Effect of Physical Resource Control on the Performance of Agriculture Projects in Rwanda

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Abstract:
Rwanda, as a developing country is confronted with multitude of project management challenges especially in agriculture projects. One of the major causes of the failure is the inability to control project physical resources. The objective of this research was to determine the effect of physical resource control on performance of Sustainable Growers Rwanda as coffee project. The study adopted descriptive research design and utilized quantitative and qualitative data collection approaches. The target population was 30 employees of Sustainable Growers Rwanda on which a census was done. Questionnaires consisting of close ended questions were applied to collect data. The data was analyzed using Statistical Package for Social Sciences (SPSS). Data was presented in form of frequency tables. The research findings showed that project machines’ control, project tools’ control and project equipment’s control influenced coffee project performance and were positively correlated and significant to the coffee project performance in Sustainable Growers Rwanda. The study therefore recommends the project members to take an initiative in resource control by controlling the machines, tools and other equipment of the organization.

Keywords: Resources, physical resource control, project and project performance

1. Introduction
A developing country as Rwanda is facing with myriad of project management challenges of technical and non-technical. The numbers of agricultural projects that have failed exceed those successful projects (MINAGRI, 2015). One of the highlighted major causes attributed to that failure is the inability to manage and control project resources as usually this leads to project delay and cost overruns. The project management was a relatively modern approach characterized by methods of restructuring management and adapting special management techniques to better control and utilize existing resources. Kerzner (2013) demarcated a project as a management of planning, organizing, directing and controlling corporate resources for a relatively short-term goal that has been established to achieve specific goals and objectives (Kerzner, 2013).

Since most of the international not-for-profit organizations were heavily dependent on external funding from donors, project performance was a main consideration on whether these organizations could retain their funding or attract new funding, without which they would end their operations. Therefore, according to Centre for Business Practices, resource measures included measure on costs versus budget, normally designated as budget versus actual analysis. Resource utilization measures included number of staff and their experience levels. Thompson, et al (2011) note that a company’s strategy is the management’s action plan for running the business and conducting operations. The company’s strategic plan is all about how management intends to grow the business, build a loyal clientele and out compete rivals (Thompson, et al., 2011).

Resource control is the management of the resources assigned to any particular project. This includes physical or material resources. Resource control begins with the use of project plan to determine the resources needed and then assigning them to the different project tasks at the right time. This process lasts throughout the project lifecycle to certify that planned resources are ready and accessible as needed to evade delivery delays. The resource control process also monitors the use of resources against the plan and, if necessary, will lead to corrective actions to shorten or extend the time required for resources. The process must be informed of any changes to the plan that impact when resources are needed (Mark B., 2010).

1.1. Statement of the Problem
In the most of developing countries, abnormal operational undertaking in functional organizations that have low project management capacity hinders the performance of projects. Further corruption has become a challenge that
confusing project management practices in these countries (Jekale, 2014). Rwanda as the one among those developing countries faces a myriad of changes in the management of technical and non-technical projects, the numbers of agricultural failure projects exceed that of successful projects (MINAGRI, 2015). One of the highlighted major causes attributed to that failure is the inability to manage and control project resources as usually this leads to project delay and cost overruns.

1.2. Conceptual Framework

![Figure 1: Conceptual Framework]

2. Literature Review

When large inflation increases resulted in large increases in the cost of carrying inventory. In any project, resource is required to carry out the project tasks. They can be human, financial, and physical or anything else capable of definition required for the completion of project activity the lack of any resource will therefore be a constraint on the completion of the project activities. Resource may be storable, or no-storable. Storable resource remains available unless depleted by usage, and maybe replenished by project tasks which produce them. Non-storable resources must be renewed for each time period, even if not utilized in previous time periods. Resource scheduling, availability, and optimization are considered key to successful project management. Allocation of limited resources is based on the priority given to each of the project activities. Their priority is calculated using the critical path method and heuristic analysis (Anderson, Melanson, & Maly, 2010).

For the case with a constraint on the number of physical resources, (Barney, 2010) stated that a firm should create the most efficient schedule possible by minimizing project duration and maximizing the use of the physical resources available. Physical resources are Physicals consumed in the completion of a task, as opposed to equipment used to complete a task. When you assign physical resource, you specify the way it is consumed. With variable Physical consumption, the quantity of Physical consumed changes as task duration changes (Barney, Is Resource-Based View a useful perspective for strategic management research?, 2010). When you assign a work resource to a task, project multiplies its standard hourly rate by the hours of work for the assignment. But physical resources don't have hours of work: You pay for them by the unit quantity, not by the hour. thus, when you set up a Physical resource, you specify a standard rate for a single unit and assign a certain number of units to each task. The cost is the number of units multiplied by the cost per use (Pretti, 2016).

According to the study of Zairra & Narimah (2017), they stated that the physical resources management is an important element in project management since materials contribute a major portion to the total project cost. It also plays a key role because of the successes of every agricultural project rely on having proper resources; thus, it gives implication on project performance (Zairra & Narimah, 2017). The key criteria of project performance affected due to material management. Generally, the criteria of project performance are identified perspective effects (Zairra & Narimah, 2017).

In the study conducted by Hillman (2014), he considered physical resource control as an economic or productive factor required to accomplish an activity, or as means to undertake and achieve desired outcome of any particular firm (Hillman, 2014). The strategies, policies in existence by governments for developed and developing countries show that financial resources, human resources and physical resources planning practices in projects undertaken by various organizations using different approaches could make the said project either to succeed or fail (Akpan & Chizea, 2002).

Akpan & Chizea (2002) in their study they argued that the strategies, policies in existence by governments for developed and developing countries show that physical resources planning practices in projects undertaken by various organizations using different approaches could make the said project either to succeed or fail (Akpan & Chizea, 2002).

Apart from the work of Zwikael & Globerson (2016), few people have investigated to what extent measures of performance and success are correlated. Turner & Zolin (2012) suggest project efficiency is important to success, because if the project is completed late and over budget it will be more difficult for it to be successful. Lester (2009) noted that there is also a general agreement that although schedule and budget performance alone are considered inadequate as measures of project performance and success, they are still important components of the overall construct (Lester, 2009). The quality of materials used is intertwined with issues of technical performance, specifications, and achievement of functional objectives and it is achievement against these criteria that will be most subject to variation in perception by multiple project stakeholders.
3. Research Methodology

The study adopted a descriptive research design and used both quantitative and qualitative data collection methods. This research had a target population of 30 employees of Sustainable Growers project Rwanda. Since the population was slightly small, this research adopted the census techniques. Since the research used a census, no sampling technique was needed to determine sample size; hence, the entire population of 30 potential respondents who participated in the study were considered. The self-administered questionnaire was designed which comprised of open and closed ended questions. For better understanding the objective of the study, a structured interview was used and a researcher referred to books, journal articles, electronic sources, and reports related to the physical resource control and project performance in Rwanda.

The data collected from the field was analyzed for both descriptive and inferential statistics methods. Statistical Package for Social Sciences (SPSS) was used for the data analysis. To establish the internal consistency of the instruments, the researcher gave questionnaires to research supervisors and other experts in the domain to verify whether the they were consistent to what they were expected to test. To achieve high level of reliability the researcher used a self-administration approach of data collection. Most questionnaires were filled in presence of researcher to ensure that the right people filled the questionnaires. This made the research findings more unbiased and reliable.

4. Research Findings and Data Interpretation

4.1. Effect of Physical Resource Control on Coffee Project Performance

 Allocation of limited resources is based on the priority given to each of the project activities.

4.1.1. Project Machines Control

The results obtained showed than the computed mean was greater than test value 3 which was 4.50 with 0.572 of Std. Deviation. This implied that the statement 'the Project Machines Control can influence project performance' was confirmed to be true and to be applied by sustainable Growers Rwanda.

4.1.2. Project Tools Control

The research findings obtained showed that the calculated mean from data collected was greater than test value 3, which were 4.10 with Std. Deviation of 0.481 at 95% of confidence interval. Hence, the statement 'Project Tools Control can influence coffee project performance' was accepted and confirmed.

4.1.3. Project Equipment Control

The mean from the results computed was greater than hypothesized value 3 as shown in table above (Mean=4.13; P-value<0.05) with 0.571 of Std. Deviation which implied that the statement 'The Project equipment control can influence coffee project performance of sustainable growers performance' was accepted.

Therefore, project machines, tools, and equipment as resource control indicators were all confirmed to influence the performance of the agricultural project in Sustainable Growers Rwanda as shown in the table below.

|                  | N  | Min | Max | Mean | Std. Deviation | Variance |
|------------------|----|-----|-----|------|----------------|---------|
|                  | Statistic | Statistic | Statistic | Statistic | Std. Error | Statistic | Statistic |
| Project Machines Control | 30 | 3   | 5   | 4.50 | .104 | .572 | .328 |
| Project Tools Control | 30 | 3   | 5   | 4.10 | .088 | .481 | .231 |
| Project Equipment Control | 30 | 2   | 5   | 4.13 | .104 | .571 | .326 |

Table 1: Descriptive Statistics of Physical Resource Control and Coffee Project Performance

4.2. Correlation between Physical Resource and Coffee Project Performance

The Correlation revealed that machines control, tools control and Equipment control were positively and significantly correlated to the coffee project performance (r=.121**, p<0.01), (r=.403*,p<0.05)and (r=.170**, p<0.01). This indicated sufficient evidence that the three variables have potential to increase coffee project performance if well addressed within the project. The Correlation analysis also indicated a positive and significant relationship between machines control and tools control (r=.564**, p <0.01), machines control and Equipment control (r=.105, p <0.05) and tools control and equipment control (r=.201,p<0.05).

The below table shows the Pearson coefficients of correlation between physical resources control and project performance.
Zairra & Narimah (2017). In their research, there are other several variables that either to succeed or fail (Zairra & Narimah, 2017) in their study. The future researches are required to evaluate other elements of resource control and project performance. The future researches will be conducted. This study can help them to conduct other researches separately, since there are other several variables that can make an impact on project performance for any particular organization. And for future researchers, this study can help them to conduct other researches separately, since there are other several variables that can make an impact on project performance for any particular organization.

Other studies that seek to illustrate how the variation in project performance can be explaining by controlling the different resources within the coffee project should be conducted. This research was only carried out on one coffee project named sustainable growers Rwanda. Thus, the results cannot be generalized to fit all projects. More researches will be required for different projects to gain better understanding the determinants of project performance. The future researches are required to evaluate other elements of resource control and project performance.

5. Discussions of the Results
The research findings obtained were supported by the results from the study of Zairra & Narimah (2017). In their study, they confirmed that the physical resources management is an important element in project management since materials contribute a major portion to the total project cost. It also plays a key role because of the successes of every agricultural project rely on having proper resources; thus, it gives implication on project performance (Zairra & Narimah, 2017). The key criteria of project performance affected due to material management. Generally, the criteria of project performance are identified perspective effects (Zairra & Narimah, 2017).

The findings were also supported by Hillman (2014) who considered physical resource control as an economic or productive factor required to accomplish an activity, or as means to undertake and achieve desired outcomes of any particular firm (Hillman, 2014). For the case with a constraint on the number of physical resources, Barney (2010) stated that a firm should create the most efficient schedule possible by minimizing project duration and maximizing the use of the physical resources available. Physical resources are physically consumed in the completion of a task, as opposed to equipment used to complete a task. When you assign physical resource, you specify the way it is consumed. With variable Physical consumption, the quantity of Physical consumed changes as task duration changes (Barney, Is Resource-Based View a useful perspective for strategic management research?, 2010).

Akpan & Chizea (2002) in their study argued that the strategies, policies in existence by governments for developed and developing countries show that physical resources planning practices in projects undertaken by various organizations using different approaches could make the said project either to succeed or fail (Akpan & Chizea, 2002).

6. Conclusions and Recommendations
Under the physical resources control, the research findings indicated that the calculated average of this indicator was greater than the test value 3 which was 4.50 and a standard deviation of 0.572. This implied that a better control of project machines could influence project performance. The mean of the project tools control was 4.10 with a standard deviation of 0.481, implying that a good control of the machine tools had an effect on the performance of the coffee project. The findings of project Equipment Control had shown a mean of 4.13 at P-value 0.05 with 0.571 of standard deviation which implied that this indicator played a major effect on coffee project performance of sustainable growers Rwanda. As results showed, all these indicators were significant with a positive correlation to the project performance of Sustainable growers Rwanda.

The study recommends the project members to take initiative in resource control. A researcher recommends to whom it may concern to control well the machines, tools and other equipment of the organization. And for future researchers, this study can help them to conduct other researches separately, since there are other several variables that can make an impact on project performance for any particular organization.

Other studies that seek to illustrate how the variation in project performance can be explaining by controlling the different resources within the coffee project should be conducted. This research was only carried out on one coffee project named sustainable growers Rwanda. Thus, the results cannot be generalized to fit all projects. More researches will be required for different projects to gain better understanding the determinants of project performance. The future researches are required to evaluate other elements of resource control and project performance.

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