UNIVERSIDAD PARA LA COOPERACION INTERNACIONAL
(UCI)

THE DEVELOPMENT OF A PROJECT MANAGEMENT PLAN FOR THE CONSTRUCTION OF A LEARNING RESOURCE CENTRE IN THE COMMUNITY OF FOND GENS LIBRE, ST. LUCIA.

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FINAL GRADUATION PROJECT SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE
MASTER IN PROJECT MANAGEMENT (MPM) DEGREE

Soufriere, St. Lucia

December, 2022

UNIVERSIDAD PARA LA COOPERACION INTERNACIONAL
(UCI)

This Final Graduation Project was approved by the University as partial fulfillment of the requirements to opt for the Master in Project Management (MPM) Degree

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DEDICATION

This project is dedicated to my husband Francis Alexander and son Shahid Alexander who provided me with unwavering support during this journey of obtaining a masters degree in project management.

ACKNOWLEDGMENTS

I express my sincere gratitude to my friend Lydia Atkins who encouraged me to pursue this master's degree. I am also grateful to all the lecturers of this program who, with a student-centered approach, imparted their knowledge to this cohort. I thank my colleagues who willingly shared their knowledge and experiences in project management, especially my St. Lucian colleagues. I sincerely thank Mrs. Charlene Charlery who willingly agreed to do the philological review of this research. I thank the General Secretariat of the Organisation of American States (OAS) and the University for International Cooperation (UCI) for awarding me the scholarship, which has created new opportunities for my professional and personal development.

I thank my family and friends for providing support, and I give praises to the Almighty God for blessing me with good health during the course of this masters degree.

ABSTRACT

This document aims to develop a project management plan, based on the standards of the Project Management Institute, for the construction of a Learning Resource Centre in the community of Fond Gens Libre. This Learning Resource Centre is community based and will provide equitable access to learning for all residents. This Learning Resource Centre will provide additional learning opportunities outside the classroom for students, provide support for adult education, literacy and skills development. This is a major step in the capacity building of the community members, allowing them to develop the skills and competencies to effectively manage their tourism products. This provides opportunities to reduce social and economic challenges, reduce poverty and develop the community.

The final product of this FGP is the development of a project management plan for the construction of the Learning Resource Centre. This includes the subsidiary plans which are management plans for scope, schedule, cost, quality, resources, communications, risks, procurement, and stakeholders. This final graduation project also includes an analysis of the impact of the project on sustainable and regenerative development. Qualitative research method and analytical research method are used along with the guide provided by the Project management Institute, to elaborate the project management plan.

This project management plan will benefit the Fond Gens Libre Development Committee which has little project management experience, by providing a guide to facilitate the successful completion of the project within the constraints of time, scope, cost and quality. It reduces the incidence of risks and increases effective communication which assures the maximum use of the community's limited resources for its continued development.

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ABBREVIATIONS AND ACRONYMS

AC	Actual Cost
BQ	Bill of Quantities
CPI	Cost Performance Index
DCA	Development Control Authority
EMV	Earned Value Management
EV	Earned value
FGL	Fond Gens Libre
FGLDC	Fond Gens Libre Development Committee
FGP	Final Graduation project
LRC	Learning Resource Centre
MEP	Mechanical, Electrical and Plumbing
P	Probability
PMI	Project Management Institute
PV	Planned Value
RBS	Resource Breakdown Structure
SPI	Schedule Performance Index
SRDF	Soufriere Regional Development Foundation
USD	United States Dollar
WBS	Work Breakdown Structure
XCD	Eastern Caribbean Dollar

EXECUTIVE SUMMARY

Fond Gens Libre Community is nested at the Base of Gros Piton, a UNESCO World Heritage site in St. Lucia. The members of this community have organized themselves into a community Development committee, the Fond Gens Libre Development Committee (FGLDC). This committee is responsible for overseeing the affairs of the community as it relates to the development of physical resources, as well as the human resources in the community. The FGLDC has recently embarked upon the use of projects to achieve its mission and vision for the prosperity of its people. One of the proposed projects is a Learning Resource Centre for the provision of an inclusive educational service for all residents as well as to serve the informational and cultural interests of the people. Hence, poverty would be reduced and eventually eradicated, and the people would develop the capacity required to better manage the tourism product which the community offers. As a Final Graduation Project, a project management plan is created for the successful completion of this LRC, to ensure that the FGLDC makes efficient use of its limited resources to achieve its objectives.

The general objective of this FGP was to develop a project management plan for the design and construction of a Learning Resource Centre in the community of Fond Gens Libre by June 30th, 2023.The specific objectives were firstly, to develop a project charter which formally authorize the existence of the project, thereby giving the project manager authority to organizational resources to project activities. The second objective was to elaborate a scope management plan which encompasses only the work required to complete the project successfully. The third objective was to create a schedule management plan, which provides the documentation needed for the effective development, monitoring and controlling of the project schedule so that it is completed on time. The fourth objective was to create cost management plan in which the cost of the project is planned, estimated, budgeted, financed, and funded, within the approved budget. The fifth objective was to create a quality management plan which ensures that the project complies with quality standards and the quality requirements and/or standards for the project and that its deliverables were correctly identified. The sixth objective was to outline a project resource management plan which defines how to estimate, acquire, manage, and utilize physical and team resources to be used in the project. The seventh objective was to formulate a communications management plan which ensures that information is effectively exchanged, so that the information needs of the project and all stakeholders are adequately met. The eighth objective was to conduct risk management plan, identification, analysis, response planning, response implementation, and monitoring risk on a project. The ninth objective was to develop a procurement management plan which identifies the processes necessary to purchase or acquire products, services, or results needed from

outside the project team. The tenth objective was to formulate a stakeholder management plan which identifies the people, groups, or organizations that could impact or be impacted by the project, analyzes stakeholder expectations and their impact on the project, and develops appropriate management strategies for effectively engaging stakeholders in project decisions and execution. The final objective was to develop a sustainable development plan to assess the impact of the project on regenerative development.
The methodology employed in this research includes a combination of quantitative research method and analytical research method. Available facts and information from reliable sources were analyzed in order to construct the project management plan. Information sources included journal articles, textbooks, and best practice guides such as the PMBOK Guide, sixth edition and seventh edition. Tools such as interviews, meetings, surveys, observations were used to gather information on the field which were presented and analyzed.

The result of this project is the project charter and nine elaborated project management plans based on the project management knowledge areas. The final deliverable of the project is forty-eight feet by thirty-six feet structure, at a cost of XCD 277,893. The project will be constructed within one hundred and seventy-eight working days. The project quality will be maintained by routine inspections and assessment of work performance information. The resources for this project will be acquired locally, with priority given to the members of the FGL community. The project manager will be at the center of the communication network, ensuring that the needs of all stakeholders are adequately met according to their interests. The delivery method for this project is the traditional design-bid build method and the contract type will be a fixed price (time and materials) contract.

During the life cycle of the project, it is recommended that the project manager actively engages the stakeholders and keeps the project team highly motivated. Materials for the project should be ordered and purchased in a timely manner so as to avoid delays to the project schedule. Risks should be carefully monitored and controlled for the successful completion of the project. The FGLDC should seek additional funding for the expansion of the project scope to include training for the LRC employees.

1 INTRODUCTION

1.1. Background

The community of Fond Gens Libre lies at the base of the Gros Piton in St. Lucia, one of the famous designated UNESCO World Heritage Sites. This community is of African descent, with a rich historical and cultural heritage. The name Fond Gens Libre is translated to Valley of the Free People. The history of this community tells a story of slaves who fought for their freedom and found refuge at the base of the Gros Piton. Most of the residents of this community are employed as tour guides, office attendants, trail maintainers and cleaners of the Gros Piton Nature trail. To date, the community is poorly developed with only the basic amenities, water, electricity and internet and an office where the tours to the Gros Piton trail is managed. The members of the community have elected a Community Development Executive to oversee community development, particularly capacity building, which will enable them to play a greater part in the management of the Piton as well as to develop the physical and human resources within the community.

The Fond Gens Libre development Committee (FGLDC) uses projects which are aligned to their vision to bring about growth and development of their community. One of the projects that have been proposed for years by the past executives of the Community Development Committee is a Learning Resource Centre in the community. Such infrastructure has never been built in the community before and there is no project management plan to date, for the design and construction of the LRC.

The community places great importance upon the education of its children as a way out of poverty. During the covid 19 pandemic, education was greatly impacted and the students in Fond Gens Libre were not actively engaged due to the unavailability of a device or access to the internet. The LRC will provide learning opportunities which will improve the students' performance in the

classroom. Building an LRC in the community of Fond Gens Libre provides a means of reinforcing student learning, especially for those with special needs. It also improves adult literacy in the community and provides the space for physical training and continuing education for tour guides and others involved in the management of the Gros Piton nature trail.

This Final Graduation Project aims to create the Project Management Plan, consisting of all the subsidiary plans, which defines the basis of all project work, and how that work of construction of an LRC in the community of Fond Gens Libre will be performed. It will be the basis and guide for the effective execution and control of the building project. It will clarify the scope, quality of work and the risks which may impact the outcome of the project, providing a roadmap for the project team to work.

Therefore, the product of this FGP which is a project management plan, with all the subsidiary plans and including the validation of regenerative development, will help to maximize the use of the community's limited resources, while reducing the incidence of risks, for the successful completion of an LRC. It will ensure that the project adheres to the sustainable development goals, assuring the growth and success of the community for generations to come.

1.2. Statement of the problem

The Fond Gens Libre Development Committee is considered 'green' in its project management initiatives. So far, the committee has worked on one project which did not achieve the project schedule and scope. This is due in part to the absence of key areas of a project management plan such as the stakeholder management plan and risk management plan. Hence, to assure the success of this new project (an LRC), an elaborate project management plan which encapsulates all ten of the knowledge areas as well as the impact of sustainable development is necessary. This will help the FGLDC to adopt the correct

principles of project management, in order to ensure that the project is successful.

1.3. Purpose

In a quest for improving the standard of living of the people and using education as a tool for advancement, the FGLDC embarks on a project aligned with its goals to construct an LRC. Although inexperienced in the field of project management, the FGLDC must make maximum use of its limited resources for the completion of this project. Inadequate planning is one of the causes of delay and cost overruns on construction projects (Yap, et. al. 2019), which results in project failure. Hence, this FGP serves the purpose of providing an elaborate project management plan, as well as an assessment of the impacts of the project on regenerative development for the successful construction of an LRC.

The project management plan will provide the following benefits to the FGLDC and the FGL community:

1. It improves communication among project team members and with stakeholders. The communication management plan provides a strategy to ensure effective communication for all stakeholders throughout the project's life cycle. Mannata et. al (2002) attribute poor project team quality to a lack of communication with stakeholders.
2. It assures that the project occurs within the stipulated budget. Careful planning reduces the incidence of poor work quality, rework, delay and scope creep which can be very costly resulting in cost overruns.
3. It reduces the incidence of negative risks while increasing the incidence of positive risks. A risk management plan determines the risks that are likely to occur and analyzes the social, political, technological, legal, and economic environments and their implications on the project (PMI., 2017).
4. It provides a means of keeping the project on track. The planned performance is compared to the actual performance monitoring and

controlling project to allowing the project manager to make timely decisions to control changes, to ensure that the project is successfully completed within the given time, budget, scope and quality.

1.4. General objective

To develop a project management plan for the design and construction of a Learning Resource Centre in the community of Fond Gens Libre by June 30th, 2023.

1.5. Specific objectives

The specific objectives for this project are as follows:

1. To develop a project charter which formally authorizes the existence of the project, thereby giving the project manager authority to organizational resources to project activities.
2. To elaborate a scope management plan which encompasses only the work required to complete the project successfully.
3. To create a schedule management plan, which provides the documentation needed for the effective development, monitoring, and controlling of the project schedule so that it is completed on time.
4. To create a cost management plan in which the cost of the project is planned, estimated, budgeted, financed and funded, within the approved budget.
5. To create a quality management plan to ensure that the project complies with quality standards and the quality requirements and/or standards for the project and its deliverables are correctly identified.
6. To outline a project resource management plan which defines how to estimate, acquire, manage, and utilize physical and team resources to be used in the project.

7. To formulate a communications management plan to ensure the effective exchange of information so that the information needs of the project and all stakeholders are adequately met.
8. To conduct risk management plan, identification, analysis, response planning, for effective response implementation, and monitoring risk on a project
9. To develop a procurement management plan which identifies the processes necessary to purchase or acquire products, services, or results needed from outside the project team.
10. To formulate a stakeholder management plan which identifies the people, groups, or organizations that could impact or be impacted by the project, analyzes stakeholder expectations and their impact on the project, and develops appropriate management strategies for effectively engaging stakeholders in project decisions and execution.
11. To assess the impact of the project on sustainable and regenerative development.

2 THEORETICAL FRAMEWORK

2.1 Company/Enterprise framework

2.1.1 Company/Enterprise background

Fond Gens Libre (FGL) is a community found at the base of one of the twin peaks, Gros Piton, in the town of Soufriere, St. Lucia. The people of this community are of the descent of African slaves who found solace in the Gros Piton Forest, hence the translation of the name, Fond Gens Libre, Valley of the Free People. With the shift from agriculture as the main economic activity, to tourism in the 1990s, there was an increase in the number of tours to the Gros piton Nature trail, creating the need to establish a community-based organization to oversee the effective management of the trail. The community capitalized on the opportunity to organize itself into a legal entity, the Fond Gens Libre Development Committee (FGLDC). This organization works in the interest of the community to advocate the physical, economic and social needs of all residents.

2.1.2 Mission and vision statements

Vision

The vision of the FGLDC is to attain a united, vibrant, prosperous, growing, culturally and environmentally conscious community.

Mission

The mission of the FGLDC is to develop and implement creative and sustainable community-based strategies so as to enhance economic opportunity, build a strong community, and ensure a dynamic framework for growth and development in the interest of the holistic development of our residents.

Some of the objectives of the FGLDC are:

1. To serve as the primary mechanism through which beneficiaries would actively participate in community development initiatives and provide effective feedback to the respective institutions and the community.

2. To co-operate with governmental and non-governmental organizations as well as community-based organizations in the promotion of community development activities geared towards improving the standard of living of the community.
3. To manage the community resources, whether directly, collaboratively or through strategic partnerships with others to ensure that it rebounds to the social and economic development of the community.
4. To conduct research and undertake awareness building among residents of the opportunities for funding of community base projects as well as educational opportunities provided by outside agencies.
5. To raise awareness among community persons on environmental and sustainable development issues relevant to community growth and progress
6. To develop programs to facilitate the establishment of strategic alliances / linkages between community-based organizations and outside governmental and non-governmental agencies.
7. To encourage and facilitate activities aimed at promoting the wellbeing of the youth and elderly in the FGL community

2.1.3 Organizational structure

The Fond Gens Libre Development Committee operates under the directives of the Ministry of Equity, Social Justice and Empowerment of the Government of St., Lucia. The mission of this ministry is to promote, support and facilitate the participation, development and organization of our people, in utilizing their resources to effect self-directed change towards the economic, social, cultural, political and spiritual advancement of themselves, their communities and the nation. The FGLDC is governed by a constitution and the executive members are elected every two years. The executive consists of a president, a vice president,

secretary, assistant secretary, treasurer and assistant treasurer, a public relations officer, and three floor members.

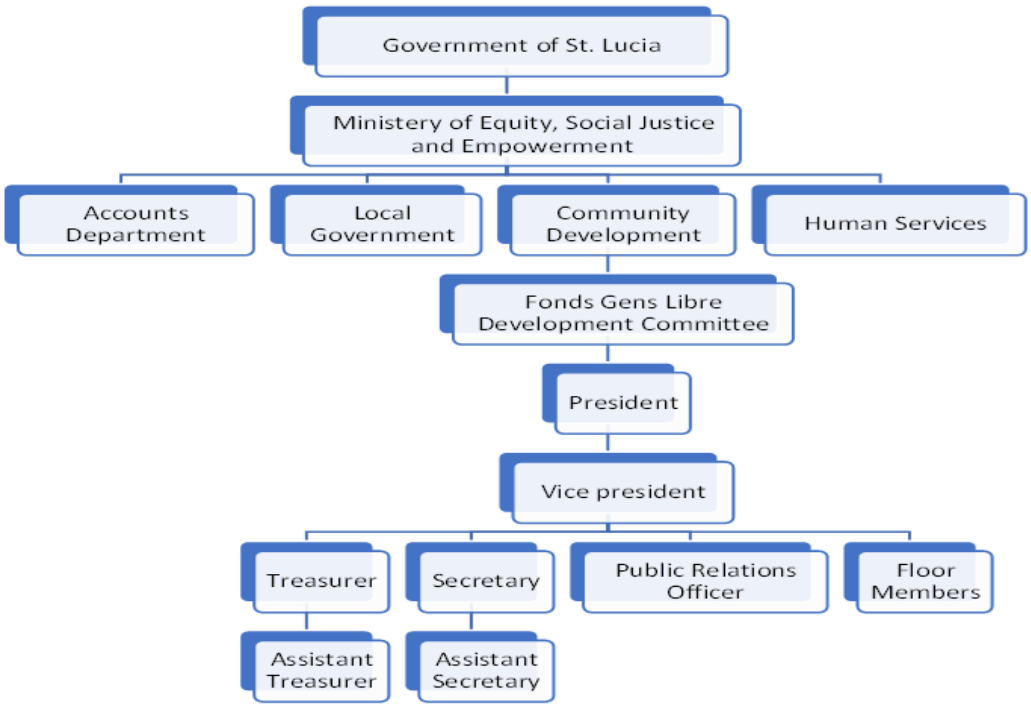

Figure 1: Organizational Structure of the FGLDC

(Source: Author)

2.1.4 Products offered

The FGLDC is currently offering the following tourism products: community culture and historical tours and tours up the Gros Piton Nature trail. As the community continues to build the capacity of its members and carry out projects which will enable it to be more competitive in a tourism market after the impacts of Covid 19, it needs to carry out best practices and effective planning and management of all its projects. A comprehensive project management plan which includes the impacts on regenerative development will help the organization to create value for its people using its rich historical and cultural heritage.

2.2 Project Management concepts

2.2.1 Project

The PMBOK Guide defines a project as a temporary endeavor undertaken to create a unique product, service, or result. A project has a beginning and an end, it can stand alone or be a part of a program or portfolio. (PMI., 2021). Koch-Ørvad, N. et al. (2019), describe a project as a driver of change. Therefore, in the case of the Fond Gens Libre community, the use of projects contributes to the accomplishment of the goals of the community, helps to surmount its challenges and improve the standard of living of its people.

2.2.2 Project management

The concept of project management came into existence when the five volunteers founded the Project Management Institute (PMI) in 1969 (Kebede. N.M, 2021). Project management is defined as, “the application of knowledge, skills tools and techniques to project activities to meet project requirements” (PMI., 2021, p.245). According to PMI. (2021), project management refers to “guiding the project work to deliver the intended outcomes” which can be achieved using approaches such as the predictive, hybrid and adaptive (PMI., 2021). It can be accomplished through the correct application and integration of the project management processes (Kebede. N.M, 2021).

Project management is rapidly becoming an integral part of many organizations today. Best practices in project management provide a competitive advantage and provides both tangible and intangible benefits which includes an increase in business value, greater benefits realization as well as greater customer and stakeholder satisfaction (Tereso et.al., 2019). The adoption of project management best practices by the FGLDC will allow it to achieve well-defined goals through the use of tools and techniques which are tailored to the needs of

the organization. The correct use of project management will enable the FGLDC to execute all its projects effectively and efficiently (PMI., 2017).

2.2.3 Project Life Cycle

The PMI defines the project life cycle as “the series of phases that a project passes through from its start to its completion” (PMI., 2021). In other words, the project life cycle is a systematic process from beginning to the end of the project. The project life cycle is made up of phases. A project phase is defined as a collection of logically related project activities that culminates in the completion of one or more deliverables.

The PMI., (2021) identifies the following as the phases of the project life cycle:

1. Feasibility: this phase determines whether the business case is valid, and the intended outcome can be delivered efficiently by the organization.
2. Design: This involves the planning and analysis which will result in the design of the deliverable which will be developed.
3. Build: this is the construction of the deliverable in a manner that complies with the specified qualities.
4. Test: This is a final quality review and inspection of the deliverables before they are taken to another stage or accepted by the customer.
5. Deploy: The project deliverables used for the benefits intended by the organization.
6. Close: At this point the project is closed, project knowledge and artefacts are archived, contracts are closed and team members are released (PMI., 2021).

The project life cycle may take varying approaches. A project management approach is the highest level of abstraction used when describing how a project will be designed or governed. The project management approaches are predictive, adaptive and hybrid approaches (Gemino, Reich, & Serrador, 2021; PMI., 2021). The type and number of project phases in the project life cycle is

determined by the timing and frequency of project deliverables, as well as the development approach. (PMI, 2021).

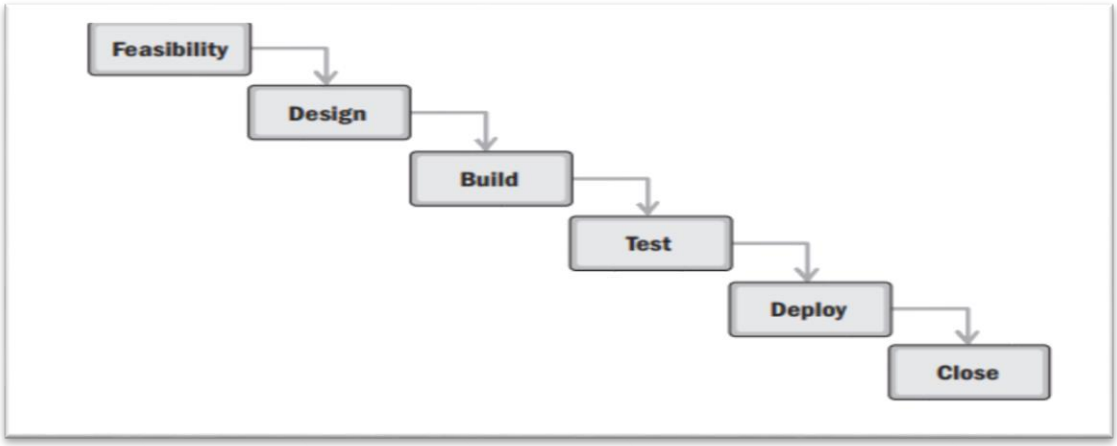

Figure 2. Project Life Cycle Following a Predictive Approach.

Source (PMI, 2021)

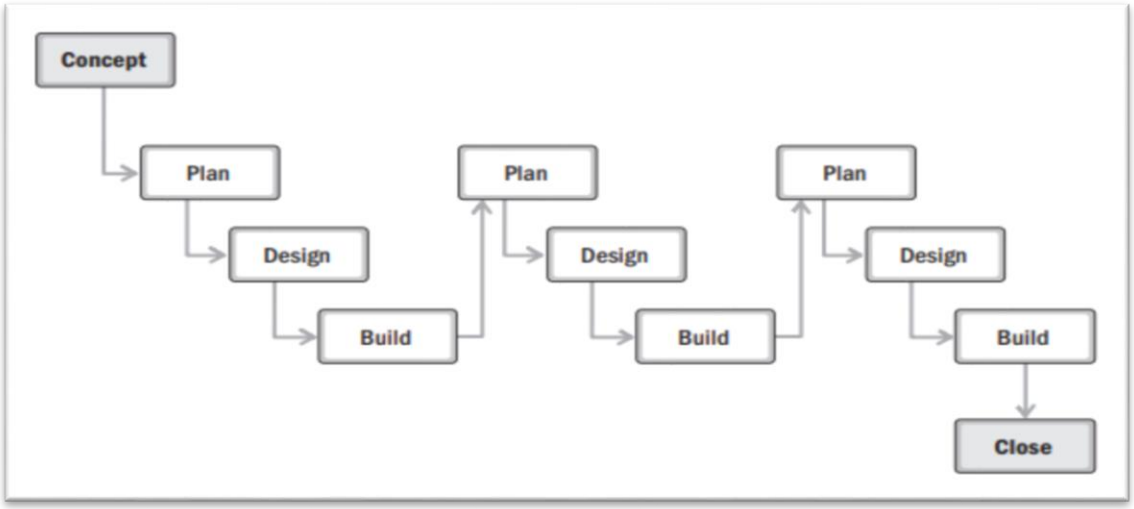

Figure 3. Project Life Cycle, Following an Incremental Approach.

Source (PMI, 2021)

2.2.4 Project management processes

Project management processes include a series of project management activities which are carried out during the project life cycle. They are organized into logical groupings of project management inputs, tools and techniques and outputs which are tailored to meet the needs of the project, stakeholders and organizations. The output of one process can be the input of another process or may be an outcome or a deliverable of the project (PMI., 2017).

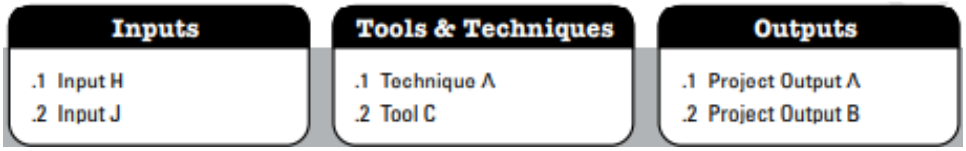

Figure 4. Project Management Process.

Source (PMI., 2017)

The PMI (2017) places the processes into three general categories.

1. Those used once or at predefined points in the project e.g. Develop Project Charter and Close.
2. Those that are performed periodically as needed, e.g. The process Acquire Resources and Conduct Procurements.
3. Those that are performed continuously throughout the project e.g. Define Activities and monitoring and control processes (PMI, 2017).

The PMI (2021) places the project management processes into the following five Project Management Process Groups:

1. “Initiating Process Group: Those processes are performed to define a new project or a new phase of an existing project by obtaining authorization to start the project or phase.
2. Planning Process Group: Those processes required to establish the scope of the project, refine the objectives, and define the course of action

required to attain the objectives that the project was undertaken to achieve.

3. Executing Process Group: Those processes are performed to complete the work defined in the project management plan to satisfy the project requirements.
4. Monitoring and Controlling Process Group: Those processes required to track, review, and regulate the progress and performance of the project; identify any areas in which changes to the plan are required; and initiate the corresponding changes.
5. Closing Process Group: Those processes are performed to formally complete or close the project, phase, or contract" (PMI., 2021).

2.2.5 Project Management Knowledge Areas

Project management bodies of knowledge such as the Guide to Project Management Body of Knowledge (PMBOK Guide) seventh edition from the project management institute, are used as best practice guides for project management. It includes proven traditional practices that are widely applied, as well as innovative practices that are emerging in the profession, including published and unpublished material (Tereso et.al, 2019).

"Project Management Knowledge Area is an identified area of project management defined by its knowledge requirements and described in terms of its component processes, practices, inputs, outputs, tools, and techniques (Kebede, N.M, 2021). There are ten knowledge areas identified by the PMI (PMI., 2017) in the PMBOK Guide, namely, project integration management, project scope management, project schedule management, project cost management, project quality management, project human resource management, project communications management, project risk management, project procurement management, and project stakeholder management.

Project Integration Management is defined as the coordination of all project management processes and “includes the processes and activities to identify, define, combine, unify, and coordinate the various processes and project management activities”.

“Project Scope Management includes the processes required to ensure the project includes all the work required, and only the work required, to complete the project successfully.

Project Schedule Management includes the processes required to manage the timely completion of the project.

Project Cost Management includes the processes involved in planning, estimating, budgeting, financing, funding, managing, and controlling costs so the project can be completed within the approved budget.

Project Quality Management includes the processes for incorporating the organization’s quality policy regarding planning, managing, and controlling project and product quality requirements, in order to meet stakeholders’ expectations.

Project Resource Management includes the processes to identify, acquire, and manage the resources needed for the successful completion of the project.

Project Communications Management includes the processes required to ensure timely and appropriate planning, collection, creation, distribution, storage, retrieval, management, control, monitoring, and ultimate disposition of project information.

Project Risk Management includes the processes of conducting risk management planning, identification, analysis, response planning, response implementation, and monitoring risk on a project.

Project Procurement Management includes the processes necessary to purchase or acquire products, services, or results needed from outside the project team.

Project Stakeholder Management includes the processes required to identify the people, groups, or organizations that could impact or be impacted by the project, to analyze stakeholder expectations and their impact on the project, and to develop appropriate management strategies for effectively engaging stakeholders in project decisions and execution" (PMI, 2017).

Table 1: Project Management Process groups

Knowledge Areas	Project Management Process Groups				
	Initiating Process Group	Planning Process Group	Executing Process Group	Monitoring and Controlling Process Group	Closing Process Group
4. Project Integration Management	4.1 Develop Project Charter	4.2 Develop Project Management Plan	4.3 Direct and Manage Project Work 4.4 Manage Project Knowledge	4.5 Monitor and Control Project Work 4.6 Perform Integrated Change Control	4.7 Close Project or Phase
5. Project Scope Management		5.1 Plan Scope Management 5.2 Collect Requirements 5.3 Define Scope 5.4 Create WBS		5.5 Validate Scope 5.6 Control Scope	
6. Project Schedule Management		6.1 Plan Schedule Management 6.2 Define Activities 6.3 Sequence Activities 6.4 Estimate Activity Durations 6.5 Develop Schedule		6.6 Control Schedule	
7. Project Cost Management		7.1 Plan Cost Management 7.2 Estimate Costs 7.3 Determine Budget		7.4 Control Costs	
8. Project Quality Management		8.1 Plan Quality Management	8.2 Manage Quality	8.3 Control Quality	
9. Project Resource Management		9.1 Plan Resource Management 9.2 Estimate Activity Resources	9.3 Acquire Resources 9.4 Develop Team 9.5 Manage Team	9.6 Control Resources	
10. Project Communications Management		10.1 Plan Communications Management	10.2 Manage Communications	10.3 Monitor Communications	
11. Project Risk Management		11.1 Plan Risk Management 11.2 Identify Risks 11.3 Perform Qualitative Risk Analysis 11.4 Perform Quantitative Risk Analysis 11.5 Plan Risk Responses	11.6 Implement Risk Responses	11.7 Monitor Risks	
12. Project Procurement Management		12.1 Plan Procurement Management	12.2 Conduct Procurements	12.3 Control Procurements	
13. Project Stakeholder Management	13.1 Identify Stakeholders	13.2 Plan Stakeholder Engagement	13.3 Manage Stakeholder Engagement	13.4 Monitor Stakeholder Engagement	

Source (PMI., 2017)

2.3 Other applicable theory/concepts related to the project topic and context

2.3.1 Project management plan and project success

Planning is a vital part of project management. It improves both project efficiency and overall project success, and the quality of the plan is positively correlated with project success in the construction industry (Sladowski G., 2018). The Planning Process Group, according to PMI. (2017), “establishes the total scope of the effort, define and refine the objectives, and develop the course of action required to attain those objectives”.

The project planning process is essential for optimal project performance as it entails the structuring and preparing for the work activities that will be carried out. They also develop the components of the project management plan and the project documents used to carry out the project. Poor project planning is a direct cause of problems which arise during the project execution and negatively impacts on project performance (cost, quality, and safety). Hence, organizations need to place utmost effort into the project management plan in order to meet their strategic objectives and have a competitive advantage (Pacagnella J.et. al., 2019, PMI., 2017).

2.3.2 Construction project management

Construction projects have a clearly defined time frame (beginning and end) and are highly structured and organized. Each construction project is unique and occurs under different conditions in rapidly changing and complex environments. Construction project management engages various disciplines, skills and competencies in order to accomplish the project, such as engineering and architecture. Construction project management is the process of managing, regulating and supervising construction processes. The process of construction project management allows for the planning of the project work during the

preconstruction phase, evaluate the project delivery and close at the end of the initiative (Sladowski, G., 2018, PMI., 2017).

The construction project management employs the same process groups that are highlighted in section 2.2.4 above, however the PMI (2016) introduces two additional Knowledge areas which are applicable to construction projects:

1. Project health, safety, security and environmental management: this deals with the health, safety, security and environmental management for construction projects. It takes into consideration site security and restricted access, as well as employee health and wellness.
2. Project financial management: this takes into account documents, tools and techniques required to navigate the financial aspects of construction projects (PMI, 2016).

3 METHODOLOGICAL FRAMEWORK

3.1 Information sources

An information source is a person, thing, or place from which information comes, arises, or is obtained. Information can be obtained from primary sources or secondary sources (Aravinthan and Natarajan, 2020).

3.1.1 Primary sources

Primary sources provide a first-hand account of an event or time period directly from the data source. It consists of data which was created at the time that the events take place but may also include sources that are created later. For this reason, primary sources are authoritative, and they are usually the first formal appearance of original research. Primary sources of information provide primary data, which is often reliable, authentic, and objective since it was collected with the purpose of addressing a particular research problem (UNSW Library. 2022, Aug 10).

Primary sources of information were required in order to obtain the information necessary for this FGP. Information was gathered from the following primary sources: interviews, minutes of meetings, the FGLDC constitution, financial reports of the FGLDC, government documents.

3.1.2 Secondary sources

Secondary sources of information provide data which has been collected in the past by someone else and made available for others to use. Secondary sources describe or explain primary sources and offer an analysis, interpretation or a restatement of primary sources and are thus persuasive. Secondary sources of information usually generalize, synthesize, interpret, comment or evaluate primary data from primary sources (UNSW Library, 10 Aug. 2022).

Some of the secondary sources which were included in this FGP are PMBOK guide 6th edition, PMBOK guide 7th Edition, Minimum Building Standards and environmental Guidelines for housing (OAS, May 2003), Construction Extension to the PMBOK guide (2016) edition, journal articles from the PMI, best practice guides as well as textbooks for best practices in building construction.

Table 2 Information Sources

Objectives	Information sources	
	Primary	**Secondary**
1. To develop a project charter which formally authorizes the existence of the project, thereby giving the project manager authority to organizational resources to project activities.	Interviews with the president of the FGLDC and other executive members, Minutes of meetings of the FGLDC as well as meetings with the entire community, emails, FGLDC constitution.	The PMBOK Guide 6th edition The PMBOK guide 7th edition Journal articles Web research Lecture presentation notes
3. To create a schedule management plan, which provides the documentation needed for the effective development, monitoring and controlling of the project schedule so that it is completed on time.	Minutes of meetings, Interviews, email, constitution of the FGLDC.	Practice standard for scheduling 3rd edition (2019). Construction Extension to the PMBOK guide edition, PMI (2016). PMBOK Guide 6th edition (2017) PMBOK Guide 7th edition (2021). The Standard for Earned Value Management, PMI (2019) Journal Articles from the PMI Web research

Objectives	Information sources	
	Primary	**Secondary**
4. To create cost management plan in which the cost of the project is planned, estimated, budgeted, financed and funded, within the approved budget.	Interviews, email, constitution of the FGLDC, minutes of meetings. Project charter Lessons learned from similar projects.	PMBOK Guide 6th edition (2017) PMBOK Guide 7th edition (2021). Practice standard for scheduling 3rd edition (2019). Practice Standard for project estimating, PMI (2019) The Standard for Earned Value Management, PMI (2019) Articles from the PMI Textbooks
5. To create a quality management plan to ensure that the project complies with quality standards and the quality requirements and/or standards for the project and its deliverables are correctly identified.	Interviews, email, constitution of the FGLDC, minutes of meetings.	Construction Extension to the PMBOK guide PMI (2016) PMBOK Guide 6th edition PMBOK Guide 7th edition Minimum Building Standards and environmental Guidelines for housing, (OAS, May 2003) Practice standard for scheduling 3rd edition, PMI (2019). Journal articles from the PMI

Objectives	Information sources	
	Primary	**Secondary**
6. To outline a project resource management plan which defines how to estimate, acquire, manage, and utilize physical and team resources to be used in the project.	Interviews with experts in the field, email, minutes of executive meetings of the FGLDC.	Construction Extension to the PMBOK guide, PMI (2016) PMBOK Guide 6th edition PMBOK Guide 7th edition Journal Articles.
7. To formulate a communications management plan to ensure the effective exchange of information so that the information needs of the project and all stakeholders are adequately met.	Interviews, email, constitution of the FGLDC, project charter.	Articles from the PMI on communications management, Construction Extension to the PMBOK guide (2016) edition PMBOK Guide 6th edition PMBOK Guide 7th edition Minimum Building Standards and environmental Guidelines for housing, (OAS, May 2003) Practice standard for scheduling 3rd edition (2019). Journal articles
8. To conduct risk management plan, identification, analysis, response planning, for	Meeting/Interviews, email, constitution of the FGLDC, lessons learned	Articles from the PMI on risk management, Construction Extension to the PMBOK guide, PMI (2016)

Objectives	Information sources	
	Primary	**Secondary**
effective response implementation, and monitoring risk on a project.	register from similar projects, Project charter.	PMBOK Guide 6th edition and PMBOK Guide 7th edition Practice standard for scheduling 3rd edition, PMI (2019). The Standard for Risk Management in Portfolios, Programs, and Projects (2019). Web research
9. To develop a procurement management plan which identifies the processes necessary to purchase or acquire products, services, or results needed from outside the project team.	Interviews, email, constitution of the FGLDC, Lessons learned register from similar projects.	Articles from the PMI on procurement management. Construction Extension to the PMBOK guide, PMI (2016) PMBOK Guide 6th edition and PMBOK Guide 7th edition Minimum Building Standards and environmental Guidelines for housing, (OAS, May 2003) Practice standard for scheduling 3rd edition, PMI (2019).
10. To formulate a stakeholder management plan which identifies the	Interviews, email, constitution of the FGLDC, Lessons learned register	Articles from the PMI on stakeholder management Construction Extension to the PMBOK guide PMI (2016)

Objectives	Information sources	
	Primary	**Secondary**
people, groups, or organizations that could impact or be impacted by the project, analyzes stakeholder expectations and their impact on the project, and develops appropriate management strategies for effectively engaging stakeholders in project decisions and execution.	from similar projects.	PMBOK Guide 6th edition and PMBOK Guide 7th edition Minimum Building Standards and environmental Guidelines for housing, (OAS, May 2003) Practice standard for scheduling 3rd edition PMI (2019). The Standard for Earned Value Management, PMI (2019)
11.To assess the impact of the project on sustainable and regenerative development	Interviews, email, constitution of the FGLDC, Observation.	Articles from the PMI on sustainable and regenerative development, Construction Extension to the PMBOK guide (2016) edition, Minimum Building Standards and environmental Guidelines for housing, (OAS, May 2003), Journal Articles,

Objectives	Information sources	
	Primary	Secondary
		Web research.

Source (Author)

3.2 Research methods

Research methods are the strategies, processes or techniques utilized in the collection of data or evidence for analysis in order to uncover new information or create better understanding of a topic (University of Newcastle Library guides, 2020).

There are different types of research methods which use different tools for data collection.

Qualitative method. Qualitative research is defined in Busetto, Wick and Gumbinger (2020), as “the study of the nature of phenomena, including their quality, different manifestations, the context in which they appear or the perspectives from which they can be perceived, but excluding their range, frequency and place in an objectively determined chain of cause and effect”. In essence the data generated is in the form of words and not numbers.

Analytical research: Analytical research is a specific type of research that involves critical thinking skills and the evaluation of facts and information relative to the research being conducted. It involves in-depth study and the evaluation of available information in an attempt to explain complex phenomenon. This type of research includes historical, philosophical, reviews and research synthesis.

In this research the analytical research method was used to make evaluations using the facts and information available from the secondary sources of information, as well as the qualitative research method to collect and analyze data which are not numerical.

Table 3 Research Methods

Objectives	Analytical Research Method	Qualitive Research Method
1.To develop a project charter which formally authorize the existence of the project, thereby giving the project manager authority to organizational resources to project activities.	Available information from the PMBOK 6th and 7th edition, the meetings of the FGLDC executive and the constitution were used to make decisions is used in the elaboration of the project charter.	Interviews with the executive of the FGLDC to determine the need for the project as well as the level of priority of the project to the community currently.
2. To elaborate a scope management plan which encompasses only the work required to complete the project successfully.	Available data and information from primary and secondary sources were used to accurately elaborate scope baseline.	This method was used, with the application of the deductive approach, gathering general data (primary and Secondary) and obtaining a specific solution to the proposed hypothesis in terms of

Objectives	Analytical Research Method	Qualitive Research Method
		requirements for the specific scope of work required.
3.To create a schedule management plan, which provides the documentation needed for the effective development, monitoring and controlling of the project schedule so that it is completed on time.	Available information from the secondary sources aforementioned were used to make evaluations and decisions is used in the elaboration of the schedule management plan e.g. Evaluation of EEPs.	This type of method was used to gather information from the experts and stakeholders using interviews, which were used to sequence activities, estimate activity durations etc.
4.To create cost management plan in which the cost of the project is planned, estimated, budgeted, financed and funded, within the approved budget.	Available information from the PMBOK 6th and 7th edition, the meetings of the FGLDC executive as well as data from other similar projects were evaluated and used to make decisions for the	The qualitative method, employing the deductive approach was used to gather information pertaining to the budget of the FGLDC in order

Objectives	Analytical Research Method	Qualitive Research Method
	accurate elaboration of the cost management plan.	to plan the project cost.
5.To create a quality management plan to ensure that the project complies with quality standards and the quality requirements and/or standards for the project and its deliverables are correctly identified.	Facts and information were used from various sources to determine the quality management plan that meets the international standards and the requirements of the stakeholders.	Valid data collected using the appropriate data collection tools were analyzed and used to determine the required quality of the project.
6.To outline a project resource management plan which defines how to estimate, acquire, manage, and utilize physical and team resources to be used in the project.	Facts and information from the PMBOK Guide (edition 6 and 7) such as tools and techniques, primary data from the previous sections such as the WBS were used in the creation of the components of the	Valid data collected using the appropriate data collection tools will be analyzed and used to determine the resources required carry out the project.

Objectives	Analytical Research Method	Qualitive Research Method
	resource management plan.	
7.To formulate a communications management plan to ensure the effective exchange of information so that the information needs of the project and all stakeholders are adequately met.	Literature on effective communication including tools and techniques from PMBOK guide were used for the analytical approach to the development of the communication management plan.	Valid data collected using the appropriate data collection tools will be analyzed and used to determine the appropriate communication models, methods and technology for the effective flow of information.
8.To conduct risk management plan, identification, analysis, response planning, for effective response implementation, and monitoring risk on a project	Facts and information from reliable sources were assessed and used in the identification, categorization and planning of risk responses.	Qualitative method was used in the Risk management plan by gathering opinions and experiences from experts and using appropriate

Objectives	Analytical Research Method	Qualitive Research Method
		tools to analyze risk and plan risk responses.
9.To develop a procurement management plan which identifies the processes necessary to purchase or acquire products, services, or results needed from outside the project team.	Historical information as well as information from project documents were used in the preparation of statements of works, assessing market conditions which can impact procurements.	Valid data collected using the appropriate data collection tools were analyzed and used to identify reliable sellers.
10.To formulate a stakeholder management plan which identifies the people, groups, or organizations that could impact or be impacted by the project, analyzes stakeholder expectations and their impact on the project, and develops appropriate management strategies for effectively	Available information from the PMBOK 6th and 7th edition, journal articles, and other sources were used to make decisions in the identification and engagement strategies elaborated in the stakeholder management plan.	Data was collected using interviews, surveys, meetings to identify stakeholders, and plan stakeholder engagement.

Objectives	Analytical Research Method	Qualitive Research Method
engaging stakeholders in project decisions and execution.		
11. To conduct an assessment of the impact of the project on sustainable and regenerative development.	Data and information from both primary and secondary sources were evaluated to accurately assess the positive and negative impact of the project on sustainability and regenerative development.	Information was collected through observation and a survey to determine how the project can improve be sustainable and improve regenerative development in the community.

Source (Author)

3.3 Tools

A data collection tool or research tool is any tool used to measure a variable, or to collect the information needed to answer a research question. Careful selection of data collection tools can help the researcher achieve the intended objectives and save time (CIKD, 2019). The tools used to gather information on each objective are listed in table 4.

Table 4 Tools

Objectives	Tools
1. To develop a project charter which formally authorize the existence of the project, thereby giving the project manager authority to organizational resources to project activities.	Interviews, meetings, charter template.
2. To elaborate a scope management plan which encompasses only the work required to complete the project successfully.	Meetings, expert judgement, interviews, observation, Work breakdown structure template Work breakdown structure dictionary template, Microsoft excel.
3. To create a schedule management plan, which provides the documentation needed for the effective development, monitoring, and controlling of the project schedule so that it is completed on time	Interviews, expert judgement, tools for data analysis: Microsoft excel, Microsoft project.
4. To create cost management plan in which the cost of the project is planned, estimated, budgeted, financed and funded, within the approved budget.	Meetings, interviews, expert judgement cost management plan template, Bottom-up estimating.
5. To create a quality management	Interviews, Microsoft excel,

Objectives	Tools
plan to ensure that the project complies with quality standards and the quality requirements and/or standards for the project and its deliverables are correctly identified.	check list, benchmarking and cost benefit analysis.
6. To outline a project resource management plan which defines how to estimate, acquire, manage, and utilize physical and team resources to be used in the project.	Meetings, Microsoft excel, Hierarchical charts, Bottom-up estimating.
7. To formulate a communications management plan to ensure the effective exchange of information so that the information needs of the project and all stakeholders are adequately met.	Meetings, interviews, brainstorming, Microsoft excel,
8. To conduct risk management plan, identification, analysis, response planning for effective response implementation, and monitoring risk on a project	Meetings, interviews, Microsoft excel, P x I template, Risk register template.
9. To develop a procurement management plan which identifies the processes	Microsoft excel, questionnaire, interviews.

Objectives	Tools
necessary to purchase or acquire products, services, or results needed from outside the project team.	
10. To formulate a stakeholder management plan which identifies the people, groups, or organizations that could impact or be impacted by the project, analyzes stakeholder expectations and their impact on the project, and develops appropriate management strategies for effectively engaging stakeholders in project decisions and execution.	Microsoft excel, interviews, expert judgement.
11. To conduct an assessment of the impact of the project on sustainable and regenerative development.	SMP template, Microsoft excel, observation, survey, interviews.

Source (Author)

3.4 Assumptions and constraints

The PMI (2021, p.235) defines an assumption as “a factor in the planning process that is considered to be true, real or certain, without proof or demonstration”. A knowledge of the assumptions for any project is of paramount importance, and according to Kinser, J. (2010), “the most important thing in project management is getting the project manager to write down their unvoiced thoughts and assumptions”.

A constraint is defined as a limiting factor that affects the execution of a project, program, portfolio, or process (PMI., 2021, p. 237). In this FGP, the identification of assumptions and constraints will occur in each of the respective knowledge areas.

Table 5 Assumptions and Constraints

Objectives	Assumptions	Constraints
1. To develop a project charter which formally authorize the existence of the project, thereby giving the project manager authority to organizational resources to project activities.	The charter will be correctly developed within the allotted time.	Time for getting the information required for the project charter is limited as the researcher may not be able to get interviews with all the main stakeholders within one week.

Objectives	Assumptions	Constraints
2. To elaborate a scope management plan which encompasses only the work required to complete the project successfully.	The researcher will have access to minutes of meetings from the FGLDC Experts will be willing to provide expert judgement and guidance. Timely feedback will be given by the tutor for timely completion of the plan.	Resources are limited to prepare the scope management plan. The researcher has to work with the given schedule of the experts to obtain interviews for gathering information.
3. To create a schedule management plan, which provides the documentation needed for the effective development, monitoring and controlling of the project schedule so that it is completed on time.	The researcher will have all the resources and tools needed to adequately create the schedule management plan.	Interviews from experts will be done after work hours which can result in time constraints.
4. To create cost management plan in which the cost of the project is planned, estimated, budgeted, financed and funded, within the approved	The FGLDC is willing to provide the information necessary to plan and estimate the budget.	The researcher has to gather information after work hours, and this may pose schedule constraints for the FGP.

Objectives	Assumptions	Constraints
budget.	Expert judgement will be readily accessible to the researcher for compiling the plan.	
5. To create a quality management plan to ensure that the project complies with quality standards and the quality requirements and/or standards for the project and its deliverables are correctly identified.	The researcher will have access to the minutes of the meetings of the FGLDC. Expert judgement is available for gathering information for the plan.	There is a lack of historical information on similar projects done by the FGLDC.
6. To outline a project resource management plan which defines how to estimate, acquire, manage, and utilize physical and team resources to be used in the project.	The researcher will be able to complete the resource management plan within the specified time frame given.	The researcher may not have access to the interviewees during work hours (8am to 4 pm) and may have to schedule for weekends which may not always be convenient for interviewees.

Objectives	Assumptions	Constraints
7. To formulate a communications management plan to ensure the effective exchange of information so that the information needs of the project and all stakeholders are adequately met.	Minutes of meetings are readily available to the researcher to determine accurately the communication needs of the stakeholders.	Face-to-face meetings with the experts may be limited due to the distance of travel and hence some of the interviews must be conducted online.
8. To conduct risk management plan, identification, analysis, response planning for effective response implementation, and monitoring risk on a project.	Expert judgement and other information to develop the plan will be readily available.	There is a lack of historical data from the organization which can be referred to for risk identification.
9. To develop a procurement management plan which identifies the processes necessary to purchase or acquire products, services, or results needed from outside the project team.	Expert judgement and other information to develop the procurement plan will be readily available.	There is a lack of historical data, as this is the first project of its type done by the organization.

Objectives	Assumptions	Constraints
10. To formulate a stakeholder management plan which identifies the people, groups, or organizations that could impact or be impacted by the project, analyzes stakeholder expectations and their impact on the project, and develops appropriate management strategies for effectively engaging stakeholders in project decisions and execution.	The researcher has access to the minutes of meetings of the executive and expert judgement will be readily available.	Time constraints may result, as the researcher has to meet with experts and stakeholders after work hours to collect information.
11. To assess the impact of the project on sustainable and regenerative development.	Adequate data is available to prepare a SMP.	Time constraints may result due to limited time to work on the SMP.

Source (Author)

3.5 Deliverables

A deliverable is any unique and verifiable product, result or capability to perform a service that is required to be produced to complete a process, phase or project (PMI., 2022). The major deliverable of this project is a project management plan for the construction of a learning resource center in the community of Fond Gens Libre, Soufriere, St. Lucia. The deliverable for each of the objectives of this project is identified in table 6.

Table 6: Deliverables

Objectives	Deliverables
1. To develop a project charter which formally authorize the existence of the project, thereby giving the project manager authority to organizational resources to project activities.	Project Charter. This short document validates the existence of the project and provides the project manager with the authority to carry out the project.
2. To elaborate a scope management plan which encompasses only the work required to complete the project successfully.	Scope management plan. This plan includes the requirements traceability matrix. WBS, WBS dictionary, scope statement.
3. To create a schedule management plan, which provides the documentation needed for the effective development, monitoring and	Schedule management plan. This plan includes the activity list, sequence of activities, activity durations, schedule model, schedule baseline.

Objectives	Deliverables
controlling of the project schedule so that it is completed on time.	
4. To create cost management plan in which the cost of the project is planned, estimated, budgeted, financed and funded, within the approved budget.	Cost management Plan. This plan includes the cost baseline, an estimate of costs and the project budget.
5. To create a quality management plan to ensure that the project complies with quality standards and the quality requirements and/or standards for the project and its deliverables are correctly identified.	Quality management plan: this plan ensures that quality is an integral part of the project, and it is carefully managed and controlled.
6. To outline a project resource management plan which defines how to estimate, acquire, manage, and utilize physical and team resources to be used in the project.	Resource management plan: This plan ensures that all project resources, both human and physical, are efficiently allocated, managed and controlled for the successful completion of the project within the required scope, time and quality.
7. To formulate a	Communications management plan

Objectives	Deliverables
communications management plan to ensure the effective exchange of information so that the information needs of the project and all stakeholders are adequately met.	includes the formulation of an appropriate approach and plan for communication based on the needs of the stakeholders, available assets and project needs.
8. To conduct risk management plan, identification, analysis, response planning for effective response implementation, and monitoring risk on a project.	Risk management plan: This plan includes the identification of risks, qualitative analysis of those risks, and the associated risk responses.
9. To develop a procurement management plan which identifies the processes necessary to purchase or acquire products, services, or results needed from outside the project team.	Procurement management plan: This plan includes the procurement activities to be developed in the project, the contract type, delivery method, and the way in which procurement will be monitored and controlled.
10. To formulate a stakeholder management plan which identifies the people, groups, or organizations that could	Stakeholder management plan: This plan includes the identification of stakeholders and the development of approaches to effectively engage them based on their needs,

Objectives	Deliverables
impact or be impacted by the project, analyzes stakeholder expectations and their impact on the project, and develops appropriate management strategies for effectively engaging stakeholders in project decisions and execution.	expectations, interests and the impact they may have on the project.
11. To conduct an assessment of the impact of the project on sustainable and regenerative development.	This assessment includes the positive or negative impacts of the project on social, economic, and environmental parameters.

Source (Author)

4 RESULTS

4.1 Project Charter

4.1.1 Title of project

The design and construction of a Learning Resource Centre in the community of Fond Gens Libre, St. Lucia.

4.1.2 Project purpose and benefits

There is a need for community growth and development, not only in its physical infrastructure, but also in the education of its residents and the building of capacity among the community members of Fond Gens Libre. Hence, this LRC will provide a learner centered environment to help reinforce student learning, especially for those with special needs. It will be providing internet access as well as access to e-Books and other literature, which will boost the motivation to learn and improve student performance. It is expected that through literacy programs, there will be an improvement in adult literacy in the community. The LRC will provide the physical space and resources for training and continuing education for tour guides and others involved in the management of the Gros Piton Nature Trail. This will help to build capacity and better equip the members for a more effective management of the Gros Piton trail. The LRC will also help in the preservation and maintenance of the history and cultural heritage of the people through a display of artefacts and audiovisual presentation.

4.1.3 Project Objectives

The general objective of this project is to design and construct an LRC in the community of Fond Gens Libre, St. Lucia, which provides a conducive environment for learning, by the end of June 2023.

The specific objectives are

1. To Design, draw and outline the specifications for the construction of a Learning resource center, based on the given requirements of the stakeholders.
2. To procure a contractor for the construction of the LRC based on competence and skill, cost and quality, through a bidding process by January 2023.
3. To obtain the permits required for constructing the LRC from the relevant authorities, by January 2023.
4. To complete the foundation works for the project by the first day of March 2023.
5. To complete the construction of all block work including the ring beam for the structure by the twenty fourth of March 2023.
6. To completely construct the roof of the structure by the fourth of April 2023.
7. To install all doors and windows of the structure by the eleventh of April 2023.
8. To construct and install all carpentry works and finishes by nineteenth of May 2023.
9. To correctly install all utilities and systems by the thirty first of May 2023.
10. Close the project and hand over the complete LRC to the owner by the thirtieth of June 2023.

4.1.4 Indicators of Success

The success of the project will be based on:

- Timely completion of the project within the given budget, quality and scope.
- Improvement in student performance and adult literacy.

- Increase in the employment rate of youth under thirty-five years by at least twenty percent within five years.
- One hundred percent usage of the facility daily.
- Improvement in the efficiency and effectiveness of the management of the Gros Piton Nature trail which will be evidenced in the increase in revenue.

4.1.5 Project description and key deliverables

This project will include the construction of a 48 feet x 36 feet structure at the base of Gros Piton. The structure will consist of large windows which provide natural lighting as well as a view of the majestic peak. The structure will consist of an open floor concept which will allow for supervision by administration, however, low carrels will provide the personal space needed for quiet work and research. It will contain one classroom and one conference room. The structure will include a male and female toilet, as well as a toilet for the physically challenged. The users of the building will be provided with computers and high-speed internet access. The deliverables of this project are:

- Design, drawing and specifications for a Learning resource center
- Procurement of contractor for the project
- Permits and legal requirements for building
- Complete substructure
- Complete superstructure
- Roof
- Doors and Windows installed
- Finishes and carpentry
- Utilities and systems
- Closing of the project

4.1.6 Scope exclusions

The scope of this project will not include the training or recruiting of staff for the LRC. It will not include the maintenance of the LRC, nor the payment of operational costs.

4.1.7 Overall project risk

The project risks will be continuously monitored and managed throughout the project.

The overall project risks include:

- Adverse weather conditions may negatively affect the project schedule and budget due to rework.
- Market place conditions and inflation may result in an increase in the cost of materials thereby increasing the budget.
- Shortage of materials on island especially cement will increase the time taken to complete the project.

4.1.8 Assumptions

It is assumed that

- The contractor is qualified with skills and abilities to deliver the project on time, within budget and with the best quality.
- The building will be completed within time, budget and at the required standard and quality.
- The area selected for construction will be approved by the Ministry of Agriculture Fisheries, Food security and Rural development and the Department of Planning of the Ministry of Infrastructure, Ports, Transport, physical development, and Urban renewal.
- There will be no resurgence of a pandemic resulting in lockdowns.
- The stakeholders will remain committed to the funding of the project to its completion.

- Some of the resources can be extracted from the community reducing the cost of materials for the project.

4.1.9 Summary milestone schedule

This project should be completed within a period of four months of the start of the execution phase. This period includes the time required for project management, design of the structure, wait time for approval, contractor approval and the execution of the project.

Table 7 Estimated Finish Dates of Key Deliverables

Deliverable (Milestone)	Finish Estimated Date
Designs (drawings and specifications)	11/30/22
Signed Contracts	01/12/23
Signed Permits	01/25/23
Completed foundation	03/01/23
Roof	04/04/23
Doors and Windows	13/08/2024
Finishes and carpentry	05/19/23
Utilities and Systems	05/31/23
Closing	06/12/23

Source (Author)

4.1.10 Financial Resources

The full project will be delivered not exceeding the cost of Two hundred and eighty thousand Eastern Caribbean Dollars (ECD $280,000.00).

4.1.11 Key Stakeholder List

The stakeholders for this project will include:

- Fond Gens Libre Development committee
- Fond Gens Libre Community
- Soufriere Regional Development Foundation

- Ministry of Social Transformation, Local Government and Community Empowerment.
- Ministry of Agriculture, Fisheries, Food security and Rural development
- Project Manager
- Project Team

4.1.12 Roles and responsibilities

Table 8: Roles and Responsibilities

Roles	Responsibilities
Project Owner	Overall responsibility for leading the project team to meet the project objectives and stakeholders' expectations.
Project Sponsors	Provide the financial resources for the completion of the project in a timely manner.
Project Manager	Lead the project team and achieve project objectives.
Project Team Members	Provide the expertise to execute the project, producing the deliverables under the guidance of the project manager.
Ministry Of Agriculture, fisheries, food security and Rural development	Provide expert advice on the sustainability of the environment in order to avoid harm to biodiversity on the trail.

Source (Author)

4.2 Scope Management Plan

4.2.1 Collect requirements

The stakeholder requirements were identified using a survey which was carried out among the residents of Fond Gens Libre and interviews held with the executive of the FGLDC. The engineer as well as a competent project manager were also interviewed for the collection of functional requirements. The stakeholders' requirement was prioritized based the challenges to implement them, demands on resources as well as the contribution to achieving the mission of the FGLDC and the objectives of this project. The project manager and the owner were responsible for the management of the requirements.

Table 9 Requirements Traceability Matrix

ID	Assistant ID	Category	Requirements description	Justification	Priority	Project Objective	Requested by	WBS element
1.	1.1	Functional	Open Floor plan	Creating a people centered space for easy access to services and information and to enable the people to adapt to changing academic needs.	High	To design, draw and outline the specifications for the construction of a Learning resource center, based on the given requirements of the stakeholders.	FGLDC	2
	1.2		Efficient PC Network	Allows access to electronic resources, eBooks, internet access, desktop applications and email facilities.	High	To correctly install all utilities and systems by the thirty first of May 2023.	FGLDC	1.8.4
	1.3		Study and work facilities: Study carrels, one classroom with audiovisual space.	Areas to facilitate quiet study, areas for group work and audiovisual interactions.	High	To construct and install all carpentry works and finishes by the nineteenth of May, 2023.	Community members of FGL	
	1.4		One Classroom	Area to facilitate training session for staff, extra lessons for students	High	To design, draw and outline the specifications for	Community members	

ID	Assistant ID	Category	Requirements description	Justification	Priority	Project Objective	Requested by	WBS element
				especially in the area of mathematics, and adult literacy classes.		the construction of a Learning resource center, based on the given requirements of the stakeholders.	of FGL	
	1.5		One conference room	Area to facilitate meetings, space is rented for generation of income to cover maintenance overheads	High	To design, draw and outline the specifications for the construction of a Learning resource center, based on the given requirements of the stakeholders.	SRDF	
			Durable Finishes and surfaces	Durable finishes and surfaces will reduce the maintenance cost	High	To construct and install all carpentry works and finishes by the nineteenth of May, 2023.	FGLDC	1.8
	1.6		Large windows	Large windows promote natural lighting and reduce the cost of overheads.	Medium	To install all doors and windows of the structure by the eleventh of April, 2023.	SRDF	1.7

ID	Assistant ID	Category	Requirements description	Justification	Priority	Project Objective	Requested by	WBS element
2.	2.1	(Non-Functional) Security	Building is located away from falling rocks from the mountain and away from areas prone to land slippage.	The building must be located in an area which is safe.	High		Community members of FGL	
	2.2	Accessibility	Handrails on both sides of steps, ramps.	Easy access to persons with disabilities.	High	To design, draw and outline the specifications for the construction of a Learning resource center, based on the given requirements of the stakeholders.	FGLDC	1.5
	2.3	Sanitary	washroom/ toilet	Availability of washrooms for users.	High		Community members of FGL	
	2.4	Adaptability	Movable partition between the classroom and conference	The building can be adapted in the future, as technology increases and the needs of the community changes.	High	To design, draw and outline the specifications for the construction of a Learning resource center,	FGLDC	

ID	Assistant ID	Category	Requirements description	Justification	Priority	Project Objective	Requested by	WBS element
			room.			based on the given requirements of the stakeholders.		
	2.5	Interactivity	Main counter is placed at the center of the room	To promote supervision and interaction between students and administration for the effective use of the services provided.	High	To design, draw and outline the specifications for the construction of a Learning resource center, based on the given requirements of the stakeholders.	FGLDC	
	2.6	Environment	Windows overlooking the Piton.	Windows provide natural ventilation and also a view of the Piton which provides a relaxing and conducive environment for the users.	High	To design, draw and outline the specifications for the construction of a Learning resource center, based on the given requirements of the stakeholders.	Community members of FGL	

Source (Author)

4.2.2 Define Scope

4.2.2.1 Project scope statement

Overall description of the work. The project is to design and build an LRC in the community of Fond Gens Libre, Soufriere. This project consists of the design and construction of a structure that meets international standards. The building will be furnished with IT infrastructure, which includes internet access and the required software and hardware.

Deliverables. The deliverables of this project are due at the end of each milestone as outlined in section 4.1.5. The final deliverable is the construction of a building which meets the international standard for a LRC and includes features in the design to allow for natural lighting, a conference room, a classroom and an open concept area for research and access to information. The complete LRC also includes the installation of an IT infrastructure to support access to electronic resources and the placement of furniture in all rooms. These deliverables will provide a conducive space for learning for all users.

Justification for the project. The FGLDC has observed the need for a LRC in the community in order to keep the people in a continuous state of learning. A focus on the education of its children who are at primary and secondary levels, will assure their improved performance. This will eventually lead to increased employment rates, improved socioeconomic conditions, thereby reducing and eventually eliminating poverty. The access to equitable information services and training will help to build capacity among the community members of Fond Gens Libre, so that they are better equipped to manage the Gros Piton nature Trail which is a lucrative resource to the community.

Constraints. St. Lucia is prone to hurricanes. If the project is done during the hurricane season, then such weather may affect the project schedule. The continuous increase in price of materials on the island may result in an increase in the cost of the project and may also lead to a change of scope in order to keep the project within budget.

Assumptions.

It is assumed that:

The stakeholders will remain committed to the funding of the project to its completion.

The weather will permit for the timely construction of the LRC.

The work will be done of optimal quality which eliminates the need for rework.

The contractor has the skills and abilities to deliver the project on time, within budget and with the best quality.

One engineer will be onsite for the construction of the LRC.

Some of the resources can be extracted from the community reducing the cost of materials for the project.

Project Exclusions.

The training and recruitment of staff for the LRC will be excluded from the project.

4.2.3 Create WBS

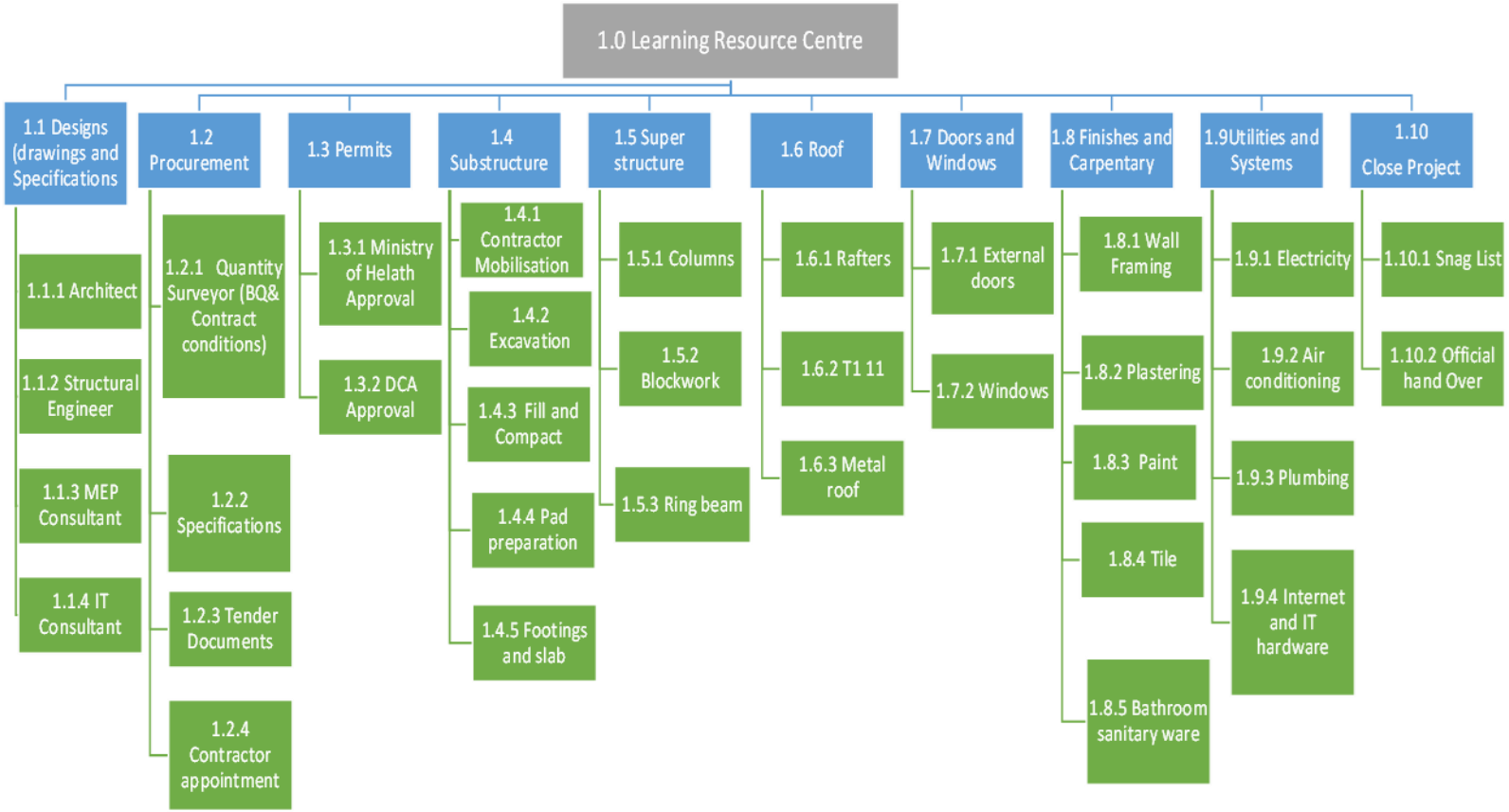

Figure 5 WBS for LRC

Source (Author)

Table 10 WBS Dictionary

WBS Code	Element Name	Description of Work	Assumptions and Constraints	Deliverables	Schedule Estimate	Acceptance Criteria	Resources
1.1	Designs, drawings, and specifi-cations	Planning and updating iterative plans throughout the project life cycle.	The design will be restricted by the budget available for the building and the boundaries of the property.	Plans and specifications	24 days	The designs drawings and specifications meet the legal requirements and stakeholder expectations.	
1.1.1	Architect	Provide technical specifications and drawings to guide construction	An affordable professional can be sourced.	Detailed plan of the structure to be constructed which includes the Foundation	20 days		Architect
1.1.2	Structural Engineer		The community does not have professionals in		10 days		Structural engineer

WBS Code	Element Name	Description of Work	Assumptions and Constraints	Deliverables	Schedule Estimate	Acceptance Criteria	Resources
		works.	the field, and they will have to be sourced on island.	Plan, Ground floor plan, Electrical Plan, roof framing plan, Front elevation, Right, rear and left elevation, door Schedule, window schedule.			
1.1.3	MEP consultant		All plans will be delivered within the given schedule.		15 days		MEP consultant
1.1.4	IT consultant				5 days		IT Consultant
1.2	Procurement	Process to identify and select	General contractor employs		42 days		

WBS Code	Element Name	Description of Work	Assumptions and Constraints	Deliverables	Schedule Estimate	Acceptance Criteria	Resources
		qualified general contractors.	competent subcontractors of successful project completion.				
1.2.1	Quantity Surveyor (BQ and contract conditions.	Quantity surveyor prepares the bill of quantities and details the contract conditions.	Quantity surveyor provides a detailed BOQ.	Bill of `Quantities, Contracts	10 days	Bill of Quantities meet the stakeholder requirements and expectations .	Quantity Surveyor
1.2.2	Specification	Detail of the work required for		Building Specifications	10 days	Specification meets the stakeholder	Quantity Surveyor

WBS Code	Element Name	Description of Work	Assumptions and Constraints	Deliverables	Schedule Estimate	Acceptance Criteria	Resources
		the project.				requirements and expectations.	
1.2.3	Tender documents	Preparation of tender documents for the tendering process.	Tender documents are detailed and unambiguous.	Tender documentation	5 days	Documents are detailed and unambiguous	Project manager
1.2.4	Contractor appointment	A contractor is selected to undertake project works.	Priority will be given to a contractor from the community. The most qualified	Contractor for project works	2 days	Contractor meets the selection criteria.	Negotiator, Lawyer

WBS Code	Element Name	Description of Work	Assumptions and Constraints	Deliverables	Schedule Estimate	Acceptance Criteria	Resources
			contractor will be awarded the contract.				
1.3	Permits	The obtention of necessary legal requirements for construction.	All the legal requirements will be obtained within the given schedule, for the construction process.	Approved documents for construction work.	45 days	Permits are given the stamp of approval by the relevant authorities at the first submission.	
1.3.1	Ministry of Health approval	Approval from the ministry of Health.	The plan will be approved by the Ministry of Health.	Plan and Drawings approved by Ministry of Health.	15 days		

WBS Code	Element Name	Description of Work	Assumptions and Constraints	Deliverables	Schedule Estimate	Acceptance Criteria	Resources
1.3.2	DCA Approval	Approval from the Ministry of Planning.	The Plan will be approved by the DCA., Obtention of legal requirements are very time consuming.	Plan and Drawings approved by DCA.	30 days		
1.4	Substructure	Preparation of earthworks for foundation.	Adverse weather conditions can delay the project.	Complete foundation.	32 days	Concrete meets the quality as specified in the BOQ. The foundation has the	Constructio n Team
1.4.1	Mobilise Contractor	Preliminary works such as building	All equipment is working up to standard.	Team mobilisation.	1 day		

WBS Code	Element Name	Description of Work	Assumptions and Constraints	Deliverables	Schedule Estimate	Acceptance Criteria	Resources
		storage sites and mobilising the team for commencement of works.	Construction team is organised.			specified dimensions. Concrete strength meets the minimum of 2500 psi.	
1.4.2	Excavation	Prepare all works necessary to build the foundation	Unexpected boulders underground can result in delay	Completed excavation works	14 days		
1.4.3	Fill and compact	Raising the foundation to the desired hight	Adverse weather conditions can delay the	Complete foundation	6 days		

WBS Code	Element Name	Description of Work	Assumptions and Constraints	Deliverables	Schedule Estimate	Acceptance Criteria	Resources
1.4.4	Pad preparation	Preparation of earthworks for foundation	project. Materials will be available for the project.	works	3 days		
1.4.5	Footings and Slab	Completion of the foundation works with in-situ surface finishes.			9 days		
1.5	Superstructure	Construction of external walls.		Complete external walls	24 days	Structure passes strength and stability	Construction team
1.5.1	Columns	Construction	Steel will be	Columns	5 days		

WBS Code	Element Name	Description of Work	Assumptions and Constraints	Deliverables	Schedule Estimate	Acceptance Criteria	Resources
		of reinforced Columns.	available on island for construction works.			testing. All areas are plumb, square, and level. Slope level of ramp meets the stakeholder's requirement.	
1.5.2	Blockwork	Construction of Brick block walling.	Blocks will be of superior quality which guarantees the integrity of the structure, adequate Local workforce will be available for the project.	Concrete 6" block external walls including reinforcement	14 days		
1.5.3	Ring beam	Construction of ring beam		Reinforced ring beam	5 days		

WBS Code	Element Name	Description of Work	Assumptions and Constraints	Deliverables	Schedule Estimate	Acceptance Criteria	Resources
1.6.	Roofing	construction of timber pitched roof.	Adverse weather conditions can delay the project.	Metal roofing	7 days		Framing team
1.6.1	Rafters	Placement of rafters	Timber is treated which increases durability.		3 days	Rafters are at 2' centre maximum. Lowest point from finished floor level to the ceiling is 9'.	
1.6.2	T1 11	Placement of plywood	Materials will be available for the construction		3 days		

WBS Code	Element Name	Description of Work	Assumptions and Constraints	Deliverables	Schedule Estimate	Acceptance Criteria	Resources
			process				
1.6.3	Metal roof	Installation of metal roof	The roofing colour (green) will be available for installation.		1 day	Matal roofing has adequate screws and hurricane straps.	Roofing company
1.7	Doors and Windows	Installation of doors and windows		Doors and windows	5 days	Windows meet the dimensions required 5' x4' And front (double swing) external	Construction Team
1.7.1	External doors	Installation of doors		Doors	5 days		Construction Team
1.7.2	Windows	Installation of Windows		Windows	5 days		Construction team

WBS Code	Element Name	Description of Work	Assumptions and Constraints	Deliverables	Schedule Estimate	Acceptance Criteria	Resources
						doors at 5’ to accommodate wheelchair.	
1.8	Finishes and carpentry		Cost of materials may increase due to inflation.		22 days		Construction Team
1.8.1	Wall framing			Plastered walls	2 days		
1.8.2	Plastering				5 days	All areas are plumb, square, and level.	
1.8.3	Paint	All walls are painted		Painted walls	5 days	Paint quality meet the stakeholder's requirement.	Painting team

WBS Code	Element Name	Description of Work	Assumptions and Constraints	Deliverables	Schedule Estimate	Acceptance Criteria	Resources
						Priming of walls before painting. Neat painting	
1.8.4	Tile	All floors are tiled, bathroom walls are tiled.		Tiled floors	8 days	Tile with equal joint spacing with neat pattern and sloping where necessary.	Tiling team
1.8.5	Bathroom sanitary ware	Installing of bathroom fixtures and fittings and		Bathroom fixtures and fittings. Septic tank.	2 days	Installation of sanitary ware meets stakeholders	Construction team

WBS Code	Element Name	Description of Work	Assumptions and Constraints	Deliverables	Schedule Estimate	Acceptance Criteria	Resources
		the completion of the septic tank.				' expectations . Septic tank (3 chamber)	
1.9	Utilities and Systems	Installation of MEP	The prices of fixtures and fittings may increase. Some materials may not be available on island and have to be ordered, affecting schedule.				
1.9.1	Electricity	Installation of electric fixtures and fittings		Electrical Fixtures and fittings	3 days	electrical fittings are aligned with IT plan. Electrical installation passes the National inspection test.	Electrical company/specialist

WBS Code	Element Name	Description of Work	Assumptions and Constraints	Deliverables	Schedule Estimate	Acceptance Criteria	Resources
1.9.2	Air conditioning	Installation of air condition fixtures and fittings.		Air condition	3 days		Air conditioning specialist
1.9.3	Plumbing	Installation of Plumbing fixtures and fittings.		Plumbing fixtures and fittings	3 days	Plumbing passes the pressure test.	Plumbing Specialist
1.9.4	Internet and It Software	Installation of IT software and hardware.		IT hardware and software installed, internet access.	5 days	All hardware and software are functional. Software passes installation	IT Specialist

WBS Code	Element Name	Description of Work	Assumptions and Constraints	Deliverables	Schedule Estimate	Acceptance Criteria	Resources
						tests; software is secure and user friendly.	
1.10	Close project	Closure of the project.		Punch list Close contracts and documents. Fully functional Learning Resource Centre	6 days	All planned work is completed. All closing documents are prepared and updated.	Project Manager
1.10.1	Snag List	Evaluation of works which need to be	All items on the SNAG checklist are rectified before the		5 days	Snag Checklist fully rectified.	

WBS Code	Element Name	Description of Work	Assumptions and Constraints	Deliverables	Schedule Estimate	Acceptance Criteria	Resources
		completed.	handover.				
1.10.2	Official hand Over	Handover of the project to the FGLDC.	Deliverable will be accepted by the owner.		1 day	All requirements are met, and structure meets stakeholder expectations.	

Source (Author)

4.2.4 Validate Scope

It is of paramount importance that the deliverables meet the required specifications, as well as the need that it is intended to meet. The project consists of clearly defined phases and requires verification steps. Hence, validation/ verification will occur at the end of the following phases: First phase- project approval where the project manager will agree on the preliminary scope and a contract which outlines what is to be constructed. The second phase is the definition phase where sufficient plans and specifications are developed to provide a baseline criteria, budget and schedule. The final phase is the acceptance of the project where the project is adequately completed in accordance with the contract. The completion of each of these phases will be marked by a formal verification process before proceeding to the next phase (PMI., 2016, p.49). The site engineer will use site inspections, test reports and measurements to validate each stage of construction before moving to the next. This will be done at the following stages: foundation, super structure, roof, finishes and carpentry, MEP. The IT specialist will carry out tests to validate the completion of all IT works. The key stakeholders and sponsors will have a walk-through visit at the completion of the structure and the completion of the MEP phase. An issue log will be used to record and monitor any issues in the deliverables and will be transferred to a change log for modification if approved. At the final walk through a punch list will be generated to guide the formal acceptance of the project.

4.2.5 Control Scope

This project will use a change management process for the effecting of changes in order to avoid scope creep which can negatively impact the schedule budget and quality of the works. Verbal changes will not be acknowledged, and hence, changes will be recorded in the change log to be processed. The project manager will, in writing, advise the sponsor and key stakeholders of the effect of the change on product quality, time and cost (PMI., 2016). Work performance Information generated will be used to compare the project scope performance to the baseline at given points in the project.

Changes to the scope of the project or changes to the requirements will be done via a Change order Log which is shown in Table 11. It shows how the changes will be initiated; how impacts will be analysed; how they will be traced, tracked, and reported; as well as the authorization levels required to approve these changes.

Table 11 Change Order Log

Change Order Description	Source Document reference	Construction Change directive	Change order request	Change Order proposal	Change order Cost or responsibility	Initial cost Proposal	Time Extension Request (#days)	Cost time and extension negotiated amount	Remarks

Source (PMI., 2016).

4.3 Schedule Management Plan

4.3.1 Plan schedule management

4.3.1.1 Project schedule model development

The life cycle of this project is a predictive one. The work breakdown structure which has been elaborated in the scope management plan was a basis for the development of the schedule. The project activities were determined from the third level of the WBS. Expert judgement was used as an input into the Project schedule model development in the form of interviews with a competent project manager and a builder. The sequence of the activities was determined, time (duration) estimates, and start and finish dates, dependences were set up; start to start and finish to finish, lags, time reserves for contingencies and uncertainties, using the critical path method. The Critical path method is inherent to the selected tool, Microsoft Project. The information was added into the project schedule software, Microsoft Project, to generate a Gantt Chart which depicts the project schedule model. The project schedule was then analyzed, then baselined.

4.3.1.2 Level of Accuracy

The activity durations used for this project are estimates of the actual time required. A significant amount of uncertainty associated with the actual durations is expected due to unstable weather conditions, possibility of lockdowns during outbreak of disease, and extra time taken for the obtention of approvals and permits. These factors can increase the project schedule. A contingency allowance in made the estimate of activity durations to allow for known unknowns.

4.3.1.3 Unit of measure

Number of days are used as the unit of measurement of time taken by each task and subtask in the project.

4.3.1.4 Schedule Model maintenance

During this process, the progress of the project will be updated and recorded. The tracking of project progress will begin after the project model is baselined, work begins, and regular monitoring and control processes are implemented. Hence, problems will be identified as quickly as possible and any impacts on successful project completion will be minimized (PMI., 2019). The contractor will record daily updates which will be compiled to a weekly report. Schedule progress will be reported by the contractor, on a weekly basis. Fortnightly progress reports will be provided to the key stakeholders by the project manager. After the project schedule is baselined, change requests must be processed for review and disposition through the Perform Integrated Change Control process, in order to include any work that was not part of the project baseline (PMI, 2017).

4.3.1.5 Rules of Performance measurement

The schedule progress will be monitored using the tool MS Project. The performance measurement method which will be used in this project is the ‘percent complete method’. The project progress will be measured on a weekly basis. A burndown chart will be used to determine whether the project is on schedule or not, for every milestone.

4.3.1.6 Reporting formats

The site manager prepares a daily log which will be used by the project manager to feed into the project tool and generate information on the project status to be communicated to key stakeholders on a fortnightly basis. If the schedule deviates from the schedule baseline, the project manager will provide

suggestions to the stakeholders which will be managed through the integrated change control process.

4.3.2 Define activities

The input to this activity included the previously elaborated schedule management plan (4.3.1), and the scope baseline (4.2). Expert judgement was obtained, in the form of a face-to-face meeting with a contractor and project manager. The outputs of the 'define activities' process were the activity list, activity attributes and a milestone list.

4.3.3 Sequence activities

Sequence Activities is the process of identifying and documenting relationships among the project activities. The key benefit of this process is that it defines the logical sequence of work to obtain the greatest efficiency given all project Constraints (PMI., 2017). The sequence of the tasks was determined, along with the mandatory and discretionary dependencies and leads and lags were established.

4.3.4 Estimate Activity durations

Activity durations were estimated based on an Analogous estimating (using the estimates using data from a similar project size), as well as bottom up estimating.

Table 12 Activity list/ Attributes/ Sequence

ID	WBS	Task Name	Duration	Start	Finish	Predecessors
1	1.	Construction of an LRC	178 days	**10/06/22**	6/12/23	
2	**1.1**	**Designs, drawings and specifications**	**40 days**	**10/6/22**	**11/30/22**	
3	1.1.1	Architect	20 days	10/6/22	11/2/22	
4	1.1.2	Structural engineer	10 days	10/20/22	11/2/22	3SS+10 day
5	1.1.3	MEP consultant	15 days	11/3/22	11/23/22	4
6	1.1.4	IT consultant	5 days	11/24/22	11/30/22	5

ID	WBS	Task Name	Duration	Start	Finish	Predecessors
7	**1.2**	**Contract Documents**	**32 days**	**12/01/22**	**1/13/23**	
8	1.2.1	Quantity Surveyor (BQ and Contract conditions	10 days	12/02/22	12/14/22	6
9	1.2.2	Specifications	10 days	12/01/22	12/14/22	6
10	1.2.3	Tender documents	5 days	12/15/22	12/21/22	8,9
11	1.2.4	Tender Period	5 days	12/22/22	12/28/22	10
12	1.2.5	Tender Review	10 days	12/29/22	1/11/23	11
13	1.2.6	Appoint contractor	2 days	1/12/23	1/13/23	12
14	**1.3**	**Permits**	**45 days**	**11/24/22**	**1/25/23**	
15	1.3.1	Submit to Ministry of Health	15 days	11/24/22	12/14/22	5
16	1.3.2	Submit to DCA	30 days	12/15/22	1/25/23	15
17	**1.4**	**Substructure**	**25 days**	**1/26/23**	**3/1/23**	
18	1.4.1	Contractor Mobilize	1 day	1/26/23	1/26/23	13,16
19	1.4.2	Excavation	14 days	2/1/23	2/20/23	18SS+4 days
20	1.4.3	Fill and Compact	6 days	2/16/23	2/23/23	19FF+3days
21	1.4.4	Pad preparation	3 days	2/24/23	2/28/23	20
22	1.4.5	Footings and Slab	1 day	3/1/23	3/1/23	21
23	**1.5**	**Superstructure**	**17 days**	**3/2/23**	**3/24/23**	
24	1.5.1	Columns	5 days	3/2/23	3/8/23	22
25	1.5.2	Blockwork	7 days	3/9/23	3/17/23	24
26	1.5.3	Ring beam	5 days	3/20/23	3/24/23	25
27	**1.6**	**Roofing**	**7 days**	**3/27/23**	**4/4/23**	
28	1.6.1	Rafters	3 days	3/27/23	3/29/23	26
29	1.6.2	T1 11	3 days	3/30/23	4/3/23	28
30	1.6.3	Metal roof	1 day	4/4/23	4/4/23	29
31	**1.7**	**Doors and Windows**	**5 days**	**4/5/23**	**4/11/23**	

ID	WBS	Task Name	Duration	Start	Finish	Predecessors
32	1.7.1	External doors and windows	5 days	4/5/23	4/11/23	30
33	1.7.2	Windows	5 days	4/5/23	4/11/23	30
34	**1.8**	**Finishes and carpentry**	**28 days**	**4/12/23**	**5/19/23**	
35	1.8.1	Wall framing	2 days	4/12/23	4/13/23	32
36	1.8.2	Plastering	5 days	4/14/23	4/20/23	34
37	1.8.3	Paint	5 days	4/26/23	5/2/23	35FS + 3 days
38	1.8.4	Tile	8 days	5/08/23	5/17/23	36FS+ 3 days
39	1.8.5	Bathroom and sanitary ware	2 days	5/18/23	5/19/23	37
40	**1.9**	**Utilities and Systems**	**8 days**	**5/22/23**	**5/31/23**	
41	1.9.1	Electricity	3 days	5/22/23	5/24/23	38
42	1.9.2	Air conditioning	3 days	5/25/23	5/29/23	40
43	1.9.3	Plumbing	3 days	5/25/23	5/29/23	40
44	1.9.4	Internet and It Software	5 days	5/25/23	5/31/23	41,42
45	**1.10**	**Close Project**	**6 days**	**6/5/23**	**6/12/23**	
46	1.10.1	Snag list	5 days	6/05/23	6/09/23	43FS+2days
47	1.10.2	Official hand over	1 day	6/12/23	6/12/23	45

Source (Author)

Table 13: Milestone List

Milestone	Due dates
Completed drawings and Specifications	11/30/22
Signed contracts	1/12//23
Approved designs and drawings	1/25/23
Completed foundation	3/1/23
Completed roof	4/4/23
Completed finishes and carpentry	5/19/23
Complete MEP and IT works	5/31/23
Official Handover of Project	6/12/23

Source (Author)

4.3.5 Develop Schedule

Figure 6. shows the resultant schedule model with planned dates for completing project activities. This schedule model must be revised and maintained to sustain a realistic schedule throughout the duration of the project.

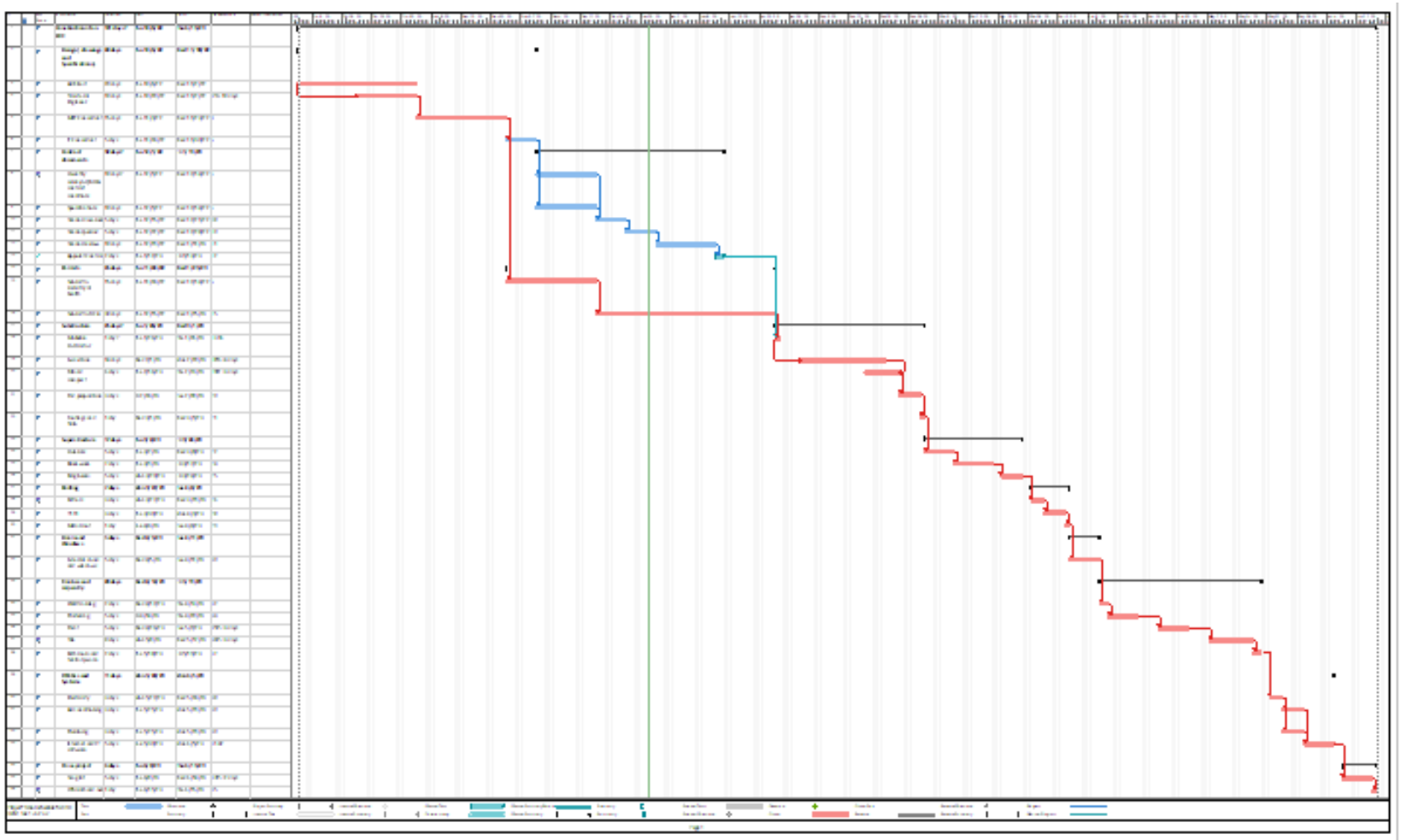

Figure 6 Schedule Model for the Construction of an LRC in Fond Gens Libre
Source (Author)

4.4 Cost Management Plan

4.4.1 Plan cost management

4.4.1.1 Units of measure:

The unit of measure for work done and materials is in square metres (m^2) and kilograms (kg). The currency used for payment is the Eastern Caribbean Dollar (XCD).

4.4.1.2 Levels of precision and accuracy

Cost estimates were rounded up to the nearest dollar. Bottom-up estimating was used to estimate project costs and develop project budget with an accuracy level of 95%.

4.4.1.3 Control thresholds.

After the cost baseline is established, a tolerance of +/- 5% of the total cost will be accepted. Corrective actions will be taken if the budget exceeds 5% of the total cost.

4.4.1.4 Rules of performance measurement:

Project cost monitoring and control of the status of the project will be communicated to stakeholders on a fortnightly basis. Project costs will be updated and tracked using the EVM. Any changes which occur to the cost baseline will be managed via the software, Ms Project, and a forecast will be provided for all remaining costs. Hence, any variance from the plan will be recognized in a timely manner, and prompt corrective and preventive actions will be taken in order to minimize project cost risk (PMI., 2016). The performance of the project will be measured using the weighted milestone method.

The cost variance is obtained using the following formula: CV = EV – AC.

4.4.2 Estimate Costs

The assumptions for this cost estimate are:

- The cost is estimated for only construction works and excludes the payment of the project manager and other administrative costs.
- Labour rates are based on approved contract values, as stated in the current labour code.
- There is no contingency included in this estimate.
- Work schedules are estimated as eight-hour days, five days a week and forty hours per week.

Table 14: Cost Estimates

Deliverables	WBS Code	Work Package	Activities Description.	Quantity	Unit	Rate XCD	Amount XCD	Total XCD
Designs and drawings	1.1.1	Architect		1	Sum	1,500	1,500	
	1.1.2	Structural engineer		1	Sum	1,000	1,000	
	1.1.3	MEP Consultant		1	Sum	1,000	1,000	
	1.1.4	IT Consultant		1	Sum	1,000	1,000	4,500
Procurement	1.2.1	Quantity surveyor		1	Sum	1,500	1,500	
	1.2.2	Specifications		1	Sum	1,000	1,000	
	1.2.3	Tender documents		1	Sum	500	500	
	1.2.4	Contractor Appointment	legal fees	1	sum	800	800	3,800
Permits	1.3.1	Ministry of health approval		1	sum	200	200	
	1.3.2	DCA approval		1	sum	200	200	400
Substructure	1.4.1	Contractor mobilisation	Mobilization costs	1	sum	2,000	2,000	
	1.4.2	Excavation	Excavating topsoil; depth ≤ 150mm	174	m^2	10	1,740	
			Excavating trenches	150	m^2	10	1,500	
			Excavating pits	29	m^2	10	290	
	1.4.3	Fill and compact	Filling to excavations	99	m^2	10	991	
			Filling to make up	45	m^2	10	450	

Deliverables	WBS Code	Work Package	Activities Description.	Quantity	Unit	Rate XCD	Amount XCD	Total XCD
			levels					
			filling to make up levels with (rubble hard core)	45	m^2	10	450	
	1.4.4	Pad preparation	Trimming to sides of excavation	438	m^2	3.5	1,533	56,750
			pad footings	156	m^2	3.5	546	
			compacting	180	m^2	3.5	630	
	.14.5	Footings and Slab	concrete	72	m^2	350	25,200	
			formwork	171	m^2	35	5,985	
			Reinforcement for concrete	3087	kg	5	15,435	
Super structure	1.5.1	Columns	Concrete	9	m^2	400	3,500	
			Formwork	138	m^2	35	4,830	
			Reinforcement for concrete	456	kg	5	2,280	
	1.5.2	Block work	Block walling	315	m^2	101.5	31,973	
			Reinforcement	873	kg	5	4,365	
	1.5.3	Ring beam	concrete	33	m^2	400	13,200	65,648
			Reinforcement	1100	kg	5	5,500	
Roof	1.6.1	Rafters	installation of	150	m^2	40	6,000	

Deliverables	WBS Code	Work Package	Activities Description.	Quantity	Unit	Rate XCD	Amount XCD	Total XCD
			rafters					
	1.6.2	T1 11	Installation of T111	150	m^2	20	3,000	24,000
	1.6.3	Metal roof		150	m^2	100	15,000	
Doors and Windows	1.7.1	External doors	Metal doors	6	N/A	400	2400	
			Flush doors	2	N/A	400	800	9.800
	1.7.2	Windows.	Aluminium windows (120mmX900mm)	15	N/A	400	6000	
			Aluminium windows (600mmX900mm)	2	N/A	300	600	
Finishes and carpentry	1.8.1	Wall framing	wall framing	280	m^2	20	5600	
	1.8.2	Plastering	walls and columns 13mm plaster	700	m^2	24.5	17150	
	1.8.3	Paint	prime and Paint	630	m^2	20	12,600	
	1.8.4	Tile	slip resistant tiles embedded in thin set and finished with grout	160	m^2	84	13,104	49.629

Deliverables	WBS Code	Work Package	Activities Description.	Quantity	Unit	Rate XCD	Amount XCD	Total XCD
	1.8.5	Bathroom and Sanitary ware	face basins	3	N/A		175	
			faucets	3	N/A		100	
			toilets	3	N/A		400	
			Septic tank	1	sum	500	500	
Utilities and Systems	1.9.1	Electricity	Installation	1	sum	3,850	3,850	
			Inspection	1	sum	350	350	
	1.9.2	Air conditioning	Installation	1	sum	3,000	3,000	
			Inspection	1	sum	100	100	
	1.9.3	Plumbing	Plumbing Installation	1	sum	500	500	
			Testing	1	sum	105	105	
	1.9.4	Internet and It hardware	Printers	1		1000	1000	24,905
			Computers	12		1000	12000	
			Installation of infrastructure and software	1	sum	4,000	4,000	
Close Project	1.10.1	SNAG list	Final inspections	1	sum	300	300	
	1.10.2	Official handover						300
Total								239,731

4.4.3 Determine budget

This process involves the aggregation of the estimated costs of individual activities or construction work packages (PMI., 2016). The cost baseline was allocated across the project schedule to reflect when the cost will be incurred, thereby allowing the project manager to balance the funds during that period with the corresponding scheduled work. The contingency funds were allocated as reserve funds to respond to risks as they occur. The management reserves were reserved for unexpected activities related to in-scope work (PMI., 2021, p.62). Figure 7 illustrates how the project budget is calculated for this project.

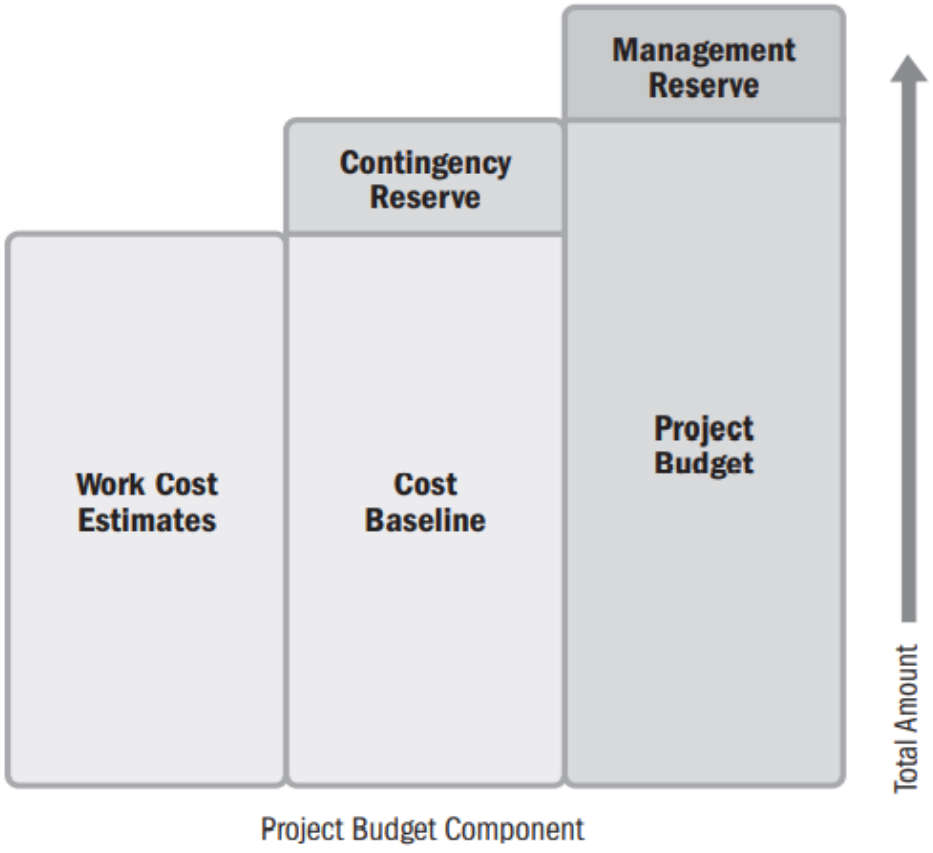

Figure 7: Determine Project Budget

Source (PMI., 2021)

Table 15 Project Budget

WBS ID	Deliverables	Time (Months) Cost (XCD)									Cumulative total costs (XCD).
		2022			2023						
		Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	
1.1	Design, drawings and Spec	2,500	2000								4,500
1.2	Procurement			3000	800						3,800
1.3	Permits			400							400
1.4	Substructure				2000	54,750					56,750
1.5	Superstructure						65,648				65,648
1.6	Roofing							24,000			24,000
1.7	Doors and windows							9800			9,800
1.8	Finishes and carpentry							35,350	14278		49,628
1.9	Utilities and Systems								24,905		24,905
1.1	Close Project									300	300
Subtotal		2500	2000	3400	2800	54,750	65,648	69,150	39183	300	239,731
Contingency reserve (10%)		250	200	340	280	5475	6565	6915	3918	30	23,973
Cost Baseline		2750	2200	3740	3080	60225	72213	76065	43101	330	263,704
Management reserve 5%		138	110	187	168	3011	3611	3803	2155	17	13,199
Project Budget		3888	2300	3927	3248	63236	75823	79868	45256	347	277,893

Source (Author)

4.4.3.1 Project planned value

The planned value represents the authorized, time-phased budget assigned to complete the scheduled work. It describes how much of the project work was planned to be performed at any given point in time. Hence, the actual project performance can be measured against the planned value.

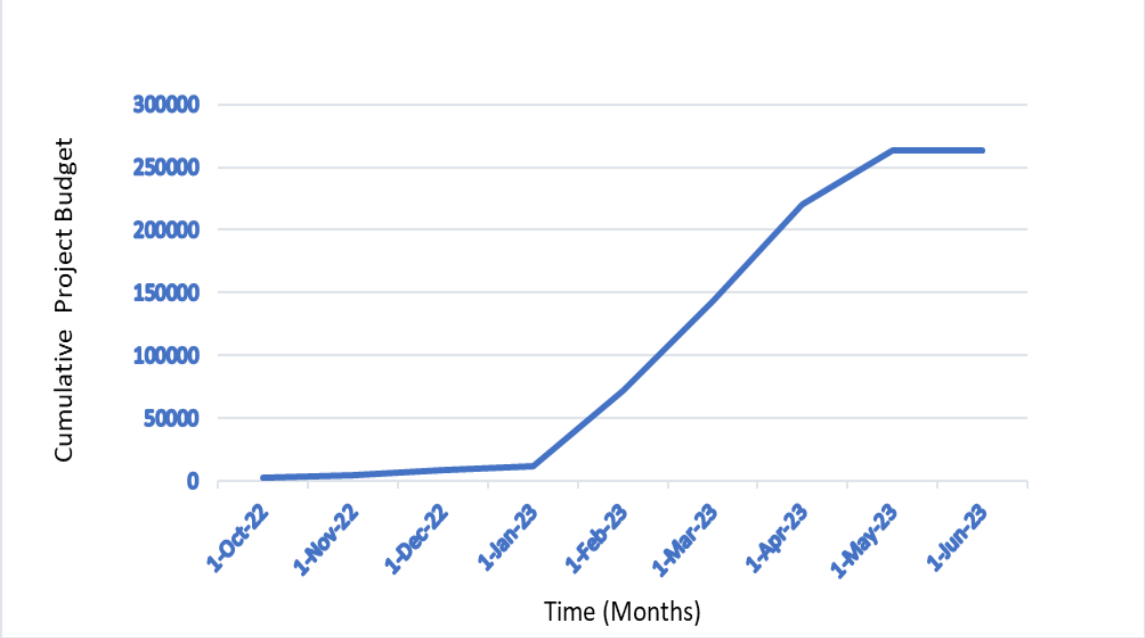

Figure 8 S curve for the Planned Value of the project.

Source (Author)

4.5 Quality Management Plan

4.5.1 Plan quality management

4.5.1.1 Quality objectives of the project:

The quality objectives of the project are as follows:

1. To complete the project within the stipulated budget, schedule and scope.
2. To design and construct the building according to the contract specifications.
3. To produce deliverables that meet the customer's requirements and satisfaction.
4. To comply with all regulations and statutory body requirements.
5. To ensure the safety of all workers on the construction site.

4.5.1.2 Quality standards to be used in the project

In this project, the quality standard is the St. Lucia Building code, *Minimum Building Standards and Environmental Guidelines for Housing*. After the contract and documents such as design drawings and specifications are approved, they become the principal project quality standards, as they specify the applicable statutory and legislative quality requirements, technical quality codes, standards, and regulations (PMI., 2016).

4.5.1.3 Quality metrics and baseline

Table 16 Quality Metrics and Baseline

Quality Objective	Metric	Metric definition	Expected Outcome or result	Measurement Frequency	Responsible
To complete the project within the stipulate budget, schedule, and scope.	SPI schedule Performance Index	SPI = EV/PV	SPI ≥0.95	At the stipulated time for completion of every deliverable.	Project manager
	Cost Performance Index	CPI =EV/AC	CPI≥0.95		
To design and construct the building according to the contract specifications	Number of defects and incidence of rework.	A measure of the number of defects and nonconformance to the plan and specifications.	Zero defects and instancing of rework.	At the beginning and end of every project phase.	Team supervisor Project manager

Quality Objective	Metric	Metric definition	Expected Outcome or result	Measurement Frequency	Responsible
To produce deliverables that meet the customer's requirements and satisfaction.	Stakeholder satisfaction score	Average stakeholder satisfaction score on the construction stakeholder satisfaction survey using a Likert scale ranging from 1-5.	Average score ≥4.5	At the end of every milestone	Project manager
To comply with all regulations and statutory body requirements.	Number of errors in the designs, drawings and specifications	Measure of the number of noncompliance errors in the designs and drawings.	100% compliance with all regulation and statutory body requirements	At the end of the Designs drawing and Specifications phase of the project.	Architect, Project manager
To ensure the safety of all workers on the construction site.	Number of accidents at the workplace.	A register of the number of accidents resulting in bodily harm on the worksite.	0% accidents	Throughout the project	Team supervisor

4.5.1.4 Quality roles and responsibilities

Table 17 Quality Roles and Responsibilities

ROLE	RESPONSIBILITY
PROJECT SPONSORS	Ensure quality objectives fit the strategic direction of the organization. Overseeing and performing quality audit activities. Establish policies, processes, procedures, and defined quality standards.
OWNER (FGLDC)	Establish the quality policy, identify quality standards and metrics. Making sure that stakeholder requirements are available and understood. Participate as needed in quality reviews and reports such as walk-throughs as well as quality control activities.
PROJECT MANAGER	Reviews bids from contractors to determine which ones will be awarded contracts Communicates quality (risks and issues) to internal and external stakeholders Communicates with the Fond Gens Libre Development committee as well as sponsors to report project status as well as any quality related issues. Inspects work site to ensure that projects are being performed according to plans.
TEAM SUPERVISOR	Oversee the activities of the team members to ensure that the project is on schedule, within budget and scope. Guide the team in the Implementation of corrective actions.
PROJECT	Actively participate in sharing knowledge, expertise, ideas

TEAM	and information. Carry out the project activities according to the required specifications given.

Source (Author)

4.5.1.5 Project deliverables and processes subject to quality review

Table 18: Project Deliverables and Processes Subject to Quality Review.

Project deliverables	Processes Subject to review.	Quality control and quality management activities planned for the project	Frequency	Tools for Quality review
Plans and Specifications	Drawings of plans and specifications	Review of plans and specifications to ensure that it meets stakeholder's satisfaction.	Once	Preconstruction checklists
Permits	Submittance of Drawings, Plans and specifications to relevant authorities.	Review of planning permissions, conditions, and obligations to ensure compliance with local authorities at the first submittal.	Once	Pre-construction site inspection checklists

Project deliverables	Processes Subject to review.	Quality control and quality management activities planned for the project	Frequency	Tools for Quality review
Foundation works	Excavation, (before excavations are filled). Foundations (before they are covered up). Laying of damp proof courses. Foundation completion.	Compaction tests for the foundation before it is covered up. Concrete tests to ensure that concrete strength ≥2500 psi and meets the dimensions as specified in the BOQ. Meetings to review risks issues and change control items which may have arisen.	At the end of each process subject to review.	Fishbone diagram Check sheet Meetings
Complete External walls	Laying of blocks and ring beam.	Tests to ensure that the walls are of the required dimensions and are plumb, square and level. Inspections of work progress compliance with plan and specifications. Review and completion of change order/s Meetings to review risks issues and	Daily	Check list, check sheet, meetings, inspections.

Project deliverables	Processes Subject to review.	Quality control and quality management activities planned for the project	Frequency	Tools for Quality review
		change control items which may have arisen. Project status reports.		
Metal roofing	Installation of rafters. Installation of T1 11	Inspections of work quality and compliance standards and specifications	Daily during the processes subject to review.	Checklist, inspections
External Doors and Windows	Installation of doors and windows.	Inspection of doors and windows for the specified dimensions and swing.	Once, at the end of the process.	Checklist, inspections

Project deliverables	Processes Subject to review.	Quality control and quality management activities planned for the project	Frequency	Tools for Quality review
Finishes and carpentry	Plastering Painting Tiling	Inspections of paints and coatings for neat workmanship. Inspections of tiles for slope and joint spacing. Walkthroughs Review and completion of change order/s. Project status reports.	Daily	check sheet inspections
Utilities and Systems	Electrical installation Plumbing installation Installation of IT infrastructure.	Inspections of work progress, compliance with plan and specifications. Pressure test for plumbing. Software installation tests. Meetings to review risks issues and change control items which may have arisen. Project status reports.	Daily. At the end of the processes.	Tests, checklist, check sheets, meetings.

Project deliverables	Processes Subject to review.	Quality control and quality management activities planned for the project	Frequency	Tools for Quality review
Closing	Punch List	The punch list has been completed and fully rectified. Walkthroughs verifying everything has been completed in accordance with the contract documents. All closing documents prepared and signed.	At the beginning and at the end of the process.	Check lists meetings, inspections.

Source (Author)

4.5.1.6 Major procedures relevant for the project, such as dealing with nonconformance, corrective actions procedures.

It is of vital importance that the project and work meet the requirements which are specified by key stakeholders for the final acceptance. Those outputs need to comply with all applicable standards, requirements, regulations, and specifications (PMI., 2017). If discrepancies are observed during the scheduled inspections and testing the template in table 19 shall be used to recorded them. Corrective action will be discussed and taken promptly.

Table 19 Template for the Record of Nonconformance

Defect ID	Defect type	Problem Area	Severity	Priority	Status	Expected result	Actual result	Decision / Corrective Action

Source (Author)

4.6 Resource Management Plan

4.6.1 Plan resource management

4.6.1.1 Identification of resources

The team and physical resources for this project were identified using bottom up estimating techniques, as well as expert judgement from professionals in the field of construction. The resources required for each activity were estimated and combined to form the resources needed for each work package and for the project as a whole.

4.6.1.2 Acquiring resources

The human resources need for the project will be acquired from within the community of Fond Gens Libre to stimulate economic activity in the community. A contract will be awarded for the execution of the project. The contractor will be required to give priority to subcontractors from within the community. In the event where the required resources are not available then, it will be procured from outside of the community. The selection criteria for the resources; both internal and external to the community, will be based on the following: availability, cost, ability, experience, knowledge, skills and attitude (PMI., 2017). Materials will be procured from the vendors and suppliers who meet the given criteria, with priority being given to members of the community. The physical resources will be acquired via the procurement process. Negotiations will be held with vendors and suppliers for good quality physical resources, giving priority to the people of the community.

4.6.1.3 Roles and responsibilities

Table 20: Roles and Responsibilities

Role	Responsibility	Competence
Owner	Appoint the project manager. Set the project success criteria and requirements for the project. Participate in the change control process.	
Sponsors	Provide the funds for the execution of the project. Participate in the development of the project charter. Participate in the change control process.	
Construction Project Manager	Develop the project management plan. Manage the scope, budget, and schedule of the project. Track project progress, budgets, and standards. Maintain relationships with the owner and key stakeholders of the project. Provide project updates to the key stakeholders of the project. Manage risks that may occur.	Knowledge of the construction industry. Very good communication and organizational skills. Good Leadership qualities. Openminded. Good negotiation skills. Experience in managing projects of similar size or of greater magnitude according to PMI

Role	Responsibility	Competence
		standards.
Contractor	Procures materials and equipment	Three years of experience in the field.
Site manager/ Supervisor	Coordinates labor, schedules, materials, tools and resources. Prepares weekly progress reports to submit to the project manager. Reads the plans. Purchases materials for each project phase. Manages and provides guidance for the construction team of the building. Ensures that health and safety rules and regulations are observed. Recruits new team members.	Good leadership qualities. Knowledge of construction. Good time management skills. Excellent communication skills.
Architect	Prepares blueprints and designs detailing specifications and resources needed. Ensure that plans meet local planning regulations.	At least two years of experience in the field as a certified architect. Excellent communication skills.
Quantity surveyor	Review construction plans. Prepare contracts. Track material use and schedule resupply.	At least three years of experience in the field of preparing contract documents and project quantities.

Role	Responsibility	Competence
		Excellent communication skills.
Structural Engineer	Designs the building according to the requirements given by the owner and stakeholders.	At least two years of experience in the field.
MEP consultant	Design the mechanical, electrical, and plumbing aspects of the building based on the specifications given by key stakeholders.	Excellent communication skills. Good ability to work as part of a team (cooperation and collaborative skills). At least two years of experience in the field.
IT Consultant	Design and install the information technology systems of the project based on the stakeholders' requirements.	Excellent communication skills. Good ability to work as part of a team (cooperation and collaborative skills). At least two years of experience.
Plumber	Read blueprints for the correct installation of plumbing fixtures and fittings.	Ability to read blueprints Critical thinker and problem solver. At least two years of experience working as a plumber.

Role	Responsibility	Competence
Electrician	Installs wiring for lights, plug sockets Inspect wiring Testing electrical installation to ensure that they meet the required standards. Install air conditioning	Ability to read blueprints. At least three years of experience in the field.
Carpenter/ Joiner	Constructs all woodwork including formworks, frames, furniture, roof work. Fit windows, doors.	At least four years of experience in the field. Good collaborative and cooperative skills. Good communication skills.
Mason	Installation of concrete work/block work, plastering.	At least four years of experience in the field. Good collaborative and cooperative skills. Good communication skills.
Steel Bender	Bending and cutting steel to the correct dimensions. Laying out steel bars, mesh, rods, and framework.	At least two years of experience in the field. Good collaborative and cooperative skills. Good physical strength and hand eye coordination. Good communication

Role	Responsibility	Competence
		skills.
Laborer	Unload construction equipment and building materials. Set up power tools and clean them after work. Clear away rubbish and packaging from the work site, erect scaffolds and safety barrier. Perform other tasks requested by skills men e.g., Mason.	Good collaborative and cooperative skills. Good communication skills. Good physical strength and hand eye coordination.

Source (Author)

4.6.1.4 Project Organizational Chart

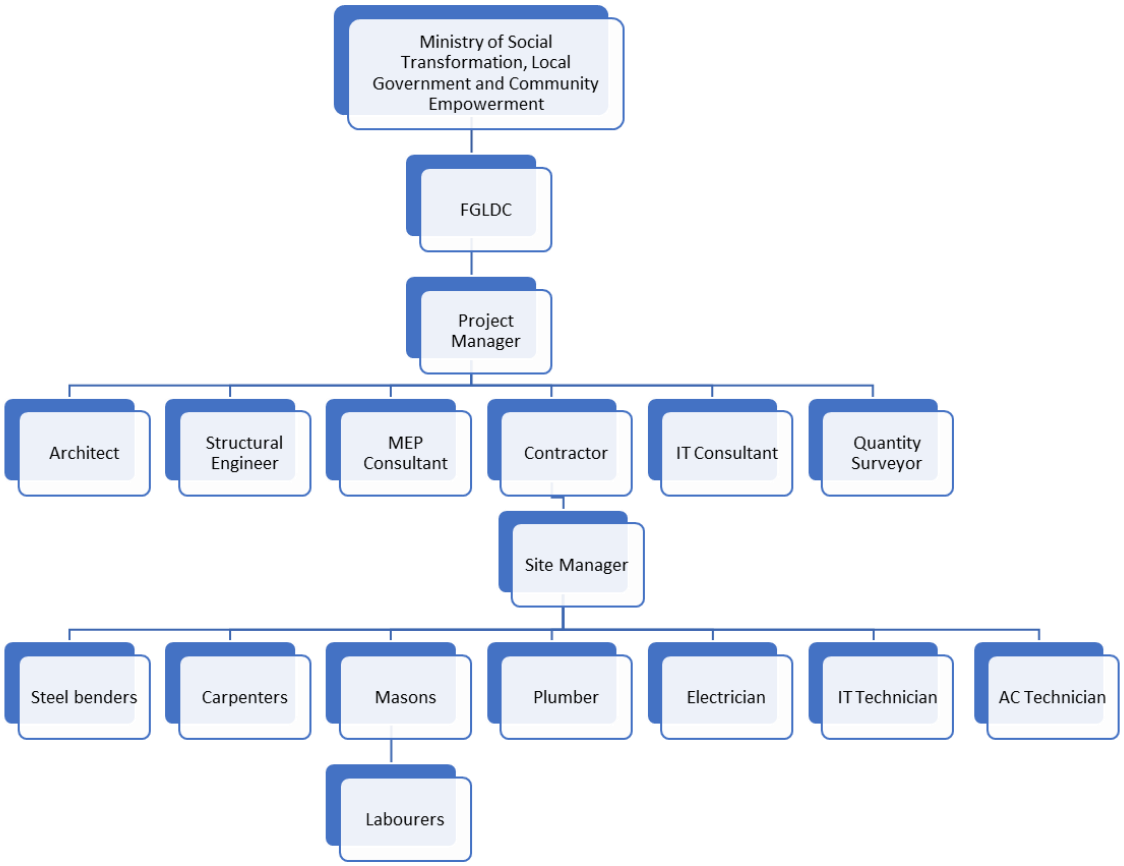

Figure 9 Project Organizational Chart

Source (Author)

4.6.1.5 Project Team Resource Management

The Effective management of team resources is important for productivity control. The project team will be staffed at the different stages of the project when required and will be released at the end of the project phase. The project manager, contractor and site manager will be released at the close of the project. The project manager will employ skills such as conflict management, emotional intelligence, influencing, decision making and leadership in the management of the project team (PMI., 2017).

4.6.1.6 Team Development

The project team is responsible for the implementation of the project objectives and therefore, the development and motivation of the team is important to achieve success. This project will last for less than a year and new members will be added to the construction team throughout the project as required by the scope of works. The project team will meet weekly, every Monday morning, for a fifteen minute stand up meeting which will prepare them for the week ahead. A link for open and honest communication will be established which will facilitate the sharing of grievances, concerns, as well as the sharing of ideas.

At the end of each milestone, the construction team will be treated to lunch with complementary drinks. Non-alcoholic drinks will be provided to the workers at every fortnight of pay day. This will improve interpersonal relationships, producing a more cohesive team, thereby improving productivity.

The project manager is responsible for resolving conflicts which arise in a timely manner and in a constructive way in order to achieve a high-performing team (PMI., 2021).

4.6.1.7 Resource Control

According to PMI., 2016, productivity and consumption rates are closely linked to the monitoring and controlling of resources in construction projects. Hence, the receipt and use of consumption materials will be controlled by inventory.

The productivity control will be performed by measuring work quantities which have been accomplished in work packages, and then measuring and relating workforce, machinery, and materials usage to those work packages (PMI., 2016). The cost baseline and schedule baseline will provide a benchmark for the measurement of productivity. Daily meetings will be held with the construction team to provide instructions and to receive feedback on work to be done.

4.6.2 Estimate Activity resources

4.6.2.1 Resource requirements.

Table 21 Resource Requirements

WBS ID	Work Package	Activities	Machines and tools	Human resource	Quantity	Materials	Quantity
1.1	Designs	Architect	NA	Architect	1		
		Structural engineer		Structural engineer	1		
		MEP Consultant		MEP consultant	1		
		IT consultant		IT consultant	1		
1.2	Procurement	Quantity Surveyor (BQ& contract Conditions)		Quantity surveyor	1		
1.4	Substructure	Excavation	Excavator	operator	1		
				labourer	2		
				supervisor	1		
				helpers	4		
		Fill and Compact	Compactor	supervisor	1	hard core material	24 m^3
				labourers	4		
		Pad preparation	spades	Labourers	4	Aggregates	8 $yd.^3$
			pickaxe	Supervisor	1		

WBS ID	Work Package	Activities	Machines and tools	Human resource	Quantity	Materials	Quantity
			shovels				
			wheelbarrow				
			compactor				
		Footings and slab	concrete mixer	labourers	4	½" steel	52 (6 m)
			buckets	steel bender	2	Cement	90 bags
			shovels	plumber	2	aggregates	8 cubic metres
			measuring box	electrician	2	plywood	8 sheets
			grinder with steel cutting disks	mason	2	2x2 lumbar 400'-0"	400'-0"
			nippers	carpenter	2	blocks 8''	650
				Supervisor		tying wire	10 lbs
						starter bars	130@4'
						prefab columns and mats	9
						BRC (A1 42)	14 sheets
						Aggregates	8 m^3
						sand	5 $yd.^3$
						nails	
1.5	Super Structure	columns		steel bender	2	lumbar (2x2)	12 150'
				helpers	4	¾Form ply	6 sheets
						nails (common and concrete)	8 lbs

WBS ID	Work Package	Activities	Machines and tools	Human resource	Quantity	Materials	Quantity
						cement	25
						aggregates	10 yd^3
			grinder	masons	4	Blocks 6”	1800
			trowel	labourers	4	1/2” steel	50 (6m)
			spades			cement	50 bags
						sand	10 $yd.^3$
				supervisor	1	tying wire	10 lbs
		Blockwork				aggregates	10 $yd.^3$
				Masons	1	1/2"steel	38 (6 m)
				Helper	3	Cement	15 bags
				Carpenter	2	Aggregate	3 yd^3
		Ring beam				5/16 ‘steel	15 (6 m)
			hammers	Carpenters	2	2x6 x20 rafters	60
			nails	labourers	3		6 2x10x20
		Rafters	power saw (circular)	Supervisor	1	Facia boards	3 2x10x18
		T1 11				1/2' T1 11	65 sheets
1.6	Roof	Metal roof				Supplier installed	
				carpenter	2	Aluminium windows (120mmX900mm)	15
						Aluminium windows (600mmX900mm)	2
						metal doors	6
	Windows and		drills			Flush doors	2
1.7	doors	Windows and doors	keyhole lockset			ironmongery	8

WBS ID	Work Package	Activities	Machines and tools	Human resource	Quantity	Materials	Quantity
			power saw (sliding bevel)	carpenters	2	trimmings	73m
		Finishes and Carpentry	router	helpers	2	3/4 white PVC panels	20 sheets
			hammer	carpenter	1	ply	4 sheets
		wall framing	power saw	supervisor	1	ironmongery	
			concrete mixer	masons	3	cement	26 bags
			spades	labourers	2	sand	10 yd.^{3}
		plastering	buckets				
			paint brushes			concrete primer	10 gallons
			roller brushes			wood primer	4 gallons
			painter's tape				
		painting	Paintable silicone	painter.	2	paint (oil)	15 gallons
			tile cutter	Tiler	2	Thin set	15 bags
			Handheld grinder	helpers	2	Grout	2 bags
						Plastic spacers	200
		Tiling				tiles	1260 sq ft.
			drill	plumber	2	toilets	2
	Finishes and	bathroom fixtures				face basins	2
1.8	Carpentry	and fittings				mirrors	2
				electrician	2	110 and 220 electrical panels	2
	Utilities and Systems	Electricity				electrical wires	
						conduits	
1.9						switches and	5, 16

WBS ID	Work Package	Activities	Machines and tools	Human resource	Quantity	Materials	Quantity
						outlets	
			voltage testers/analysers			Florescent bulbs	10
		Air conditioning		AC Technician	2	AC units	2
		Plumbing	Screwdriver	Plumber	2	PVC pipes, valves, and fittings	15 m
			Wrench			flange	
		Internet and IT Soft ware	Network testers	IT Technician	1	router	1
						modem	2
						switches	1
						ports	5
						twisted pair cables	12m
						Multifunction printer	1
						computer desktops and monitors	12
						Coaxial cables	10 m
1.10	SNAG list	Final Inspections		Architect	1		

Source (Author)

4.6.2.2 Basis of Estimates

The method used to develop the estimate is bottom-up estimating. The team and physical resources were estimated at the activity level and then aggregated to develop the estimates for work packages, control accounts, and summary project levels (PMI., 2017). Interviews with contractors and builders in the field of building construction were a primary source of information for the development of the estimate.

The assumptions associated with the estimate are:

- The project blueprint and specifications do not change throughout the lifecycle of the project.
- The resources are available for use during the respective phases of the project.
- Tools and equipment are adequately maintained and work at their optimum.
- There are no major changes to the scope of the project.

The constraints associated with the estimates are:

- The estimates are developed in the absence of an approved blueprint, based on the specified dimensions given by the key stakeholders. This contributes to the decrease in the accuracy levels of the estimate.

This estimate is done with a 95% confidence level, given the risks and constraints associated with the given resources.

Some of the identified risks which may influence the estimate include:

- Accidents and illness can cause worker turnover rate which decreases productivity.
- The increase in prices of the product per kilogram or square meter will result in an increase in the quantities of materials.

4.6.2.3 Resource Breakdown Structure

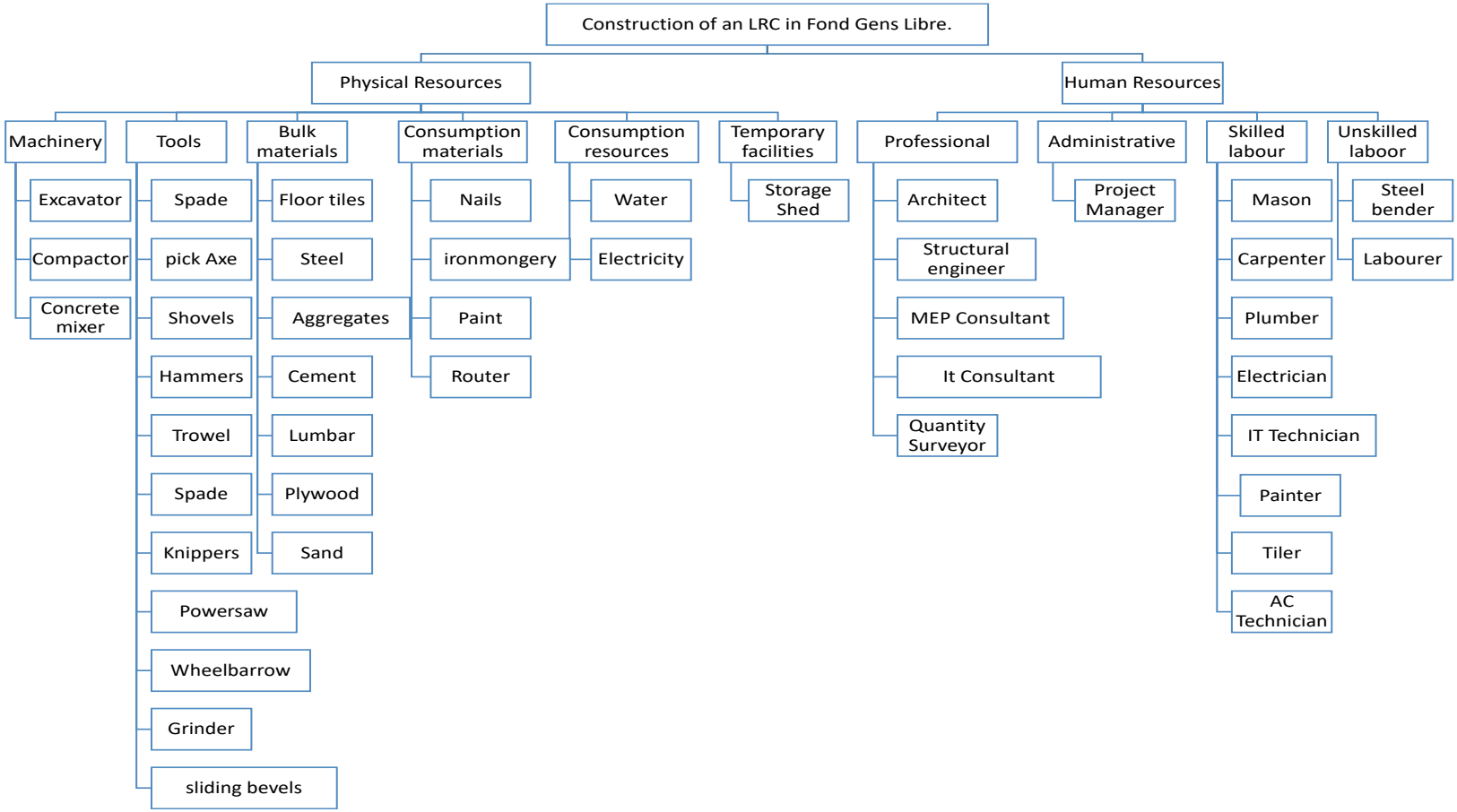

Figure 10 Resource Breakdown Structure

Source (Author)

4.7 Communications Management Plan

4.7.1 Plan communications management

In construction projects such as this one, the project manager is at the center of project communication.

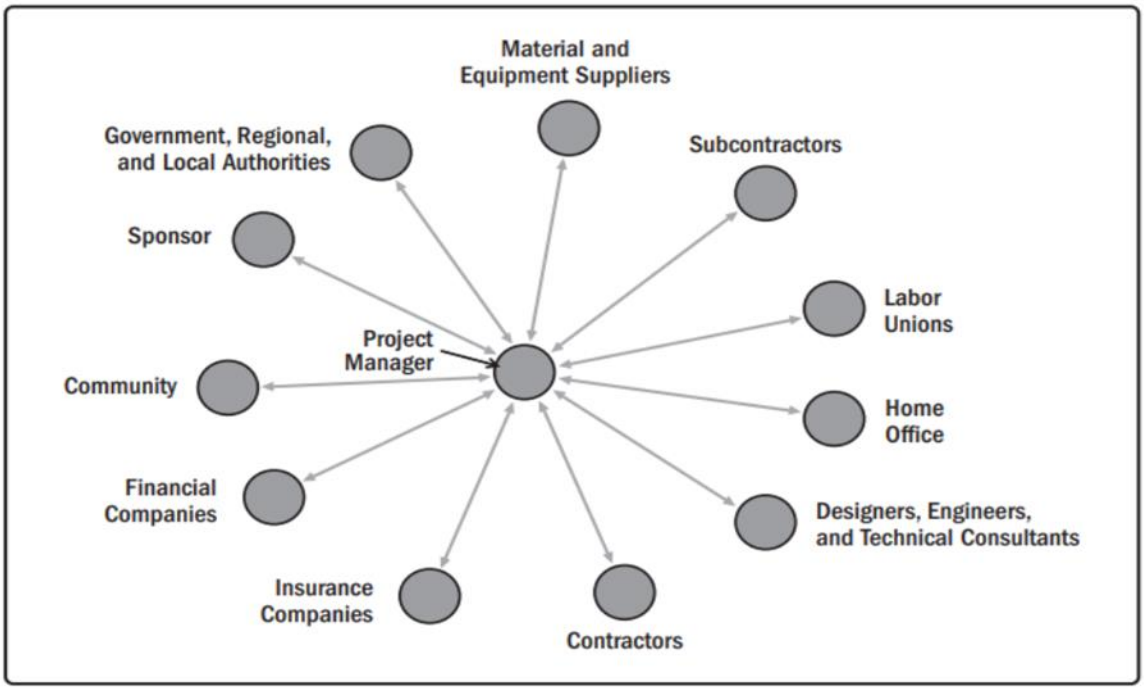

Figure 11 Communication Network

Source (PMI., 2016)

4.7.1.1 Stakeholder communication requirements.

All formal forms of communication with stakeholders will be done in the English Language. Informal communication may be done in both English and Creole (verbal).

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Table 22 Stakeholder Communications Requirements

Stakeholders	Power /Interest	Key interest and Issues	Frequency of communication	Method of Communication
Fond Gens Libre Development Committee	High	Budget, Resources, Decision making Project risks	Weekly	Verbal (meetings)
Fond Gens Libre Community	High	Project progress	End of every milestone	Mass communication
Soufriere Regional Development Foundation	High	Budget, Resources, Decision making. Project risks	Weekly	Verbal (meetings) Written (emails and hard copy reports)
Ministry of Social Transformation, Local Government and Community Empowerment.	High	Budget, Resources, Decision making.	At the end of every Milestone.	Written (emails and hard copy reports) Verbal (meetings)
Ministry of Agriculture, Fisheries, Food security and Rural development	Medium	Effect of the project on Biodiversity	Once at the planning stage of the project. Once at the site preparation phase of the project	Verbal (meetings) Emails
Ministry of Health /DCA	High	Approval of the blueprint	Once during the planning stage of the project.	Written e- mail.
Contractor/Project team	Medium	Project execution	Daily	Verbal (Meetings) Written (email and hard copies of work instructions and requirements)

Stakeholders	Power /Interest	Key interest and Issues	Frequency of communication	Method of Communication
Subcontractors	Medium	Project execution		Verbal (phone calls), Written (email)
Vendors and Suppliers	Low	Supply materials for project execution.	During the execution phase of the project.	Verbal. (E-mail, face to face)

Source (Author)

4.7.1.2 Modes of Communication

In this project, interactive communication and push communication methods are used. Communication will be both formal and informal.

Table 23 Modes of Communication

Communication method	Communication approach	Artefacts
Interactive Communication	Interpersonal communication	Meetings, phone calls, WhatsApp,
	Small group communication	Meetings,
	Networks and Social computing communication	
Push communication	Interpersonal communication	e-mails, reports
	Small group communication	Memos, Reports
	Networks and Social computing communication	Press release on social media

Source (Author)

4.7.1.3 Communications matrix

Table 24 Communications Matrix

Information to be communicated	Reason for distribution of information	To whom is the information sent	Medium	Timeframe and frequency for the distribution of required information	Person responsible for communicating the information.	Methods or technologies used to convey the information.
Confirmation of project objectives	Introduce project and project objectives.	Project team, Sponsor, owner, other stakeholders	Verbal	Once, at the start of the project	Project manager	Face to face, kick off meeting
Plan of the structure	To gain approval from authorities	Ministry of Health/ DCA	Written	Once during the planning stage of the project.	Project Manager	e-mail.
Commencement of project	To announce the commencement of the project	Community members and wider public	Written	Once at the beginning of the project and at the close of the project	Project Manager	Press release Billboard

Information to be communicated	Reason for distribution of information	To whom is the information sent	Medium	Timeframe and frequency for the distribution of required information	Person responsible for communicating the information.	Methods or technologies used to convey the information.
Daily team activities	Track project progress	Site Manager	Verbal	Daily, in the morning before work begins	Team leader	Face to face meetings
Time sheets	Manage cost and schedule	Project manager	Written	Fortnightly, (every other Thursday)	Site manager	e-mail
Project status	Track project progress	Sponsors, owner	Verbal	Monthly	Project manager	Face to face meetings
Change Orders	To facilitate change to the project budget and scope	Project manager Architect Contractor	Written	As needed	Sponsors/Owner	e-mail
Requests for information	To obtain information from vendors and suppliers	Vendors and suppliers	Written	As needed	Project Manager	e-mail

Information to be communicated	Reason for distribution of information	To whom is the information sent	Medium	Timeframe and frequency for the distribution of required information	Person responsible for communicating the information.	Methods or technologies used to convey the information.
Routine Instructions	To provide instructions for project implementation	Construction team	Verbal	At the beginning of every milestone	Site Manager	Face to face meetings
Incidents/ Accidents	To inform of any accidents which occur on site	Contractor	Written	When accidents occur	Project manager	Email, memo
Safety information	Inform community members and Visitors of hazards on the construction site	Public	Visual	Daily	Site manager	Signs
Requests for materials	To send in requests for materials and equipment for project execution.	Site manager	Written	As required	Contractor	e-mail, WhatsApp

Information to be communicated	Reason for distribution of information	To whom is the information sent	Medium	Timeframe and frequency for the distribution of required information	Person responsible for communicating the information.	Methods or technologies used to convey the information.
Delays	delays caused by various factors such as the unavailability of materials and weather conditions.	Project team.	Verbal, written	As required	Project manager	Meetings, memo, WhatsApp
Project closure	Closing of the project	Sponsors, owner	Verbal, Written	The close of the project	Project Manager	Hard copy of documents which are signed by both parties
		Project Team/ Contractor	Verbal		Project Manager	Team meeting, memo

Source (Author)

4.7.1.4 Release of Confidential Information

Confidential information and documents including tender responses and propriety methodologies cannot be divulged to unauthorized individuals or groups. The following flow chart represents the procedure for the release of confidential information.

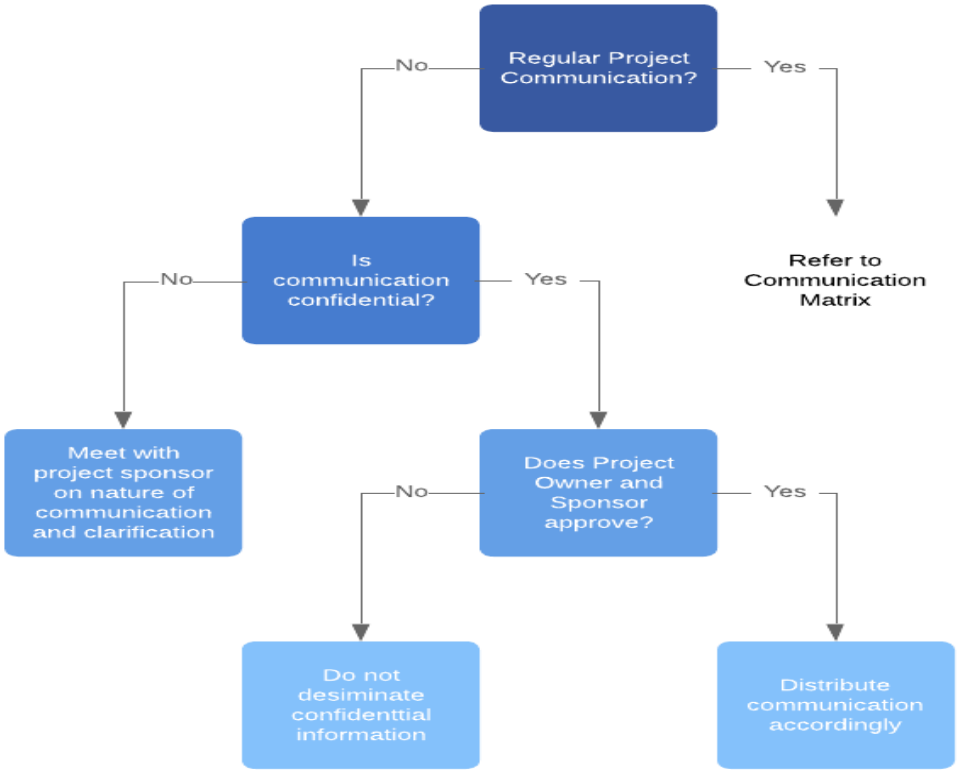

Figure 12 Release of Confidential Information

Note. Adapted from *How to Write a Project Management Communication Plan,* by Lucid Content Team, 2018. (https://www.lucidchart.com/blog/project-management-communication-plan). Copyright 2018 by Lucid Chart. Permission not sought.

4.7.1.5 Method for updating and refining the communications management plan

The communications management will be updated if, the project at any given stage is behind schedule or overbudget, (SPI≤0.95 and CPI ≤ 0.95), or if the needs of the stakeholders change throughout the life cycle of the project. The update to the plan will be done via a change request which will be approved by the owner and project manager.

4.7.1.6 Flow chart of the information flow in the project

The construction communication workflow can have implications for the cost and budget of the project and therefore must be effectively managed.

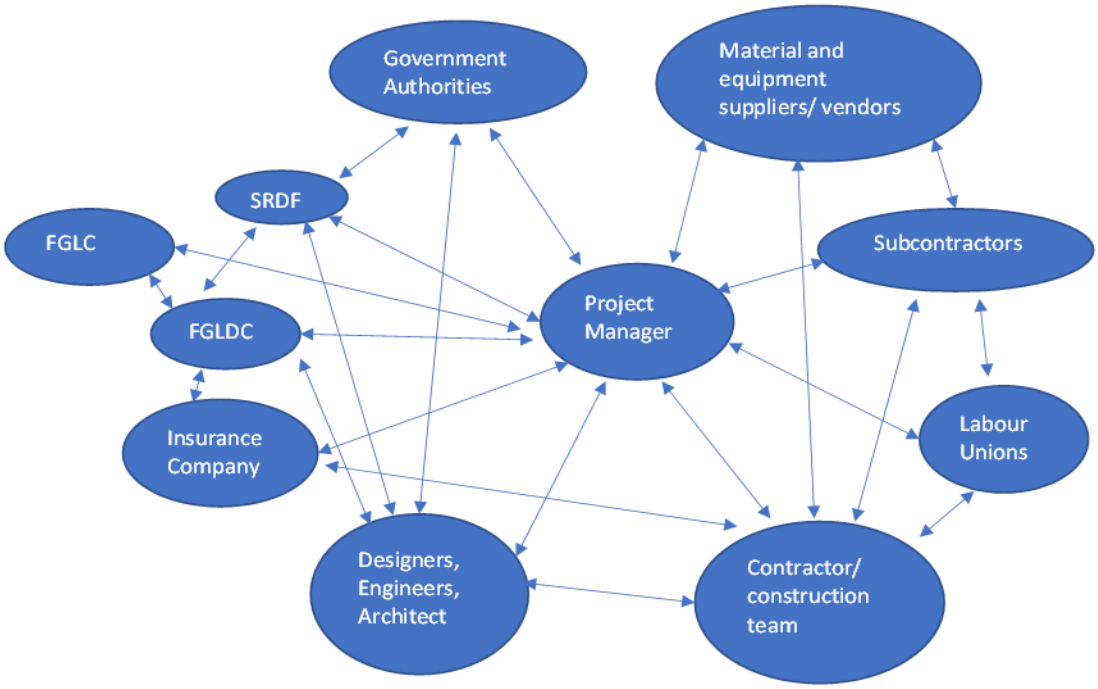

Figure 13 Flow Chart of Flow of Information

Source (Author)

4.8 Risk Management Plan

4.8.1 Plan Risk Management

4.8.1.1 Methodology

The Qualitative risk analysis was done to prioritize individual risks. The probability of occurrence of each risk were determined and their impact on the project was assessed, this was documented in the risk register.

The risk responses were carefully planned according to the type of risks, their impact on achieving project objectives, and the resources available. The risk register will be updated at the end of this process, as well as the relevant management plans through the change control process.

The actions will be delegated to the relevant risk owners who will monitor the actions to determine their effectiveness and identify secondary risks that may result from the implementation of those risk responses. The project manager will be responsible for the response to the current level of overall project risk (PMI., 2019b). Throughout the project life cycle, the performance of these risks' responses will be monitored and controlled; identified risks reassessed and risk information updated (PMI., 2016).

4.8.1.2 Roles and Responsibilities

Table 25: Roles and Responsibilities in Risk Management

Roles	Responsibilities
Sponsors	Clearly define objectives, minimizing project management risks. Clearly communicate the risk thresholds and risk attitude.

Roles	Responsibilities
	Participate in the change control process, keeping the overall project risks at an acceptable range. Compare project outcome with the project charter (objectives) to identify lessons learned which will minimize generic risks in future projects. Ensures staff members understand their responsibilities with respect to risk management and are supported with training and assistance
Owner	Clearly define objectives, minimizing project management risks. Clearly communicate the risk thresholds and risk attitude. Participate in the change control process, keeping the overall project risks at an acceptable range. Compare project outcome with the project charter (objectives) to identify lessons learned which will minimize generic risks in future

Roles	Responsibilities
	projects.
Project Manager	Identifies project risks in collaboration with other project stakeholders. Ensures that all risks are accurately assessed, plans risk responses, and controls and monitors these responses. Identifies risk owners so that risks can be effectively assessed, monitored and controlled. Communicates risk information to the organisation (FGLDC) in the form of risk reports. Manages the risk register.
Design Team	Collaborate with owner and project manager for clear objectives, minimizing and eliminating design/ technical errors. Identify risks and demonstrate a risk aware culture.
Quantity Surveyor	Collaborate with owner and project manager for clear objectives, minimizing and eliminating design/ technical errors.

Roles	Responsibilities
	Identify risks and demonstrates a risk aware culture.
Contractor	Ensure that the construction team and subcontractors understand their responsibility to manage risk and have the skills, capability and resources to do so.
Construction team	Manages risk within their area of work. Adheres to strict safety protocols in order to avoid construction risks such as accidents. Assesses new risk that may arise and monitors change in known risks. Demonstrates a positive, risk-aware attitude.

Source (Author).

4.8.1.3 Funding

The contingency reserve will be used to fund the risks that occur during the project. A ten percent of the project cost estimate has been allotted for the funding of known risks. Five percent of the project cost estimate which is the management reserve will be used for funding unknown unknowns which may emerge during the project life cycle.

4.8.1.4 Risk Categories

Table 26: Risk Breakdown Structure

RBS LEVEL 0	RBS LEVEL 1.	RBS LEVEL 2
All Sources of Project Risk	Design/Technical Risk	Errors and omissions by consultants
		Continuous changes to the project scope
		Restricted work hours
	Construction Risks	Unavailability of skilled workers
		Shortage of materials on island
		Timely availability of special Equipment/equipment breakdowns
		Capability of the contractor
		Site access
		Unforeseen subsurface conditions
		Adverse weather conditions
		Theft
		Change orders
		Subcontractor default
		Accidents and injuries
		Defective work
	External risks	Political instability

RBS LEVEL 0	RBS LEVEL 1.	RBS LEVEL 2
		Market changes/ unexpected increase in price
		Environmental organisations rejecting the project
	Project management Risks	Communication breakdown within the team
	Business Risks	Funding and Financing

Source (Author)

4.8.2 Identify Risks

Identify Risks is the process of identifying individual project risks as well as sources of overall project risk and documenting their characteristics. The preliminary risk report is used to record project risks. This register is updated after the qualitative analysis process and after the plan risk response process.

Table 27 Preliminary Risk Register Format

Risk ID	Risk category	Description of risk	Current Risk status	Causes	Effects on Objectives	Risk triggers

Source (Author)

4.8.3 Perform Qualitative Analysis of Risk

4.8.3.1 Definition of risk probability and impact

Table 28: Definition for Probability and Impacts

		Positive or Negative Impact on Project Objectives.		
Scale	**Probability**	**Time**	**Cost**	**Quality**
Very high	>70%	> 10 days	>$7,000	Very significant impact on project quality.
High	51-70%	8-10 days	$5,000-$7,000	Significant impact on project quality.
Medium	31-50%	5-7 days	$3,000-$5,000	Some impact on project quality.
Low	11-30%	2-4 days	$1,000-$3,000	Minor impact on project quality.
Very low	1-10%	1-2 days	$500	Insignificant impact on project quality.
Nil	<1%	No change	<$400.	No impact on project quality.

Note: Table adapted from *Guide to the Project Management Body of Knowledge (PMBOK® Guide)* (6th ed., p.407), by Project Management Institute, 2017, Project Management Institute, Inc. Copyright 2017. Permission not sought.

4.8.3.2 Probability impact matrix

Probability	Very Likely	0.9	0.045	0.09	0.18	0.36	0.72
	Likely	0.7	0.035	0.07	0.14	0.28	0.56
	Possible	0.5	0.025	0.05	0.1	0.2	0.4
	Unlikely	0.3	0.015	0.03	0.06	0.12	0.24
	Very Unlikely	0.1	0.005	0.01	0.02	0.04	0.08
			0.05	0.1	0.2	0.4	0.8
			Very Low	Low	Medium	High	Very high
			Impact				

Colour code	
Very High	>0.70
High	0.51-0.70
Medium	0.31-0.50
Low	0.11-0.30
Very low	0.01-0.10
Nil	<0.01

Figure 14: Probability Impact Matrix

Note. Table adapted from *Guide to the Project Management Body of Knowledge (PMBOK® Guide) (6th ed*., p.408), by Project Management Institute, 2017, Project Management Institute, Inc. Copyright 2017. Permission not sought

Each risk was given a probability score based on the percentage probability as shown in Table 28. A risk with more that seventy percent probability of occurrence is considered very high and carries a probability score of 0.9. Similarly, the impact of a risk which can increase the cost of the project by more than seven thousand dollars, or increase the project schedule by eight to ten days is considered very high, and has an impact score of 0.8 The probability impact matrix in Figure 14, illustrates the product of the probability score and the impact score. This provides an indication of the urgency of the risk, in order to implement the most appropriate risk response. The color code gives an indication of the severity of the risks according to the risk score. For example, the severity of the risk with a score which is higher than 0.70 is very high, and denoted by the color deep red.

If the risk impacts multiple categories, for example, cost and time, or cost and quality, then, the risk score was determined using the value of the highest impact of the given categories. For example, if the impact on the quality is very high (0.8) and the impact on the schedule is very low (0.05), then the higher impact value which is 0.8, is used to calculate the risk score.

Hence, the product of the probability and impact of the risk is calculated using the following formular:

PX I = Probability x (highest impact score).

4.8.4 Plan Risk Responses

Selecting the most effective and appropriate risk responses will ultimately reduce individual threats while maximising individual opportunities (PMI., 2019b).

Table 29: Risk Register

Risk ID	Risk category	Identified Risk Description	Risk causes	Effect on Objectives	Risk Triggers	Potential risk owners	Quantitative Analysis			Potential risk responses
							Probability	Impact	PXI	
1	Design/ technical	Errors and omissions in the plans	Inaccuracy	Deterioration of project quality	Architect incompetence, Poor communication.	Project Manager	0.3	0.2	0.06	Increased communications with project owner and sponsor.

Risk ID	Risk category	Identified Risk Description	Risk causes	Effect on Objectives	Risk Triggers	Potential risk owners	Quantitative Analysis			Potential risk responses
							Probability	Impact	PXI	
2	Design/ technical	Continuous changes to the project scope	Change requests by project owner/sponsor	Increases cost and time	Poor communication	Project Manager	0.1	0.4	0.04	Controlled change process to approve all changes before they are implemented.

Risk ID	Risk category	Identified Risk Description	Risk causes	Effect on Objectives	Risk Triggers	Potential risk owners	Quantitative Analysis			Potential risk responses
							Probability	Impact	PXI	
3	Construction Risks	Unavailability of skilled workers from the community.	It is a require-ment to give priority to workers from the community..	Deterior-ation of project quality.	Lack of training for the unskilled in the community.	Contractor	0.5	0.2	0.10	Selection of workers based on experience and technical skills. Workers will also be recruited from neigh-bouring commu-nities if there is a lack in the community.

Risk ID	Risk category	Identified Risk Description	Risk causes	Effect on Objectives	Risk Triggers	Potential risk owners	Quantitative Analysis			Potential risk responses
							Probability	Impact	PXI	
4	Construction Risks	Shortage of materials on island	Supply chain issues	Increased project schedule	Pandemic lock downs	Contractor	0.5	0.4	0.20	Provide overtime incentives for extra hours.
5	Construction Risks	Timely availability of special Equipment/ equipment breakdowns	Construc-tion boom on the island. Insufficient available special equipment rental services	Delay in project schedule	Constructio n boom	Contractor	0.5	0.1	0.05	Increase potential suppliers for constructi on equipment .

Risk ID	Risk category	Identified Risk Description	Risk causes	Effect on Objectives	Risk Triggers	Potential risk owners	Quantitative Analysis			Potential risk responses
							Probability	Impact	PXI	
6	Construction Risks	Capability of the contractor	Insufficient cash flow.	Delays	Recession	Project Manager	0.1	0.8	0.08	Develop a robust selection criterion which encompasses not only technical ability but also financial ability and past performance record.

Risk ID	Risk category	Identified Risk Description	Risk causes	Effect on Objectives	Risk Triggers	Potential risk owners	Quantitative Analysis			Potential risk responses
							Probability	Impact	PXI	
7	Construction Risks	Site access	Topo-graphy limits access to only small vehicles.	Increases cost and time for the manual transport of materials from the main road.	Geographical Landscape, selected site for construction	Project Manager	0.9	0.1	0.09	Vehicular access to the site is limited to small trucks.

Risk ID	Risk category	Identified Risk Description	Risk causes	Effect on Objectives	Risk Triggers	Potential risk owners	Quantitative Analysis			Potential risk responses
							Probability	Impact	PXI	
8	Construction Risks	Unforeseen subsurface conditions	Site is located at the base of a mountain.	Increase in cost and schedule		Contractor	0.5	0.2	0.10	Contingency reserve to absorb costs. Overtime hours in order to maintain schedule.
9	Construction Risks	Adverse Weather conditions	The construc-tion phase will be during the rainy season.	Delay in schedule. Increase in cost due to rework of destroyed work in the event of a	Commence-ment of the hurricane season.	Project Manager	0.9	0.4	0.36	Insurance coverage to cover rework.

Risk ID	Risk category	Identified Risk Description	Risk causes	Effect on Objectives	Risk Triggers	Potential risk owners	Quantitative Analysis			Potential risk responses
							Probability	Impact	PXI	
				hurricane.						
10	Construction Risks	Theft	The construc-tion site is open and vulnerable to theft.	Increase in cost for replacement of stolen materials.	High unemployment rates.	Contractor	0.5	0.2	0.1	Insurance coverage, Assignment of night security.

Risk ID	Risk category	Identified Risk Description	Risk causes	Effect on Objectives	Risk Triggers	Potential risk owners	Quantitative Analysis			Potential risk responses
							Probability	Impact	PXI	
11	Construction Risks	Change orders	Project owner and sponsor request change orders	Increase in cost, schedule and decrease in project quality.	Inadequate design or errors in the plan	Project Manger	0.3	0.8	0.24	Careful selection of design team based on stringent criteria. Continuous and effective communication.

Risk ID	Risk category	Identified Risk Description	Risk causes	Effect on Objectives	Risk Triggers	Potential risk owners	Quantitative Analysis			Potential risk responses
							Probability	Impact	PXI	
12	Construction Risks	Accidents and injuries	Irresponsibility, neglect to follow safety rules.	Increase in cost for compensations, delays due to inadequate workers.	Lack of training in safety protocols.	Contractor	0.3	0.2	0.06	Insurance coverage. Safety training and instructions.
13	Construction Risks	Defective work	Communication breakdown.	Increase cost and schedule due to rework.	Inadequate skills men.	Contractor	0.3	0.8	0.24	Routine Inspections
14	Construction Risks	Subcon-tractor default	Poor cash flows	Increase in schedule	Recession	Contractor	0.3	0.4	0.12	Insurance coverage

Risk ID	Risk category	Identified Risk Description	Risk causes	Effect on Objectives	Risk Triggers	Potential risk owners	Quantitative Analysis			Potential risk responses
							Probability	Impact	PXI	
15	External risks	Market changes/ unexpected increase in price	Cost-push factors (increase in supply costs).	Increase in costs	Increase in exchange rates	Project Manager	0.5	0.8	0.4	Purchase materials in advance. Explore the use of alternative materials. Plan contin-gency reserve to cushion hike in prices.
16	External risks	Political instability	Change in political parties.	Increase in project schedule	Elections period	Project Owner	0.1	0.8	0.008	Accept.

Risk ID	Risk category	Identified Risk Description	Risk causes	Effect on Objectives	Risk Triggers	Potential risk owners	Quantitative Analysis			Potential risk responses
							Probability	Impact	PXI	
17	External risks	Environ-mental organisations rejecting the project	Poor communication with interest groups.	Delay in schedule.	Gros Piton Trail is a world heritage site.	Project manager	0.1	0.05	0.005	Increase transparency, communi-cation with public.
18	Project Management risk	Communication breakdown within the team	Lack of self-awareness	Increased cost. Increased schedule	Limited platform for workplace communication.	Project Manager	0.3	0.2	0.06	Establish clear and effective communication links
19	Business risks	Funding and Financing	Insufficient revenue earned by sponsors	Increased schedule. Decreased quality.	Fall in tourism industry	Project owner	0.1	0.8	0.08	Seek increased opportunities for funding.

Source (Author)

4.9 Procurement Management Plan

4.9.1 Plan procurement management

4.9.1.1 Type of contract to be used

Contract Type: Fixed Price Contract.

4.9.1.2 Integration of procurement activities with other project aspects

The contractor shall be integrated into the various project areas such as scope, schedule and risk management, to ensure project success. The contractor's WBS will be incorporated into the scope of the project thereby generating a joint WBS. The contractor's schedule, including milestones will be incorporated into the schedule of the project. The risk register of the contractor will be made available to the project manager, and will be updated throughout the project lifetime.

4.9.1.3 Timetable of key procurement activities

Table 30: Key Procurement Activities

Milestone	Date
Bill of Quantities and Contract conditions complete.	12/14/22
Specifications completed	12/14/22
Tender document completed	12/21/22
Tender Period deadline	12/28/22
Tender review	12/29/22-11/23/22
Appoint contractor deadline.	1/13/23

Source: (Author)

4.9.1.4 Procurement metrics

Table 31: Contractor Performance Metrics

Area	Metric	Measurement method
Regularity	Check -in compliance	Digital Attendance sheet
Reliability and Dependability	Work order completion percentage.	Project schedule variance
Work Quality	Percentage of rework	Inspections

Source: (Author)

4.9.1.5 Selection criteria

The contractor should have experience in construction for more than three years. The selection criteria will be quality and cost-based; this method allows the cost to be included as a factor in the seller selection process (PMI., 2017, p. 474).

4.9.1.6 Stakeholder roles and responsibilities related to procurement.

Table 32: Stakeholder Roles and Responsibilities

Role	Responsibility	Sign-Off Authority.
Project manager	Overall project management	$25,000
Quantity Surveyor	Contract review and negotiations. Legal guidance Preparation of documents and tendering process.	None
Sponsors	Selection of contractor, Approval of project spending. Final Approval of contract documentation.	$200,000
Owner	Selection of contractor Approval of project spending.	$75,000

Source (Author)

4.9.1.7 Constraints and Assumptions.

- The project has been approved for adherence to regulatory laws.
- The project is accurately defined and estimates of cost have an accuracy which is not less than ninety four percent.
- The Quantity surveyor is knowledgeable on construction law for the accurate preparation of accurate procurement documents.

4.9.1.8 Legal Jurisdiction and Currency in which payments will be made

Payments will be made in the Eastern Caribbean Currency (XCD).

4.9.1.9 Use of Independent Estimates

The price proposals of the seller will be compared against an independent estimate which is prepared by the representative of the owner. This will serve as a means of evaluating the priced proposals to ensure that the criteria have been understood by the contractor and that he has provided a fair price to complete the work to the required scope and quality (PMI., 2016).

4.9.1.10 Risk Management Issues

1. Selecting the wrong contractor may result in issues relating to cost, schedule and quality.
2. Inclement weather may result in project schedule delays.
3. If the contractor hires incompetent subcontractors, the quality of the work can be negatively impacted.

4.9.1.11 Procurement strategy

Table 33: Procurement Strategy

Objective	Method	
Delivery Methods	Traditional (Design -bid- build).	
Contract payment type	Fixed price- paid based on the complete delivery within the stipulated time according to the terms of the contract. Time and Materials Paid according to the units stated in Table 14. Advance payment will be made for mobilization.	
Procurement Phases		
Phase	**Specific objectives**	**Criteria for moving to next phase**
Bill of Quantities and Contract conditions.	To accurately prepare the BQ and detailed contract conditions.	Completed BQ and contract conditions.
Specifications	To detail project specifications which describes the work and standards required.	Specifications are approved by the project manager and project owner/sponsor.
Tender Document	To compile project tender documents which clarifies the tender to potential contractors.	Completed tender document which has been approved and verified. Advertisement of the contract.
Tender Period	To invite the prequalified persons to tender.	End of the tender period.
Tender Review	To evaluate tender submissions based on important factors to the project owner/sponsor.	Recommendations are made to the project owner/ sponsor.
Appoint Contractor	To award a contract to the most suitable candidate and sign the legal agreement.	Notification of the contractor and signing of the contract.

Source (Author)

4.9.1.11 Monitoring and Controlling Project Procurements

The contract is monitored and controlled to ensure that both the general contractor, the owner and sponsor adhere to the contract conditions.

The contractor will provide a weekly progress report on the work which he performs, and this includes the work done by subcontractors, vendors and suppliers. Any change request will be taken to the owner and sponsor, through the project manager for approval. The architect, along with the project manager, will conduct scheduled performance reviews of the contractor's work to ascertain that the contractor complies with the contract conditions and adheres to the schedule, budget and quality of work. Scheduled inspections as stated in the quality management plan in section 4.5.5 will be held to ensure that the contractor complies with technical parameters, industry standards for materials and workmanship, based on the contract documents (PMI., 2016). The contract will outline the methods of resolving disputes which may emerge.

4.9.1.12 Project procurement management closing

The contract will close at the end of the project with a written communication from the contractor informing the owner and sponsor that the project is completed. A punch list will be generated to reflect outstanding works or works done which need corrective action to be performed by the contractor. Prior to closing out, and during the construction defects liability period, the contractor will complete the work. Five percent of the payments shall be withheld until all works are completed as per the contract conditions. A final inspection will be done and completed works will be verified for completeness and accepted by the buyer (PMI., 2016).

4.10 Stakeholder Management Plan

4.10.1 Identify stakeholders

It is important that the stakeholders are identified iteratively throughout the life cycle of the project and constantly updated. The names and titles of the stakeholders who have a significant influence on project success, are impacted or perceive themselves to be impacted by the project, were recorded in the stakeholder register. The power/interest of each identified stakeholder was represented using a power interest grid. The stakeholder register will be updated as new stakeholders are identified, via the change control process.

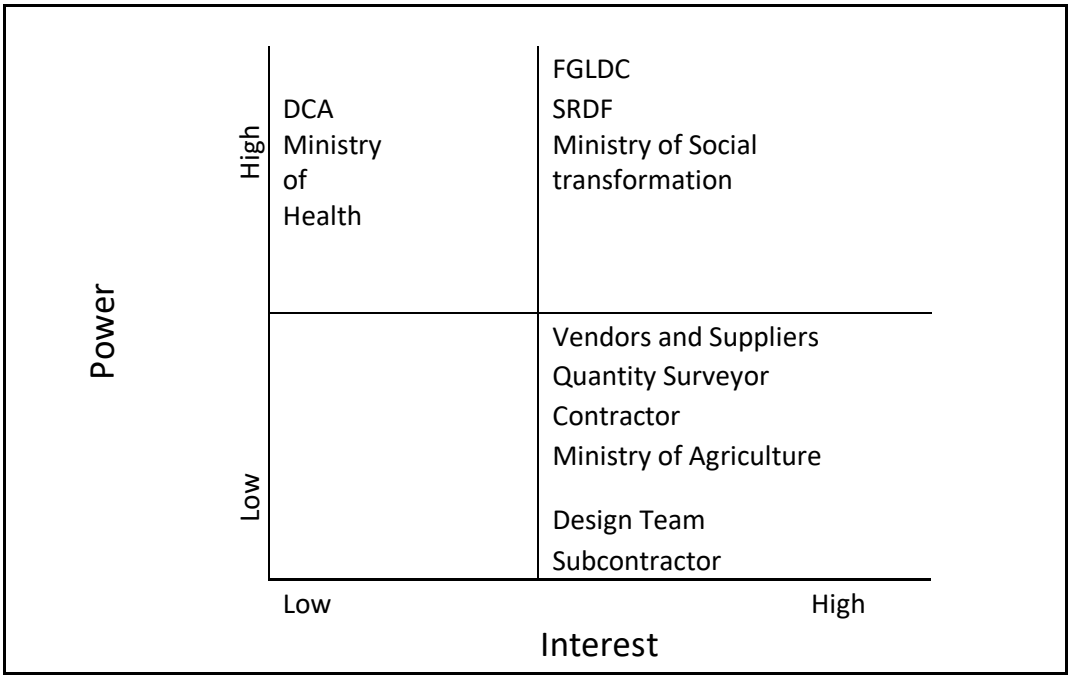

Figure 15: Power Interest Grid

Source (Author)

Table 34: Stakeholder Register

Name	Location and contact details	Role	Responsibility	Major requirements and expectations	Phase of major Impact	Direction of Influence	Impact	Power	Interest
Fond Gens Libre Development Committee	Fond Gens Libre	Project Owner	Clearly communicate project objectives and requirements.	The project will be completed within the required, budget, scope, and time.	All phases	Upward	High	High	High
Fond Gens Libre Community	Fond Gens Libre	End User		The project meets the needs of the community members; the building provides a safe and conducive environment for learners of all ages. Opportunities are provided to community members for employment.	All phases	Downward	Medium	Medium	High
Soufriere Regional Development Foundation	Soufriere	Project Sponsor	Provide the financial resources for the completion of the project	The project is completed within the required budget and quality.	All phases	Upward	High	High	High

Name	Location and contact details	Role	Responsibility	Major requirements and expectations	Phase of major Impact	Direction of Influence	Impact	Power	Interest
			in a timely manner.						
Ministry of Social Transformation, Local Government and Community Empowerment.	Castries	Project Sponsor	Provide the financial resources for the completion of the project in a timely manner.	The project will be completed within the required, budget, scope and time.	All Phases	Upward	High	High	High
Sherlan Alexander	Laborie	Project Manager	Lead the project team and achieve project objectives.	Deliver the project within the given scope, budget, and schedule. Engage stakeholders for the successful completion of the project.	All Phases	Sideways	High	Medium	High

Name	Location and contact details	Role	Responsibility	Major requirements and expectations	Phase of major Impact	Direction of Influence	Impact	Power	Interest
Ministry of Agriculture, Fisheries, Food security and Rural development	Castries	Interest Group	Provide expert advice on the sustainability of the environment to avoid harm to biodiversity on the trail.	The project has a sustainable impact and does not alter the biodiversity and natural landscape of the Gros Piton Nature trail.	Execution phase	Outward	Medium	Low	High
Melvin Thomas	Vieux Fort	Quantity Surveyor	Managing all aspects of the contractual and financial side of construction projects	Effective communication with the project manager and owner to prepare tender documents, contracts, budgets, bills of quantities for successful procurement.	Procurement	Downward	High	Low	High
Jacquline Trim, Tommy Haynes, Jane Drake, Joel Serrieux.	Choiseul, Soufriere	Design Team	Provide the expertise for the planning and design, given the stakeholders requirements.	Clear communications with the owner and project manager. Provide a deliverable that meets the	Planning phase	Downward	High	Low	Medium

Name	Location and contact details	Role	Responsibility	Major requirements and expectations	Phase of major Impact	Direction of Influence	Impact	Power	Interest
				owner/sponsor's expectations.					
SAFE Designs and Construction.	Laborie	Contractor	Provide the expertise to execute the project, producing the deliverables under the guidance of the project manager,	Effective communication with the project manager. Be provided with sufficient time to produce a deliverable of the required quality and within budget. Timely payments for work done according to contract.	Execu-tion phase	Downward	Medium	Low	High

Name	Location and contact details	Role	Responsibility	Major requirements and expectations	Phase of major Impact	Direction of Influence	Impact	Power	Interest
		Construction Team	Provide the expertise to execute the project, producing the deliverables under the guidance of the project manager,	To be equipped with the equipment, tools and materials to execute the project successfully within scope time and quality.	Execution Phase	Downward	low	Low	Low
Ministry of Health	Castries		Approve the project plans for meeting health requirements	The project complies with the statutory regulations of the country.	Planning phase	Outward	Low	High	Low
DCA	Castries		Approve the project plans/design in compliance with the National building regulations and Standards.	The project is completed according to the required regulations and standards.	Planning phase	Outward	Low	High	Low

Name	Location and contact details	Role	Responsibility	Major requirements and expectations	Phase of major Impact	Direction of Influence	Impact	Power	Interest
Sub-contractors	Fond gens Libre, Soufriere, Choiseul			Expectations are clearly communicated	Execution phase	Downward	Low	Low	High
Vendors and Suppliers	Local, (St. Lucia)	Vendors and Suppliers	Provide reliable, high-quality materials and equipment in a timely manner	Timely and effective communication. Timely payment for goods and services	Execution phase	Outward	High	Low	High

Source (Author)

4.10.2 Plan stakeholder engagement

Table 24 of section 4.7.1.3 shows how the stakeholders will be engaged. This communication plan will ensure that the project receives the maximum support from each stakeholder while reducing resistance from interest groups. This plan is updated regularly to reflect changes to the stakeholder community when new individuals or groups become stakeholders, current stakeholders are no longer part of the stakeholder community or the importance of stakeholders to the project's success changes (PMI., 2017). As the needs of the stakeholders are identified, relationships will be developed which will increase their level of participation.

The stakeholder Engagement Assessment matrix will be used at every project stage to assess the current levels of engagement levels of stakeholders and compare it to the required levels of engagement which is required for successful project delivery.

Table 35: Stakeholder Engagement Assessment Matrix

Stakeholder	Unaware	Resistant	Neutral	Supportive	Leading
Fond Gens Libre Development Committee					C, D
Fond Gens Libre Community				C	D
Soufriere Regional Development Foundation					C, D
Ministry of Social Transformation, Local Government				C	D

Stakeholder	Unaware	Resistant	Neutral	Supportive	Leading
and Community Empowerment.					
Ministry of Agriculture, Fisheries, Food security and Rural development				C	D
Ministry of Health /DCA				C	
Contractor					C, D
Subcontractors					C, D
Project team					C, D
Vendors and Suppliers			C	D	
C- Current D -Desired					

Source: (Author)

4.10.3 Manage stakeholder engagement

During this project, negotiations and communication will be used to maintain the commitment of the stakeholders to the project. Any risks or concerns related to stakeholder management will be addressed as they arise. Identified issues will be documented in the issue log to be resolved and clarified. The community tends to be politically divided, hence, the project manager will ensure that the community is adequately informed, that they understand the objectives and

benefits of the project, especially during the planning stage, to avoid significant resistance.

4.10.4 Monitor stakeholder engagement

During this project, constant communication with stakeholders will be maintained to ensure that their needs are being met and that their issues are resolved efficiently. Changes will be made to increase the effectiveness of those methods of communication that are inefficient. During this process, the communications management plan, as well as the stakeholder engagement plan will be regularly reviewed and updated. Updates to the issue log and stakeholder register will be made as information is obtained during the monitor stakeholder engagement process.

5 CONCLUSIONS

1. A project management plan was developed for the construction of a learning resource center in the community of Fond Gens Libre by the end of July 2023. The development of subsidiary plans assures effective project management for the overall success of the project, that it exceeds the customers' expectations in terms of cost, budget, schedule and quality.
2. The project charter provided the high-level requirements and formally authorized the use of resources for the completion of the project.
3. The scope management plan was elaborated using the requirements of stakeholders. The scope of works for the final deliverable, a LRC, was clearly defined in a WBS dictionary, and methods for validating and controlling the scope were outlined in the scope management plan.
4. The schedule management plan indicated that the project should be completed within one hundred and seventy-eight (178) days. The schedule model was developed and must be monitored and controlled throughout the project life cycle. This ensures the prompt identification and resolution of problems that may impact the timely completion of the project.
5. The cost management plan revealed that the project cost is estimated at XCD 277,893. A tolerance of +/- 5% will be accepted on the total cost of the project. The project cost will be monitored using EVM.
6. The quality management plan established the quality standards for the project design is based on the St. Lucia Building Code. The approved designs, specifications and contract become the principal project quality standards for the construction phase of the project. The project deliverables and processes will be subject to quality review and any nonconformity will be recorded and subject to corrective actions.

7. The Resource management plan described how the resources will be identified, acquired, and managed. The physical resources were identified using the bottom up estimating technique. First priority will be given to vendors and suppliers from within the community for providing physical resources. Priority will be given to human resources from within the community who meet the selection criteria. The cost baseline and schedule baseline will provide a benchmark for the measurement of productivity.
8. The communications management plan provided a network of communications among the stakeholders, where the project manager is at the center. The flow of information was clearly outlined in order to facilitate the alignment with project objectives. Only the English language will be used for formal communication and both the creole language and English will be used for informal communications.
9. The risk management plan discussed the methodology for risk management. The impact of the nineteen identified risks were analyzed using qualitative risk analysis, and the methods for management were outlined according to their probability and impact.
10. The procurement management plan provided the details of the procurement of a contractor for the construction of the LRC. The type of contract to be used for the project is a fixed price contract. The delivery method is the traditional design-bid build method. The procurement activities were integrated into the project activities in the procurement management plan.
11. The stakeholder management plan provided the basis for effective stakeholder engagement, according to their interest and involvement throughout the project life cycle. During this project, constant communication with stakeholders will be maintained to ensure that their needs are being met and that their issues are resolved efficiently. The

stakeholder engagement analysis in this plan revealed the current state of the stakeholders which is vital for the improvement of engagement methods to get them to the desired state.

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6 RECOMMENDATIONS

It is recommended that:

1. The owner, the FGLDC, seeks additional funding for the expansion of the scope of work to include landscaping, and training of the employees for the LRC.
2. The FGLDC invites the project manager to attend a community meeting with the Fond Gens Libre Community, to get a better understanding of their expectations of the project. This will improve the effectiveness of the *collect requirements* process and meet the expectations of the end users of the product.
3. The contractor must secure the materials and equipment for the project, (especially those that are frequently in short supply on the island), in a timely manner so as to avoid schedule delays.
4. The project manager provides regular reports to the FGLDC and the SRDF. The FGLDC must have regular meetings with the community members to ensure that they are adequately informed of the project objectives.
5. The project manager must require regular and timely inspection reports from the responsible individuals according to the quality management plan and take prompt corrective actions to ensure that the project proceeds within the required quality.
6. The contractor provides the opportunity for community members to be employed as masons, laborers, painters and carpenters. This will ensure that the stakeholder needs of the community members are met and that despites do not arise which can hinder the progress of the project.
7. The project manager hires a contractor from the Fond Gens Libre Community. If none meets the requirements then, a local contractor from the island can be hired. The project manager should ensure that

funds are dispersed in a timely manner to keep the construction team motivated for the successful completion of the project.

8. The project manager maintains relations with all stakeholders, anticipating and resolving disputes promptly and effectively, while adequately representing the interests of the sponsor and owner of the project.

7 VALIDATION OF THE FGP IN THE FIELD OF REGENERATIVE AND SUSTAINABLE DEVELOPMENT

The community of Fond Gens Libre is at a juncture where it is undergoing changes which will lead to an improvement in the lives of its residents. Therefore, it must be able to cope and adapt to changing situations in both the internal and external environment. Hernandez (2019) defines Regenerative Development as “an approach that encourages communities to support and create positive relationships that will benefit society and our environments by allowing the system to evolve and adapt to changing circumstances”. Hence, the success of this community project depends on its sustainability and regenerative nature.

The entire community of Fond Gens Libre has to be involved and feel its connections to the natural system of which it forms a part. There must be an appreciation of the need for sustainability and regeneration. This can be achieved through the establishment of honest, deep, and ongoing dialogue between the community and the FGLDC, and between the community and the project team.

7.1 Dimensions of regenerative development

7.1.1 Environmental

The community of Fond Gens Libre is nested in a world heritage site, the base of the Gros Piton. This environment is protected by law, as it is the home to many endemic flora and fauna. Regenerative design for the construction of the project (LRC) will be employed to ensure that there is an enhancement of ecological health, and not merely minimal damage done to the environment. Strict regulations will be followed regarding the disposal of solid waste to avoid the contamination of the river which runs at the base of the Piton. The water used in the construction process will be pumped from the river to avoid the use of scarce potable water. Also, a few trees must be cut in the areas where the building is to

be sited, however, these same species will be obtained from the forestry department and planted in the locations as advised by the department.

7.1.2 Social

This project will provide equal opportunities for all. During the construction of the project, jobs and contract will be awarded based on qualification and skill, indiscriminate of sex, gender, religion, or political affiliation. After its completion, education services will be available for all, regardless of age, religion, or political affiliation. Persons with physical disabilities or mental retardation will also benefit immensely from this project.

This project in the long term will help to build capacity in the community, thereby enabling the development of confidence, skills and knowledge required to effectively manage and improve the tourism product offered by the community. It will foster both holistic growth of the community and personal development of the people. This human capacity of the community will be developed through continuous learning, through the avenue provided by this project. This will help to build the economic performance of the tourism business run by the community, creating greater value for the community.

7.1.3 Economic

This project will benefit the residents of Fond Gens Libre both in the short term and in the long term. The implementation of the project will bring significant income to the community and people who have been unemployed will gain temporary employment. The end users will benefit from a facility, a learning resource center, which provides all the information necessary to support their social and economic development.

7.1.4 Political

The executive of the FGLDC must demonstrate ethics and transparency during the entire project life cycle, through quality control and financial audits. The project manager will effectively engage all stakeholders, leveraging their power and authority for the success of the project. For example, there must be a complete involvement of the forestry department of the Ministry of Agriculture, Fisheries, Physical Planning, Natural Resources and Co-operatives, to provide guidance and expert judgement in preservation of endemic species during the construction phase of the project. This will help avoid the rise of any political issues relating to the world heritage site.

Corruption in all its forms can adversely affect the project outcomes. Hence, the FGLDC will follow the ten principles of the UN Global Compact, in particular principle 10 which states that “Businesses should work against corruption in all its forms, including extortion and bribery” The Ten Principles | UN Global Compact. (2022).

7.1.5 Cultural and spiritual

The community of Fond Gens Libre is unique, and the cultural dimension of regenerative development focuses on the revitalization of the historical and cultural heritage of that community. It is rich in historical sites dating from the time of the Amerindians to slavery. The end users of the product will benefit from the display of literature and artefacts that tell of the history of the people. They will also learn to appreciate, and hence, preserve the history and culture and pass it on to future generations. The orientation of the building will provide the majestic view of the peak of the Piton which the ancestors have looked upon as a source of strength and motivation from God. All these helps to create that spiritual connection with the systems of nature in that environment, which will be passed on for generations.

7.2 Key Performance Indicators

Table 36: Key performance Indicators (source Author)

P5 domain	Category	Key performance Indicator
Product	Lifespan of Product	% of community members who use the facility.
	Servicing of the product	Frequency of maintenance works on a yearly basis.
Process	Effectiveness of the project process	% of rework from given contracts
	Efficiency of the project process	
	Fairness of the project process	% of contractors from within the community
People	Labour practices and decent work	Percentage of volunteers given a stipend. Percentage of employees who are part of a union.
	Society and customers	Percentage of community members who are involved in the project/ who attend meetings regularly.
	Human rights	Difference in wages of men and women who do the same work.
	Ethical behavior	Percentage of local suppliers.
Planet	Transport	Percentage of building materials purchased in bulk.
	Energy	Percentage of work done during daylight hours.
	Land, Air and Water	Ratio of Volume of rainwater to potable water used in the construction process.
	Consumption	Percentage of materials reused at different phases of the project.
Prosperity	Economic Stimulation	Persons of skilled/ trained personnel from the community involved in managing the facility. Percentage of services that are provided in the facility.

7.3 P5 Analysis

Table 37: P5 Analysis of the construction of an LRC (Source Author)

Category / Subcategory / Element	Description (Cause)	Potential Impact	Impact Score Before	Proposed Response	Impact Score After	Change
2.1 Product Impacts						
2.1.1 Lifespan of the product	The product requires both human resources, electricity, water in order to be fully functional;	The community will incur cost of operation and maintenance	1	A special room can be rented to groups and other communities for events such as meetings to generate income	5	4
2.1.2 Servicing of product	The structure needs to be maintained during its lifetime	New technologies will be required to make the project more sustainable	1	Employment of a trained maintenance technician	5	4
2.2 Process (Project Management) Impacts						
2.2.1 Effectiveness of project processes	The FOLDC has little experience in project management	The Project process will be less effective	3	The organisation will use benchmarking to improve the performance of the project	5	2
2.2.2 Efficiency of project processes						
2.2.3 Fairness of project processes	Some of the materials required for construction are supplied on a small scale by the community	Suppliers will be sourced from outside the community	4	Contracts will be awarded first to suppliers from the community and the external suppliers will be contracted for resources that are not available in the community	5	1
		Product and Process Average	2.3		5.0	2.8
3 People (Social) Impacts						
3.1 Labor Practices and Decent Work						
3.1.1 Employment and staffing	Project requires volunteer staff from the community	Some of the persons willing to volunteer are unemployed	3	Volunteer staff will be given a stipend	4	1
3.1.2 Labor/management relations	Construction workers are generally not part of a union	Well qualified staff may not be drawn to the project	2	The legal and human rights for all employees are supported by management	5	3
3.1.3 Project health and safety	The construction site poses many hazards to health and safety	Health and safety issues result in time lost from injuries, leading to delays		Recruiting of a health and safety officer for the project	5	
3.1.4 Training and education						
3.1.5 Organizational learning						
3.1.6 Diversity and equal opportunity	Women are less likely to be employed on a construction site given the culture of the people	Discrimination against women	4	Equal opportunity is provided for employment based on skill and performance	4	0
3.1.7 Local competence development	Community members do not have all the competencies required for the project	External human Resources will be needed	4	Local labour will be used whenever possible	4	0
3.2 Society and Customers						
3.2.1 Community support	The project is a community project	The community members will be engaged in the project	5	Improved communication with the community and project team	5	0
3.2.2 Public policy compliance						
3.2.3 Protection for indigenous and tribal peoples						
3.2.4 Customer health and safety						
3.2.5 Product and service labeling						
3.2.6 Market communications and advertising						
3.2.7 Customer privacy						
3.3 Human Rights						
3.3.1 Non-discrimination	Women tend to be paid less for their work compared to their male counterparts	Discriminatory bias against women	3	Compensate all staffs based on skill and experience	5	2
3.3.2 Age-appropriate labor						
3.3.3 Voluntary labor						
3.4 Ethical Behavior						
3.4.1 Procurement practices	Sand mining from the beaches is prohibited by law	Local Suppliers may engage in this practice to be able to supply sufficient sand	2	Suppliers will be held to the standards of sustainability to avoid destruction to coastlines and beaches	5	3
3.4.2 Anti-corruption						
3.4.3 Fair competition						
		People Average	3.3		4.6	1.3
4 Planet (Environmental) Impacts						
4.1 Transport						
4.1.1 Local procurement	Contractors and consultants with the required expertise will be required for the implementation phase of the project	External contractors and consultants may be hired to meet the project requirements	4	Priority will be granted to qualified personnel in the community and within the immediate communities surrounding Fond Gens Libre	5	1
4.1.2 Digital communication	It may not be convenient for Community members and executive members to have face to face meetings	Decrease in timely feedback to stakeholders	2	Online collaboration tools such as video conferencing will be used for meetings, emails will be used to communicate with stakeholders	5	3
4.1.3 Traveling and commuting	The team is within the community itself. However, contractors and other resource persons may have to travel on occasion to the community for meetings and site visits of the construction project	Due to the nature of the project remote work is not possible	2	Transportation arrangements can be made for workers outside the community so to allow for mass transit, saving energy and costs	5	3
4.1.4 Logistics	Materials are not all available in the community	Materials must be transported to and from the project site and this results in transportation costs and air pollution	4	Materials will be purchased in bulk to minimize frequency of transportation of materials to the site	5	1
4.2 Energy						
4.2.1 Energy consumption	Project must be completed within the stipulated schedule	The team will work overtime hours which will increase energy costs	1	Use of solar lighting as a renewable source of energy to reduce energy costs	4	3
4.2.2 CO2 emissions						
4.2.3 Clean energy return						
4.2.4 Renewable energy						
4.3 Land, Water, and Air						
4.3.1 Biological diversity	The land must be cleared for the preparation for the site	Physical impact to the area designated a world heritage site, due to destruction of flora	1	Species of plants uprooted will be planted along the trail with the advice of the forestry department	5	4
4.3.2 Water and air quality						
4.3.3 Water consumption	There is a need for water as a resource for the project work	Increase the use of potable water	2	Rain water can be harvested in order to minimize the amount of potable water used	5	3
4.3.4 Sanitary water displacement						
4.4 Consumption						
4.4.1 Recycling and reuse	Waste is generated as a result of project works	Increased disposal costs and pollution of the environment	1	Recycle/reuse materials throughout the different phases of the project	5	4
4.4.2 Disposal	Waste is generated as a result of project works	Increased disposal costs and pollution of the environment	1	Dispose of all unneeded items in a responsible manner	4	3
4.4.3 Contamination and pollution						
4.4.4 Waste generation						
		Planet Average	2.0		4.8	2.8
5 Prosperity (Economic) Impacts						
5.1 Business Case Analysis						
5.1.1 Modeling and simulation						
5.1.2 Present value						
5.1.3 Direct financial benefits						
5.1.4 Return on investment						
5.1.5 Benefit-cost ratio						
5.1.6 Internal rate of return						
5.2 Business Agility						
5.2.1 Flexibility/optionality						
5.2.2 Business flexibility						
5.3 Economic Stimulation						
5.3.1 Local economic impact	The community may not have sufficient trained personnel to run the facility	Economic benefits would be derived by persons from outside the community with the required skills and expertise	4	Persons from the community will be trained and employed in the facility	5	1
5.3.2 Indirect benefits	The location of the facility may make it unattractive to persons from other communities who may want to use its services	Insufficient funds may be generated from outside the community for the use of the facility	3	Interesting services can be provided such as the use of conference room for meetings with refreshments, educational tours for schools on the history of St Lucia	5	2
		Prosperity Average	3.5		5.0	1.5
		Overall Average	2.6		4.8	2.2

8 BIBLIOGRAPHY

Aravinthan, M. & Natarajan,R (2020). *Information Literacy Among Rural Women: A Study*. IGI Global, Publisher of Timely Knowledge. https://www.igi-global.com/chapter/information-literacy-among-rural-women/258134

Browning, T. R. (2019). Planning, Tracking, and Reducing a Complex Project's Value at Risk. Project Management Journal, 50, 71–85.

Busetto, L., Wick, W. & Gumbinger, C. (2020). How to use and assess qualitative research methods. *Neurol. Res. Pract.* 2(14) https://doi.org/10.1186/s42466-020-00059-z.

CIKD (2019, Dec 22) Research tools 1: Observation. https://icndbm.cikd.ca/research-tools-1-observation/#:~:text=A%20data%20collection%20tool%20or,to%20answer%20a%20research%20question.

Gemino, A., Reich, B. H., & Serrador, P. M. (2021). Agile, Traditional, and Hybrid Approaches to Project Success: Is Hybrid a Poor Second Choice? *Project Management Journal,* 52(2), 161–175. doi: https://doi.org/10.1177/8756972820973082.

Kebede. N.M, 2021). Assessment study on the challenges of Project Management Knowledge areas. *International Journal of Management and Development Studies.* 10(10), 01-10.

Kinser, J. (2010). Don't make an ass out of you and me—using assumptions effectively. Paper presented at PMI® Global Congress 2010—North America, Washington, DC. Newtown Square, PA: Project Management Institute.

Koch-Ørvad, N., Thuesen, C., Koch, C., & Berker, T. (2019). Transforming Ecosystems: Facilitating Sustainable Innovations through the Lineage of Exploratory Projects. *Project Management Journal*, 50(5), 602–616.

Manata, B., Miller, V. D., Mollaoglu, S., & Garcia, A. J. (2022). Documenting the Interactive Effects of Project Manager and Team-Level Communication Behaviors in Integrated Project Delivery Teams. *Project Management Journal*, 53(1), 33–48. doi: https://doi.org/10.1177/87569728211047296

Ortiz, J. I., Pellicer, E., & Molenaar, K. R. (2019). Determining Contingencies in the Management of Construction Projects. *Project Management Journal, 50*, 226–242.

Pacagnella Jr., A. C., da Silva, S. L., Pacífico, O., de Arruda Ignacio, P. S., & da Silva, A. L. (2019). Critical Success Factors for Project Manufacturing Environments. *Project Management Journal*, 50, 243–258.

Project Management Institute (2016) Construction Extension to the PMBOK® Guide. Project Management Institute, Inc,2016.

Project Management Institute. (2017). A guide to the Project Management Body of Knowledge (PMBOK guide) (6th ed.). Project Management Institute, Inc., 2017.

Project Management Institute. (2019). Practice Standard for Scheduling - Third Edition, Project Management Institute Inc., 2019

Project Management Institute. (2019b). The Standard for Risk Management in Portfolios, Programs, and Projects, Project Management Institute Inc., 2019.

Project Management Institute. (2021). A Guide to the Project Management Body of Knowledge, (*PMBOK® Guide*) - Seventh Edition, Project Management Institute, Inc., 2021.

Sladowski G. (2018) Use of Meta- Networds to evaluate key agents, knowledge and resources in the planning of construction projects. *Archives of Civil Engineering,* 64(3)121-129.

Tereso, A., Ribeiro, P., Fernandes, G., Loureiro, I., & Ferreira, M. (2019). Project Management Practices in Private Organizations. *Project Management Journal,* 50, 6–22.

The Ten Principles | UN Global Compact. (2022). Retrieved 10 June 2022, from https://www.unglobalcompact.org/what-is-gc/mission/principles

University of Newcastle Library guides. (2022, Feb 23). Research methods: What are research Methods? https://libguid+es.newcastle.edu.au/researchmethods.

UNSW Library. (2022, Aug 10). Primary and Secondary Sources. UNSW Sydney. https://www.library.unsw.edu.au/using-the-library/information-resources/primary-and-secondary-sources

Yap, J. B. H., Skitmore, M., Gray, J., & Shavarebi, K. (2019). Systemic View to Understanding Design Change Causation and Exploitation of Communications and Knowledge. *Project Management Journal*, 50, 288–305.

9 APPENDICES

Appendix 1: FGP Charter

CHARTER OF THE PROPOSED FINAL GRADUATION PROJECT (FGP)

1. Student name

Sherlan Avril Williams Alexander

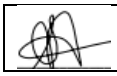
2. FGP name

The Project Management Plan for the construction of a Learning Resource Centre in the community of Fond Gens Libre, St. Lucia.

3. Application Area (Sector or activity)

Construction

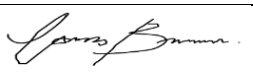
4. Student signature



5. Name of the Graduation Seminar facilitator

Carlos Brenes

6. Signature of the facilitator



7. Date of charter approval

03/09/2022

8. Project start and finish date

18/09/2022	05/12/2022

9. Research question

What are the components of a Management Plan necessary for the design and construction of a Learning Resource Centre in the community of Fond Gens

Libre?

10. Research hypothesis

A project management plan will provide the elements required for the design and construction of a Learning Resource Centre in the community of Fond Gens Libre to facilitate continuous education for the residents of all ages, specifically the students in the community.

11. General objective

To develop a project management plan for the design and construction of a Learning Resource Centre in the community of Fond Gens Libre by June 30th, 2023.

12. Specific objectives

The specific objectives for this project are as follows:
Specific objectives

1. To develop a project charter which formally authorizes the existence of the project, thereby giving the project manager authority to organizational resources to project activities.
2. To elaborate a scope management plan which encompasses only the work required to complete the project successfully.
3. To create a schedule management plan, which provides the documentation needed for the effective development, monitoring and controlling of the project schedule so that it is completed on time.
4. To create a cost management plan in which the cost of the project is planned, estimated, budgeted, financed and funded, within the approved budget.
5. To create a quality management plan to ensure that the project complies with quality standards and the quality requirements and/or standards for the project and its deliverables are correctly identified.
6. To outline a project resource management plan which defines how to estimate, acquire, manage, and utilize physical and team resources to be used in the project.
7. To formulate a communications management plan to ensure the effective exchange of information so that the information needs of the project and all stakeholders are adequately met.
8. To conduct risk management plan, identification, analysis, response planning, response implementation, and monitoring risk on a project
9. To develop a procurement management plan which identifies the processes necessary to purchase or acquire products, services, or results needed from outside the project team.
10. To formulate a stakeholder management plan which identifies the people,

groups, or organizations that could impact or be impacted by the project, analyzes stakeholder expectations and their impact on the project, and develops appropriate management strategies for effectively engaging stakeholders in project decisions and execution.

11. To assess the impact of the project on sustainable and regenerative development.

13. FGP purpose or justification

This FGP aims to create a complete Project Management Plan, consisting of all the subsidiary plans for the construction of a Learning Resource Centre in the community of Fond Gens Libre. It will be the basis and guide for the effective execution and control of the building project. It will clarify the scope, quality of work and the risks which may impact the outcome of the project, providing a roadmap for the project team to work.

The community of Fond Gens Libre lies at the base of the Gros Piton in St. Lucia, one of the famous designated UNESCO World Heritage Sites. This community is of African descent, with a rich cultural heritage. The members of this community have elected a Community Development Executive to oversee community development, particularly capacity building, which will enable them to play a greater part in the management of the Piton as well as to develop the physical and human resources within the community.

One of the projects that have been proposed for years by the past executives of the Community Development Committee is a Learning Resource Centre in the community. Such infrastructure has never been built in the community before. There is no project management plan to date, for the design and construction of the LRC. The presence of a plan will enable them to be able to seek additional grants and sponsorship so that the project can successfully come to fruition. Hence, this project management plan will serve as a guide for the execution and monitoring phases of the project to ensure that it is successfully completed within the constraints of quality, budget, scope and time.

The community places great importance upon the education of its children as a way out of poverty. During the covid 19 pandemic, education was greatly impacted and the students in Fond Gens Libre were not actively engaged due to the unavailability of a device or access to the internet. Building a LRC in the community of Fond Gens Libre provides the means of reinforcing student learning, especially for those with special needs, improves adult literacy in the community, and provides the space for physical training and continuing education for tour guides and others involved in the management of the Gros Piton nature trail. Therefore, the product of this FGP which is a project management plan, with all the subsidiary plans and including the validation of regenerative development, will help to maximize the use of the community's limited resources, while reducing the incidence of risks, for the completion of a project. It will ensure that the project adheres to the sustainable development goals, assuring the growth and success of the community for generations to come.

14. Work Breakdown Structure

1 FGP

- 1.1 FGP profile
  - 1.1.1 Introduction
  - 1.1.2 Theoretical framework
  - 1.1.3 Methodological framework
  - 1.1.4 Preliminary bibliographical research
  - 1.1.5 Annexes
    - 1.1.5.1 FGP schedule
    - 1.1.5.2 FGP WBS
    - 1.1.5.3 FGP Charter
  - 1.1.6 Graduation Seminar approval
- 1.2 Tutoring and FGP development
  - 1.2.1 Tutor
    - 1.2.1.1 Tutor Assignment
    - 1.2.1.2 Communication
  - 1.2.2 Project charter
  - 1.2.3 Scope management plan
    - 1.2.3.1 Collect requirements
    - 1.2.3.2 Define scope
    - 1.2.3.3 Create WBS
    - 1.2.3.4 Validate scope
    - 1.2.3.5 Control Scope
  - 1.2.4 Schedule management plan
    - 1.2.4.1 Plan schedule management
    - 1.2.4.2 Define activities
    - 1.2.4.3 Sequence activities
    - 1.2.4.4 Estimate activity duration
    - 1.2.4.5 Develop Schedule
    - 1.2.4.6 Control Schedule
  - 1.2.5 Cost management plan
    - 1.2.5.1 Plan cost management
    - 1.2.5.2 Estimate cost
    - 1.2.5.3 Determine budget
  - 1.2.6 Quality management plan

1.2.6.1 Plan Quality Management
1.2.7 Resource management plan
1.2.7.1 Plan resource management
1.2.7.2 Estimate activity resources
1.2.8 Communications management plan
1.2.8.1 Plan communications management
1.2.9 Risk management plan
1.2.9.1 Plan risk management
1.2.9.2 Identify risks
1.2.9.3 Perform qualitative risk analysis
1.2.9.4 Plan risk responses
1.2.10 Procurement management plan
1.2.10.1 Plan procurement management
1.2.11 Project stakeholder management plan
1.2.11.1 Identify stakeholders
1.2.11.2 Plan stakeholder engagement
1.2.11.3 Manage stakeholder engagement
1.2.11.4 Monitor Stakeholder engagement
1.2.12 Conclusions
1.2.13 Recommendations
1.2.14 Validation of regenerative and sustainable development
1.2.15 Reference Lists
1.2.16 Annexes
1.2.17 Tutor approval and Reading
1.3 Readers Review
1.3.1 Reviewers' assignment request
1.3.1.1 Assignment of two reviewers
1.3.1.2 Communication
1.3.1.3 FGP submission to reviewers
1.3.2 Reviewer's work
1.3.2.1 Reviewer 1
1.3.2.1.1 FGP Reading
1.3.2.1.2 Reader 1 report
1.3.2.2 Reviewer 2
1.3.2.2.1 FGP reading
1.3.2.2.2 Reader 2 report.
1.4 Adjustments
1.4.1 Report from reviewers
1.4.2 FGP update
1.4.3 Second review by reviewers
1.5 Board of examiners evaluation

1.5.1 Final review by board
1.5.2 FGP Grade

15. FGP budget

Expense	**Total Cost (XCD)**
Transportation fees to gather information	$100.00
Philologist fees for reading of FGP	$300
Printing and binding, Shipping FGP to Costa Rica	$400.00
Total cost	**$800.00 (US 300.00)**

16. FGP planning and development assumptions

The following are the assumptions for the development of the FGP

1. The information required for the completion of this project is available and easily accessible from the Ministry of Infrastructure, Ports Energy and Labour.
2. The community of Fond Gens Libre continues to show interest in the project and is willing to provide the information needed for the development of the project management plan.
3. The time given for the completion of the project is sufficient for successful completion.
4. Researcher time for the FGP will be at least 12 hours per week during the FGP development process.

17. FGP constraints

The following are the limiting factors which limit fulfillment of the FGP.

1. The project manager is not an engineer by profession. Hence, expert judgement has to be sought in order to achieve the project's quality and scope.
2. The maximum time frame to finalize the FGP is 7 weeks.
3. Since the researcher is engaged in full time employment, time may be a constraint in the completion of the project.
4. The advancement of the researcher depends on the feedback given by the tutor. If feedback is not prompt, then there would be constraints on time.

18. FGP development risks

The following are risks associated with the completion of the FGP.

1. Pandemic lockdowns (Covid 19 and monkey pox) may restrict movement, hinder visits to the community for meeting with stakeholders and gathering information.
2. In light of the current pandemics, in the event that the researcher falls sick, the schedule can be delayed.
3. The increase in fuel will increase the cost of transportation, thereby modifying the budget of the project.
4. A busy hurricane season has been predicted for the Eastern Caribbean. In the event of a hurricane or severe storm, internet connections may be affected which will result in interruptions to tutor-student interactions and a delay in the project schedule.

19. FGP main milestones

Milestones are related to deliverables on the second level (deliverables) and third level (control accounts) of the WBS of section 14 of this Charter. At the same time the deliverables are related to the specific objectives (in the case of the FGP please include the times for the tutorship reviews as well as for the readership).

Deliverable	**Finish estimated date**
1.**1 FGP profile**	28/08/2022
1.1.1 FGP Charter	24/ 07/2022
1.1.2 FGP WBS	31/07/2022
1.1.3 FGP Schedule	14/08 2022
1.1.4 Chapter 1. Introduction	21/08/2022
1.1.4 Chapter II. Theoretical framework	28/08/2022
1.1.4 Chapter III Methodological Framework	04/09/2022
1.1.5 Graduation Seminar Approval	11/09/2022
1.2 **FGP development**	
1.2.1 Project Charter and Scope Management plan	25/09/2022
1.2.2 Schedule management Plan	02/10/2022
1.2.3 Cost Management Plan	09/10/2022
1.2.4 Tutor feedback and corrections	16/10/2022
1.2.5 Quality Management Plan	17/10/2022
1.2.6 Resource Management Plan	23/10/2022
1.2.7 Communications Management Plan	30/10/2022
1.2.8 Risk Management Plan	6/11/2022
1.2.9 Procurement Management Plan	13/11/2022
1.2.10 Tutor feedback and corrections	20/11/2022
1.2.11 Stakeholder Management Plan	27/11/2022
1.2.12 Impact on regenerative development	27/11/2022
1.2.13 Tutor approval and reading.	05/12/2022

1.3 Readers review	08/01/2023
1.4 Adjustments	15/01/2023
1.5 Board of examiners evaluation	05/02/2023

20. Theroretical framework

20.1 State of the "matter"

The members of the Fond Gens Libre Community have organized themselves into a legal entity, the Fond Gens Libre Development Committee (FGLDC). This committee was created to serve as a community-based organization which will represent the members of the community and advocate the physical, economic and social needs of all residents.

The FGLDC has recently embarked upon the use of projects in order to create solutions to solve its challenges and to improve its tourism product on the global market. The project carried out so far included a project management plan, however, the plan was not complete as some of the subsidiary plans of the project management plan were not included. Also, the impact of the project on regenerative and sustainable development were not included. Poor project planning has been highlighted by Browning (2019), as a cause for project failure (Browning, 2019). The creation of a detailed project management plan for this new project will set the pace for future projects, ensuring that there is a balance among all the project plans so that the project can be of exceptional quality and be delivered within schedule and on budget, while considering the impacts on regenerative development. In a competitive tourism industry, the FGLDC, must take advantage of developing project plans e.g. Risk management plans which will ensure that enhances project performance and improves stakeholder satisfaction. The absence of any of the knowledge areas from a plan will pose significant risks to the success of the project (Kebede, 2021).

In order to reach its mission, the community needs to build capacity. Community capacity building starts with the current generation of children and youth. In order to achieve this, the solution of a learning resource center is proposed. The development of a project management plan will facilitate a successful project management process, for the construction of a learning resource center which will serve the educational needs of the community, providing access to innovative technology, learning resources and services to every resident.

20.2 Basic conceptual framework

Construction project management Project management plan Project life cycle Project management knowledge areas. Regenerative development

21. Methodological framework

Objective	Name of deliverable	Information sources	Research method	Tools	Restrictions
1. To develop a project charter which formally authorize the existence of the project, thereby giving the project manager authority to organizational resources to project activities.	Project charter.	Secondary: Journal articles Textbooks Lecture presentation notes PMBOK guide 6th and 7th edition. Primary: Interviews, meetings, FGLDC constitution	Analytical Qualitative	Interviews, focus groups, charter template	Time for getting the information required for the project charter is limited.
2 To elaborate a scope management plan which encompasses only the work required to complete the project successfully.	Scope management plan	Secondary PMBOK Guide Journal articles Practice Standard for WBS 3rd edition Primary:	Analytical and qualitative	Meetings, interviews, observation, scope management plan template, Work breakdown structure template	Resources are limited to prepare the scope management plan. The researcher has to work with

		Interviews Meetings, Building codes of St. Lucia		Work breakdown structure dictionary template, Microsoft excel.	the given schedule of the experts to obtain interviews for gathering information.
3. To create a schedule management plan, which provides the documentation needed for the effective development, monitoring and controlling of the project schedule so that it is completed on time.	Schedule management plan	Secondary: Practice Standards for Scheduling 3rd edition. Construction Extension to the PMBOK guide edition, PMI (2016). PMBOK Guide 6th edition (2017) PMBOK Guide 7th edition (2021). Journal Articles from the PMI Primary: Meetings Interviews, email, constitution	Analytical and qualitative	Meetings, tools for data analysis: Microsoft excel, Microsoft project Schedule management plan template.	Interviews from experts will be done after work hours which can result in time constraints.

		of the FGLDC.			
4. To create cost management plan in which the cost of the project is planned, estimated, budgeted, financed and funded, within the approved budget	Cost management Plan	Secondary: PMBOK Guide 6th edition (2017) PMBOK Guide 7th edition (2021). Articles from the PMI Textbooks Primary: Interviews, email, constitution of the FGLDC, minutes of meetings. Project charter Lessons learned from similar projects.	Analytical and qualitative	Meetings, interviews, cost management plan template, bottom-up estimating.	The researcher has to gather information after work hours and this may pose schedule constraints for the FGP.
5. To create a quality management plan to ensure that the project complies with quality standards and the quality requirements and/or	Quality management plan	Secondary: Construction Extension to the PMBOK guide PMI (2016) PMBOK Guide 6th edition PMBOK	Analytical and qualitative	Meetings, tools for data analysis: Microsoft excel, interviews, check list.	A lack of historical information on similar projects.

standards for the project and its deliverables are correctly identified.		Guide 7th edition Minimum Building Standards and environmental Guidelines for housing, (OAS, May 2003) Practice standard for scheduling 3rd edition, PMI (2019). Journal articles from the PMI Primary: Interviews, email, constitution of the FGLDC, minutes of meetings.			
6. To outline a project resource management plan which defines how to estimate, acquire, manage, and utilize physical and team	Resource management plan	Secondary: Construction Extension to the PMBOK guide, PMI (2016) PMBOK Guide 6th edition PMBOK	Analytical	Meetings, tools for data analysis, Hierarchical charts, Parametric estimating.	The researcher may not have access to the interviewees at any time of the 8-4 workday and may

resources to be used in the project.		Guide 7th edition Primary: Interviews, email, constitution of the FGLDC, minutes of executive meetings of the FGLDC.			have to schedule for weekends which may not always be convenient for interviewees.
7. To formulate a communications management plan to ensure the effective exchange of information so that the information needs of the project and all stakeholders are adequately met.	Communications management plan	Secondary: Articles from the PMI on communications management, Construction Extension to the PMBOK guide (2016) edition PMBOK Guide 6th edition PMBOK Guide 7th edition Primary: Interviews, email, constitution of the FGLDC, project	Qualitative Analytical	Meetings, interviews, Microsoft excel.	Face-to-face meetings with the experts may be limited due to the distance of travel and hence some of the interviews have to be conducted online.

		charter,			
8. To conduct risk management plan, identification, analysis, response planning, response implementation, and monitoring risk on a project	Risk management plan	Secondary: Articles from the PMI on risk management, Construction Extension to the PMBOK guide, PMI (2016) PMBOK Guide 6th edition and PMBOK Guide 7th edition Minimum Building Standards and environmental Guidelines for housing, (OAS, May 2003) Practice standard for scheduling 3rd edition, PMI (2019). Primary: Interviews, email, constitution of the FGLDC, lessons	Analytical and Qualitative	Meetings, interviews, Microsoft excel, checklist, PxI template, Risk register template	Lack of historical data from the organization which can be referred to for risk identification.

		learned register from similar projects Project charter			
9. To develop a procurement management plan which identifies the processes necessary to purchase or acquire products, services, or results needed from outside the project team.	Procurement management plan	Secondary: Journal articles PMBOK Guides 6th and 7th editions. Primary: Interviews, email, constitution of the FGLDC, Lessons learned register from similar projects.	Analytical and Qualitative	Microsoft excel, checklist, questionnaire, interviews.	Lack of historical data from the organization as this is the first project of its type done by the organization.
10. To formulate a stakeholder management plan which identifies the people, groups, or organizations that could impact or be impacted by the project, analyzes	Stakeholder management plan	Secondary: Articles from the PMI on stakeholder management Construction Extension to the PMBOK guide PMI (2016) PMBOK	Analytical and Qualitative	Microsoft excel, checklist, questionnaire, interviews, expert judgement, templates of matrices for power mapping.	Time constraints may result as the researcher has to work after work hours to collect information.

stakeholder expectations and their impact on the project, and develops appropriate management strategies for effectively engaging stakeholders in project decisions and execution		Guide 6th edition and PMBOK Guide 7th edition Minimum Building Standards and environmental Guidelines for housing, (OAS, May 2003) Practice standard for scheduling 3rd edition PMI (2019). The Standard for Earned Value Management, PMI (2019) Primary: Interviews, email, constitution of the FGLDC, Lessons learned register from similar projects.			
11. To conduct an assessment of the impact	Assessment of the impact of	Secondary: Journal articles	Analytical and Qualitative	SMP template, Microsoft excel, observation,	Time constraints may result

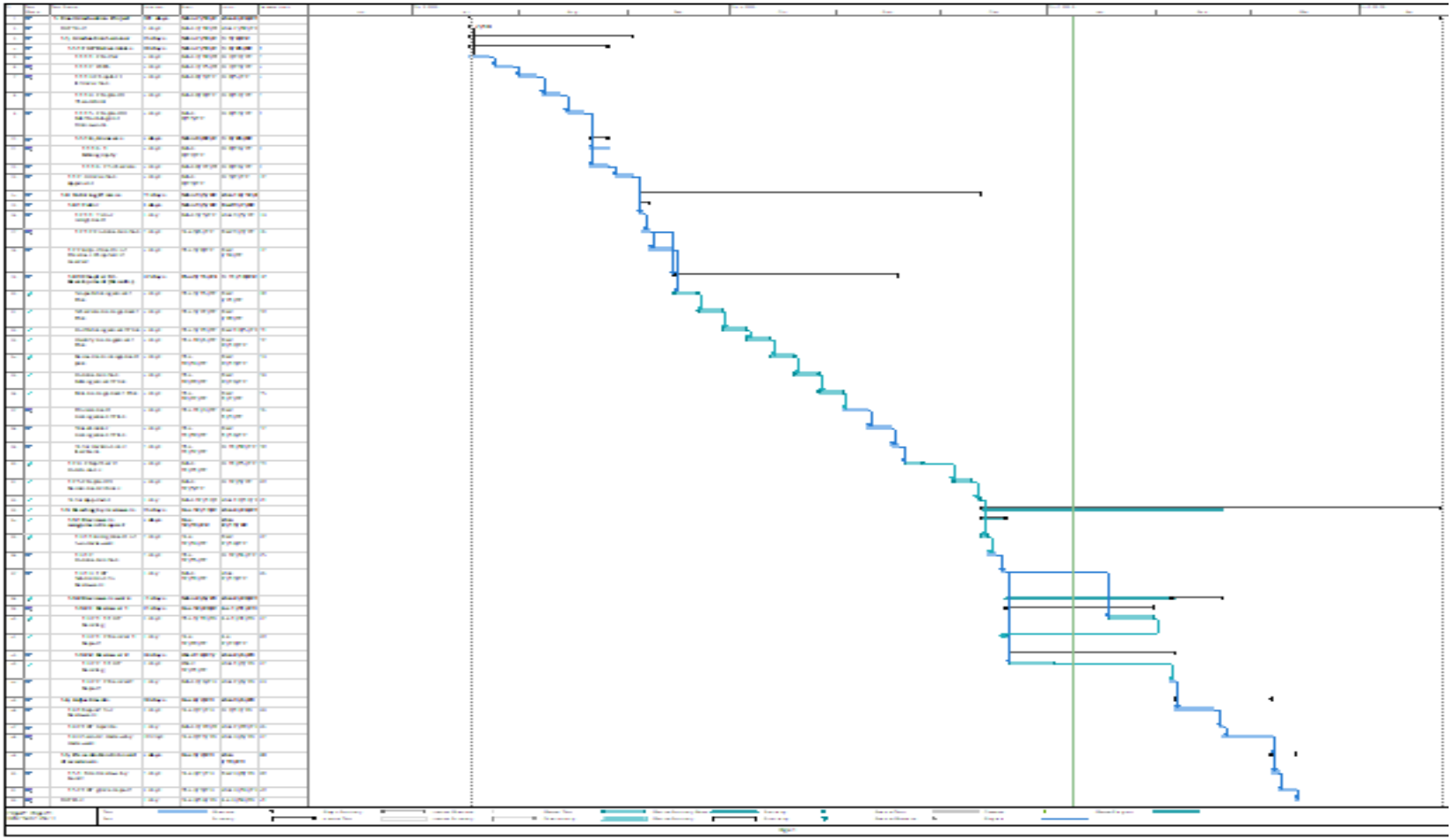
of the project on sustainable and regenerative development.	the project on sustainable and regenerative development.	Construction extension to PMBOK Guide Web research Primary: Interviews, email, constitution of the FGLDC, Observation.		survey, interviews.	due to limited time to work on the SMP.

2. Validation of the work in the field of regenerative and sustainable development.

The success of the construction of an LRC in the community of Fond Gens Libre St. Lucia, depends on its sustainability and regenerative nature. The project requires the entire community to be participative, with an appreciation for the need for regenerative development.
This FGP not merely caters for a reduction in the harm to the environment, but an enhancement of the ecological health of the forest area. It ensures that social equity abounds throughout the project life cycle and also during the use of the end product. The economic benefits to be derived are not just temporal, through employment during the project but also long term as the community develops and educates its people, a key to exiting poverty. The cultural and spiritual regeneration is brought about by continuous display and education of the people on history and culture.
Some of the potential indicators are as follows:
Transport: in the procurement of materials, bulk purchasing arrangements will be made in order to reduce the emission of carbon dioxide into the air from the burning of fossil fuels. This is measured by the percentage of building materials purchased in bulk.
Human rights: In the employment of persons, there will be no discrimination in sex or gender and employees will be awarded fairly for their work. This is measured by the difference in wages of men and women who do the same work.

Appendix 2: FGP WBS

Appendix 3: FGP Schedule



Appendix 4: Preliminary bibliographical research

Belete, S., Duke, C., Hinzen, H. et al. (2022). Community learning centers (CLCs) for adult learning and education (ALE): development in and by communities. *International Review of Education*, 68, 259-290. https://doi.org/10.1007/s11159-022-09954-w

This article emphasizes the need for lifelong learning and makes recommendations towards creating conditions for a creative an effective Community Learning Centre. Of these recommendations is the importance to strike a balance between community needs and interests and national policies and priorities, while allowing the communities' needs and interests to be the main driver of the types of services to be delivered at the community learning centers. The Construction of a Learning resource centre at Fond Gens Libre provides the opportunity and infrastructure necessary for continuous learning for persons of all ages.

Bella B, O., Koome, P., Kamuru, S, (2021). Effects of instructional materials used at the community Learning Resource Centres on adult learners participation in community development Activities in Nyamira North Sub-county Kenya. *International Journal of Education and Literacy Studies*, 9(1) 15-24. http://journals.aiac.org.au/index.php/IJELS/article/view/6471

Community learning resource centers were founded in order to offer an education to those who have missed out on either primary or secondary education. The center provides a means of providing adult literacy. In the community of Fond Gens Libre, adult literacy is of paramount importance and such a center will provide not only physical space, but also the resources required for adult literacy.

Daniel, J. (2020). Education and the covid 19 pandemic. *Prospects,* 49: 91-96.

This article describes the impact of Covid 19 on the teaching and learning process. It provides a synopsis of the challenges faced by students of all levels, in terms of their

ability to complete the curricula. It suggests the use of asynchronous learning to combat the problem. Herin lies the need for a resource centre in the community of Fond Gens Libre. The students need the support of a LRC in order to be able to effectively engage in both synchronous learning and asynchronous learning as many of them are without internet or a device.

Ekanem, J. E. (2015). Problems and prospects of educational resources centres in Nigeria. *Journal of Education and Practice*, 6(30), 66-70.

This article justifies the need for learning resources centres in Nigeria to encourage self-instruction, either supervised or entirely independent. It reiterates the view that a learning resource centre allows the access to educational resource materials for the needs of the community by acquiring, storage and provision of easy retrieval of these resources. A learning resources centre at Fond Gens Libre, will provide the access to educational resource materials, for use in self-instruction or guided instruction.

Engzel P., Frey A., Verhagen, M. D. (2020). Learning loss due to school closures during the covid 19 pandemic. PNAS 118 (17). https://doi.org/10.1073/pnas.2022376118

This article describes the impact of covid on the teaching and learning process. Teachers were faced with a difficult time in providing instruction as well as assessing students and providing feedback to parents and students. The students who live in Fond Gens Libre have faced a similar problem. A learning resource centre in the community provides the support which students require and will be a point of student learning and engagement during future periods of lockdowns.

Le, A.T.P. (2018). The contributions of community learning centres (CLCs) to personal and community development in Myanmar. *Int Rev Educ* 64, 607–631 https://doi.org/10.1007/s11159-018-9721-2

This article provides a viewpoint of how learning resource centers are developed in and by various communities in both Asia and Africa. In some of these communities, there is a high level of community involvement where it is set up and managed by the local people in order to provide various learning opportunities for community development and improvement of the quality of life. Similarly, the project of the construction of a learning resource centre in the community of Fond Gens Libre, will require community involvement and will ultimately improve the quality of life of its people.

Pradipta, R. F. et al. (2020). The role of the resource centre in the implementation of Inclusive education in Basic, Medium and higher education institutions: A grounded theory approach. Advances in Social Science, *Education and Humanities Research*, 508, 490-496.

This article describes the presence of a learning resource center as an institution which plays a vital role in providing inclusive education in the community. The resource centre is described as an institution which provides a sound support system in providing services for children with special needs, teachers, parents and the community in the implementation of inclusive education. This article emphasizes the need for resource centres to provide the support and assistance needed especially for children with mild, moderate and severe disabilities. The article aptly describes the functions and roles of the resource centres which include: to take initiative and actively carry out special needs education / inclusive education, as a center for information and innovation in the field of special education / inclusive education, to provide support to schools (regular schools and special schools) in the implementation of inclusive education, to become a consultant for all parties who need information, services, guidance, and special handling and to provide support for various parties to improve services to children / students, including those with special needs. This article helps to validate the need of such a project in the community.

Singh, S., & Kataria, S. (2018). Learning resource centre at Jaypee University: An overview of best practices. *Journal of Knowledge & Communication Management*, 8 (1), 13-19.

This article discusses the best practices which are used in developing the learning resource centre and highlights the which one can surmount the challenges posed by the modern digital era. This article would assist in the resources that are necessary for this project in the resource management plan as well as provide a benchmark for the quality management of the project.

Somerton, M., Helmer, J., Kasa, R. et al. (2021). Defining spaces: resource centres, collaboration, and inclusion in Kazakhstan. *J Educ Change*, 22, 315–334 https://doi.org/10.1007/s10833-020-09384-1

The results of this paper show how resource centres contribute to developing inclusive practices within the education system. The findings of the article show how the key stakeholders are implied in the immediate need for a common vision in terms of education. Likewise, in order for the construction of the learning resource centre in Fond Gens Libre to be successful, the stakeholders must have a common vision for this project. This article helps in the stakeholder management plan in establishing the roles of the stakeholders.

Wannapiroon, P. et al. (2021). The virtual Learning resource centre for the digital manpower. *International Education Studies*; 14(9), 28-43.

One of the aims of his article is to develop the guidelines for developing a virtual learning resource center for the digital manpower for public and private sectors. This is very similar to the project of constructing an LRC in the community. It provides the steps needed for the successful design and development of the LRC. This article can be used in this project to provide a guide to what the scope of the project should be.

Appendix 5.
Philological Dictum

CHOISEUL SECONDARY SCHOOL
LA FARGUE, CHOISEUL
ST. LUCIA
Email: augutav@hotmail.com
TEL: 1758-459-3396/1758-4593250/1758-7276558

25th November 2022

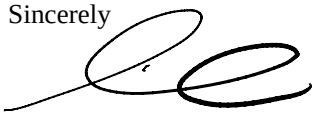
Academic Advisor
Masters Degree in Project Management
University for International Cooperation (UCI)
San Jose
Costa Rica

Dear Academic Advisor

I, Augusta Charleen Charlery, testify that the writing, spelling, and grammar used in the Final Graduation Project **–*The Development of a Project Management Plan for the Construction of a Learning Resource Centre in the Community of Fond Gens Libre, St. Lucia,* –** by Sherlan Ávril Williams Alexander is correct.

I have over 20 years of experience as an educator in English Language. This I think qualifies me to make the above assessment. Additionally, I hold a Masters degree in Educational Management from the University of Sheffield in England (2008) and an Associate degree in teacher education (Sir Arthur Lewis Community College St. Lucia (1999).

Sincerely



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AUGUSTA CHARLEEN CHARLERY