

# How resource allocations influence implementation of market shade construction project in Mageta Island, Siaya county Kenya

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**Abstract:** Although a lot of research is done on how construction companies manages their resources, few research are published with the major focus on the individual companies and how they manages their resources which ensures successful delivery of the project. Majority of construction projects get abandoned, take time before completion, stalls or take a good duration with major studies pointing out to factors such as poor methods of allocation, huge variations, changes in the weather system or donor withdrawal as one of the major contributors to such effects without looking at the individual management of respective companies. Despite such stated obvious assumption many projects are successfully implemented within the stipulated period and same conditions with similar companies having same qualifications. The study was done to find out more about the individual management of company resources by carrying out a research on the influence of resource management on the implementation of market shade construction project in Mageta island Siaya County Kenya. Resource allocation is used as one of the variable which is measured by technical knowhow, sources of resources and resource scheduling. The study found out a strong correlation of more than 0.5, 0.898 and 0.957 respectively of the measured variables in relation to resource allocation and implementation of market shade construction.

**Keywords:** Resource management, Resource allocation, technical knowhow, resource scheduling and sources of resources.

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## I. INTRODUCTION

Resource allocation problems begin when it is assumed that its availability is constrained to a maximum value and its main objective is to allocate the available resources to activities in the project with an attempt to find the shortest project duration. The main constrains in resource allocation is scheduling for the order in which each activity will be done e.g use of network diagrams, critical paths network. A construction project has network of activities with each activity given specific duration, resources e.g labour and material to accomplish the work. [1] When allocating human resource, the firms have the choices of training local temporary employees and assigning its regular staff the work based on the companies' strategies for a distant project sites. Allocation strategies guide the project management expenses and the risk level. Workers assigned projects away from home base, shows reluctance in accepting the offer due to lack of familiarization to the new environments. Therefore to enable competent workers to carry on such jobs the companies have to increase wedges to be very high. Hiring of locals leads to high risk as they take charge of remote projects though it's cheaper they are not efficient like regular employees therefore errors may occur in large capacity. In the end you end up with a project loss including effects in quality, progress, cost, safety and un-healthier management as examined [2].

Therefore it's important to note that human resource is important for the success of a project. According to the research done on skilled and non-skilled labour [3], the entire respondents that ware interviewed agreed that human resource management is important for the resources of a construction projects. To manage human in construction industry more attention should be on communication and team work. Communication should follow the correct channel i.e. flow of information from top to bottom and vice versa freely. The result will be of more energized teamwork in a construction site. In addition, a construction site for instance, whereby the management have no proper communication, it may end up being disastrous and full of conflicts. An example is given [4] a young supervisor fresh from school giving instruction to

workforce whom was more elderly experienced the young supervisor wanted to place his theoretical knowledge quickly to the transformation into action very quickly at the site. The work force opposed it, the difference in age resulting into alteration. This result into a delay and repeat of the same job as strict instruction will come from one side

Moreover, a person needs to understand that there is a difference between the employees of a company and the independent contractors. Days have passed by under which employees would use the independent contractors indiscriminately agent to carry out jobs within the company which they do not fit within the jobs classification so that they have it all. It can be argued that even in resources management, there should be a difference between the company employees and other employee whom are hired to carry out a practice job within a stipulated time. Advice is given to employees to avoid entry into a relationship in which pretend (purported on paper) independent contractors same as the extra staff hired on time frame may carry out activities such as retaining them to provide services that are part of the employees normal production process, retaining them indefinitely to provide services on a daily basis on an on-going project, that require details of work to be provided by employer. He concluded that all the employees should avoid confusing contractor operating independently i.e. subcontractors with regular employees [5]

Furthermore, key element of resource allocation involves project scheduling. A scheduling provides a smooth process which includes all operations under which resource are allocated and all constraints are fully satisfied [6]. Most methods have been used to handle the problems associated with project scheduling problem (MRCPS) it consider implementation of project in different modes. Each mode stands for an optional combination of renewable and non-renewable resources and the quantities in place to fully implement a given project [7]. The equivalent project duration is a function of quantities of resource used i.e. a project can be done faster by adding more quantities coming into operation [8] The methods consider time, cost and quantity to develop minimum standard schedule for construction as evaluation criteria. Inclusion of sustainability factors is paramount since the construction industry is moving towards the sustainability i.e social sustainability [9]. He recommended the use of a three phase solution strategy that allowed decision makers to add their preference and revealing trade-off between objectives.

In comparison with other scheduling process, project ware schedule with objective of time minimization, in phase two the aim was to minimize cost without allowing decline of the optimal completion time achieved in first phase. Lastly the 3<sup>rd</sup> phase, maximization of labor sustainability was the main object allowing decline in the time and cost objectives therefore he concluded that development of optimal scheduling contribute to finding out actions and formulating strategies to prevent social burdens only if social sustainability practices are considered in order to make program management more sustainable, therefore his idea was to formulate a more realistic set of performance indicators which are sustainable to take into account other social aspects as the same as the environment.

## II. BODY CONTENT

### 2.1 Introduction

The purpose of the study was to investigate the influence of resource management on the implementation of market shade construction project in Mageta Island, Siaya county Kenya. The objective of the study for this publication was to determine how resource allocation influences implementation of market shade construction project in Mageta Island, Siaya county Kenya. Analysis of data, interpretation of the outcome and discussion on the influence of resource management on implementation of market shade construction project in Mageta Island, Siaya Kenya, and this section presents the findings and interpretation of the study. The demographic information of the respondents is presented first. The descriptive statistics was used to describe and summarize the data inform of tables, frequencies and percentages. Thereafter inference is drawn out of the sample used. Correlation analysis [10] was used to establish the influence of resource capacity on implementation of market shade construction. All tests of significance are computed at  $\alpha = 0.05$ . For the qualitative data a thematic analysis approach is used. The Statistical Package for Social Sciences (SPSS) was used to analyse the data.

### 2.2 Questionnaire return rate

The study focused on the construction workers who worked in the construction of market shade project, both technical, management and casual workers. These gave a target population of 214 people; the study examined 130 correspondents out of 139 respondents that were issued with the questionnaire. This gave a return rate of 93.5% this gave a reliability test of 0.89 using the Cronbach's Alpha formulae as shown in table 2.1

### 2.3 Demographic Information of the Respondents.

The data used in this study was drawn from a sample population of 130 of construction industry employees. The sampled respondents were 130 employees (n=130) achieved by the use of Sloven's formulae with a 95% confidence level. Given that the questionnaires were administered personally by the researcher, it was noted that 93.5% of the questionnaires were appropriately filled. The demographic characteristics of the employee's respondents were summarized below.

**Table 2.1: Showing gender and age in percentages**

		Gender			
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	69	53.1	53.1	53.1
	Female	61	46.9	46.9	100
	Total	130	100	100	
		Age			
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	18-30 years	55	42.3	42.3	42.3
	30-40 years	47	36.2	36.2	78.5
	40-50 years	28	21.5	21.5	100
	Total	130	100	100	

The exploratory data analysis in the table 2.1 above reveals that there were more male respondents who took part in the study than their female counterparts; 53.1% of them were male and only 46.9% of them were female but nearly balanced showing gender rule was observed among the people. Majority (42.3%) of the respondents were aged between 18-30 years. (36.2%) of the respondents were aged between 30-40 years and (21.5%) of the respondents were between the age of 40-50 years. This information has been demonstrated in table 2.1.

**Table 2.2: Showing analysed result of duration of work in construction industry**

		Duration of work in the construction Industry			
		Frequency	Per cent	Valid per cent	Cumulative per cent
Valid	1-3 Years	38	29.2	29.2	29.2
	4-6 Years	37	28.5	28.5	57.7
	7-8 Years	31	23.8	23.8	81.5
	Over 9 Years	24	18.5	18.5	100
	Total	130	100	100	

The exploratory data analysis in the table 2.2 above reveals (18.5%) of the respondents had over 9 years of working experience in construction Industries. (29.2%) of the respondents had worked in construction industry between 1-3 years. (28.5%) of the respondents had worked in the construction industry between 4-6 years. (23.8%) of the respondents had worked in construction industry between 7-8 years and (18%) of the respondents had experience of over 9 years in construction industry. This shows that the necessary experienced required for construction at all levels were available with regards to the project therefore effective management of the project. This information has been demonstrated in table 2.2

**Table 2.3: Showing the level of education of correspondents in percentages.**

		Level of Education			
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Tertiary	37	28.5	28.5	28.5
	Undergraduate	18	13.8	13.8	42.3
	Form Four Level	46	35.4	35.4	77.7
	Primary School Level	29	22.3	22.3	100
	Total	130	100	100	

The exploratory analysis for level of education of the respondents in the table 2.3 above reveals that majority (35.4%) of the respondents are form four level certification. Also, (28.5%) of the respondents has tertiary education, 13.8% of the respondents had undergraduate level certification. 77.7% of the respondents have at least the form four level certification. 42.3% of the respondents have at least tertiary and degrees.

#### 2.4 Likert Scale Results

The construction employee's respondents were presented with statements that had measure the different levels on a Likert-scale. The respondents were to choose from 5-point score; strongly agree (SA), Agree (A), Neutral (N), Disagree (D) and Strongly Disagree (SD). The respondents were asked to score on each statement based on their perception on the statement regarding resource capacity influence on implementation of market shade construction. The researcher computed percentage frequencies of the responses from the students and was tabulated as shown below.

**The following will be used to determine the influence of resource allocation on implementation of market shade construction project in mageta island, Siaya County**

##### 2.5.1 Resource scheduling

**Table 2.4: Showing result analyzed of resource scheduling in terms of percentages.**

No	Item	SA	A	N	D	SD
1	The company had a work program for delivery of the construction of market shade project	42.1	25.6	5	15.7	11.6
2	Management implemented the work program accordingly	50.4	29.8	3.3	7.4	9.1
3	All tasks to be done were allocated in the work program	52.9	14	6.6	15.7	10.7
4	The methodology of work program implementation was included and applicable for the tasks assigned	52.1	28.9	3.3	6.6	6.6
5	Management was ready to change implementation methods in case the scheduled methodology was not working	33.1	27.3	8.3	14.9	16.5

From the findings in resource scheduling in table 2.4, A significant number of the respondents (67.7%) agree that the company had a work program for delivery of the construction material of market shade project Only 27.3.2% held the opinion that the company did not have a work program for delivery of the construction material of market shade project. this means that the company had great arrangements of various activities they were expected to carry out on site, a work program me kept them to carry out each activities on time. It also means that other works would start concurrently and get delivered. 80.2% of the respondents agree that Management implemented the work program accordingly. Against 16.5% who held a different opinion. This means that all workers were aware of the activities they were to carry out from the start to the end. They were in a position to identify at what point they were to leave site hence easy transitioning. 81% of the respondents agree that the methodology of work program implementation was included, against 13.2% who shared a different opinion of 60.4% of respondent agrees that the management was ready to change the methodology incase the recommended one was not working. This means that the methodology of work provided for by the contractor worked well as majority were okay with it, it also shows that the contractor was keen on the implementation method such that in case it doesn't work would bring a new one that was favourable to all. These shows high level of consultation and cooperativeness. Generally, respondents above the average agree that resource scheduling influence on implementation of market shade construction project in mageta island, Siaya County

To address the objective of the study, the null hypothesis "There is no statistically significant relationship between resources scheduling and **market shade construction project in mageta island, Siaya County.**" was tested. To do this a correlation analysis was conducted. The set scores on the resource scheduling were used as the independent variable while scores from market shade construction was used as the explanatory variable (dependant variable). The results of the correlation are presented in table 2.5.

**Table 2.5: showing results analyzed for correlation between resource scheduling and market shade construction.**

		Market shade construction	Resources scheduling
<b>Market shade construction</b>	Pearson Correlation	1	.898**
	Sig. (2-tailed)		.000
	N	130	130
<b>Resources scheduling</b>	Pearson Correlation	.898**	1
	Sig. (2-tailed)	.000	
	N	130	130

The Pearson Product-Moment correlation coefficient ( $r = .898$ ) computed indicated that there was high positive correlation between Resources scheduling and **market shade construction project in mageta island, Siaya County**. The analysis revealed highly significant ( $p < 0.05$ ) positive relationship between Resources scheduling and **market shade construction project in mageta island, Siaya County**, with high levels of associated with the fact that the all tasks to be done were allocated in the work program and that the company had a work program for delivery of the construction of market shade project.

### 2.5.2 Technical knowhow

**Table 2.6: Showing results analyzed for technical knowhow in terms of percentages**

No	Item	SA	A	N	D	SD
1	Each task was assigned to the individual based on their qualification.	26.4	29.8	14	19	10.7
2	During allocation of tasks management allocated duties based on years of experience	16.5	34.7	11.6	21.5	15.7
3	Allocation of task based on skills affected the quality and time for the implementation of market shade construction.	54.5	21.5	2.5	10.7	10.7
4	Management providing good leadership role to ensure implementation of market shade construction project is completed.	62	24	3.3	6.6	4.1
5	Management was well equipped with knowledge and skills to solve dispute	41.3	13.2	4.1	24	17.4

From the findings in technical knowhow table 2.6 above, 49.2% of respondent agree that each task was assigned to the individual based on their qualification. 50.2% of the respondents agree that during allocation of tasks management allocated duties based on years of experience. 76% of the respondents agree that the allocation of task based on skills affected the quality and time for the implementation of market shade construction. This means that the management had an expertise consideration I conjunction with experience. Ii addition the management seemed to have been allocating tasks to workers duties they can perform well and knowledgeable about. 86% of the respondents agree that the management provided good leadership role to ensure implementation of market shade construction project is completed. While, 54.5% of the respondents agree that the management was well equipped with knowledge and skills to solve dispute. This means that the level of consultation regarding various challenges on site from different workers were done wisely without intimidations as majority agrees.

To address the objective of the study, the null hypothesis “There is no statistically significant relationship between technical knowhow and **market shade construction project in mageta island, Siaya County**.” was tested. To do this a correlation analysis was conducted. The set scores on the technical knowhow were used as the independent variable while scores from market shade construction was used as the explanatory variable (dependent variable). The results of the correlation are presented in table 2.7

**Table 2.7: Showing results analyzed for correlation analysis for technical knowhow and market shade construction.**

		Market shade construction	Technical knowhow
<b>Market shade construction</b>	Pearson Correlation	1	.957**
	Sig. (2-tailed)		.000
	N	130	130
<b>Technical knowhow</b>	Pearson Correlation	.957**	1
	Sig. (2-tailed)	.000	
	N	130	130

The Pearson Product-Moment correlation coefficient ( $r = .957$ ) computed indicated that there was lack of positive correlation between technical knowhow and **market shade construction project in mageta island, Siaya County**. The analysis revealed highly significant ( $p < 0.05$ ) positive relationship between technical knowhow and **market shade construction project in mageta island, Siaya County**, with high levels of the fact that the management employed skilled and non-skilled labor and that each task was assigned to the individual based on their qualification.

### 2.5.3 Sources of resources

**Table 2.8: Showing results analyzed for sources of resources in terms of percentages.**

No	Item	SA	A	N	D	SD
1	The resources for construction are available in the island	60.3	18.2	2.5	11.6	7.4
2	The sources of construction material are many in the island	44.6	30.6	0	14.9	9.9
3	The quality of materials from the sources are high	34.7	36.4	5.8	17.4	5.8
4	Sources of construction material are unreliable	38	21.5	7.4	22.3	10.7
5	Resources not available are easily transported to the island	10.7	15.7	2.7	36.4	34.5

From the findings in table 2.8 78.5% of the total respondents agree that the resources for construction are available in the island. Against 19% who share a different opinion. This means that resources such as ballast, sand and water which form the major part of construction were available within the island however not for ready use. The ones that were found for ready use may have not been of the standard required. 75.2% of the respondents hold the opinion that the sources of construction material are many in the island. Against 23.2% who disagree that the sources of construction material are many in the island. The majority agrees to this as the island has many natural resources for construction. The remaining percentage were of different opinion because of the standards that are required in a material to meet certain quality was not guaranteed from these sources. 71.1% agree that the quality of materials from the sources is high. While, 59.5% of the respondents agree that the sources of construction material are unreliable this means that however the materials maybe available but their reliability depended on payments of suppliers at the same time the materials had to be prepared for use as their availability state were not possible to use, this required an extra work to refine them for example the rocks available were to be broken down in advance to be used as ballast before commencement of the construction takes place. In addition, there are no ready suppliers of such within the island who had such materials before order.. Only 32.7% think that the sources of construction material are reliable. 70.9% of respondent had an opinion that the material not available is easily transported to the island. This means that even though transportation is a major challenge within the island majority had the opinion that the available means would be used to transport the materials, in addition its indicates that the transportation cost would be very high.

## III. CONCLUSION

### 3.0 Demographic data

Majority of people employed in the market shade construction project were male at 53.1 % and female of 46.9%, this conforms with the gender rule of at least two thirds of the opposite sex representation. Majority of the employees were bellow age thirty but of legal age of 18 at 55%. The duration of employees working in construction was relatively distributed even though majority had less than three years' experience but having 55% of respondent with over seven years experienced shows the site had good number of technical workers with technical experience in the field. Majority of the workers had form four certificate indicating availability of more skilled and non-skilled labour, the 18%



undergraduate were at the top managerial levels and tertiary at 37 per cent showed a great percentage of technical staff. These combinations indicate that the site was managed properly at all levels because the knowledge and skills required would easily be found due to distribution of knowledge required at all levels. In addition, activities were well distributed as per the capacity of each individual required.

### **3.1 Resource allocation and performance of market shade construction project**

From table 2.4 majority of the respondent at 67.7% had an opinion that the construction company had a work program for the delivery of material on site, this may have resulted to materials required for construction, are delivered to site prior to their use therefore avoiding delay of works. This was proven by the fact that 80.2% respondent were confident and agreed that the construction company implemented the work accordingly. The task done in the site was allocated in the program showing that the program was working as only 13.2% disagreed. The management was also ready to change implementation with the 60.4 % respondent agreeing with the method. Furthermore, the result indicates that the close consultation was involved between the management and workers regarding their understanding therefore the proposed alternatives were working accordingly. These indicate that the site management was focused and more knowledgeable with ideas to give various alternatives to avoid work being shut down at any point during the implementation of market shade unless under unavoidable circumstances.

In table 2.6 46.2 of respondent believed that task were allocated based on the qualification but at same time about 19% were not sure of this, these may have meant that the slightly half of employees were being given work based on years of experience. The huge number of people who were not sure whether work was being allocated based on experience or education may have been selected to work due to the availability of cheap labour in the island and at the same time they were ready to learn and work according to instructions provided for by management. Moreover, 76.0% respondent agrees that task allocation based on skills affected the quality of works being done. This may lead to proper quality of work being implemented as each person is tasked with works that he or she knows best.

In table 2.8 majority of respondent agrees that resources of construction materials were available in the island at 78.5%, this is because of unexploited sources of materials within the island. The natural materials such as sand, water and ballast were in plenty even though a person may have required additional workforce to make the materials ready for construction many respondent believed that they were suit for construction despite most not meeting the minimum standards required. In general majority of the respondent agrees that most materials for construction material were available within the island. However it's noted that 70.9% of respondent agreed that the special resources that were needed for the construction market shade were not easily available and had to be transported from the mainland therefore resulting into more cost of construction.

Generally from all the analysis and conclusions derived from the findings, there is a strong correlation of resource allocation and implementation of market shade. If a company organised their resources well, use correct technical skills and make good use of resources available they are likely to make more profit and complete the project in time.

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### **REFERENCES**

- [1] Heon Jun, D., & El-Rayes, K. (2011). Multiobjective Optimization of Resource Leveling and Allocation during Construction Scheduling. *Journal Of Construction Engineering & Management*, 137(12), 1080-1088. doi:10.1061/(ASCE)CO.1943-7862.0000368
- [2] Kuo-Liang, L. (2011). Human Resource Allocation for Remote Construction Projects. *Journal Of Management In Engineering*, 27(1), 13-20. doi:10.1061/(ASCE)ME.1943-5479.0000032
- [3] Al-Othman, A.A.R. (2012) Investigation of groundwater flow in complex aquifer systems in Saudi Arabia using numerical models. PhD thesis, University of Birmingham, UK.

- [4] Radhakrishnan, S., Selvan, K. G., & Kumar, S. S. (2017). Reasons for Spiraling Costs in Construction Industry. *International Journal Of Multidisciplinary Approach & Studies*, 4(2), 8-14.
- [5] Reilly, T. H. (2015). Employee vs. Independent Contractor Status: A Critical Decision for California Employers. *Employee Relations Law Journal*, 41(1), 47-54.
- [6] Michael L. Pinedo (2005): ISBN 0-387-22198-0, Springer, New York. In , *Mathematical Methods of Operations Research* (pp. 187-189). Springer Science & Business Media B.V. doi:10.1007/s00186-005-0048-y
- [7] Gruen, A., Remondino, F. and Zhang, L., "Reconstruction of the great Buddha of Bamiyan," *ISPRS Commission V Symposium*, Corfu (Greece) 2002.
- [8] Hartmann, D. L., 2001, *Global physical climatology*: San Diego, California, United States, Academic Press, 411 p.
- [9] Florez, L., Castro-Lacouture, D., & Medaglia, A. (2013). Sustainable workforce scheduling in construction program management. *The Journal of the Operational Research Society*, 64(8), 1169-1181. Retrieved from <http://www.jstor.org/stable/24501102>
- [10] Mugenda A.G. (2011). *Social Science Research Methods: Theory and Practice*, ARTS Press: Nairobi.