, delivery, risk factor, quality standards and sustainability factor.

Bello (2003) argued that cost ratio as a supplier appraisal method relates all identifiable purchasing costs to the monetary value of the goods received from vendors. The higher the ratio of costs to value, the lower the rating applied to the vendor. He further notes that the method is based on cost analysis that considers cost ratios for product quality, customer service, price and delivery. The cost ratio measures the cost of each factor as a percentage of total purchase for the supply. Arsan (2011) supports use of cost-based system as the procuring entity is able to quantify the additional costs incurred if a supplier doesn't perform as agreed.

Saaty (2000) discovered that, people had often many issues when it came down to make certain decision or to prioritize some points of their work. This motivated him to create the analytical hierarchy process so that people would be able to make more complex decisions a lot easier and faster. The analytical hierarchy model takes an approach towards the decision making from the rational and intuititive point of view and gives the ability to select the best solution from the various alternatives.

Further Saaty (2000), the reason why this kind of hierarchy is applicable in supplier appraisal is because it is possible to judge the importance of the elements in a given level with a respect to some or all of the elements in the adjacent level above. Analytical hierarchy process utilizes fundamental scale which for the purpose of supplier appraisal it tries to help to show how much of a fraction the one is larger than the other in terms of contributing to the general objective.

Darren (2006) advocates supplier appraisal as it enables the procuring entity to identify weaknesses on the part of the supplier, data may be used to evaluate and compare performance of new suppliers, appraisal can be used as the basis for continuous improvement, appraisal on a two-way basis can highlight the buyer's deficiencies, which may be the source of common problems within many supplier relationships. However supplier appraisal may require time and resources cost of carrying out, assessing only objective or only subjective criteria could lead to skewed results, the weightings and the actual scores given to suppliers can be influenced by a biased buyer.

Kiruri (2013) in her study concluded that, supplier appraisal is a practice highly adopted in the procurement of goods and services for which the criterion used in supplier appraisal varied depending on the nature of goods and services being procured. In her findings 100% of the respondents strongly agreed that financial and technical capability appraisals were given highest priority in all procurement exercises. Quality appraisals and cost of product/services were considered as supported by 84.9% of the respondents. Production capacity assessment was considered as supported by 80.8% of the respondents. Human resource assessment, 63.0%, organizational structure appraisal 61.6%, organizational past performance, were less considered. The findings also supported that supplier appraisal enabled the organization to effectively manage public procurement. Mungai (2014) established that, site visits and use of reference checks were the most common ways of appraising suppliers. He also

established that the supplier appraisal practices determine how the supplier performs in the supply of goods and services.

3.6. Performance of projects funded by Constituency Development Fund

There are many times when project success measured in time and budget is not sufficient, especially over a longer period of time after the project is complete. "Quite often, what seemed to be a troubled project, with extensive delays and overruns, turned out later to be a great business success" (Shenhar *et al.,* 2001). Shenhar *et al* (2001) cite the example of the Sydney Opera House. It took three times longer and five times the cost than anticipated. But it quickly became Australia's most famous landmark, with few tourists wanting to leave Australia without seeing it (Shenhar *et al.,* 2001). With projects reported to be continually failing, Atkinson (1999) questioned this failure with respect to the criteria for success, particularly with respect to the commonly used 'iron triangle' time, cost and quality. He asserted that the reason for projects to be labeled as failed could be due to the criteria used for success.

Bienkoski (1989) asserts that project failures are caused by; inadequate resources leading to task taking longer than expected to complete, deadlines and milestones get missed, and project completion date comes into jeopardy; Poor risk management meaning that the project initiation stage is not properly planned and insufficient non-resources are not allocated to the project; for instance, it is not possible for a project to succeed if the right resources are made available for that project.

Some scholars and reports (Standish Group, 2009, Kutsch *et al.,* 2011; Sharma *et al.,* 2011) have acknowledged that projects are continuing to fail. For example (Flyvbjerg *et al.,* 2003) highlighted the Channel Tunnel project (1987-1994) whose estimated cost was £2,600 million but on completion the cost had blown out to £4,650 million a cost overrun of 80%. Further (Shore, 2008) highlighted the Airbus A380 project which was initiated in the year 2000 was disrupted in the year 2006 when the aircraft was in the assembly stage when a pre-assembled wiring harness produced in Germany failed to fit into the airframe which led to halting of production and deliveries postponed for 2 years and costs escalated significantly.

According to Okungu (2008), 70% of the constituencies have reported mismanagement, theft, fraud and misappropriation and that CDF issues are of political nature. Ongoya and Lumallas, (2005) asserted that, CDF has the potential of being used by politicians to build their reputation in their constituencies and mobilize political support. The fund has no specific development agenda; hence, it stands out as a political tool (Gikonyo, 2008).

According to Radoli (2008), 60% of Members of Parliament who had billions of CDF money unspent in the CDF bank accounts, had incomplete and poor projects. Further Kairu (2014) in his study factors affecting effective implementation of CDF projects in Machakos Town Constituency reported that between 2006-2012, the National Tax Payers and Auditor General reports revealed irregularities in procurement procedures and systems led to embezzlement of millions of shillings by skewing resource allocation in the constituency.

4. Research Methodology

4.1. Research Design

A cross-sectional survey research design was adopted to determine the role of supplier appraisal on the performance of projects funded by CDF. The target population was the projects funded by CDF in Machakos County between 2008-2012 as listed in CDF website (www.cdf.co.ke, 2014). The sample population was picked using the following formulae adapted from Kothari (2004)

Desired sample size =

$$n = \frac{Z^2 p.q.\ N}{e^2\ (N-1) + Z^2 pq}$$

This resulted to a minimum of 290 projects been selected for the study. Further stratified random sampling was adopted. The sampling frame was broken into geographical areas (constituencies) and a simple random sampling was done to get the sample size which was a minimum of 50 respondents per constituency.

4.2. Data Collection Instruments

For this study, questionnaires were used to collect primary data. The questionnaire had both quantitative and qualitative questions which were coined after review of the literature. The qualitative questions were open ended with the essence of capturing factual information on the subject matter. Likert scale was adopted for the quantitative questions.

4.3 Data Collection Procedure

The researcher first sought a permit from National Commission for Science, Technology and Innovation (NACOSTI) for the purpose of authorization to collect data from the public schools. Once the permit was granted the questionnaires were hand delivered to the respective respondents with the help of research assistants. The research assistants were first briefed in regard to the structure of the questionnaire for the purpose of ensuring they

understood the subject matter for which they would make clarifications to the respondents if need be. In some schools, the response was instant while in other schools the questionnaires were dropped and picked after a day or so. Data collection was undertaken for the period between March-August 2016.

4.4 Validity and Reliability

Validity indicates the degree to which an instrument measures what it is supposed to measure. It's the extent to which differences found with a measuring instrument reflect true differences among those being tested The two main types of validity are content validity which is the extent to which a measuring instrument provides adequate coverage of the topic under study and criterion-related validity which relates to our ability to predict some outcome or estimate the existence of some current condition (Kothari, 2004). A pilot study was undertaken in a constituency which was not part of the sample size where supply chain officers were involved. This led to the improvement of some bits of the questionnaires. The reliability of a scale which indicates how free it is from random error was measured using the statistic Cronbach's coefficient Alpha. This statistic provides an indication of the average correlation among all of the items that make up the scale. Nunnally (1978) recommends a minimum level of 0.7 Cronbach Alpha value. The results are presented in the table below;

Table 1. Reliability statistics

S/NO	Variable	No of items	Cronbach Alpha
1.	Supplier Appraisal	10	.929
2.	Performance of projects funded by Constituency Development Fund	6	.951

4.5. Data Analysis

After data collection, both qualitative and quantitative data was coded and entered in Statistical Package for Social Sciences (SPSS) version 18. Descriptive statistics were analyzed for the purpose of determining the different views of the respondents in regard to supplier appraisal. To establish the strength and direction of the relationship between supplier appraisal and the performance of projects funded by Constituency Development Fund, Correlation analysis was undertaken. Logistic regression was used to determine the predictive role of supplier appraisal and subsequently test of the hypothesis. $H_{0:}$ $\beta i=0$ was rejected which meant that Xi (i=1) were taken to be a significant predictor of Y. The corresponding t-values and p-values were used to arrive at a decision that is $H_{01:}$ rejected whenever p-value <5%. The Logistic regression model used is illustrated below;

$Y=\beta_0+\beta_1 X_{1+}\varepsilon$

Where Y=Logit (p), p being the probability that a project is successfully implemented (Performance of projects funded by CDF)

$\beta_{0=}$ Constant

$X_{1=}$ supplier Appraisal

$\beta_{1 =}$ Regression co-efficient

ε=Error term

4.6. Research Findings

4.7. Descriptive statistics

As noted by Darren (2006), supplier appraisal is a pre-contractual assessment of potential suppliers' capabilities of controlling quality, quantity, price, delivery and other factors to be embodied in a contract. Further, supplier appraisal is an essential aspect of both strategic sourcing and supplier management. As such various aspects of supplier appraisal were assessed with the objective of determining their predictability role in CDF project performance. The obtained results are summarized in the table below;

Table 4. 1. Supplier appraisal

S/NO	Statement	N	Mean	Std. Dev.
1.	Financial appraisal of the supplier was done	298	3.87	.797
2.	Supplier ability to offer after sale services (maintenance) was appraised	298	3.82	.857
3.	The contractors competency of key personnel was appraised	293	3.74	.968
4.	Contractors technical ability to meet to meet the project requirements was appraised	297	3.66	1.063
5.	Contractors legal capacity was appraised	296	3.79	.911
6.	Suppliers' quality control systems were appraised	297	3.75	.975
7.	Visit to the contractors/suppliers' premises was made	295	3.82	.976
8.	Contractors experience to undertake the project was appraised	298	3.82	.914
9.	Suppliers commitment to supply for the project was appraised	295	3.95	.819
10.	Contractors ability to consistently meet project requirements was appraised	291	3.64	1.059

From the results above, it is eminent that supplier appraisal was practiced for most of the projects funded by CDF. Supplier commitment to supply for the project was the highly rated appraisal with a ($\bar{x}$=3.95). Financial appraisal was the second appraisal that was highly practiced with a ($\bar{x}$=3.87). These findings concur with (Kiruri, 2013; Mungai, 2014) who found out that financial, quality, technical assessments were the main criteria used to appraise suppliers. Further the need for the procuring entity to make visits to suppliers/premises as a way to assess the suppliers capability was practiced as agreed by ($\bar{x}$=3.82) of the respondents. This in line with Mungai (2014) who in his study established that site visit was one of the common ways of appraising suppliers and their performance.

4.8. Correlation Analysis

Correlation is a measure of the degree of relatedness of variables (Ken, 2010). Several measures of correlation are available, the selection of which depends mostly on the level of data being analyzed. For only ordinal-level or ranked data, Spearman's rank correlation (r), can be used to analyze the degree of association of two continuous variables. Pearson product-moment correlation coefficient r, requires at least interval level of measurement for the data (Ken, 2010). To determine the strength and direction of the linear relationship between supplier appraisal and performance of projects funded by Constituency Development Fund, Pearson Product Moment Correlation was used and the results obtained are summarized in the table below;

Table 4.2. Pearson Product moment correlation

Variable		Performance	Supplier Appraisal
Performance	Pearson Correlation	1	.462**
	Sig. (2-tailed)		.000
	N	300	297
Supplier Appraisal	Pearson Correlation	.462**	1
	Sig. (2-tailed)	.000	
	N	297	298

**. Correlation is significant at the 0.01 level (2-tailed).

There was positive correlation between supplier appraisal and performance of projects funded by constituency Development Fund ($r>0.2$, $p<.001$). The strength of the relationship between Supplier Appraisal and performance of projects funded by constituency Development Fund was medium (r=.462). This concurred with Kiruri (2013) who found out that, there was positive medium (moderate) relationship between supplier appraisal and procurement performance in the public sector entities.

4.9. Regression results

For this study, Logistic regression was used as the results from the dependent variable were categorical. The predictive power of supplier appraisal is presented in the table below;

Table 4.3. Logistic regression results for supplier appraisal

Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	61.229	1	.000
	Block	61.229	1	.000
	Model	61.229	1	.000

Model Summary

Step 1	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
	258.350[a]	.186	.283

Classification table

	Observed		Predicted		
			Performance		Percentage
			Below Average	Above Average	Correct
Step 1	Performance	Below Average	20	48	29.4
		Above Average	15	214	93.4
	Overall Percentage				78.8

Variables in the equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1[a]	F1	1.558	.228	46.762	1	.000	4.750
	Constant	-4.439	.824	29.035	1	.000	.012

The Omnibus Tests of Model Coefficients gives us an overall indication of how well the model performed. In this case, the model with Supplier Appraisal as a predictor variable was found to be significant (chi-square value=61.229, df=1, p<.001). Supplier Appraisal explained 18.6% of the variation in Y (Cox R square=.186) which is basically the probability of CDF project success. In the classification table the predictor was able to achieve 78.8% of correct classification.

The Variables in the Equation table gave information about the significance of the predictor variable which was used to test the hypothesis. The model is Y=Logit (p) =-4.439+1.558. Under the null hypothesis which is H_0: β1=0 versus H_0: β1≠0, the null hypothesis was rejected (β1=1.558, Wald=46.76 df=1 p<.001) The odds ratio revealed that those projects where Supplier Appraisal had been done were 4.8 times more likely to succeed than those where supplier appraisal hadn't been done (Exp (B) =4.75). The results concur with (Mungai, 2014) who found out that, supplier appraisal criteria, supplier appraisal models and supplier appraisal practices were paramount to procurement performance (project performance).

5. Conclusion

From the analysis, financial appraisal and supplier commitment were the most common form of supplier appraisals that were done for most of the contractors for various projects. The study concludes that, supplier appraisal if done well can be a good tool to eliminate non committal suppliers before entering into a contract which could highly affect project performance. Although supplier appraisal was found to be practiced across most of the projects across the constituencies, the study recommends from a national perspective there should be approved list of contractors/suppliers for various inputs/services which would eliminate the dilemma of non-performance and the need for appraisal at the grass roots which would take a lot of time and resources.

References

Arsan (2011) Performance Measurement and Metrics: An Analysis of Supplier Evaluation retrieved from www.scm.ncsm.edu/scm-articles on 13th June 2015.

Atkinson, R. (1999). Project management: cost, time and quality, two best guesses and a phenomenon, its time to accept other success criteria. International Journal of Project Management, 17(6), 337-342.

Bello, S. (2003). A case study approach to the supplier selection process. (msc. Project). University Of Puerto Rico: San Juan.

Bienkowski, D. (1989) Ten Causes of Project Busts, Computerworld, Feb.13; 23, 6; ABI/INFORM Global.

Compton, H.K., & Jessop, D. (2006).Official Dictionary of Purchasing and Supply. UK: Liverpool Academic Press.

Darren, F. (2006). Appraisal and monitoring of suppliers. UK: Chartered Institute of Purchasing and Supply.

Deng, J.-L., (1982). Introduction to grey system theory. The Journal of grey system, 1 (1), 1-24.

Deng, J.-L., (1989). Introduction to grey system theory. The Journal of grey system, 1 (1), 1-24.

Flyvbjerg, B., Bruzelius, N., & Rothengatter, W. (2003). Maga projects and Risk - An anatomy of ambition.

Cambridge: Cambridge Unversity Press.
Gikonyo, W. (2008). The CDF social audit guide: A handbook for communities. Open Society Initiative for East Africa: Nairobi.
Kairu. P. (2014). Factors affecting effective implementation of CDF projects in Machakos Town Constituency. International Journal of Current Business and Social Sciences 1 (2).
Kanagaraj, G., Ponnambalam, S. & Jawahar, N., (2014). Reliability-based total cost of ownership approach for supplier selection using cuckoo-inspired hybrid algorithm. The International Journal of Advanced Manufacturing Technology, 1-16.
Karmakar, S. & Mujumdar, P., (2006). Grey fuzzy optimization model for water quality management of a river system. Advances in Water Resources, 29 (7), 1088-1105.
Karmakar, S. &Mujumdar, P., (2008). Grey fuzzy multi-objective optimization. Fuzzy multi-criteria decision making. Springer, 453-482.
Ken, B. (2010). Business Statistics for Contemporary Decision Making (6th Ed.). USA: John Wiley & Sons, Inc.
Kiruri, S. N. (2013). Role of supplier appraisal on management of public procurement at Rift Valley Water Services Board, Nakuru. International Journal of Social Sciences and Entrepreneurship, 1 (5), 384-414.
Kothari, C.(2004). Research Methodology: Methods and Techniques (2nd Ed.). New Delhi: New Age International.
Kutsch, E., Maylor, H., Weyer, B., & Lupson, J. (2011). Performers, trackers, lemmings and the lost : Sustained false optimism in forecasting project outcomes - Evidence from a quasi-experiment. International Journal of Project Management, 29(8), 1070-1081.
Lysons. C. & Farrington, B. (2006). Purchasing and Supply Chain Management. London:Financial Times.
Malala, J. (2011). Effects of procurement on performance of constituency development fund projects in kenya: A case study of Kikuyu Constituency, (unpublished Msc Procurement & Logistics project) JKUAT, Nairobi, Kenya.
Monczka , R., Trent, R. & Handfield, R. (2005). Purchasing and Supply Chain Management (3rd Ed.). USA:Thomson; international.
Muhammad S., Young H., & Sonia I.(2012). A Grey System Theory Based Approach for Supplier Evaluation and Selection. American Journal of Engineering and Applied Sciences, 5 (1).
Muhammad S., Young H., Sonia I., (2012). A Grey System Theory Based Approach for Supplier Evaluation and Selection. American Journal of Engineering and Applied Sciences, 5 (1).
Mungai, P. (2014).Influence of Supplier Appraisal on Procurement Performance in the Real Estate Industry in Kenya: A case study of International House Ltd. International Journal of Operations and Logistics Management, 3, (3), 250-262.
National Taxpayers Association (2012).Citizen's Constituency Development Fund Report Card for Machakos Town Constituency, Machakos County. Nairobi Kenya: Author.
Nunnally, J. O. (1978). Psychometric theory. New York: McGraw-Hill.
Okungu, J, (2008). The beauty and shame of Kenya's Constituency Development Fund. [Online] Available: http:/www.afroarticles.com/article-dashboardarticle.php?id=6337&act=print.
Ongoya, Z. & Lumallas, E. (2005). A critical appraisal of the Constituency Development Fund Act. Nairobi:Kenya.
Public Procurement Oversight Authority (2009).The Long Term Policy Framework for Public Procurement in Kenya. Draft Zero. Nairobi: Government Printer.
Radoli, M. (2008). "CDF. A double edged sword. "The CDF Insight. Nairobi: Kenya.
Saaty, T. L. (2000). Fundamentals of decision making and priority theory with the analytic hierarchy process. Pittsburgh, PA: RWS Publications.
Sharma, A., Sengupta, S., & Gupta, A. (2011). Exploring risk dimensions in the Indian software industry. Project Management Journal, 42(5), 78-91.
Shenhar, A. J., Dvir, D., Levy, O., & Maltz, A. C. (2001). Project Success: A Multidimensional Strategic Concept. Long Range Planning, 34(6), 699-725.
Standish Group. (2006).Chaos Report. Boston: Massachusetts.
Tahriri, F., Rasid, M. R., Ali, A., & Mohd Yusuff, R. (2008). A review of supplier selection methods in manufacturing industries. Suramaree Journal of Science Technology, 15(3): 201-208.
The Institute for Social Accountability (TISA) (2009). The CDF Status Report December. Report by The Institute for Social Accountability, Nairobi: Author.
Wang, H., Che, Z. & Wang, M., (2009). A three-phase integrated model for product configuration change problems. Expert Systems with Applications, 36 (3), 5491-5509.
World Bank and International Finance Corporation, (2009).Enterprise survey, http://www.enterprisesurveys.org/.