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EFFECT OF PROJECT MANAGEMENT TRIPLE CONSTRAINTS ON MAIZE PRODUCTION: A CASE OF ONE ACRE FUND KAKAMEGA COUNTY

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Abstract: **The Triple Constraint is a model that incorporates cost, time and scope as determinants of the quality of the output realized. All over the world, project managers have appreciated the role of the Iron Triangle as a model for analyzing and their projects. Project management triple constraint has proved to be a handy tool. One Acre Fund is an organization that is based in Kenya, Rwanda, Tanzania, Zambia, Malawi and Uganda with the aim of loaning farmers farm inputs and training them on the right crops to plant at given seasons, proper agronomic practices, altitudes and soil health. Among the crops planted include: maize, beans, sorghum, rice, soy beans onions, kales, other horticultural crops and trees seedlings among others. For One Acre Fund farmers to manage its projects well, they should consider applying Iron/project Triangle in order to ensure high maize adoption over other crops and high maize crop production is not only successful to the organization but the harvests also meet the needs of the farmers as well. The study aimed at examining the effects of the project management triple constraints on maize production among One Acre Fund farmers in Kakamega County. Specifically, the study was to: investigate the effect of project quality; assess the effect of project cost; determine the effect of project time; and evaluate the effect of project scope on maize production among One Acre Fund farmers in Kakamega County. the study was underpinned by the: Models of Project Management Triple Constraints; Theory of PM Triangle quality and the Theory of Equitable Relationship. Descriptive survey design was adopted and the targeted population was One Acre Fund farmers in Kakamega county totaling to 50,670. A sample of 100 farmers was used. The study also found that 32.4% of variation in maize production among OAF farmers in Kakamega County was explained by project quality and also11.7% of variation of maize production among One Acre Fund farmers in Kakamega County was explained by project cost.**

Keywords: **project management triple constraints, maize production, one-acre fund.**

I. INTRODUCTION

Project management entails equipping the project team with all the necessary tools and methods so that the constraints in the Iron Triangle can be met [1]. The Triple Constraint is a model that incorporates cost, time and scope as determinants of the quality of the output realized. Other applicants of the Iron Triangle have adapted the model to have the elements as finance, time and human resources. The idea utilized in this case is that in order to reduce the duration of a project, more workers and finances can be injected in the project. All over the world, project managers have appreciated the role of the Iron Triangle as a model for analysing and their projects. John Storck who worked as a project management lecturer in USA, applied the model in the development of Alaska Pipeline. In his case, the project had to be completed without compromising the timeline stated [2]. The problem was that the budgetary allocation made was not increased. The project was to be done within the stipulated budget without increment and within the given time. It means that, the scope of the

work and project quality output had to be tampered with. The project was successful but at the variations being made at the scope such as additional workers but of course quality was not at par. Environmental impact assessments have also been areas that the Iron/Project Triangle has been applied. From the points of beginning construction programs such as national highways, traffic management and construction of large buildings such as malls, Project management triple constraint has proved to be a handy tool. An example of a project in USA was the O'Hare Modernization in Chicago, Illinois which is still under construction began in 2001 [1]. The project employed the Iron Triangle model with initial costs estimated to be $6.6 billion. Due to high project quality that was required, the time span was increased to 2026 with consecutive increment of budget by $ 2.2 billion [3]. The project scope was also increased to accommodate more terminal 2 as well as remote concourses.

The other mega project that is notable with regards to application of Triple Constraints Model is the proposed new capital of Egypt in Africa. The work began in 2015 and it still continues until 2022. It is expected that the capital be able to accommodate more than 250 000 people [4]. Other projects in Africa also make use of the elements of the Triple Constraint Models such as optimum costs, scope and time in order to realize high quality constructions in the proposed capital of Egypt [5]. Locally, Kenya has engaged in various major projects such as construction of Thika Super Highway and SGR among others that found Project Triangle so crucial. The Mombasa-Nairobi SGR made use of the Iron/project Triangle to manage the project where the cost involved was Ksh 327 billion [3]. The scope of the project entailed construction of 609 km, 25 000 workers and time span being about 5 years. There were variations in the elements of the Iron Triangle which were adjusted in order to achieve the quality of the project as desired [5]. One Acre Fund is an organization that is based in Kenya, Rwanda, Tanzania, Zambia, Malawi and Uganda with the aim of loaning farmers farm inputs and training them on the right crops to plant at given seasons, proper agronomic practices, altitudes and soil health [6]. Among the crops planted include: maize, beans, sorghum, rice, soy beans onions, kales, other horticultural crops and trees seedlings among others. For OAF to manage its projects well, they should consider applying Iron/project Triangle in order to ensure high maize adoption over other crops and high maize crop production is not only successful to the organization but the harvests also meet the needs of the farmers as well [7].

A. Iron Triangle (Quality, Cost, Time and Scope)

The Iron Triangle has been used from as early as 1950s. It is also referred to as the project management triangle, the project triangle or the triple constraint [5]. The Iron Triangle is a model that is employed in project management with variants such as time, cost and quality of the works that are done. The figure I below shows how it looks like:

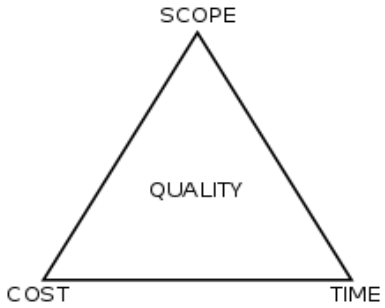

Figure 1: Iron Triangle in Project Management [8]

The elements of the Triangle have an effect on each other. The cost that is utilized in the project has an impact in the quality of work produced as well as the time taken and the scope of operations. The triangle is an aid to project managers to trade between constrains that are presented by the elements [2]. Any alteration of any of constrains shall have boomeranging impact on the quality of the work produced in the project. An example is when the project is done fast through increasing the budgetary allocations. The same can also be achieved through the reductions of the project scope. As long as the project scope is increased, the budget and time elements also increase consequently in equal or given proportions. In cases where the budget for the project is cut down while the schedule and scope maintained, the quality of the work produced becomes low [5]. According to [4], practical applications of the Iron Triangle have shown that some challenges are always faced in trading between the constraints especially when the project managers are biased to a given element. An illustration can be given in cases where the project coordinators decide to increase more budgetary allocation and workers in a project that is already staffed, would not improve efficiency but instead slow it down. In other times where the projects are poorly managed, the possibility of increasing cost of the work, timeline or scope shall negatively

affect the quality of the end product [5]. The aim of the Project Management Triangle is to assist the project managers to analyse their works. There are limitations cited by the users of the Triple Triangle such as being insufficient as a project model since, it fails to incorporate other factors such as influence of stakeholders and fulfilment of the beneficiaries of the project done [8].

B. Iron Triangle and Maize Performance among Kenyan Farmers

With the challenge of maize production by maize farmers and other stakeholders, maize project managers question themselves on how to apply project management models and principles in order to experience the project success. According to PMBOK, the success of a project can be realized through a fulfilment of different factors such as satisfaction of the customers and operating within project constrains such as scope, budget, time and quality among others [9]. In other words, for maize production to be successful, the farmers have to be satisfied that when they choose to plant maize varieties over other crops, they will reap more benefits. The project manager had in mind the benefits that shall accrue to the farmers at the end of the project [10]. The Iron Triangle aided the project managers in estimating the budget of running the whole project, time lines, scope and the quality that the project shall deliver to OAF and the farmers. The study assessed the effects of project management triple constraint on maize production: a case of One Acre Fund, Kakamega County. The Iron Triangle elements acted as the independent variables in the project upon which maize production by the farmers depend on [11]. Maize production among farmers and other stake holders were therefore, the dependent variable in the study. Maize production as a variable, incorporated factors such as quality of yields, costs of production, climatic conditions, crop period to harvesting time and profits among others that influence farmers and stakeholders to choose or reject maize projects over others.

C. Overview of One Acre Fund

One Acre Fund is a non-profit making organization that assists in alleviating poverty and malnutrition through financing and training the small-scale farmers in Kenya so as to fight hunger and ensure food security. OAF has its international offices in New York City in USA that houses 20 workers [12]. The other offices are spread across sub-Saharan Africa such as Kenya, Uganda, Burundi, Rwanda, Tanzania and Malawi among others. In Kenya, the headquarters of OAF is at Kakamega Town in the -former Western Province. The other offices are situated at Kisii and Nairobi [6]. The interest of OAF is to put farmers first ahead of any other things. The organization realized that farmers work hard but they are categorized as those who experience hunger the most as compared to other occupations. According to OAF research, over 50 million small scale farmers in Sub-Saharan Africa are caught up in the vicious cycle of hunger as they cannot be able to produce sufficient food for themselves and their families [13]. The effects are always on the children that experience malnutrition that retard their growth and expression of their full potentials. OAF discovered that the problem of hunger though has devastating impact, it can be solved. The organization has employed modern agricultural technologies and trained farmers as well as financed their farm inputs especially in areas where the farmers have been unable to access asset financing [6]. When the farmers are made to prosper through farm produce, the communities that surround them also prosper. Such families have their children experience improved academic performance in schools. The children grow healthy such that their growth and developmental stages are not affected by hunger. The other overflowing effect can be seen in the manner in which they improve their lives through educational, infrastructural and business investments. OAF has greatly invested in sustainable farming methods which also protects their environments [14]. OAF model also utilizes market-based strategies to fight poverty experienced in the rural areas. The model that is employed is holistic and has a long-term approach. It also ensures that the company remains sustainable financially and extends its hands to more farmers annually.

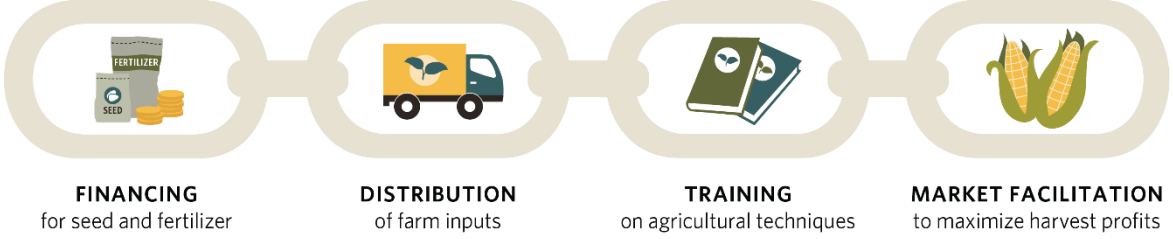

Figure 2: OAF model of operation (OAF, 2019)

The model works through asset-based loans. It entails farmers being supplied with farm inputs such as high-quality seed and fertilizer on credit [7]. They then pay back their loans which are flexible in realistic instalments till the term of the loan comes to an end. The model uses a distribution system where the farmers are supplied with the farm inputs to places that are walking distance to their farm locations [15]. The organization shoulders the transportation costs to the places where farmers can easily access them. The model then allows the farmers on the program to be trained in the whole season of the crop through application of modern agricultural methods. The model continues with market facilitation process. It carries out market research and conveys to the farmers the right time to hoard products and offer them for sale for profit maximization [14].

D. Statement of the Problem

Low agricultural productivity in the developing world is a problem at both micro and macro levels: three-quarters of poor people in developing countries live in rural areas and depend at least in part on agriculture for their livelihoods. Further, studies show that GDP growth originating in agriculture benefits the poor substantially more than growth originating in other sectors [16]. In Kenya, 40% of the population lives in poverty, and a large share of the poor engage in smallholder farming as their primary occupation. The agriculture sector contributes 51% to the country's GDP (25 percent indirectly) and is dominated by these small-scale producers [16]. In 2011 study found that 62% of farmers in western Kenya used money that was intended for investment in a small business to buy food. Over 55% of farmers sold or consumed seed that was meant for next season's planting because of insufficient food [14]. Low yields among Kenyan farmers can be traced to several sources, including low adoption of improved technologies. A non-exhaustive list of the various factors identified in the literature as determinants of technology adoption includes education, wealth, risk preferences, access to complementary inputs, and access to information. More specifically, 70% of Kenya's maize is produced by smallholder farmers who farm between 0.2 and 3 hectares [16].

Recently the Galana-Kulalu Food Project that was financed by the government and an Israel bank known as Bank Leumi, consumed close to KES7.1 billion. The project should be making KES1.2 billion in maize sales per season, per projections. Instead, it has only managed 119,000, 90kg bags of maize, worth about KES273.7 million [14]. The research study therefore aimed at solving this problem through conducting a study on the effects of Iron Triangle (quality, cost, time and scope) on maize production among One Acre Fund farmers in Kakamega County. The study results are expected to benefit the farmers by adopting maize as a crop to grow and OAF for using a useful project management tool that solves their maize production problems. As a Country, Kenya shall also benefit due to increased maize harvests and thereby food security for the whole country.

E. Objective of the Study

The General objective of this study was to examine the effects of the project management triple constraints on maize production among OAF farmers in Kakamega County.

Specifically, this study sought to achieve the following objectives:

i. To investigate the effect of project quality on maize production among OAF farmers in Kakamega county.

ii. To assess the effect of project cost on maize production among OAF farmers in Kakamega county.

F. Research Hypotheses

H_{01}: Project quality has no significant influence on maize production among OAF farmers in Kakamega County.

H_{02}: Project cost has no significant influence on maize production among OAF farmers in Kakamega County.

II. LITERATURE REVIEW

A. Theoretical Review

This study will be guided by the theory of PM triangle quality and the theory of equitable relationship. The theory of PM Triangle quality states that the outcome of the triple constraint is ideally quality. It puts emphasis on the quality as an end product of the project of all the other elements. It calls for the PM Managers to increase the budgetary allocation in the project to acceptable level since it has a direct proportional effect on the quality that is produced by the project. In most cases, it adopts the version where quality is at the centre of the triangle [17]. A poorly designed project experiences a lot of variation in the elements which keeps taking the PM Manager back to the drawing board in re-adjusting the scope, time

or cost of the project so that the quality desired can be achieved. The theory also holds that quality should not be grouped with the other elements since it is not a constraint but ideally an outcome. When a project is finished, it can either attain the description of poor or good quality which is an outcome. It also highlights that each of the constraints should contribute equal shares to make an equilateral PM triangle though this may happen in ideal situations as projects differ in nature.

Theory of equitable relationship explains that in ideal conditions, the PM Manager should ensure that a balance is maintained of the three factors, that is, scope, cost and time. The challenge that often arises is that clients such as contractors have a tendency of altering the project scope but maintaining the costs and time as fixed. The equitable relationship theory calls for the parties in a project to have a balance so as the employer's interests as well as of the project are safeguarded. The application of the phrase equitable relationship explains a situation where the stakeholders in a project have a fair and balanced relationship [4]. As they relate equitably, the scope, costs and project timelines should be well defined in the project beginning. When these factors are balanced then the project managers can be sure of having a project success.

B. The conceptual Framework

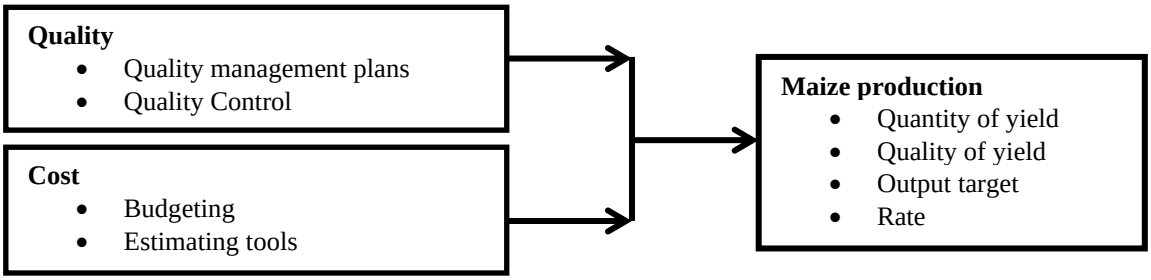

Figure 3: The Conceptual Framework

i. Project Quality and production

Project quality management encompasses the processes and activities that are used to figure out and achieve the quality of the deliverables of a project. Quality is what the customer or stakeholder needs from the project deliverables [18]. Kenya is a country that has greatly invested in development of maize seed varieties. Agricultural statistical reports of 2015 by The Kenya Agricultural and Livestock Research Organization (KALRO) shows that there are over 279 maize seed varieties that have been developed in the nation [14]. In the year 2015, through research and development works, 37 more new varieties were brought into the Kenyan market [13]. The investment in maize research is to enable the increased maize yields in the long run through having maize that resist harsh climatic conditions and biotic stresses (diseases). One Acre Fund carried out an enrolment of more than 300 000 small scale farmers in Kenya in 2017 so as to be included in their funding program targeting long rains of 2018 [12]. OAF presented a variety of maize seeds to the farmers so that they would choose and adopt as their crops. The varieties of maize seeds that were offered for adoption included: SC Duma 43, WE 1101, H614D, PAN 4M-21, DK8031, H6213, DH04, PAN 67, PAN 691, SC PundaMilla 53 and WH 507 [14].

They used seed catalogues that had seed details such as resistance to maize diseases, suitability to climatic conditions and soils [7]. It also had details of maturity period so that the farmers would know when they would harvest. Apart from the catalogue, in the past the farmers had been given recommendations on every maize seed variety to be planted in specific climatic conditions [15]. The OAF field officers also ensure that they update their information annually based on adoption patterns of the farmers. These help to determine the evolving nature of adoption of maize varieties among the small-scale farmers. According to OAF findings on maize adoption in 2015, it was realized that there was lack of maize seeds varieties information to the farmers to inform their choice and farming [6]. They were planting without knowledge from agricultural organizations. Due to poor mass education and trainings many farmers adopted other crops such as onions, beans, potatoes, sugar cane and coffee as opposed to maize that produced low yields [19]. OAF had to change its strategy to focus on the variety recommendations and mass trainings of farmers. Through variety recommendations per district the farmers would be able to know the right maize seeds to adapt to various climatic and soil conditions. The consequence would be increased maize yield per hectare thereby leading hunger eradication in the country.

ii. Project Cost and Production

Project cost assists the Project Manager to estimate the financial requirements of a project as well as a baseline to work with so that the budget is not overstretched [1]. The merit of having a project cost was to avoid losing finances to misappropriations which reduces a project's profitability. The process entailed carrying out project costs estimation of all the tasks to be done. The budget was then developed from the costs per task. Example, estimating labour costs where number of labourers, timelines and rates per hour are essential. The other aspects included the material costs, travel expenses, space, insurance charges and units of measurements being factored in. The PM also planned for inflation, natural emergencies and other unexpected costs. The budget was tracked at every stage using monitor software that acted in real time. Prompt response was ideal in management of this project, though some losses were experienced as one waited.

III. RESEARCH METHODOLOGY

The research adopted the descriptive research design in seeking to understand the relationship amongst the independent and dependent variables. The researcher adopted this design as it was relatively inexpensive; it describes a large population and ensures flexibility by deciding how questions should be administered [20]. The target population of this study comprised of all the enrolled OAF farmers in Kakamega County, totalling to 50, 670 farmers where unit of respondents were group leaders. Sample size for this study was therefore 100. In this study regression analysis was done to establish whether independent variables predict the dependent variable. The R square, t-tests and F-tests and Analysis of Variances (ANOVA) tests was generated by SPSS to test the significance of the relationship between the variables under the study and establish the extent to which the predictor variables explain the variation in dependent variable [21].

IV. RESEARCH FINDINGS AND DISCUSSION

A. Response Rate

In this study, 100 questionnaires were distributed and 97 of them were filled and returned. Therefore, 97 questionnaires were correctly filled and used for the analysis, which made up a response rate of 97%.

B. Collinearity Tests

Collinearity is the measure of the degree of association between the variables [5]. Serial correlation was performed using the Durbin Watson test statistic. Study findings shows that there is a positive autocorrelation as depicted by (D-W=2.017> 2). The result of the Durbin Watson (D-W) statistic measure was 2.013 which is greater than the threshold of 2. This shows that the dependent variables and the independent variables are positively auto-correlated. The summary of the findings is as shown in Table I.

TABLE I: SUMMARY TABLE ON COLLINEARITY TESTS

Strategy	Collinearity statistics
Project cost	2.209
Project quality	1.925
Durbin Watson (D-W) statistic=2.013	

C. Descriptive analysis

i. Project Quality and Maize Production

With reference to quality of production, 49.4% of the respondents strongly agreed that there has been a steady increase in the production of maize in OAF with a mean of 4.12. In relation to quantity of maize spoiled, 38.1% of the respondents agreed that there has been a steady decrease in the quantity of spoilt/rejected maize in OAF being rejected. 44.3% of the respondents with a mean of 4.36 agreed that there has been consistency in the maize farming cycle in OAF. Likewise, 41.2% of the respondents strongly agreed that there has been a steady increase in output, rate, and quality of the maize produced in OAF, while 45.4% agreed that as an OAF farmer, you know time it takes for maize farming or the cycle time for a maize farming. With respect to the resources being used, 35.1% of the respondents strongly agreed that personnel and machinery are being used efficiently. This is in agreement with [15] where they affirm that the OAF field officers also ensure that they update their information annually based on adoption patterns of the farmers. These help to determine the evolving nature of adoption of maize varieties among the small scale farmers. Through variety recommendations per

district the farmers would be able to know the right maize seeds to adapt to various climatic and soil conditions. The consequence would be increased maize yield per hectare thereby leading hunger eradication in the country. Lastly, 47.4% of the respondents strongly agreed that OAF has put in necessary measures to avoid delays/errors or avoidable inconveniences all through the maize farming cycle.

ii. Project Cost and Maize Production

From the study findings 49.5% of the respondents strongly agreed that OAF defines the cost plan before every project begins and 51.5% of the respondents agreed that estimation of the project cost is normally done to establish the cost of the entire project before the commencement of every project. Determination of the required project was strongly agreed by 51.5% of the respondents is considered mandatory before any project is initiated by OAF. The merit of having a project cost is to avoid losing finances to misappropriations which reduces a project's profitability. The process entails carrying out project costs estimation of all the tasks to be done. The budget can then be developed from the costs per task [1]. At the onset of the project formulation and development, 48.4% of the respondents strongly agreed that there is a department set aside to ensure that project costs are controlled. Likewise, 49.4% of the respondents agreed that funding sources are normally established at the planning stage for every project in OAF. 43.2% of the respondents agreed that financing of projects is normally secured before the beginning of every project in OAF. Finally, 39.1% of the respondents strongly agreed that projects are normally completed within the approved budget in OAF.

D. Inferential analysis

i). Hypothesis 1: Project quality and maize production

H_{o1} There exists no significant influence of project quality on maize production among One Acre Fund farmers in Kakamega County.

TABLE II: MODEL SUMMARY FOR PROJECT QUALITY AND MAIZE PRODUCTION

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.569[a]	.324	.312	1.10736

From findings in Table II, the value of R-Square is 0.324. This implies that, 32.4% of variation in maize production among OAF farmers in Kakamega County was explained by project quality.

TABLE III: ANOVA TABLE FOR PROJECT QUALITY

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	231.216	1	231.216	85.73	.036[b]
	Residual	256.241	95	2.697		
	Total	487.457	96			

a. Predictors: (Constant), project quality
b. Dependent Variable: Maize production

From the findings in Table III, at 0.05 level of significance the ANOVA test indicated that; project quality is important in predicting of maize production among One Acre Fund farmers in Kakamega county as indicated by significance value=0.036 which is less than 0.05 level of significance (p=0.036 < 0.05).

TABLE IV: COEFFICIENTS FOR THE MODEL FOR PROJECT QUALITY

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	8.127	1.213		6.699	.000
	Project Quality	0.721	.181	.711	3.983	.015

a. Dependent Variable: Maize production

From Table IV; the study revealed that project scope had significant influence on maize production among One Acre Fund farmers in Kakamega County (t statistic=3.983, p-value=0.015 < 0.05). Therefore, at 5% level of significance the

null hypothesis was rejected, indicating project quality had a positive influence maize production among One Acre Fund farmers in Kakamega County. Again for every unit increase in project quality there was an increase in maize production among One Acre Fund farmers in Kakamega County by 0.721.

ii). Hypothesis 2: Project cost and maize production

H_{o2} There exists no significant relationship between project cost and maize production

TABLE V: MODEL SUMMARY FOR PROJECT COST AND MAIZE PRODUCTION

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.342[a]	.117	.1169	2.4161

From the study findings in Table V, the value of R-square is 0.117. This implies that, 11.7% of variation of maize production among One Acre Fund farmers in Kakamega County was explained by project cost.

TABLE VI: ANOVA TEST FOR PROJECT COST AND MAIZE PRODUCTION

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	199.221	1	199.221	43.785	.001[b]
	Residual	432.296	95	4.550		
	Total	**631.517**	**96**			

a. Dependent Variable: maize production

b. Predictors: (Constant), project cost

From the findings in Table VI, at 0.05 level of significance the ANOVA test indicated that project cost is important in predicting maize production among OAF farmers in Kakamega county as indicated by significance value=0.000 which is less than 0.05 level of significance (p=0.001 < 0.05).

TABLE VII: COEFFICIENTS MODEL

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	10.038	1.955		5.135	.0459
	Project cost	.517	.102	.562	5.080	.035

a. Dependent Variable: maize production

From Table VII, the study findings illustrate that project cost had significant influence on maize production among One Acre Fund farmers in Kakamega county (t-statistic=5.080, p-value=0.035< 0.05). Therefore, at 5% level of significance the null hypothesis was rejected, indicating that supplier project cost had a positive significant relationship with maize production among One Acre Fund farmers in Kakamega County. Thus, for every unit increase in project cost there was a corresponding increase of maize production among One Acre Fund farmers in Kakamega County by 0.517.

V. SUMMARY OF FINDINGS

a) Project Quality and Maize Production

The inferential statistics showed that project quality is significant in predicting of maize production among One Acre Fund farmers in Kakamega county. Project quality had a positive influence maize production among One Acre Fund farmers in Kakamega County. The study also found that 32.4% of variation in maize production among OAF farmers in Kakamega County was explained by project quality. In regard to descriptive statistics with reference to quality of production, the study found a steady increase in the production of maize in OAF. At the same time quantity of maize spoilt or rejected, decreased. There was a consistency in the maize farming cycle in OAF. The output, rate, and quality of the maize produced in OAF increased and OAF farmers know the time it takes for maize farming or the cycle time for a maize farming. The personnel and machinery as resources are being used efficiently. The OAF field officers also ensure that they update their information annually based on adoption patterns of the farmers. These help to determine the evolving nature of adoption of maize varieties among the small scale farmers. OAF has put in necessary measures to avoid delays/errors or avoidable inconveniences all through the maize farming cycle.

b) Project Cost and Maize Production

The study found 11.7% of variation of maize production among One Acre Fund farmers in Kakamega County was explained by project cost. Project cost is significant in predicting maize production among OAF farmers in Kakamega county. Project cost had a positive significant relationship with maize production among One Acre Fund farmers in Kakamega County. From the descriptive statistics the study found that OAF defines the cost plan before every project begins. Further, the estimation of the project cost is normally done to establish the cost of the entire project before the commencement of every project. the study also found that determination of the required project was considered mandatory before any project is initiated by OAF. The study found that there is department set aside to ensure that project costs are controlled. Funding sources are normally established at the planning stage for every project in OAF. financing of projects was found to be normally secured before the beginning of every project in OAF. Finally, projects were found to be s normally completed within the approved budget in OAF.

VI. CONCLUSIONS

The triple constraint constitutes a balance of the three interdependent project elements of scope, time and cost as a function of the project higher purpose. The goal of any project manager or indeed stakeholders in a project is to complete it successfully within the triple constraint. The study sought to assess the triple constraints by taking the perspectives of the project manager. The constraints are mainly caused by project scope changes, project risks, poor project planning, and project delays. Nevertheless, many recent findings have also pointed towards the importance of Organization and Individual factors. From the study, project scope and project cost are the most common triple constraint elements faced in maize production among One Acre Fund farmers in Kakamega county as highlighted by the project managers. Budgets can put pressure on deadlines; deadlines can alter performance. The constraints are mainly caused by project scope changes, project risks, poor project planning, and project delays. Additionally, the present study implies a very strong relationship of the constraints and maize production among the One Acre Fund farmers in Kakamega County.

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