UNIVERSIDAD PARA LA COOPERACIÓN INTERNACIONAL
(UCI)

PROJECT MANAGEMENT PLAN FOR THE EFFICIENT IMPLEMENTATION OF THE COVERED STRUCTURE AND CAPACITY ENHANCEMENT PROJECT IN BELIZE

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DEDICATION

This work is dedicated to God the Almighty, and my family.

To my wife, whose love, patience, and unwavering support have been my constant source of strength and motivation. To my mom, brother, sisters and nephews whose support has made this journey possible. Thank you for standing by my side, for your endless encouragement, and for sharing this dream with me. Your faith has fueled my determination and inspired me to pursue my goals with confidence.

ACKNOWLEDGMENT

First, I want to thank God the Almighty for giving me the knowledge and wisdom to undertake this program of studies under his divine grace and guidance. I also take this opportunity to thank my wife, daughter, mother, brother and sisters for their overwhelming support and patience during this endeavor. Lastly but certainly not least, to my tutor Mrs. Sophia Crawford Mora, for her unwavering support and guidance during this educational achievement.

ABSTRACT

The objective of this research is to develop a Project Management Plan to execute the Covered Structure and Capacity Enhancement Project (Covered Structure Project) in Belize effectively and efficiently.

The development of this plan aims to assist the Ministry of Agriculture Food Security and Enterprise (MAFSE) in Belize in achieving higher project success. The MAFSE has traditionally been using the waterfall approach to implement projects, but such an approach has resulted in the failure of many projects. The use of a correctly written Project Management Plan is very important in today's world since project management processes and procedures are more complex and dynamic.

Upon completion, this research will produce a Project Management Plan for the successful and efficient implementation of the Covered Structure and Capacity Enhancement Project in Belize, consisting of a project charter, scope, schedule, cost, quality, resource, communication, risks, procurement, stakeholders, and the validation the of project in a sustainable and regenerative perspective. This is carried out with the use of quantitative, qualitative, mixed research methods and tools such as meetings, data analysis and expert judgement.

It is therefore anticipated that the development of a Project Management Plan for the Covered Structure Project in Belize will greatly improve the management and control of project works and resources throughout the project's life cycle in an effective and efficient manner.

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ABBREVIATIONS AND ACRONYMS

ARID	Agriculture Research Innovation and Development
BAIMS	Belize Agriculture Information Management System
BZD	Belize Dollars
CDF	CARICOM Development Fund
FGP	Final Graduation Project
GOB	Government of Belize
KPI	Key Performance Indicator
MAFSE	Ministry of Agriculture, Food Security and Enterprise
M-BAR	Managing Belizean Agriculture Resilience
PMBOK	Project Management Body of Knowledge
PEU	Project Execution Unit
PMI	Project Management Institute
RBS	Risk Breakdown Structure
WBS	Work Breakdown Structure

EXECUTIVE SUMMARY

Today's business landscape is marked by continuous change and persistent innovation, giving project managers the ability to plan, execute, and monitor projects with greater precision.

Project management provides the framework and necessary tools to turn ambitious visions into tangible realities. It empowers business organizations to adapt, respond, and thrive amidst challenges and opportunities. In Belize, the Ministry of Agriculture, Food Security and Enterprise (MAFSE) has been managing projects for many years utilizing antique project management methodologies. Such methods have resulted in the failure of many projects when compared to scope, time, and cost. This research presents the development of a Project Management Plan to implement the Covered Structure and Capacity Enhancement Project (Covered Structure Project) in Belize in an effective and efficient manner. Given a correctly written Project Management Plan, it is expected that the Covered Structure Project will be implemented effectively, efficiently, sustainably, and in a regenerative manner. The general objective of the Project Management Plan is to implement the Covered Structure Project in Belize successfully and efficiently.

The specific objectives are: to create a project charter to properly define key input elements for the development of the project management plan, to develop a Scope Management Plan to ensure the project includes all the work required to complete the project successfully and only the work required by the project, to develop a Schedule Management Plan that will define execution methodologies for the timely completion of the project, to create a Cost Management Plan that will define budget management for the successful completion of the project within budget, to develop a Quality Management Plan for managing and controlling quality within the project, to develop a Resource Management Plan to ensure timely availability of required resources for the successful completion of the project, to design a Communication Management Plan to ensure all stakeholders, including the project team, are properly and timely informed on project progress, to develop a Risk Management Plan to identify potential risks and identify risk owners to mitigate negative risks and capitalize on positive risks to increase chances of project success, to create a Procurement Management Plan to carry out fair and ethical procurement of goods, services, or results for the successful completion of the project, to design a Stakeholders Management Plan for the identification and management of stakeholders who directly or indirectly impact the successful completion of the project, to validate the project from a regenerative and sustainable perspective to assess the impact of the project and its deliverables in regenerative and sustainable development.

The methodology for this research involves the use of the PMBOK Guide, 6th Edition, 2017, PMBOK Guide, 7th Edition, 2021, project documents of past similar projects, journals and historical data and information to develop the elements of the Project Management Plan. The use of mixed, quantitative and qualitative methods for research allowed gathered data to be

viewed from a statistical and comprehensive perspective. The tools used in the research were meetings, templates, expert judgement, data analysis and gathering.

In Belize, the Ministry of Agriculture, Food Security and Enterprise operates as a public entity tasked with providing its people with nutritious food and economic stability for all agriculture producers. The MAFSE has been implementing projects for the past years using antique project management approaches with very limited knowledge in project management practices and procedures. The use of the antique methodologies has caused the failure of many projects due to poor planning, limited project implementation and management, coupled with scope creep and costly overruns.

In conclusion, MAFSE should consider effective and efficient project management methods during the planning and implementation of projects. The methods and practices include scope planning, stakeholders' identification and utilization, cost management, quality management and the integration of the project management processes.

It is therefore strongly recommended that MAFSE integrate these methods and practices at the earliest to guide and improve the overall project success rating on all ongoing projects under the umbrella of the Ministry. The correct use of these new recommended practices and methods will further assist in delivering on the objectives of the Ministry of Agriculture Food Security and Enterprise which include food security, nutrition and economic stability of agriculture producers and people.

1 INTRODUCTION

The main objective of the development of this Project Management Plan for the Covered Structure and Capacity Enhancement Project in Belize is to apply and integrate what was learnt and studied during the Master's Degree Program at the University for International Cooperation (UCI) and incorporate the practical application of concepts and processes of Project Management, Regenerative and Sustainable development. This plan includes concepts and templates that serve as a guide for the implementation of future projects in Belize. The PMBOK® Guide 6th Edition, 2017 and PMBOK® Guide 7th Edition, 2021 are the principal literature sources used for the development of this Project Management Plan. This is strengthened with the use of bibliographical research documents and similar historical project documents.

1.1. Background

The Ministry of Agriculture, Food Security and Enterprise (MAFSE) in Belize is a public institution whose mission is to ensure food security for its people while at the same time providing an enabling environment for business opportunities in a sustainable and competitive setting. The mission has proven effective with the establishment of the Project Execution Unit (PEU) in the MAFSE which undertakes the operation, management and successful implementation of projects, ensuring results are delivered to the project beneficiaries. Presently, the MAFSE is executing a total of eight (8) projects, thus requiring high degrees of expectations to stakeholders and beneficiaries, including International Funding Institutions and local government. Currently, a setback within the PEU is its

understaffed circumstances with only the Project Coordinator and Procurement Officer working on a full-time basis. Given the present conditions, all Project Coordinators have additional duties apart from those responsibilities that the projects require. The situation has triggered issues with the implementation of projects and its successful delivery to project beneficiaries. The elaboration of a Project Management Plan for the effective and efficient implementation of the Covered Structure and Capacity Enhancement Project will cover the 10 knowledge areas as recommended by the Project Management Institute as well as the alignment with the project sustainable and regenerative development goals. With a correctly written Project Management Plan, adhering to all procedures and processes the Ministry of Agriculture Food Security and Enterprise can improve the successful delivery of projects.

1.2. Statement of the Problem

The Ministry of Agriculture Food Security and Enterprise in Belize has been managing projects for many years using antique methods that are less efficient in the present project management environment. In Belize, collaborations are made with local, regional, and international funding institutions on projects to fulfill underlying needs within the agriculture sector. Presently, the projects are written using Waterfall Methodology and Project Managers are assigned to fulfill the requirements of such projects. A pre-established project document is then handed to the assigned Project Manager to execute and deliver the project deliverables as expected. This method of operation has caused significant delays with the project delivery schedule and has proven inefficient and ineffective. The Ministry will continue to face several challenges executing projects using those antique methods and procedures and if no changes

are made then more projects will fail in the future. In addition to the methodology used, MAFSE is also implementing projects without a properly written Project Management Plan, and this has resulted in a 50% success rate in project execution when rated against the triple constraint of time, cost, and scope. Therefore, to improve MAFSE project execution successes one effective approach is the use of a correctly written Project Management Plan. This research aims to answer the question of: 'Can the components of a Project Management Plan contribute to the successful implementation of the Covered Structure and Capacity Enhancement Project in Belize?' The question is expected to be answered after solving the hypothesis question of: Is it possible to improve project execution efficiency of the Covered Structure and Capacity Enhancement Project in Belize with the use of a Project Management Plan? It is strongly believed that a properly written Project Management Plan can improve the implementation of the Covered Structure Project in Belize.

1.3. Purpose

The main purpose of this research is to solve the hypothesis question of: Is it possible to improve project execution efficiency of the Covered Structure and Capacity Enhancement Project in Belize by using a Project Management Plan? Through this project, the research will focus on the creation of a Project Management Plan for the Covered Structure and Capacity Enhancement Project (Covered Structure Project) that is being implemented by the Ministry of Agriculture Food Security and Enterprise in Belize. Presently, there are no projects under the management of the Ministry that are being implemented using a Project Management Plan, therefore one will be developed to ascertain whether the project can be

implemented and be successful while being effective and efficient during its implementation. The key benefit of developing this management plan is the production of a comprehensive document that defines the basis of all project work and guides the project work performance. This integrated document will guide the Project Manager and project team on project requirements, timing, and budgetary considerations under each activity during project implementation. This comprehensive document will keep the Project Manager on track of all project activities and requirements. The results of this research will be passed to the Project Execution Unit for historical and documentation purposes to be used as guidance on future projects implemented by the Ministry of Agriculture, Food Security and Enterprises. This project will impact the lives of vegetable producers in Belize since it will increase their knowledge and enhance their ability to produce and generate income. The project is targeting disadvantaged women and youths who would have otherwise been marginally secluded and unemployed. The success of this project is empirical, and the utilization of a Project Management Plan will guide the successful implementation and delivery of the end results to all project beneficiaries.

1.4. General Objective

To develop a Project Management Plan to implement the Covered Structure and Capacity Enhancement Project in Belize successfully and efficiently.

1.5. Specific Objectives

1. To create a project charter that will formally authorize the development of the Project Management Plan and allow possible change controls that may be required.

2. To develop a Scope Management Plan to ensure the project includes all the work required to complete the project successfully and only the work required by the project.

3. To develop a Schedule Management Plan that will define execution methodologies for the timely completion of the project.

4. To create a Cost Management Plan that will define budget management for the successful completion of the project within budget.

5. To develop a Quality Management Plan for managing and controlling quality within the project.

6. To develop a Resource Management Plan to ensure timely availability of required resources for the successful completion of the project.

7. To design a Communication Management Plan to ensure all stakeholders, including the project team, are properly and timely informed on project progress.

8. To develop a Risk Management Plan to identify potential risks and identify risk owners to mitigate negative risks and capitalize on positive risks to increase chances of project success.

9. To create a Procurement Management Plan to carry out fair and ethical procurement of goods, services, or results for the successful completion of the project.

10. To design a Stakeholders Management Plan for the identification and management of stakeholders who directly or indirectly impact the successful completion of the project.

11. To validate the project from a regenerative and sustainable perspective to assess the impact of the project and its deliverables in regenerative and sustainable development.

2 THEORETICAL FRAMEWORK

In this chapter the theoretical elements for the development of a Project Management Plan for the Covered Structure and Capacity Enhancement Project are presented. These theoretical elements serve as a guide to understanding the research objectives and detailing the tools and processes necessary to implement and utilize a Project Management Plan for the successful implementation of a project in Belize.

2.1 Company/Enterprise Framework

2.1.1 Company/Enterprise Background

The Ministry of Agriculture, Food Security and Enterprise is a public entity whose goal is to provide an environment that is conducive to increasing production and productivity, promote investment, and encourage private sector involvement in agribusiness enterprises to ensure competitiveness, quality production, trade, and sustainability (Ministry of Agriculture, 2024).

2.1.2 Mission and Vision Statement

Mission

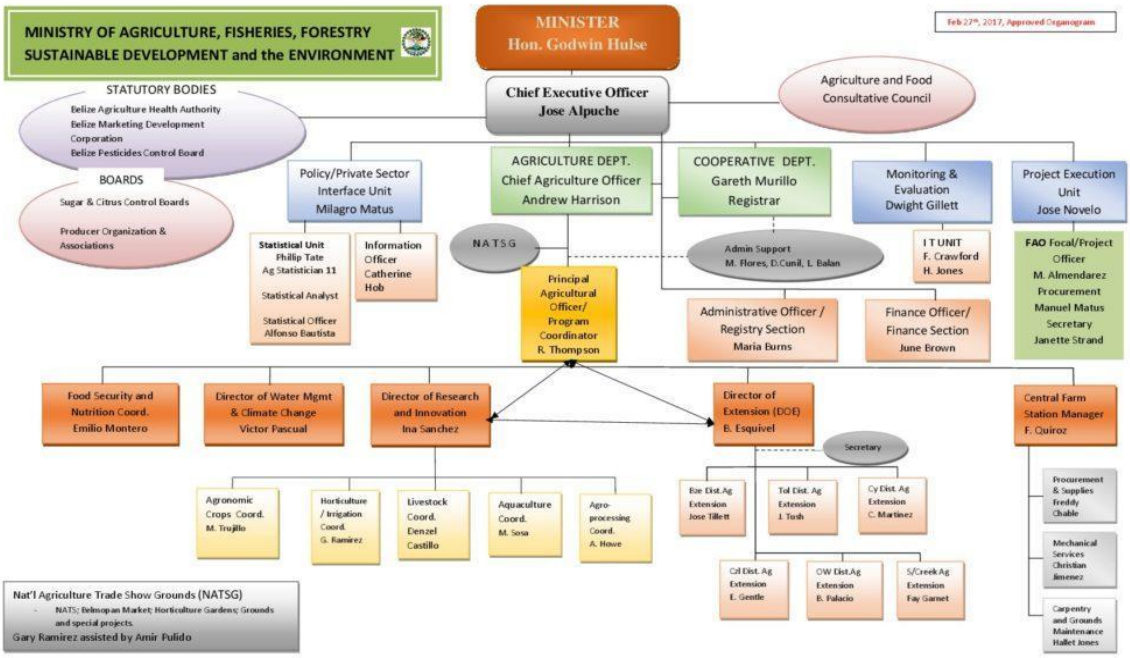
To grow and continue as a key economic pillar, ensuring food and nutrition security, diversifying business opportunities, reducing poverty, and enhancing human resources capacity in a sustainable and competitive environment (Ministry of Agriculture, 2024).

Vision

An agriculture and Food Sector that is innovative, competitive, diversified, and sustainable (Ministry of Agriculture, 2024).

2.1.3 Organizational Structure

Figure 1 Organizational Structure



Note. This Organizational Structure was extracted from the Ministry of Agriculture, Food Security and Enterprise web page: www.agriculture.gov.bz with permission (Source: Ministry of Agriculture, 2024)

Explanation of Units in Figure 1:

The Ministry of Agriculture Food Security and Enterprises in Belize is composed of five units namely: Policy and Statistics Unit, Agriculture Department, Cooperative Department, Monitoring and Evaluation Unit, and the Project Execution Unit. The Policy and Statistics Unit is responsible for creating and managing policy direction within the Ministry and other relevant stakeholders. The Agriculture Department's function is based on research, innovation, development, extension services and importation of agricultural commodities. The Cooperative Department oversees the development and management of cooperatives in

the country. The Monitoring and Evaluation unit works directly under the Project Execution Unit, and both are responsible for efficient project implementation and management.

2.1.4 Products Offered

The Ministry of Agriculture Food Security and Enterprise offers multiple products and services to its stakeholders which include industry partners in development, learning institutions, farmers, and international organizations working along the agricultural domain. These products and services include but are not limited to:

a) Community outreach and support

   The Ministry of Agriculture Food Security and Enterprises main contribution to community outreach is the instatement of free food feeding programs in primary schools with the support of International Funding Institutions. The collaboration objective is aimed at ensuring that the farm to table slogan is working and is beneficial to the less fortunate.

b) Capacity building of farmers, students, and lecturers

   The Ministry of Agriculture Food Security and Enterprise is a public entity that is responsible for transferring innovative agricultural technology to the Belizean populace. The primary means of information dissemination is through capacity building. The main clients of the Ministry of Agriculture, Food Security and Enterprise are farmers, students, and lecturers with the goal of preparing individuals for the continuously changing agricultural environment.

c) Extension services

The Ministry of Agriculture Food Security and Enterprises operates with six district stations countrywide which are fully equipped with qualified Technical Extension Officers who are responsible for the dissemination of information and training for stakeholders in the most recent agricultural developments. The main function of the extension service is to increase farmers' efficiency so farmers can reap the highest benefits from their agricultural enterprises.

d) Belize Agriculture and Marketing Information Systems (BAIMS)

The Belize Agriculture Information Management System (BAIMS) is a web-based application that serves as a central repository for all agriculture data utilized by the Ministry of Agriculture Food Security and Enterprises. Farmers and policy makers use this stored data to analyze agriculture statistics for timely and effective decision making.

e) Agricultural Research, Innovation and Development

The Research, Innovation and Development Unit's goal is to promote sustainable practices in horticulture crop production while addressing the research needs of the agricultural sector through Research and Development networking. The Central Farm Research, Innovation and Development Center is a centralized station in the Cayo District comprising five main sections: Administration, Livestock, Crops, Agro-processing, and Agriculture Engineering. These five units are responsible for executing research that promotes agricultural sustainability.

f) Importation and Exportation License

Agricultural commodities produced by local farmers are commercialized on the local market thus providing income and a means of livelihood to those involved. This local production is protected by the quantity and frequency of imported commodities into the local economy. These licenses are only issued if there is an underproduction or loss of a local commodity.

g) Project Execution and Management

The Project Execution and Management Unit is responsible for managing projects that are under the umbrella of the Ministry of Agriculture, Food Security and Enterprises. The success of these projects is highly dependent on the productivity and effectiveness of this unit.

The products and services offered reflect the vision and mission of the Ministry of Agriculture Food Security and Enterprises which speak about food security and the integration of sustainable agricultural practices in Belize.

2.2 Project Management Concepts

2.2.1 Project Management Principles

Project

The PMBOK Body of Knowledge 7th Edition (2021) defines a project as a temporary endeavor which is conducted to achieve a unique product, service, or result.

Process Groups

Project Management Process Groups are sequentially grouped Project Management Processes that guide the execution of a project from start to finish. The five (5) groupings as outlined by the PMBOK Body of Knowledge 7th Edition (2021) are as follows:

- Initiating Process Group
- Planning Process Group
- Executing Process Group
- Monitoring and Controlling Process Group
- Closing Process Group

2.2.2 Project Management Domains

The PMBOK Body of Knowledge 7th Edition (2021) indicates that project performance domains are, "a group of related activities that are critical for the effective delivery of project outcomes. Collectively, the performance domains represent a project management system of interactive, interrelated, and interdependent management capabilities that work in unison to achieve desired project outcomes." This indicates that the project performance domains are important for the successful implementation of a project. Please see the eight performance domains below:

1. Stakeholders

   According to PMBOK Body of Knowledge 7th Edition (2021), the stakeholders performance domain addresses activities and functions associated with stakeholders. It

also states that a stakeholder is, “an individual, group, or organization that may affect, be affected by, or perceive itself to be affected by a decision, activity, or outcome of a project, program, or portfolio.”

2. Team

According to PMBOK Body of Knowledge 7th Edition (2021), the Team Performance Domain addresses activities and functions associated with the people who are responsible for producing project deliverables that realize business outcomes. It further states that the performance domain establishes the culture and environment that enables a collection of diverse individuals to evolve into a high-performing project team.

3. Development, Approach and Lifecycle

“The Development Approach and Life Cycle Performance Domain addresses activities and functions associated with the development approach, cadence, and life cycle phases of the project” (PMI, 2021). This performance domain also establishes the development approach, delivery cadence, and project life cycle needed to optimize project outcomes.

4. Planning

According to PMBOK Body of Knowledge 7th Edition (2021), “the Planning Performance Domain addresses activities and functions associated with the initial, ongoing, and evolving organization and coordination necessary for delivering project

deliverables and outcomes." The main purpose of planning is to develop a road map to create the project deliverables.

5. Project Work

   According to PMBOK Body of Knowledge 7th Edition (2021), "the Project Work Performance Domain addresses activities and functions associated with establishing project processes, managing physical resources, and fostering a learning environment." Project work establishes the processes and performing the work to enable the project team to deliver the expected deliverables and outcomes.

6. Delivery

   "The Delivery Performance Domain addresses activities and functions associated with delivering the scope and quality that the project was undertaken to achieve. Projects support strategy execution and the advancement of business objectives" (PMI, 2021). Project delivery primarily focuses on meeting requirements, scope, and quality expectations to produce the expected deliverables that will drive the intended outcomes.

7. Measurement

   According to PMBOK Body of Knowledge 7th Edition (2021), "The Measurement Performance Domain addresses activities and functions associated with assessing project performance and taking appropriate actions to maintain acceptable performance. Measurement involves assessing project performance and implementing appropriate responses to maintain optimal performance.

8. Uncertainty

   According to PMBOK Body of Knowledge 7th Edition (2021), “the Uncertainty Performance Domain addresses activities and functions associated with risk and uncertainty. Projects exist in environments with varying degrees of uncertainty. Uncertainty presents threats and opportunities that project teams explore, assess, and decide how to handle.”

2.2.3 Predictive, Adaptative and Hybrid Projects

Predictive

In Predictive Project Management (Traditional), the details of project and requirements are clearly defined during the planning stage of the project and are usually followed throughout the life of the project unless requested and approved changes are made to the project scope and baseline. This type of management requires detailed planning to avoid scope creep during project implementation. The Covered Structure and Capacity Enhancement Project corresponds in this group of projects.

Adaptive

Adaptive Project Management, also known as Agile Project Management, is used for projects of high complexities that require varying degrees of iterations during project execution. Each iteration is timeboxed with consistent durations that aims to deliver products or services that are of high value to customers.

Hybrid

Hybrid Project Management is a combination of two or more project management methodologies and is usually used based on a project's complexity and uniqueness during the development stage to ensure a project's success. Hybrid Project Management can use the predictive approach to clarify the requirements but deliver the products or services using an iterative or adaptive approach. This method allows for multiple functions while achieving the same results.

2.2.4 Project Management

According to the PMBOK Body of Knowledge 7th Edition (2021), Project Management encompasses the use of knowledge, skills, tools, and techniques to meet the project requirements. The PMBOK Body of Knowledge 6th Edition (2017) further states that, "Project management is accomplished through the appropriate application and integration of the Project Management Processes identified for the project. Project Management enables organizations to execute projects effectively and efficiently."

2.2.5 Project Management Knowledge Areas and Processes

Project Integration Management

"Project Integration Management includes the processes and activities to identify, define, combine, unify, and coordinate the various processes and Project Management activities within the Project Management Process Groups. In the Project Management context, integration includes characteristics of unification, consolidation, communication, and interrelationship. (PMI, 2017, p. 69)

Figure 2 Project Integration Management Overview

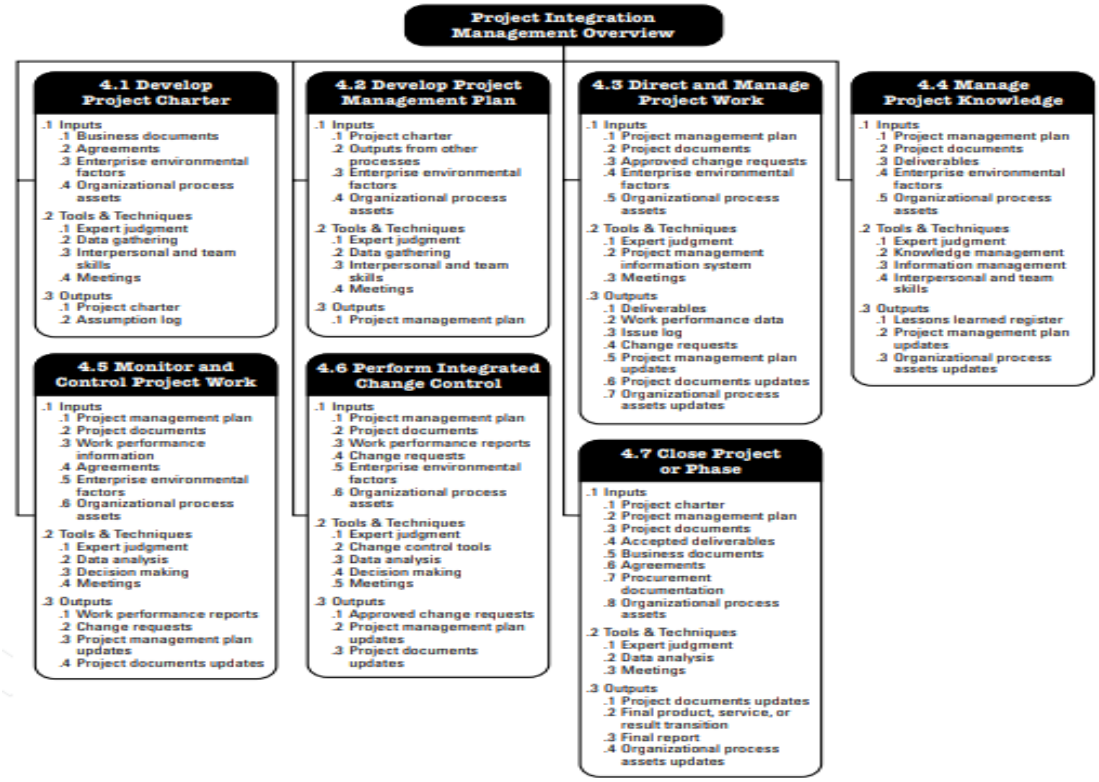


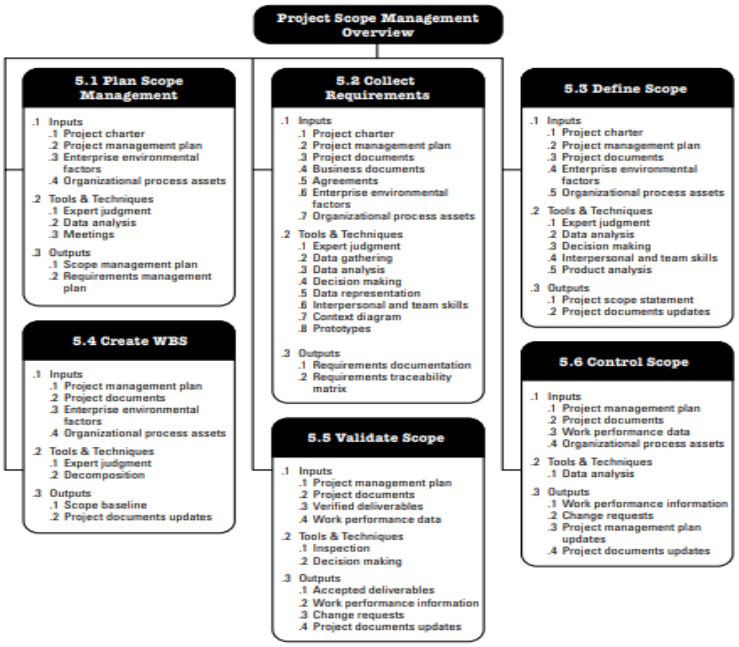
Figure 4-1. Project Integration Management Overview

Note. This figure was sourced from PM Body of Knowledge, 2017, p. 71.

Project Scope Management

According to the PMBOK Body of Knowledge 6th Edition (2017), "Project Scope Management includes the processes required to ensure that the project includes all the work required, and only the work required, to complete the project successfully. Managing the project scope is primarily concerned with defining and controlling what is and is not included in the project." The Project Scope Management Processes include Plan Scope Management, Collect Requirements, Define Scope, Create WBS, Validate Scope, and Control Scope.

Figure 3 Project Scope Management Overview



Note. This figure was sourced from the PM Body of Knowledge ,2017, p. 130.

Project Schedule Management

According to the PMBOK Body of Knowledge 6th Edition (2017), “Project Schedule Management includes the processes required to manage the timely completion of the project.” The Schedule Management Processes include: Plan Schedule Management, Define Activities, Sequence Activities, Estimate Activity Durations, Develop Schedule, and Control Schedule.

Figure 4 Project Schedule Management Overview

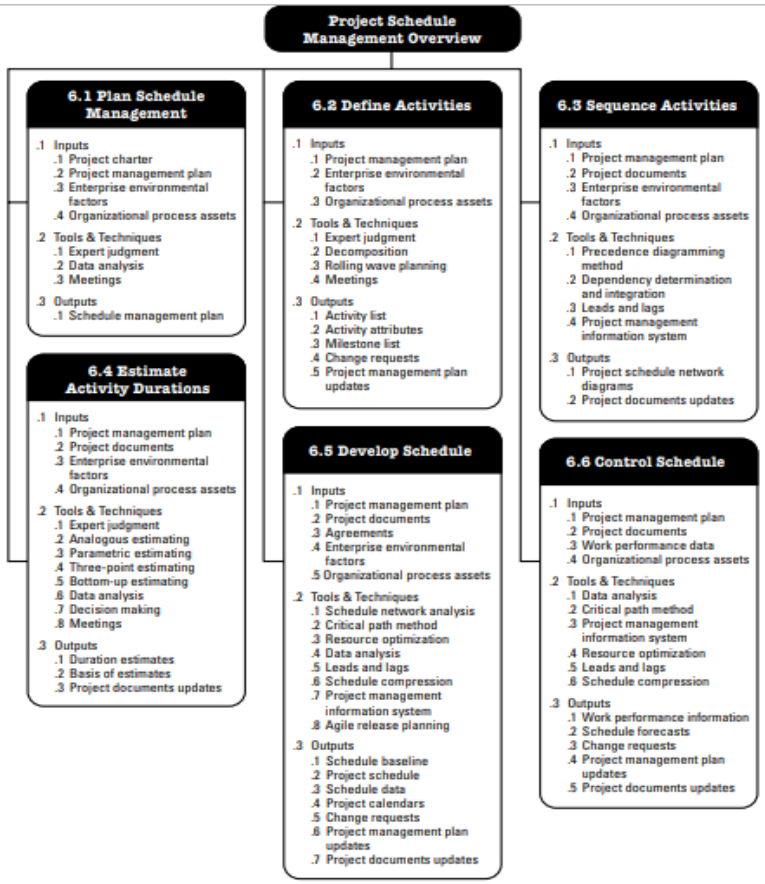


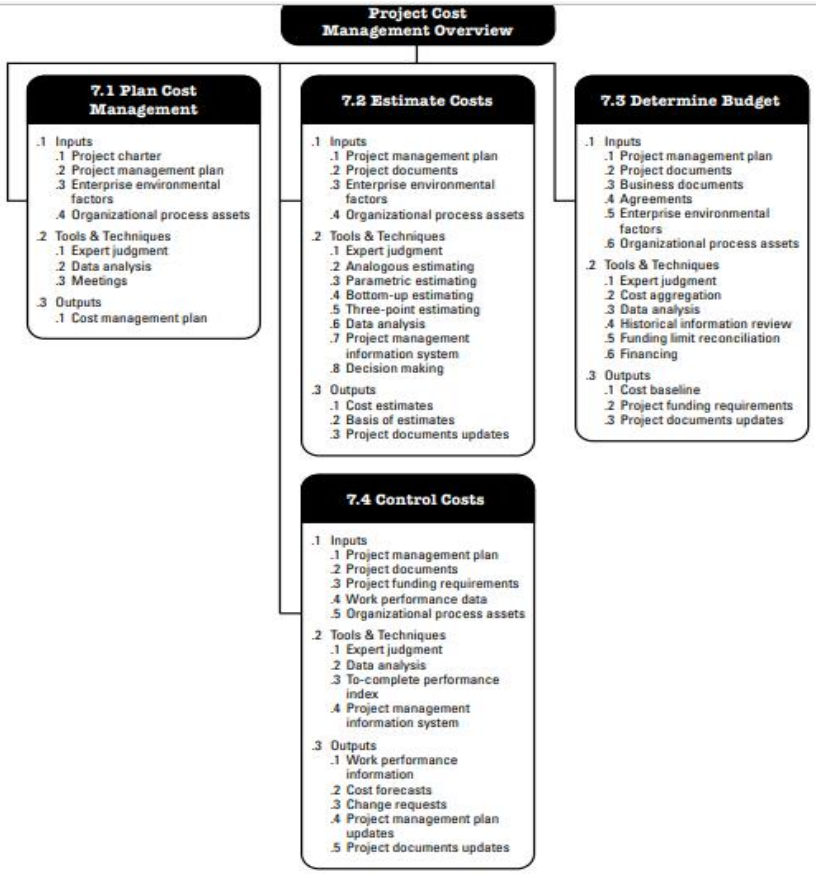
Figure 6-1. Project Schedule Management Overview

Note. This figure was sourced from the PM Body of Knowledge ,2017, p. 174.

Project Cost Management

According to the PMBOK Body of Knowledge 6th Edition (2017), "Project Cost Management includes the processes involved in planning, estimating, budgeting, financing, funding, managing, and controlling costs so that the project can be completed within the approved budget." The Project Cost Management Processes include Plan Cost Management, Estimate Costs, Determine Budget, Control Costs.

Figure 5 Project Cost Management Overview



Note. This figure was sourced from PM Body of Knowledge 2017, p. 232.

Project Quality Management

According to the PMBOK Body of Knowledge 6th Edition (2017), "Project Quality Management includes the processes for incorporating the organization's quality policy regarding planning, managing, and controlling project and product quality requirements to meet stakeholders' objectives. Project Quality Management also supports continuous process improvement activities as undertaken on behalf of the performing organization." The Project Quality Management Processes include Plan Quality, Manage Quality and Control Quality.

Figure 6 Project Quality Management Overview

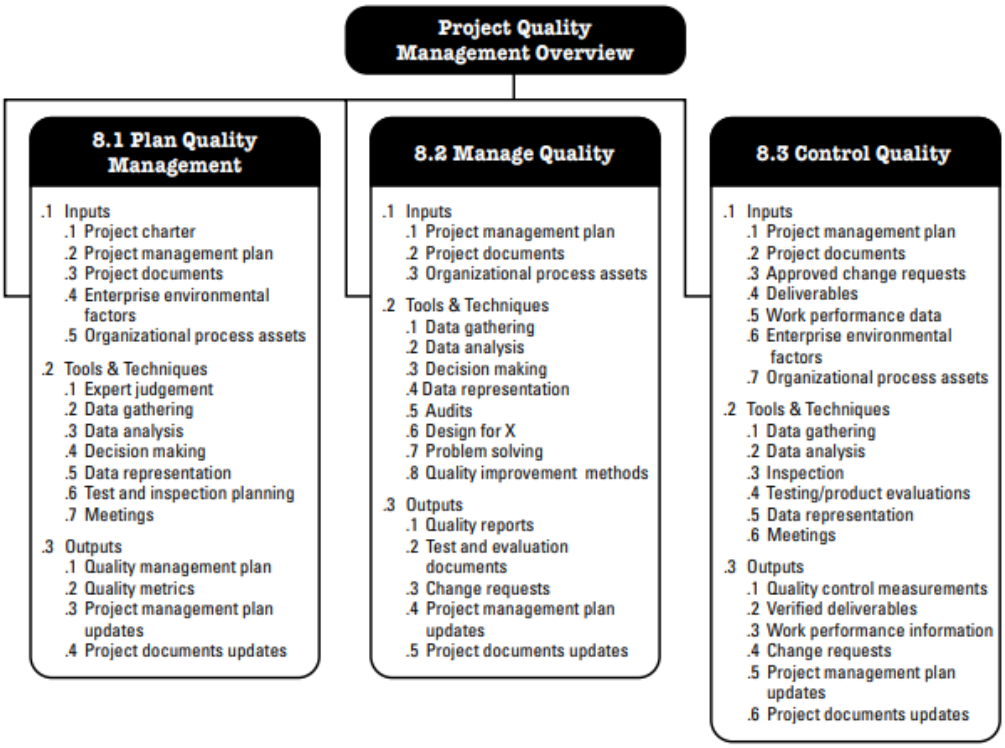


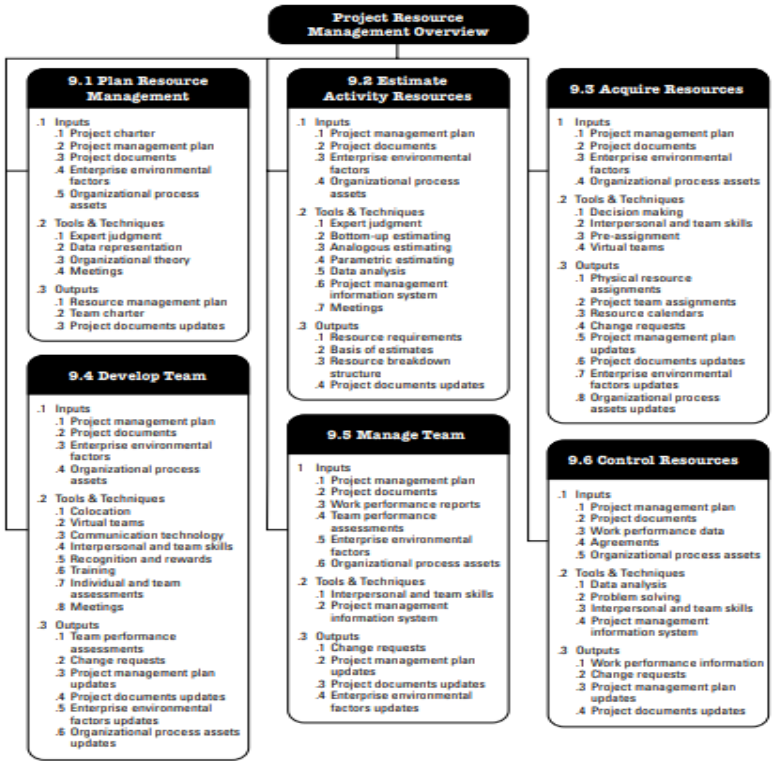
Figure 8-1. Project Quality Management Overview

Note. This figure was sourced from PM Body of Knowledge, 2017, p. 272.

Project Resource Management

"Project Resource Management includes the processes of identifying, acquiring, and managing the resources needed for the successful completion of the project. These processes assist to ensure that the right resources will be available to the Project Manager and project team at the right time and place." The Project Resources Management Processes include: Plan Resource Management, Estimate Activity Resources, Acquire Resources, Develop Team, Manage Team, and Control Resources. (PMI, 2017, p. 307).

Figure 7 Project Resource Management Overview



Note. This figure was sourced from PM Body of Knowledge, 2017, p. 308.

Project Communications Management

"Project Communications Management includes the processes necessary to ensure that the information needs of the project and its stakeholders are met through the development of artifacts and implementation of activities designed to achieve effective information exchange. Project Communications Management consists of two parts. The first part is the development of a strategy to ensure communication is effective for stakeholders. The second part is conducting activities necessary to implement the communication strategy." The Communications Management Processes include: Plan Communications Management, Manage Communications, and Monitor Communications. (PMI, 2017, p. 359)

Figure 8 Project Communications Management Overview

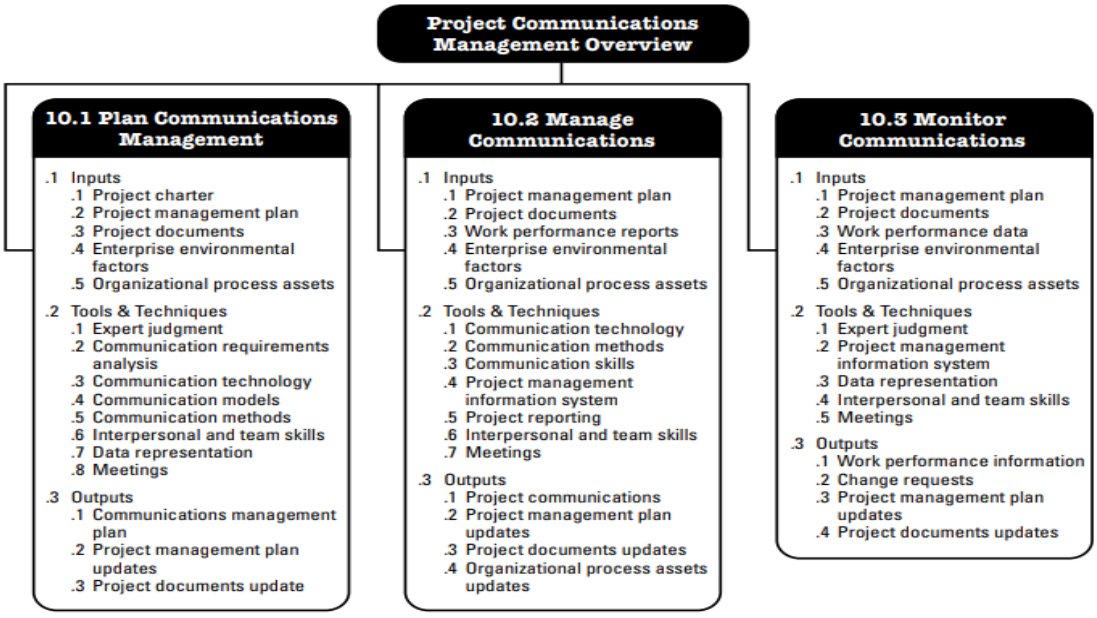


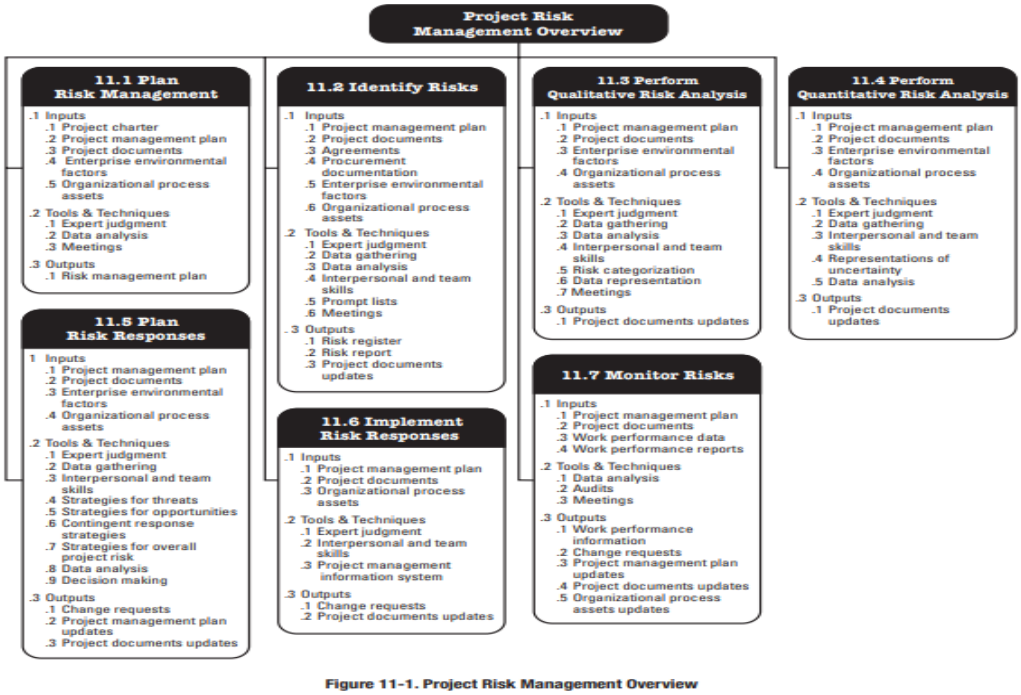
Figure 10-1. Project Communications Overview

Note. This figure was sourced from PM Body of Knowledge, 2017, p. 360.

Project Risk Management

According to the PMBOK Body of Knowledge 6th Edition (2017), "Project Risk Management includes the processes of conducting Risk Management Planning, identification, analysis, response planning, response implementation, and monitoring risk on a project. The objectives of Project Risk Management are to increase the probability and/or impact of positive risks and to decrease the probability and/or impact of negative risks, in order to optimize the chances of project success." The Project Risk Management Processes include Plan Risk Management, Identify Risks, Perform Qualitative Risk Analysis, Perform Quantitative Risk Analysis, Plan Risk Responses, Implement Risks Responses, and Monitor Risks.

Figure 9 Project Risks Management Overview



Note. This figure was sourced from PM Body of Knowledge, 2017, p. 396.

Project Procurement Management

"Project Procurement Management includes the processes necessary to purchase or acquire products, services, or results needed from outside the project team. Project Procurement Management includes the management and control processes required to develop and administer agreements such as contracts, purchase orders, Memoranda of Agreements (MOAs), or internal Service Level Agreements (SLAs)." The Project Procurement Processes include Plan Procurement Management, Conduct Procurement Management, and Control Procurement Management. (PMI, 2017, p. 359).

Figure 10 Project Procurement Management Overview

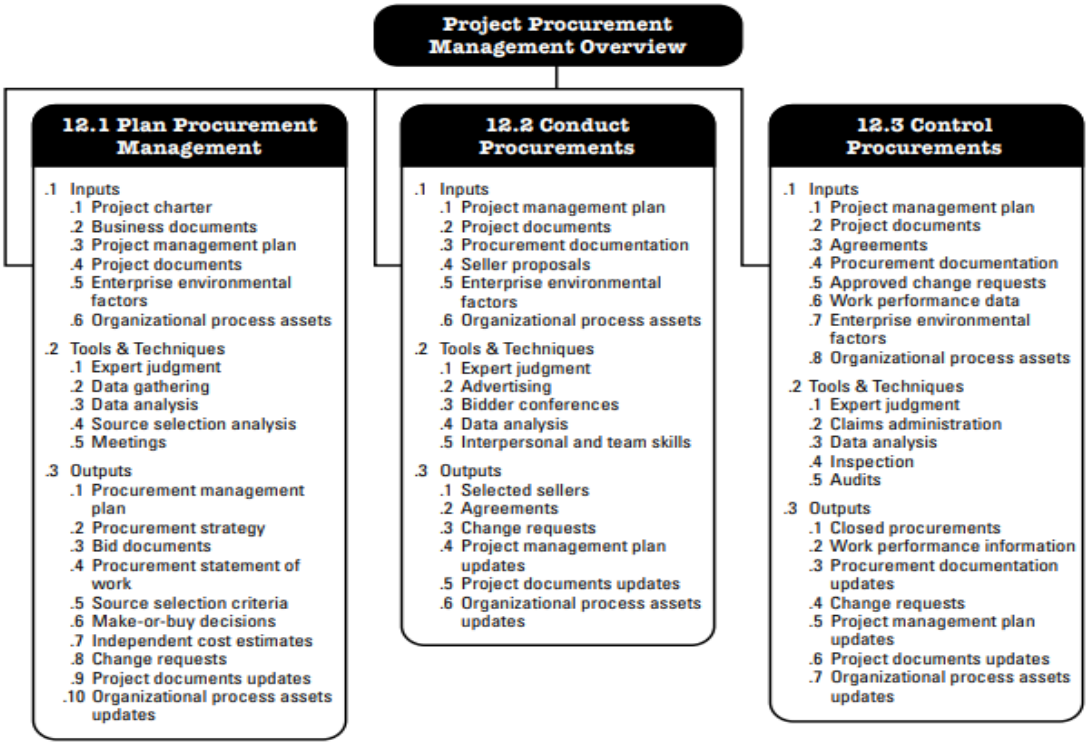


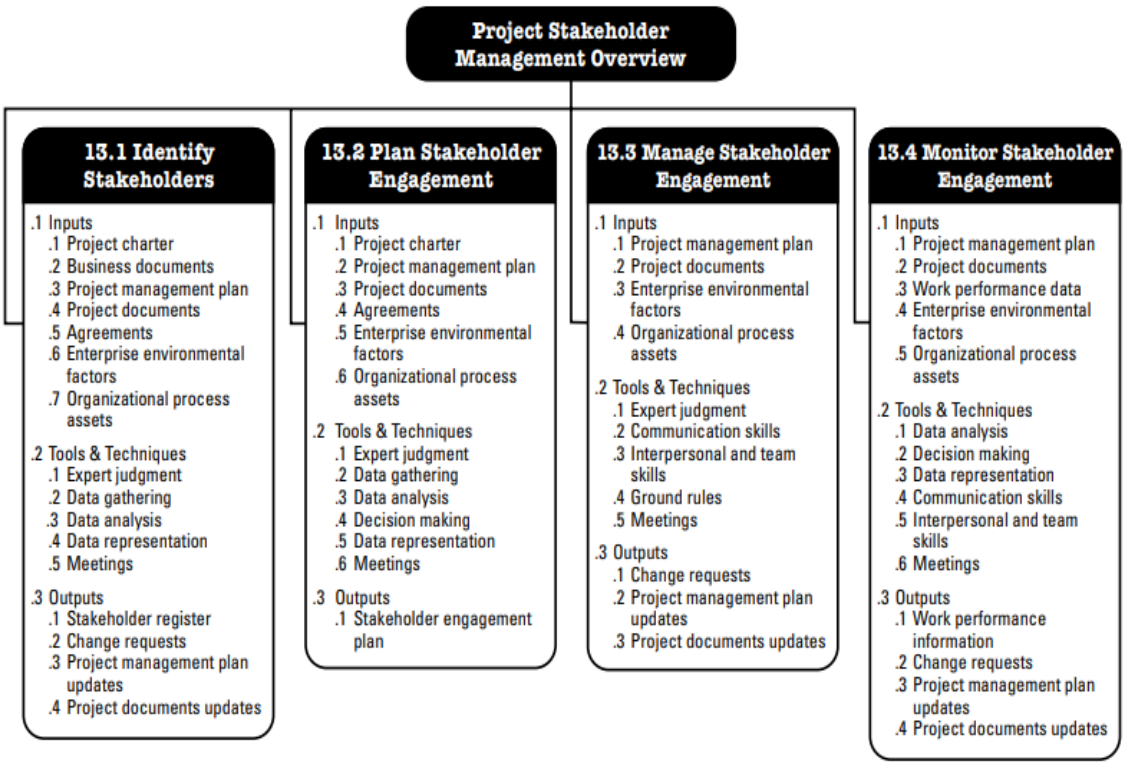
Figure 12-1 Project Procurement Management Overview

Note. This figure was sourced from PM Body of Knowledge, 2017, p. 460.

Project Stakeholder Management

"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." The Project Stakeholder Management Processes include Identify Stakeholders, Plan Stakeholder Engagement, Manage Stakeholders Engagement and Monitor Stakeholders Engagement. (PMI, 2017, p. 503).

Figure 11 Project Stakeholders Management Overview

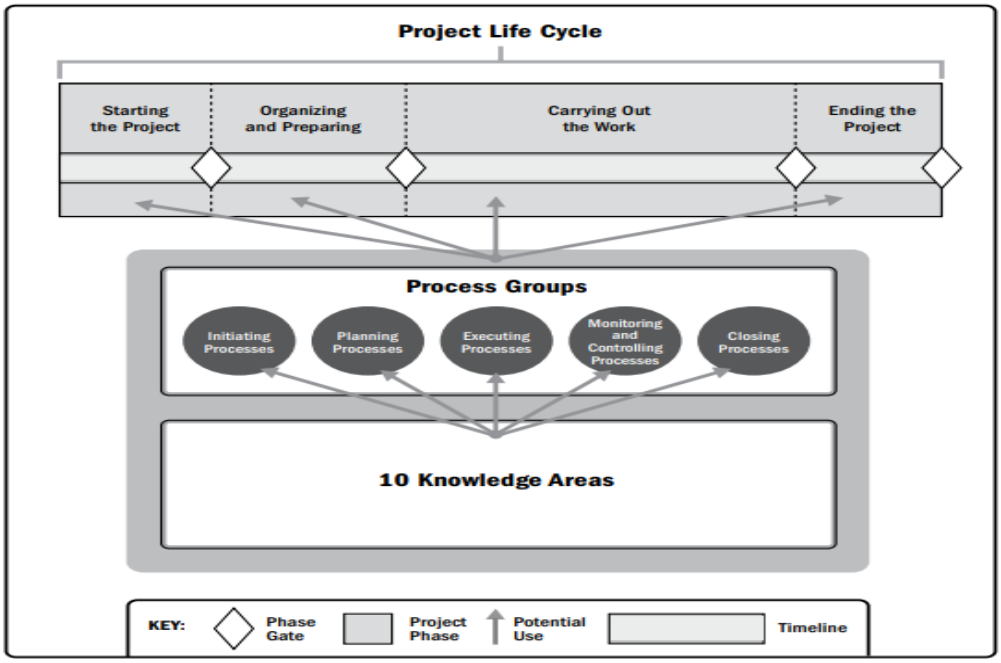


Note. This Figure was sourced from PM Body of Knowledge, 2017, p. 504.

2.2.6 Project Life Cycle

The PMBOK Body of Knowledge 7th Edition (2021), states the methods used to create and evolve product, service, or results during the project life cycle, such as a predictive, iterative, incremental, adaptive, or hybrid method. The PMBOK Body of Knowledge 6th Edition (2017), states that a project's life cycle comprises a series of phases that a project passes through from start to finish. These phases include: initiation, planning, execution, monitoring, and closure. Within this particular project, the life cycle (Predictive) will be identical as it is well suited for the constitution of phases needed for the implementation of the Covered Structure and Capacity Enhancement Project.

Figure 12 Interrelationship of PMBOK Guide Key Components in Projects



Note. This figure was sourced from PM Body of Knowledge, 2017, p. 18.

Figure 13 Generic Depiction of a Project Life Cycle

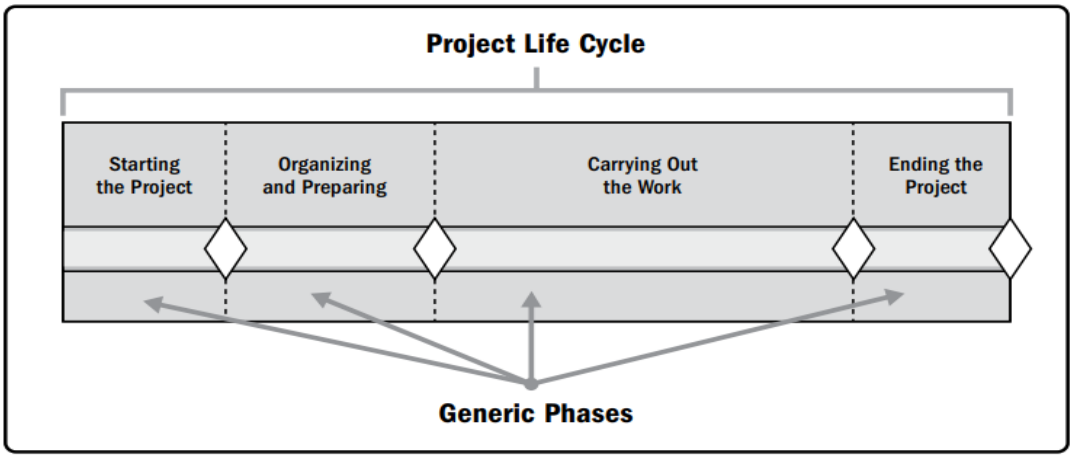


Figure 1-2. Generic Depiction of a Project Life Cycle

Note. This figure was sourced from PM Body of Knowledge, 2017, p. 548.

2.2.7 Company Strategy, Portfolios, Programs and Projects

Company Strategy

To provide an environment that is conducive to increasing production and productivity, promoting investment, and encouraging private sector involvement in agribusiness enterprises to ensure competitiveness and quality production.

Portfolios

The Portfolio of the Ministry of Agriculture, Food Security and Enterprise Portfolio includes:

- Community outreach and Support
- Capacity building of farmers, students, and lecturers
- Extension services
- Agricultural Research, Innovation and Development (ARID)
- Belize Agriculture and Marketing Information Systems (BAIMS)
- Importation and Exportation License
- Project Execution and Management

Projects

Ongoing projects include:

- Food Systems and Transformation Project
- Enhancing Sugarcane Farmers' Resilience to Natural Hazard Events
- CARICOM-FAO-Mexico Initiative 'Cooperation for Climate Change Adaptation and Resilience in the Caribbean' subproject Resilient School Feeding programme: GCP /SLC/018/MEX.
- Mesoamerica without Hunger Programme: Improve Food and Nutrition Security and encourage healthy eating habits in Belize through strengthening the school feeding programme.
- Belize Agriculture Sector Policy with Focus in Seed Policy, Backyard Poultry, Marketing and Indigenous Territories
- Follow-up Cooperation for Training on Development of Agricultural Cooperatives and Improvement of Management Capacity.
- Managing Belizean Agriculture Resilience (M-BAR).
- Belize: Climate Resilient Sustainable & Agriculture Project CRESAP

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

2.3.1 Current situation of the problem or opportunity in study

The Ministry of Agriculture Food Security and Enterprises in Belize has been executing projects for many years using the Predictive or Waterfall Project Management methodologies. Such management strategies have proven ineffective to project success, as the rate of success is roughly 50% when calculating project completion based on time, budget, and scope. The Waterfall/Predictive Approach to Project Management allows for projects to be planned with much detail from the beginning and is expected to minimize

variations and changes during project execution. This method allows for structure and predictability since some projects are designed to be implemented using the Straight-Line Approach. In addition to the poor methodologies used, projects implemented by the Ministry of Agriculture are carried out without the use of a Project Management Plan to guide project success. According to the PMBOK Body of Knowledge 6th Edition (2017), "Project Management Plan is the process of defining, preparing, and coordinating all plan components and consolidating them into an integrated Project Management Plan. With the key benefit of the process being the production of a comprehensive document that defines the basis of all project work and work performance. This integrated document will guide Project Managers on project requirements, timing, and budgetary considerations for each activity. With a comprehensive written Project Management Plan, projects will be guided towards less mistakes that can have costly results. According to Simplilearn. (2023), "A Project Management Plan is a formal, approved document that defines how the project is executed, monitored, and controlled. It may be a summary or a detailed document and may include baselines, subsidiary management plans, and other planning documents." Through the elaboration of this research, it is assumed that future projects implemented by the Ministry of Agriculture Food Security and Enterprises will be executed using a Project Management Plan for a higher project success rate.

2.3.2 Previous research done for the topic in study

Vegetable production under cover structures can lead to year-round produce as opposed to limited seasonal production as is currently being practiced in Belize. However, it is no secret that crop production in any country is a challenge and any project relating to vegetable production can prove challenging given the dangers involved with pests, diseases and the negative effects of climate change. It is even more challenging to manage a covered structure project without an existing Project Management Plan.

The Ministry of Agriculture Food Security and Enterprises (2024) states that vegetable production under covered structures in Belize has proven viable and has contributed to the creation of micro-enterprise, income generating ventures, gender equality and contributing significantly to the national economy. In 2017, there were approximately sixty- eight (68) farmers involved in vegetable production under covered structures.

Singh et al. (2024) states that greenhouse crop production is destined to play an increasingly important role in the Mediterranean climate environment as a means for sustainable crop intensification leading to optimization of water-use efficiency in an environment of water scarcity in addition to better control of product quality and safety, in line with the market demand, standards and regulations.

The Ministry of Agriculture (2017) states that the overall goal of the Ministry is to increase, diversify and sustain agricultural production, food security, income and employment generation and as such it is committed to creating a climate resilient agriculture sector that will promote the use of climate smart technologies, efficient agricultural services and climate resilient infrastructure for stakeholders within the agriculture sector.

2.3.3 Other theory related to the topic in study

There are very few studies on vegetable production under covered structures in Belize that are published so information relating to the effective and efficient management of the Covered Structure and Capacity Enhancement Project in Belize is limited or non-existent. This is due to poor record keeping from crop farmers initiatives during the past years. Nevertheless, vegetable production under covered structure technology keeps contributing to the food security of Belize by providing employment and improved livelihood to marginal residents. Currently, fresh vegetables are in high demand in the country and the need for a constant supply is creating a niche market for the women and youth. More documented research is needed to determine where the industry has been and where exactly it is heading in the near future. It is important to note that this sector is considered a priority to the Ministry of Agriculture Food Security and Enterprises in Belize.

The implementation of the Covered Structure and Capacity Enhancement Project in Belize is the first documented project, and it is expected that data collected will be used in critical decision making and lessons learnt will be key importance for future projects in the country. With the inclusion of an effective Project Management Plan, it is expected that all the deliverables of the project will be met, and the project will be guided to success. This Project Management Plan is designed to guide all Project Management activities towards project success.

3 METHODOLOGICAL FRAMEWORK

Pfister et al. (2022), states that a Methodological Framework introduces and integrates a student-centered research base, blended learning and social leadership approaches. The framework guides the research with the aim of increasing its efficiency and delivering evidence-based results. The framework main function is to provide researchers with the necessary tools to deliver the results as expected, which includes determining what data should be collected and how it should be analyzed. In addition, the framework can also be used to assess the strengths and weaknesses of a study's methodology.

3.1 Information Sources

According to Ashikuzzaman (2023), information sources refer to the origins or channels from which individuals obtain data, facts, knowledge, or insights. These sources can be diverse and encompass various mediums and formats. Thus, information sources are critical in guiding our understanding of the world and contributing to the foundation of knowledge and decision-making processes. Information sources can be divided into Primary and Secondary sources.

3.1.1 Primary sources

"Primary sources of information are the first published records of original research and development or description of new application or new interpretation of an old theme or idea. There are original documents representing unfiltered original ideas" (Ashikuzzaman, 2023).

3.1.2 Secondary sources

"Secondary sources of information are those which are either compiled from or refer to primary sources of information. The original information has been casually modified, selected, or reorganized to serve a definite purpose for a group of users. Such sources contain information arranged and organized based on some definite plan. These types of sources contain organized repackaged knowledge rather than new knowledge (Ashikuzzaman, 2023).

Chart 1

Information Sources

Objectives	**Information Sources**	
	Primary	**Secondary**
1.To create a project charter that will formally authorize the development of the Project Management Plan and allow possible change controls that may be required.	○ PMBOK Guide, 6th Edition, 2017 ○ PMBOK Guide 7th Edition, 2021 ○ Past project documents of similar projects	○ Conference Papers ○ Lecture Notes ○ Journals ○ Historical data and information
2. To develop a Scope Management Plan to ensure the project includes all the work necessary to	○ PMBOK Guide, 6th Edition, 2017 ○ PMBOK Guide 7th Edition, 2021	○ Conference Papers ○ Lecture Notes ○ Journals

Objectives	**Information Sources**	
	Primary	**Secondary**
complete the project successfully and to focus only on the work required by the project.	○ Past project documents of similar projects	○ Historical data and information
3. To develop a Schedule Management Plan to define execution methodologies for the timely completion of the project.	○ PMBOK Guide, 6th Edition, 2017 ○ PMBOK Guide 7th Edition, 2021 ○ Past project documents of similar projects	○ Conference Papers ○ Lecture Notes ○ Journals ○ Historical data and information
4. To create a Cost Management Plan to define budget management for the successful completion of the project within the approved budget.	○ PMBOK Guide, 6th Edition, 2017 ○ PMBOK Guide 7th Edition, 2021 ○ Past project documents of similar projects	○ Conference Papers ○ Lecture Notes ○ Journals ○ Historical data and information
5. To develop a Quality Management Plan to manage and control quality within the project.	○ PMBOK Guide, 6th Edition, 2017 ○ PMBOK Guide 7th Edition, 2021	○ Conference Papers ○ Lecture Notes ○ Journals

Objectives	**Information Sources**	
	Primary	**Secondary**
	○ Past project documents of similar projects	○ Historical data and information
6. To develop a Resource Management Plan to ensure timely availability of required resources for the successful completion of the project.	○ PMBOK Guide, 6th Edition, 2017 ○ PMBOK Guide 7th Edition, 2021 ○ Past project documents of similar projects	○ Conference Papers ○ Lecture Notes ○ Journals ○ Historical data and information
7. To develop a Communication Management Plan to ensure all stakeholders, including the Project Team, are properly and timely informed on all project progress.	○ PMBOK Guide, 6th Edition, 2017 ○ PMBOK Guide 7th Edition, 2021 ○ Past project documents of similar projects	○ Conference Papers ○ Lecture Notes ○ Journals ○ Historical data and information
8. To develop a Risk Management Plan to identify potential risks and identify risk owners to	○ PMBOK Guide, 6th Edition, 2017 ○ PMBOK Guide 7th Edition, 2021	○ Conference Papers ○ Lecture Notes ○ Journals

Objectives	**Information Sources**	
	Primary	**Secondary**
mitigate negative risks and capitalize on positive risks to increase the chances of project success.	○ Past project documents of similar projects	○ Historical data and information
9. To create a Procurement Management Plan to perform fair and ethical procurement of goods and services for the successful completion of the project.	○ PMBOK Guide, 6th Edition, 2017 ○ PMBOK Guide 7th Edition, 2021 ○ Past project documents of similar projects	○ Conference Papers ○ Lecture Notes ○ Journals ○ Historical data and information
10. To design a Stakeholders Management Plan to identify and manage stakeholders who directly or indirectly impact the successful completion of the project.	○ PMBOK Guide, 6th Edition, 2017 ○ PMBOK Guide 7th Edition, 2021 ○ Project documents of past similar projects	○ Conference Papers ○ Lecture Notes ○ Journals ○ Historical data and information
11. To validate the project from a regenerative and sustainable perspective to	○ PMBOK Guide, 6th Edition, 2017	○ Conference Papers ○ Lecture Notes ○ Journals

Objectives	Information Sources	
	Primary	**Secondary**
assess the impact of the project and its deliverables in regenerative and sustainable development.	○ PMBOK Guide 7th Edition, 2021 ○ Past project documents of similar projects	○ Historical data and information

Note. This chart was sourced from F. Chable, Author, 2024. Own Work

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." (Sakyi et al., 2020)

3.2.1 Quantitative Methods

According to Sakyi et al., (2020) "quantitative method collects numerical data and analyzes it using statistical methods. The aim is to produce objective, empirical data that can be measured and expressed in numerical terms. Quantitative research is often used to evaluate hypothesis, identify patterns, and make predictions.

3.2.2 Qualitative Methods

According to Sakyi et al., (2020) "quantitative method collects numerical data and analyzes it using statistical methods. The aim is to produce objective, empirical data that can be measured and expressed in numerical terms." Quantitative research is often used to evaluate hypotheses, identify patterns, and make predictions.

3.2.3 Mixed Methods

"Mixed methods strategically integrate or combine rigorous quantitative and qualitative research methods to draw on the strengths of each. Mixed method approaches allow researchers to use a diversity of methods, combining inductive and deductive thinking, and offsetting limitations of exclusively quantitative and qualitative research through a complementary approach that maximizes strengths of each data type and facilitates a more comprehensive understanding of health issues and potential resolutions." (*Mixed Methods Research*, n.d.)

3.2 Research Methods

Chart 2

Research Methods

Objectives	**Research Methods**		
	Qualitative	**Quantitative**	**Mixed**
1.To create a project charter that will formally authorize the development of the Project Management Plan and allow possible change controls that may be required.	The qualitative method will be used to gain a comprehensive perspective for the creation of the Project Charter.	The quantitative method will be used to analyze the historical data and variables for the creation of the Project Charter.	A combination of the qualitative and quantitative methods will be used to determine relationships for the creation of the project charter.

Objectives	**Research Methods**		
	Qualitative	**Quantitative**	**Mixed**
2. To develop a Scope Management Plan to ensure the project includes all the work necessary to complete the project successfully and to focus only on the work required by the project.	The qualitative method will be used to gain a comprehensive perspective for the creation of the Scope Management Plan.	The quantitative method will be used to analyze the historical data and variables for the creation of the Scope Management Plan.	A combination of the qualitative and quantitative methods will be used to determine relationships for the creation of the Scope Management Plan.
3. To develop a Schedule Management Plan to define execution methodologies for the timely completion of the project.	The qualitative method will be used to gain a comprehensive perspective for the creation of the Schedule Management Plan.	The quantitative method will be used to analyze the historical data and variables for the creation of the Schedule Management Plan.	A combination of the qualitative and quantitative methods will be used to determine relationships for the creation of the Schedule Management Plan.

Objectives	**Research Methods**		
	Qualitative	**Quantitative**	**Mixed**
4. To create a Cost Management Plan to define budget management for the successful completion of the project within the approved budget.	The qualitative method will be used to gain a comprehensive perspective for the creation of the Cost Management Plan.	The quantitative method will be used to analyze the historical data and variables for the creation of the Cost Management Plan.	A combination of the qualitative and quantitative methods will be used to determine relationships for the creation of the Cost Management Plan.
5. To develop a Quality Management Plan to manage and control quality within the project.	The qualitative method will be used to gain a comprehensive perspective for the creation of the Quality Management Plan.	The quantitative method will be used to analyze the historical data and variables for the creation of the Quality Management Plan.	A combination of the qualitative and quantitative methods will be used to determine relationships for the creation of the Quality Management Plan.

Objectives	**Research Methods**		
	Qualitative	**Quantitative**	**Mixed**
6. To develop a Resource Management Plan to ensure timely availability of required resources for the successful completion of the project.	The qualitative method will be used to gain a comprehensive perspective for the creation of the Resource Management Plan.	The quantitative method will be used to analyze the historical data and variables for the creation of the Resource Management Plan.	A combination of the qualitative and quantitative methods will be used to determine relationships for the creation of the Resource Management Plan.
7. To develop a Communication Management Plan to ensure all stakeholders, including the project team, are properly and timely informed on all project progress.	The qualitative method will be used to gain a comprehensive perspective for the creation of the Communication Management Plan.	The quantitative method will be used to analyze the historical data and variables for the creation of the Communication Management Plan.	A combination of the qualitative and quantitative methods will be used to determine relationships for the creation of the Communication Management Plan.

Objectives	**Research Methods**		
	Qualitative	**Quantitative**	**Mixed**
8. To develop a Risk Management Plan to identify potential risks and identify risk owners to mitigate negative risks and capitalize on positive risks to increase the chances of project success.	The qualitative method will be used to gain a comprehensive perspective for the creation of the Risk Management Plan.	The quantitative method will be used to analyze the historical data and variables for the creation of the Risk Management Plan.	A combination of the qualitative and quantitative methods will be used to determine relationships for the creation of the Risk Management Plan.
9. To create a Procurement Management Plan to perform fair and ethical procurement of goods and services for the successful completion of the project.	The qualitative method will be used to gain a comprehensive perspective for the creation of the Procurement Management Plan.	The quantitative method will be used to analyze the historical data and variables for the creation of the Procurement Management Plan.	A combination of the qualitative and quantitative methods will be used to determine relationships for the creation of the Procurement Management Plan.

Objectives	**Research Methods**		
	Qualitative	**Quantitative**	**Mixed**
10. To design a Stakeholders' Management Plan to identify and manage stakeholders who directly or indirectly impact the successful completion of the project.	The qualitative method will be used to gain a comprehensive perspective for the creation of the Stakeholders' Management Plan.	The quantitative method will be used to analyze the historical data and variables for the creation of the Stakeholders' Management Plan.	A combination of the qualitative and quantitative methods will be used to determine relationships for creation of the Stakeholders' Management Plan.
11. To validate the project from a regenerative and sustainable perspective to assess the impact of the project and its deliverables in regenerative and sustainable development.	The qualitative method will be used to gain a comprehensive perspective for validation of the Covered Structure and Capacity Enhancement	The quantitative method will be used to analyze the historical data and variables for validation of the Covered Structure and Capacity	A combination of the qualitative and quantitative methods will be used to determine relationships for validation of the Covered Structure and Capacity Enhancement

Objectives	Research Methods		
	Qualitative	**Quantitative**	**Mixed**
	Project from a regenerative and sustainable perspective.	Enhancement Project from a regenerative and sustainable perspective.	Project from a regenerative and sustainable perspective.

Note. This chart was sourced from F. Chable, Author, 2024. Own Work

3.3 Tools

"A tool can be defined as something tangible, such as a template or software program, used in performing an activity to produce a product or result" (Project Management Institute, 2017). The tools utilized for the creation of this project included the following:

- Integration Management Plan Template - Outline for the development of the Integration Management Plan.
- Scope Management Plan Template – Outline for the development of the Scope Management Plan.
- Schedule Management Plan Template - Outline for the development of the Schedule Management Plan.
- Cost Management Plan Template - Outline for the development of the Cost Management Plan.
- Project Management Plan Template - Outline for the development of the Project Management Plan.

- Quality Management Plan Template - Outline for the development of the Quality Management Plan.
- Resource Management Plan Template - Outline for the development of the Resource Management Plan.
- Communication Management Plan Template - Outline for the development of the Communication Management Plan.
- Risk Management Plan Template - Outline for the development of the Risk Management Plan.
- Procurement Management Plan Template - Outline for the development of the Procurement Management Plan.
- Stakeholder Management Plan - Outline for the development of the Stakeholder Management Plan.
- Sustainable Management plan Template - Outline for the development of the Sustainable Management Plan.
- Project Management Scheduling Software – Software used to create the project schedule.
- Stakeholder Prioritization Matrix – Matrix used to prioritize project stakeholders.
- Project Charter Template – Document to outline key project information.
- Risk Register Template – Register to document project risks.
- Requirements Traceability Matrix – Matrix to match deliverables with their requirements.

- Work Breakdown Structure – Used to break down large projects into manageable pieces.
- Work Breakdown Dictionary – Contains details of tasks, activities, and deliverables.
- Bottom-up Estimation – Estimation technique to determine project costs by working from the details and combining for the overall costs.
- Activity List Template – Used to create the list of scheduled activities.
- Responsibility Assignment Matrix – To assign responsibilities to the Project Team.
- Communication Matrix – Matrix to outline project communication.
- Stakeholder Engagement Assessment Matrix – Matrix used to assess stakeholder engagement needs.
- P5 Impact Analysis – Tool used to determine the impact on the sustainable development of the project.

Chart 3

Tools

Objectives	**Tools**
1.To create a project charter that will formally authorize the development of the Project Management Plan and allow possible change controls that may be required.	○ Activity List ○ Integration Management Plan ○ Expert Judgement ○ Work Breakdown Structure ○ Requirements Traceability Matrix

2. To develop a Scope Management Plan to ensure the project includes all the work necessary to complete the project successfully and to focus only on the work required by the project.	○ Scope Management Plan Template ○ Requirements Traceability Matrix ○ Expert Judgement ○ Data Analysis ○ Meetings ○ Work Breakdown Structure ○ Work Breakdown Structure Dictionary
3. To develop a Schedule Management Plan to define execution methodologies for the timely completion of the project.	○ MS Projects ○ Schedule Management Plan ○ Expert Judgement ○ Data Analysis ○ Meetings ○ Activity List ○ Meetings ○ Bottom – Up Estimation
4. To create a Cost Management Plan to define Budget Management for the successful completion of the project within the approved budget.	○ Expert Judgement ○ Data Analysis ○ Meetings ○ Bottom – Up Estimation ○ Cost Management Plan Template

5. To develop a Quality Management Plan to manage and control quality within the project.	○ Decision making ○ Data representation ○ Test and inspection planning ○ Meetings ○ Expert Judgement ○ Data gathering ○ Data analysis ○ Quality Activities Matrix Template ○ Quality Management Plan Template
6. To develop a Resource Management Plan to ensure timely availability of required resources for the successful completion of the project.	○ Organizational Theory ○ Meetings ○ Expert Judgement ○ Data representation ○ RACI ○ Resource management Plan Template
7. To develop a Communication Management Plan to ensure all stakeholders, including the project team are properly and timely informed on all project progress.	○ Interpersonal and team skills ○ Data representation ○ Meetings ○ Communication Management Plan ○ Expert Judgement ○ Communication requirements analysis

	○ Communication technology and methods
8. To develop a Risk Management Plan to identify potential risks and identify risk owners to mitigate negative risks and capitalize on positive risks to increase the chances of project success.	○ Expert Judgement ○ Data Analysis ○ Meetings ○ Risk Register Template ○ Risk Management Plan Template
9. To create a Procurement Management Plan to perform fair and ethical procurement of goods and services for the successful completion of the project.	○ Meetings ○ Procurement Management Plan ○ Template ○ Expert Judgement ○ Data gathering ○ Data analysis ○ Source selection analysis
10. To design a Stakeholders Management Plan to identify and manage stakeholders who directly or indirectly impact the successful completion of the project.	○ Expert Judgement ○ Data gathering and analysis ○ Data representation ○ Meetings ○ Stakeholder Register Template ○ Stakeholder Assessment Matrix

	○ Stakeholder Management Plan Template
11. To validate the project from a regenerative and sustainable perspective to assess the impact of the project and its deliverables in regenerative and sustainable development.	○ Data gathering ○ Data analysis ○ Sustainable Management Plan Template ○ Expert Judgement ○ P5 Impact Analysis

Note. This chart was sourced from F, Chable, Author, 2024. Own Work

3.4 Assumptions and Constraints

According to the PMBOK, 7th Edition (2021), "An assumption is a factor that is considered to be true, real, or certain, without proof or demonstration. A constraint is a limiting factor that affects the execution of a project, program, portfolio, or process." The triple constraints include scope, schedule, and cost but in recent years quality and risks have been added to the list of constraints.

Chart 4

Assumptions and Constraints

Objectives	Assumptions	Constraints
1.To create a project charter that will formally authorize the development of the Project Management Plan and allow possible change controls that may be required.	All the information to create the project charter is readily available.	○ Limited information available for the development of the project charter.
2. To develop a Scope Management Plan to ensure the project includes all the work necessary to complete the project successfully and to focus only on the work required by the project.	All information to determine the full extent of the scope is readily available.	○ Disorganized project sponsors. ○ Scope definition is unclear due to missing information.
3. To develop a Schedule Management Plan to define execution methodologies for the timely completion of the project.	Schedule will follow the pre-design project implementation method.	○ Project must meet deadlines and milestones. ○ Deadlines on certain activities are uncertain.
4. To create a Cost Management Plan to define Budget Management for the	Inflation will not affect the cost of	○ Limited Budget.

Objectives	Assumptions	Constraints
successful completion of the project within the approved budget.	implementing the Project.	○ Poor funds distribution from project sponsors.
5. To develop a Quality Management Plan to manage and control quality within the project.	Requirements from stakeholders are readily available.	○ Lack of accurate information from project stakeholders. ○ Changes to internal policies from project sponsors.
6. To develop a Resource Management Plan to ensure timely availability of required resources for the successful completion of the project.	○ Resources are readily available when needed. ○ Resources are of the required quality.	○ Project resources unavailable when needed. ○ Poor distribution of allocated resources.
7. To develop a Communication Management Plan to ensure all stakeholders, including the project team, are	○ All stakeholders are properly	○ Lack of response from stakeholders

Objectives	Assumptions	Constraints
properly and timely informed on all project progress.	informed about project activities. o Stakeholders willingness to share information.	o Poor project communication policies from sponsors.
8. To develop a Risk Management Plan to identify potential risks and identify risk owners to mitigate negative risks and capitalize on positive risks to increase the chances of project success.	o All risks are identified. o Risk owners are doing their assigned responsibilities properly.	o Limited information on historical risks since the project is new. o Extreme natural disasters.
9. To create a Procurement Management Plan to perform fair and ethical procurement of goods and services for the successful completion of the project.	o Local suppliers have the capacity to supply the resources needed by the project. o Suppliers abide by signed contractual agreements.	o Capacity of local suppliers o International shipping and transportation issues.

Objectives	Assumptions	Constraints
10. To design a Stakeholders Management Plan to identify and manage stakeholders who directly or indirectly impact the successful completion of the project.	○ All stakeholders are properly identified. ○ All stakeholders. functioning as per assignment.	○ Stakeholders are not responding to project requirements. ○ Poor Organizational structure of project stakeholders.
11. To validate the project from a regenerative and sustainable perspective to assess the impact of the project and its deliverables in regenerative and sustainable development.	○ A sustainable and regenerative approach will be applicable to the implementation of the Covered Structure and Capacity Enhancement Project.	Local suppliers can supply goods and services that are sustainable and regenerative in nature.

Note. This chart was sourced from F. Chable, Author, 2024. Own Work

3.5 Deliverables

According to the PMBOK, 6th Edition (2017), deliverables refer to all tangible and intangible outputs produced within the scope of the project.

Chart 5

Deliverables

Objectives	**Deliverables**
1.To create a project charter that will formally authorize the development of the Project Management Plan and allow possible change controls that may be required.	Project Charter
2. To develop a Scope Management Plan to ensure the project includes all the work required to complete the project successfully and only the work required by the project.	Scope Management Plan
3. To develop a Schedule Management Plan which will define execution methodologies for the timely completion of the project.	Schedule Management Plan

Objectives	**Deliverables**
4. To create a Cost Management Plan that will define Budget Management for the successful completion of the project within budget.	Cost Management Plan
5. To develop a Quality Management Plan for managing and controlling quality within the project.	Quality Management Plan
6. To develop a Resource Management Plan to ensure the timely availability of required resources for the successful completion of the project.	Resource Management Plan
7. To design a Communication Management Plan to ensure all stakeholders, including the project team, are properly and timely informed on project progress.	Communication Management Plan
8. To develop a Risk Management Plan to identify potential risks and identify risk owners to mitigate negative risks and capitalize on positive risks to increase the chances of project success.	Risk Management Plan
9. To create a Procurement Management Plan to conduct fair and ethical purchasing of goods,	Procurement Management Plan

Objectives	**Deliverables**
services, or results for the successful completion of the project.	
10. To design a Stakeholders Management Plan to identify and manage stakeholders who directly or indirectly impact the successful completion of the project.	Stakeholders Management Plan
11. To validate the project from a regenerative and sustainable perspective to assess the impact of the project and its deliverables in regenerative and sustainable development.	Sustainable and Regenerative Management Plan

Note. This chart was sourced from F. Chable, Author, 2024. Own Work

4 RESULTS

The Results Analysis Chapter analyzes how the specific objectives, and the application of Project Management Processes of the Covered Structure and Capacity Enhancement Project, can be effective and efficient in producing a Project Management Plan for managing project activities in MAFSE from inception to completion, with the confidence of achieving higher project success.

4.1 Integration Management Plan

4.1.1 Integration Management Introduction

This section comprises the Project Charter and the Project Management Plan. It highlights the different processes and Project Management activities and their interaction when working together.

4.1.2 Develop Project Charter

This project charter is created to describe the project and give readers an overall understanding of what it entails. According to PMI, the charter formally authorizes the existence of a project and allows the Project Manager the ability to mobilize resources. The project charter is outlined below:

Project Name: Covered Structure and Capacity Enhancement Project in Belize

Project Manager Name: _____

Project Manager Signature: _____

Project Start Date: September 01, 2023

Project End Date: August 31, 2025

Project Objectives

General Objective:

To implement the Covered Structure and Capacity Enhancement Project in Belize to increase livelihood opportunities in rural communities.

Specific Objectives:

- Increase capacity building of 36 farmers involved in the production of vegetables under covered structure technology.
- Increase the efficiency of vegetable production by improving the construction design and irrigation systems of at least 36 structures by the end of 2025.
- To raise the volume of vegetables on the local market that are produced under cover structures, by not less than 2.0 percent of the 2023 level by the end of 2025, while increasing the incomes and quality of life for beneficiaries under the project.

Project Purpose or Justification

Vegetable production is seasonal in Belize and with the adverse effects of climate change, it can be negatively affected by unseasonal drought or flood conditions. Additionally, pest problems characteristically manifest themselves during dry periods while wet periods propagate diseases especially in waterlogged soil conditions. Under these conditions, vegetable production becomes sub-optimal with supply shortages in the domestic market. Higher market prices for imports of vegetables are often the consequence, thereby lowering nutrition of disadvantaged social groups.

The search for a remedy saw the birth of the Covered Structure and Capacity Enhancement Project. This project is targeting thirty-six (36) new vegetable farmers of which 50% of the beneficiaries must be women and youth. Through the implementation of this project, it is expected to increase the efficiency of vegetable production under covered structures by improving the construction design and irrigation systems of at least thirty-six (36) structures by the end of 2025. This increase will greatly contribute to poverty reduction and food security for the country of Belize.

Since there are no projects within the auspices of the Ministry of Agriculture in Belize that are being implemented using a Project Management Plan, one will be developed for the effective and efficient implementation of the Covered Structure and Capacity Enhancement Project. The key benefit of developing this plan is the production of a comprehensive document that defines the basis of all project work and how the work will be performed. This integrated document is needed to guide the Project Manager and Project Team on project requirements, timing, and budgetary considerations for each activity during project implementation.

Description of Product of Service to be generated by the Project – Project final Deliverables:

1. Capacity Building of 36 Project Beneficiaries.
2. Procurement and distribution of Covered Structure Equipment and Materials.
3. Establishment of thirty-six (36) Covered Structures Units.

4. Project Management Plan

Assumptions

1. Vegetable producers are willing to train and adhere to the Best Horticulture Practices.
2. Covered Structure Units will be utilized by beneficiaries as an educational tool.
3. Covered Structure materials and equipment are locally available.
4. Importation of Covered Structure materials and equipment from neighbouring countries is affordable.

Constraints

1. Vegetable producers are refusing to be trained.
2. Covered Structure Units not functioning to Best Horticulture Practice Standards.
3. Covered Structure materials and equipment are not locally available.
4. Importation of Covered Structure material and equipment from neighbouring countries is too costly.

Risks

1) Extreme weather conditions can delay project activities.
2) Pest and Disease damaging vegetable production.
3) Inferior quality of covered structure materials and equipment
4) Supplier delays
5) Non-compliance of beneficiaries to Best Horticulture Practices

Budget

The budget is estimated at $ 1,500,000.00 BZD.

Milestones and Dates

Milestone	Start Date	End Date
Capacity Building of Project Beneficiaries	September 01, 2023	August 31, 2024
Procurement of Covered Structure Equipment and Materials	August 01, 2024	November 30, 2024
Distribution of Irrigation and Fertigation Equipment and Materials	October 01, 2024	December 31, 2024
Establishment of 36 Covered Structure Units	December 31, 2024	July 31, 2025
Project Management	September 01, 2023	August 31, 2025

Stakeholders:

The following are the project stakeholders:

1. Project Manager
2. Project Team
3. Ministry of Agriculture, Food Security and Enterprise (MAFSE)
4. Government of Belize (GOB)
5. Belize Marketing and Development Cooperation (BMDC)
6. CARICOM Development Fund (CDF)
7. Vegetable Producers
8. Suppliers
9. Citizens of Belize

4.1.3 Project Management Plan

According to PMI (2017), this process defines, prepares, and coordinates all plan components while integrating them into the overall Project Management Plan.

a. Change Control

For any changes that may be necessary during the project, an integrated change control process will be followed.

- Change request is submitted.
- The proposed change is assessed to determine its effect on the project.
- The Project Steering Committee, Project Manager and Project Sponsor give approval or rejection.
- The decision is recorded in the change log.
- Project documents are updated.

Chart 6

Change Control Template

Change Request Form			
Project Name: Covered Structure and Capacity Enhancement Project			
Change Name:			
Change Number:			
Requested By: _____	**Contact: _____**	**Date: _____**	
Description of Change:			
Priority:	**High**	**Medium**	**Low**
Impact on Objectives:			
Date Required: _____	**Approval of Request: (Y/N)**	**Date: _____**	
Change Potential Impact			

Change Request Form				
Scope:				
Cost:				
Schedule:				
Risk:				
Quality:				
Recommended Alternatives:				
Comments				
For Official Use Only				
Select One:	**1. Accepted**	**2. Deferred**	**3. Rejected**	**4. More Information Needed**
Comments:				
Project Manager Signature: _____				
PSC Chairman Signature: _____				

Note. This chart was sourced from F. Chable, Author, 2024. Own Work

b. Lessons Learned

A Lesson Learned Register will be used to record knowledge gained during the project and to capture important information to enable continual improvement throughout the project. Please see the Lessons Learned template for the Covered Structure Project below:

Chart 7

Lessons Learned Template

Lessons Learned Template						
Project Name: Covered Structure and Capacity Enhancement Project						
Project Number:						
Project Sponsor:						
Project Manager Name:						
Number	**Date Identified**	**Date Entered**	**Issue**	**Potential Impact**	**Recommendations or Comments**	**Follow-ups**

Note. This chart was sourced from F. Chable, Author, 2024. Own Work

c. Project Closure

According to PMI (2017), the project closure finalizes all activities for the project, phase, or contract. For the project to be closed the following must be completed and approved:
Acceptance criteria met and approved by the Government of Belize (GOB) and CARICOM Development Fund (CDF).

a) A handing-over certificate is provided.

b) All project beneficiaries signed a Memorandum of Agreement (MOA)

c) Completed and signed audit report is submitted.

4.2 Scope Management Plan

4.2.1 Scope Management Introduction

The objective of Project Scope Management is to ensure that all the work to be done for the project is carried out and only that work should be done. This is important since any changes to the project scope can affect the schedule and budget of the entire project. The Scope Management Plan allows stakeholders to understand what is included in the project and what is not. To avoid cost, time and budget overruns, each item of work is clearly defined and documented.

4.2.2 Collect Requirements

Collecting requirements allows the project team to ensure that the needs of all the stakeholders are considered. Without this, the project work would be completed without bringing value to the stakeholders.

Chart 8

Requirements Traceability Matrix

Project Name	**Covered Structure and Capacity Enhancement Project**			
Project Description	Building an enabling environment for enhanced livelihood of vegetable producers in Belize.			
ID	**Requirements Description**	**Business Needs, Opportunities, Goals, Objectives**	**Project Objectives**	**Verification**
R1	Capacity building must be carried out using local language and pre-approved presentations	Production efficiency	Ensure vegetable producers learn about Best Horticulture Practices	Field activities
ID	**Requirements Description**	**Business Needs, Opportunities, Goals, Objectives**	**Project Objectives**	**Verification**
R2	Capacity building must be carried out within the locality of the Vegetable Producers.	Production efficiency	Ensures the inclusion of practical activities	Field activities
R3	Covered Structure Units must be accessible to Vegetable Producers for training purposes.	Fulfill training needs	Ensures continuous capacity building of	Site reports

			Vegetable Producers	
R4	Materials and equipment must be sourced locally	Empower local entrepreneurs	Ensures quality materials and equipment	Inspection
R5	Materials and equipment must be inspected by the project technical coordinator prior to distribution	Supply of quality materials and equipment to vegetable producers	Ensures longevity	Inspection
R6	Structure Framing Materials must be produced from renewable sources	Environmental considerations	Ensures renewable sources of materials	Site visit, Inspection
R7	Structure Covering Materials must be produced from renewable sources	Environmental considerations	Ensures renewable sources of materials	Site visit, Inspection
R8	Each covered structure unit must be 60 ft long and 20ft wide	Efficient production	Ensure quantitative production parameters are met	Production records
R9	Delivery of equipment and material must be done during daytime	Safety regulations	Ensures safe transportation of materials and equipment to its destination	Inspection, records
ID	**Requirements Description**	**Business Needs, Opportunities, Goals, Objectives**	**Project Objectives**	**Verification**
R10	Each Covered Structure Unit should contain complete irrigation and fertigation systems installed.	Efficient production	Ensure quantitative production parameters are met	Production records

Note. This chart was sourced from F. Chable, Author, 2024. Own Work

4.2.3 Define Scope

Project Scope Statement

Project Description

The Covered Structure and Capacity Enhancement Project (Covered Structure Project) entails the provision of two training courses at the introduction level, two at the advanced level, procurement and distribution of covered structure equipment and materials, and the establishment of thirty-six (36) Covered Structure Units over the six (6) districts. The training will be conducted prior to the establishment of Covered Structure Units and distribution of equipment and materials to ensure vegetable producers are prepared to manage their enterprises effectively and efficiently.

Project Deliverables:

1. (2) Best Horticulture Practices Training at the Introduction and Advance levels.
2. Procurement of Covered Structure Equipment and Materials.
3. Distribution of Irrigation and Fertigation Equipment and Materials.
4. (36) Established Covered Structure Units
5. Project Management

Acceptance Criteria

- Training must be done in English.
- Training must be held in the locality of vegetable producers.
- Materials and Equipment are procured from local sources.

- Materials and Equipment are of acceptable quality.
- Public safety during the transportation of equipment and materials is mandatory.

Project Exclusions

- Inspection of existing vegetable beds for pests and disease prior to introduction of seedlings.
- Management of Covered Structure Units after the expiration of the Memorandum of Agreement.
- Importation of Materials and Equipment by local entrepreneurs.

Constraints

- Project to be carried out within the budget of $ 1,500,000.00 BZD.
- All works to be conducted within 24 months.
- Sourcing materials and equipment locally

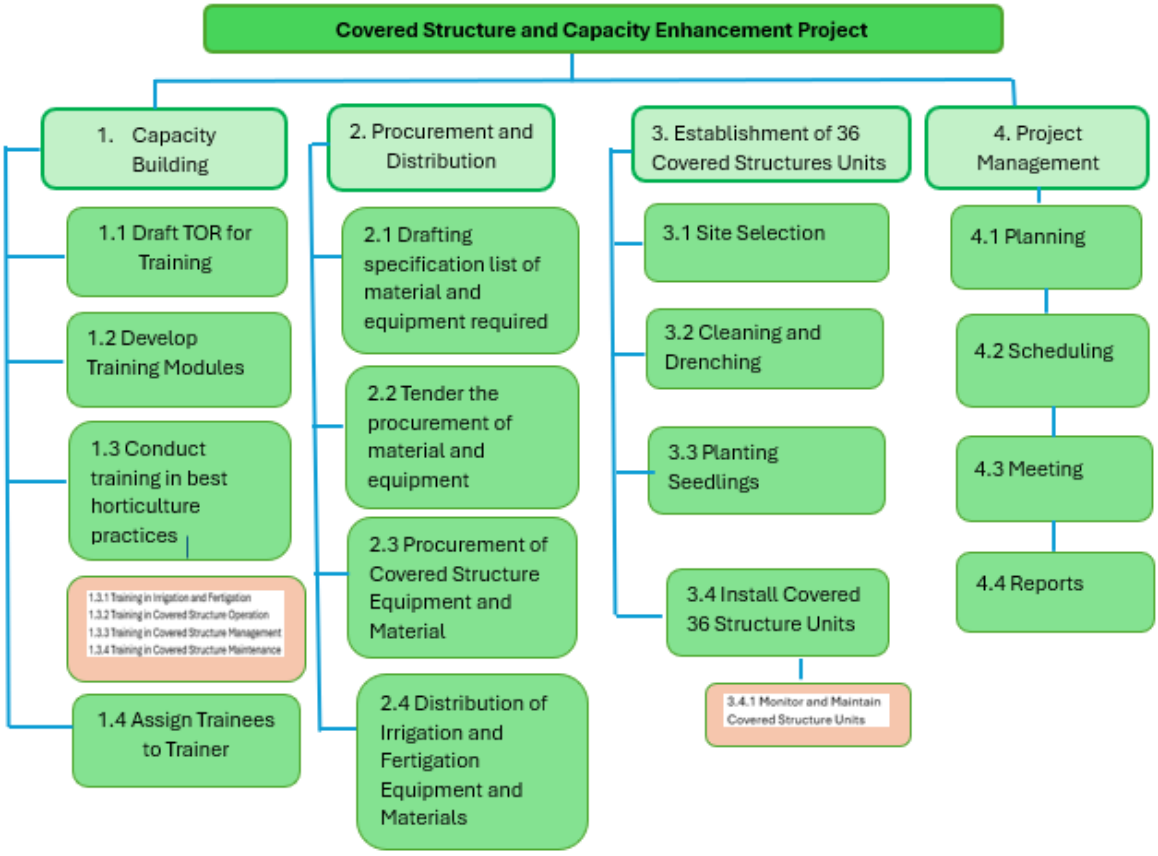
Assumptions

- All work can be carried out within budget.
- All work can be carried out within a given time frame.
- Materials and equipment can be imported within budget.

4.2.4 Create WBS

Figure 14

Work Breakdown Structure



Note. This figure was sourced from F. Chable, Author, 2024. Own Work

4.2.5 WBS Dictionary

The PMBOK guide to Project Management Knowledge 7th Edition (2021) states that the WBS dictionary provides detailed deliverables, activities, and scheduling about each component within the Work Breakdown Structure. The following WBS dictionary was created based on the WBS and provides the aforementioned project information:

Chart 9

WBS Dictionary

Level	WBS Code	WBS Name	Description/Definition	Budget ($ BZD)	Resources
1	1	Capacity Building	Creating the Terms of Reference for the trainers and the training packages	$180,000.00	Project Manager and Project Team
2	1.1	Draft TOR for training modules	Formulating the Terms of Reference for hiring consultants.	$ 8,000.00	Project Manager and Project Team
2	1.2	Develop Training Modules	Creation of training modules and topics to conduct training.	$ 8,000.00	Project Manager and Project Team
2	1.3	Conduct Training in Best Horticulture Practices	Train vegetable producers on the Best Fertilizer application practices including Pest and Diseases	$ 35,000.00	Project Manager, Consultants and Project Team
3	1.3.1	Training in the Operation of Covered Structure Units	Conduct training Operation of Covered Structure Units for Vegetable Producers	$ 35,000.00	Project Manager, Consultants and Project Team
3	1.3.2	Training in the Management of Covered Structure Units	Conduct training in the Management of Covered Structure Units for Vegetable Producers	$ 35,000.00	Project Manager, Consultants and Project Team
3	1.3.3	Training in the Maintenance of Covered Structure Units	Conduct training in the Maintenance of Covered Structure Units for Vegetable Producers	$ 35,000.00	Project Manager, Consultants and Project Team
3	1.4	Assigning Trainees to Trainers	Selection of Trainers to continue training the beneficiaries for a two-week period	$ 24,000.00	Project Manager, Consultants, Mentors and

Level	WBS Code	WBS Name	Description/Definition	Budget ($ BZD)	Resources
					Project Team
1	2	Procurement and Distribution	Procurement and Distribution of materials and equipment to beneficiaries	$602,000.00	Project Manager and Project Team
2	2.1	Drafting the list and specification of equipment and materials required	Creating the specific requirements for all materials and equipment to be purchased by the project	$3,000.00	Project Manager, PSC and Project Team
3	2.2	Tendering the procurement of equipment and materials.	Advertise requirements by the project for fair and equitable procurement practices	$2,000.00	Project Manager, PSC and Project Team
3	3.3	Procurement of Materials and Equipment	Procurement of materials and equipment needed to operate a Covered Structure Unit.	$ 517,00.00	Project Manager, PSC and Project Team
3	3.4	Distribution of Materials and Equipment	Distribution of materials and equipment to beneficiaries	$80,000.00	Project Manager, PSC and Project Team
1	3	Establishment of 36 Covered Structure Units	Establishment of 36 Covered Structure Units that will be used to train beneficiaries, students, and lectures.	$500,000.00	Project Manager and Project Team
3	3.1	Site Selection	Selection of appropriate location to place the covered structure units.	$ 36,000.00	Project Manager, Consultants and Project Team
3	3.2	Cleaning and drenching	Clearing of debris from around the location and preparing drainage systems	$ 60,000.00	Project Manager, Consultants and Project Team

Level	WBS Code	WBS Name	Description/Definition	Budget ($ BZD)	Resources
3	3.3	Planting Seedlings	Planting of Vegetable Seedlings	$120,000.00	Project Manager, Consultants and Project Team
3	3.4	Installation of 36 Covered Structure Units	The construction and installation of 36 Covered Structure Units	$124,000.00	Project Manager, CDF, Project Team
3	3.4.1	Monitor and Maintain of Covered Structure Units	Monitor and Maintain 36 Covered Structure Units	$160,000.00	Project Manager, CDF, Project Team
1	4	Project Management	Application of project management processes and procedures throughout the duration of the project	$218,000.00	Project Manager, CDF, PSC and Project Team
2	4.1	Planning	Planning project activities throughout the life of the project.	$90,000.00	Project Manager, CDF, PSC and Project Team
2	4.2	Scheduling	Scheduling project activities throughout the life of the project.	$81,000.00	Project Manager, CDF, PSC and Project Team
2	4.3	Meetings	Attending meetings with stakeholders to update them on project activities and progress.	$22,000.00	Project Manager, CDF, PSC and Project Team
2	4.4	Reports	Providing project reports, including daily logs, weekly reports, change updates and monthly work programs and support	$25,000.00	Project Manager, CDF, PSC and Project Team

Note. This chart was sourced from F. Chable, Author, 2024. Own Work

4.2.6 Roles and Responsibilities

The roles and responsibilities for the project are outlined in the table below. This will allow the Project Team to have access to reference material for ease of collaboration with relevant stakeholders.

Chart 10

Roles and Responsibilities

Role	Responsibilities
CARICOM Development Fund (CDF)	Project Funding Institution
Ministry of Agriculture, Food Security and Enterprise (MAFSE)	Co-sponsor and oversight on project progress and reporting.
Project Steering Committee (PSC)	Overall management and control of project activities and approvals.
Project Manager	Overall management of the project and its activities through the application of the best Project Management Practices and procedures.
Suppliers	Sourcing and procuring quality materials and supplies requested from the project
Project Team	Support the Project Manager with the successful implementation of the project.
Vegetable Producers	Beneficiaries of the project.

Note. This chart was sourced from F. Chable, Author, 2024. Own Work

4.2.7 Validate Scope

Scope validation dictates if the project deliverables will be accepted or rejected. This decision should be as objective as possible to avoid bias. Therefore, measurable metrics should be employed. The criteria within the requirements traceability matrix will be utilized to ensure impartiality.

4.2.8 Control Scope

Scope control is vital to the successful completion of the project. Without proper scope control, the project could be threatened with scope creep which adds work, time, and cost to the project without added value. To avoid this, the project scope will be continually monitored for changes in variances. In addition, to effectively control any detriments to the project scope a robust change request procedure should be implemented.

4.3 Schedule Management Plan

4.3.1 Schedule Management Introduction

According to the PMBOK guide 7th edition, the Schedule Management Plan is a component of the Project Management Plan that establishes the criteria and activities for developing, monitoring, and controlling the schedule. This is important to ensure the timely completion of the project.

4.3.2 Schedule Management Approach

The Schedule Management Plan will be created using information from MAFSE similar past projects as well as knowledge and experience within the project area. Based on historically past and similar projects, 20 activities necessary to carry out the project will be defined. Using this knowledge and the work packages outlined in the WBS, the activities will be listed. After the listing of the activities, they will be sequenced, and the durations estimated. Once those tasks are completed the project schedule will be created using Microsoft Projects.

4.3.3 Define Activities

The activities were defined using personal and expert judgement, and historical information from past and similar projects. Additionally, predecessor and successor information were outlined to fully understand the interdependencies of the activities.

Chart 11

Activity List

ACTIVITY LIST			**ACTIVITY ATTRIBUTES**		
ACTIVITY ID	**ACTIVITY NAME**	**ACTIVITY DESCRIPTION**	**PREDECESSOR ACTIVITY IDs**	**SUCCESSOR ACTIVITY IDs**	**RESOURCE REQUIREMENTS**
1.1	Draft TOR for training	Formulating the Terms of Reference for hiring local consultants.			Project Manager, PSC, CDF & Project Team
1.2	Develop Training Modules	Creation of training modules and topics to conduct training.	1.1	1.2	Project Manager & Project Team
1.3	Conduct Best Horticultur e Training	Train vegetable producers on the Best Horticulture Practices including Pest and Diseases	1.2	1.3	Project Manager & Project Team
1.3.1	Training in Covered Structure Operation	Conduct training in the operation of Covered	1.3	1.3.2	Project Manager, Consultant & Project Team

		Structure to beneficiaries			
1.3.2	Training in Covered Structure Management	Conduct training in the Management of Covered Structure to beneficiaries	1.3.1	1.3.3	Project Manager, Consultant & Project Team
1.3.3	Training in Covered Structure Maintenance	Conduct training in the Maintenance of Covered Structure to beneficiaries	1.3.2	1.4	Project Manager, Consultant & Project Team
1.4	Assigning Trainees to Trainers	Selection of Trainers to continue training the beneficiaries for a two-week period	1.3.3		Project Manager, PSC, & Project Team
2.1	Draft the list and specification of equipment and materials required	Creating of specified requirements for all materials and equipment to be purchased by the project	2.2	2.1	Project Manager, Consultant, CDF, & Project Team
2.2	Tender the procurement of equipment and materials.	Advertise requirements by the project for fair and equitable procurement practices	2.1	2.3	Project Manager, & Project Team
2.3	Procurement of Covered Structure Equipment and Materials	Procurement of materials and equipment needed to operate the	2.2	2.4	Project Manager, & Project Team

		covered structure units			
2.4	Distributio n of Irrigation and Fertigation Equipment and Materials	Distribution of Irrigation and Fertigation equipment and materials to beneficiaries	2.3		Project Manager, & Project Team
3.1	Site Selection	Selection of an appropriate location to place the Covered Structure Units	3.2	3.3	Project Manager, Technical Officer & Project Team
3.2	Cleaning and Drenching	Clearing of obstacles from around the location of the Covered Structure unit and drenching for water drainage	3.1	3.3	Project Manager, & Project Team
3.3	Procure of seedlings	Procurement of vegetable seedlings to plant in covered structure unit	3.2	3.4	Project Manager, & Project Team
3.4	Installation of Covered Structure Units	Complete installation of Covered Structure Units	3.4		Project Manager, & Project Team
3.4.1	Monitor and maintain Covered Structure Units	Monitoring and Maintain Covered Structure Units ensure that seedlings	3.4		Project Manager, & Project Team

		are properly cared for to avoid larceny			
4.1	Planning	Planning project activities throughout the life of the project.	1.1		Project Manager, Consultant, CDF, & Project Team
4.2	Scheduling	Scheduling project activities throughout the life of the project.	1.1		Project Manager, Consultant, CDF, & Project Team
4.3	Meetings	Attending meetings with stakeholders to update them on project activities and progress.	1.1		Project Manager, Consultant, CDF, & Project Team
4.4	Reports	Providing project reports, including daily logs, weekly reports, change updates and monthly work programs and support	1.1		Project Manager, Consultant, CDF, & Project Team

Note. This chart was sourced from F. Chable, Author, 2024. Own Work

4.3.4 Sequence Activities

At this stage, the activities were placed in their corresponding order using the established relationships.

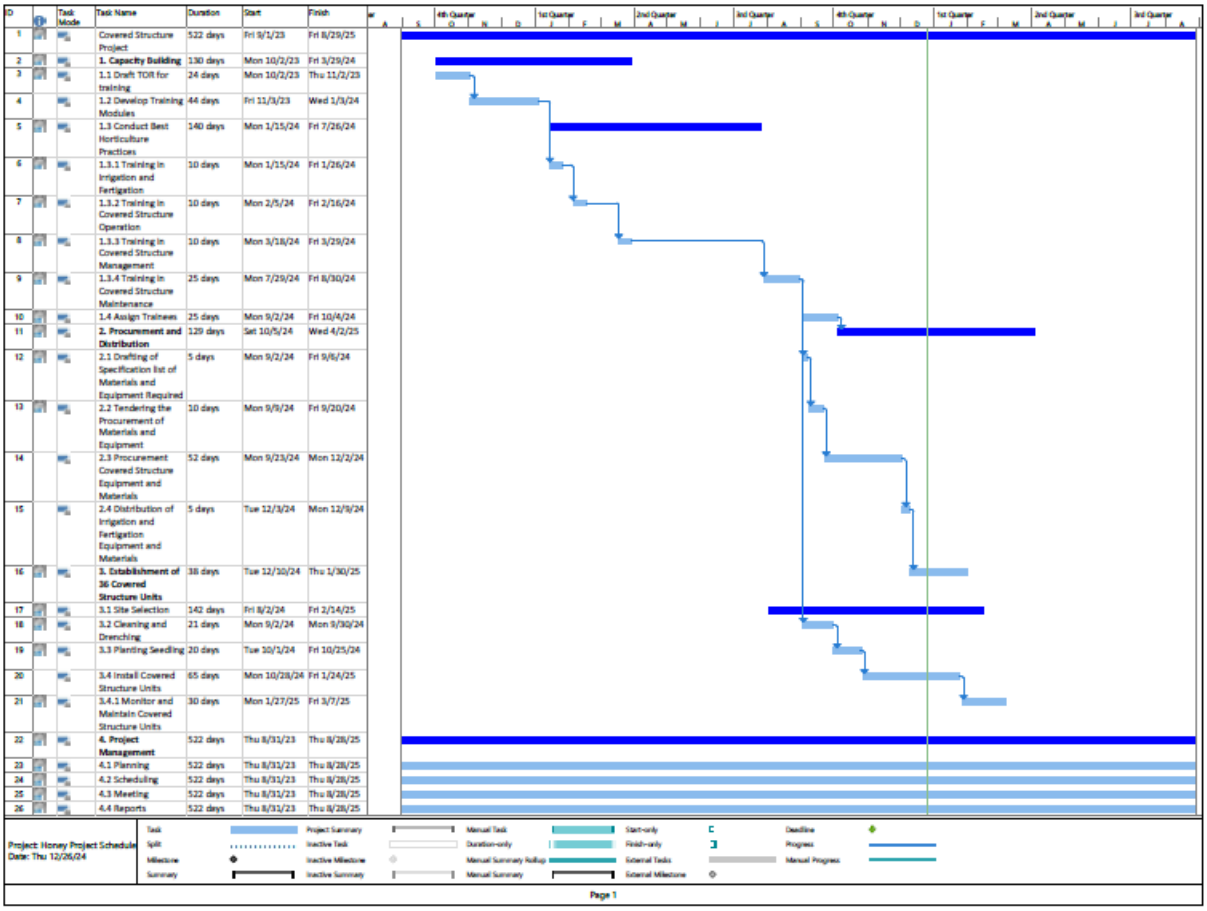
4.3.5 Estimate Activity Durations

Due to the diversity of agricultural projects, durations are typically estimated using a combination of expert judgement and past historical data. Depending on the degree of similarity between the projects, determinations are made. Factors may include number of beneficiaries, geographical location, resources, and scope. Based on these and other factors, decisions are made as to whether these tasks would require more or less time to complete.

4.3.6 Develop Schedule

Figure 15

Project Schedule



Note. This figure was sourced from F. Chable, Author, 2024. Own Work

4.3.7 Project Schedule Changes

Schedule control is empirical to ensure that the project activities and timelines do not fall behind. It is inevitable that changes will occur in a project, but it is very important that the Project Manager and his team monitor these changes to ensure they do not negatively affect the project. Monitoring is done by the Project Team and Project Manager by scrutinizing

the recommended changes and the risk they possess to the scope, cost, and schedule of the project. If the effects are found to be acceptable, then the Project Manager or the PSC approves the changes and makes necessary changes to the schedule.

4.3.8 Control Schedule

According to PMI (2017), control schedule is the process of monitoring the status of project activities to update project progress and manage changes to the schedule baseline to achieve the plan. The schedule control procedure will be used to monitor the activities and tasks of the Covered Structure and Capacity Enhancement Project to ensure that the project activities proceed as planned. The procedure will be used to monitor the status of the project, update the different processes, and manage changes that occur during the execution of the project.

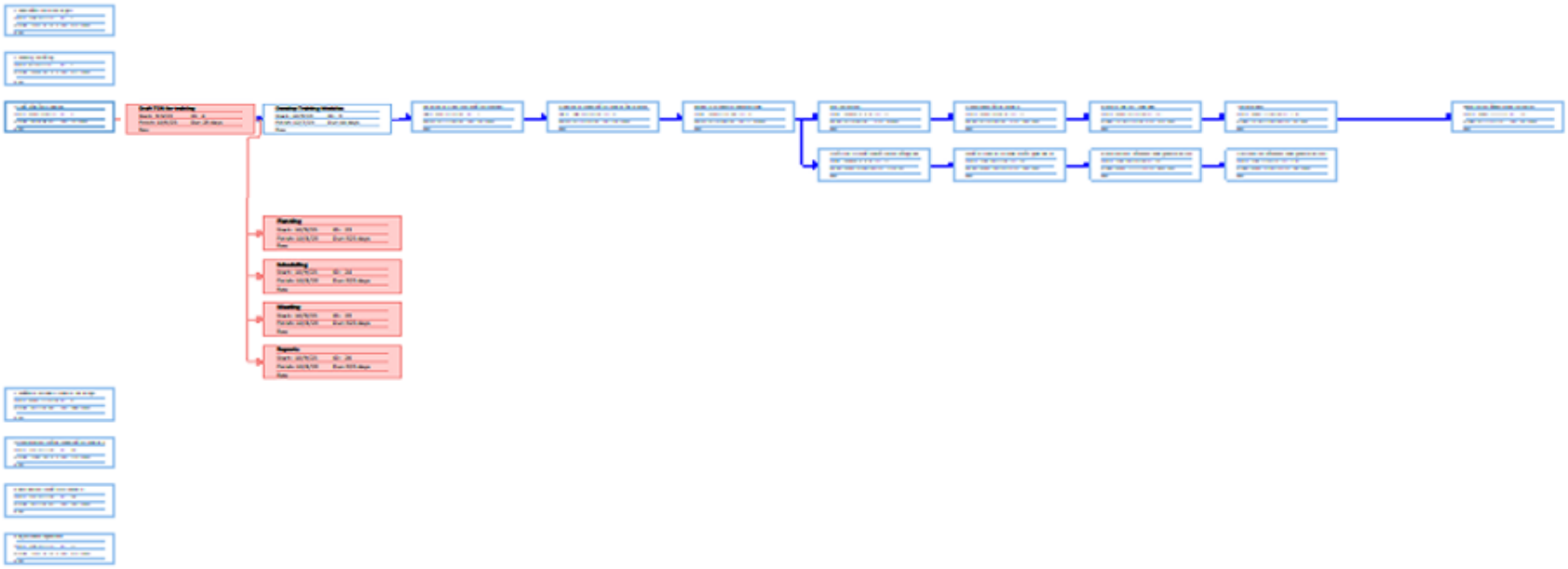
Several techniques will be employed to control the Covered Structure Project schedule. Earned Value Analysis is one of the most reliable ways to track and manage schedule performance. It will be used to assist in measuring how much progress the team has made on the project, and to track whether they are on schedule and within budget. The iteration burndown chart will also be used to control the project schedule. The chart will illustrate how much work has been completed, how much work remains, and the speed of progress. This information will assist the Project Manager in identifying potential problems and making necessary changes. Performance reviews will be used to gauge, compare, and analyze the performance of work in progress against the baseline of the Covered Structure Project. The

Critical Path Method is the longest sequence of dependent tasks in a project and will also be used as an important technique to control the schedule.

4.3.9 Network Diagram

Figure 16

Network Diagram



Note. This chart was sourced from F. Chable, Author, 2024. Own Work

4.3.10 Reserve Analysis

Reserve Analysis is carried out to determine the amount of contingency and management reserve needed for the project to account for uncertainty within the schedule. Contingency reserves are the estimated duration within the schedule baseline. These are based on identified and accepted risks. Management reserves are estimated from the schedule management for the project that is withheld for management control purposes and are reserved for unforeseen work that is within scope of the project. For the Covered Structure Project reserves will be applied to all activities as a basis for project schedule reserves. This probabilistic approach will provide an estimated time built into the schedule to accommodate unforeseen delays that can occur in the project's life cycle. As the project progresses, the reserves may be used to cover the cost of risk mitigation activities, whether foreseen or unforeseen.

Chart 12

Activity List and Variance calculating using PERT

WBS Code	Activity Name	Predecessor	Optimistic Duration (t0)	Most likely Duration (tM)	Pessimistic Duration (tP)	Expected Duration (tE)	Variances (SD^2)
1	Start						
1.1	Draft TOR for training	N/A	22	25	30	25.3	1.8
1.2	Develop Training Modules	1.1	40	44	48	44.0	1.8
1.3	Conduct Training in Best Horticulture Practices	1.2	135	140	151	141.0	7.1
1.3.1	Training in Irrigation and Fertigation	1.3	8	10	12	10.0	0.4
1.3.2	Training in Covered Structure Operation	1.3.1	7	10	11	9.7	0.4
1.3.3	Training in Covered Structure Management	1.3.2	7	10	12	9.8	0.7
1.3.4	Training in Covered Structure Maintenance	1.3.3	18	25	30	24.7	4.0
1.4	Assign Trainees to Mentorship	1.4	3	5	7	5.0	0.4
2.1	Draft the list and specification of equipment and materials required	2.1	8	10	14	10.3	1.0
2.2	Tender the procurement of equipment and materials.	2.2	44	52	59	51.8	5.3
2.3	Procurement of Covered Structure Equipment and Materials	2.3	3	5	7	5.0	0.4
2.4	Distribution of Irrigation and Fertigation	2.4	32	38	45	38.2	3.7

	Equipment and Materials						
3.1	Site Selection	3.1	20	21	25	21.5	0.7
3.2	Cleaning and Drenching	3.2	18	20	24	20.3	1.0
3.3	Planting Seedlings	3.3	60	65	72	65.3	3.0
3.4	Installation of 36 Covered Structure Units	3.4	24	30	36	30.0	3.0
3.4.1	Monitor and Maintain Covered Structure Units	3.4.1	26	32	38	32.0	3.1
			510		512.0		37.9

Total Expected Duration (TE) – 512 days

Total Variance – 37.9

Standard Deviation - 6.16

Project duration with 84% probability = 518.16 days (512 + 6.16)

4.4 Cost Management Plan

According to PMI (2017), the Project Cost Management processes are defined as:

- Plan Cost Management
- Estimate Cost
- Determine Budget
- Control Cost

4.4.1 Plan Cost Management

This section focuses on the financial aspect of the project. It includes the outline of methodology for estimates, the project budget and how project funds will be monitored and

controlled throughout the project. This is important to prevent the mismanagement of funds which can adversely affect the outcome of the project. The Plan Cost Management process for the Covered Structure Project will establish the cost of all resources needed to successfully complete the project. The plan will be aligned to the recommendations of PMI (2017), to plan, manage, budget and control project costs. Project deliverables will be divided into work packages and major milestones. Each activity under a work package will be listed with its estimated unit cost and tallied to establish an initial cost baseline. The total cost for this project is BZD $ 1,500,000.00 (750,000.00 USD). Contingency Reserves are calculated as a percentage (10%) of the deliverables relating to the implementation of the project and Management Reserves are calculated as a percentage (25%) of the deliverables for management control only. All cost estimates are in Belize Dollars.

4.4.2 Estimate Costs

Costs were estimated using a combination of Bottom – Up Estimation and expert judgement. This enabled project cost to be determined by using information from past similar projects and agricultural diversification initiatives with similar objectives. This means that where possible, typical details were used to estimate material and labor costs and where these were not available, past project information was utilized.

Chart 13

Cost Estimates

ACTIVITY ID	ACTIVITY NAME	ACTIVITY DESCRIPTION	RESOURCES	UNIT	RATE	QTY	AMOUNT
1.1	Draft TOR for training	Formulating the Terms of Reference for hiring local consultants.	Project Manager, PSC, CDF & Project Team	No.	$1,333.33	6	$ 8,000.00
1.2	Develop Training Modules	Creation of training modules and topics to conduct training.	Project Manager & Project Team	No.	$1,333.33	6	$ 8,000.00
1.3	Conduct Best Horticulture Training	Train vegetable producers on the Best Horticulture Practices including pest and diseases	Project Manager & Project Team	No.	$5,833.33	6	$35,000.00
1.3.1	Training in Covered Structure Operation	Conduct training in the operation of Covered Structure to beneficiaries	Project Manager, Consultant & Project Team	No.	$4,375.00	8	$35,000.00
1.3.2	Training in Covered Structure Management	Conduct training in the Management of Covered Structure to beneficiaries	Project Manager, Consultant & Project Team	No.	$4,375.00	8	$35,000.00
1.3.3	Training in Covered Structure Maintenance	Conduct training in the Maintenance of Covered Structure to beneficiaries	Project Manager, Consultant & Project Team	No.	$4,375.00	8	$35,000.00

ACTIVITY ID	ACTIVITY NAME	ACTIVITY DESCRIPTION	RESOURCES	UNIT	RATE	QTY	AMOUNT
1.4	Assigning Trainees to Trainers	Selection of Trainers to continue training the beneficiaries for a two-week period	Project Manager, PSC, & Project Team	No.	$3,000.00	8	$24,000.00
2.1	Draft the list and specification of equipment and materials required	Creating of specified requirements for all materials and equipment to be purchased by the project	Project Manager, & Project Team	Each	$1,500.00	2	$3,000.00
2.2	Tender the procurement of equipment and materials.	Advertise requirements by the project for fair and equitable procurement practices	Project Manager, & Project Team	Each	$500.00	4	$2,000.00
2.3	Procurement of Covered Structure Equipment and Materials	Procurement of materials and equipment needed to operate the covered structure units	Project Manager, & Project Team	No.	$51,700.00	10	$517,00.00
2.4	Distribution of Irrigation and Fertigation Equipment and Materials	Distribution of Irrigation and Fertigation equipment and materials to beneficiaries	Project Manager, & Project Team	No.	$8,000.00	10	$80,000.00
2.4.1	Site Selection	Selection of an appropriate location to place the	Project Manager, & Project Team	No.	$1,000.00	36	$36,000.00

ACTIVITY ID	ACTIVITY NAME	ACTIVITY DESCRIPTION	RESOURCES	UNIT	RATE	QTY	AMOUNT
		Covered Structure Units					
3.1	Cleaning and Drenching	Clearing of obstacles from around the location of the Covered Structure unit and drenching for water drainage	Project Manager, Consultant, CDF, & Project Team	No.	$1,666.67	36	$60,000.00
3.2	Procure of seedlings	Procurement of vegetable seedlings to plant in covered structure unit	Project Manager, & Project Team	No.	$3,333.33	36	$120,000.00
3.3	Installation of Covered Structure Units	Complete installation of Covered Structure Units	Project Manager, & Project Team	No.	$3,444.44	36	$124,000.00
3.4	Monitor and maintain Covered Structure Units	Monitoring and Maintain Covered Structure Units ensure that seedlings are properly cared for to avoid larceny	Project Manager, & Project Team	No.	$4,444.44	36	$160,000.00
4.1	Planning	Planning project activities throughout the life of the project.	Project Manager, Consultant, CDF, & Project Team	No.	$7,500.00	12	$90,000.00
4.2	Scheduling	Scheduling project activities throughout	Project Manager, Consultant, CDF,	No.	$6,750.00	12	$81,000.00

ACTIVITY ID	ACTIVITY NAME	ACTIVITY DESCRIPTION	RESOURCES	UNIT	RATE	QTY	AMOUNT
		the life of the project.	& Project Team				
4.3	Meetings	Attending meetings with stakeholders to update them on project activities and progress.	Project Manager, Consultant, CDF, & Project Team	No.	$1,833.33	12	$22,000.00
4.4	Reports	Providing project reports, including daily logs, weekly reports, change updates and monthly work programs and support	Project Manager, Consultant, CDF, & Project Team	No.	$2,083.33	12	$25,000.00

Note. This chart was sourced from F. Chable, Author, 2024. Own Work

4.4.3 Determine Budget

According to PMI (2017), Determine Budget is the process of aggregating the estimated costs of individual activities or work packages to establish an authorized cost baseline. A project budget helps set expenditure expectations and is an important aspect in getting project approval, ensuring funds are available when needed, and measuring the project's performance. The process is dynamic and requires constant monitoring, reviews, and updates throughout the project lifecycle. The project budget is an essential document for the project's decision-making processes that need to be communicated to stakeholders to realize the needs of the project, i.e., financial, human resource, materials, equipment, training etc.; the process

of determining budget also provides a baseline for the Project Manager to track project expenditures and identify project needs. It will identify the skill and expertise needed to realize work packages and activities whilst prioritizing activities and measuring performance against actual cost as the project matures. The inputs used to determine the budget for the Covered Structure Project are the Project Management Plans including the Cost Management Plan, Resource Management Plan, Schedule Management Plan, and Scope Baseline. The tools and techniques used in this process will be expert judgement and the use of historical and financing data. This process will lead to obtaining the cost baseline for the project and updates to the project schedule and risk register for the project. The contingency reserves and management reserves for the project will be 15% and 25% respectively.

Figure 17

Determine Budget

ACTIVITY	ACTIVITY NAME	ACTIVITY DESCRIPTION	COST	Start	Finish	DURATION (Month)	2024																2025							
							September	October	November	December	January	February	March	April	May	June	July	August	September	October	November	December	January	February	March	April	May	June	July	August
1.1	Draft TOR for training modules	Formulating the Terms of Reference for hiring consultants.	$8,000.00	1-Sep-23	10-Nov-23	3	$ 2,666.67	$ 2,666.67	$ 2,666.67																					
1.2	Develop Training Modules	Creation of training modules and topics to conduct trainings.	$8,000.00	11-Oct-23	8-Dec-23	3		$ 2,666.67	$ 2,666.67	$ 2,666.67																				
1.3	Conduct Training in Best Horticulture Practices	Train vegetable producers on the Best Fertilizer application practices including Pest and Diseases	$35,000.00	3-Jan-24	26-Jun-24	6					$ 5,833.33	$ 5,833.33	$ 5,833.33	$ 5,833.33	$ 5,833.33	$ 5,833.33														
1.3.1	Training in the Operation of Covered Structure Units	Conduct training Operation of Covered Structure Units for Vegetable Producers	$35,000.00	15-Jan-24	28-Feb-24	2					$ 17,500.00	$ 17,500.00																		
1.3.2	Training in the Management of Covered Structure Units	Conduct training in the Management of Covered Structure Units for Vegetable Producers	$35,000.00	5-Feb-24	16-Mar-24	2						$ 17,500.00	$ 17,500.00																	
1.3.3	Training in the Maintenance of Covered Structure Units	Conduct training in the Maintenance of Covered Structure Units for Vegetable Producers	$35,000.00	14-Mar-24	29-Apr-24	1							$ 17,500.00	$ 17,500.00																
1.4	Assigning Trainees to Trainers	Selection of Trainers to continue training the beneficiaries for a two-week period	$24,000.00	5-Apr-24	31-Aug-24	5								$ 4,800.00	$ 4,800.00	$ 4,800.00	$ 4,800.00	$ 4,800.00												
2.1	Draft the list and specification of equipment and materials required	Creating the specific requirements for all materials and equipment to be purchased by the project	$3,000.00	1-Aug-24	31-Aug-24	1												$ 3,000.00												
2.2	Tendering the procurement of equipment and materials.	Advertise requirements by the project for fair and equitable procurement practices	$2,000.00	9-Aug-24	18-Oct-24	3												$ 666.67	$ 666.67	$ 666.67										
2.3	Procurement of Materials and Equipment	Procurement of materials and equipment needed to operate a Covered Structure Unit.	$ 517,00.00	26-Aug-24	5-Nov-24	4												$ 129,250.00	$ 129,250.00	$ 129,250.00	$ 129,250.00									
2.4	Distribution of Materials and Equipment	Distribution of materials and equipment to beneficiaries	$80,000.00	1-Nov-24	28-Dec-24	2															$40,000.00	$40,000.00								
2.4.1	Site Selection	Selection of appropriate locations to place the covered structure units.	$36,000.00	3-Nov-24	31-Dec-24	2															$ 18,000.00	$ 18,000.00								
3.1	Clearing and drenching	Clearing of debris from around the location and preparing drainage systems	$60,000.00	3-Aug-24	30-Oct-24	3												$ 20,000.00	$ 20,000.00	$ 20,000.00										
3.2	Planting Seedlings	Planting of Vegetable Seedlings	$120,000.00	1-Oct-24	28-Oct-24	3													$ 40,000.00	$ 40,000.00	$ 40,000.00									
3.3	Installation of 36 Covered Structure Units	The construction and installation of 36 Covered Structure Units	$124,000.00	29-Sep-24	27-Nov-25	8																$ 15,500.00	$ 15,500.00	$ 15,500.00	$ 15,500.00	$ 15,500.00	$ 15,500.00	$ 15,500.00	$ 15,500.00	$ 15,500.00
3.4	Monitor and Maintain of Covered Structure Units	Monitor and Maintain 36 Covered Structure Units	$160,000.00	28-Dec-25	10-Feb-25	3																$ 53,333.33	$ 53,333.33	$ 53,333.33						
4.1	Planning	Planning project activities throughout the life of the project.	$90,000.00	1-Aug-23	31-Aug-29	24	$ 3,750.00	$ 3,750.00	$ 3,750.00	$ 3,750.00	$ 3,750.00	$ 3,750.00	$ 3,750.00	$ 3,750.00	$ 3,750.00	$ 3,750.00	$ 3,750.00	$ 3,750.00	$ 3,750.00	$ 3,750.00	$ 3,750.00	$ 3,750.00	$ 3,750.00	$ 3,750.00	$ 3,750.00	$ 3,750.00	$ 3,750.00	$ 3,750.00	$ 3,750.00	$ 3,750.00	$ 3,750.00
4.2	Scheduling	Scheduling project activities throughout the life of the project.	$81,000.00	1-Aug-23	31-Aug-29	24	$ 3,375.00	$ 3,375.00	$ 3,375.00	$ 3,375.00	$ 3,375.00	$ 3,375.00	$ 3,375.00	$ 3,375.00	$ 3,375.00	$ 3,375.00	$ 3,375.00	$ 3,375.00	$ 3,375.00	$ 3,375.00	$ 3,375.00	$ 3,375.00	$ 3,375.00	$ 3,375.00	$ 3,375.00	$ 3,375.00	$ 3,375.00	$ 3,375.00	$ 3,375.00	$ 3,375.00	$ 3,375.00

Determine Budget

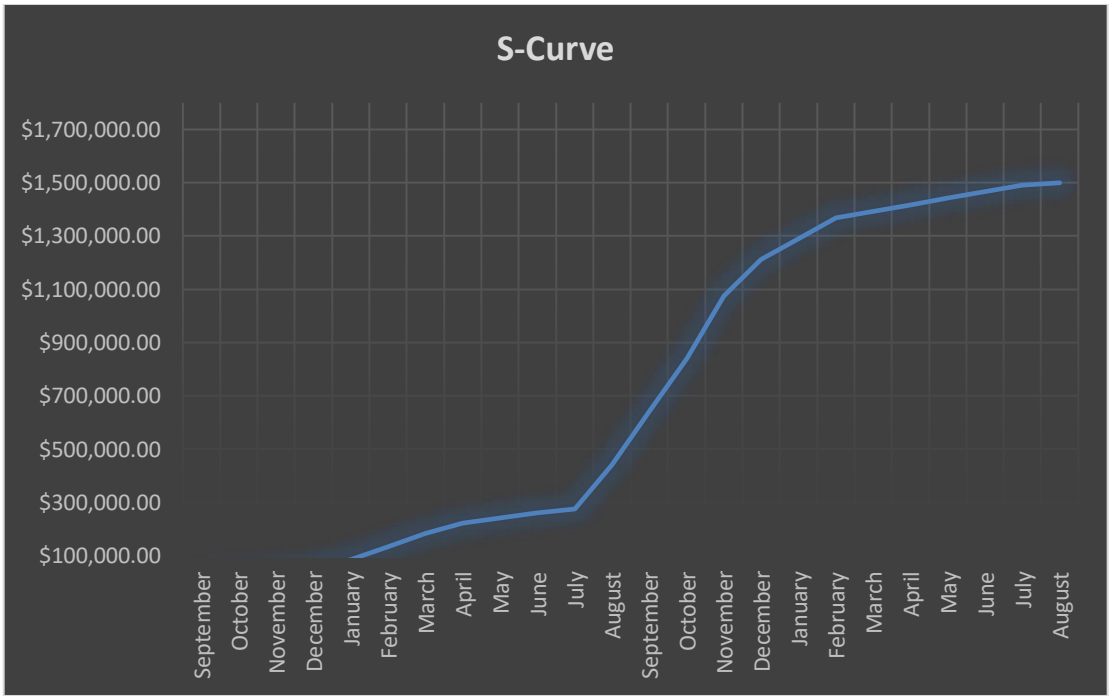
4.3	Meetings	Attending meetings with stakeholders to update them on project activities and progress	$22,000.00	1-Aug-23	31-Aug-23	24	$ 916.67	$ 916.67	$ 916.67	$ 916.67	$ 916.67	$ 916.67	$ 916.67	$ 916.67	$ 916.67	$ 916.67	$ 916.67	$ 916.67	$ 916.67	$ 916.67	$ 916.67	$ 916.67	$ 916.67	$ 916.67	$ 916.67	$ 916.67	$ 916.67	$ 916.67	$ 916.67	$ 916.67
4.4	Reports	Providing project reports, including daily logs, weekly reports, change updates and monthly work programs and support	$25,000.00	1-Aug-23	31-Aug-23	24	$ 1,041.67	$ 1,041.67	$ 1,041.67	$ 1,041.67	$ 1,041.67	$ 1,041.67	$ 1,041.67	$ 1,041.67	$ 1,041.67	$ 1,041.67	$ 1,041.67	$ 1,041.67	$ 1,041.67	$ 1,041.67	$ 1,041.67	$ 1,041.67	$ 1,041.67	$ 1,041.67	$ 1,041.67	$ 1,041.67	$ 1,041.67	$ 1,041.67	$ 1,041.67	$ 1,041.67
	Sub-total		$1,500,000.00																											
	Contingency Reserves		$225,000.00																											
	Baseline Cost		$1,500,000.00																											
	Management Reserve		$375,000.00																											
	Total Project Cost		$1,875,000.00																											
							$ 11,750.00	$ 14,416.67	$ 14,416.67	$ 11,750.00	$ 32,416.67	$ 49,916.67	$ 49,916.67	$ 37,216.67	$ 19,716.67	$ 19,716.67	$ 13,883.33	$ 166,800.00	$ 199,000.00	$ 199,000.00	$ 236,333.33	$ 135,916.66	$ 77,916.67	$ 77,916.67	$ 24,583.33	$ 24,583.33	$ 24,583.33	$ 24,583.33	$ 24,583.33	$ 9,083.33
							$ 11,750.00	$ 26,166.67	$ 40,583.34	$ 52,333.34	$ 84,750.00	$ 134,666.67	$ 184,583.34	$ 221,800.00	$ 241,516.67	$ 261,233.34	$ 275,116.67	$ 441,916.67	$ 640,916.67	$ 839,916.67	$ 1,076,250.00	$ 1,212,166.67	$ 1,290,083.34	$ 1,368,000.00	$ 1,392,583.34	$ 1,417,166.67	$ 1,441,750.00	$ 1,466,333.34	$ 1,490,916.67	$ 1,500,000.00

Note. This figure was sourced from F. Chable, Author, 2024. Own Work

A combination of Bottom – Up Estimating and Expert Judgement were utilized to determine the project budget. This allowed for the monthly expenditure to be estimated and determined based on when activities would be carried out and their durations in the overall project schedule. This was represented graphically on the S - Curve below.

Figure 18

S Curve



Note. This figure was sourced from F. Chable, Author, 2024. Own Work

4.4.4 Control Costs

Project Cost Control involves monitoring and controlling the project budget from influences that may affect changes to the authorized cost baseline. This is done through the integrated Change Control Process. This process allows for the review and scrutinization of all change requests. Cost Control allows for all requests to be analyzed to determine the potential effects on the cost baseline, scope, and schedule of the project. In the absence of this process, funds can be mismanaged and used in ways that negatively affect the overall project. For this project, Earned Value Management was used to manage the project costs. With this technique indicators for scope, cost and schedule can be used to measure project performance and progress. Indicators include Cost Variance (CV), Schedule Variance (SV), Cost Performance Index (CPI) and Schedule Performance Index (SPI). These are constantly monitored throughout the project to determine if the actual cost, scope, and schedule are as planned and on schedule. If not, they can also be used to determine how much adjustment must be made to get back on track.

4.4.5 Cost Variance Response

The Cost Variance Response process expounds on the control thresholds for the project and what actions will be taken if the project triggers a control threshold. As a part of the response process, the Project Management Team typically presents options for corrective action to the Project Sponsor.

Chart 14

Cost Variance Response Process

Performance Measure	**Yellow Condition**	**Red Condition**
Schedule Performance Index (SPI)	Between 0.8 and 0.9 or 1.1 and 1.2	Less than 0.8 or Greater than 1.2
Cost Performance Index (CPI)	Between 0.8 and 0.9 or 1.1 and 1.2	Less than 0.8 or Greater than 1.2
Indicator	**Response**	
Yellow Alert	Project Manager to conduct analysis and carry out necessary adjustments to the project budget to strengthen cost control and expenditure.	
Red Alert	Project Manager to conduct project cost performance overview, determine corrective actions and present to Project Steering Committee and Project Sponsor for approval.	

Note. This chart was sourced from F. Chable, Author, 2024. Own Work

Responses Based on EVM

Yellow Condition

Upon reviewing the indicators for the reporting period, if the control thresholds of CPI or SPI are between 0.8 and 0.9 or between 1.1 and 1.2, or if the SPI or CPI has a variance of between 0.1 and 0.2 since the prior reporting period, the Project Manager must report to the Project Sponsor and explain the causes.

Red Condition

Upon reviewing the indicators for the reporting period, if the control thresholds of CPI or SPI are less than 0.8 or greater than 1.2, or if the SPI or CPI has a variance of greater than 0.2, the Project Manager must report the causes and provide the PSC and the Project

Sponsor with a Cost Variance Corrective Action Plan to regain acceptable Project Performance.

4.4.6 Cost Change Control Process

The Cost Change Control Process involves the following steps to ensure that requests are justified and add value to the Project.

1. Receive the request
2. Record the request
3. Assess the request
4. Make recommendations
5. Accept or reject the request

4.5 Quality Management Plan

4.5.1 Introduction

According to PMI (2017) the Quality Management Plan includes processes for integrating the organization's quality policies regarding planning, managing, and controlling project and product quality requirements to meet stakeholders' objectives.

The Quality Management Plan for the Covered Structure Project will establish activities, processes, and procedures to ensure that implementation adheres to project design, quality standards and sustainability requirements. The Project Quality Management processes are defined as:

- Plan Quality Management
- Manage Quality

- Control Quality

4.5.2 Plan Quality Management

The Plan Quality Management process for the Covered Structure Project will involve the identification of quality requirements and standards to guide the project to achieve success throughout its life cycle. During the planning stage, the MAFSE will engage the services of the BMDC to ensure that every aspect of the project meets the required standards and specifications necessary to ensure quality is embedded into the project. Input for the process includes the project schedule, activity list and budget, which are all necessary to manage and schedule quality assessments throughout the project lifecycle. Quality assurances will also be strengthened through inspections, walk-throughs, meetings and expert judgement.

4.5.3 Roles and Responsibilities

Chart 15

Project Resource Management Roles and Responsibilities

Role	**Responsibilities**
Funding Institution (CDF)	Providing funding to execute the project
Implementing Agency (MAFSE)	Project execution
Beneficiaries (Vegetable Producers)	Directly benefit from the project
Suppliers	Supply the goods and services

Note. This chart was sourced from F. Chable, Author, 2024. Own Work

4.5.4 Quality Management Approach

According to PMI (2017), Manage Quality is described as the process of translating the Quality Management Plan into executable quality activities that incorporate the organization's quality policies into the project. The Quality Management approach for Covered Structure Project is aimed at ensuring that the proper regulations, standards and procedures as well as specifications are followed to ensure quality products that will perform as required, that meet the needs of the end users and are in satisfaction with the requirements of the Project Funding Institution. To do this, quality requirements are outlined, metrics specified, and the means of verification are stated. This allows for clarity of the process and accountability. Contractors will be expected to have a quality assurance plan approved by the Chief Executive Officer and validated for implementation throughout the project's life cycle. The Quality Assurance Processes for the Covered Structure Project include measuring metrics, lessons learnt from previous projects, analyzing process data, quality control and quality assurance recommendations.

4.5.5 Customer Prioritization

Chart 16

Customer Prioritization

Customer Prioritization	MAFSE	CDF	Vegetable Producers	Suppliers	Row Total	Relative Dec. Value
MAFSE		1	0.2	0.1	1.3	0.04
CDF	1		0.1	0.2	0.3	0.01
Vegetable Producers	5	10		5	20	0.54
Suppliers	10	5	0.2		15.2	0.41
Total					36.8	

Note. This chart was sourced from F. Chable, Author, 2024. Own Work

Based on customer prioritization, the level of importance is as follows:

1) Vegetable Producers

2) Suppliers

3) Ministry of Agriculture, Food Security and Enterprise (MAFSE)

4) CARICOM Development Fund (CDF)

4.5.6 Quality Requirements

a) Regulatory compliance

b) Policy adherence

c) Environmental considerations

d) Within budget

e) Sustainable

4.5.7 Requirements Prioritization

Chart 17

Requirements Prioritization (MAFSE)

Requirements Prioritization: Ministry of Agriculture Food Security and Enterprise (MAFSE)	Regulatory Compliance	Policy Adherence	Environmental Considerations	Within Budget	Sustainable	Row Total	Relative Dec. Value
Regulatory Compliance		1	10	5	1	17	0.30
Policy Adherence	1		5	0.1	0.2	6.3	0.11
Environmental Considerations	0.1	0.2		0.2	1	1.5	0.03
Within Budget	0.2	10	5		10	25.2	0.44

Sustainability	1	5	1	0.1		7.1	0.12
Total						57.1	

Note. This chart was sourced from F. Chable, Author, 2024. Own Work

Chart 18

Requirements Prioritization (CDF)

Requirements Prioritization: CARICOM Development Fund (CDF)	**Regulatory Compliance**	**Policy Adherence**	**Environmental Considerations**	**Within Budget**	**Sustainable**	**Row Total**	**Relative Dec. Value**
Regulatory Compliance		5	10	0.1	5	20.1	0.35
Policy Adherence	0.2		1	0.1	0.2	1.3	0.02
Environmental Considerations	0.1	1		0.2	1	2.3	0.04
Within Budget	10	10	5		1	26	0.46
Sustainability	0.2	5	1	1		7.2	0.13
Total						56.9	

Note. This chart was sourced from F. Chable, Author, 2024. Own Work

Chart 19

Requirements Prioritization (Vegetable Producers)

Requirements Prioritization: (Vegetable Producers)	**Regulatory Compliance**	**Policy Adherence**	**Environmental Considerations**	**Within Budget**	**Sustainable**	**Row Total**	**Relative Dec. Value**
Regulatory Compliance		10	0.1	1	0.2	11.3	0.20
Policy Adherence	0.1		5	1	0.1	6.1	0.11
Environmental Considerations	10	0.2		0.2	1	11.4	0.20
Within Budget	1	1	5		5	12	0.21
Sustainability	5	10	1	0.2		16.2	0.28
Total						57	

Note. This chart was sourced from F. Chable, Author, 2024. Own Work

Chart 20

Requirements Prioritization (Suppliers)

Requirements Prioritization: (Suppliers)	Regulatory Compliance	Policy Adherence	Environmental Considerations	Within Budget	Sustainable	Row Total	Relative Dec. Value
Regulatory Compliance		0.1	0.2	0.1	1	1.4	0.02
Policy Adherence	10		10	0.1	0.1	10.2	0.17
Environmental Considerations	5	0.1		0.2	5	10.3	0.17
Within Budget	10	10	5		1	26	0.43
Sustainability	1	10	0.2	1		12.2	0.20
Total						60.1	

Note. This chart was sourced from F. Chable, Author, 2024. Own Work

Chart 21

Customer Weighted Requirements Prioritization

Customer - Weighted Requirements Prioritization	MAFSE	CDF	Vegetable Producers	Suppliers	Row Total	Relative Dec. Value
Regulatory Compliance	0.01	0.00	0.11	0.01	0.12	0.12
Policy Adherence	0.00	0.00	0.06	0.07	0.13	0.13
Environmental Considerations	0.00	0.00	0.11	0.07	0.18	0.19
Within Budget	0.02	0.00	0.11	0.18	0.31	0.32
Sustainable	0	0	0.15	0.08	0.23	0.24
Total					0.97	

Note. This chart was sourced from F. Chable, Author, 2024. Own Work

Based on the requirements prioritization, the level of significance is as follows:

- Within Budget
- Sustainable
- Environmental Considerations

- Policy Adherence
- Regulatory Compliance

4.5.8 Factors Related to Quality.

Chart 22

Factors related to quality.

Factor	Factor Definition
Communication	Communication is an important factor for any project since the successful implementation and completion relies on the successful communication among stakeholders.
Leadership	This represents the Ministry of Agriculture Food Security and Enterprise ability to lead the Project Team to the successful completion of the Covered Structure and Capacity Enhancement Project.
Supplier Involvement	Supplier involvement is empirical to minimizing errors in the delivery of quality deliverables. Suppliers should be involved from the start of the project.
Employee Involvement	The Project Team must take ownership in the delivery of quality products and deliverables to potential customers.

Customer Satisfaction	The key success factor in quality is to ensure that the customers are satisfied. For this to happen quality products must be delivered.

Note. This chart was sourced from F. Chable, Author, 2024. Own Work

4.5.8 Metrics and Quality Baseline

Chart 23

Metrics and Quality Baseline

Quality Objective	Metric	Metric definition	Expected outcome/result	Measurement frequency	Responsible
To receive 100% of the funding project by August 2025	Percentage of funds received	Indicating CDF complete funds disbursement for the project by August 2025	Successful implementation of the Covered Structure Project by MAFSE.	Quarterly review of funds available balances.	CARICOM Development Fund/ Ministry of Agriculture
To complete 100% of the activities by August 2025	Percentage of work completed	MAFSE should complete all project	Successful and timely completion of the Covered Structure Project	Quarterly review of project activities	CARICOM Development Fund/ Ministry of Agriculture

Quality Objective	Metric	Metric definition	Expected outcome/result	Measurement frequency	Responsible
		activities by August 2025			
For project beneficiaries to receive 100% of materials by August 2025	Number of items received by beneficiaries	Vegetable Producers should receive all training, equipment and materials August 2025	Beneficiaries satisfied with the quality of products received by the project	Quarterly meeting and feedback requests	Ministry of Agriculture/ Beneficiaries
To supply 100% of items to the customers by August 2025	Number of items delivered to customers	The suppliers should supply all equipment and materials to the beneficiaries by August 2025	All items procured by the project are delivered on a timely basis and with quality specifications	Every delivery will be monitored for quantity and quality	MAFSE and Suppliers

Note. This chart was sourced from F. Chable, Author, 2024. Own Work

4.5.9 Control Quality

The process determines whether project outputs comply with applicable standards, requirements, regulations, and specifications and determines whether corrective action is to be taken (PMI, 2017). The Covered Structure Project team will apply quality control at project inception and continue throughout the project lifecycle and this will be the responsibility of the Project Manager. It is the duty of the Project Manager that suppliers and contractors comply with the quality requirements of the project and if there is any non-compliance, then corrective action should be immediately taken. To ensure compliance at all levels, the Project Manager, along with his technical coordinator, will inspect every item and services being offered on behalf of the project. This will be complemented with daily and weekly meetings that will generate reports and be shared with the relevant stakeholders. Cost and schedule will be monitored by examining planned results against actual results to identify variances and determine corrective actions to where necessary. Inputs for this process include project documentation such as Scope Baseline, Schedule Management Plan and budget.

4.5.10 Quality Activities

Quality activities are the activities that will be carried out from the commencement of the project through to its completion to ensure quality within the project. This ensures that there are proper checks and balances.

Chart 24

Quality Activities Matrix

Deliverable	Requirement	Manage and Control activities	Frequency	Responsible
Project approval	Submission of project proposal by MAFSE	Manage: Project submission	Initial stage of project	MAFSE
		Control: Approval	Initial stage of project	MAFSE
Selection of beneficiaries	Call for application	Manage: Receive applications	Initial stage of project	MAFSE
		Control: Evaluation of applications	Initial stage of project	MAFSE/CDF
Capacity building	Providing training to all Vegetable Producers in Best Horticulture Practices	Manage: Evaluate efficiency	Monthly	MAFSE
		Control: Monitor progress	Monthly	MAFSE/CDF
Procurement of materials and equipment	Broadcast call for supplier bids for items and materials needed by the project	Manage: Provide payments	Quarterly	MAFSE/CDF
		Control: Evaluate quality	Quarterly	MAFSE/ Suppliers
Distribution of materials and equipment to project beneficiaries	Providing benefits to beneficiaries	Manage: Timely distribution	Quarterly	MAFSE
		Control: Verification of delivery	Quarterly	MAFSE/ CDF

Note. This chart was sourced from F. Chable, Author, 2024. Own Work

4.5.11 Quality Documents

Monthly Achievement Check Sheet

Monthly Achievement Check Sheet	
Period – January to December 2024	
Achievements	Quality Standards (Y/N)
Training vegetable producers	Yes
Identification of trainers	Yes
Procurement of Covered Structure Equipment and Materials	Yes
Distribution of equipment and materials	No
Farmers' exchange visit	No
Production of Vegetables under Covered Structures	Yes
Labeling and Packaging	No
Marketing of Vegetables	Yes

Quality Check Sheet

Quality Checklist				
Project: Covered Structure Project	**Date: 18th February 2024**			
Verification				
Items	Yes/No	N/A	Signature	Comments
Corrugated Arcs	Yes			
UV Plastic	No			Too thick
Water Tanks	Yes			
PVC Pipes	Yes			
Lumber	Yes			
Fertigation System	No			Wrong Type
Irrigation System	Yes			

Seedlings	Yes			
Ladders	No			Wrong Make

4.5.11 Continuous Improvement Plan

Chart 25

Continuous Improvement Plan

Process Description
1. **Employee Training:** To ensure success at every level of the Covered Structure Project implementation, it is important that the Project Team remain capable of delivering quality products to the beneficiaries. Training must be practical and carried out by technical experts from both the public and private sectors.
2. **Skills Development:** The introduction and advance training provided is expected to continue building on the skills of the Project Team and of the beneficiaries. These skills acquired will allow the beneficiaries to financially gain from carrying out the necessary activities required to be productive in vegetable production.
3. **Improving Internal Processes:** Internal processes within the Ministry of Agriculture are needed to ensure that projects are given the importance that they deserve. To ensure that the project beneficiaries receive all the benefits owed to them it is important that the right human resources are put in the right position.
4. **Client Feedback:** Clients' feedback provides a review of their satisfaction with the organization, company, or product. This feedback creates an environment of continuous improvement with the necessary data and information for improvement. Gathering feedback can be as simple as a questionnaire, interviews, surveys or in person conversations.
5. **Timely Audits:** Audits are used to determine if project activities are in line with the organization's processes and policies, so it is important that timely audits are conducted so that mistakes and re-work are reduced and corrected as quickly as possible. The auditing of the Covered Structure Project will serve as the check and balance needed to ensure that the appropriate training, materials, and equipment are being supplied to the beneficiaries.

Note. This chart was sourced from F. Chable, Author, 2024. Own Work

The key factors for success for the Covered Structure Project identified were communication, leadership, supplier involvement, employee involvement and customer satisfaction. For this project to deliver quality products and services to the beneficiaries, the listed factors must be given attention and priority. The metrics and quality baseline will be used to perform measurements to track performance while executing the project. Quality baseline is the quality objective of the project and is what will be used to measure and report on quality. The quality documents used for this plan are a checklist and check sheet. These documents highlight processes necessary to ensure that quality requirements are being adhered to and accomplished.

4.6 Resource Management Plan

4.6.1 Resource Management Plan Introduction

According to PMI (2017), the Resource Management Plan involves the processes to identify, acquire and manage the resources needed for the successful completion of the project. This plan provides guidance on how project resources are categorized, allocated, managed, and released. (PMI, 2017). This chapter focuses on the development of a Resource Management Plan for the Covered Structure Project through the practical application of Project Resource Management. Effective management of resources from the design stage to final delivery of materials, equipment and training is highly dependent on accuracy of application of the intended Resource Management Processes for the Covered Structure Project.

4.6.2 Resource Management Approach

This plan covers the processes that deal with the creation and management of the Project Team and the roles and responsibilities of each member and how team members are chosen. In addition, the plan will address the acquisition and management of physical resources; namely consultants for training and covered structure materials and equipment that are necessary to operate a covered structure unit. These resources must be used as effectively as possible to keep the project on schedule and within budget. The utilization of resources will sometimes overlap and to avoid conflicts between tasks, these overlapping must be identified and resolved prior to this realization.

4.6.3 Project Resources Management Processes

The Resource Process Group includes identifying and acquiring appropriate and timely project resources such as facilities, materials, people, infrastructure, tools, and equipment useful to the realization of project activities. As stated by PMI (2017), the Project Resource Management processes are defined as:

- Plan Resource Management
- Estimate Activity Resources
- Acquire Resources
- Develop Team
- Manage Team
- Control Resources

4.6.4 Plan Resource Management

Resource planning and management are integral to Project Management success and must be incorporated using input tools such as expert judgment and meetings. According to PMI (2017), Plan Resource Management is the process of defining how to estimate, acquire, manage, and use team and physical resources.

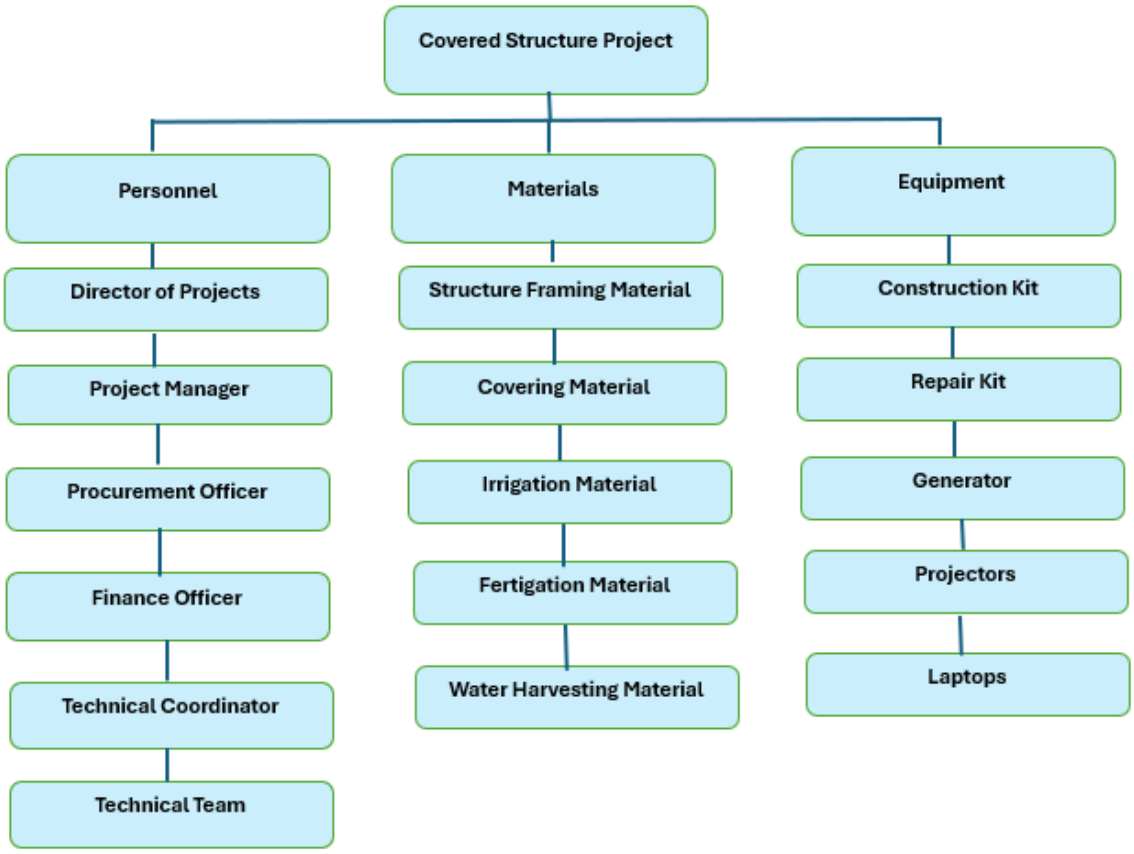
Resources are critical to enhancing and guiding efficiency and quality of output needed to realize the objectives of the Covered Structure Project. This planning process establishes the procedures used to estimate needed resources, manage, and acquire essential resources. The Project Manager has a pivotal role throughout the project's life cycle and ensures that resources are available when needed for the successful implementation and completion of the project. In the planning phase of this project, a Project Steering Committee was established to provide oversight and guidance for assurance of achieving project objectives. Project Steering Committee Meetings were held monthly to report on the project status and to obtain feedback from committee members. The committee was chaired by the Chief Executive Officer with support from the Director of Project, Project Manager, Technical Coordinator, and other members from the Ministry of Economic Development and MAFSE. All activities relating to the upcoming month were discussed and agreed upon during these meetings.

4.6.5 Resource Breakdown Structure

Resource Breakdown Structure is a hierarchical representation of resources by category and type (PMI, 2021).

Figure 19

Resource Breakdown Structure



Note. This figure was sourced from F. Chable, Author, 2024. Own Work

4.6.6 Project Organizational Chart/RACI Matrix

The RACI Chart, also known as the Responsibility Assignment Matrix, links Project Team members with tasks and activities that strengthen accountability within the project.

Chart 26

Responsibility Assignment Matrix

Task	Director of Projects	Project Manager	Procurement Officer	Finance Officer	Technical Coordinator	Technical Team
Draft TOR for training	I	R	C	I	A	I
Develop Training Modules	C	R	I	I	A	A
Conduct Best Horticulture Training	C	R	C	I	A	A
Training in Covered Structure Operation	C	R	C	I	A	A
Training in Covered Structure Management	C	R	C	I	A	A
Training in Covered Structure Maintenance	C	R	C	I	A	A
Assigning Trainees to Trainers	I	R	I	I	A	C
Draft the list and specification of equipment and materials required	I	R	R	I	A	C
Tender the procurement of equipment and materials.	I	R	R	I	A	I
Procurement of Covered Structure Equipment and Materials	I	R	R	C	I	I
Distribution of Irrigation and Fertigation Equipment and Materials	I	R	I	I	A	A
Site Selection	I	R	I	I	A	A

Cleaning and Drenching	C	R	C	I	A	A
Procurement of seedlings	C	R	A	C	I	I
Installation of Covered Structure Units	C	R	A	C	I	I
Monitor and maintain Covered Structure Units	C	R	I	I	A	A
Planning	R	R	C	C	I	I
Scheduling	R	R	C	C	I	I
Meetings	R	R	C	C	I	I
Reports	R	R	C	C	I	I
R= Responsible A=Accountable C= Consult I= Inform						

Note. This chart was sourced from F. Chable, Author, 2024. Own Work

4.6.7 Estimate Activity Resources

According to PMI (2017) Estimating Activity Resources is the process of estimating team resources and the type and quantities of materials, equipment, and supplies necessary to perform project work. Once activities are sequenced, quantity and type of resources are determined.

Therefore, to optimize the efficiency of the Covered Structure Project the effective use of equipment, materials, supplies and human resources were well managed to achieve maximum output during project execution. Activity schedules and change request control mechanisms were established to track project progress and manage information dissemination to stakeholders. Daily and weekly stand-ups meetings were held to provide feedback, identification of potential risks, planning and overall progress tracking were done to ensure adequate delivery and availability of resources when needed. Project progress and minutes

of meetings were disseminated to the stakeholders to ensure proper communication and updates. The inputs necessary to realize this process are the Resource Management Plan Scope and Scope Baseline, Activity List and Cost Estimates. Tools and techniques used were expert judgement, data analysis, meetings, interviews, and e-mails. The table below depicts a summary of the resource allocation aligned with the proposed schedule per project deliverable.

Chart 27

Resource Calendar

Level	WBS Code	Task Name	Duration (Days)	Start	Finish	Resources
2	1.1	Draft TOR for Training	25	September 10, 2023	October 7, 2023	Project Manager and Project Team
2	1.2	Develop Training Modules	44	October 8, 2023	December 6, 2023	Project Manager and Project Team
2	1.3	Conduct Best Horticulture Training	90	January 2, 2024	April 5, 2024	Project Manager, Consultants and Project Team
3	1.3.1	Training in Covered Structure Operation	10	January 14, 2024	January 25, 2024	Project Manager, Consultants and Project Team
3	1.3.2	Training in Covered Structure Management	10	February 5, 2024	February 15, 2024	Project Manager, Consultants and Project Team
3	1.3.3	Training in Covered Structure Maintenance	10	March 19, 2024	March 30, 2024	Project Manager, Consultants and Project Team
3	1.4	Assigning Trainees to Trainers	25	July 30, 2024	August 31, 2024	Project Manager, Consultants, and Project Team

Level	WBS Code	Task Name	Duration (Days)	Start	Finish	Resources
2	2.1	Draft the List and Specification of Equipment and Materials Required	5	September 10, 2024	September 16, 2024	Project Manager and Project Team
2	2.2	Tender the Procurement of Equipment and Materials.	10	September 10, 2024	September 21, 2024	Project Manager and Project Team
2	2.3	Procurement of Covered Structure Equipment and Materials	50	September 21, 2024	December 1, 2024	Project Manager, Procurement Officer, Finance Officer
2	2.4	Distribution of Irrigation and Fertigation Equipment and Materials	5	December 5, 2024	December 11, 2024	Project Manager and Project Team
3	2.4.1	Site Selection	35	December 9, 2024	January 30, 2025	Project Manager and Project Team
2	3.1	Cleaning and Drenching	20	September 2, 2024	September 22, 2024	Project Manager, PSC and Project Team
2	3.2	Procure of seedlings	20	October 5, 2024	October 26, 2024	Project Manager, Procurement Officer, Finance Officer
2	3.3	Installation of Covered Structure Units	60	October 20, 2024	January 28, 2025	Project Manager, Procurement Officer, Finance Officer
2	3.4	Monitor and maintain Covered Structure Units	30	January 31, 2025	March 14, 2025	Project Manager and Project Team
2	4.1	Planning	522	September 1, 2023	August 31, 2025	Project Manager, CDF, PSC and Project Team
2	4.2	Scheduling	522	September 1, 2023	August 31, 2025	Project Manager, CDF, PSC and Project Team

Level	WBS Code	Task Name	Duration (Days)	Start	Finish	Resources
2	4.3	Meetings	522	September 1, 2023	August 31, 2025	Project Manager, CDF, PSC and Project Team
2	4.4	Reports	522	September 1, 2023	August 31, 2025	Project Manager, CDF, PSC and Project Team

Note. This chart was sourced from F. Chable, Author, 2024, Own Work

4.6.8 Acquire Resources

Team members will comprise officers from MAFSE. These Officers have extensive knowledge and experience in their assigned responsibilities and together will collectively contribute to the success of the Covered Structure Project. The team members will include the Director of Projects, Project Manager, who will be assigned by the Director of Projects, the Finance Officer, Procurement Officer, Technical Coordinator, who will be assigned by the Project Manager and the Technical Team, who will be assigned by the Technical Coordinator. All members of the Project Team will be assigned roles and responsibilities that they must carry out as planned in the responsibility assigned matrix. Since each member of the project is already employed by the MAFSE, the coordination and execution of the project's activities is expected to be as per design. The inputs used in this process are Resource Management Plan, project documents, enterprise environmental factors, and Organizational Process Assets. Tools and techniques used are virtual teams, pre-assigned work, and negotiation.

Chart 28

Project Resource Roles and Responsibilities

Roles	Responsibilities
Director of Projects	Provide oversight of all projects within the auspices of the Ministry of Agriculture, Food Security and Enterprise. He is also responsible for reporting to International Funding Institutions.
Project Manager	Responsible for the execution of the project, activities planning, updating of project documents, scheduling, reporting, and networking with stakeholders.
Finance Officer	Monitor and control project finances, purchases, and reports.
Procurement Officer	Responsible for issuing tender, accepting bids, conducting meetings with potential suppliers, evaluating bids and issuing contracts to suppliers.
Technical Coordinator	Work in close collaboration with the Project Manager and is responsible for executing the technical work of the project and report to the Project Manager of progress of the project.
Technical Team	Work along the beneficiaries of the project to ensure they abide by the requirements of the project and report to the Technical Coordinator and Project Manager on the progress of the project.

Note. This chart was sourced from F. Chable, Author, 2024. Own Work

4.6.9 Team Development

Team Development will be a continuous process utilized throughout the execution of the Covered Structure Project. This is important for the technical team who will be executing the project in the six (6) districts. Weekly meetings will be held with all team members to ensure that everyone is informed and knowledgeable about the pending tasks. Training will be included in the project that specifically targets project team members to ensure they are up

to date with the latest technology in vegetable production under covered structures. The inputs necessary for the development of team processes are Resource Management Plan, Lessons Learned Register, Project Schedule, Project Team Assignments, Resource Calendars, Team Charter, enterprise environmental factors and organizational process assets. Tools and techniques included colocation, communication technology, interpersonal and team skills, recognition and rewards, training, individual and team assessments and meetings.

4.6.10 Managing Team

According to PMI (2017), "Manage Team is the process of tracking team member performance, providing feedback, resolving issues, and managing team changes to optimize project performance." The team will be directly managed by the Project Manager with responsibility for the technical team assigned to the technical coordinator. This is important to ensure that there is accountability in every aspect of the project. Documents that will be used to manage team members include: Issue Log, Lessons Learned Register, RACI, and Resource Management Plan. The tools and techniques used in this process are interpersonal and team skills, namely: conflict management, decision-making, emotional intelligence, influencing, leadership, and Project Management Information System. General reminders are constantly given to ensure that these are being adhered to and used when required. Adopting and using the above-mentioned tools will provide for clarity, thus reducing impending conflicts and disagreements. Conflict resolution is usually through dialogue, team collaboration or problem solving where a win-win situation is expected. Regardless of the

situation, the best positive outcome is where a compromise is derived that benefits the project and its deliverables.

4.6.11 Resource Management Document

Issue Log Template

Covered Structure Project Issue Log							
ID	**Name**	**Date Identified**	**Description of Issue**	**Priority**	**Issue Owner**	**Target Date**	**Notes**
1	Material unavailability	10/11/2024	UV Plastic not available in country	High	Project Manager	15/12/24	Will need to be imported into the Country
2							
3							

4.6.12 Control Resources

According to PMI (2017), “Control Resources is the process of ensuring that the physical resources assigned and allocated to the project are available as planned, as well as monitoring the planned, versus actual utilization of resources and taking corrective action as necessary.” This process is performed continuously throughout the project’s lifecycle.

The Project Manager for the Covered Structure Project will ensure that resources are procured when needed, available when required and distributed as planned. Project Team members should receive all the resources necessary to conduct their duties without obstruction and beneficiaries should receive their materials and equipment as planned. This is important to avoid project delays that can lead to scope creep. The inputs to the Resource Control Group for this project are Resource Management Plan, Project Documents, Work

Performance Data, Procurement Agreements and organizational process assets. Tools and techniques used are problem solving, and performance reviews and analysis.

4.7 Communication Management Plan

4.7.1 Communication Management Plan Introduction

The Communication Management Plan will be used to guide information and communication flow among stakeholders for effective project execution and coordination. Communication flow in this project refers to the art of controlling, monitoring, verifying, recording, and documenting information to strengthen and reinforce relationships within the project. As per the PMI (2017), the Communication Management Process includes:

- Plan Communication Management
- Manage Communications
- Control Communications

4.7.2 Audiences

The main audiences for this project are as follows:

- Government of Belize (GOB)
- Ministry of Agriculture, Food Security and Enterprise (MAFSE)
- CARICOM Development Fund (CDF)
- Vegetable Producers
- Suppliers

4.7.3 Plan Communication Management

The Plan Communication Management process is one of the key processes within the Communication Management Plan since it involves developing an approach on how communication will be addressed throughout the project. This will establish the flow of communication among stakeholders and ensure that communication within the project is effective and aligned with project goals, ultimately contributing to project success and stakeholder satisfaction. One of the first steps in developing and in achieving this objective is to identify all stakeholders who need to be communicated with and involved in the project. The communication requirements are then determined to ensure that stakeholders receive the right information, in the correct format, within a specified timeline and, very importantly, through the right channel. The stakeholder and communication requirements analysis for the Covered Structure Project is shown in Chart 28 below.

Chart 29

Stakeholder Identification and Communication Requirements

Stakeholder	Title	Communication Requirements	Communication Method	Contact Information	Responsible
Dr. Kyron Barker	CDF Project Funding Institution	○ Project Status Reports ○ Financial Reports ○ Project Risks	○ Meetings ○ Emails ○ Telephone Calls	kyron.barker@cdf.org	Project Manager

Dr. Servulo Baeza	MAFSE CEO	○ Project Status Reports ○ Financial Reports ○ Change Request ○ Annual Operational Plans	○ Meetings ○ Emails ○ Telephone Calls	ceo@mafse.gov.bz	Project Manager
Freddy Chable	Project Manager	○ Project Annual Operational Plan ○ Project status and quarterly reports, ○ Project Budget ○ Financial Reports	○ Meetings ○ Emails ○ Telephone Calls	pm.csp@mafse.gov.bz	Project Finance Associate
Geneva Castillo	Project Finance Associate	○ Project budgets/financial reports ○ Status reports ○ Project risk updates	○ Meetings ○ Emails ○ Telephone Calls	g.21castillo@mafse.gov.bz	Project Finance Associate

Note. This chart was sourced from F. Chable, Author, 2024. Own Work

4.7.4 Communication methods

The communication methods in Chart 29 below identifies all the types of communications required to successfully implement the Covered Structure Project.

Chart 30

Communication Matrix

Communication	Purpose	Medium	Frequency	Audience	Communicator
Project Steering Committee Meetings	Approvals and decision making	Meetings	Quarterly	Project Steering Committee Members, Project Team	Project Manager
Progress Reports	Update of project's progress	Meetings	Monthly	Project Manager, Project Team, IFI, Government of Belize	Project Manager
Technical Team Meeting	Making technical decisions	Meetings	Weekly	Project Manager, Technical Team	Technical Coordinator
Request for Information Meetings	Request project information and progress update	Email, Phone Calls	Monthly	Project Manager, Project Team, IFI, MAFSE, GOB	Project Manager
Beneficiaries Meetings	Update on project's progress	Meetings	Monthly	Project Manager, Technical Team, Beneficiaries	Technical Coordinator

Note. This chart was sourced from F. Chable, Author, 2024. Own Work

4.7.5 Manage Communications

According to PMI (2017), Manage Communications is the process of ensuring timely and appropriate collection, creation, distribution, storage, retrieval, management, monitoring, and the ultimate disposition of the project's information.

Projects are successful if open and honest communication is shared among the stakeholders, which builds trust and promotes transparency within the project. This free flow of information entails the involvement of the Project Team and their methodology of information gathering and dissemination. Manage communications for the Covered Structure Project will be executed using all the communications methods indicated in the Planned Communication Process. The Project Manager must ensure there is an enabling environment for the works of the project to flow and unhindered to create that communication flexibility that is required during project implementation. The effective use of the Communication Matrix must be employed to keep the relevant parties up to date with the project. This tool was developed for communication alignment which must be used appropriately and timely. In the event of conflicts or issues arising because of project communication that cannot be solved by the Project Manager, then those issues will be escalated to the authoritative level. The Project Team will maintain an issue log, which will be managed by the Project Manager, to record all issues arising during the lifecycle of the project and to ensure the continuation of the project.

4.7.6 Communication Escalation Process

For the Covered Structure project, a structured communication escalation process will be critical for effectively managing issues that cannot be resolved at the operational level and require higher-level intervention. The process begins with the identification of the issue or conflict by any team member or stakeholder. When the problem arises, the initial step will be to attempt resolution at the immediate level within the team or among the individuals directly involved. Involving open discussions and problem-solving sessions aimed at reaching a consensus or solution swiftly. If the issue persists at this stage, it will be documented and escalated to the next level of management, typically involving the Project Team leads or Functional Managers, who review the problem, gather relevant information, and work towards a resolution.

If the issue remains unresolved after escalating to team leaders, it will be further escalated to the Project Manager. The Project Manager will then conduct a more detailed analysis, involving relevant stakeholders and carrying out formal meetings to address the issue. At this level, the focus will be on assessing the impact of the problem on the project's scope, schedule, and budget, and determining appropriate corrective actions. The Project Manager will involve the Project Steering Committee or Project Funding Institution if the issue has significant implications or requires a decision beyond the Project Manager's authority. This higher-level intervention is designed to ensure that critical issues receive the attention and resources needed for effective resolution.

The Covered Structure Project's communication escalation process will also include clear documentation and reporting mechanisms. With each escalation documented with details

about the issue, actions taken at each escalation level, and the final resolution. This documentation will be important to maintain a transparent record of how the issues are handled and for learning purposes to improve future Project Management practices. Regular status reports will be provided to all relevant authorities, ensuring that there is a clear understanding of the issues at hand and the corrective actions being taken to address them. This structured escalation process helps in minimizing disruptions, ensuring timely resolution of conflicts, and maintaining project momentum.

Chart 31

Escalation Chart

Project Name: Covered Structure and Capacity Enhancement Project									
Project Number: BZE/G0009									
Issue #	Issue Details	Raised By	Date Raised	Priority			Escalate		To Whom
				H	M	L	Y	N	

Note. This chart was sourced from F. Chable, Author, 2024. Own Work

Key Priority H= High: Resolve Within Two Weeks; M= Medium: Resolve Within Three Weeks; L= Low: Resolve within one month

Escalate: Y=Yes; N= No

4.7.7 Monitor Communication

Monitor Communications is the process of ensuring the information needs of the project and its stakeholders are met (PMI, 2017). Effective monitoring of communication is essential for ensuring that information flows seamlessly among stakeholders in the Covered Structure Project. This involves the implementation of a systematic process to track and evaluate the

communication activities against the Communication Management Plan. Regular communication audits will be conducted to assess the effectiveness of communication channels, the clarity of information shared, and stakeholder engagement levels (PMI, 2021). These audits will involve the review of meeting minutes, reports, and communication logs to ensure that all key messages are delivered timely and precisely. Feedback mechanisms such as surveys and direct feedback sessions will be utilized to gauge stakeholder satisfaction with communication practices and identify any gaps or areas for improvement. Additionally, performance metrics such as response times, the frequency of updates, and the resolution of escalated issues will be tracked to measure the efficiency and effectiveness of communication. By continuously monitoring communication processes, the Covered Structure Project can adapt and refine its strategies to enhance transparency, improve stakeholder engagement, and ensure that all project participants are well-informed and aligned with the project's goals.

4.8 Risk Management Plan

4.8.1 Risk Management Plan Introduction

According to PMI (2017), risks are uncertain events or conditions; that if they occur, have a positive or negative effect on a project's objectives. All projects have associated risks which can prove both positive and negative on the project's outcome. The various characteristics that can affect the level of project risk include: project complexity, uniqueness, assumptions and constraints, people, requirements of stakeholders, changes, and environment.

Furthermore, PMI (2017), states that the objectives of Project Risk Management are to increase the probability and or/ impact of positive risks and to decrease the probability and/ or impact of negative risks, to optimize the chances of project success. This will allow the Project Team to maximize the opportunities presented from the positive risks and maximize the possible negative effects of the negative risks.

As stated by PMI (2017), the Project Risk Management processes are as follows:

- Plan Risk Management
- Identify Risks
- Perform Qualitative Risk Analysis
- Perform Quantitative Risk Analysis
- Plan Risk Responses
- Implement Risk Responses
- Monitor Risks

4.8.2 Plan Risk Management

Plan Risk Management involves the processes of establishing methodologies to manage risks throughout the project life cycle of the Covered Structure Project. The Project Manager and team of the Covered Structure Project are tasked with identifying all possible risks and evaluating their consequences on the successful outcome of the project. The PMI provides the necessary tools to effectively identify, monitor and respond to risks in the event of something happening. To efficiently manage potential risks, the Project Manager and team will create a Risk Management Plan in the planning phase that will be monitored throughout

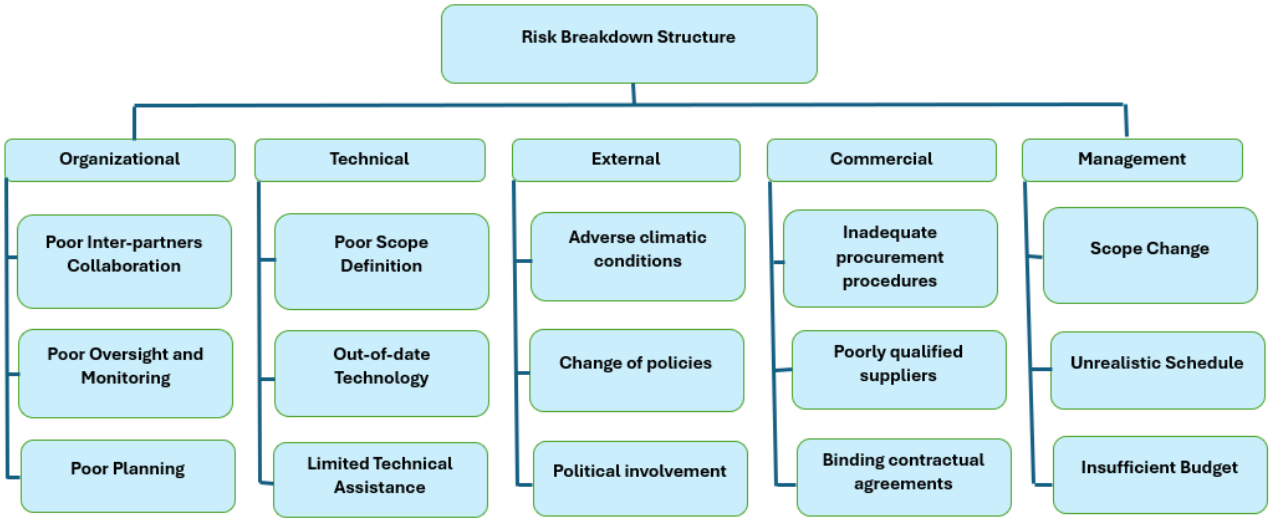
the execution of the project. The Risk Management Plan requires input from the Project Charter, Stakeholder Register, Procurement Records, Activity Durations, and Activity Cost. Tools required for this process include expert judgement and meetings. The objective of this plan is to increase the probability of the positive risk while at the same time decreasing the probability of negative risks from the project.

4.8.2.1 Risk Breakdown Structure

This Risk Breakdown Structure will be used to structure and guide the Risk Management Process through the understanding of the distribution of risk on the project and aiding in effective Risk Management.

Figure 20

Risk Breakdown Structure



Note. This figure was sourced from F. Chable, Author, 2024. Own Work

4.8.2.2 Probability and Impact Scales

According to the PMI (2017), definitions of risk probability and impact levels are specific to the project context and reflect the risk appetite and thresholds of the organization and key stakeholders. The PMI (2017) states that Qualitative Risk Analysis and Quantitative Risk Analysis processes highlight the probability of a risk occurring and potential impact on project outcomes. The Probability Scale Matrix below will be used to evaluate both threats and opportunities of the three objectives of the project which include: to increase rural livelihood opportunities through vegetable production in farming communities especially among women and youth, increase national production and productivity of vegetables, and increase the quality of vegetables through the promotion of best horticulture practices.

Chart 32

Probability and Impact Scales

Scale	Probability	-/+ Impact on Project Objectives		
		Time	Cost	Quality
Very High	>70%	>1 Year	>$1M	Very significant impact on overall functionality
High	51-70%	9 Months - 1 Year	$500 - $1M	Significant impact on overall functionality
Medium	31-50%	6-9 Months	$300-$500T	Some impact in key functional areas
Low	11-30%	3-6 Months	$100-$300T	Minor impact on overall functionality
Very Low	1-10%	1-3 Months	$50T-$100TM	Minor impact on secondary functions
Nil	<1%	No Change	No Change	No Change in functionality

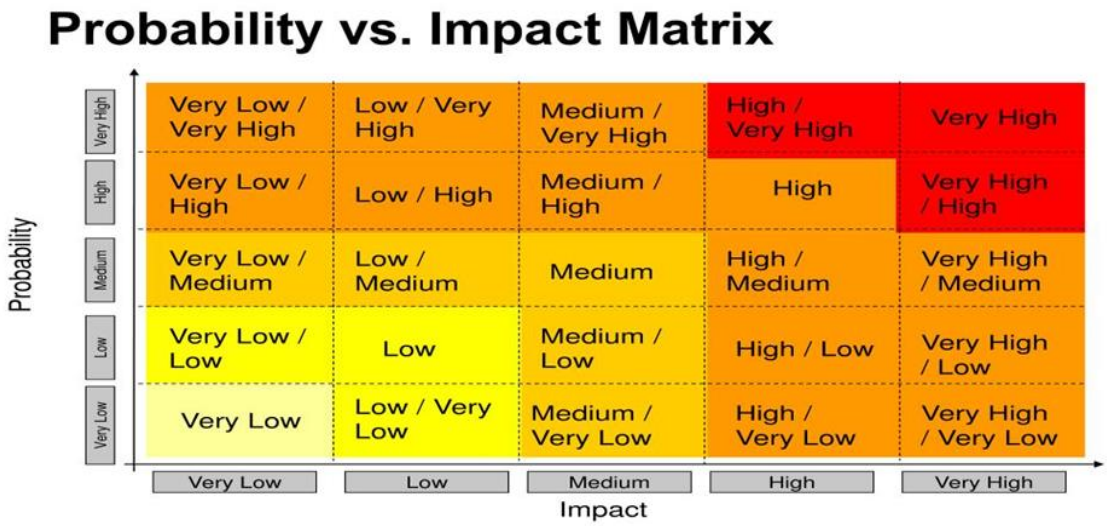
Note. This chart was sourced from F. Chable, Author, 2024. Own Work

4.8.2.3 Probability and Impact Matrix

The Probability and Impact Matrix presented below represents opportunities and threats using positive definitions of impacts for opportunities and negative impacts for threats. The Probability vs. Impact Matrix graph below describes what can be found in the probability and impact assessment. The Probability and Impact Matrix is a part of the qualitative analysis in the Risk Management Process. The matrix is a grid used to identify and track the probability of risk occurrence and its impact on the project's objective if the risk occurs (PMI, 2017).

Figure 21

Probability and Impact Matrix



Note. This figure was sourced from F. Chable, Author, 2024. Own Work

4.8.2.4 Covered Structure Project Probability and Impact Matrix

Chart 33

Covered Structure Project Probability and Impact Matrix

Covered Structure Project Probability and Impact Matrix

Risk Description	Risk Category	Probability	Impact	Risk Rating	Response
Poor Planning	Organizational	High	High	Very High	Manage
Unrealistic schedule	Management	High	High	Very High	Manage
Insufficient budget	Management	High	High	Very High	Manage
Adverse climatic conditions	External	High	High	Very High	Manage
Poor scope definition	Technical	High	High	Very High	Manage
Scope Change	Management	High	High	Very High	Manage
Inadequate procurement procedures	Procurement	High	High	Very High	Manage
Poor oversight and monitoring	Organizational	Medium	High	High	Attention
Out-of-date technology	Technical	Medium	High	High	Attention
Limited technical assistance	Technical	Medium	High	High	Attention

Change of policies	External	Medium	High	High	Attention
Political involvement	External	Medium	High	High	Attention
Poorly qualified suppliers	Commercial	Medium	Low	Medium	Monitor
Binding contractual agreements	Procurement	Medium	Low	Medium	Monitor

Note. This chart was sourced from F. Chable, Author, 2024. Own Work

4.8.3 Identify Risks

According to PMI (2017) Identify Risk is the process of identifying individual project risks as well as sources of overall risk and documenting their characteristics. The Risk Identification Process for the Covered Structure Project was a collaborative effort between the Project Team and the consultants hired during the project planning phase. During this process, historical, environmental, and geographical locations were conducted to obtain information on possible impacts on socio-economic impact of the beneficiaries. This process was conducted during the initiating and planning stages of the project and information obtained was used to develop the Risk Register for the project. The Identify Risk Process is continuous and iterative in nature, and it is required throughout the project as new risks can present themselves at any time during the project's life cycle.

4.8.4 Qualitative Risk Analysis

According to PMI (2017) the Qualitative Risk Analysis is the process of prioritizing individual project risks for further analysis or action by assessing their probability of occurrence and impact as well as other characteristics. The Qualitative Risk Analysis for the Covered Structure Project was conducted by the Project Team led by the Project Manager in consultation with the Project Steering Committee and other stakeholders, through a process of assessing risk prioritization using probability of risk occurrence. Inputs for conducting the Qualitative Risk Analysis included the Risk Register, Assumption Log, Organizational Process Assets, and other project documents. The Project Manager is responsible for guiding the project team in reviewing and updating project documents for project risks and issues throughout the project's life cycle.

4.8.5 Quantitative Risk Analysis

Perform Quantitative Risk Analysis is the process of numerically analyzing the combined effect of identified individual project risks and other sources of uncertainty on overall project objectives (PMI, 2017). This process requires quantitative analysis for risk impact that includes evidence and verified data to identify effective risk response. For this project, performing Quantitative Risk Analysis was not utilized since the project is considered small-scale so only qualitative analysis was used for the level of risk identification and the identification of possible responses.

4.8.6 Risk Register

The Risk Register provides details for each individual risk, previously identified, and prioritized, which requires risk responses. The prioritization of each risk will assist in the selection of risk responses. High-priority threats or opportunities may require greater importance, action, and proactive measures. On the other hand, threats and opportunities in the low-priority level may not require the same actions as in the high-priority other than being reflected in the risk register; watch list or adding contingency reserve (PMI 2017).

The Risk Register for the Covered Structure Project was developed by the Project Manager, the Project Team, the Project Steering Committee, and other stakeholders. The register highlights previously identified risks, risks owners, triggers and possible responses in the event those risks should occur.

Risk Register

chart 34

Risk Register

RBS Code	Cause	Risk	Consequence	Probability	Impact	PXL	Priority	Risk Trigger	Risk Response	Risk Owner
R001	Project writing team uncertain of project requirements	Poor Planning	Can cause project delays and cost overruns	High	High	0.28	High	Delayed delivery of important tasks	Ensure project writing team are knowledgeable and skilled in the project requirements	Project Manager, Stakeholders
R002	Stakeholders requesting changes in project schedule and timelines	Unrealistic Schedule	Can cause extended timelines and cost overrun	High	High	0.28	High	Late approvals from funding institutions and local government	Conduct strict time management and document/record project progress	Project Manager
R003	Inflation	Insufficient budget	Can cause Cost overruns and project shortfalls	High	High	0.28	High	Completion delays	Allocate appropriate contingency reserves	Project Manager, Sponsor
R004	Time of year	Adverse climatic conditions	Can cause extended timelines and cost overrun	High	High	0.28	High	Flooding or Drought	Conduct projects during the suitable time of the year	Project Manager

RBS Code	Cause	Risk	Consequence	Probability	Impact	PXL	Priority	Risk Trigger	Risk Response	Risk Owner
R005	Stakeholders unsure of project requirements and schedule	Poor Scope Definition	Can cause Scope creep and delayed timelines	High	High	0.28	High	Scope creep, due to ad hoc requests by the stakeholders, this will be shown by civilians' discontent	Ensure stakeholders are in possession of project documents to be certain of project requirements.	Project Manager
R006	Stakeholders requesting changes to project requirements	Scope Change	Can cause Cost to increase over budget	High	High	0.28	High	Delays delivery of project requirements	Establish strict adherence to change control process	Project Manager, Stakeholders
R007	Inflation and corruption during project implementation	Inadequate procurement procedures	Can cause cost overruns and delayed timelines	High	High	0.28	High	Delays and cost to the project	Establish appropriate procurement review and approval procedures	Procurement Officer
R008	Poor communication among stakeholders	Poor oversight and monitoring	Can cause delays and poor-quality delivery	Medium	High	0.20	High	delays in project implementation	Provide clear and effective communication mechanisms to stakeholders	Project Manager
R009	Poor planning and changes in project requirements	Out-of-date technology	Can cause project delays and timelines	Medium	High	0.20	Medium	Scope creep and schedule delays	Ensure technological requirements are specified in project document	Project Manager
R010	Poorly trained technical team	Limited technical assistance	Can cause delays and costs overruns to the project	Medium	High	0.20	Medium	Inferior quality delivery of requirements	Conduct capacity building of technical staff	Project Manager, Technical team

RBS Code	Cause	Risk	Consequence	Probability	Impact	PXL	Priority	Risk Trigger	Risk Response	Risk Owner
									in related field of work	
R011	Changes in Government requirements	Change in policies	Can cause delays in project timeline and cost overruns	Medium	High	0.2	Medium	Scope creep	Ensure the project agreement is adhered to by policies and unchanged	Project Manager
R012	Government changes	Political involvement	Can cause scope creep, project delays and cost overruns	Medium	High	0.2	Medium	Scope creep, lack of communication	Ensure the project agreement is adhered to by political parties	Project Manager
R013	Poor vetting of suppliers	Poorly qualified suppliers	Can cause extended timeline and poor-quality deliverables	Medium	High	0.2	Medium	Vague procurement process	Develop an open tendering suppliers application process	Procurement Officer
R014	Poor formulation of contractual agreements	Binding contractual agreements	Can cause project delays and inferior work delivery	Medium	High	0.4	Medium	Unsatisfied customers	Acquire legal advice to review contracts for their adherence to the procurement regulations and procedures	Project Manager

4.8.7 Plan Risk Responses

According to PMI (2017), Risk Response is the process of developing options, selecting strategies, and agreeing on actions to address overall project risk exposure, as well as treating individual project risks. The Project Team members of the Covered Structure Project, including the Project Manager, are each assigned a risk or risks that they are responsible for regarding monitoring and implementing agreed responses where necessary. Risk owners are responsible for reporting any threat that may pose detrimental to project objectives. These reports must be done using the appropriate channels and hierarchy. Risk Responses for the Covered Structure Project were instituted through daily and weekly meetings and discussions as scheduled in the Communication Matrix, whereby risk owners had to prepare summary reports during progress updates. Risk actions were developed by selecting one of the options: Avoid, Mitigate, Exploit, Transfer, or Accept Risk. The Risk Register will be updated periodically with the appropriate risk response while risks are monitored.

4.8.8 Implement Risk Response

Implement Risk Response is the process of implementing agreed upon risk response plans (PMI, 2017). Implementing Risk Response for the Covered Structure Project entailed the pre-agree assignment of risk owners and their responses as agreed in the Risk Register. This is important since it minimizes risk exposures and threats and maximizes opportunities. The Project Manager is directly responsible for this process, with the assistance of the Project Team. The inputs required for this process are project documents which include the Risk

Register, Lessons Learnt Register, Project Management Plans, and Organizational Process Assets. The tools and techniques include expert judgement and interpersonal and team skills.

4.8.9 Monitor Risks

According to PMI (2017), Risk Monitoring is the process of monitoring previously identified risks and reinforcing the existing structures and Risk Response Strategies to identify, analyze and plan for newly identified risks. The Project Management Team will continuously update the Risk Register to ensure risks are being kept under strict monitoring and progress reports are being documented and acted upon. Risk monitoring for the Covered Structure Project will reassure the effectiveness of the Risk Management Plan. Inputs for this process included work performance data, Lessons Learnt Register, and Risk Register and work performance reports. Tools for this process included audits and meetings.

4.9 Procurement Management Plan

According to PMI (2017), the planning process in Procurement Management entails the recording and documentation of decisions agreed upon for purchasing, goods and services as well as the method to find and utilize specific suppliers. The determination of procurement needs of a project is work specific and can be conducted weekly, monthly or yearly based on the scope and the Project Management Plan of the project. This process clearly defines the roles and responsibilities of each team member to ensure appropriate and skilled personnel

as described in the Resource Management Plan of the project. This is coupled with a detailed checklist of works that should be completed prior to commencing the procurement process. Some of the inputs that the PMBOK recommends and that were used throughout the Covered Structure Project include:

- Project Charter
- Project Management Plan
- Project documents such as Resource Management Plan, requirements documents and Matrix, and a Stakeholder Register.
- Enterprise environmental factors, esp. equipment and materials availability
- Organizational process assets

The tools and techniques utilized were expert judgement and meetings.

Chart 35

Procurement Management Plan Roles and Responsibilities

Role	**Responsibilities**
Project Manager	○ Identification of project resources ○ Provide technical specifications and Terms of Reference ○ Monitoring and Evaluation of procured resources. ○ Assignment of Resources
Procurement Officer	○ Preparation of bid proposals ○ Evaluation of bids ○ Vendor selection and contractual agreements.
Finance Officer	○ Approving contracts ○ Approval of payments

	○ Financial Record Keeping

Note. This chart was sourced from F. Chable, Author, 2024. Own Work

4.9.1 Conduct Procurement Management

According to PMI (2017), Conduct Procurement is "the process of obtaining seller responses, selecting a seller, and awarding a contract." This process is important since it assists in the selection of qualified sellers and provides legal support for goods and services procured by the project. The legal support is established through signed Memorandum of Agreements (MOA), purchase orders and contracts. The inputs for this process include the Project Management Plan (Scope Management Plan, Requirements Management Plan, Communications Management Plan, Risk Management Plan, Procurement Management Plan, And Cost Baseline); project documents (Lessons Learned Register, project schedule, requirements documentation, Risk Register and Stakeholder Register), procurement documentation, seller proposals, contracts, enterprise environmental factors, and organizational process assets.

4.9.2 Procurement Definition

The Bill of Quantities (BOQ) below outlines the materials, services and equipment needed for the execution of the Covered Structure Project.

Chart 36

Bill of Quantities

Item	Description	Units	Quantity	Justification
	Draft TOR for Training			
1	Definition of training requirements	No.	6	To ensure training delivered meets the standard for Best Horticulture Practices
2	Hire Consultant to establish TOR for training	No.	1	Training conducted for vegetable producers using best horticulture practices methodologies
	Develop Training Modules			
1	Identification of Thematic Areas	No.	4	To match with project requirements
2	Hire consultant to create Training Modules	No.	1	To ensure uniformity in the delivery of training to vegetable producers.
	Conduct Best Horticulture Trainings			
1	Training in Covered Structure Operation	No.	2	To train vegetable producers on the importance of the Operation of Covered Structure Units.
2	Training in Covered Structure Management	No.	2	Train vegetable producers in complete management of Covered Structure Units.
3	Training in Covered Structure Maintenance	No.	2	Train vegetable producers in the Maintenance of Covered Structure Units.
	Assigning Trainees to Trainers			
1	Selection of qualifying Trainees to be assigned	No.	36	Trainees to receive ten days of theory and practical training and guidance
2	Contractual agreement with Trainers	No.	4	Delivery of Training to Vegetable producers
	Site Selection			
1	Fuel	Gal	100	For the Project Team to find the appropriate location for the 36 Covered Structure Units.
	Cleaning and Drenching			

Item	Description	Units	Quantity	Justification
1	Weed Trimmer	No.	1	Keeping the area clean
2	Fuel	Gal	5	To be used in the weed trimmer
	Draft the list and specification of equipment and materials required			
1	Hire Consultant	No.	1	To work with technical team to draft specifications for equipment and materials
	Tender the procurement of equipment and materials.			
1	Advertisement	No.1	6	Fair equitable publication of project requirements
	Procure Covered Structure Equipment and Materials			
1	Covering Materials	No.	36	To be used for the Construction of the Covering of the 36 structures.
1	Structure Framing Materials	No.	36	To be used for the Construction of the Structure of the 36 structures.
1	Irrigation and Fertigation Materials	No.	36	To be used for the Construction of the Irrigation and Fertigation Systems of the 36 structures.
	Covered Structure Installation			
1	Complete Covered Structures	No.	36	Complete construction of the 36 Covered Structure Units.
	Monitor and Maintain Covered Structure Units			
1	Fuel	Gal	100	To keep the area clean

Note. This chart was sourced from F. Chable, Author, 2024. Own Work

4.9.3 Type of Contract

A Fixed Price Contract will be used to carry out the Project. This is common for agricultural projects since the project's details were written during the planning stage so very little

changes are expected during the execution of the project. A Fixed Price Contract is the most appropriate for this project since it includes materials, equipment, and services. All costs associated with the project will be negotiated prior to contract signing. Contracts will be monitored using the Contract Administration Matrix below.

Contract Administration Matrix

CONTRACT ADMINISTRATION MATRIX				
Project:			**Contract:**	
Contract Manager:				
Contact:				
Technical Group:				
Validity of the Contract:				
Start Date:	**Closing Date:**			
ACTIVITIES	**DATE**	**REQUIRES VALIDATION?**	**VALIDATED BY**	**OTHER ASPECTS**
REVIEWS / VISITS				
PAYMENTS / AMOUNTS				
VERIFICATION OF GUARANTEES				
SUBCONTRACTOR CONTROL				
CLOSING CONTRACT				
OBSERVATIONS: Breaches, actions taken, endorsements, fines applied, acknowledgments, temporary receptions, etc.				
Approved by:				
Signature and date:				

Note: Source UCI, 2024

4.9.4 Decision Criteria

Throughout the Covered Structure Project, suppliers will be required to meet all Project specifications. The criteria are listed below:

- Be able to deliver goods within specified timelines.
- Provide material quality certificates upon request.
- High quality standards
- Reasonable prices

4.9.5 Control Procurement Management

According to PMI (2017), Control Procurement is concerned with managing and monitoring procurement activities including managing contracts and ensuring that the performance of every party conforms with the agreed upon requirements as per the contract. The Procurement Officer in the Ministry of Agriculture, Food Security and Enterprise will take full responsibility for the procurement processes of the Covered Structure Project. In addition, the Procurement Officer will also ensure that the procurement procedure of the project is aligned with the regulations and policies of the Government of Belize and will oversee the entire project's procurement processes to ensure that consultants and contractors are operating within the confinements of the procurement framework for the project. The Procurement Officer in consultation with the finance officer and Project Manager will administer and ensure each delivery meets agreed quality standards through the implementation of quality control systems such as checklists and specification requirements. The Project Manager and the Project Management Team, including consultants, will provide

status updates on project activities in a timely manner to ensure stakeholders are informed and aware of the project's progress.

4.9.6 Procurement Change Control Process

Procurement Change Control is a critical process designed to manage and document any modifications to procurement contracts or requirements throughout the Covered Structure project's lifecycle. The process ensures that any changes in procurement such as adjustments in scope, cost, schedule, or vendor performance are evaluated, approved, and implemented thoroughly. When identifying a need for change, a formal change request will be submitted, detailing the nature of the change, its justification, and potential impacts on the project. This request will undergo a thorough review by the Procurement Team and relevant stakeholders, who assess the implications for project objectives, budget, and timelines. Approved changes will be documented, communicated to all affected parties, and integrated into the procurement plan and contracts. This rigorous control mechanism will ensure that all procurement changes align with project goals, mitigate risks, and maintain contractual integrity, thereby supporting the successful execution of the Covered Structure Project.

4.10 Stakeholders Management Plan

4.10.1 Introduction

According to PMI (2017), Stakeholder Management is the process required to identify the people, groups, or organizations that can 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. The effective management of stakeholders can reduce the undesirable effects of the negative impacts on project's success and capitalize on the opportunities of the positive impacts for project's success. This capitalization will not be possible without first identifying those stakeholders that are influential for the project's success, managing them and controlling their influence. The Covered Structure Project Stakeholder Management Plan will identify the stakeholders to foster positive relationships, mitigate risks and maximize stakeholder support which are key aspects for the success of the project. It will also determine the stakeholders' power, interest and influence/impact on the project.

According to PMI (2017), the Project Stakeholder Management processes are:

- Identify Stakeholders
- Plan Stakeholder Engagement
- Manage Stakeholder Engagement
- Monitor Stakeholder Engagement

4.10.2 Identify Stakeholders

According to PMI (2017), Identify Stakeholders is the process of identifying project stakeholders regularly and analyzing and documenting relevant information regarding their interests, involvement, interdependence, influence, and potential impact on project success. Stakeholders' identification for the Covered Structure Project started in the initiation and planning phase. The Director of Projects and Project Team conducted weekly meetings to identify possible stakeholders, their roles and responsibilities and determine their level of

influence on project activities. This was carried out in consultation with past experts within the MAFSE and other past hired consultants. The effort was to ensure that all stakeholders were properly identified and documented prior to project implementation. This process also involved the determination of each stakeholder's expectation from the project, where during the project they are most influential and their manner of communication as the project advanced. The Project Manager took the lead in contacting each stakeholder and created an effective communication channel to ensure each stakeholder' contribution to the success of the project, this was always documented.

Inputs to this process were the Project Charter, organizational process assets and enterprise environmental factors. A stakeholder Register Matrix was used to identify persons, groups, and organizations that have an interest in the project work, and results.

4.10.2.1 Stakeholder Analysis

The Stakeholder Analysis was prepared with the use of past existing project documents, such as the Project Charter, brainstorming sessions, and meetings. Determining the stakeholder influence and impact started during the initial phase of the project phases and continued throughout the project life cycle.

Chart 37

Stakeholder Analysis

Stakeholder	Project Involvement	Interest	Competence
The Government of Belize (GOB)	○ Project authorization ○ Funds approval	○ Project success ○ Economies of scale	Financial support
Ministry of Economic Development and Finance	○ Releases funding for the project as agreed. ○ Communicate project status reports.	○ Project success	Funds release
Ministry of Agriculture, Food Security and Enterprise (MAFSE)	○ Project Implementation ○ Receives progress report ○ Sends progress report to Financial Institution	○ Project success ○ Beneficiaries' socio-economic benefits	Project Execution
CARICOM Development Fund (CDF)	○ Funds Approval and disbursement ○ Receives reports ○ Conduct Checkups ○ Drafts reports ○ Conducts Disbursements	○ Project success ○ Socio-economic benefits of vegetable producers	Funds approval, disbursement and control
Vegetable Producers	○ Beneficiaries of the Project ○ Attending training courses ○ Signing MOA	Creating a vegetable enterprise	Vegetable producers
Suppliers	○ Deliver quality products as per agreement ○ Source equipment and materials for the project	Economic Benefit	Supplying good quality equipment and materials

Note. This chart was sourced from F. Chable, Author, 2025. Own Work

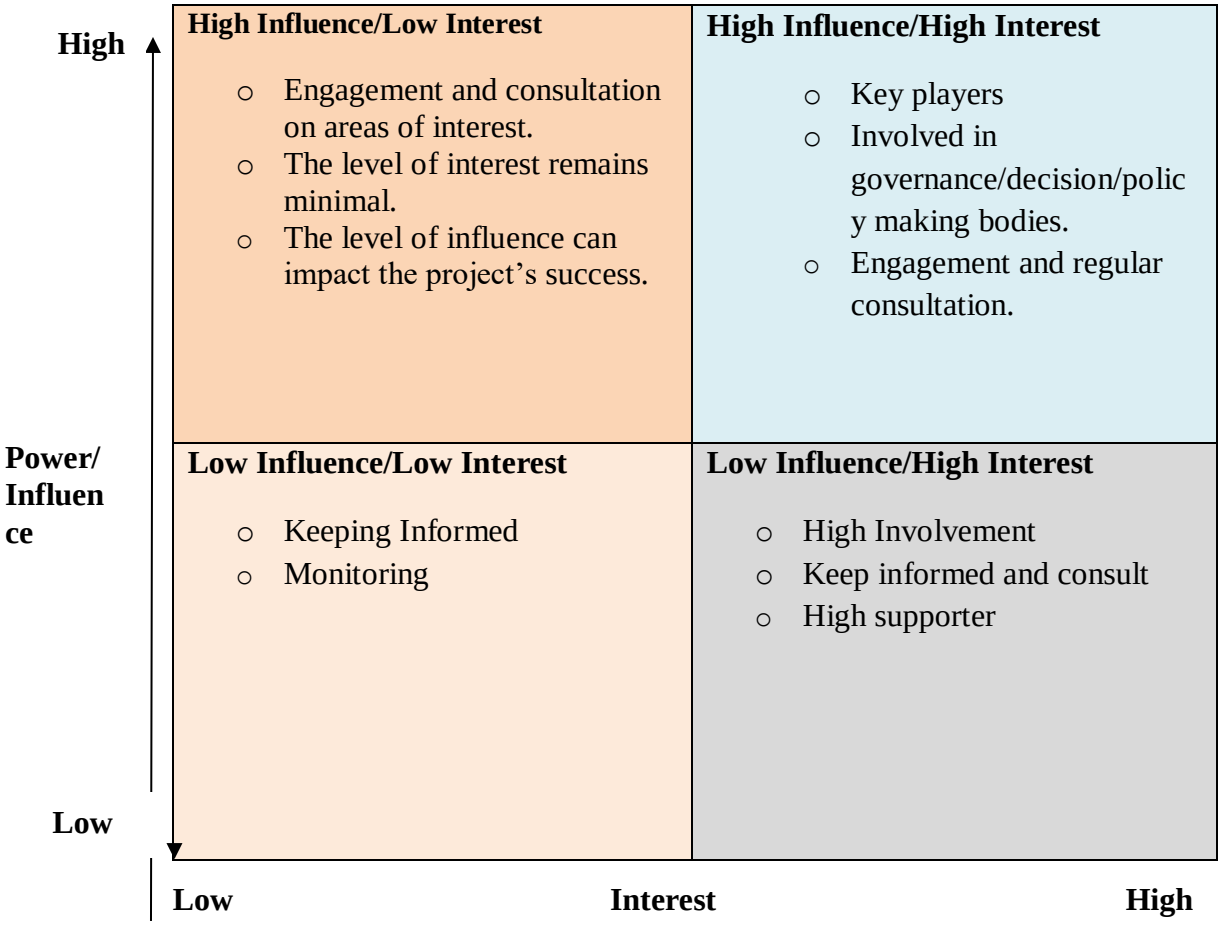
The Covered Structure Project stakeholders were classified into 4 categories:

- High influence/High Interest
- High influence/Low interest
- Low influence/High interest
- Low influence/Low interest

Chart 38 below indicates the influence/interest model for the Covered Structure Project:

Chart 38

Influence/Interest Model



Note. This chart was sourced from F. Chable, Author, 2025. Own Work

The most critical stakeholders are members of the high interest / high influence category. The analysis of the stakeholders will be executed with the use of expert judgment, lessons learnt, brainstorming techniques, and the results included in the stakeholder registry.

Chart 39

Stakeholders Register

ID	Stakeholders	Functional Area	Roles	Responsibilities	Expectations	Requirements	Influence/Interest (Low-High)
1	The Government of Belize (GOB)	Government of Finance and Economic Development	Project Approver	Approving project based on Sustainable Development Plan of Belize 2020-2030	For funds to be utilized for the intended purpose and to receive all reports from the implementing agency.	For the implementation agency to provide timely and accurate reports.	Medium Influence, High Interest
2	Ministry of Economic Development and Finance	Financial Administration	Funding Institution Focal Point Representative	Direct communication between IFI and executing agency To ensure funds are requested and disbursed on a timely basis	To receive timely reports from the implementing agency on the project's progress For the executing agency to request funds	Effective project management processes and practices Project execution carried out according to local standards and regulations	High Influence, High Interest

ID	Stakeholders	Functional Area	Roles	Responsibilities	Expectations	Requirements	Influence/Interest (Low-High)
					on a timely basis		
3	Ministry of Agriculture, Food Security and Enterprise	Project Administration	Project Execution	Assignment of Project Manager Selection of Project Team Selection of beneficiaries Selection of consultants Coordinate the timely disbursement of funds from IFI Organize and participate in all PSC meetings Provide reports to IFI	Timely execution of project Timely disbursement of funds from IFI Timely receipt of progress reports from Project Manager	Effective project management procedures and processes Completion of project as per schedule and budget	High Influence, High Interest

ID	Stakeholders	Functional Area	Roles	Responsibilities	Expectations	Requirements	Influence/Interest (Low-High)
4	CARICOM Development Fund	International Funding Institution	Sponsor/Approver	Provide funds on a timely basis or as required by the implementing agency Approve the Project Schedule, Project Management Plan, List of Beneficiaries, procurement plan, procedures and purchases etc.	Funds are utilized as indicated in the project document and procurement plan Deliverables are per agreement	Correct project execution and timely completion as per agreed schedule and budget	Medium Influence, High Interest
5	Vegetable Producers	Beneficiaries	Beneficiaries	To receive full benefits as indicated in the project document and MOA. To sign MOA with MAFSE as per agreement	To grow the vegetable industry in Belize	To establish a micro-vegetable enterprise and contribute to food security	Low Influence, High Interest

ID	Stakeholders	Functional Area	Roles	Responsibilities	Expectations	Requirements	Influence/Interest (Low-High)
6	Suppliers	Suppliers	Suppliers	To abide by the local procurement rules and regulations	To deliver quality equipment and materials to the project	Timely availability of services, materials and equipment to the project	Medium Influence, High Interest

Note. This chart was sourced from F. Chable, Author, 2025. Own Work

4.10.3 Plan Stakeholder Engagement

According to PMI (2017), Plan Stakeholder Engagement is the process of developing approaches to involve project stakeholders based on their needs, expectations, interests, and potential impact on the project. The input used for this process were project documents that included the Risk Register, Project Schedule and Stakeholder Register. The organizational process assets used was a Lesson Learnt Registry that was used during the execution of a similar project. Expert judgment, meetings and data analysis were also used to plan stakeholder engagement. A comprehensive Stakeholder Engagement Matrix is used for the Covered Structure Project to determine the level of stakeholder involvement and participation for project success and delivery.

Classification of stakeholders for the Covered Structure Project was as follows:

- Unaware – Not aware of the project and its impacts.
- Resistant – Aware of the project and impacts, but resistant to it.
- Neutral – Aware of the project, but neither in support nor opposed.
- Supportive – Aware of the project and supportive of the work and its outcomes.
- Leading – Aware of the project and actively engaged in making sure that the project is successful.

4.10.4 Stakeholders Engagement Matrix

According to PMI (2017)," a Stakeholder Engagement Assessment Matrix supports comparison between the current engagement levels of stakeholders and the desired engagement levels required for successful project delivery."

C - represents the current level of engagement

D - represents the desired level of engagement

Chart 40

Stakeholders Engagement Matrix

Stakeholders Engagement Matrix					
Project Number	Project Name				Project Manager
BZ/G0009	Covered Structure and Capacity Enhancement Project				F. Chable
Stakeholder	**Unaware**	**Resistant**	**Neural**	**Supportive**	**Leading**
The Government of Belize				C, D	
Ministry of Economic Development and Finance				C, D	
Ministry of Agriculture, Food Security and Enterprise					C, D
CARICOM Development Fund					C, D
Vegetable Producers				C, D	
Suppliers				C, D	

Note. This chart was sourced from F. Chable, Author, 2025. Own Work

4.10.5 Manage Stakeholder Engagement

Manage Stakeholder Engagement is the process of communicating and working with stakeholders to meet their needs and expectations, address issues, and foster appropriate stakeholder involvement, (PMI, 2017). During the implementation of the Covered Structure

Project, stakeholders will be continuously reminded of their roles and responsibilities and properly communicated on the goals of the project. The communication included project updates, pending and impending risks and the collection of valuable feedback to improve project success and collaboration.

The Project Manager for the Covered Structure Project will be responsible for conducting the following activities to manage stakeholder engagement:

- Regular stakeholder meetings: Organize regular stakeholder meetings of forums to gather input, provide updates and address concerns. The Project Manager will encourage active participation and collaboration among stakeholders.
- Feedback mechanisms: Establish feedback mechanisms to gather input from stakeholders throughout the lifecycle of the project. Collect the feedback and incorporate the inputs into the project planning and decision making.
- Conflict Resolution: Address conflicts or disagreements among stakeholders promptly and fairly.
- Stakeholder register: Update the stakeholder register on a regular basis by incorporating new stakeholders and maintaining updated information on existing stakeholders.
- Foster relationships: Build stakeholder relationships through constant communication, by addressing their needs, and by being transparent.
- Engagement strategies: Implement engagement strategies based on stakeholder analysis.

- Manage Expectations: Set clear expectations with stakeholders regarding project scope, timelines, deliverables and outcomes.

4.10.6 Monitor Stakeholder Engagement

According to PMI (2017), Monitor Stakeholder Engagement is the process of monitoring stakeholder relationships and tailoring strategies for engaging stakeholders through modifications of engagement strategies and plans. This process is actualized throughout the Covered Structure Project to maintain, control, and improve the efficiency and effectiveness of stakeholder engagement activities and involvement. It is the responsibility of the Project Manager to engage all stakeholders on project work, progress and blocks (if any) and collect necessary feedback for the project's success.

The Project Manager will be responsible for the following activities to monitor stakeholder engagement:

- Review in a timely manner the Communication Matrix to evaluate which communication medium utilized is most effective.
- Constantly review and evaluate the Stakeholder Engagement Assessment Matrix to assess the effectiveness of the engagement strategies.
- Update the Stakeholder Register with information obtained from monitoring stakeholder engagement.
- Constantly update the "Lessons learned register" with information on challenges and how their reoccurrence can be prevented.
- Maintain continuous communication with stakeholders to address concerns, provide guidance and ensure accountability and transparency.

- Constantly update the risk register with possible responses to address the risks.

4.11 Sustainable Development Plan

4.11 Sustainability Management Plan

The Sustainability Management Plan is a strategic section within the Project Management Plan that is designed to promote economic, social and environmental progress while preserving resources and minimizing negative impacts on the planet. It aims to achieve a balance between meeting current needs and ensuring the ability of future generations to meet their own needs. According to GPM® (2019), a Sustainability Management Plan (SMP) describes how sustainability will be addressed during a project. The integration of sustainability must be integrated at the initiation stage of the project. P5 (People, Planet, Prosperity, Process, Products) has an integral role in developing an SMP as P5 identifies the subjects to be addressed. An SMP includes:

- Purpose
- Approach
- Roles and Responsibilities
- Budget
- Key Performance Indicators for Sustainability
- Monitoring and Reporting

4.11.1 Approach

4.11.2.1 Identifying sustainability impacts will include:

The Project Team will identify and further develop the sustainability impacts of the Covered Structure Project by analyzing the Sustainable Development Goals (SDGs), and by conducting the following activities:

- The Project Team will update the P5 Impact Analysis to further identify and evaluate the sustainability impacts. These results will then be integrated into the project planning and implementation phase to get a more comprehensive understanding of the potential impacts.
- Engage stakeholders from the local communities, environmental groups, academia, non-governmental organizations, village councils and any other stakeholder working in or around the project site to obtain varied perspectives on potential impacts.
- Conduct quarterly meetings with the Project Team and any other key stakeholders to review and update the P5 Standard for Sustainability in Project Management version 5.01. The results of the P5 Impact Analysis will be monitored and tracked quarterly from the P5 initial score.
- Organize mid- and end-of-year workshops and meetings to get feedback on the impact that the Covered Structure Project is having in the area.
- Establish Key Performance Indicators (KPIs) to measure and monitor sustainability impacts. These KPIs may include metrics related to

regulatory compliance, resiliency, policy development, local economic growth, and environmental protection.

- Covered Structure Project P5 Score

Chart 41

Covered Structure Project P5 Score

People Impacts	**Initial Score**	**New Score**	**Change**
Labor Practices and Decent Work	2.0	4.1	2.1
Society and Customers	2.0	4.0	2.0
Human Rights	2.0	4.0	2.0
Ethical Behavior	2.0	4.1	2.1
Overall People Score	**4.1**		
Planet Impacts	**Initial Score**	**New Score**	**Change**
Transport	1.7	4.3	2.6
Energy	2.0	4.6	2.6
Land Air, and Water	1.8	4.6	2.8
Consumption	2.2	3.6	1.4
Overall Planet Score	**4.3**		
Prosperity Impacts	**Initial Score**	**New Score**	**Change**
Project Feasibility	2.2	4.1	1.9
Business Agility	2.0	4.3	2.3
Local Economic Impact	2.2	4.1	1.9
Overall, Prosperity Score	**4.2**		
Overall Project P5 Score	**4.2**		

Note. This chart was sourced from F. Chable, Author, 2025. Own Work

4.11.2.2 Responding to sustainability impacts will include:

The Covered Structure Project Team will proactively respond to the sustainability impacts as follows:

- Update the P5 Impact Analysis and develop mitigation strategies for all domains and categories that have a negative value or severe impact scores.

- Schedule monthly or quarterly meetings with the objective to review, discuss and update the team on the status of the sustainability impacts based on the P5 Impact analysis or any other risk/opportunity that may occur that may pose a direct impact on sustainability.
- Integrate sustainability risk and opportunities within the Project Risk and Opportunity Management Framework.
- Collaborate and partner with other local organizations, projects, government and non-governmental organizations, institutions, and academia to identify possible sustainable solutions that can be adopted by the project.
- Conduct regular revisions of the Sustainable Development Plan to evaluate the sustainability impacts, and effectiveness of the response measures that have been identified and implemented.
- Incorporate stakeholder feedback to maintain open communication with them whilst gaining trust and promoting transparency.
- Report to Project Board, Project IFI and key stakeholders, on a quarterly basis, the sustainability initiatives and mitigation strategies that have been implemented by the team. This report will promote trust between the project, communities and key stakeholders.

4.11.2 Roles and Responsibilities

Project Manager

- Provide leadership and guidance on sustainability issues and ensure that the project goals and the sustainability goals are aligned.
- Develop and conduct the P5 Impact Analysis.
- Integrate the activities and resources identified from the Sustainable Management Plan into the Project Management Plan so that they are contemplated in the scope, schedule, risk and budget of the project.
- Engage with stakeholders, including communities, suppliers, and regulators to understand their sustainability priorities and concerns.
- Management of project resources in a sustainable manner. This includes optimizing resource use, minimizing waste generation, and promoting energy efficiency throughout the project lifecycle.
- Communicate the project's sustainability initiatives, progress and achievements to internal and external stakeholders.
- Organize training sessions for the Project Team to understand the necessity and manner in how the sustainable principles, practices and goals align to the project.

Project Team

- Identify sustainability impacts and describe them in the prescribed formats.
- Assess the impact of sustainability-related actions on project success criteria.
- Perform the impact response actions assigned.

Sustainability Impact Owner

- Develop and/or update the assigned risk response strategy.
- Monitor the risk assigned and inform the Project Manager of changes to probability or impact.
- Monitor the risk trigger and risk queue and inform the Project Manager as appropriate.

4.11.3 Sustainability Budget

This budget is aimed at implementing the Covered Structure Project sustainably and with environmental considerations.

Chart 42

Sustainability Budget

Covered Structure Project Sustainable Management Budget			
Budget Category	***Description***	***Cost estimate (USD)***	***Total Budget (USD)***
Research and Innovation	Conduct comprehensive research on producing sustainably and feasible under covered/protective structures.	$2,000.00	$2,000.00
Stakeholder Engagement	Organize community training, seminars, workshops, and campaigns to raise awareness and gain support.	$3,000.00	$3,000.00
Packaging and Distribution	Promotion of eco-friendly packed products and its distribution to local markets.	$2,000.00	$2,000.00
Marketing	Develop marketing campaigns to promote vegetables produced under covered structures	$2,000.00	$2,000.00
Community outreach	Promoting educational campaigns on the importance of sustainable farming.	$3,000.00	$3,000.00
Green Certifications	Obtaining eco-labels, certifications	$1,500.00	$1,500.00
Environmental Impact Assessment	Assessment of the project's ecological footprint	$1,000.00	$1,000.00
Reporting	Compilation of project results	$500.00	$500.00
Monitoring and Evaluation	Implement a system to track and assess the effects on vegetables produced under of covered structures and its effects on the environment	$500.00	$500.00
Contingency	Reserve funds for unexpected expenses.	$2,000.00	$2,000.00
Total			**$17,500.00**

Note. This chart was sourced from F. Chable, Author, 2025. Own Work

4.11.4 Key Performance Indicators

Key Performance Indicators are measurable values that demonstrate how effectively the project is achieving its goals. This information will permit the Project Manager and the Project Team to evaluate the project’s progress in achieving the sustainability

goals and targets by providing an assessment of the environmental, social and economic performance.

Chart 43 below shows how the KPIs align with the Covered Structure Project.

Chart 43

Key Performance Indicators

P5 Domain	Lens	Category	Element	KPI	Metric
People	Servicing	Labor Practices and Decent Work	Training and Qualifications	Training and Skill Development	Count - Measures the degree of staff awareness and capacity building for producing vegetables using sustainable and environmentally friendly means.
	Lifespan	Society and Customers	Community Engagement	Public Awareness and Education	Public Awareness Index - Measures the level of public awareness of producing vegetables using sustainable and environmentally friendly means.
	Effectiveness	Human Rights	Dignity, Diversity, Equity, and Inclusion	Inclusive participation	Weeks – Months – Measures the participation of stakeholders that have been involved in the project.
	Lifespan	Ethical Behavior	Green Claims and Greenwashing	Green Claims transparency	Percentage - Measures the percentage of crop producing industries who are accurate and reliable in their disclosure of their sustainable activities.
Planet	Lifespan	Transport	Local Procurement	Outsourcing from local	Number of established

P5 Domain	Lens	Category	Element	KPI	Metric
				communities .	partnerships for local acquisition of goods and services.
	Effectiveness	Energy	Renewable Energy & Clean Energy Return	Utilization of modernized tools	Rating -Measures the project's commitment to environmental sustainability and lower carbon emissions through modernized technologies.
	Effectiveness	Land, Air and Water	Biological Diversity	Reduction of ecological vulnerability	Count - Determines the degree to which unsustainable behaviors have reduced ecological vulnerability.
	Servicing	Consumption	Recycling and Reuse	Recycle initiatives	Count -Measures the degree of suppliers' willingness to recycle and re-use materials used to construct the covered structure units.
Prosperity	Lifespan	Project Feasibility	Business Case Analysis	Risk identification	Number of mitigation plans developed
	Efficiency	Business Agility	Resilience	Crisis Response Time	Weeks – Months -To demonstrate the stakeholders' ability to manage and respond to project unexpected events.
	Fairness	Market and Economic Simulation	Local Economic Impact	Waste Management Job Creation	Rating- To assess the extent of direct job opportunities because of the Covered Structure Project.

Note. This chart was sourced from F. Chable, Author, 2025. Own Work

4.11.5 Monitoring and Reporting

The monitoring of the Sustainable Management Plan throughout the lifecycle of the Covered Structure Project will allow for an in-depth understanding of the impact that the project will have and allow leaders to make sound decisions. The following are the methods that will be used to monitor the sustainability performance of the project.

- Project status meetings will be held monthly to discuss the project's sustainability plan and make recommendations where necessary to ensure its optimum efficiency.
- The P5 Impact Analysis will be updated with the corresponding results. This analysis will be repeated at the end of important milestones.
- The environmental, social, and economic performance of the project will be monitored against the KPIs.
- All reports will include a section reflecting the project's sustainability performance that will serve as the foundation for decision-making.
- Stakeholder engagement analysis will occur at the end of every quarter to assess the stakeholder perception of the project's sustainability impacts. The results will guide the team on how to address areas that need to be strengthened.

5 CONCLUSIONS

The Covered Structure and Capacity Enhancement Project (Covered Structure Project) was developed to support the Ministry of Agriculture Food Security and Enterprises commitment to keep vegetable production as an element of its work program and support the expansion of the strategy for employment, poverty alleviation and food security by providing economic opportunities to women and marginalized youths in Belize. In collaboration with the CARICOM Development Fund (CDF), MAFSE strategized the development of this project with the goal of developing the Vegetable Industry in Belize. It is anticipated that the development of this Project Management Plan will provide effective guidance, management and control of all project activities leading to the successful completion of the project. Conclusions as per project's objectives are as follows:

1. The Project Charter formally authorized the development of the Project Management Plan and allowed for the Covered Structure and Capacity Enhancement Project to be implemented. It established key parameters such as the project objectives, justification, key deliverables, assumptions, constraints, preliminary risks, budget, project milestones, project stakeholders and the authorized signatories. In essence, it was the foundation for the project that provided a clear roadmap from initiation to completion.
2. The Scope Management Plan focused on the predefined work that was required to complete the project. It outlined the project requirements to ensure a thorough understanding of the work required for the project completion. It included the work

breakdown structure, a tool that was used to define and decompose work packages and tasks that were required to complete the project. The Scope Management Plan established parameters in managing stakeholders' expectations, schedule and cost variances, resource management, and overall project outcomes. This process prevented Scope Creep and provided efficiency during the overall project implementation. In addition, the plan also provided for collecting and logging assumptions, documenting lessons learned, and creating an enabling environment to plan, control and properly utilize equipment, material, services and funds necessary for project completion.

3. The Schedule Management Plan was developed to guide the project to completion within the given time frame as per signed project agreement. The milestones list, Gantt Chart, critical path and cost baseline assisted in tracking, controlling, and managing the project activities while simultaneously measuring performance, tools and procedures were utilized throughout the projects' implementation.

4. The Cost Management Plan was developed to provide guidance in estimating, allocating and controlling the project's expenditures through the application of the cost baseline. The Cost Management Plan ensured that the financial resources were allocated efficiently, controlled, and that all project activities were completed within the allocated budget.

5. The Quality Management Plan helped the Covered Structure Project in validating quality parameters, procedures, and criteria for managing quality throughout the project covered structure project lifecycle. It outlined the quality metrics and quality standards, the quality assurance approach, and control that was used by the Project Team to guarantee stakeholder satisfaction and overall success of the project.

6. The Resource Management Plan provided classification and efficient use of resources allocated to the project. It also provided for the allocation of team members, identification of individual skills, weaknesses and the development of methodologies to build their capacities to meet project requirements. The plan also established approaches in planning, scheduling, distribution and control of project resources whilst concurrently evaluating and documenting resource management.

7. The Communications Management Plan highlighted the communication methodologies between Project Team members and stakeholders for the efficient dissemination of information throughout project execution. It outlines the stakeholder and communication requirements, the communication matrix, and the management, monitoring and control of communication through the communication escalation process.
8. The Risk Management Plan for the Covered Structure Project was developed to define planning for risks, managing and controlling risks which may occur during the project lifecycle. The plan included the creation of a Risk Breakdown Structure (RBS) and the Probability and Impact Matrix to establish risk ownership, impact

probabilities and risk control mechanisms. In addition, the Risk Management Plan for the Covered Structure Project included a Risk Register, which is important for prioritizing risks and highlighting risk triggers which can be used to control potential risks.

9. The Procurement Management Plan was developed based on the Government of Belize procurement procedures rules and regulations. The plan guided the Project Team in acquiring goods and services within the national rules and regulations. It further guided the project in ensuring effective supplier selection, procurement change control process, transparency and accountability during the execution of the project.

10. The Stakeholder Management Plan was developed to foster good communication relationships among stakeholders, including the Project Team, Project Steering Committee, donors and beneficiaries. In addition, the plan identified the stakeholders' influence, interest, and power in the Covered Structure Project. The main tools used were the stakeholder register, stakeholder power/influence grid, stakeholder engagement and engagement matrix.
11. A validation of the project in the field of regenerative and sustainable development was conducted through the application of P5 Impact Analysis (P5IA) to assess or establish favorable or unfavorable end results to regenerative and sustainable development. The process was conducted through a tabulated analysis of People,

Planet, Prosperity, Process, Products (P5) that involved the situation, the causes, potential impact of the cause and response. A grading coefficient was applied based on the effects of the impact before and after impact response using an interpretation guideline ranging from 5 (strongly agree) to 1 (strongly disagree). The overall Impact Score after responding to individual Impacts was 4.2 which is a strong indication that the project favored Sustainability and Regenerative Development.

6 RECOMMENDATIONS

1) MAFSE is directly responsible for the implementation of all agricultural related projects in Belize. It is therefore recommended that MAFSE incorporates the development of a Project Management Plan for each project being implemented since it provides clarity, direction and structure to project activities, thus increasing the probability of its success.
2) MAFSE should allow the use of the Project Management Plan for the Covered Structure Project that was developed as a guide to implement the project to ensure that it is completed within schedule and budget. This document can also be used and adopted by other ongoing projects at MAFSE.

3) The implementation of projects without clear operational and technical directions has led MAFSE to many unsuccessful projects. This can be corrected with the inclusion of a Scope Management Plan which can serve as a guide for operational and technical execution of projects, thus avoiding scope creep. A fully functioning Scope Management Plan adds value to projects through the implementation of effective Project Management processes.

4) The management of budgetary financial reserves has proven challenging for MAFSE. The lack of a cost control mechanism has caused significant delays in the execution of Projects. The recommendation is hereby made to MAFSE to conduct cost-variance

exercises, which are important to ensure projects are being implemented according to stipulated budgets.

5) Planning, managing and controlling quality have proven challenging for the MAFSE. The recommendation is of the use of an effective Quality Management Plan which can improve the quality of deliverables to stakeholders. It is strongly recommended that the MAFSE create a Quality Management Plan for all projects to ensure that quality considerations are included in all aspects of the project phases including costs and schedule management processes.

6) Communication during the implementation of projects within the MAFSE is done using conventional means and not properly organized and documented. The Project Manager should utilize the Communication Matrix to effectively engage the stakeholders and discuss the organizational structure to avoid communication problems that can cause delays in project implementation.

7) A well-planned Stakeholders' Management Plan can contribute to the unity as projects are being implemented. The MAFSE should start to incorporate stakeholders' management as part of project designs. Stakeholders must be properly identified, assigned roles and responsibilities and kept informed. This can be done by conducting a stakeholders' engagement and management plans that will deliver remarkable success for project delivery.

8) For the past years, MAFSE has not been using the P5 tool to analyze projects for sustainability and regeneration. Therefore, it is strongly recommended that the MAFSE incorporates the use of the P5IA tool for project viability in the fields of Regenerative and Sustainable Development to proactively assess and address the impacts of project impacts on the environment, people and economy.

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

The implementation of the Covered Structure and Capacity Enhancement Project in Belize aligns with the Sustainable Development Goals of no poverty, zero hunger, clean water and sanitation, good health and well-being, quality education, gender equality, affordable and clean energy, decent work and economic growth, industry, innovation and infrastructure, reduced inequalities, sustainable cities and communities, and responsible consumption and production. In addition, the project aligns with the Regenerative Development Approach that integrates the six processes of regeneration which includes: Environmental, which highlights the regeneration of the environment and biodiversity; the social aspect, deals with inclusive and equitable societies, and the economic aspect includes fair and equitable economies.

The political aspect of the regeneration model includes participatory governance, transparency, and ethics. With the other two processes including cultural and spiritual, entailing the cultural diversity and local knowledge and values, ethics and a caring society. With the development of a Project Management Plan for the Covered Structure and Capacity Enhancement Project in Belize, the beneficiaries will benefit from resources to create micro-enterprises and improve their financial capacities while minimizing the need for deforestation. Vegetable production is seasonal in Belize and with the adverse effects of climate change, can be negatively affected by unseasonal drought or flood conditions. Additionally, pest problems characteristically manifest themselves during dry periods while wet periods propagate diseases especially in waterlogged soil conditions. Under these conditions, vegetable production becomes suboptimal resulting in supply shortages in the domestic market. Higher market prices for and imports of vegetables are often the

consequence, thereby lowering nutrition of disadvantaged social. It is therefore essential to overcome these constraints by securing and increasing vegetable production during these unseasonal periods. Covered structures cultivation which creates a controlled environment is the most workable means towards achieving the desired results.

Greenhouses provide the advantage of crop protection from direct rain, sun, wind as well as pests and diseases. This type of production also enables farmers to achieve year-round production as opposed to seasonal production thereby addressing the inconsistency of supply. Sheltered cultivation through better management of diseases, water and mineral supplies, ensures better yield than cultivating in the open-field, and generally improves quality and attractiveness of farm produce and improves prospects for even better prices. Additionally, greenhouses enable production on smaller land spaces achieving significantly greater volumes of output per unit of arable land space due to intensive crop spacing and rotation techniques. This project will create equitable opportunities for the beneficiaries while at the same time improving the environment and contributing to food security. The efficient management of this project will ensure that waste is minimized, and project efficiency is improved.

The Covered Structure and Capacity Enhancement Project was written with environmental considerations and is people centered. To measure the contributions to sustainable and regenerative development, Key Performance Indicators (KPIs) could be monitored such as the distribution of gender equality, usage of materials versus what was planned originally, time, scope, quality and the overall effects on the environment.

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Appendix 1: FGP Charter

CHARTER OF THE PROPOSED
FINAL GRADUATION PROJECT (FGP)

1. Student name

Freddy Yaser Chable

2. FGP name

Project Management Plan for the Efficient Implementation of the Covered Structure and Capacity Enhancement Project (Covered Structure Project) in Belize.

3. Application Area (Sector or activity)

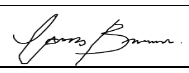
Agriculture

4. Student Signature

5. Name of the Graduation Seminar Facilitator

Ing. Carlos Brenes Mena

6. Signature of the facilitator



7. Date of charter approval

December 10th,2024

8. Project start and finish date

December 11th ,2024	

9. Research Question

Can the components of a Project Management Plan contribute to the successful implementation of the Covered Structure and Capacity Enhancement Project in Belize?

10. Research Hypothesis

Is it possible to improve project execution efficiency of the Covered Structure and Capacity Enhancement Project in Belize by using a Project Management Plan?

11. General Objective

To develop a Project Management Plan to implement the Covered Structure and Capacity Enhancement Project in Belize successfully and efficiently.

12. Specific Objectives

1. To create a project charter to properly define key input elements for the development of the Project Management Plan.
2. To develop a Scope Management Plan to ensure the project includes all the work required to complete the project successfully and only the work required by the project.
3. To develop a Schedule Management Plan that will define execution methodologies for the timely completion of the project.
4. To create a Cost Management Plan that will define Budget Management for the successful completion of the project within budget.
5. To develop a Quality Management Plan for managing and controlling quality within the project.
6. To develop a Resource Management Plan to ensure timely availability of required resources for the successful completion of the project.
7. To design a Communication Management Plan to ensure all stakeholders, including the Project Team, are properly and timely informed on project progress.
8. To develop a Risk Management Plan to identify potential risks and identify risk owners to mitigate negative risks and capitalize on positive risks to increase chances of project success.
9. To create a Procurement Management Plan to carry out fair and ethical procurement of goods, services, or results for the successful completion of the project.
10. To design a Stakeholders Management Plan for the identification and management of stakeholders who directly or indirectly impact the successful completion of the project.

11. To validate the project from a regenerative and sustainable perspective to assess the impact of the project and its deliverables in regenerative and sustainable development.

13. FGP Purpose or Justification

Vegetable production is seasonal in Belize which with the adverse effects of climate change can be negatively affected by unseasonal drought or flood conditions. Additionally, pest problems characteristically manifest themselves during dry periods while wet periods propagate diseases especially in waterlogged soil conditions. Under these conditions, vegetable production becomes sub-optimal with supply shortages in the domestic market. Higher market prices for imports of vegetables are often the consequence, thereby lowering nutrition of disadvantaged social groups.

The search for a remedy saw the birth of the Covered Structure and Capacity Enhancement Project. This project is targeting 36 new vegetable farmers of which 50% of the beneficiaries must be women and youth. Through the implementation of this project, it is expected to increase the efficiency of vegetable production under covered structures by improving the construction design and irrigation systems of 36 structures by the end of 2025. This increase will greatly contribute to poverty reduction and food security for the country of Belize.
Since there are no projects within the guidance of the Ministry of Agriculture Food Security and Enterprise in Belize that are being implemented using a Project Management Plan, one will be developed for the effective and efficient implementation of the Covered Structure and Capacity Enhancement Project. The key benefit of developing this plan is the elaboration of a comprehensive document to be used to define the basis of all project work and guide its performance. This integrated document will also be used to guide the Project Manager and Project Team on project requirements, timing, and budgetary considerations under each activity during project implementation.

14. Work Breakdown Structure (WBS). In table form, describing the main deliverable as well as secondary, products or services to be created by the FGP.

1. Graduation Seminar
   1.1 FGP Deliverables
   1.1.1 Charter Items 1-10, Preliminary Bibliographical Research
   1.1.2 Charter Items 11-12, FGP WBS, Self-Assessment
   1.1.3 Corrections, Charter Items 13-19
   1.1.4 Corrections, Chapter 2 Theoretical Framework,

Charter Item 20, Self-Assessment 2
1.1.5 Corrections, Chapter 3 Methodological Framework, Charter Item 21
1.1.6 Corrections, Introduction, Chapter 7 Project Validation in Regenerative and Sustainable Design, Charter Item 22, FGP Schedule
1.1.7 Corrections, Executive Summary, Abstract, Indexes, signed FGP Charter
1.2 Graduation Seminar Approval

2. Tutoring Process
   - 2.1 Tutor
     - 2.1.1 Tutor Alignment
     - 2.1.2 Communication
   - 2.2 Adjustments to previous chapters (if necessary)
   - 2.3 Chapter IV. Development (Results)
     - 2.3.1 Signed Charter
     - 2.3.2 Scope Management Plan
     - 2.3.3 Schedule Management Plan
     - 2.3.4 Cost Management Plan
     - 2.3.5 Quality Management Plan
     - 2.3.6 Resource Management Plan
     - 2.3.7 Communications Management Plan
     - 2.3.8 Risk Management Plan
     - 2.3.9 Procurement Management Plan
     - 2.3.10 Stakeholders Management Plan
     - 2.3.11 Project Validation in Regenerative/Sustainable perspective
   - 2.4 Chapter V. Conclusions
   - 2.5 Chapter VI. Recommendations
3. Reading by Reviewers
   - 3.1 Reviewers Assignment Request
     - 3.1.1 Assignment of two reviewers
     - 3.1.2 Communication
     - 3.1.3 FGP Submission to reviewers
   - 3.2 Reviewers work
     - 3.2.1 Reviewer 1
       - 3.2.1.1 FGP Reading
       - 3.2.1.2 Reader 1 Report
     - 3.2.2 Reviewer 2
       - 3.2.2.1 FGP Reading
       - 3.2.2.2 Reader 2 Report
4. Adjustments
   - 4.1 Report for reviewers
   - 4.2 FGP update
   - 4.3 Second review by reviewers

5. Presentation to Board of Examiners
    5.1 Final review by board
    5.2 FGP Grade report

15. FGP budget

Printing Cost – $100 USD

Binding Cost - $30 USD

Transportation Cost (Fuel) - $60 USD

Shipping Cost – $300 USD

Total cost - $490 USD

16. FGP Planning and Development Assumptions

1) The researcher will dedicate at least 15 hours per week to the development of the FGP.
2) There will be continuous communication between the researcher and project facilitators.
3) Information about vegetable production under covered structures will be readily available to develop FGP.
4) The Project Management Plan will be useful during the implementation of the Covered Structure and Capacity Enhancement Project in Belize.

17. FGP Constraints

1) The maximum time frame to finalize the FGP is 6 months.
2) The FGP must be completed within budget.
3) The quality of the FGP is subject to the quality of information received.
4) Resource availability is limited to the researcher only.

18. FGP Development Risks

1) The unexpected ailment of the researcher might delay the delivery of FGP.
2) Technical difficulties with computer software and hardware can cause project delays.
3) Facilitators' unavailability can delay the FGP successful completion.
4) The project timeline may experience delays due to delayed feedback from FGP facilitators.

19. FGP main milestones

Deliverable	**Finished estimated date**
Charter Items 1-10, Preliminary Bibliographical Research	October 28th, 2024
Charter Items 11-12, FGP WBS, Self-Assessment	November 4th, 2024
Corrections, Charter Items 13-19	November 11th, 2024
Corrections, Chapter 2 Theoretical Framework, Charter Item 20, Self-Assessment 2	November 18th, 2024
Corrections, Chapter 3 Methodological Framework, Charter Item 21	November 25th, 2024
Corrections, Chapter 1 Introduction, Chapter 7 Project Validation in Regenerative and Sustainable Design, Charter Item 22, FGP Schedule	December 2nd, 2024
Corrections, Executive Summary, Abstract, Indexes, signed FGP Charter	December 9th, 2024
Graduation Seminar Approval	December 10th, 2024
Tutoring Process	March 12th, 2025
Reading by Reviewers	March 16th, 2025
Adjustments	March 28th, 2025
Presentation to Board of Examiners	March 30th, 2025
Final Review by Board	April 1st, 2025
FGP Grade Report	April 4th, 2025

20. Theoretical Framework

20.1 Estate of the "Matter"

Vegetable production in Belize has been on the decline since 2017 and the urgent need to re-vitalize the industry prompted the Ministry of Agriculture Food Security and Enterprises to submit project proposals to International Funding Agencies for updated technological vegetable revitalization projects. A proposal was approved by the CARICOM Development Fund (CDF) for the development and integration of updated Covered Structure Technology for the vegetable industry in Belize. One of the greatest setbacks in Project Management within the Ministry of Agriculture of Agriculture Food Security and Enterprise, is the lack of Project Management Plans for the effective implementation of projects. With the inclusion of a Project Management Plan for the Covered Structure and Capacity Enhancement Project, it is expected that the project will be executed effectively and efficiently.

20.2 Basic Conceptual Framework

List of the basic concepts to be included in the document.

Examples: Project Management, Sustainable Agriculture Production, Regenerative Inclusion, Green Agriculture Production.

21. Methodological framework

Objective	Name of deliverable	Information sources	Research method	Tools	Restrictions
To create a project charter to accurately define key inputs for	Project charter	PMBOK 6th (2017) & 7th (2021) Editions	○ Qualitative ○ Quantitative ○ Mixed	○ Expert Judgement ○ Work Breakdown Structure	Limited availability of information for the development of the project charter.

the development of the project management plan.		-Lecture Notes -Historical data and information - Conference - Journal Papers		○ Integration Management Plan ○ Requirements Traceability Matrix ○ Activity List	
To develop a Scope Management Plan to ensure the project includes all the work necessary to complete the project successfully and to focus only on the work required by the project.	Scope Management Plan	PMBOK 6th (2017) & 7th (2021) Editions -Lecture Notes -Conference -Papers Journals -Historical data and information	○ Qualitative ○ Quantitative ○ Mixed	○ Expert Judgement ○ Data Analysis ○ Meetings ○ Scope Management Plan Template ○ Requirements Traceability Matrix ○ Work Breakdown Structure ○ Work Breakdown Structure Dictionary	○ The disorganization of Project sponsors. ○ Unclear Scope definition due to missing information.
To develop a Schedule Management Plan to define execution methodologies for the timely completion of the project.	Schedule Management Plan	PMBOK 6th (2017) & 7th (2021) Editions -Lecture Notes -Conference -Papers Journals -Historical data and information	○ Qualitative ○ Quantitative ○ Mixed	○ Expert Judgement ○ Data Analysis ○ Meetings ○ Activity List ○ MS Projects ○ Schedule Management Plan ○ Expert Judgement ○ Data Analysis ○ Meetings	○ Project must meet deadlines and milestones. ○ Deadlines for certain activities are uncertain.

				○ Bottom – Up Estimation ○ Cost Management Plan Template	
To create a Cost Management Plan to define budget management for the successful completion of the project within the approved budget.	Cost Management Plan	PMBOK 6th (2017) & 7th (2021) Editions -Lecture Notes -Conference -Papers Journals -Historical data and information	○ Qualitative ○ Quantitative ○ Mixed	○ Expert Judgement ○ Data Analysis ○ Meetings ○ Bottom – Up Estimation ○ Cost Management Plan Template	○ Project budget is limited. ○ Poor funds distribution from project sponsors.
To develop a Quality Management Plan to manage and control quality within the project.	Quality Management Plan	PMBOK 6th (2017) & 7th (2021) Editions -Lecture Notes -Conference -Papers Journals -Historical data and information	○ Qualitative ○ Quantitative ○ Mixed	○ Expert Judgement ○ Data gathering ○ Data analysis ○ Decision making ○ Data representation ○ Test and inspection planning ○ Meetings ○ Quality Activities Matrix Template ○ Quality Management Plan Template	○ Limited information from stakeholders. ○ Unclear internal policies from project sponsors.
To develop a Resource	Resource Management Plan	PMBOK 6th (2017) & 7th	○ Qualitative ○ Quantitative	○ Expert Judgement	○ The unavailability of Project

Management Plan to ensure timely availability of required resources for the successful completion of the project.		(2021) Editions -Lecture Notes -Conference -Papers Journals -Historical data and information	○ Mixed	○ Data representation ○ Organizational theory ○ Meetings ○ RACI ○ Resource management Plan Template	resources when needed. ○ Inadequate distribution of allocated resources.
To develop a Communication Management Plan to ensure all stakeholders, including the project team, are properly and timely informed on all project progress.	Communication Management Plan	PMBOK 6th (2017) & 7th (2021) Editions -Lecture Notes -Conference -Papers Journals -Historical data and information	○ Qualitative ○ Quantitative ○ Mixed	○ Expert Judgement ○ Communication requirements analysis ○ Communication technology ○ Communication models ○ Communication methods ○ Interpersonal and team skills ○ Data representation ○ Meetings	○ Lack of response from stakeholders ○ Poor project communication policies from sponsors.
To develop a Risk Management Plan to identify potential risks and identify risk owners to mitigate	Risk Management Plan	PMBOK 6th (2017) & 7th (2021) Editions -Lecture Notes -Conference -Papers Journals	○ Qualitative ○ Quantitative ○ Mixed	○ Expert Judgement ○ Data Analysis ○ Meetings ○ Risk Register Template ○ Risk Management Plan Template	○ Limited information available on historical risks since the project is new. ○ Extreme natural disasters.

negative risks and capitalize on positive risks to increase chances of project success.		-Historical data and information			
To create a Procurement Management Plan to perform fair and ethical procurement of goods and services for the successful completion of the project.	Procurement Management Plan	PMBOK 6th (2017) & 7th (2021) Editions -Lecture Notes -Conference -Papers Journals -Historical data and information	○ Qualitative ○ Quantitative ○ Mixed	○ Expert Judgement ○ Data gathering ○ Data analysis ○ Source selection analysis ○ Meetings ○ Procurement Management Plan Template	○ Limited capacity of local suppliers ○ International shipping and transportation delays.
To design a Stakeholders Management Plan to identify and manage stakeholders who directly or indirectly impact the successful completion of the project.	Stakeholders Management Plan	PMBOK 6th (2017) & 7th (2021) Editions -Lecture Notes -Conference -Papers Journals -Historical data and information	○ Qualitative ○ Quantitative ○ Mixed	○ Expert Judgement ○ Data gathering ○ Data analysis ○ Data representation ○ Meetings ○ Stakeholder Register Template ○ Stakeholder Assessment Matrix ○ Stakeholder Manageme	○ Poor response of Stakeholders to project requirements. ○ Limited Organizational structure of project stakeholders.

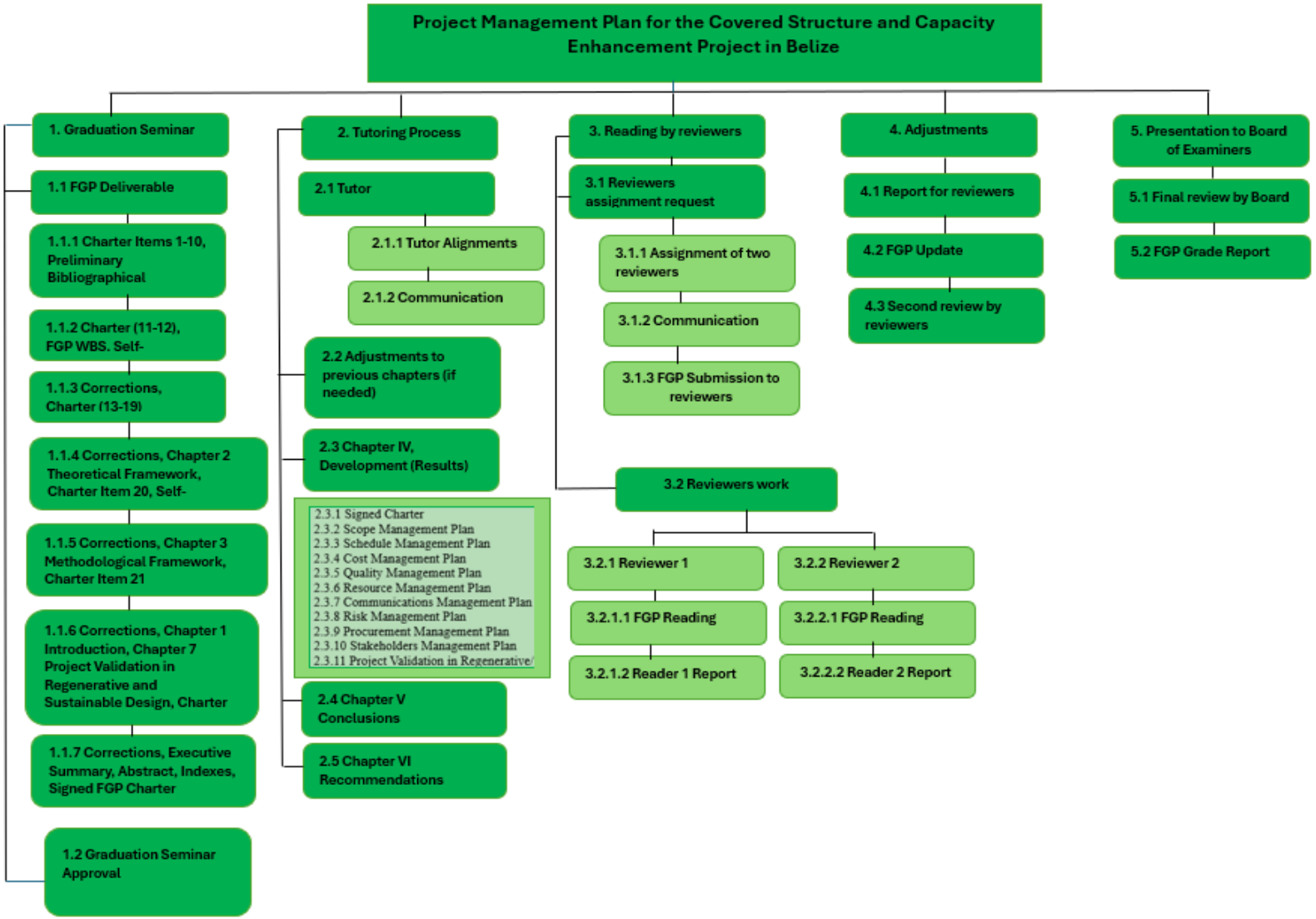
				nt Plan Template	
To validate the project from a regenerative and sustainable perspective to assess the impact of the project and its deliverables in regenerative and sustainable development.	Sustainable and Regenerative Management Plan	PMBOK 6th (2017) & 7th (2021) Editions -Lecture Notes -Conference -Papers Journals -Historical data and information	○ Qualitative ○ Quantitative ○ Mixed	○ Sustainable Management Plan Template ○ Expert Judgement ○ Data gathering ○ Data analysis ○ P5 Impact Analysis	○ Local suppliers are able to supply goods that are sustainable and regenerative in nature.

Note. This chart was sourced from F. Chable, Author, 2024. Own Work

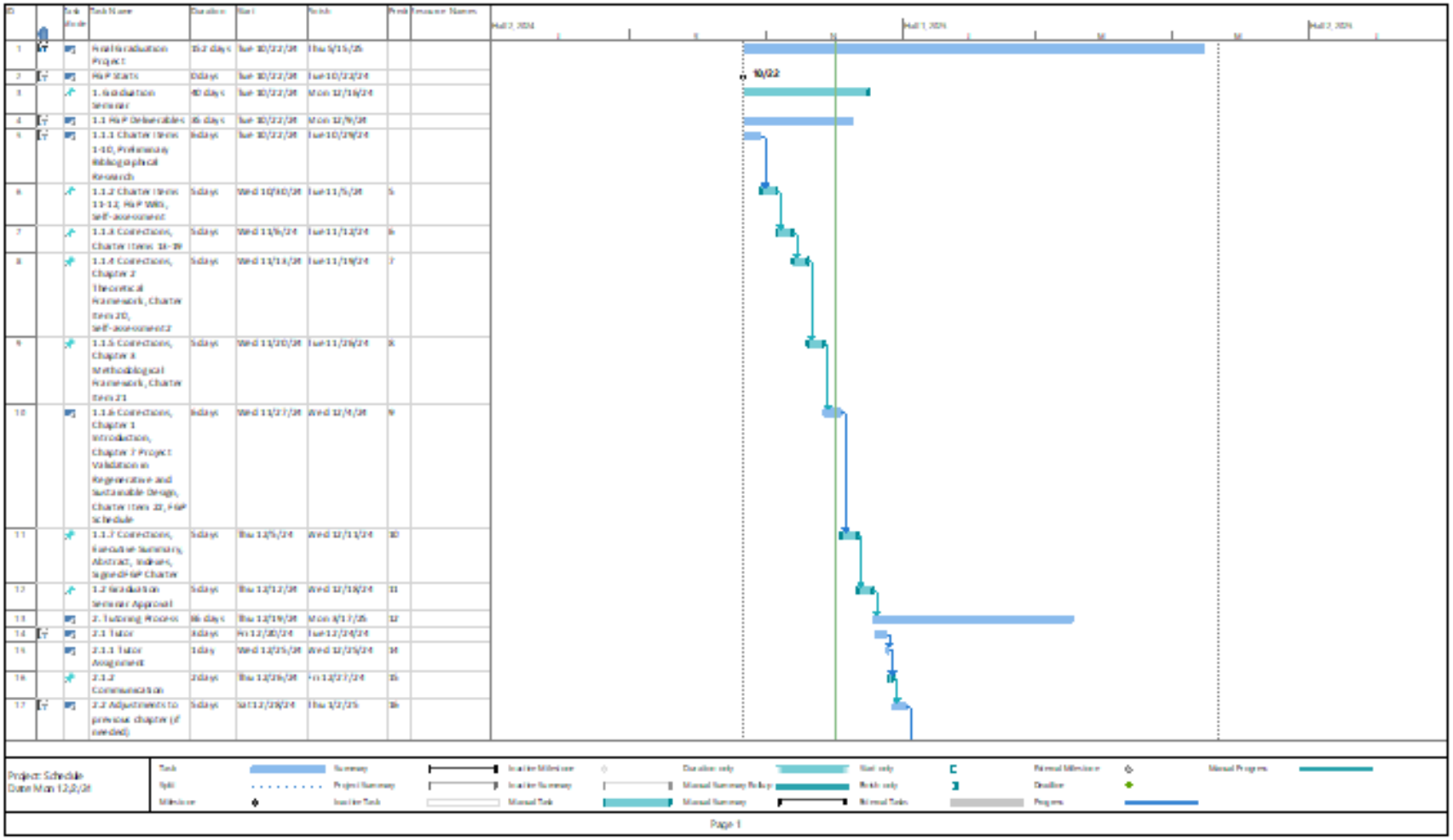
22. Validation of the work in the field of regenerative and sustainable development.

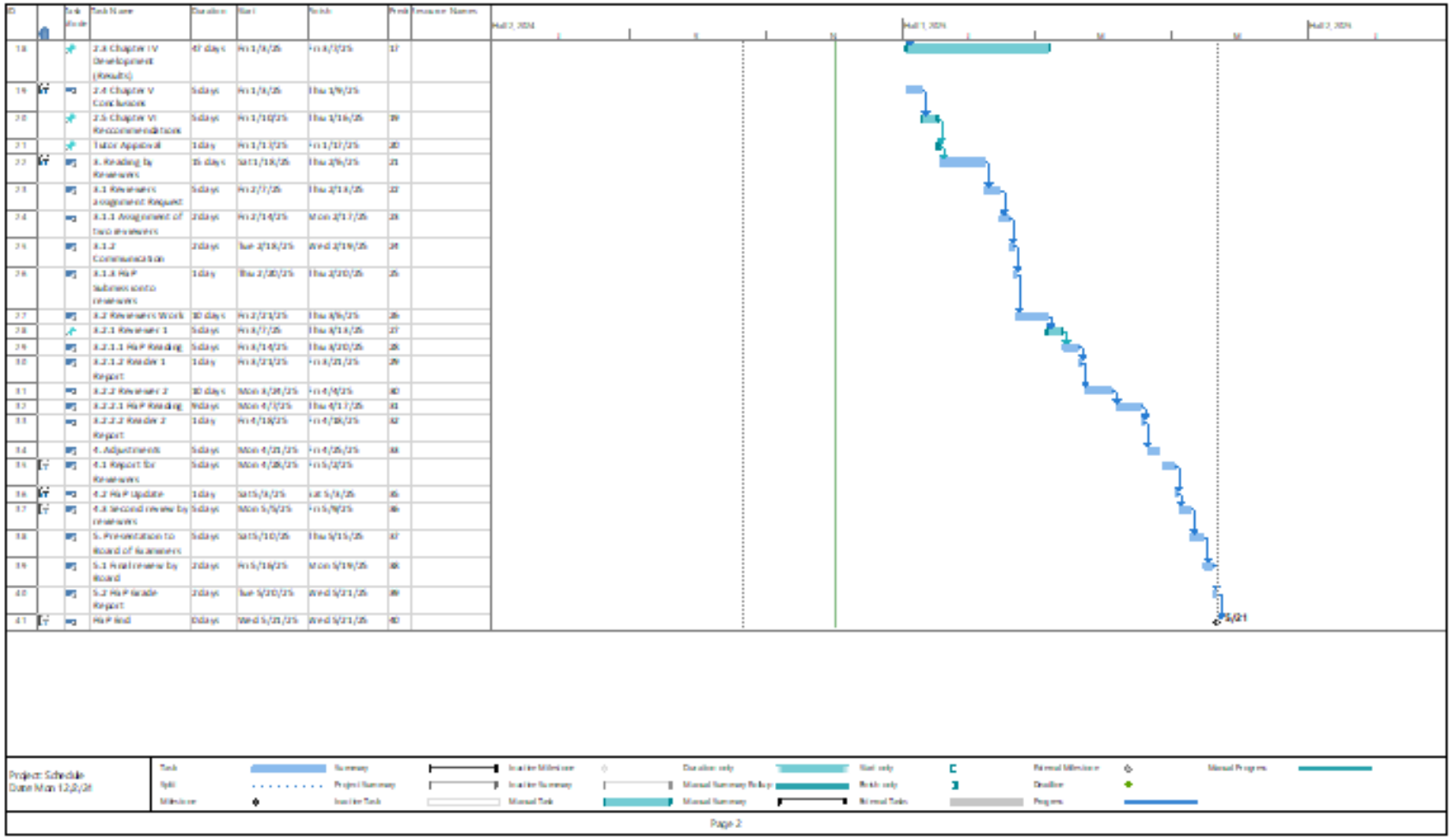
With the development of a Project Management Plan for the Covered Structure and Capacity Enhancement Project in Belize, the beneficiaries will benefit from resources to create a micro-enterprise, thus improving their financial capabilities and at the same time, minimize the need for deforestation. Covered Structures enable vegetable production on smaller land spaces achieving significantly greater volumes of output per unit of arable land space due to intensive crop spacing and crop rotation techniques. The dual purpose of this project will create equitable opportunities for the beneficiaries while at the same time improving the environment and contributing to food security. The efficient management of this project will ensure that waste is minimized, and project efficiency is improved. The Covered Structure and Capacity Enhancement Project was written with environmental considerations and is people centered. To measure the contributions to sustainable and regenerative development, Key Performance Indicators (KPIs) could be monitored such as the distribution of gender equality, usage of materials versus what was planned originally, time, scope, quality and the overall effects on the environment.

Appendix 2: FGP WBS



Appendix 3: FGP Schedule




Project: Schedule
Date: Mon 12/2/24
Page 2

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Appendix 5: Other Relevant Information

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February 24, 2025

TO WHOM IT MAY CONCERN:

This is to certify that I, the undersigned, Alice Loreen Medard, having possessed a Bachelor of Education Degree in Language Education and Literacy Studies, have reviewed the final project of Mr. Freddy Yaser Chable which was completed in partial fulfillment for the requirement to complete a Master's Degree in Project Management.

I hereby confirm that Mr. Chable has made all the requested corrections to the Final Graduation Project document. It is my professional opinion that Mr. Chable's work meets the literary and linguistic standards expected by a student completing a degree at the Master's level.

Yours respectfully,

Alice L. Medard
Philologist

THE UNIVERSITY OF THE WEST INDIES

Alice Loreen Medard

having completed the Course of Study approved by the University and having satisfied the Examiners, has this day been admitted by the Senate to the Degree of

BACHELOR OF EDUCATION
LANGUAGE EDUCATION
(LITERACY STUDIES)

CERTIFIED TRUE COPY

Head of Centre
UWI Open Campus, St. Lucia

with

Second Class Honours (Upper Division)

July 1, 2012

DATE

VICE-CHANCELLOR