

DELAYS IN RURAL ELECTRIFICATION PROJECTS AND COMMUNITY EMPOWERMENT IN NYAGATARE DISTRICT, RWANDA

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ABSTRACT

Project delays are a big problem in project implementation, the rural electrification project in Nyagatare is one of the many projects affected by delays. As a consequence, the community suffered with no access to electricity for a long time. This research aimed to address this issue by carrying out research on project delays on community empowerment in Rwanda, taking a case of rural electrification project in Nyagatare District. It was guided by three specific objectives, namely, to investigate the effect of delays in project designing on the community empowerment in rural electrification project in Nyagatare District; to assess the effect of delays in project implementation on the community empowerment in rural electrification project in Nyagatare District and to investigate the effect of delays in project reporting on the community empowerment in rural electrification project in Nyagatare District. This study was anchored on three theories, namely, the results-based management theory, the iron triangle theory and stakeholders' theory. The study used both descriptive and correlational research designs. The target population was made up of 206 respondents from which a sample of 136 participants was selected using stratified random sampling technique. Primary data was collected using structured questionnaires and face-to-face interview. Data collected was analyzed using Statistical Package for Social Sciences (SPSS) version 23. The key findings using Pearson's correlation analysis showed that project designing, ($r=-0.699$, $p<0.05$), project implementation ($r=-0.649$, $p<0.05$) and project reporting ($r=-0.751$, $p<0.05$) all have negative and significant correlations on community empowerment. The analysis of regression coefficient showed that delays in project designing ($\beta_1=-0.392$, $t=-7.445$, $p<0.05$), project implementation ($\beta_2=-0.194$, $t=-6.486$, $p<0.05$) and project reporting ($\beta_3=-0.233$, $t=-6.976$, $p<0.05$) have negative and statistically significant repercussions on the community empowerment. Since the p-values were less than 5%, all the three null hypotheses were rejected. The $R^2=0.774$ implied that 77.4% of the variations in community empowerment is determined by the schedule performance of the projects. In conclusion, this study has evidenced the negative effects of project delays on community empowerment. The researcher recommends that project managers should be keen to cover areas that can lead to project delays. Project managers should actively engage the community especially during the need assessment and the project implementation stages to avoid project delays.

Key Words: Project delay, project design, project implementation, project reporting, community empowerment, Rwanda

1.0 INTRODUCTION

1.1 Background of the Study

Community-Based Projects (CBPs) are those projects whose main objective is to serve a given community by providing public services or good. Such projects target a community at large rather than a particular individual. Most of the CBPs are donor-funded, which could include local or international funding. These projects are usually designed with a specific mission to achieve in terms of creating social welfare, empowering the community or creating a community projects. All in all, CBPs are community oriented, and as such, their success will be measured based on how much the community benefit from them. As stated by Kupperts (2019), community-based projects are, by definition, oriented towards community development and empowerment. Hence, they are also referred to as Community Development Projects (CDPs). These projects bring public facilities to the community helping them to access quality health services, transportation services, electricity, clean water, as well as enhanced security facilities. In the same breath, CBPs create job opportunities for the community.

According to Amadei (2015), community development is a process through which government, nongovernment and faith-based agencies target to support a given community by identifying their pressing needs. The agencies while involving the community and other stakeholders, take collective actions to empower the community. Some of the key concerns that brings community empowerment involves community training, capacity building, skills development and in most instances, direct support. In empowering the community with needed skills, the Community development projects train the members of the community so that they can be able to effect changes in their socioeconomic lives. Globally, these projects have aimed to empower community in terms of creating job opportunities, developing skills and direct financial or nonfinancial support. Such supports bring real economic and social transformation to the community by initiating projects that support the community. However, these community-based projects face different challenges from their initiation to execution (Kupperts, 2019).

One of the challenges that may hinder the projects from achieving their mission stem from delays within the project lifecycle. According to Burr and Castro (2016), project delays happen when there is time overrun and the project cannot be completed within the scheduled time. The project delays may arise from the client, the donor, from the project team members or even from the community. Whatever the source of project delays, it is possible to identify project delays by investigating the stage at which the delay took place. Hence, project delays can be looked at as delays in the project designing, delays in project implementations and delays in communicating the project progress. Any form of delay in the project scheduled time will eventually have ramification effect on the entire project. According to Trauner, *et al.* (2017), the delays in terms of time overrun causes other unintended negative consequences on the project including cost overrun. It may cause revisions on the project scope in attempt to incorporate the additional costs and time.

For instance, in Asia, Alenazi, Adamu and Al-Otaibi (2022) document that delayed projects negatively affect the completion. When a project is not finalized as per the original contracted schedule, it tends to bring consequences in form of increased costs, lost expected revenue, delayed community service and delayed project delivery. This affect the intended beneficiaries where there is delayed expected outcomes. Further, Hussain, *et al.*, (2017) noted that delays in CBPs imply delayed empowerment of the rural community in Pakistan. The community access

to and use of public facilities is delayed, which negatively affect their economic and social lives. Among the negative socioeconomic impacts of delays include lack of educational opportunities, higher cost of transportation, increased cost of life, barriers to accessing quality health, missed economic opportunities.

In Nigeria, Akhund, *et al.*, (2018) opine that time is an important parameter when measuring the performance of donor-funded projects whose objectives are for community empowerment. Time provides a basis during the feasibility analysis of such projects, and when there are any time overruns, the projects usually encounter difficulties in accomplishing the intended mission. As such, there is need for effective coordination of development projects to ensure timely delivery of the project promises to the community. In addition, the time overruns result to unintended implications on the empowerment goals of the community. For instance, Amoatey, *et al.* (2015) note that project delays in Ghana delays access to the needed commodities or services to the community. In this case, where the community-based project was to salvage and empower the community, negative implications are experienced which could even lead to casualties. Further, as the community development projects delay, they become exposed to more and greater risks that were initially unforeseen in the initial designing and planning stage.

In Kenya, a study by Murithi, Makokha and Otieno (2017) emphasizes on the need for timely completion of projects. According to the authors argument, project schedule importantly communicates to the project team what needs to be done, at what time, which resources are required and who is to perform the task. This therefore, lays the ground for breaking the projects into different stages whose completion may be required to progress to the next stage. Such critical activities are crucial in determining the project feasibility and project success. A delayed critical activity causes a delay in completion of the entire project. This will come with negative ramifications which will also lead to cost overruns, and consequently compromise the quality of the final project delivered. In Tanzania, Kikwasi (2012) studied the causes and effect of delays and disruptions in construction projects. The author identifies delays and disruptions in construction projects as the main challenges that negatively affect schedule performance of many projects in Tanzania. Some of the causes of delays in project identified include design changes, payment delays, information delays, poor project management and disagreements. These delays affect the project scheduling and lead to cost overrun and negative social impact.

In Rwanda, Amandin and Kule (2016) investigated the effect of project delays on cost overrun risks, The authors identified different causes of government construction projects faced at planning, implementation and delivery stages of the project. They further indicated that public construction projects may cause delayed benefits for the intended community. However, their main concern in their study was on the causes of project delays and cost overrun implications. Similarly, a study by Umuhzoza and An (2019) in Rwanda concentrated on the delay factors in building construction projects in Rwanda. The study aimed to find out critical factors causing delays in project completion in the construction sector. This show that there are few studies conducted on project delays, and those in this area are more concerned about the causes of the delays rather than the implications. The current study therefore seeks to address this gap by investigating the effect of project delays on the empowerment of the beneficiaries. The study proposes that delayed projects will delay the community in accessing the benefits of such projects, hinder their socioeconomic development and have negative effect on the community empowerment. To address this, the current study takes the rural electrification project carried by Rwanda Energy Group (REG) and Arab Bank of Economic Development of Africa (BADEA) and the Government of Rwanda (GoR). According to the project plan and design, this project which covered Nyagatare District, commenced on 20th May 2014 and was intended to be completed by 8th June 2020. The project intended to extend the national grid by 221.4 km of MV lines and 393.15 km of LV lines. New connections were to be made and increase electricity connectivity in the district, thereby, enhance the community access to electricity. However, the

project experienced challenges leading to project delay and hence, the project was completed in 2022 which was two years after the initially scheduled time.

1.2 Problem Statement

Community development projects (CDPs) play significant role in facilitating sustainable economic and social development within a community. These projects enhance community development by providing economically viable opportunities especially to the local community, empowering the community to be economically self-reliant. However, these CDPs are faced with different challenges that delay their completion as per the scheduled time. For example, Amandin and Kule (2016) showed that 65.7% of the public construction projects in Rwanda lag behind their scheduled completion time. These delays have various socioeconomical implications to the intended beneficiaries. Although various studies have investigated project delays, they have mainly focused on the factors causing delays (Umuhoza & An, 2019) and failed to address the negative impacts arising from such delays. Some of the studies that have investigated the impact of project delays, have only focused on the implications to the contracting parties, that is, to the clients and to the contractors (for instance, Amanyana & Njenga, 2022). They have not studied the socioeconomic effects of project delays to the community, and more specifically on the lost opportunities to empower the community. There exists therefore, a gap in literature adequately addressing the implications of project delays on community empowerment. The gap is even accentuated here in Rwanda, where most research have concentrated on project success (for example, Kobusingye, Mungatu & Mulyungi, 2017). This study therefore was intended to address this research gap by investigating the effect of project delays on community empowerment in Rwanda, taking a case of rural electrification project in Nyagatare District.

1.3 Objectives of the Study

The general objective of this research was to investigate the effect of project delays on community empowerment in Rwanda, taking a case of rural electrification project in Nyagatare District. The research was informed by three specific objectives:

- i). To examine the effect of delays in project designing on community empowerment in rural electrification project in Nyagatare District.
- ii). To assess the effect of delays in project implementation on community empowerment in rural electrification project in Nyagatare District.
- iii). To determine the effect of delays in project reporting on the community empowerment in rural electrification project in Nyagatare District.

1.4 Research Hypotheses

The study tested the following research hypotheses

H₀₁: There is no significant effect between delays in project designing and community empowerment in rural electrification project in Nyagatare District.

H₀₂: There is no significant effect of delays in project implementation on community empowerment in rural electrification project in Nyagatare District.

H₀₃: There is no significant effect of delays in project reporting on community empowerment in rural electrification project in Nyagatare District.

2.0 REVIEW OF RELATED LITERATURE

2.1 Theoretical Literature

According to Alenazi, *et al.* (2022), project delays relate to a project inability to meet the time schedule as originally planned during the project planning and designing stage. As the authors describe, a project comprises of five main stages, namely, the initiation stage, the planning stage, the implementation stage, monitoring and control stage and the project closure. During the initiation and planning stage, the project managers and donors must clearly define the project objectives. They must indicate the project scope, the budget and the timeframe expected to bring the project to completion. Therefore, project delay is seen as a time overrun problem,

where the project stretches beyond its expected timeframe. As noted by Akhund *et al.* (2018), there are various causes of project delays especially in relation to construction projects. Some of these causes may be attributed to the client or to the contractor or to other factors including geographical and sociopolitical factors.

Project design is considered at the early stage of project lifecycle. During project designing, project managers plan on all the requirements of completing a project, and put estimates that are necessary to bring the project to fruition. In this case, different ideas are laid down and decisions made based on the project objectives and the targeted beneficiaries. It is during this phase of project planning that a project design is defined and key resources identified. Moreover, project designing involves detailed analysis of the required resources, the project processes and deliverables for the given project (LeFevre, 2019). It is during the planning phase that the project manager spends time to assess the needs of the community, design a project that will address these needs and estimate the project needs. It is therefore a defining moment, as noted by (Levy, 2018) who adds that project designing can determine the success or failure of a project.

According to (Levy, 2018) defining project scope should be carried early on when the project before the actual execution of a project. In particular, the project managers and the donor must craft a complete project scope defining the project by its timeframe, its scope and resource requirements, by its budget and by the quality of the finished product. In community-based projects, the intention is to achieve a community need and to serve the majority. Therefore, it is important for the project managers to critically review the project plan to ensure that the plans are complete, compatible and the objectives are achievable. In addition, during the planning phase, the managers must make sure that the interest of the key stakeholders are incorporated. This is important in building a project that would eventually achieve its objective. sooner, there would be increased need to review a project as time goes by. However, a well-designed project would make it easier for future adjustments without necessarily causing unnecessary delays.

Doloi, *et al.* (2012) analyzed different factors causing delays in Indian construction projects. Cited in their research as main causes of project delays include poor project planning, lack of clarity in project scope definition and poor communication. Attributed to poor project planning and lack of clarity in project scope design included factors like lack of skilled professionals, changes in design, changes in sub-contractors and increased scope of work. The authors found that poor planning and designing causes project delays which delay the beneficiaries in accessing the projects. Muhwezi, *et al.* (2014) assessed different factors that cause delays on building construction projects in Uganda. The study used structured interviews and questionnaire, which involved contractors, consultants and clients. The authors grouped the factors into four different categories, namely, contractor-related, consultant-related, client-related and external-related factors and used relative importance index (RII) to rank these factors. Among the identified causes of project delays were in related to scope, errors in project designing and design changes. These delays lead to unprecedented consequences to the clients, contractor and especially to the clients and intended beneficiaries. For community construction projects, the delays cause the community to lag behind as they await to benefit from the completed project.

According to PMI (2017), project implementation is among the most important phases of project management. It refers to bringing the project plans in to actions. Without project execution (or implementation), the project plans are mere ideas existing in the mind and books of initiators. However, through project implementation, the ideas and plans are brought into life. Project implementation begins from looking at the project plans that have already being designed at the project initiation and planning phases. With project implementation, the critical components of the project are identified and various tasks are assigned to qualified personnel. Since every CBP is unique, there is need to have a project implementation plan for each project. The implementation plan is a critical component of project management. This plan focuses on laid down strategies of executing the project plans. It should therefore be carried out with care to

ensure that all details are incorporated in the plans. It acts as a blueprint guiding the project team on what to do, when to do it and what is the expected timeline to finish the current task.

As described by the Project Management Institute (PMI), project work breakdown structure is deliverable oriented and is usually in a hierarchical order cutting down the work to be done by the project team in order to achieve the entire project objectives. Each of the descending level represents a detailed definition of the project work (PMI, 2017). During the implementation stage, project managers can effectively control for possible project delays by use of WBS which provides a roadmap for each project team as well as on the use of resources. Further, with WBS, project managers can be able to assign responsibilities to different people for each component of the project. In addition, it become easy to create Grantt chart showing each activity and the time required to complete it. The Grantt charts when used together with the WBS schedule help the managers to estimate the timeframe for each task and enable the project team members to visualize the overall timelines of the project. This aids the project managers to avoid unnecessary delays along the project implementation phase.

According to Tafazzoli and Shrestha (2017), project managers can approach the implementation of construction projects from the various tasks to be performed. This after dividing the projects to smaller defined tasks and processes. The tasks or processes can be addressed and completed simultaneously by different members of the project team, thereby improving project delivery and efficiency. As per PMI (2017) discussions, different types of WBS can be used including deliverable-based WBS, responsibility-based WBS and phased-based WBS. Phased-based WBS divides the project into five distinct phases, namely, project initiation stage, planning stage, execution stage, control and monitoring stage and closure stage. The responsibility-based WBS divides the project according to the team or individuals responsible to accomplish certain tasks while the deliverable-based WBS divides the project based on the project scope and the deliverables. In any case, the project management become more efficient as the project team focuses on each work that assigned for today.

In Rwanda, Amandin and Kule (2016) investigated the effect of project delays on cost overrun risk for public construction projects in Gasabo District. Primary data was collected using open-ended questionnaires from a sample of 42 project managers, consultants and implementors. The authors found that many challenges encountered in public construction projects hinder the timely delivery of the projects. One of the main delay factors are experienced at the implementation stage, where the project plans are brought in to action. It is during this stage that the designs and plans are tested whether they work effectively. Hence, the authors recommended the use of mitigation techniques to reduce the schedule overrun and cost overrun. Umuhoza and An (2019) investigated the delay factors affecting building construction projects in Rwanda. The authors found that most delay factors are pronounced at the implementation stage. The main delay factors identified include lack of qualified labor, delays in material sourcing, lack of materials in local market, inspection challenges and delayed approval of changes during the implementation stage. These factors affect the delivery of the project, which negatively affect the empowerment of the intended beneficiaries.

According to PMI (2017), project management becomes more effective if there is efficient communication and information flow from one end to another. The authors further note that exchange of information enables the project manager to communicate the project plan and objectives to the stakeholders and to the project team. This helps to bring everybody into the same reading page, such that they can all work together as a team. As noted by Hynes (2019), communication within the project brings synergy and enables teamworking. It also helps in coordinate different parts and people into one organized unit. As one element recognized under the Project Management Body of Knowledge (PMBOK), project communication can ease the operational performance of a project through timely information exchange. In addition, effect communication within a project allows information to flow in all direction, from top to bottom,

horizontally and from bottom to top. Hence, create room for feedback information flow (PMI, 2017).

However, if not effectively managed, poor communication can break the operational performance of a project. Poor communication may lead to delayed information, which affect the flow of resources and therefore poor coordination of the processes. As noted by Hynes (2019), lack of proper channels of communication may delay procurement of essential material, leading to project delays and sometime may cause the whole project to stop. Further, poor communication leads to resource underutilization. For instance, poor communication will lead to poor coordination of the project team members, which would cause idle time among some of the members. Consequently, poor communication would have a negative effect on the project ability to be finished within the planned time. It is therefore important for project managers to establish communication channels that would ensure timely reporting is done by the relevant person, and that this is relayed to all other project team members for action.

Bizinde and Shukla (2017) investigated the integrated farming initiative as a strategy in empowering women in Rwanda. The research used descriptive research with structured questionnaires distributed to a sample of 97 respondents. The study showed that community-based projects improve the women status by empowering them both economically and socially. However, for these projects to achieve their objective, women must be engaged actively. This would ensure timely delivery of projects deliverables as expected. Tumwebaze and Irechukwu (2022) investigated the effect of stakeholder involvement on the sustainability of World Bank funded projects in Rwanda. The findings showed that stakeholders' empowerment increase sustainability of projects. In addition, empowerment increases stakeholders' satisfaction and ownership level of the project.

2.2 Theoretical Framework

Results-Based Management (RBM) Theory

The origin of Result-Based Management (RBM) theory is credited to Barney (1991). According to Barney (1991), organizations are formed with specific objectives in mind. These objectives are set from the start and they define the organization's purpose of existence. Hence, organizations work by orienting all their actions and resources towards the achievement of these clearly defined outcomes. The RBM theory therefore proposes that an organization should direct its efforts and resources towards a given goal or predefined outcome. In this way, the management communicates and organizes all the available resource, including the human resources, towards achieving the desired results. The success of an organization, and a manager in that case, is measured on its ability to achieve the desired results within a given time and budget.

As discussed by Ortengren (2016), RBM theory provides guidelines on what should be considered during the project designing and planning phase. In CBPs, the project design should be such that it outlines the project expected results, provides a clear resource mapping on how these results will be attained as well as give the expected timelines for delivering the project results. Further, the implementation of these plans plays significant role in ensuring that the project results are delivered on a timely manner and within the expected quality or scope. It is with this in mind that the RBM theory is applicable in this research. The main argument is that project results should be delivered to the intended beneficiaries within a given timeframe. Any delays to bring the project to completion would imply that the community will not be able to enjoy the project results until a later date. These delays have negative implications to the community empowerment.

Iron Triangle Theory

In project management, this theory is also known as the triple constraint theory. According to Wright and Lawlor-Wright, (2018), the iron triangle theory is attributed to Dr. Martin Barnes who in 1988 proposed three main project constraints, namely, scope, time and cost/budget. These

constraints were considered crucial in a project and referred to as iron since the project manager cannot change one constraint without affecting the other two. The iron triangle theory proposes that a project comprises three components which are considered as constraints to the project. These include project scope, time and budget. These three form a triangle shape with each at the corners of the triangle. The iron triangle theory therefore proposes that a project is constrained by the three components and any changes to any one of these components will have a ripple effect on the other two and the overall quality of the project. The theory sees the three components as interlinked variables. Any changes, for example to the time schedule would lead to changes in budget and/or scope of the project, which eventually has an effect on the quality of project.

As discussed by Morris and Pinto (2010), the iron triangle theory has become a common tool of measuring the performance of projects. A project is considered to be successful if it is delivered within the scheduled time, the expected scope and within the budget. Otherwise, a project is considered to have failed to meet the expectations if the scope is compromised, or is delayed in delivery or there are cost overruns. A project with such challenges will have an overall effect on the quality of the project. In this research, the main concern is on time overrun, where the researcher argues that delayed project delivery compromises on other aspects of a project. In community-based projects, efficient in timely delivery of project results will benefit majority of the community who are able to enjoy the accruing benefits of such projects. Any delays in delivering these projects implies continued negative effects on empowerment of the community.

Stakeholder Theory

The stakeholder theory can be traced in the year 1984, and is attributed to Freeman in his book “strategic management: a stakeholder approach” (Freeman, 1984). As per the stakeholder theory, a stakeholder is any group or individuals who are affected or can affect a project. A stakeholder is seen as all people with vested interests in the planning, financing or implementation of a project or will benefit from the output of the project. Since these people are directly or indirectly affected or influencing the performance of a project, the stakeholder theory states that for effectiveness of the project, it is important to include all the key stakeholders in the running of the project. The theory further postulates that project managers, planners and donors must actively do a stakeholders’ analysis in the initial stages of the project to ensure that all key stakeholders are identified, their interests are addressed and that they are engaged actively in the project. Failure to do this, the project may likely fail to identify the pressing needs of the people and consequently fail to meet their expectations.

According to Freeman *et al.*, (2010), stakeholders may play a significant effect on the success of a project if their interests and their contributions are considered in each stage of the project. The authors further point that different stakeholders can be identified at different stages of a project, and therefore, propose continuous stakeholders’ review. Further, the need for inclusion of stakeholders is evidenced in project failures attributed to poor stakeholders’ mapping. In particular, community-based projects require recognizing the community as key stakeholder in the project. This would require the active engagement of the community as well as incorporating their interests in the project. With this, the stakeholder theory postulates that community-based projects can improve in their delivery of the expected outcomes in a timely manner and within the project scope and budget. Therefore, this theory is directly related to this study as it proposes a stakeholders’ mapping that is necessary in reducing project delays in community-based projects. Moreover, through this approach, project managers can easily identify the pressing needs of the community and put the as priority, which in turn would increase the project delivery within the proposed timeframe.

2.3 Conceptual Framework

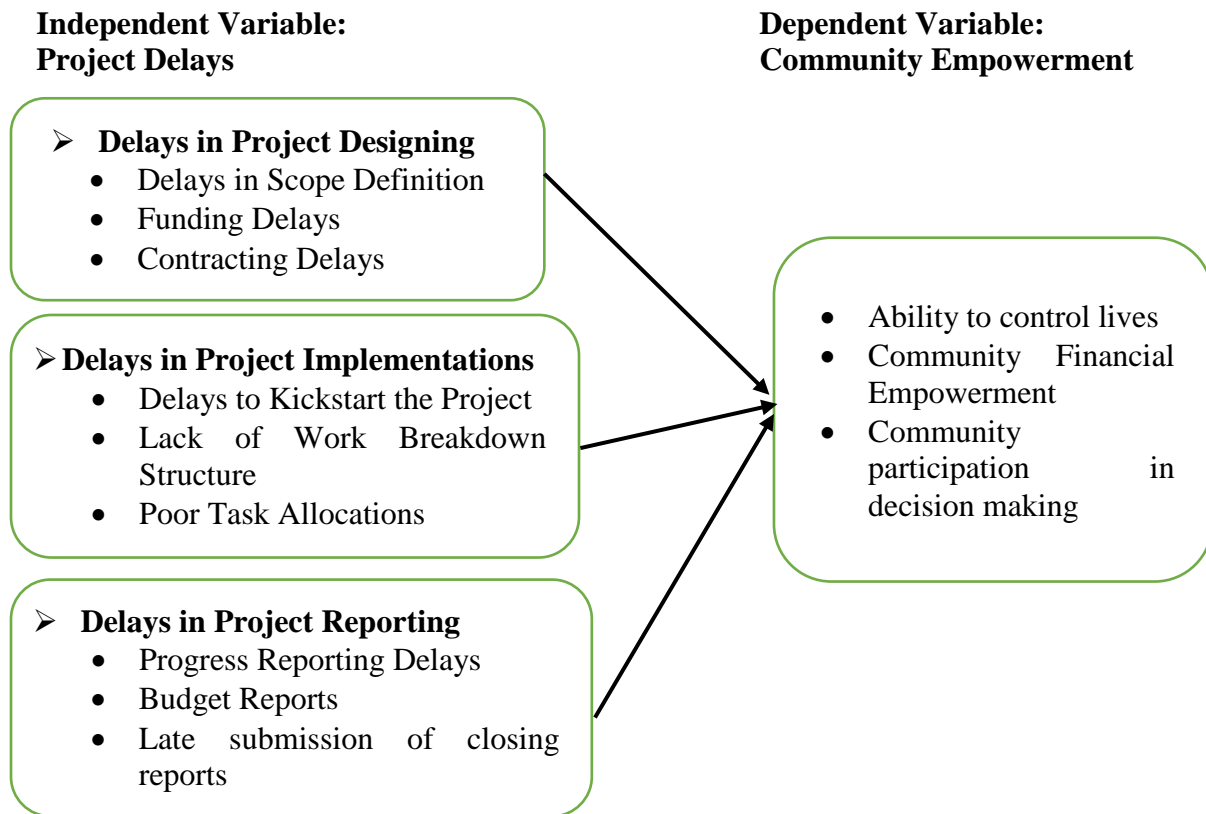


Figure 1: Conceptual Framework

Source: Researcher (2023)

Figure 1 shows the main variables for this study. On one side is the independent variable while on the other side is the dependent variable. The independent variable is project delays. The main indicators used to determine project delays include delays in project designing, delays in project implementation and delays in project reporting. Each of these has its own sub-variables which helped the researcher to adequately measure the concepts. On the other hand, the dependent variable is community empowerment. Delayed projects will have negative implications to the community in terms of community empowerment.

3.0 RESEARCH METHODOLOGY

3.1 Research Design

Research design is defined by Saunders and Lewis (2017) as the blue print that provides a researcher with guidance, directions and principles to follow while carrying out research. It describes the various research procedures, the type of data to use, methods for data collection and data analysis. In this study, both descriptive and correlational research designs were used. The descriptive research helped the researcher to systematically describe the population, the sample size used and a general picture of interest in this study. The correlational research design helped to address the general and specific objectives by measuring the strength and direction of relationship between project delays and community empowerment

3.2 Target Population and Sampling Design

Target population is the entire elements or people involved in a study. This study focuses on rural electrification project at Nyagatare District carried out by Rwanda Energy Group (REG). Therefore, the study target population was made up of the employees working at Rwanda Energy Group (REG), community leaders and beneficiaries of the rural electrification project in Nyagatare District. The project aimed at providing electricity connection to 2 health centers, 18

schools, 6 public offices and more than 7,854 households in Nyagatare District (REG, 2020). So, the total population included 7,880 beneficiaries, 75 staff of REG and 5 community leaders giving a total population of 7,900. However, due to challenges in accessing the households, the total households included as target population was 100 households. Therefore, the target population comprised of 100 households, 2 health centers, 18 schools and 6 public offices, 75 staff of REG and 5 community leaders, giving a total of 206.

According to Saunders and Lewis (2017), a sample size involves a selected group in research to represent the entire population. A researcher may decide to select a representative group if the target population is too big, the population is covering a wide geographical area, is not clearly defined or it is not fully accessible. In this study, the target population was big and covered a wide geographical area, hence, justification for sampling. Due to challenges in accessing the households, the total households included in sample computation was 100 which was determined purposively. Therefore, the adjusted target population was made up of 100 households, 2 officers at health center, 18 school headteachers and 6 public officers, 75 staff of REG and 5 community leaders, giving a total of 206. Sample size was determined using Slovin’s formula as quoted by Allibang (2020).

$$n = \frac{206}{1 + 206 * 0.05^2} = 135.97 \approx 136$$

Where n is sample size, N is the target population and e is the error of margin at 5%. Hence, the total sample size was 136 respondents.

The researcher used stratified random sampling to select the sample elements for the purpose of primary data collection. According to Singh and Mangat (2013), stratified random sampling technique allows the selection of participants by first grouping them into homogenous groups. Then, random selection is done based on each group proportion. Therefore, this method allowed the researcher to randomly select the sample based on each group proportion.

Table 1: Sample size distribution

Category	Population	Proportion	Sample
REG Staff	75	0.36	50
Local Leaders in the district	5	0.02	3
Schools Heads	18	0.09	12
Health Centers Officers	2	0.01	1
Public Officers	6	0.03	4
Households	100	0.49	66
Total	206		136

Source: Researcher computation (2023)

3.4 Data Collection Methods

This study used both primary data and secondary data. Primary data was obtained from the field, where participants selected from those people participating in the Rural electrification project in Nyagatare District and the beneficiaries to this project. The secondary data was collected using documentary review method. The primary data on the other hand was collected using structured questionnaire and guided interview. The questionnaire was formulated with questions or statements rated on a five-point Likert scale with 5=strongly agree, 4=agree, 3=not sure, 2=disagree and 1=strongly disagree. The interview was also be a guided interview, with preset questions.

According to Saunders and Lewis (2017), reliability and validity of research is very crucial in research to ensure that only data that is relevant and that can be relied on are collected. While reliability tests for the consistence in the research instrument, validity test for accuracy of the measured values or variables. Further, the authors argue that reliability and validity of the

research instruments remove redundancy and save a lot of time for the researcher when it comes to data cleaning and analysis. In this study, the reliability of the research instruments was tested using Cronbach's statistic test normally known as Cronbach's alpha. This was conducted using Statistical Package for Social Sciences (SPSS) version 23. According to this test, an alpha of 0.7 or more is considered sufficient for a research instrument. As per the reliability test of the research instruments reported in Table 2, the Cronbach's alpha obtained was 0.804 which was higher than the allowable minimum of 0.7. This showed that the questionnaire was sufficiently reliable and could be administered for the purpose of primary data collection.

Table 2: Test of reliability of the instruments using Cronbach's alpha

Cronbach's Alpha	N of Items
.804	33

Source: Researcher, (2023)

For the validity test Ruel, Wagner and Gillespie (2015) note that there are different validity tests that a researcher should conduct. These can be broadly grouped in to three groups, namely, content validity, construct validity and criterion validity. These measure whether an instrument is measuring what is supposed to measure accurately and approximate the facts as they should be. Construct validity measures where the instrument is related to the variables and the concepts that the researcher intend to investigate. On the other hand, the criterion validity shows whether the right measurement scale has been used to measure accurately the question items. The construct and the criterion validity in this study was informed through literature reading and the expertise of the supervisor. Content validity measures the degree to which the research items accurately represent or measure the information researcher is interest on. The question items in the research instruments should be objective enough such that they represent what could be asked by any other person in similar research. In addition, the Content Validity Index (CVI) formula given below was used.

$$CVI = \frac{\text{number of relevant items}}{\text{number of total items}} = \frac{33}{38} = 0.868$$

According to Rodrigues (2013), a CVI of 0.8 and above is considered an indicator that the research instrument is content valid. In this study, a CVI of 0.868 was obtained. This implied that the questionnaire was valid and could be effective in collecting primary data.

3.5 Data Analysis

This study used both descriptive statistics and inferential statistics which was done and processed through SPSS version 23. In the SPSS, the data was further cleaned and coded to enable quantitative analysis of the data. In addition, data transformation and computation were done to enable computation of Pearson correlation and estimation of the regression equation. For this purpose, then, the following multiple regression equation was used to find the final regression output and regression coefficients.

$$Y = \beta_0 + \beta_1 * x_1 + \beta_2 * x_2 + \beta_3 * x_3 + \epsilon$$

Where Y= the dependent variable (project delays)

$$\beta_0 = \text{regression constant}$$

$$\beta_1, \beta_2, \beta_3 = \text{regression coefficients for } x_1, x_2, x_3, \text{ respectively}$$

x_1, x_2 and x_3 =independent variables, project designing, project implementation and project reporting, respectively.

4.0 RESEARCH FINDINGS AND DISCUSSIONS

4.1 Key Findings

In this empirical study, the researcher presents the key findings using inferential statistics such as Pearson correlation analysis and multiple regression analysis. These analyses helped to adequately respond to the research objectives as well as for the purpose of testing the hypotheses earlier stated in the study.

Table 3: Pearson’s correlation analysis on community empowerment

	Community Empowerment	Project Designing	Project Implementation	Project Reporting
Pearson Correlation1				
Community Empowerment	Sig. (2-tailed)			
	N	122		
	Pearson Correlation	-.699**		
Project Designing	Sig. (2-tailed)	.000		
	N	122	122	
	Pearson Correlation	-.649**	.337**	
Project Implementation	Sig. (2-tailed)	.000	.000	
	N	122	122	122
	Pearson Correlation	-.751**	.523**	.491**
Project Reporting	Sig. (2-tailed)	.000	.000	.000
	N	122	122	122

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

Source: Researcher, (2023)

Table 2 reports the Pearson’s correlation analysis conducted between the indicators of project delays and community empowerment. In this study, the independent variable was project delays which was measured using three key indicators, namely, project delays in the project designing, project delays in project implementation and project delays in project reporting. The researcher argued that these delays, if experienced in community-based projects, would result in negative impacts on community empowerment. Hence, three specific objectives, and their corresponding hypotheses, were formulated. For the first specific objective concerning project delays in the project designing, the Pearson’s correlation analysis ($r=-0.699$, $p<0.05$) showed that there is a negative and statistically significant correlation between project delays due to project designing and community empowerment. The p-value was less than 5% threshold and therefore the correlation was determined to be significant. The first null hypothesis was formulated as follows.

H_{01} : There is no significant effect between delays in project designing and community empowerment in rural electrification project in Nyagatare District.

According to the rule of thumb, if statistical analyses give p-values less than 5%, then the null hypothesis should be rejected. The rejection of the null hypothesis implies that the alternative hypothesis is upheld. In this case, then, since the p-value obtained through Pearson’s correlation analysis was less than 5%, the null hypothesis was rejected. This meant that the alternative hypothesis that there is a significant effect between delays experienced during the project designing and community empowerment was held to be the correct hypothesis. It was concluded that project delays in project designing would have negative repercussions on the community which was expecting that the project would empower them on timely basis. If such delays are experienced, therefore, they would delay the community empowerment both socially and economically.

For the second specific objective concerning project delays in the project implementation, the Pearson’s correlation analysis ($r=-0.649$, $p<0.05$) showed that there is a negative and statistically significant correlation between project delays due to project implementation and community

empowerment. The p-value was less than 5% threshold and therefore the correlation was determined to be significant. The second null hypothesis was formulated as follows.

H₀₂: There is no significant effect of delays in project implementation on community empowerment in rural electrification project in Nyagatare District.

In this case, since the p-value obtained through Pearson’s correlation analysis was less than 5%, the null hypothesis was rejected. This meant that the alternative hypothesis that there is a significant effect between delays experienced during the project implementation and community empowerment was held to be the correct hypothesis. It was concluded that project delays in project implementation would have negative repercussions on the community empowerment. When such delays are experienced, they negatively affect the community empowerment both socially and economically.

For the third specific objective concerning project delays in the project reporting, the Pearson’s correlation analysis ($r=-0.751$, $p<0.05$) showed that there is a negative and statistically significant correlation between project delays due to project reporting and community empowerment. The p-value was less than 5% threshold and therefore the correlation was determined to be significant. The third null hypothesis was formulated as follows.

H₀₃: There is no significant effect of delays in project reporting on community empowerment in rural electrification project in Nyagatare District.

In this case, since the p-value obtained in the Pearson’s correlation analysis was less than 5%, the null hypothesis was rejected. This meant that the alternative hypothesis that there is a significant effect between delays experienced during the project reporting and community empowerment was held to be the correct hypothesis. It was concluded that project delays in project reporting would have negative repercussions on the community which expected that the project would empower them on timely basis. Such delays experienced due to project reporting would delay the community empowerment and affect them negatively both socially and economically.

The researcher further carried out multiple regression analysis. To be able to carry out this analysis, the responses obtained from primary data were transformed in SPSS and their means computed to create new variables combining the statements into measurable variables.

Table 4: Regression summary for project delays against community empowerment

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.880 ^a	.774	.768	.14318

a. Predictors: (Constant), Project Designing, Project Implementation, Project Reporting

Source: Researcher, (2023)

In the multiple regression analysis, the independent variable project delay was measured using project designing, project implementation and project reporting. These three were inputted as the predictor variables while the dependent variable was community empowerment. Table 4 shows the summary of the multiple regression analysis. As per the findings, the model had a good fit with $R=0.880$. The results also gave $R^2=0.774$, which implied that 77.4% of the community empowerment is influenced by project success in terms of schedule performance. This also means that negative effects that may delay project completion would significantly affect the empowerment of the community. Amanywa and Njenga (2022) found an $R^2=0.588$ between project delays and cost overrun.

Table 5: Analysis of Variance (ANOVA) between project delays and community empowerment

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	8.282	3	2.761	134.666	.000 ^b
	Residual	2.419	118	.021		
	Total	10.701	121			

a. Dependent Variable: Community Empowerment

b. Predictors: (Constant), Project Designing, Project Implementation, Project Reporting

Source: Researcher, (2023)

Table 5 reports the regression results in relation to the analysis of variance (ANOVA) between project delay and community empowerment. In this study, the researcher had argued that any project delays experienced in any project phase such as during project designing, project implementation or in project reporting would have negative implications to community empowerment. The results from the analysis of variance ($F=134.66$, $p<0.00$) have confirmed this since the p-value obtained was less than 5% implying that the multiple regression model was statistically significant. Again, this means that project delays significantly leave bearings on the community empowerment prospects and opportunities.

Table 6: Analysis of the multiple regression coefficients between project delays and community empowerment

Model		Unstandardized		Standardized	t	Sig.
		Coefficients				
		B	Std. Error	Beta		
1	(Constant)	5.225	.187		27.975	.000
	Project Designing	-.392	.053	-.385	-7.445	.000
	Project Implementation	-.194	.030	-.328	-6.486	.000
	Project Reporting	-.233	.033	-.389	-6.976	.000

a. Dependent Variable: Community Empowerment

Source: Researcher, (2023)

In addition to the previous analysis, the researcher sought to investigate the contributing effect of each of the three indicator variables. This was done through the analysis of the multiple regression coefficients. As per the findings reported in Table 6, any delays in project designing ($\beta_1=-0.392$, $t=-7.445$, $p<0.05$) will have negative and statistically significant repercussions on the community empowerment. Since the p-value was less than 5%, the first null hypothesis was rejected. This meant that there is a negative and significant effect of project delays in designing on the empowerment of the community. Project delays in the designing phase would lead to a decrease in community empowerment by 39.2%. Again, any delays in project implementation ($\beta_2=-0.194$, $t=-6.486$, $p<0.05$) will have negative and statistically significant effects on the community empowerment. Since the p-value was less than 5%, the second null hypothesis was rejected. This meant that there is a negative and significant effect of project delays in the implementation stage on the empowerment of the community. Project delays in experienced in this phase would lead to a decrease in community empowerment by 19.4%.

Furthermore, the multiple regression analysis of the coefficients showed that any delays in project reporting ($\beta_3=-0.233$, $t=-6.976$, $p<0.05$) will have negative and statistically significant repercussions on the community empowerment. Since the p-value was less than 5%, the third null hypothesis was rejected. This meant that there is a negative and significant effect of project delays in reporting on the empowerment of the community. Project delays in the reporting would

lead to a decrease in community empowerment by 23.3%. The results therefore confirmed that project delays in community-based projects will translate to delayed empowerment opportunities for the targeted community. Such delayed empowerment has negative implications on the social and economic aspects of the community.

4.2 Discussions of Key Findings

This study sought to investigate the effect of project delays on the empowerment of the targeted community. The study was therefore set out within the project management framework. Through literature review, the researcher was able to identify three key areas in project delays, namely, project delays experienced at the designing, implementation and project reporting phases. Consequently, three specific objectives were formulated, each concerned with the three areas of concentration. Moreover, the primary data was collected from the field using structured questionnaires and interview guide. The respondents involved indicated their level of agreement (or otherwise) to the various statements used to measure the study variables. The data presentation and analysis were conducted using descriptive and inferential statistics.

As per the findings, all the three null hypotheses were rejected since their respective values were less than 5%. On the first specific objective, the findings showed that delays in project designing negatively influences the empowerment of the community. Consequently, if project managers involved in community-based projects want to help the community, they must put all measures to curb project delays at the designing phase. Failure to this would lead to delayed empowerment opportunities of the community, thereby negatively affecting their social and economic lives. These results are in congruent with the previous empirical studies that showed negative implications of project delays. Studies by Doloi, *et al.* (2012), Khattri, *et al.*, (2016) and by Bajjou and Chafi (2020) have shown that project delays will have negative effect on project budget, can compromise the project quality and thereby affect the beneficiaries.

In the analysis of the second objective, the results showed that any delays in project implementation phase would lead to negative effects on the community empowerment. The results showed that there is need to cure project delays earlier on when detected. If projects are successfully implemented as per the scheduled timeframe, then the community would be equipped sufficiently and on a timely manner to deal with their social and economic challenges of life. However, if this is not achieved, then the community would continue struggling with their live challenges as it were before the commencement of the project. These results are supported by previous studies where authors like, Amanya and Njenga (2022) pointing the negative effects of project delays on cost overrun.

The study also found that project delays experienced in project reporting would negatively affect the community empowerment. Project reporting is considered as an important practice for the success of any community project projects. It allows for information flow from one end to another and hence, the communication of the project needs, objectives and progress. If there is no effective and timely project reporting, then lack of information flow would delay the project completion and consequently affect the empowerment of the community. These results are in line with previous study by Soliman (2017) which showed that a negative effect on project success is experienced whenever a project deviates from its scheduled timeframe. It is imperative therefore that project managers and other key stakeholders to ensure timely reporting of the project progress and needs to equip everyone with necessary information for the sole purpose of the performance of community-based projects. Other researchers like Doloi, *et al.* (2012) have shown that poor communication leads to poor coordination in the project which increases project delays. Soliman (2017) has shown that poor communication results to lack of team working among the stakeholders increasing tension and delays.

4.3 Conclusions

The main objective of this research was to investigate the effect of project delays on the community empowerment. Three key areas of interest were identified, namely, project delays in

project designing, project delays in project implementation and project delays in project reporting. Hence, three specific objectives and three related hypotheses were formulated in relation to project designing, project implementation and project reporting. In order to achieve the research objectives and to adequately address the stated hypotheses, the researcher collected primary data and analyzed them using descriptive and inferential statistics. The findings revealed that project delays as evidenced by delays in project designing, project implementation and project reporting negatively affect the empowerment of the community.

All the three null hypotheses were rejected, and the conclusion was that project delays in project designing, in project implementation and in project reporting negatively affect community empowerment. The sole purpose of community-based projects is to bring particular services or goods to the community. Through these projects, governments, government agencies, non-governmental organizations and faith-based organizations are able to reach to the marginalized people, empower them to take active responsibility of their lives and transform them both socially and economically. However, delayed project completion is delayed opportunities to empower the community. Therefore, it is imperative that project planners, donors and other key stakeholders take note on the importance of timely completion and delivery of community development projects.

4.4 Recommendations

This research was conducted with an aim to establish the effects of project delays on community empowerment. Hence, the study concentrated on community-based projects whose sole objective is to benefit the targeted community both socially and economically. Initiating community-based project ignites a lot of expectations to the community. For projects like rural electrification, the community draws high expectations that the timely completion of these project would help them access electricity for their consumption and for creating business opportunities. However, project delays kill such high expectations and tend to drag the community backwards to an extent that they feel socially excluded. This study has evidenced the negative effects of project delays on community empowerment.

The researcher therefore recommends that project managers should be keen to cover areas that can lead to project delays. Such areas arise from project designing phase including scope definition challenges, contracting problems and funding challenges. If the project planners and donor are not keen during the project designing stage, then such community project will fail terribly in terms of schedule performance. It is imperative that project managers to pay keen attention to project designing to avoid project delays in the community-based projects. Further, donors should always come up with sound plans that clearly define the project scope early on to avoid last-minute rash.

In addition, it is important for project managers to pay attention to details during the project execution phase where coordination of tasks, resources and activities is very crucial. The researcher therefore recommends the use of work breakdown structure where complex projects can be subdivided into smaller and simpler components. Work or tasks can be later allocated to different personnel based on these different sections. Further, the researcher recommends that project managers should actively engage the community especially during the need assessment and the project implementation stages. This would ensure that the community embraced the project and are able to fully benefit from the fruits of the project. Moreover, such projects aim at empowering the community, which can only happen if they are actively engaged. In this way, the project managers can also be able to tackle challenges that may affect the schedule performance. The researcher also recommends to the government, government agencies, non-governmental organizations and faith-based institutions that are involved in CBPs to ensure that they provide timely delivery of the projects.

Lastly, this study has shown the importance of project reporting to track the progress in the performance of a project. Lack of effective communication through project reports can hinder the

successful implementation of community-based projects. Thereby, causing project delays. To avoid these project delays, the researcher recommends that project managers in collaboration with donors and other stakeholders, should ensure that there are effective communication channels in place. Frequent use of reports would enhance communication among the various parties and therefore improves the schedule performance of the community-based projects.

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