

# Effect of Top Management Support on Resource Planning and Leveling (RP&L) Among Contractors in the Kenyan Construction Industry

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**Abstract:** Construction as a sector of economy is defined by the economic activity of building and civil engineering works (Bon & Crosthwaite, 2000b). Many authors agree that the construction industry is crucial for the growth of developing economies (Ndaiga, 2014; Giang & Pheng, 2010; Muiruri & Mulinge, 2014; Wachira, 1999; and Cytonn, 2016 among others). This criticality of the construction industry calls for efficient execution of construction projects which are the backbone of the industry. Resource Planning and Leveling has been attributed to improved project performance in terms of cost, time and even quality (Newell, 2002; Mendoza, 1995 and Dubey, 2015). For any project to be successful there should be support from top management. According to Schultz, Slevin, & Pinto, (1987), management support during project implementation is a major determinant to the success or failure of the project. Project management could be regarded as one of the means in which the top management implements its goals and objectives for the firm. This study sought to establish the effect of Top Management Support on Resource Planning and Leveling (RP&L) among Contractors in the Kenyan Construction Industry. Results indicated weak negative (-0.038) statistically insignificant (0.736) relationship between top management Support versus age of firm; a weak positive (0.275) statistically significant (0.048) relationship between extent of top management support and extent of carrying out Equipment Resource Planning (ERP); a very weak positive (0.079) statistically insignificant (0.494) relationship between extent of top management support and extent of carrying out Labour Resource Planning (LRP); a very weak positive (0.162) statistically insignificant (0.156) relationship between extent of top management support and extent of carrying out Material Resource Planning (MRP); a weak positive (0.257) statistically significant (0.022) relationship between extent of top management support and extent of carrying out Equipment Resource Leveling (ERL); a weak positive (0.230) statistically significant (0.041) relationship between extent of top management support and extent of carrying out Labour Resource Leveling (LRL); and a weak positive (0.245) statistically significant (0.029) relationship between extent of top management support and extent of carrying out Material Resource Leveling (MRL). The author recommended that there should be more support by top management with regard to Resource Planning and Leveling since the two variables were found to be directly proportional.

**Index Term:** Construction Industry, Resource Planning, Resource Leveling, Top Management Support.

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## I. INTRODUCTION

The construction industry is a very key sector in the Kenyan economy. Ndaiga (2014) asserts that the construction industry is not only a significant contributor to our country's Gross Domestic Product (GDP) but also plays a leading role in determining our economic growth. According to Giang & Pheng, (2010) and as cited by Muiruri & Mulinge, (2014), the construction industry typically contributes to 11% of Gross Domestic Product (GDP) in most developing countries. Wachira, (1999) states that the construction industry in Kenya contributes approximately 4% of the country's G.D.P and currently employs 79,000 persons. Another report by Cytonn, (2016) the real estate sector contributed to 8.2% of Kenya's GDP in the first quarter of 2016. This criticality of the construction industry calls for efficient execution of construction projects which are the backbone of the industry. Effective implementation of projects requires efficient utilization of available resources.

The theory of human needs suggests that humans have unlimited wants but the resources to satisfy the wants are limited. The same could be said about projects, the client has unlimited needs but the resources are limited. This constraint has the likely effect of resulting into increased project costs, schedule overrun and also compromising on the quality of the output (Simon, Gwaya, & Diang'a, 2017). This creates the need for maximizing the use of the available resources to overcome such challenges. Proper utilization of internal and external resources is mandatory, for which the construction companies have to execute best business decisions and maximized business goals for better survival in the existing competitive environment (Shi & Halpin, 2003). Resource Planning and Leveling are strategies which have been known to enhance the performance of projects in terms of cost, time and quality (Mendoza, 1995). However, the extent to which Resource Planning and Leveling could be said to be influenced by the extent of Top Management Support. The purpose of this study therefore is to establish whether such relationships exist and give recommendations on how such relationships could be exploited to enhance project performance to the benefit of clients, contractors, consultants and other stakeholders in the Kenyan construction industry.

**II. LITERATURE REVIEW**

**2.1. Resource planning**

Resource planning has been defined by Newell, (2002) as the process of determining resources (people, equipment, materials) required to execute project activities and in what quantities.

Lack of resources at the required times has the effect of causing delays to affected activities and probably affecting the project completion date. According to Newell, (2002) such problem occurs when a task is scheduled that uses a particular resource and that resource is being utilized in some other part of the project or on some other project altogether.

A Resource Plan summarizes the amounts of resources needed to execute the project. A properly prepared Resource Plan should be able to specify the exact quantities of materials, labor, and equipment required to complete the project. A Resource Plan is supposed to be created during the resource planning phase of the project. Those responsible for the project resource management will need to create a comprehensive Resource Plan. This helps to ensure that all the resources required to execute the project are identified. By implementing proper resource planning practices, it also helps the project stakeholders with budgeting and forecasting project expenditure.

**2.2 Resource Leveling**

Resource Leveling is any form of network analysis in which scheduling decisions (start and finish dates) are driven by resource management concerns (e.g., limited resource availability or difficult-to-manage changes in resource levels). According to Badawiyeh, (2010) resource leveling is a trial and error method where noncritical activities are delayed beyond their early start with the aim of maintaining a uniform resource requirement levels. Dubey, (2015) sums this up succinctly when he describes resource leveling as the act of taking a project with people assigned to a bunch of tasks and making it so that they do not have to work overtime. Some of the benefits which can be achieved from Resource Leveling include: reduction of peak demands for resources and creating requirements of the same resources in other off-peak times; there is continuity in the workforce since there is reduced need for the contractor to employ and fire employees at different stages of the project (Mendoza, 1995)

**2.3 Top Management Support**

According to Zwikael, (2008) there is a high importance of top management involvement in projects. Top management support is a necessary ingredient in successful Resource Planning and Leveling (RP&L) implementation (Anto, 2016). According to this author, aspects which indicate elements of top management support in RP&L exercise are commitment, participation and strong leadership.

**III. RESEACH METHODOLOGY**

According to Rajasekar, Philominathan, & Chinnathambi, (2006) a study design is the process that guides the investigator on how to collect, present, analyze and interpret observations. The preparation of such a design facilitates research to be as efficient as possible yielding maximal information (Kothari, 2012). Creswell, (2009), points out that

there are only two major quantitative research designs: (i) experimental design and (ii) surveys, which include cross-sectional and longitudinal studies using questionnaires and structured interviews for data collection. This study adopted a survey approach where questionnaires were used to collect data from randomly chosen respondents. The study comprised of 106 respondents who were contractors operating in the local industry.

Analysis of correlations was carried out to establish and review the strength of possible relationships between variables. Since the data was mainly ordinal, the non-parametric Spearman’s correlation coefficient was used to measure the strength of such relationships instead of the Pearson’s product moment correlation coefficients which is appropriate when both variables have measured at an interval level (Ankrah, 2007). Variables can either be positively related, negatively related or not related at all. According to Field (2009) , the correlation coefficient (r) falls between –1 and +1. Ankrah, (2007) asserts that when the coefficient is close to +1 or -1, the variables have an almost perfect linear relationship. Kombo & Tromp, (2006) agree with this assertion by saying that the correlation coefficient is a number ranging from 1 (which creates a perfect positive relationship) through 0 (no existing relationship between the variables) to -1 (which creates a perfect negative relationship). However, according to the same author, there is little or no correlation when the coefficient is close to zero. Weir, (2003) further gives more details on interpretation of spearman’s correlation coefficient values: 0.0-0.19, “very weak”; 0.20-0.39, “weak”; 0.40-0.59, “moderate”; 0.60-0.79, “strong”; 0.80-1.0, “very strong”.

**IV. DATA ANALYSIS**

**4.1 Respondents' Response Rates**

81 questionnaires were returned to the researcher from a total of 106 distributed. This translated to 76% response rate which was considered by the researcher to be acceptable for data analysis and making inferences.

**4.2 Age the Firm**

**Table 4.1: Age of the Firm**

<b>Age of the Firm</b>	<b>N</b>	<b>Percent</b>
Up to 5 years	32	40.0%
6 - 10 years	22	27.5%
11 - 15 years	9	11.3%
16 - 20 years	4	5.0%
More than 20 years	13	16.3%
<b>Total</b>	<b>80</b>	<b>100.0%</b>

*Source: (Author, 2016)*

The above table indicated that majority of 60.1% of the contracting firms participating in this particular survey had been present in the local construction industry for more than 6 years.



**4.3 Extent of support by Top Management**

The table below (4.2) shows frequencies for the extent of support given or showed by the top level management in regard to resource planning through policies and guidelines.

**Table 4.2: Extent of support by Top Management (Frequencies)**

Extent of support by Top Management	N	Percent
None	9	11.3
Low	12	15.0
Moderate	14	17.5
High	30	37.5
Very High	15	18.8
Total	80	100.0

Source: (Author, 2016)

**Table 4.3: Extent of support by Top Management (Mean)**

	N	Mean	Std. Deviation
Extent of support from top management	80	3.38	1.267

**Table 4.4: Correlation between Top Management Support and Age of Firm**

		Extent of support from top management	Age of firm
Spearman's rho	Extent of support from top management	Correlation Coefficient	1.000
		Sig. (2-tailed)	.736
		N	80
	Age of firm	Correlation Coefficient	-.038
		Sig. (2-tailed)	1.000
		N	80

Source: (Author, 2016)

The table 4.4 above indicates that the spearman's correlation coefficient of top management Support versus age of firm is -0.038. This shows that there is weak negative monotonic relationship between the variables. This means that the higher the age of the firm, the less the extent of support from top management. However, a correlation significance value indicates that the correlation coefficient obtained in this analysis is statistically insignificant.

**Table 4.5: Correlation between Top Management Support and Extent of RP**

		Extent of support from top management	Extent of Equipment Planning	Extent of Labor Planning	Extent of Materials Planning
Spearman's rho	Extent of support from top management	Correlation Coefficient	1.000	.275*	.162
		Sig. (2-tailed)	.	.015	.494
		N	80	78	78
	Extent of Equipment Planning	Correlation Coefficient	.275*	1.000	.543**
		Sig. (2-tailed)	.015	.	.000
		N	78	78	78

Source: (Author, 2016)

While it is clear that majority (56.3%) of respondents responded with "high" and "very high" regarding the extent to which the top management supports resource planning through policies and guidelines, the researcher also noted that comparatively, majority of the contractors' representatives on sites and offices gave lower levels of top management support compared to contractors themselves. Since those who responded as "contractors" in the question regarding the role in the firm automatically fell in the category of top level management, they claimed to provide a lot of support regarding resource planning while this was contradicted by their representatives. In light of the above, a mean of 3.38 as seen in table 4.3 would therefore be considered to be low.

**4.4 Relationship between Top Management Support and Age of Firm**

The table below (4.4) shows frequencies for the extent of support given. A spearman's correlation was run to measure the relationship between Top Management Support and Age of Firm. The results were tabulated below.

**4.5 Relationship between Top Management Support and Extent of RP**

The table below (4.5) shows a correlation between Top Management Support, extent of carrying out Equipment Resource Planning (ERP), extent of carrying out Labour Resource Planning (LRP) and extent of carrying out Material Resource Planning (MRP).



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<b>Extent of Labor Planning</b>	Correlation Coefficient	.079	.543**	1.000	.564**
	Sig. (2-tailed)	.494	.000	.	.000
	N	78	78	78	78
<b>Extent of Materials Planning</b>	Correlation Coefficient	.162	.485**	.564**	1.000
	Sig. (2-tailed)	.156	.000	.000	.
	N	78	78	78	78
*. Correlation is significant at the 0.05 level (2-tailed).					
**. Correlation is significant at the 0.01 level (2-tailed).					

Source: (Author, 2016)

The above table indicates a spearman’s correlation coefficient of 0.275 between the extent of top management support and extent of carrying out Equipment Resource Planning (ERP). This result indicates a weak positive monotonic correlation between the variables meaning that the extent of carrying out Equipment Resource Planning (ERP) increases with an increase in the extent of top management support. The correlation coefficient in this case is statistically significant since the correlation significance is 0.048

The above table also indicates a spearman’s correlation coefficient of 0.079 between the extent of top management support and extent of carrying out Labour Resource Planning (LRP). This result indicates a very weak positive relationship between the variables meaning that the extent of carrying out Labour Resource Planning (LRP) slightly increases with an increase in the extent of support from top management. Since the correlation is statistically significant at 0.05, therefore, any correlation of  $\leq 0.05$  is significant. The correlation significance in this relationship is 0.494 which makes it statistically insignificant.

Further, the above table (4.5) indicates a spearman’s correlation coefficient of 0.162 between the extent of top management support and extent of carrying out Material Resource Planning (MRP). This result indicates a very weak positive relationship between the variables meaning that the extent of carrying out Material Resource Planning (MRP) slightly increases with an increase in the extent of support from top management. Since the correlation is statistically significant at 0.05, therefore, any correlation of  $\leq 0.05$  is significant. The correlation significance in this relationship is 0.156 which makes it statistically insignificant.

**4. 6 Relationship between Top Management Support and Extent of RL**

A spearman's correlation was run to measure the relationship between Top Management Support Extent of ERL, LRL and MRL. The results were tabulated below.

**Table 4.6: Correlation between Top Management Support and Extent of RL**

			<b>Extent of support from top management</b>	<b>Extent of Equipment Leveling</b>	<b>Extent of Labour Leveling</b>	<b>Extent of Material Leveling</b>
<b>Spearman's rho</b>	<b>Extent of support from top management</b>	Correlation Coefficient	1.000	.257*	.230*	.245*
		Sig. (2-tailed)	.	.022	.041	.029
		N	80	79	79	79
	<b>Extent of Equipment Leveling</b>	Correlation Coefficient	.257*	1.000	.492**	.470**
		Sig. (2-tailed)	.022	.	.000	.000
		N	79	80	80	80
	<b>Extent of Labour Leveling</b>	Correlation Coefficient	.230*	.492**	1.000	.663**
		Sig. (2-tailed)	.041	.000	.	.000
		N	79	80	80	80
	<b>Extent of Material Leveling</b>	Correlation Coefficient	.245*	.470**	.663**	1.000
		Sig. (2-tailed)	.029	.000	.000	.
		N	79	80	80	80
*. Correlation is significant at the 0.05 level (2-tailed).						
**. Correlation is significant at the 0.01 level (2-tailed).						

Source: (Author, 2016)

The above table (4.6) indicates a spearman’s correlation coefficient of 0.257 between the extent of top management support and extent of carrying out Equipment Resource Leveling (ERL). This result indicates a weak positive monotonic correlation between the variables meaning that the extent of carrying out Equipment Resource Leveling (ERL) increases with an increase in the extent of top management support. The correlation coefficient in this case is statistically

significant since the correlation significance is 0.022.

Results from the above table also indicate a spearman’s correlation coefficient of 0.230 between the extent of top management support and extent of carrying out Labour Resource Leveling (LRL).



This result indicates a weak positive monotonic correlation between the variables meaning that the extent of carrying out Labour Resource Leveling (LRL) increases with an increase in the extent of top management support. The correlation coefficient in this case is also statistically significant since the correlation significance is 0.041.

The above table indicates a spearman's correlation coefficient of 0.245 between the extent of top management support and extent of carrying out Material Resource Leveling (MRL). This result indicates a weak positive monotonic correlation between the variables meaning that the extent of carrying out Material Resource Leveling (MRL) increases with an increase in the extent of top management support. The correlation coefficient in this case is statistically significant since the correlation significance is 0.029.

## V. CONCLUSIONS & RECOMMENDATIONS

The mean for the extent of support from top management regarding Resource Planning was 3.38 as seen in table 4.3. This was considered to be low for the reasons given in section 4.3. There is need for top management in older firms to increase their support for Resource Planning and Leveling if they are to reap the benefits associated with such. Increased level of support by top management was found to result into increased levels of Resource Planning and Leveling in the three major categories of resources namely; equipment, labour and materials. Therefore, contracting firms in the local construction industry need to offer more support towards Resource Planning and Leveling which will go a long way in ensuring projects are delivered on time, within budget and of the desired quality.

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