Journal of Entrepreneurship & Project Management


# Community Participation and Project's Performance of Solar Power Project in Rwanda: A Case of Rwamagana Photovoltaic Solar Power Plant

**Mr. Fabien Izabayo & Dr. Gitahi Njenga**

**ISSN: 2616-8464**

**Stratford Peer Reviewed Journals and Book Publishing**
**Journal of Entrepreneurship & Project Management**
**Volume 6||Issue 2||Page 42-59 ||May||2022|**
**Email: info@stratfordjournals.org ISSN: 2616-8464**

# Community Participation and Project's Performance of Solar Power Project in Rwanda: A Case of Rwamagana Photovoltaic Solar Power Plant

**[1*]Mr. Fabien Izabayo & Dr. Gitahi Njenga**

**[1] School of Business and Economics, Master of Business Administration (MBA), Project Management, Mount Kenya University, Kigali, Rwanda**

**[2]Mount Kenya University, Kigali, Rwanda**

***How to cite this article*: Izabayo F. & Njenga G. (2022). Community Participation and Project's Performance of Solar Power Project in Rwanda: A Case of Rwamagana Photovoltaic Solar Power Plant. *Journal of Entrepreneurship & Project Management. Vol* 6(2) pp. 109-131.** https://doi.org/10.53819/81018102t2064

## Abstract

The main purpose of this research was to investigate Communities' participation and project's performance in Rwamagana photovoltaic solar power plant. This study used descriptive survey research with target population of three hundred and eighty (380) respondents. A Sample size of seventy-nine (70) respondents were determined using Nassiuma (2001) formula. Simple random sampling technique made the basis for selection of respondents from sample size. The researcher used drop and pick later method to distribute the study questionnaires. Data collected were coded and analyzed using descriptive (percentages and frequencies) while concept of statistics such regression and correlation analysis was used to determine relationships between the independent and dependent. The study's results obtained indicate that project selection had moderate positive correlation (r =0.411 with a P value = 0.000) project planning had moderate positive correlation (r =0.366 with a P value = 0.000) while project execution had moderate positive correlation (r = 0.391 with a P value = 0.000) with project performance. The study further found that indicate that when independent variables (Project execution, Project planning and = Project selection) were held constant project performance is 1.000. a unit increase in project selection would lead increase project performance by 0.721 with P value of 0.000 a unit increase in project planning would lead increase project performance by 0.698 with P value of 0.000 while unit increase in project execution would increase project performance by 0.946 with P value of 0.000. The study draws a conclusion that all project should continue to use project selection, project planning and project execution identify and assess project performance. In addition, the study concludes that a project management team should identify the specific elements contributing to the project performance regard to how the project owners determine a project's performance. The study recommends Rwamagana photovoltaic solar power plant to continue applying project selection, project planning and project execution process how they will involve Communities to assess projects before they are implemented. It is very crucial to involve Communities on all project stages. Project management team at Rwamagana photovoltaic solar power plant should identify specific elements contributing to the project

Stratford Peer Reviewed Journals and Book Publishing
Journal of Entrepreneurship & Project Management
Volume 6||Issue 2||Page 42-59 ||May||2022|
Email: info@stratfordjournals.org ISSN: 2616-8464

performance. Finally, the study recommends Rwamagana photovoltaic solar power plant to establish another performance measuring tool to be used to analyze and evaluate all potential projects before resources are allocated. The study recommends future researchers to conduct research on the influence of community participation on project performance.

**Keywords:** *Community Participation, Project Performance, Solar Power Project, Rwanda*

## 1. Introduction

One of the main factors of economic development of different countries is project performance. A number of projects implemented at high costs regularly manage to comprehend the challenges of project performance. Bigger developmental institutions such as bilateral aid agencies, Asian Development Bank and World Bank have greatly revealed their apprehension on the issue of project performance. Based on numerous recent studies conducted on project execution show serious incessant project performance where on the other side tendency with pole execution performance is relatively unsatisfactory progressively and a few projects are able to be sustained.

Peter *et al.,* (2015) said that communities and the entire community are only regarded as the beneficiaries and taken as hurdle in the executing phase of a given project. In many cases, project's executing personals face challenges wherever Communities and members of the community participate in all phases of the project when they have inadequate skills, required competences and enough knowledge of project management (Green hall & Revere, 2014). If local people are allowed to actively participate in all phases of project lifecycle, this will help and facilitate a project to be able to meet and achieve its target objectives especially social and community development projects (Daphy, 2011). According to Bal (2013) and Ndengwa (2015) in their respective studies, they stated that most projects have been successful and be able to achieve their desired objects because they have allowed Communities to actively participate in stages of project decision making process. In addition, their findings concluded that allowing Communities to fully participate in all phases of a project contribute to project performance especially the donor funded projects. However, Bal (2013) and Ndengwa (2015) in their studies lacked description and explanation to explore how Communities' participation lead to project performance.

Further studies were conducted in East Africa to reflect on contribution of Communities' participation in a project's performance and among them were done by Havly *et al.,* (2011) and Freeman (2014). Their studies presented responsibilities and contributions of Communities' involvement in leading to project performance. They said that if Communities are fully allowed to freely participate in all phases of a project and not only in early phases of the project implementation in which their participation is considered as consultancy. In addition, Communities should not only be informed the project's status and progress but instead should be involved in participating and making all project decisions.

### 1.1 Objectives of the study

#### 1.1.1 General objective

The study's general objective was to assess influence of community participation on project performance of Photovoltaic solar power plant with a case of Rwamagana Photovoltaic solar plant.

Stratford Peer Reviewed Journals and Book Publishing
Journal of Entrepreneurship & Project Management
Volume 6||Issue 2||Page 42-59 ||May||2022|
Email: info@stratfordjournals.org ISSN: 2616-8464

### 1.1.2 Specific Objectives of the Study

(i) To assess how project selection influences project performance on Rwamagana Photovoltaic solar power plant.

(ii) To assess how project planning influences on project performance of Rwamagana Photovoltaic solar power plant.

(iii) To investigate how Project execution influence on project performance of Rwamagana Photovoltaic solar power plant

### 1.1.3 Research Hypotheses

H01: There is no significant role of consultative planning on performance of funded projects in Rwanda;

H02: Collective implementation has no significant role on the performance of funded projects in Rwanda

H03: Joint monitoring has no significant relationship with performance of funded projects in Rwanda.

## 2.1 Empirical Literature Review

### 1.1 2.2.1 Project selection and Project Performance

Communities of given project are those specific groups, and persons that are directly affected, impacted by project that is in pipeline to be executed, to be accomplished that in the long run will influence the project objectives and results. A project's Communities have a pale in a project achieving its objectives. Project Communities have a right to participate in implementation where in many cases their participation is either by interest; right to participate in which most cases rights to participate might exist as legal or ethical ownership in circumstances

Carol, Cohen and Palmer, (2013) studied Project risk identification and management Communities take benefit for having their prospects and opportunities comprehended and accomplished through suitable communication channels to line with the project management team and ensure all communities understand and provide support to the project. This is because during project planning and initiation process, that's where the nature and scope of the project are determined and set.

Nijkamp *et al.,* (2016) said that once planning and project initiation phases are not well performed in the right approach, the chances of a project to succeed are less. For a project to be initiated and implemented, there should first be a common understanding of the environment of that project and ensure all the required specifications are assimilated in the project. Project managers should be able to identify, report and make right recommendations to overcome those issues (Albert, 2013). Activities such as selecting a given project that best fits to the problem being targeted to be solved, reflecting the value of the project, allocating the project to a specific project manager, setting and defining the project objectives, establishing source of investment capital, doing the financial, social and economic analysis of benefits and costs associated, and carrying out community analysis all are established in the planning and initiation phase of the project being targeted to be implemented. For a project management team to be able to deal with the project's impact, they have to first identify their respective power, proximity and determine the influence of the project (Curley, Steve & Ricky, 2012). A project's execution process involves identifying Communities, assigning individuals to activities and tasks to be completed leading to the achievement of the project. In addition, project team determines suitable and applicable strategies that they can use to

enhance the positive influence of Communities. Failure of project managers to establish different fundamental risk management measures might make it for the project to succeed and be able to achieve the set objectives (Malunga & Banda, 2011).

### 2.1.2 Project Execution and Project Performance

Chandra (2010) noted that projects implementation is an important activity in many organizations which serves as a strategy for performance and continuous improvement of projects. Similarly, development sectors such as infrastructure renewal, urban regeneration, and community development, project management practices are becoming increasingly important since good organization and management of projects helps in developing related sectors (Kerzner, 2017). Project implementation Practices are activities that are exercised by the project managers that ensure project performance. They include initiating, planning, executing, monitoring and controlling communication systems to ensure project performance (Winter, *et al.* ,2006) implementation practices help in organizing and implementing resources in such a way that resources deliver all the work required in completing the project within the defined scope, time and cost constraints.

World Bank Report (2007) indicated that the leaders and governments around the world are recognizing the importance of project implementation in realizing strategic management objectives. The implementation are known to create an understanding of the application of the required skills, tools and techniques to project activities which is important in delivering expected benefits. Stare (2011) reveals that implementation issues affecting projects include effective planning, effective monitoring and evaluation (M&E), effective project team, proper project scoping, realistic requirement, delays in release of funds for the project, management support and right commitment to the project, community participation and user involvement, demand on project resources by certain key stakeholders, proper feasibility study, adequate basis for the project.

The implementation exercised within the project group like project planning, project management practices, communication management, monitoring, and evaluation are seen to be endogenous while others implemented out of the organization but affect the performance of the projects like environmental enablers and political environment form part of exogenous implementation (Grisham, 2006). Project implementation entails the execution and actualization of all the activities given in the planning of projects. It takes 80-85% of all the project activities and resources utilization. It requires a combination of techniques, procedures, people and systems focused on the successful completion of a project (Meredith & Mantel, 2010). Due to its significance, there is a great need for coordination, monitoring and controlling together with the application of all techniques of project management. It is in this phase that planning effort, change management, communication management, and motivation is also exercised as part of project management practices. Project implementation includes hiring the required skills, training some of the people without necessary skills, assigning responsibilities, and establishing performance standards as well as the reporting process

### 2.1.3 Project Planning and Performance Project

Project planning refers to the phase of project design that involves defining work requirements of the project, project objectives, establishing resource specifications for the project, allocation of available resources, setting project schedule, risk management analysis

and establishing measures to control and overcome risks associated to the project. Having said this, all Communities of the project should all participate in the planning phase in that it helps a project manager to strengthen and make implementation process easy. According to Harold (2013), stakeholder participation in the planning phase facilitates project managers to clearly understand roles and places, develop milestone, scope of the project, allocating people to tasks and activities, establishing which deliverables to be achieved, developing work structure, project schedule development, determining which resources are required, setting project timeframe, estimating associated project costs, risk planning, seeking all the approvals before the project is implemented (Rosario, 2012).

Addition to this, project planning is a critical phase before a project is implemented in that it establishes different responsibilities and roles of the involved Communities so to be able put in place a warm and favorable working environment for the project team. Project plan and milestone reviews are the most common techniques or tools employed in the planning phase of a given project. A project's planning process consists of full commitment of different Communities in the. During the planning process of a project, a project manager prepares a project budget, set objectives to each participant and plan works (Madeeha and Imran, 2014). This role is ensured by the management and control of major project and public procurement in Guinea. They advise and assist Government or organizations in preparation and management of different projects stakeholder. There are other operating departments which approve project budget, schedule and work plan in their respective fields. Finally, the logic behind of engaging Communities in planning stage is to deliver successful and sustainable projects through identifying, analyzing, scheduling, coordinating, controlling every factor that could influence performance of the project.

**2.1.3 Community Participation and Performance of Project**

King'ori (2014) in his research inspected what leads to a successful expansion of initiatives and his findings concluded that communities should actively contribute cash or any other kind of support. This in return helps to exploit the available local resources so as to be able to reduce dependence on outside resources, create sense of ownership by the community, guarantees no outside influences alter already made choices, and appropriately determine desires of the final project beneficiaries. Based on how efficient and effective Indonesian projects about water supply in the country in 1980's and 1990's, Chifamba (2013) established that when Communities actively participate in implementation of the project, it increases the success rate of the project. Guaranteeing transparency concerning contribution of each individual member of the community regarding the project leads to a decrease in habit of joy showjumping of the a few Communities of the project.

Furthermore, Chifamba (2011) in his research about the influence of community involvement in a project focusing on projects from the northern Pakistan, his findings indicate that community involvement is not in all cases beneficial and it's not a must a project's success depend on their participation as whole. However, different other studies were conducted by the same author indicate that full community participation is necessary. Correspondingly (Chifamba, 2013) studied the 3 projects and witnessed the following: in El Salvador, the bridge project received much of funding from the community when it was constructed. The project went on to be very successful due to the contributions of the community and also the government in the (Ofuoku, 2011) design and construction.

The final product was of very high quality and the project was found functional after it was assessed a few months after the project's implementation. Honduran waste water project was able to succeed because the project beneficiaries managed to contribute cash and equipment to be used in the implementation of the project and this was as a result of project ownership by the community. A different bridge project in Honduras took the biggest cash portion contribution from local municipality and appreciated sourcing of employment locally and results indicate that the success of the project depended on community ownership.

Therefore, this kind of community ownership results into performance of the project. Community's participation and involvement in all stages of decision-making process of the project empowers and builds capacity of the project Communities (King'ori, 2014). Therefore, different findings by other scholars indicate that community cash contributions is among one of the greatest factor guaranteeing a project's operation success, while as non-cash contributions like community inputs on decision-making, monitoring and evaluation.

### 2.2 Research gap

The project study concentrated on knowledge gap by telling in details contribution of role played every stakeholder in guaranteeing performance of donor funded projects at Rwanda photovoltaic solar power plant. There is weakness associated with this theory is multiple inclusions. This is where some Communities belong to more than one group. The problem with multiple inclusions is that people with different roles across different groups within a project may end up influencing the project multiple times within the various stages (Meridith, 2009). The theory has also been said to be subjective in its categorizations where analysis groups have the potential of being affected by their backgrounds as well as the interaction with their colleagues and the environment (Morrow, 2006). Because Communities' influence, powers and interests keep changing in each stage, there is always a problem when generalizing.

Kaur (2013) community participation in development projects in Philippines ran irrigation projects. While the summary of results is that the study established that influence of contribution on productivity, resource management and obligation of local groups were substantial thus research gap of the study was conducted in developed countries and did not focus on local case the study did not itemize on the different areas of community participation. Agarwal (2014) did a research on Gender and forest conservation. Summary of findings was the influence of women involvement in communal forest governance joint administration between conservator and the community one village increased production planting and protecting teak and bamboo trees was enhanced therefore the research gap identified, Study was conducted in a field that is not in water and as well it was not conducted in local society.

Prokopy (2015) did research on connection between stakeholder participation and project results and his findings of this study indicate that participation by people through the decision-making process of all stages of a given project starting with the design till the level of maintenance contributed greatest results happened from rural water supply projects in India. Therefore, the research gap identified of the study focused on community participation into the different stages and failed to focus on life of the project after donors exit.

### 2.3 Conceptual Framework

The Conceptualizing a framework refers to a diagram that demonstrate the relation existing between the study variables. In this case, this conceptualized framework shows how related is

Stratford Peer Reviewed Journals and Book Publishing
Journal of Entrepreneurship & Project Management
Volume 6||Issue 2||Page 42-59 ||May||2022|
Email: info@stratfordjournals.org ISSN: 2616-8464

the independent variable known here as participation of stakeholder and dependent variable known as project performance of solar power plant.

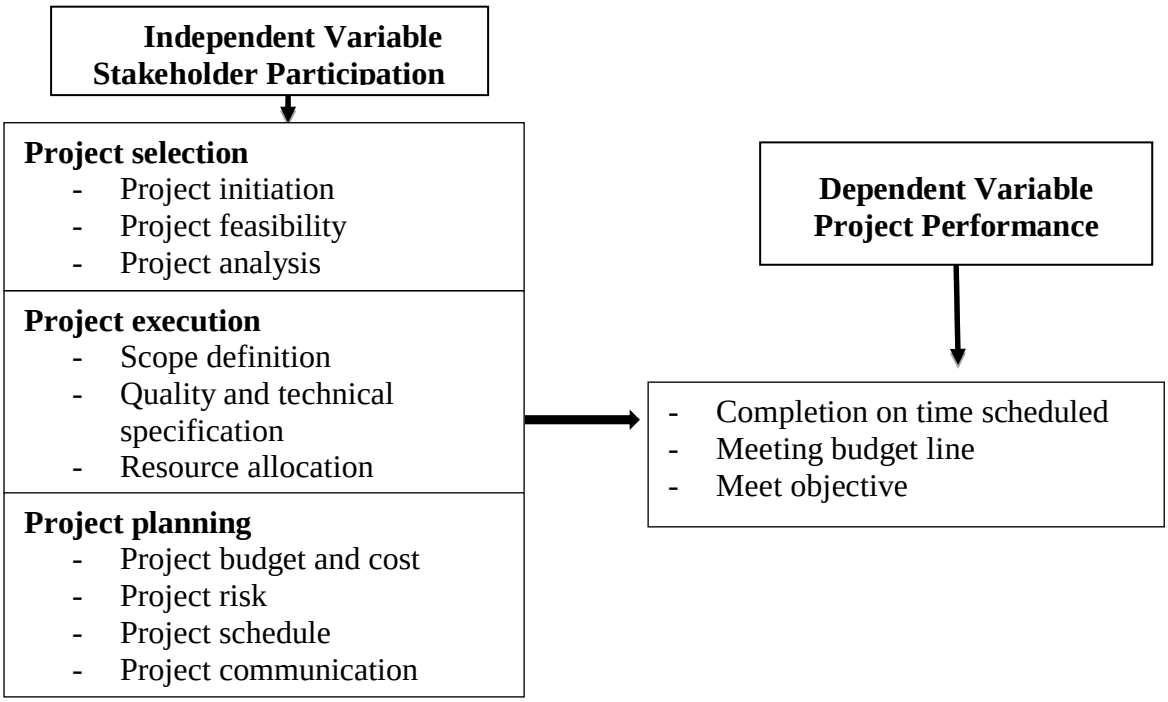


**Figure 1: Conceptual Framework**
**Source: Researcher, 2022**

Figure 1 Project selection is one of independent variables where the stage of identification has some activities project manager has to think about such as project initiation, project feasibility, project analysis. All those activities under project identification have direct impact on project performance.

Secondly, project planning is also independent variable where it has some activities that affect directly project performance those activities are project budget and cost, project risk, project schedule and project communication where all those above activities are performed Communities, thirdly project execution is also independent variable where scope definition, quality and technical specification and resource allocation affect project performance good way or bad way depending on level of performance. All those independent variables support completion on time of the project, meeting the budget of the project and meet objectives of the project and all those three activities lead to project performance. Moderating variables such as government policy on new project and level of project funding are always to support both independent and dependent variables.

## 3. Materials and Methods

The descriptive research survey was used. This was used because a descriptive survey design identifies the characteristics of study concepts (Lewis &Thornhill, 2017). This research design allows the researcher to clearly define the variables they want to measure using a clear definition of that population they seek to measure. This research design was the right choice for this research in that it facilitated to interpret data collected to reflect the influence of Communities' participation on project's performance in Rwanda. The study's population was 380 Communities who are the project beneficiaries. Thus, 75 respondents were selected using the formula of Naissuma formula simplified by Gathii *et al.*, (2019) and simple random

Stratford Peer Reviewed Journals and Book Publishing
Journal of Entrepreneurship & Project Management
Volume 6||Issue 2||Page 42-59 ||May||2022|
Email: info@stratfordjournals.org ISSN: 2616-8464

sampling. The questionnaire was used to collect the data from the field. Thus, the reason for preferring questionnaires is that they reach a relatively bigger number of respondents and take less time compare to other data collection methods, it is quick method. The open-ended questionnaires make it possible to obtain personal responses from respondents. Because follow up is not necessary when using questionnaires, they are less costly to administer.

Therefore, the primary data were collected using administered questionnaires with a five-point Likert based questions with indicators 1= No Degree, 2 = Small Degree, 3 = Moderate Degree, 4 = High Degree, 5 = Very High Degree. Data were analyzed using descriptive statistics. Data analyses process was composed of different data preparations ways to such as data cleaning, data organization, data description, underlying assumptions testing and creating inferences. Considering that this is a descriptive research, for observation you calculated mean and standard deviation to describe that observations. SPSS which is the statistical product and service solution was used to code and enter quantitative data collected. In addition, table of frequency distribution and percentages was used to analyze qualitative data collected. For the study to be able to test direction and magnitude of relationship of variables, Spearman rank correlation of coefficient was then used due to the fact that the study is using an ordinal scale of measurement which is Likert Scale. Results and findings obtained were presented in narrations and tables. Furthermore, for the study to be able to determine the relationship between both the independent and dependent variables, the study used regression analysis and correlation analysis. Regression equation to be used will be as follows; $Y=\beta_0+\beta_1X_1+\beta_2X_2+\beta_3X_3+ \varepsilon$ where $X_1$ = Project selection, $X_2$ = Project planning, and $X_3$ = project execution.

## 4. Research Findings and discussion

### 4.1. Project selection and project performance

Respondents were asked to rate the influence of project selection on the performance of Rwamagana photovoltaic solar power plant project a scale of 1-5, where Strongly agree=5; Agree=4; neutral =3; strongly Disagree=1 Disagree=2 The percentage means and standard deviations for the variable were computed and presented as shown in table 1.

**Table 1: influence of project selection**

| Project selection related statements | 1 | 2 | 3 | 4 | 5 | Mean | SD |
|---|---|---|---|---|---|---|---|
| Communities participate in project's initiation process that helped in the project's performance | 9.4 | 7.5 | 15.1 | 30.2 | 37.7 | 3.79 | 1.291 |
| Communities involved in project identification | 7.5 | 5.7 | 13.2 | 32.1 | 41.5 | 3.94 | 1.216 |
| Communities have participated in the project's feasibility process that helped in the project's performance | 13.5 | 9.6 | 13.5 | 23.1 | 40.4 | 3.67 | 1.438 |
| Communities participate in the project's project analysis to help project performance | 11.5 | 9.6 | 11.5 | 25.0 | 42.3 | 3.77 | 1.395 |
| Community participation contributes to project identification towards a project's performance | 7.5 | 9.4 | 17.0 | 22.6 | 43.4 | 3.85 | 1.292 |
| **Aggregate** | | | | | | **3.57** | **1.382** |

**Source: Primary Data (2022)**

From table 1 show that majority of respondents 67.9% agreed that communities have participated in project's initiation process that helped in the project's performance with mean

Stratford Peer Reviewed Journals and Book Publishing
Journal of Entrepreneurship & Project Management
Volume 6||Issue 2||Page 42-59 ||May||2022|
Email: info@stratfordjournals.org ISSN: 2616-8464

of 3.79 and Standard Deviation of 1.291while 16.9% disagreed while 15.1% while neither agreed nor disagreed. On statement communities involved in project identification 73.6% agree mean 3.94 with 1.216 standard deviation. Communities have participated in the project's feasibility process that helped in the project's performance 63.5% agree 23.1% disagreed while 13.5% neither agreed nor disagreed on the statement with mean 3.67 with 1.438. On statement that communities have participated in the project's project analysis that helped in the project's performance 67.3 % agree 21.1% disagree with mean of 3.77 with standard deviation 1.395 project selection on the performance of Rwamagana photovoltaic solar power plant project. On statement that the contributions of community participation in project identification towards a project's performance 70% agree 16.9% disagree while 22.6% neither agreed nor disagreed. The overall means with 3.57 with standard deviation 1.382 meaning that project selection influence the performance of Rwamagana photovoltaic solar power plant project.

### 4.2 Project planning and project performance

Respondents were asked to rate the influence of Project planning on the performance of performance of Rwamagana photovoltaic solar power plant project. On a scale of 1-5, where Strongly agree=5; Agree=4; neutral =3; strongly Disagree=2; Strongly Disagree=1 The percentage means and standard deviations for the variable were computed and presented as shown in Table 2.

**Table 2 influence of Project planning on the performance of performance**

| Project planning related statements | 1 % | 2 % | 3 % | 4 % | 5 % | Mean | SD |
|---|---|---|---|---|---|---|---|
| Communities participated in project's budget and cost estimation process | 3.8 | 9.4 | 11.3 | 26.4 | 49.1 | 4.08 | 1.158 |
| Communities participated in project's planning process | 1.9 | 18.9 | 34.0 | 7.5 | 37.7 | 3.60 | 1.230 |
| Communities participated in project's risk management process | 5.7 | 7.5 | 9.4 | 26.4 | 50.9 | 4.09 | 1.197 |
| Communities participated in project's scheduling process | 7.5 | 18.9 | 13.2 | 17.0 | 43.4 | 3.70 | 1.395 |
| Communities have participated in communicating the project's performance updates and status. | 9.4 | 17.0 | 11.3 | 18.9 | 43.4 | 3.1 | 1.422 |
| contributions of community participation in project planning towards a project's performance | 15.1 | 20.8 | 20.8 | 15.1 | 28.3 | 3.21 | 1.446 |
| **Aggregate** | | | | | | **3.43** | **1.308** |

**Source: Primary Data (2022)**

As indicated in Table 2, most of the respondents 75.5% agreed that communities have participated in project's budget and cost estimation process that communities involved in project execution 13.2 % disagreed while 11.3% while neither agreed nor disagreed on the statement with mean of 3.38 and Standard Deviation of 1.390. On statement communities have participated in project's planning process 45.2% agree 20.8 % disagreed while 34.% while neither agreed nor disagreed on the statement mean 3.60 with 1.230 standard deviation.

Stratford Peer Reviewed Journals and Book Publishing
Journal of Entrepreneurship & Project Management
Volume 6||Issue 2||Page 42-59 ||May||2022|
Email: info@stratfordjournals.org ISSN: 2616-8464

On the statement that communities have participated in project's risk management process 77.3% agree 13% disagreed 26.4% while neither agreed nor disagreed on the statements with mean 4.09 with 1.197. On statement communities have participated in project's scheduling process 60.4% agree 26.4% disagreed 13.2% while neither agreed nor disagreed on the statements with mean 3.1 with 1.422. On statement that Communities have participated in communicating the project's performance updates and status 62.3 % agree 26.4% disagree while 11.3% neither agreed nor disagreed with mean of 3.36 with standard deviation 1.1199. On statement that the contributions of community participation in project planning towards a project's performance 43.4 % agree 35.9 % disagree while 20.8% neither agreed nor disagreed with mean of 3.31 with standard deviation 1.260. On the statement that communities have participated in ways in to saves on expenditure Process 62.3% agree 26.4% disagree while 11.3% neither agreed nor disagreed with mean of 3.21 with standard deviation 1.446.

The overall means with 3.43 with standard deviation 1.308 meaning that Project planning slightly influence performance of performance of Rwamagana photovoltaic solar power plant project. The above findings suggested that the involvement of project beneficiaries in planning the project or rather putting project activities in action significantly influenced the performance of Rwamagana photovoltaic solar power plant project. Involvement of Communities in project's budget and cost estimation process this can lead to performance of project. In addition, above findings suggested that the involvement of project beneficiaries in project's risk management process of the project or rather putting project activities in action significantly influenced the performance of the said project.

### 4.2 Project execution and project performance

The third research objective was to find how project execution influenced project performance at Rwamagana photovoltaic solar power plant. Respondents were asked to rate the influence of community participation in project execution influenced project performance at Rwamagana photovoltaic solar power plant. On a scale of 1-5, where Strongly agree=5; Agree=4; neutral =3; strongly Disagree=2; Disagree=1 The percentage means and standard deviations for the variable were computed and presented as shown in Findings were recorded in Table 3.

**Table 3: Project execution and project performance**

| Project execution and project performance | 1 % | 2 % | 3 % | 4 % | 5 % | Mean | SD |
|---|---|---|---|---|---|---|---|
| Communities involved in project execution | 9.4 | 20.8 | 26.4 | 9.4 | 34.0 | 3.38 | 1.390 |
| Communities have participated in project's scope definition | 9.4 | 7.5 | 22.6 | 17.0 | 43.4 | 3.77 | 1.339 |
| Communities have participated in the project's quality and technical specification | 7.8 | 3.9 | 13.7 | 33.3 | 41.2 | 3.36 | 1.199 |
| Communities have participated in the project's resource allocation Process | 5.7 | 11.3 | 15.1 | 22.6 | 45.3 | 3.31 | 1.260 |
| Communities have participated in ways in to saves on expenditure | 11.3 | 15.1 | 11.3 | 28.3 | 34.0 | 3.58 | 1.393 |
| Communities have participated execution and regularly report the progress of the project to management | 26.4 | 9.4 | 24.5 | 17.0 | 22.6 | 3.00 | 1.506 |
| **Aggregate** | | | | | | **3.4** | **1.347** |

**Source: Primary Data (2022)**

Stratford Peer Reviewed Journals and Book Publishing
Journal of Entrepreneurship & Project Management
Volume 6||Issue 2||Page 42-59 ||May||2022|
Email: info@stratfordjournals.org ISSN: 2616-8464

From table 3 majority of respondents 43.8% agreed that communities involved in project execution with mean of 3.38 and Standard Deviation of 1.390 while 30.2% disagreed while 9.4% while neither agreed nor disagreed on the statement. On statement communities involved in project identification 73.6% agree mean 3.94 with 1.216 standard deviation. Communities have participated in project's scope definition 50.4% agree 16.9% disagreed 22.6% while neither agreed nor disagreed on the statements with mean 3.67 with 1.438. On statement communities have participated in the project's quality and technical specification 74.5 % agree 11.7% disagree while 13.7% neither agreed nor disagreed with mean of 3.36 with standard deviation 1.1199. On statement that the communities have participated in the project's resource allocation Process 67.9 % agree 16.8% disagree while 15.1% neither agreed nor disagreed with mean of 3.31 with standard deviation 1.260. On the statement that communities have participated in ways in to saves on expenditure Process 62.3% agree 26.4% disagree while 11.3% neither agreed nor disagreed with mean of 3.58 with standard deviation 1.393.

On the statement that Communities have participated execution and regularly report the progress of the project to management 39.6% agree 35.8 % disagree while 24.5% neither agreed nor disagreed with mean of 3.00 with standard deviation 1.508. The overall means with 3.4 with standard deviation 1.3472 meaning that project execution has slight influence on project performance at Rwamagana photovoltaic solar power plant. The findings showed that during execution stage there were small number of community members who participated at execution stage of Rwamagana photovoltaic solar power plant project. A big number of participants at site were from a broad hence performance of the project was not guaranteed. The findings suggested that with high level of participation on Communities at stage of identifying the scope of project it can lead to performance of the project which is the factor that lacked at Rwamagana photovoltaic solar power plant.

Findings suggested that the involvement of community beneficiaries in project's quality and technical specification influences project performance at Rwamagana photovoltaic solar power plant project. Local people were participating in construction of project after getting training from the management, they were supervised to meet technical specification. The findings suggested that respondents were actively in execution especially in allocating resources during implementation. Small group had no information on what is executed at the site and it was shown that with high level of participating in execution of project that can lead to the performance of the project especially at Rwamagana photovoltaic solar power plant project.

**4.4 Performance of project**

Respondents were asked to rate the in Performance of project of Rwamagana photovoltaic solar power plant project. On a scale of 1-5, where Strongly agree=5; Agree=4; neutral =3; Strongly Disagree=1; Disagree=2 The percentage means and standard deviations for the variable were computed and presented as shown in Table 4.

**Table 4: Performance of project**

| performance of performance | 1 % | 2 % | 3 % | 4 % | 5 % | Mean | SD |
|---|---|---|---|---|---|---|---|
| Project completed on time scheduled | 20.3 | 6.4 | 29.3 | 21.1 | 23.9 | 3.38 | 1.168 |
| Project is able to meets desired objectives | 49 | 47 | 0 | 4 | 0 | 2.60 | 1.230 |
| Completed and achieved within the budget | 5.7 | 7.5 | 9.4 | 26.4 | 50.9 | 4.09 | 1.197 |
| **Aggregate** | | | | | | 3.35 | |

https://doi.org/10.53819/81018102t2064

Stratford Peer Reviewed Journals and Book Publishing
Journal of Entrepreneurship & Project Management
Volume 6||Issue 2||Page 42-59 ||May||2022|
Email: info@stratfordjournals.org ISSN: 2616-8464

As indicated in Table 4, most of respondents 44% had agreed that on management of time regarding to completion of the project where by which of respondents participated in completion of project based on schedule, 29.3% of respondents had neither agreed nor disagreed , 26.7% of respondents disagreed that completion of project based on time planned with mean of 3.38 and standard deviation of 1.168. The above findings suggested that the involvement of project beneficiaries in completion of project based on project schedule or rather putting project activities in action significantly influenced the performance of the said project.

On statement that Project is able to meets desired objectives, 96% of respondents did not agree with statement while 4% of respondents dis agree with mean of 2.06 and standard deviation of 1.230. The above findings suggested that the involvement of project beneficiaries in communicating achieved project objectives or rather putting project activities in action significantly influenced performance of the said project. Finally, on statement that completed and achieved within the budget 77.3% agreed, 26.4 % neither agreed nor disagreed while 13.2% disagreed with mean of 4.09 and standard deviation of 1.197.

## 4.2 Inferential Statistics

### 4.2.1 Correlation Coefficient Analysis

For the study to determine a relationship between dependent and independent variables, regression analysis was used to determine the co-variation of the variables towards their direction and change. Mugenda and Mugenda (2003) said that for every measurement in each variable (y), there is a corresponding value for the other variable (x). Correlation analysis on the other hand was conducted to determine the level of relation between the dependent and independent variables. Therefore, correlation analysis illustrates the cause and effect, strength and direction of the two variables. It gives the Pearson's coefficient value (correlation test) and the significance value (measuring significance of the association). In this study, the Pearson r statistic is used to calculate bivariate correlations Values between 0 and 0.3 (0 and -0.3) indicate no correlation (variables not associated), 0.3 and 0.5 (-0.3 and -0.5) a weak positive (negative) linear association, Values between 0.5 and 0.7 (-0.5 and -0.7) indicate a moderate positive (negative) linear association and Values between 0.7 and 1.0 (-0.7 and-1.0) indicate a strong positive (negative) linear association. The significance of the relationship is tested at 95% level with a 2-tailed test where a statistically significant correlation is indicated by a probability value of less than 0.025

**Table 5: Correlation Coefficients between community participation and Project performance**

| | | Project selection | Project planning | Project execution |
|---|---|---|---|---|
| Project performance | Pearson Correlation | .462** | .296** | .411** |
| | Sig. (2-tailed) | 0.00 | 0.00 | 0.00 |
| | N | 75 | 75 | 75 |

** Correlation is significant at the 0.01 level (2-tailed)

**Source: Primary Data (2022)**

Correlation analysis was also used to determine the relationship between the community participation and project performance The study assessed relationship between project selection and project performance and gave moderate positive correlation (r =0.411 with a P

value = 0.000 ), between project planning and project performance (r=0.296 with a P value =0.00) and between project execution and project performance (r = 0.391 with a P value = 0.000) have a positive and moderation correlation. Hence, this implies that there is a positive and moderate relationship between community participation and performance of voltaic solar energy plan project in Rwamagana District, Rwanda.

### 4.2.2 Regression analysis

The study used both regression analysis and correlation analysis to come to conclusions based on the data collected from the respondents. The study used SPSS to code, tabulate and compute measurement of multiple regressions. Regression analysis was used to determine the influence of the predictor (Independent variable). In a more summarized way, reports OLS results for study as follows

**Table 6: Model Summary**

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate |
|---|---|---|---|---|
| | **0.894[a]** | **0.841** | **0.831** | **0.09852** |

b. Predictors: (Constant), project selection, project planning and project execution.

**Source: Primary Data (2022)**

Coefficient of determination (R squared) was computed to determine variation of the dependent variable caused by the independent variable The R-squared assumes that every independent variable justifies variation on dependent variable (project performance). On the other hand, the Adjusted R square expresses the variation justified by independent variables expressed in percentages. From Table 6, R-square is 0.831 showing that independent variables explain 83.1% of the influencers of project performance by using project selection, project planning and project execution at a confidence interval of 95%while other factor not studied contribute 17.9%. Therefore, results obtained reflected a positive relationship between the dependent and independent variables. R is the correlation coefficient, which shows the relationship between the study variables. The findings show that there was a strong positive relationship between the study variables as shown by 0.894

**Table 7: ANOVA**

| Model | Sum of squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|
| Regression | 5.346 | 3 | 1.789 | 9.221 | 0.000[b] |
| Residual | 0.842 | 72 | 0.194 | | |
| **Total** | **6. 188** | **75** | | | |

**a.** Dependent Variable: Project performance,

b. Predictors: project selection, project planning, and Project execution.

**Source: Primary Data (2022)**

From the ANOVA statistics in table above, the processed data, which is the population parameters, had a significance level of 0.05 which shows that the data is ideal for making a conclusion on the population's parameter as the value of significance (p-value) is less than 5%. Shows that model was significant since the p-value was less than 0.05without the interaction term the ariables predicted project performance, F (3, 72) = 9.221, < 0.05. The significance value was less than 0.05 an indication that the model was statistically significant.

Stratford Peer Reviewed Journals and Book Publishing
Journal of Entrepreneurship & Project Management
Volume 6||Issue 2||Page 42-59 ||May||2022|
Email: info@stratfordjournals.org ISSN: 2616-8464

**Table 8: Regression Coefficients**

| Model | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. |
|---|---|---|---|---|---|
| | B | Std. Error | Beta | | |
| **(Constant)** | 1.000 | 0.74 | | 0.000 | 1.000 |
| Project selection | 0.721 | 0.087 | 0.741 | 8.147 | 0.000 |
| Project planning | 0.698 | 0.076 | 0.583 | 9.184 | 0.000 |
| Project execution | 0.946 | 0.096 | 0.967 | 9.854 | 0.000 |

**Source: Primary Data (2022)**

The study used multiple regression to be able to predict project performance from project selection, project planning and project execution. From Table 8, unstandardized coefficients reflect the level at which dependent variable changes in relation to each independent variable when other factors of the independent variables remain constant.

The equation $Y=\beta_0+\beta_1X_1+\beta_2X_2+\beta_3X_3+\varepsilon$ becomes

$Y = 1.000 + 0.721\ \mathbf{X_1} + 0.698\ \mathbf{X_2} + 0.946\ \mathbf{X_3}$

Where

$X_1$ = Project selection
$X_2$ = Project planning
$X_3$ = Project execution

The result indicate that when independent variables (Project execution, Project planning and = Project selection) were held constant project performance is 1.000. a unit increase in project selection would lead increase project performance by 0.721 with with P value of 0.000 a unit increase in project planning would lead increase project performance by 0.698 with P value of 0.000 while unit increase in project execution would increase project performance by 0.946 with P value of 0.000

### 4.4 Hypothesis Testing

The first null hypothesis was to $H_{01:}$ Project selection has no statistically significant influence on project performance of Rwamagana photovoltaic solar power plant project. . Based on Table 8 results obtained indicate that project selection had P = 0.000 < 0.05 hence we fail to reject null hypothesis and conclude that Project selection has no statistically significant influence on project performance of Rwamagana photovoltaic solar power plant project.

The second null hypothesis was to $H_{02:}$ Project planning has no statistically significant influence on project performance of Rwamagana photovoltaic solar power plant project. . Based on Table 8 results obtained indicate that project planning had P = 0.000 < 0.05 and in hence we fail to reject null hypothesis and concluded that project planning has no significant influence on project performance of Rwamagana photovoltaic solar power plant project. .

The third null hypothesis $H_{03:}$ Project execution has no statistically significant influence on project performance of Rwamagana photovoltaic solar power plant project. Based on Table 8 results obtained indicate that project execution had P = 000< 0.05 and hence we fail to reject null hypothesis and concluded that project execution has significant influence on project performance of Rwamagana photovoltaic solar power plant project.

https://doi.org/10.53819/81018102t2064

Stratford Peer Reviewed Journals and Book Publishing
Journal of Entrepreneurship & Project Management
Volume 6||Issue 2||Page 42-59 ||May||2022|
Email: info@stratfordjournals.org ISSN: 2616-8464

### 5.1 Conclusion

In conclusion, this project focused on community participation on project performance at Rwamagana photovoltaic solar power plant, the study can conclude that for organizations to implement and run a given project successful, they have to allocate resources in form of money, time and dedication to run operation as required. To be able to complete a project in budget range and time frame, the organizations have to set smart objectives and goals.

On project selection based on the findings, the study concludes that for any project before it implements or invests in any project, project selection should be the key in project cycle.

On project execution it can be conclude projects execution is an important activity in many organizations which serves as a strategy for performance and continuous improvement of projects. Implementation help in organizing and implementing resources in such a way that resources deliver all the work required in completing the project within the defined scope, time and cost constraints. Communities actively participate in implementation of the project; it increases the success rate of the project. Guaranteeing transparency concerning contribution of each individual member of the community regarding the project leads to a decrease in habit of joy showjumping of the a few Communities of the project.

On project planning the study can conclude that project planning process requires all involved communities of the project to develop a baseline plan that includes explanation of resources and their allocations, different methodologies of how the project will be delivered and time schedule. Proper project planning should analyze different phases of activity and this in the long run helps project managers to be able to separately evaluate each project results to each small increment. For project planning phase to be fully completed, all involved project Communities have to actively participate in all decision-making process of phases.

### 5.2 Recommendations

This project focused on community participation on project's performance at Rwamagana photovoltaic solar power plant in Rwamagana district. The researcher finished this work by the following recommendations.

Photovoltaic solar power plant in Rwamagana district management should applied to seek to go- ahead for the actions and also facilitate in early detection of losses into the projects so that resources can be judiciously utilized in the appropriate way. Another widely applied approach for appropriate selection of measures in project management is iron triangle.

Government of Rwanda should get involved in some projects so that beneficiaries are considered during primary phases of the project, projects are operated in environment surrounded by community therefore it is very critical to involve of Communities for purpose of project performance.

Rwamagana photovoltaic solar power plant project should involve all Communities of the project at all stages of the project. During selection of the project owners of the project should think who are going to participate in the project that is the stage where members of community should start to be thought. They should ask them their expectation of the project. Donors of the project should focus on project planning if project performance an objective.

Rwamagana photovoltaic solar power plant project management should allow Communities actively participate in implementation of the project; it increases the success rate of the project. Guaranteeing transparency concerning contribution of each individual member of the

community regarding the project leads to a decrease in habit of joy show jumping of the a few Communities of the project.

### 5.3 Acknowledgement

This research would not been achieved without invaluable contribution from different people, to the people I want to thank with my gratitude to what they have done in my academic journey. I am humbly thanking all people not appearing on this page of acknowledge, but who would have contributed actively and passively in the realization of my education as well as this work.

## References

Agarwal, B. (2014). *Gender and forest conservation: The impact of women's participation in community forest governance. Ecological Economics, 68(11), 2785-2799. https://doi.org/10.1016/j.ecolecon.2009.04.025*

Albert, H. (2014). *Handbook of Project Management Procedures. England: TTL publishing Ltd.century Report.*

Bal, M., Bryde, D., Fearon, D. and Ochieng, E. (2013).*Communities Engagement Achieving Performance in the construction sector, ISSN 2071-1050. https://doi.org/10.2139/ssrn.2622147*

Carol, Y., Cohen, M.W. & Palmer, G.R. (2004).*Project risk identification and management, AACE International Transactions.*

Chifamba, E. (2013).Confronting the Challenges and Barriers to Community Participation in Rural Development Initiatives in Duhera District, ward 12 Zimbabwe. *International Journal of Current Research and Academic Review, 1(2): pp 01-19.*

Curley, M. Steve and Ricky, (2006). *Voluntary Management; Mobilization of the Community Resources, 195.*

Kaur, S. (2013). *Community participation in development projects in Philippines irrigation Projects.* Washington, DC: World Bank.

King'ori, A.N.(2014). *Influence of community participation in completion of development projects: a case of Korogocho slums, Nairobi country,* Kenya. Unpublished project. University of Nairobi.

Madeeha, S. & Imran, H. N. (2014). *Impact of Internal Community Engagement on Project Portfolio Management Success, it Industry in Lahore, Pakistan. Journal of Science International (Lahore), 26(4), 1777-1782.*

Malunga, C. & Banda, C., (2011).*Understanding Organizational Performance through African Proverbs. Washington: Pact Publications.*

Nijkamp, M.L. & Tanis, C. (2002). *The project System Experience – from Adoption of Success, Novartis Foundation for Sustainable Development. (2004). Development Assistance at the Threshold of the 21st*

Ofuoku, A. U. (2011). *Effect of community participation on performance of rural water projects in Delta Central agricultural zone of Delta State, Nigeria. Journal of Agricultural Extension and Rural Development, vol.3 (7), pp. 130-136,*

Peter, G., George, T., Kirui, K. and Luvega, C. (2013). *The Dilemma in performance of Community Based Approach.*

Ochieng. E. (2013). *Stakeholder engagement: Achieving performance in the construction sector.* ResearchGate.

Prokopy, L. S. (2015). *The relationship between participation and project outcomes: Evidence from rural water supply projects in India.* World development, 33(11), 1801-1819. https://doi.org/10.1016/j.worlddev.2005.07.002

Reed, M. S., A. Graves, N. Dandy, H. Posthumus, K. Hubacek, J. Morris, C. Prell, C. H. Quinn, and L. C. Stringer. (2009). Who's in and why? A typology of stakeholder analysis methods for natural resource management. *Journal of Environmental Management 90(5):1933-1949. https://doi.org/10.1016/j.jenvman.2009.01.001*

Rosario, J.G. (2000). *On the leading edge: Critical Success Factors in PROJECTS implementation. Journal of project management. 4 (3).*

Stringer, L. C., C. Twyman, and D. S. G. Thomas. 2010. *Combating land degradation through participatory means: the case of Swaziland. Ambio 36(5):387-393. https://doi.org/10.1579/0044-7447 (2007)36[387: CLDTPM] 2.0.CO;2*