
**EFFECT OF PROJECT MONITORING AND EVALUATION ON
PERFORMANCE OF ROAD INFRASTRUCTURE PROJECTS
CONSTRUCTED BY LOCAL FIRMS IN KENYA.**

Densford Ochenge Maendo; Dr Rosemary James and Dr Lucy Kamau

Abstract

Efficient performance of road infrastructure projects is essential for economic growth and development of any country. Local construction firms contribute significantly towards realization of this goal. However they experience challenges in completing the projects within the budgeted cost, time schedule and attaining the desired quality. This paper sought to establish the effects of project monitoring and evaluation on performance of road projects. The study was carried out in the Lake Basin Region, Kenya. The study covered 41 road projects. The study concludes that project monitoring and evaluation has a significant effect on performance of road projects.

Keywords: Project monitoring and evaluation, Infrastructure projects, Local firms, Road projects and project performance.

Introduction

Performance of road infrastructure projects is essential for the economic growth and development of any country. These projects play a critical role in the economy in terms of wealth creation and provision of employment opportunities. Infrastructure covers a range of services, from public utilities such as power, telecommunications, water supply, sanitation and sewerage, solid waste collection and disposal, and piped gas; to public works such as roads, dams and canal works, railways, urban transport, ports, waterways and airports (World Bank, 2012). Massive investments are put into infrastructure projects.

Throughout the world, the business environment within which construction firms operate continues to change rapidly. Firms failing to adapt and respond to the complexity of the new environment tend to experience survival problems (Lee, 2009). With increasing users' requirements, environmental awareness and limited resources and high competition, contractors have to be capable of continuously improving their performance (Samson & Lema, 2011).

There are several factors that impact on performance of projects, complexity of the project, Shortage of skills of manpower, weaknesses in organizational design and capabilities, poor supervision and poor site management, unsuitable leadership, shortage and breakdown of equipment among others cause delays in the United Arab Emirates (Faradic & El-Saying, 2010). Conflict, poor workmanship and incompetence of contractors had also negative impact on project performance in sub-Saharan Africa (Carter, 2012). Carter further noted that project managers should be given full authority to implement the projects. Harries and Ryman (2010) noted that on average 65 percent of road projects constructed by local firms in Africa were considered to have failed. These projects were suspended and later contracted to other firms.

Therefore, performance of projects is a subject many scholars have discussed with the objective of ensuring that projects are undertaken within the stipulated cost, time schedule and meet the desired quality. However, little attention has been focused on road projects constructed by local firms. There is need therefore to understand the effects of project monitoring and evaluation on the performance of road infrastructure projects constructed by local firms.

Performance of Road Infrastructure Projects

A road project is said to have performed if it is accomplished within the required time, cost and quality. Measurement and evaluation of performance of projects can be done using performance indicators such as time, cost, quality, client satisfaction, client changes, business performance, health and safety (Cheung, 2010). Time, cost and quality are however the three key performance indicators. In Europe, Mabin and Baldrestone (2015) indicated that improved road construction technology and methodologies can help execute projects more efficiently and in lesser time. Construction technologies such as fabricated and modular construction and innovative construction materials can further help execute road projects with reduced resources.

KPMG-PMI (2014) report indicated that 25 percent of ongoing projects in India are delayed due to inadequate planning and inadequate use of modern technology. Furthermore, lack of adequate number of trained workforce and sufficient construction equipment do contribute to road project delays. Sunderland (2012) noted that although road infrastructure projects were doing fairly well in South Africa, most of the major road projects were being done by foreign construction firms. Sunderland (2012) further argued that, local construction firms in South Africa had numerous challenges in completing infrastructure projects within the budgeted cost and time schedule.

Sunderland stated that foreign construction firms employed proper planning and control techniques, proper coordination between designers and contractors, technical and professional expertise which enabled the firms to complete their projects within the time schedule and budgeted cost. Management commitment, sufficient information and communication channels and competent staff was also significant in the delivery of success infrastructure projects (Body, 2009). Lavasseur (2010) noted that construction firms in Tanzania experienced lack of trained manpower, inefficient cost management and scope creep and these factors led to cost overruns and delays in the of infrastructure projects. Harrison (2008); Mambo & Chiragu, 2013; Reyman and Harries (2008) and Harold (2013) noted that project monitoring and evaluation plays a crucial role in the performance of road infrastructure projects.

Project Monitoring and Evaluation and Performance of Road Projects

According to Harrison (2008), project monitoring and evaluation involves routine collection and analysis of information to track the progress of a project. Monitoring and evaluation of infrastructure projects has been recognized as an indispensable management function. It helps in tracking the progress of infrastructure projects. It also provides regular reports on the implementation of projects in terms of input delivery, work schedules and targeted outputs.

Project evaluation is defined as an objective assessment of on-going or completed projects in terms of their design, implementation and results (Mambo & Chiragu, 2013).

Project monitoring and evaluation therefore plays a crucial role in project performance. Through M&E, information is collected and analyzed that helps to track the progress of a project (Martin, 2012).

Literature Review

Literature review enables a researcher to formalize key constructs; Project monitoring and evaluation, Infrastructure projects, Local firms, Road projects and project performance were useful for this research on the effect of project monitoring and evaluation on performance of road infrastructure projects. Literature review also highlights various studies done by other scholars and their findings. In summary, it introduces the effects of project monitoring and evaluation on performance of road infrastructure projects.

Project Monitoring and Evaluation and Performance

The theory of project management competency explains the role of project management competencies in monitoring and evaluation on the performance of infrastructure projects. Gladder (2010) noted that technical project managers should be able to apply knowledge, skills, tools and techniques effectively so as to deliver as expected and be able to achieve the project's goals and optimize the integrated cost, schedule and effort. The study found out that two of the most influential standards; the PMBOK address only the knowledge aspect of competence while a third, Australian's National competency standards focuses on demonstrable performance. The study also found out that some project managers do not have the required competence skills to monitor and evaluate the road infrastructure projects effectively.

Ryman and Harries (2008) study established the constraints and problems that hamper Monitoring and evaluation of development projects. In order to achieve the intended objectives, data on 37 projects was used. The study found out that the role of monitoring and evaluation of projects is can no longer be underestimated. The study results also showed the main constraints and problems that hampered monitoring and evaluation in development projects. They include; lack of commitment to conduct monitoring and evaluation, failure to carry out, discuss, share and incorporate the results of monitoring and evaluation activities. Other constraints found out from the study were: shortage of trained staff, insufficient technical resources, and inadequate allocation of funds to monitoring and evaluation and limited training opportunities. However, this study was done in Europe and the findings may not necessarily apply in Kenya.

Harold (2013) showed that knowledge about monitoring and evaluation helps project contractors and managers to effectively monitor and evaluate the infrastructure projects and therefore improve the performance of the projects. The study also found out that project managers of road infrastructure projects need to know the extent to which their projects are meeting the desired client standards. Furthermore, the study indicated that information generated through monitoring

and evaluation enables the project managers to make better decisions that will lead to better performance of road infrastructure projects. Harries and Reyman (2010) established that the project manager should be able to identify the purpose and scope of the M&E system, plan for information reporting and utilization, collection and management of data, analysis of data, monitoring and capacity building of human resource. Kabwegyere and Kiyega (2010); Kerzner (2011) study outlines the key monitoring and evaluation activities in a project. They include; initial needs assessment, project design logical framework, M&E planning and base line study. They further argued that M&E system should focus on the usage of project inputs and the effectiveness of the project implementation process to ensure that the final road project attains the desired quality.

Role of M&E in Result Based Management

Leung Xha (2014) established the importance of supervising project activities during project implementation. The study results indicated that a well functioning supervisory system is a critical part of good project management. The results indicated that M&E systems are a critical part of Result Based Management (RBM). Result based management supports better performance of infrastructure projects as it forms the basis for clear and accurate reporting on the results achieved by a project. Lawrence (2014) found out that timely, regular and reliable monitoring and evaluation system on infrastructure projects provides information to support projects implementation and contribute to organizational learning and knowledge sharing, uphold accountability and compliance provide opportunities for stakeholder feedback and contribute to resource mobilization.

Reyman and Harries (2008); Kerzner (2011); Leung Xha (2014) and Lawrence (2014) studies were not only done in other countries more advanced than Kenya but also focused on other dimensions other than performance of road infrastructure projects. The studies also used explanatory research design while the current study will use both explanatory and descriptive research designs which will make the results more viable.

Effect of M&E Skills in Infrastructure Performance

McRae (2013) studied the role of monitoring and evaluation skills in managing infrastructure projects in Europe. The study asserted that the acquisition of M&E skills will boost the performance of construction firms in terms of quality and time taken to complete the projects. Training will therefore empower people to make better decisions and provide better quality goods and services. Ghura (2013) pointed out that adequate and timely planning of M&E personnel prevents cost overruns in road infrastructure projects. Leyman (2013) noted that lack of staff with the Mescals required to perform a task in infrastructure projects is another challenge in the implementation of projects. This is very critical to project success. This aspect was found lacking in the most construction firms and led to projects being completed long after the time scheduled initially. Leyman said that skilled M&E human resource leads to the achievement of quality, productivity and efficiency in implementing infrastructure projects. The above studies

focused on the implementation of road projects and not performance of road projects and were also done in other countries.

Discussion of Findings

Descriptive Results

The study focused on the effect of Project monitoring and evaluation on performance of road infrastructure projects in the Lake Basin Region undertaken by local firms in Kenya. Results are shown in Table 3.1 below. The results from the study indicated that 77.6 percent of the respondents indicated that monitoring and evaluation activities on road projects were not conducted regularly while 22.2 percent indicated that it was conducted regularly. The mean and standard deviation for this characteristic was 2.69 and 1.01 respectively. The responses show that majority of project managers and supervisors did not conduct M&E activities on the road projects. Figure 3.1 showing the relationship between project M&E and performance is attached at the end of this paper.

Regarding the question on whether local firms allocated sufficient resources for M&E of road infrastructure projects, the responses were: 16.7 percent of the respondents indicated to a very little extent, 46.7 percent a little extent, 18.9 percent average extent, 11.1 percent great extent and 6.7 indicated a very great extent. The mean for this characteristic was 3.56. Cumulatively, 62.4 percent of the respondents indicated that there was no allocation of sufficient financial resources towards M&E of road activities. This implies that project contractors and managers were not able to monitor road projects during construction. Lawrence (2014) noted that timely, a regular and reliable monitoring and evaluation system on infrastructure projects is key in determining the performance of projects. When asked whether local firms were able to acquire staff with relevant skills for M&E activities in road projects; 13.3 percent of the respondents indicated very little extent, 51.1 percent little extent, 24.4 percent average extent, 6.7 percent great extent and 4.4 percent of the respondents indicated very great extent. The mean and standard deviation for this characteristic was 3.38 and 1.024 respectively. These findings show that majority of the respondents (64.2 percent) indicated that local firms were not able to acquire the right staff to conduct M&E activities. The importance of having competent M&E officers is supported by Leung Xha (2014) study on the effects of M&E on development projects. Respondents were also required to state whether M&E activities can improve the quality of road projects and their responses were; 71.5 percent indicated that M&E activities can improve the quality of road projects, 20.3 percent reported it may not improve and 8.2 percent of the respondents were not sure. The mean and standard deviation for this characteristic was 4.42 and 0.964 respectively. These findings show that majority of the respondents understood the importance of M&E activities on infrastructure projects. The respondents also noted that financial resources allocated to M&E were insufficient and this contributed to poor performance of road infrastructure projects undertaken by local firms. According to Reyman and Harries (2008), monitoring and evaluation system is a critical part of Result Based Management (RBM).

Performance of road projects therefore depends on conducting M&E activities regularly and allocation of sufficient finances.

Table 3:1 Monitoring and Evaluation and Performance

	V. Little Extent %	Little Extent %	Average Extent %	Great Extent %	V. Great Extent %	Mean	SD
Conducting M&E activities on regular basis.	2.2	33.3	42.2	8.9	13.3	2.69	1.014
Allocation of financial resources for M&E activities.	6.7	46.7	28.9	11.1	6.7	3.56	0.848
Acquisition of staff with relevant skills for M&E activities.	2.2	44.4	28.9	17.6	6.7	3.38	1.024
Overall effect of M&E on project Performance.	2.1	4.2	8.3	18.7	66.7	4.42	0.964

Source (2017)

Figure 3.1 below shows the effect of project monitoring and evaluation on performance of road infrastructure projects.

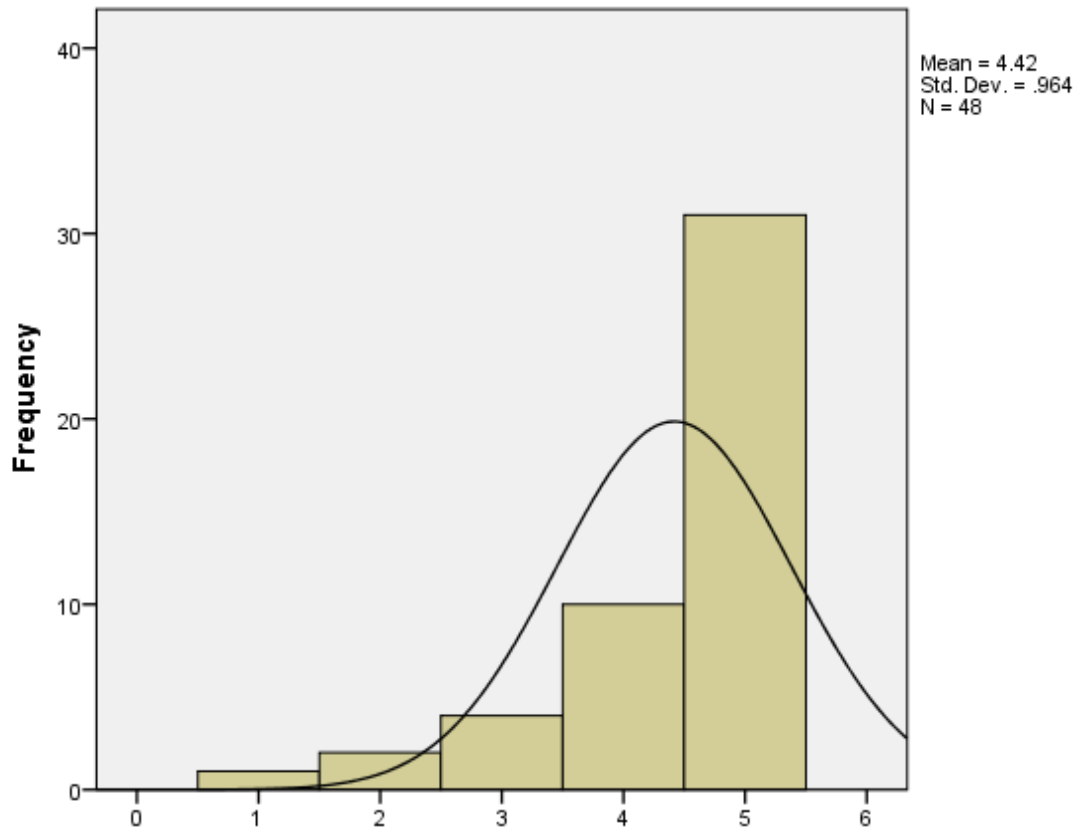


Figure 3.1: Project Monitoring and Evaluation

Regression Results

The regression coefficient for project monitoring and evaluation was 0.198 and its p-value was 0.034. Results are shown in Table 3.2 below. The results show that both the regression coefficient and the p-value were significant. The regression coefficient implies that the mean of performance of road infrastructure projects change by 0.198 per unit change in project monitoring and evaluation holding the other variables constant. Also, the p-value was less than 0.05 implying that the more road projects are monitored and evaluated the better the performance. Thus the null hypothesis that project monitoring and evaluation do not have significant effect on performance of road infrastructure projects was rejected. These findings concurs with those of Reyman and Harries (2008) who asserted that close supervision of projects is increasingly being recognized as indispensable management function.

Table 3.2: Regression Results

Model	Unstandardized Coefficients	Standardized Coefficients	T	Sig.

	B	Std Error			
Constant	0.299	0.291		1.026	0.311
M&E	0.198	0.090	0.229	2.193	0.034

a. Dependent Variable: PRI

Conclusion

The study concludes that project monitoring and evaluation has a significant effect on performance of road infrastructure projects undertaken by local firms. Therefore conducting M&E on regular basis, allocating sufficient finances for M&E activities and employing of staff with required skills play a critical role in the performance of road infrastructure projects.

Contribution to Knowledge

Road infrastructure projects constructed in developing countries by local construction firms have continued to perform poorly in terms of cost, time and quality. Kenya's overall performance was 36.9 percent for the period 2011 to 2014. Despite this poor performance, none of the previous studies had focused on the role of M&E on performance of road infrastructure projects constructed by local firms in Kenya. Most of the studies focused on implementation of infrastructure projects. A few studies that have been done on performance focused other countries and hence there is need to conduct a study in Kenya.

Furthermore, no study has specifically focused on the Lake Basin Region in spite of poor road infrastructure network. The study therefore has shed light on the effect of project monitoring and evaluation on the performance of road projects constructed by local firms in Kenya. Hence conducting monitoring and evaluation regularly, employing of staff with relevant skills and allocating sufficient finances play a critical role in the performance of road infrastructure projects. Previous studies emphasized more on supervision of the workforce while neglecting the performance the road infrastructure projects.

REFERENCES

- Amit, R.&Schoemaker, J. (2011).The Concept of Bottleneck in Road Infrastructure Development. *Working paper No. 2005-05-01, Ahmadabad 25.*
- Anderson, A.& Glen, K. (2011): Improving Kenya's Infrastructure for future generations. *Economical Journal*62, 461-78.
- Bjarne, K. (2010). *Planning and controlling construction projects*. Theory and Practice (pg 159). Nyt Teknisk
- Body, D. (2009), *Why Good Projects Fail Anyway: Building and Leading the Team*, Upper Saddle River, New Jersey, Prentice Hall.

- Bullock, M.& Richard, O. (2010).*The economics of infrastructure in a globalized world: issues, lessons and future challenges*. The Brookings Institution, Washington DC.
- Calderon, F. Benejee, A.& Morella, B. (2008), “Infrastructure and Growth in Africa”, *Policy Research Working Paper 4914, World Bank, Washington D.C*
- Cleland, D.(2006).*Global Project Management Handbook*. McGraw-Hill Professional.
- Carter, M. (2012). Factors Leading Towards Realization of Quality Infrastructure in Sub-Saharan Africa. *Review of Economics and Statistics*, vol. 49, 2012, pp 92-107.
- Clist K. & Morrissey T. (2011).*Developing Project Management Competency Skills*. Belmont, Calif: Brooks/Cole.
- David, J. (2013). Secrets Behind Successful Management of Infrastructure projects in Columbia. *European Journal of Business Management* vol. 1, issue 11, 2014
- Dubrene, V.& Lehman, J. (2011), *Managing Virtual Teams, Business Express Teams*, LLC, New York.
- Edum-Fotwe, F.T &McCaughey, R. (2011), Developing Project Management Competency Profiles. Perspective from the construction industry. *International Journal of Project Management*, 111-124.
- Elias, K.&Kagwathi G. (2012).*Sustainable Methods of Addressing Challenges Facing Infrastructural projects in Kenya: A Supply Chain Management Approach*
- Escribiano, B.,Guarsch,A.&Jorge,T. (2010), “Assessing the Impact of Infrastructure Quality on Firm Productivity in Africa” *Policy Research Working Paper 5191,,World Bank, Washington D.C*.
- Foster,V., (2008), “*Overhauling the Engine of Growth; Infrastructure in Africa*; Background Paper of the Africa Infrastructure Country Diagnostic, Washington D.C
- Fox, H. & Benedict (2010), “Connecting the Continent; *Costing the Needs for Spending on ICT Infrastructure in Africa*” AICD Background Paper 3 Africa Region, World Bank, Washington D.C
- Francist, K. & Ronald, B. (2010). Investigation of Factors Affecting Cost and Time Overrun in Indian Construction projects. *Project Management Journal*, 30, 55-67.
- Garrish, R.&Heumann, K. (2009). *Specific Competencies in the Project Oriented Society, Project Management Days: Projects and Competencies* Vienna, 18-24.
- Gitenya, J,&Ngugi, E. (2012), Assessments of the Determinants of Implementation of Infrastructure Projects. *Journal of International Development, Volume 23, Issue 2, March 2011, pp 165–180*.
- Gladder, A. (2010).*Learning and Competence Development-The study of Competency Development in Large Swedish Organizations*, UMEA School of Business Economics.

- Gulyani, S., Sumila, Y., Debebrata, N. & Darby, L. (2009). *How to Manage Mega Road Infrastructure Projects*. Bell and Howell Company.
- Gwilliam, K. (2008). "The Burden of Maintenance: Roads in Sub-Saharan Africa." *AICD Background Paper 14, Africa Region, World Bank, Washington D.C*
- Harries, T. & Reyman, K. (2010). 'Understanding and Monitoring the Cost- Determining Factors of Infrastructure Projects'. A user's Guide, Brussels.
- Harrison, F.L. (2004). *Advanced Project Management*. A structured approach. Gower Publishing Ltd.
- [Harold K.](#) (2013). *Project Management: A Systems Approach to Planning, Scheduling, and Controlling* (8th Ed. ed.). Wiley. [ISBN 0-471-22577-0](#).
- Heinrich, A. & Bofinger, M. (2009). *Performance Evaluation Setting Model in Road infrastructure*. Great Britain, Prentice Hall.
- Hill, W. (2011), *Strengthening Kenya's Road and Rail Interfaces*, 2nd edition. Boston: PWS-KENT Publishing Co.
- Hilson, D. & Murray, W. (2012). *Scaling the PEAKS of Project Management Competency*; PMI Europe. The Project Management Festival, 19-20.
- Kabwegyere, M. & Kiyega, G. (2008). M & E Human Resource and Capacity Building of Workers. *Quarterly Journal of Economics* 90, 651-666.
- Kometa, D. & Jubb, R. (2007). Competencies; Leadership Competency Profiles of successful project managers: *Management Development Review*, 9(5), 25-29.
- Kothari, C. (2008). *Research Methodology: Methods and Techniques*, 2nd Edition.
- Lehman, B. & Dufrene, K. (2011). Factors Leading to Poor Group Dynamics. *Review of Human Resource Studies* 10, 66J -69J.
- Length, (2014). Effects of Failure to Supervise Project Activities. *International Journal of Project Management*, vol. 12, pp. 94-106.
- Leung, D., Chan, J. & Olomalaye, S. (2010). Assessment of Workmanship and Slow Service Delivery in Project Management. *World Bank Policy Research Working Paper 3142*.
- Leyman, G. (2013). Effects of Project Competency Skills in Large Swedish organizations. *Journal of operation management* 25, 765-786
- Linhares, A. (2009). "Theory of Constraints and the Combinatorial Complexity of the product-mix decision in Infrastructure projects" *International Journal of Production Economics*, 121(1): 121-129.
- Lavasseur, D. (2010). *Organization structure and Project Management*, (9th Edition). Gower Publishing Ltd.

- Maina, W. (2010), Facing Organization Challenges in the Performance of Infrastructure Projects. *ICTD Working Paper 15, Brighton*.
- Mambo, S. &Charagu, K. (2013). Collapse of Road Construction Structures. *IEK presentation, 2009*.
- Martin, S. (2012). *Project Management Pathways*. APM Publishing Ltd.
- Matta, N.&Ashkenas, P. (2015) “*Infrastructure projects Risk Management Guide* U.C.L Press.
- Muller, R. & Turner, G. (2010).Authentic Leadership for 21st Century Project Delivery. *International Journal of Project Management*, vol. 28, pp. 342-367.
- Martin Stevens (2012). *Project Management Pathways*. Association for Project Management. APM Publishing Limited, 2002 [ISBN 1-903494-01-X](#)p.xxii.
- Mcrael, B. (2013). Effects of Managerial Skills in Managing Infrastructure Projects in Europe. *Project Management Journal*, 39(2), pp. 65-74.
- McClelland, S. &McBer, N. (1980). *Project Management Competency Theory*. 4th Edition, Sage Publications, Inc. Thousand Oaks, CA.
- Might, H.& Fisher, M. (2011).Causes and Delays in Malaysian Construction Industry. *International Journal of Project Management*, vol. 25, 342-371.
- Mohammed, E. (2012). Role of Project Managers in Resource and Work Allocation in Project Management. *European Management Journal*, Vol. 21 (3), 369-395.
- Mugenda, A. (2008).*Social Science Research*. Theory and Principles. Applied Research. Mugenda, O.&Mugenda, A. (2003).*Research methods, quantitative andqualitativeapproaches*. Nairobi, Acts Press.
- Musa, P. (2010). Challenges Facing Implementation of Construction Projects in Kenya. *Economics and Politics* 4, 117-36
- Mwandali, K. (2013). "Implementing a new Performance Management System within a Project-Based Organization: A case study", *International Journal of Productivity and Performance Management*, Vol. 56 Iss: 1, pp.60 – 75
- Odeyinka, H. and Yusuf, A. (2014). The causes and effects of delays on infrastructure projects. *Journal of financial management*, 3, 35-43.
- Olive, and Abel (2014). *Research methods: Qualitative and quantitative approaches*, African enter for technology (ACT) press
- Phillips, J., (2011). *PMP Project Management Professional Guide*. McGraw-Hill Publishers. Poverty Reduction Strategy Paper, Kenya, (2004- 2005).Unpublished.

- PMI, (2008). *A guide to Project Management Body of Knowledge*, 4th Edition, Project Management Institute, Newton Square, PA.
- Robert, S. and, Bradley, T. (2010), *Organizational Behaviour*, Pearson Educational Ltd, Harlow England.
- Ruth and David (2011). Five Elements of Competency Framework. *Paper prepared for the annual meetings of the Inter- American Development Bank, Santiago Chile.*
- Ryssel (2013). *Traditional Management of Infrastructure Projects*. Charies E. Mervin Publishing Company.
- Saunders, M., Lewis, P., Thorn Hill , A. (2007), *Research Methods for Business Students* , 4th Edition, Pearson Education Ltd, Harlow England.
- Schaffer and Siegel (2009): Efficient use of Regional Transport Infrastructure, Communication Networks and Human Capital, *Journal of Infrastructure Systems*, 15(4),263-272.
- Shanmugapriya, S. & Subramanian, K. (2013). Investigation of Factors Affecting Cost and Time Overrun in Indian Construction Projects. *Project Management Journal*, 34(2), 65-79.
- Soderland, J. (2012). Developing project competence: Empirical Regularities in Competitive Project Operations. *International journal of innovation Management* 9(4), 451-480.
- Stephene N. (2013). Effects of Application of Technology in the Performance of Infrastructure Projects in Switzerland. *International Journal of Project Management* (19); 393-419.
- Steyn, H., (2010). “An investigation in the Fundamentals of Critical Chain Project scheduling.”*International Journal of Project Management* (19); 363-369.
- Triestich M. (2015). *Developing Technical, Behavioural and Contextual Competencies in Project Management*. New York: McGraw-Hill.
- Ugwa, K. & Hupt, D. (2010). Appraising Performance of Project Managers. *Journal of Project Managemen*, vol. 4, pp. 243-251.
- Werner felt, H. (1984). *Critical issues in Resource Based View Theory*. Perseus Publishing, Cambrige, MA.
- Wysocki, A.& Robert, N. (2005). Highway Robbery? A Financial Analysis of Design-Build-Finance-Operate in UK Roads. *Transport Reviews*, 26(3): 257-274.
- William, G.&Dettmer, Y. (2007). Firm’s Superior Performance. *Policy Research Working Paper* 4912, World Bank Washington D.C