UNIVERSIDAD PARA LA COOPERACION INTERNACIONAL

(UCI)

PROJECT MANAGEMENT PLAN FOR THE STRATEGIC IMPLEMENTATION OF HYBRID MELON SANSON GOLD (SVMF5675) SEED IN BELIZE

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

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(UCI)

This Final Graduation Project was approved by the University as

partial fulfillment of the requirements to opt for the

Master in Project Management (MPM) Degree

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REVIEWER No.2

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Student full name

STUDENT

DEDICATION

I dedicate this Final Graduation Project (FGP) to my parents, Felix Chan and Irma Chan, to my sisters Kiria Chan and Jemima Chan. Most importantly to my brother Jose Puc who always motivated me to continue with my studies. The completion of my FGP is also dedicated to my fiancée Rosa Reyes and the rest of the family. All have significantly supported in the completion of my FGP through their inspirations and good advices.

ACKNOWLEDGMENTS

Firstly, I want to thank God for the knowledge he gave to complete my FGP and all the blessings he has given me. Secondly, I want to give thanks to all my family for the support and motivation through the entire Master's program.

I want to give thanks to all the professors and tutors that have assisted me in the entire Master's program. Also, to my colleagues who motivated me to pursuing the objective we all shared which was to get through every course and finally complete the FGP.

Lastly, I want to acknowledge the contribution the company Prosser Fertilizer gave me through the entire FGP. Also, the knowledge the agronomist shared with me encouraged me to develop my FGP more technical.

ABSTRACT

This project aimed to develop and implement a comprehensive plan for the cultivation and distribution of the hybrid melon Sanson Gold (SVMF5675) seed in Belize, in collaboration with local farmers. Given the absence of an established protocol for this seed variety in Belize, the project conducted seed trials to evaluate outcomes and attract potential customers for the Prosser Fertilizer Company Ltd. These trials demonstrated favorable production results, incentivizing other farmers to adopt the seed thereby increasing the company's sales. The initiative sought to enhance agricultural productivity, increase farmer profitability, and ensure sustainable agricultural practices. By providing widespread education and structured cultivation practices, the project aimed to support farmers willing to purchase the melon seeds, ultimately increasing Prosser Fertilizer & Agrotec Co. Ltd's profitability and contributing to the advancement of Belize's agricultural sector.

The objective of this Final Graduation Project was to develop the project management plan based on the PMBOK Guide reflecting the requirements from its inception of plant growth, education of plantation necessities, and its subsequent distribution to farmers. In doing this, it gave farmers an extensive awareness of why selecting this particular seed variety is a superior option for their production. The seeds are a recent addition to Belize's agricultural business, therefore the farmers are unfamiliar with these seeds and have been doubting their ability to grow and, more importantly, to produce profit.

The result of the project has demonstrated that farmers require seed trials to guarantee their efficacy. Preparing a more informative trial is essential to the project's advancement, particularly for commercial growers who aim to increase profits from the Hybrid Melon Sanson Gold (SVMF5675) seeds. In addition to sustaining and growing revenues for the Prosser company.

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ABBREVIATIONS AND ACRONYMS

BZE	Belize
Belizeans	People from the country of Belize
Co.	Company
FAO	Food and Agriculture Organization of the United Nations
FGP	Final Graduation Project
lbs.	Pounds
Ltd.	Limited
NPK	Nitrogen, Phosphorus and Potassium
P5	People, Planet, Prosperity, Processes and Products
PMBOK	Project Management Body of Knowledge
PMI	Project Management Institute
SDGs	Sustainable Development Goals
Three P's	Portfolios, Programs and Projects
TYLCV Virus	Tomato Yellow Leaf Curl Virus
WBS	Work Breakdown Structure

EXECUTIVE SUMMARY

Agriculture is a major industry in Belize, with farmers frequently seeking high-value crops to maximize profits. The Prosser Fertilizer & Agrotec Co. Ltd Company, a highly respected and essential supplier in Belize, provides critical support to farmers, including crop inputs, tools, and advisory services. The company conducts research to investigate new products and assess their effectiveness in addressing farmers' concerns. Despite the advertisement of a newly introduced seed variety, most farmers remain hesitant to adopt it. Consequently, a strategy was implemented to conduct trials with small-scale farmers to evaluate the plant's growth and compare it to previous varieties, educate farmers on it, and eventually gain sales from it. Developing an approach that offers guidance to potential buyers is expected to boost the company's sales and increase demand. A trial was conducted by the agronomist and information was retrieved and later presented through workshops to farmers. The trial results were used to persuade other farmers to invest in the melon seeds

This project aimed to develop a comprehensive management plan for the cultivation and distribution of the hybrid melon Sanson Gold (svmf5675) seed in Belize. The plan will integrate all aspects of the project, ensuring alignment with overall goals and stakeholder expectations. Key components included incorporating all project elements to ensure cohesive execution through the Project Integration Management Plan. Essentially, defining and documenting detailed deliverables, boundaries, and acceptance criteria via the Scope Management Plan. Outlining tasks, milestones, and deadlines for timely project completion was reflected in the Schedule Management Plan. While the Cost Management Plan monitored project costs to stay within budget. The quality Assurance Management Plan established standards and control measures to ensure seed quality. Identifying and managing necessary resources for efficient execution was done using the Resource Management Plan. Likewise, ensuring effective dissemination of information to all stakeholders was followed through the Communication Management Plan. The Risk Management Plan identified and mitigated potential project risks. Establishing processes for timely and cost-effective procurement was reflected in the Procurement Plan. Lastly, engaging and managing stakeholder needs and expectations throughout the project lifecycle was followed and planned with the use of the Stakeholder Management Plan. The totality of these plans enhanced agricultural productivity, increased company profitability, and ensured sustainable agricultural practices.

In conclusion, the hybrid melon project has significantly advanced melon cultivation by improving quality, yield, and resistance to pests and diseases. The Sanson Gold (SVMF5675) hybrid melon outperforms local varieties with higher fruit weight, longer shelf life, and robust resistance to agricultural challenges, making it a promising option for farmers in Belize and surrounding regions. The collaboration between agronomists, quality assurance officers, and local farmers has been crucial, with rigorous monitoring ensuring consistent seed performance and valuable farmer feedback driving continuous improvement. The project's success highlights the importance of integrating scientific research into practical agricultural practices to enhance productivity and sustainability. Moving forward, refining the hybrid seeds, expanding farmer training, and fostering stakeholder engagement will further strengthen the agricultural landscape.

1 INTRODUCTION

Belize, a small and sparsely populated country with approximately 360,000 inhabitants, is situated on the Caribbean coast, bordered by Mexico to the north and Guatemala to the west. The country is vulnerable to severe weather conditions such as hurricanes, draughts and flooding (Salvo, Valdes, Martel, & Foster, 2017)**.** Agriculture plays a crucial role in Belize's economy, forming the backbone of the productive sector and employing a significant portion of the population. This sector also contributes to national food security by providing locally grown fruits and vegetables for domestic consumption (International Trade Administration, 2024). On average, the agriculture industry contributes around BZE$500 million to the Belizean economy (Food and Agriculture Organziation of the Unites Nations, 2020). Agriculture is a significant industry in Belize, with farmers constantly seeking high-value crops to maximize profits. The Prosser Fertilizer & Agrotec Co. Ltd, a reputable supplier in Belize, offers essential support to farmers, including crop inputs, tools, and advisory services.

Farmers can evaluate the effectiveness of products and methods within their agricultural systems through well-designed trials. These trials are essential for predicting responses to various agricultural practices and products (Iowa State University, 2019). Despite the introduction of the new Sanson Gold melon seed variety, many farmers remain hesitant to adopt it in Belize. To address this, a project strategy was developed to conduct trials with small-scale farmers to evaluate the seed's performance and demonstrate its benefits, implement the education system and sell these seeds for high-yield profitability for the Prosser Fertilizer & Agrotec Co. Ltd.

This final graduation project (FGP) aimed to fulfill the requirements for a master's degree in project management by providing a comprehensive and systematic approach to the cultivation and distribution of the hybrid melon Sanson gold (svmf5675) seed in Belize with the cooperation of farmers within its project execution. The project summarized its purpose in the integration management plan and explored and developed plans for critical areas such as project scope, time/schedule, cost, human resources, communication, risk, quality, procurement, and stakeholder management.

1.1. Background

Prosser Fertilizer & Agrotec Co. Ltd is a reputable agricultural supplier in Belize, providing high-performance crop inputs, tools, and solutions to optimize land use for farmers. Employing over 70 Belizeans nationwide, the company is locally owned and has been operational since its founding in November 1971. With over 48 years of field expertise, it has established itself as a leading provider of high-quality products, including fertilizer mixtures, secondary nutrients, seeds, pesticides, and equipment supplies.

The company possesses the knowledge and tools necessary to meet diverse agricultural needs. To ensure customer satisfaction, continuous research is conducted to update products and enhance inventory and service capacity. The company is committed to introducing innovative products, such as the Hybrid Melon Sanson Gold (SVMF5675) seed, addressing the limitations of older seed varieties by offering new and improved options.

Feedback from the company's agronomist, gathered during farm visits, highlights the current challenges in cultivation, underscoring the need for strategies to help farmers achieve high yields and profitability. The company supplies seeds for commonly grown vegetables and fruits, including radish, okra, cabbage, cilantro, onion, melons, watermelons, and corn. Some seeds, like the Sanson Gold, are sourced from the United States, specifically from the seed company Seminis.

Prosser Fertilizer & Agrotec Co. Ltd specializes in fertilizers and prides itself on designing customized fertilization regimens. The company offers flexible delivery options, allowing customers to receive goods according to their schedules, thus eliminating the need for inventory storage. With extensive experience, the company has become a leader in the field, renowned for its exceptional quality and service. It provides outstanding agricultural solutions applicable to any location or environment within Belize (Prosser Fertilizer, n.d.).

1.2. Statement of the problem

Climate change poses a major challenge to the agriculture sector in Belize, adverse weather conditions result in significant losses for many farmers. Often, farmers do not consider practices that could safeguard their crops under varying weather conditions. They require assistance in identifying and implementing methods that are resilient to climate change, where farmers require guidance on adopting environmentally sustainable practices to ensure long-term agricultural success.

Despite the introduction of the Hybrid Melon Sanson Gold (SVMF5675) seed, farmers remain reluctant to purchase it from the company. This hesitation stems from commercial farmers' aversion to the risks associated with cultivating a new variety, which could potentially result in

financial losses. The uncertainty surrounding the growth and cultivation of the new seed variety further intensifies their reluctance. Although similar cultivation practices can be applied, farmers are still unwilling to take the risk.

Currently, Belize lacks an established method for cultivating the Sanson Gold melon seed. Implementing a precise and effective cultivation method would enable farmers to achieve favorable results. Farmers seek concrete evidence of the seed's growth performance and its potential to produce high yields that translate into profitability. Providing such proof would significantly benefit the company by persuading farmers to purchase the seeds, demonstrating their effectiveness and profitability.

1.3. Purpose

The Final Graduation project aimed to develop and implement a comprehensive plan for the cultivation and distribution of the hybrid melon Sanson Gold (SVMF5675) seed in Belize, in collaboration with local farmers. This initiative sought to enhance agricultural productivity, increase farmer profitability, and ensure sustainable agricultural practices. Belize currently lacks an established protocol for the cultivation of the Hybrid Melon Sanson Gold (SVMF5675) seed. Therefore, the company conducted seed trials to evaluate outcomes and attract potential clients. As other farmers observe the favorable production results from these trials, they are incentivized to purchase the seeds, thereby boosting the company's sales. The rationale for this project is to provide widespread education and cultivation practices, which would greatly assist all farmers willing to purchase the melon seeds, simultaneously increasing Prosser Fertilizer & Agrotec Co. Ltd ’s profitability.

1.4. General objective

To develop a detailed project management plan for the cultivation and distribution of the hybrid melon Sanson Gold (svmf5675) seed in Belize, in collaboration with local farmers, aimed at enhancing agricultural productivity, increasing company profitability, and ensuring sustainable agricultural practices.

1.5. Specific objectives

1. To develop a cohesive Project Integration Management: that incorporates all aspects of the cultivation and distribution of the hybrid melon Sanson Gold (svmf5675) seed, ensuring alignment with the overall project goals and stakeholder expectations.
2. To define and document the project scope, including detailed deliverables, boundaries, and acceptance criteria, to ensure all project activities are aligned with the cultivation and distribution objectives.
3. To create a detailed project schedule management plan that outlines all tasks, milestones, and deadlines, ensuring timely completion of all project phases from seed cultivation to distribution.
4. To develop a comprehensive Project Cost Management plan that estimates all project costs, monitors expenditures, and ensures the project remains within the allocated budget.
5. To establish quality standards and control measures through Project Quality Management for the cultivation and distribution processes, ensuring the hybrid melon seeds meet the desired quality and performance criteria.
6. To identify, acquire, and manage all necessary resources, including personnel, equipment, and materials, to ensure efficient and effective project execution through the development of a Project Resource Management Plan.

7. To develop a Project Communications Management plan that ensures timely and effective dissemination of project information to all stakeholders, including farmers, suppliers, and project team members.
8. Project Risk Management: To identify potential project risks, assess their impact, and develop mitigation strategies to minimize their effect on the project's success.
9. To establish procurement processes for acquiring necessary goods and services, ensuring timely and cost-effective procurement aligned with project requirements detailed within Project Procurement Management.
10. To identify all project stakeholders, analyze their needs and expectations, and develop strategies for effective stakeholder engagement and management throughout the project lifecycle.

2 THEORETICAL FRAMEWORK

The theoretical framework for this project is grounded in the principles of agricultural innovation, climate resilience, and sustainable farming practices. The absence of an established cultivation method for the Sanson Gold melon seed in Belize necessitates the development of a precise and effective methodology. This framework of this FGP creates the foundation that the seed's growth performance and profitability will incentivize farmers to adopt the new variety, thereby enhancing agricultural productivity and profitability. Additionally, the framework incorporates the challenges posed by climate change, recognizing the need for adaptive strategies to mitigate the impacts of excessive rainfall, floods, and hurricanes. By integrating climate-resilient practices and providing comprehensive guidance on environmentally sustainable farming methods, the project aims to support farmers in achieving consistent yields despite adverse weather conditions. This holistic approach not only addresses the immediate needs of farmers but also promotes long-term sustainability and resilience in Belize's agricultural sector.

Farmers prioritize seed quality as it is fundamental to successful agriculture, ensuring proper germination and the development of vigorous seedlings that guarantee high production. Poor seed quality can be identified by low germination rates, delayed emergence, and weak growth, all of which negatively impact production. Additionally, farmers are interested in effective management practices (Salvo, Valdes, Martel, & Foster, 2017). Climate change poses a significant threat to cultivation if not properly managed.

2.1 Company/Enterprise framework

2.1.1 Company/Enterprise background

Prosser Fertilizer & Agrotec Co. Ltd, established in November 1971, is a Belizean-owned company that has grown to become a leading provider of agricultural products and services in Belize. With over 50 years of experience, the company employs more than 70 Belizeans and offers a wide range of high-quality crop inputs, equipment, and advisory services to farmers, gardeners, and other clients across the country. Prosser Fertilizer & Agrotec Co. Ltd is committed to enhancing agricultural productivity and sustainability through continuous research and innovation.

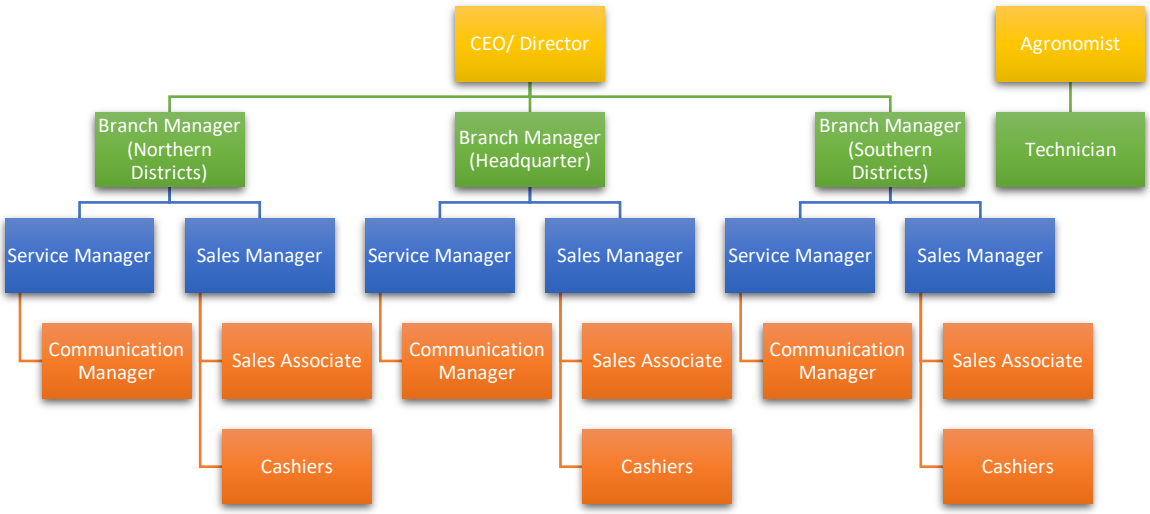
2.1.2 Mission and Vision Statements

The Prosser Fertilizer and Agrotec Co Ltd.'s vision is to be the foremost agricultural supplier in Belize, delivering precision agriculture solutions that ensure business success and sustainable practices. Its mission is to support the agricultural community by providing superior products, customized solutions, and expert guidance, thereby fostering prosperity and growth for all stakeholders.

2.1.3 Organizational structure

The Prosser group is directed by CEO of all branches, located across the country in Belize, including Corozal, Orange Walk, Belize City Branches 1 & 2, Mango Creek, and Santa Elena. Each unit is divided into three units, depicted in the organization chart in figure 1.

Figure 1 Prosser Fertilizer & Agrotec Co. Ltd. Organization Chart



Note: Adapted from the Prosser Fertilizer & Agrotec Co Ltd's Organizational Structure via website.

2.1.4 Products Offered

Prosser Fertilizer & Agrotec Co. Ltd offers an inclusive range of products and services, including NPK mixtures, specialized fertilizers, pesticides, crop inputs, water treatment chemicals, formulation and packing services, and equipment supplies. The company also provides farm operations and field trial services. Crop inputs encompass a variety of seeds, fertilizers, insecticides, fungicides, sprayers, and veterinary products. Within farm operations, the company delivers products and consultancy services aimed at enhancing agricultural procedures for farmers.

Field trial services include providing technical assistance to farmers for the cultivation of diverse crops across the country (Prosser Fertilizer, n.d.)

2.2 Project Management Concepts

2.2.1 Project Management Principles

The Project Management Institute outlines twelve principles to guide project managers in delivering successful projects by focusing on value, collaboration, and adaptability. Focusing on the following principles:

1. Stewardship: Emphasizes integrity, trustworthiness, and compliance, considering financial, social, and environmental impacts.
2. Team Collaboration: Encourages project teams to work together effectively within organizational cultures.
3. Stakeholder Engagement: Proactively involves stakeholders to contribute to project success and satisfaction.
4. Value Focus: Continually evaluates and adjusts project alignment to business objectives to maximize value.
5. Systems Thinking: Recognizes the dynamic nature of projects and the need to respond to internal and external changes.
6. Leadership: Demonstrates and adapts leadership behaviors to support team needs and promote positive outcomes.
7. Complexity: Each project is unique, requiring tailored methods to achieve desired outcomes.

8. Tailoring: Adjust methods, processes, and practices to fit the project's unique circumstances and context.
9. Quality: Focus on quality throughout the project lifecycle to meet or exceed stakeholder expectations.
10. Complexity Management: Recognize and manage project complexity, considering factors such as interdependencies, constraints, and uncertainties.
11. Adaptability and Resilience: Be adaptable and resilient, responding to changes and challenges with a flexible approach.
12. Change: Continuously seek ways to improve project processes, outcomes, and personal and organizational development.

2.2.2 Project Management Domains

The (Project Management Institute, 2021) identifies these essential domains for effective project management, and they consist of:

1. Stakeholders: They identify and prioritize the requirements and scope of the project team.
2. Team: It involves determining the culture and environment that allows a group of different people to progress into a high-performing project team.
3. Development Approach and Life Cycle: This involves determining the development approach, delivery cadence, and project life cycle required to improve project results.
4. Planning: In the planning proactively develop an approach to create the project deliverables.
5. Project Work: Creates the procedures and performs the work to assist the project team to deliver the assumed deliverables and results.

6. Delivery: It aims to meet requests, scope, and quality prospects to generate the expected deliverables that will drive the projected results.
7. Measurement: It implies evaluating project performance and applying applicable responses to sustain optimum operation.
8. Uncertainty: Shows risks and opportunities that project teams investigate, evaluate, and determine in what way it can be handled.

2.2.3 Predictive, Adaptative and Hybrid projects

Predictive: A specific plan is made and adhered to during the period of the project. The timetable, budget, and deliverables are all required and defined from the start of the project. The method is optimum for projects that have precise requirements and stable environments (Iqbal, 2023).

- They are efficient when project and product requisites are precise and stable at the start.
- Highlights complete planning and implementation created on primary wants.
- Follows a traditional model where each stage is finished before the next one commences (PMI, 2024)

Adaptive: Change based frequently known as Agile, places emphasis on adaptability and flexibility. The comments from stakeholders and changes in the advancement environment, requests and project plans are always reviewed and re-examined. This approach is perfect for projects that swiftly change requirements and a high level of indecision (Iqbal, 2023).

- Ideal for projects where requirements are subject to high level of ambiguity and instability and are probable to change throughout a project.
- Uses an iterative and progressive method, permitting more flexibility and adaptation.

- Inspires constant partnership and embraces change as a natural part of the procedure (Project Management Institute, 2021).

Hybrid: Change based as its name indicates, encompasses features of both the predictive and adaptive methods. It involves drafting a high-level approach at the start of the project though tolerating flexibility and adjustment as the project progresses. The method is ideal for projects with requirements of a balance of probability and flexibility (Iqbal, 2023).

- Unites features of both predictive and adaptive methods.
- Ideal for projects with changing degrees of certainty and flexibility.
- Permits some project elements to be precise and continuous while others are subject to modification (PMI, 2024).

2.2.4 Project Management

Project management is when knowledge, skills, tools and techniques are applied to project activities to meet project requests. It's also the practice of planning, organizing, and implementing the responsibilities required to turn a bright idea into a tangible product, service, or deliverable (PMI, 2024).

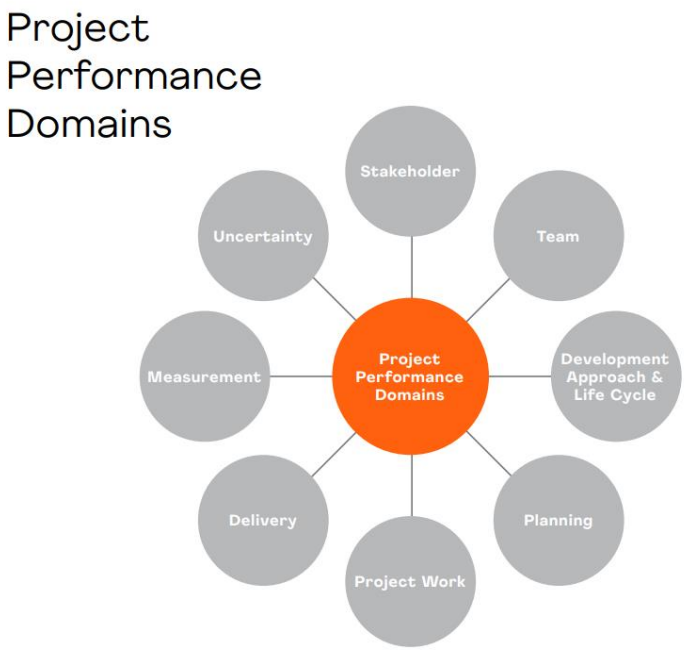
Important aspects of project management include:

- Defining project scope
- Identifying deliverables
- Managing risks
- Effective communication across teams

2.2.5 Project Management Knowledge Areas and Processes

Project management is a structured approach to planning, executing, and completing projects effectively. The Project Management Body of Knowledge (PMBOK®) outlines ten key knowledge areas that encompass 49 processes essential for successful project management (Project Management Institute, 2021). These knowledge areas include Project Integration, Scope, Schedule, Cost, Quality, Resource, Communications, Risk, Procurement, and Stakeholder Management. Each area addresses specific aspects of project management, ensuring comprehensive coverage from initiation to closure. Understanding and applying these processes helps project managers achieve project goals efficiently and effectively.

Figure 2 Project Performance Domains

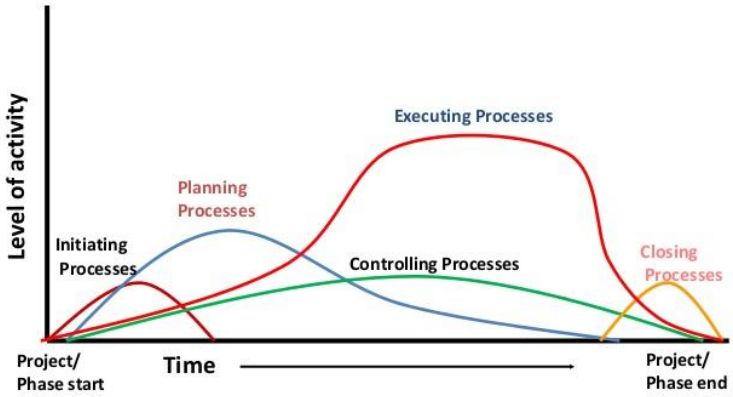


Note: Extracted from the Project Management Institute, 2021

The performance domains collectively form a cohesive system essential for the effective completion of projects and the achievement of desired outcomes. These domains function as an integrated system, with each domain interdependent on the others. Throughout the project lifecycle, performance domains operate concurrently, irrespective of the method of value delivery. While performance domains are inherent in all projects, their interrelationships can vary from one project to another (Project Management Institute, 2021).

Project management process groups can be logically categorized into groups of tools, strategies, and outputs tailored to meet the specific demands of the project and the needs of the organization's stakeholders. According to the PMBOK (2021), the following five process groups provide an organizational framework for process-based initiatives:

Figure 3 Process Groups Overlap



Note: Adapted from Project Management ioesolutions.esigncom, 2024

1. **Initiating**: Procedures undertaken to authorize a new project or a new phase within an existing project, securing approval to commence.
2. **Planning**: Procedures required to define the project's objectives, determine the necessary course of action to achieve them, and outline the project's scope.
3. **Executing**: Procedures followed to meet project requirements by completing the tasks specified in the project management plan.
4. **Monitoring and Controlling**: Procedures necessary to track, review, and regulate the project's performance, identify areas requiring changes, and implement those adjustments.
5. **Closing**: Actions taken to formally conclude a project, phase, or contractual agreement.

2.2.6 Project Lifecycle

The project lifecycle is crucial because it provides a structured framework that guides project managers and teams through the various stages of a project, from initiation to closure. Here are some key reasons why the project lifecycle is important:

- Clarity and Organization: It helps in organizing and defining the sequence of activities, ensuring that each phase of the project is clearly outlined and understood.
- Improved Planning: By breaking down the project into distinct phases, it allows for more detailed and effective planning, helping to identify potential risks and allocate resources efficiently.
- Enhanced Control: The lifecycle provides checkpoints at each phase, enabling project managers to monitor progress, make necessary adjustments, and ensure that the project stays on track.
- Stakeholder Engagement: It facilitates better communication and engagement with stakeholders by providing a clear roadmap of the project's progress and milestones.
- Quality Assurance: Each phase includes specific deliverables and review processes, which help in maintaining the quality of the project outputs.
- Risk Management: By identifying and addressing risks at each stage, the project lifecycle helps in mitigating potential issues before they escalate.
- Continuous Improvement: Lessons learned from each phase can be documented and applied to future projects, fostering a culture of continuous improvement.*Note*. The 5 phases of the project life cycle.

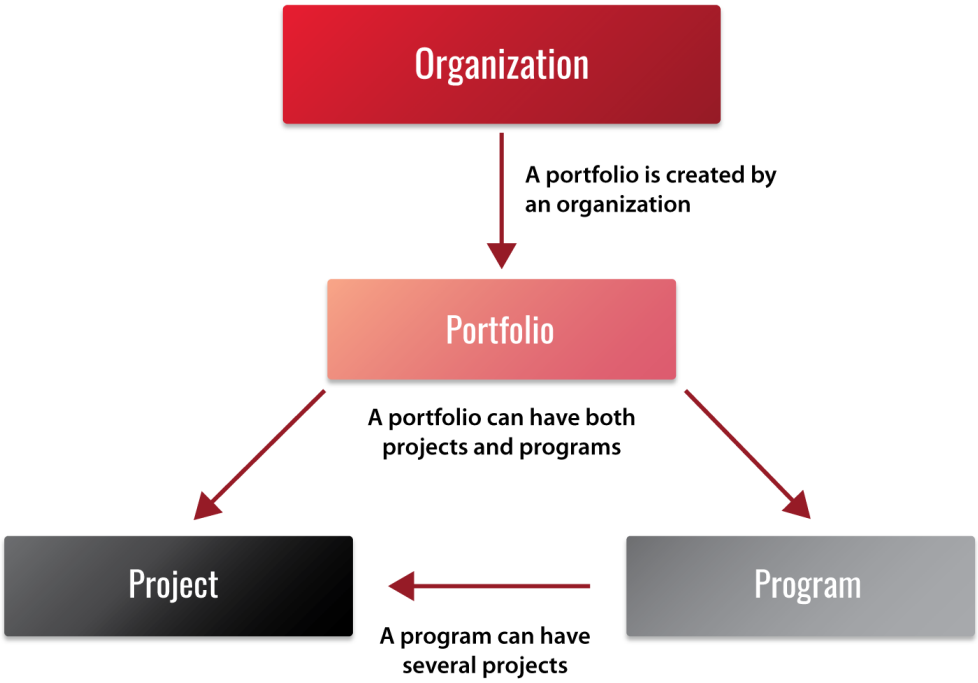
Figure 4 Lifecycle Phases of Projects

Note: Reprinted from Mastering the project life cycle: A complete guide, February 09, 2023

2.2.7 Company strategy, portfolios, programs and projects

The Project Management Institute (Project Management Institute, 2021) defines that portfolios include projects, programs, subsidiary portfolios, and operations that are administered as a group to obtain tactical goals. A program represents linked projects, subsidiary programs, and program activities that are managed in a corresponding manner to acquire benefits not obtainable from managing them individually. A project is a momentary effort undertaken to form a unique product, service, or result. The temporary nature of projects specifies a beginning and an end to the project work. Projects can stand unaccompanied or be part of a program portfolio (Project Management Institute, 2021).

Figure 5 The relationship between the three P's of Project Management



Note: The relationship between the three P's of Project Management reprinted from Project, Program, Portfolio, Strategy, December, 13, 2020

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

Despite the introduction of the Hybrid Melon Sanson Gold (SVMF5675) seed by Prosser Fertilizer & Agrotec Co Ltd, farmers remain hesitant to purchase it. Their reluctance stems from the risks associated with commercial farming, particularly the potential for financial loss if the cultivation process is not successful. In Belize, there is currently no established methodology for cultivating the Sanson Gold melon seed. Developing an approach would enable farmers to manage the cultivation process more precisely and effectively, thereby increasing the likelihood of positive outcomes.

To address these concerns, the company dispatched agronomists to visit farmers and recommended seeds. While these efforts led to some improvement in sales, the results did not meet the company's expectations. To further boost customer confidence and increase sales, the company planned to conduct seed trials, allowing farmers to observe the results firsthand.

2.3.2 Previous research done for the topic in study

Research on this topic within the country is limited or even non-existent, primarily because certain vegetables and fruits have not been extensively studied in Belize. Most information has been derived from other companies' research and foreign studies involving different seed trials which are listed in detail below. While the company has conducted trials with various seeds, these efforts have not been systematically documented. Previous trials, which focused mainly on vegetables, yielded positive results with new varieties but did not include analysis documentation. However, these trials lacked a proposed methodology for cultivation. Farmers collaborating with the company were expected to successfully grow the varieties and achieve high yields. The procedures typically involved identifying willing farmers to participate in the trials. After harvesting, the agronomist and the cooperating farmers evaluated the production. This data was then used in meetings and discussions, where the agronomist would highlight the benefits of the new variety to be sold by the company. Implementing a proposed methodology for specific seed varieties and increasing farm visits by the agronomist would further assist farmers in achieving better outcomes.

1. **Combining Ability and Heterotic Studies on Hybrid Melon (Cucumis melo L.)**: This study evaluated the heterotic and combining ability effects in diallel crosses of melon for yield and quality traits. The research involved seven melon genotypes crossed to produce

49 hybrids, which were then assessed for various traits such as fruit weight, flesh thickness, and sweetness. The study found significant differences among genotypes and identified six hybrids with potential for high yield and quality. The results indicated that most traits were controlled by nonadditive gene action, suggesting the breeding material could be effectively used for hybrid cultivar production

2. **Performance of Melon (Cucumis melo L.) Hybrids Across Diverse Environmental Conditions**: This research assessed the performance of melon hybrids obtained from full-diallel crosses under three different environmental conditions in East Java, Indonesia. The study evaluated 38 selected hybrids for yield characteristics such as fruit weight, diameter, and sweetness. The findings revealed that environmental conditions significantly influenced the performance of the hybrids, with certain hybrids consistently outperforming commercial cultivars across all test locations
3. **Agronomic Evaluation of Three Hybrid Melon (Cucumis melo) Varieties**: This study focused on the agronomic evaluation of three hybrid melon varieties (Gold Honey, Rina F1, and Ovation) in Colombia. The research aimed to enhance rural development through the implementation of these crops. The study involved phenological follow-up to assess crop yield and provided insights into the potential of these hybrids for improving agricultural productivity in the region

These studies highlight the importance of evaluating hybrid melon varieties under different conditions to identify those with the best performance for yield and quality traits. They also emphasize the role of genetic and environmental factors in determining the success of hybrid cultivars.

2.3.3 Other theory related to the topic in study

Climate Change

Particularly in Belize City, Belize is susceptible to hurricanes and storms with accompanying floods, wind damage, and storm surge. The low-lying topography of the nation makes flooding a greater risk. There is a chance of extremely high temperatures in Belize. It is now well acknowledged that climate change poses a serious danger to attempts to fulfill the expanding requirements of the most vulnerable communities and has a substantial influence on disaster management operations (World Bank Group, 2021). Belize's climate research suggests that the climate is an essential determinant for agriculture. However, in Belize, the climate is highly unpredictable and issues with drought and flooding have a direct impact on production. Additionally, diseases, weeds, and insect infestations linked to climate change frequently inflict harm in developing countries such as Belize.

Challenges Faced by Small Farmers in Belize

The small farmers in Belize face several challenges, such as poor market prices for food, pests and illnesses, weather-related disasters, and a lack of capital for business growth. Although just roughly 9.7% of Belize's land is utilized for agricultural activities, it is estimated that 38% of the country's land mass is suitable for farming or rearing cattle. The inadequate use of accessible land can be attributed to a variety of factors, but two main obstacles facing farmers are the high input costs associated with land development and their restricted access to financing. The majority of the small farmers raise livestock and crops for their own use or as a source of revenue for the nearby market and exporters. Belize's geographic position makes it vulnerable to hurricanes. The nation's infrastructure and agriculture are impacted by hurricanes and other natural catastrophes.

The people most negatively impacted by these natural disasters are small farmers. Furthermore, inadequate infrastructure continues to be a major obstacle for small farmers (Reynolds, 2020)

Sustainability Challenges in Belize

It is essential to improve agricultural communities' capacity to deal with the effects of climate change, as some smallholder farmers struggle to adjust to rising temperatures and unfavorable weather occurrences like floods and droughts. Under increasingly harsh climatic circumstances, investments in weather forecasting systems, insurance plans, effective irrigation equipment, and heat or drought-tolerant crop varieties can assist to increase agricultural production (Villegas Aguilar, 2018).

Sustainable Farming Practices in Latin America

In Latin America, environmentally friendly agricultural methods promote a more vibrant future for the region's citizens as well as a healthier earth. The region is adopting climate-smart agriculture, precision farming, agroecology, and nature-based solutions to make agriculture more resilient, productive, and ecologically friendly. These methods not only safeguard smallholder farmers' lives but also present chances for economic expansion. As the region keeps coming up with new ideas and working together, it inspires the rest of the globe with its dedication to using ecologically friendly agriculture to reduce poverty (Lyazov, 2025)

3 METHODOLOGICAL FRAMEWORK

3.1 Information sources

Resources for data and information are crucial to the success of the project. They consist of the information, reports, and data required to finish the project. Project success is significantly influenced by the information resources' relevance, accuracy, and accessibility. The technology, healthcare, and finance sectors are among those that mostly rely on information resources. Accurate and pertinent data must be stored, retrieved quickly, and managed effectively in order for information resources to be managed effectively.

3.1.1 Primary sources

Primary sources are original, firsthand documents or evidence directly related to the topic of research. They provide direct access to the subject of study and include materials such as diaries, letters, speeches, photographs, official records, and artifacts. In scientific research, primary sources can also include original research articles, experiments, and data sets. These sources are invaluable for research projects because they offer authentic insights and direct evidence, allowing researchers to interpret and analyze information without the influence of secondary interpretations. Utilizing primary sources helps ensure the accuracy and credibility of the research findings (Nicholas, 2023).

3.1.2 Secondary sources

Secondary sources are materials that interpret, analyze, or summarize information from primary sources. They provide secondhand accounts and include resources such as textbooks, review articles, encyclopedias, and critical essays. These sources are valuable in research projects because they offer context, commentary, and a broader understanding of the topic. Secondary sources help

researchers by synthesizing existing knowledge, identifying trends, and providing various perspectives on the subject. By using secondary sources, researchers can build upon the work of others, compare different viewpoints, and develop a well-rounded analysis of their research topic. The secondary sources that were used in the development of the FGP are journal articles, essays and documentaries.

Table 1 Information Resources (Source: Author of Study)

Objectives	Information sources	
	Primary	Secondary
To develop a cohesive Project Integration Management: that incorporates all aspects of the cultivation and distribution of the hybrid melon Sanson Gold (svmf5675) seed, ensuring alignment with the overall project goals and stakeholder expectations.	Interviews, meetings with farmers and data, email communication amongst team members for reference.	PMBOK Guide 7th edition, articles, and lecture notes
To define and document the project scope, including detailed deliverables, boundaries, and acceptance criteria, to ensure all project activities are aligned with the cultivation and distribution objectives.	Meetings, and gathered clinical trial data	PMBOK Guide 7th edition, articles, journal, and agriculture lecture notes
To create a detailed project schedule management plan that outlines all tasks, milestones, and deadlines, ensuring timely completion of all project phases from seed cultivation to distribution.	Interviews, meetings, photographs, and lessons learnt from similar projects	PMBOK Guide 7th edition, articles, journals

To develop a comprehensive Project Cost Management plan that estimates all project costs, monitors expenditures, and ensures the project remains within the allocated budget.	Interviews, meetings, photographs, previous clinical trial data	Articles, Journals
To establish quality standards and control measures through Project Quality Management for the cultivation and distribution processes, ensuring the hybrid melon seeds meet the desired quality and performance criteria.	Interviews, meetings with farmers and data, email communication amongst team members for reference	PMBOK Guide, PMI Database, internet and public database.
To identify, acquire, and manage all necessary resources, including personnel, equipment, and materials, to ensure efficient and effective project execution through the development of a Project Resource Management Plan.	Meetings, One-on-One discussion with resources	PMBOK Guide, PMI Database, internet and public database.
To develop a Project Communications Management plan that ensures timely and effective dissemination of project information to all stakeholders, including farmers, suppliers, and project team members.	Interviews, meetings with farmers and data, email communication amongst team members for reference	PMBOK Guide, PMI Database, internet and public database.
Project Risk Management: To identify potential project risks, assess their impact, and develop mitigation strategies to minimize their effect on the project's success.	Existing budget requests with team members.	PMBOK Guide, PMI Database, internet and public database.

To establish procurement processes for acquiring necessary goods and services, ensuring timely and cost-effective procurement aligned with project requirements detailed within Project Procurement Management.	Revision of existing Company Procurement and Warehouse processes	PMBOK Guide, PMI Database, internet and public database.
To identify all project stakeholders, analyze their needs and expectations, and develop strategies for effective stakeholder engagement and management throughout the project lifecycle.	Interviews, meetings, photographs, data	Public Seed Articles & Journals

3.2 Research methods

In order to guarantee accurate and trustworthy findings that answer the goals, objectives, and research questions of the study, a researcher must carefully plan their research approach. (Walliman, 2011).

3.2.1 Quantitative method

The focus of quantitative methods is on objective measurements and the statistical, mathematical, or numerical analysis of data gathered via surveys, polls, and other means of gathering information, as well as the use of computer technology to manipulate statistical data that has already been obtained. Determining the relationship between something and another within a population is your aim while doing a quantitative research study (Missisipi State University, 2023)

3.2.2 Qualitative method

Implies a focus on characteristics of substances as well as meanings and processes that are not subjected to experimental analysis or quantified in terms of quantity, amount, intensity, or frequency. Many social and behavioral scientists view qualitative forms of inquiry as both a

method and a viewpoint on how to approach studying a research subject (University of Southern California, 2024).

3.2.3 Mixed methods

It integrates aspects of both qualitative and quantitative research to address your research issue. The integration of the advantages of both approaches can provide you with a more comprehensive picture than a solitary quantitative or qualitative investigation. It is frequently employed in the social, behavioral, and health sciences, particularly in complicated situational or societal studies in multidisciplinary contexts (George, 2021).

Table 2 Research Methods (Source: Author of Study)

Objectives	Research methods		
	Quantitative method	Qualitative method	Mixed method
To develop a cohesive Project Integration Management: that incorporates all aspects of the cultivation and distribution of the hybrid melon Sanson Gold (svmf5675) seed, ensuring alignment with the overall project goals and stakeholder expectations.	Information and data from past research will be examined to be knowledgeable in the topic.	Engaging in participant observation by spending time in the fields and distribution centers to observe and document the processes, interactions, and behaviors of those involved.	Use the qualitative findings to design experiments and surveys that test the identified variables on a larger scale that would create the necessary schedule to follow the seed clinical trials.

To define and document the project scope, including detailed deliverables, boundaries, and acceptance criteria, to ensure all project activities are aligned with the cultivation and distribution objectives.	Information from pre-existing data will be analyzed to develop the methodology project.	Information on costs will be utilized.	Information and data from past, and present research.
To create a detailed project schedule management plan that outlines all tasks, milestones, and deadlines, ensuring timely completion of all project phases from seed cultivation to distribution.	Data from interviews, meetings and feedback will be used.	Use information from past and present research to determine the precise procedures.	Use the qualitative findings to design experiments and surveys that test the identified variables on a larger scale that would create the necessary schedule to follow the seed clinical trials.
Developing a comprehensive Project Cost Management plan that estimates all project costs monitors expenditures, and ensures the project remains within the allocated budget.	Assessing the cost-effectiveness of different cultivation and distribution methods by calculating input costs, labor, and potential revenue.	Conducting h interviews with farmers, distributors, and consumers to gather detailed insights into their experiences, perceptions, and challenges related to the cultivation and distribution	Use the qualitative findings to design experiments and surveys that test the identified variables on a larger scale that would impact the cost plan required.

		of the hybrid melon.	
To establish quality standards and control measures through Project Quality Management for the cultivation and distribution processes, ensuring the hybrid melon seeds meet the desired quality and performance criteria.	Using statistical tools to analyze data collected from experiments and surveys. This includes regression analysis, ANOVA, and multivariate analysis to identify significant factors affecting yield and distribution.	Focus Groups, Qualitative risk Assessment	Use the qualitative findings to design experiments and surveys that test the identified variables on a larger scale that would create the necessary schedule to follow the seed clinical trials.
To identify, acquire, and manage all necessary resources, including personnel, equipment, and materials, to ensure efficient and effective project execution through the development of a Project Resource Management Plan.	Quantifying yield (e.g., weight, number of fruits per plant) and quality traits (e.g., sweetness, firmness) through standardized measurement protocols.	Engaging in participant observation by spending time in the fields and distribution centers to observe and document the processes, interactions, and	• Collect both quantitative (e.g., field trials, surveys) and qualitative (e.g., interviews, observations) data simultaneously. • Compare and contrast the

		behaviors of those involved.	findings from both methods to validate and enrich the results.
To develop a Project Communications Management plan that ensures timely and effective dissemination of project information to all stakeholders, including farmers, suppliers, and project team members.	Distributing structured surveys to farmers and distributors to gather data on cultivation practices, challenges faced, and market demand for the hybrid melon	Conducting in-depth interviews with farmers, distributors, and consumers to gather detailed insights into their experiences, perceptions, and challenges related to the cultivation and distribution of the hybrid melon.	PM will start with qualitative interviews to identify key factors, follow with quantitative surveys to measure their prevalence, and conclude with focus groups to discuss the findings after implementation.
Project Risk Management: To identify potential project risks, assess their impact, and develop mitigation strategies to minimize their effect on the project's success.	Implementing large-scale field trials to compare the performance of Sanson Gold with other melon varieties	Analyzing stories and narratives from farmers and distributors to identify common themes, patterns, and insights related to their experiences with the hybrid melon.	

To establish procurement processes for acquiring necessary goods and services, ensuring timely and cost-effective procurement aligned with project requirements detailed within Project Procurement Management.	Data from interviews, meetings, and feedbacks will be used. Also, information from past researches. Evaluating the efficiency of the supply chain from seed production to market distribution, including transportation logistics and storage conditions.	Analyzing stories and narratives from farmers and distributors to identify common themes, patterns, and insights related to their experiences with the hybrid melon.	Information and data from past, and present research.
To identify all project stakeholders, analyze their needs and expectations, and develop strategies for effective stakeholder engagement and management throughout the project lifecycle.	Data from interviews, meetings and feedbacks will be used. Also, information from past researches.	Utilize past and present information from interviews and feedbacks examining the growth process.	Information and data from past, and present researches.

3.3 Tools

According to the (Project Management Institute, 2021), choosing the tools that the project team will use for the project is an example of tailoring. The project team is frequently the one with the most understanding of which technologies are appropriate for the job, but depending on the expenses involved, those decisions may need to be moderated.

Software programs for proper project management assist project managers and their teams in planning, monitoring, and carrying out projects quickly and efficiently. They are intended to help with project activity management, scheduling, reporting, and planning. They facilitate communication and guarantee project completion within the allocated budget, schedule, and scope. There are several types of project management tools, ranging from basic to advanced. Gantt charts, task lists, and calendars are a few examples that can be created through Microsoft Project. Modern Project Management methodologies include systems like Waterfall and Agile, which provide flexible and iterative project management techniques (Adobe Experience Cloud Team, 2023).

The tools used for the FGP charter were data analysis, decision making, communication skills, interpersonal and teamwork skills. The data analysis section is important when identifying how the proposal will benefit. Decision making will define the most efficient procedures for cultivation. Communication skills will benefit when the company's agronomist interact with the stakeholders. Interpersonal and teamwork skills are useful when having meetings and sharing the progress information to the company.

Table 3 Tools (Source: Author of Study)

Objectives	Tools
To develop a cohesive Project Integration Management: that incorporates all aspects of the cultivation and distribution of the hybrid melon Sanson Gold (svmf5675) seed, ensuring alignment with the overall project goals and stakeholder expectations.	Meetings Expert judgement Data gathering/ feedback
To define and document the project scope, including detailed deliverables, boundaries, and acceptance criteria, to ensure all project activities are aligned with the cultivation and distribution objectives.	Microsoft Word
To create a detailed project schedule management plan that outlines all tasks, milestones, and deadlines, ensuring timely completion of all project phases from seed cultivation to distribution.	Microsoft Project, Jira Project Management Tool
To develop a comprehensive Project Cost Management plan that estimates all project costs, monitors expenditures, and ensures the project remains within the allocated budget.	Microsoft Project
To establish quality standards and control measures through Project Quality Management for the cultivation and distribution processes, ensuring the hybrid melon seeds meet the desired quality and performance criteria.	
To identify, acquire, and manage all necessary resources, including personnel, equipment, and materials, to ensure efficient and effective project execution through the development of a Project Resource Management Plan.	Google Workspace: For document creation, sharing, and collaboration. Dropbox: For secure file storage and sharing.

To develop a Project Communications Management plan that ensures timely and effective dissemination of project information to all stakeholders, including farmers, suppliers, and project team members.	Meetings, Expert judgment Data gathering/feedback Researches
Project Risk Management: To identify potential project risks, assess their impact, and develop mitigation strategies to minimize their effect on the project's success.	Meetings Expert judgement Data gathering
To establish procurement processes for acquiring necessary goods and services, ensuring timely and cost-effective procurement aligned with project requirements detailed within Project Procurement Management.	Meetings Expert judgement Data gathering and analysis Feedbacks
To identify all project stakeholders, analyze their needs and expectations, and develop strategies for effective stakeholder engagement and management throughout the project lifecycle.	Meetings/ Interviews Expert judgement Data gathering Feedbacks

3.4 Assumptions and constraints

A factor that is taken for granted without evidence or justification is called an assumption. A constraint is an impediment that limits the way a project, program, portfolio, or process may be carried out (PMBOK Guide, 2021). Constraints and assumptions play a crucial role in your project. They must be recognized, managed, and constantly observed. A constraint is a limitation on your project, whereas an assumption is a condition you believe to be true. Throughout the course of the project, limits must be established and assumptions must be properly assessed. Controlling assumptions and constraints is essential to finishing your job with the least amount of difficulty (Usmani, 2024).

Table 4 Assumptions & Constraints

Objectives	Assumptions	Constraints
To develop a cohesive Project Integration Management: that incorporates all aspects of the cultivation and distribution of the hybrid melon Sanson Gold (svmf5675) seed, ensuring alignment with the overall project goals and stakeholder expectations.	It is assumed that stakeholders will agree to develop the clinical trials. The cultivation and distribution of the hybrid melon are economically viable, providing a good return on investment for farmers and distributors.	Lack of skilled labor in rural areas can lead to delays in cultivation and harvesting activities. Challenges in reaching markets and securing fair prices for the produce can affect the profitability of the project Unpredictable weather patterns, such as droughts, floods, and temperature extremes, can negatively impact crop yields and quality
To define and document the project scope, including detailed deliverables, boundaries, and acceptance criteria, to ensure all project activities are aligned with the cultivation and distribution objectives.	It's expected to find researches and get feedback from stakeholders. The cultivation and distribution of the hybrid melon are economically viable, providing a good return on investment for	Difficulty in obtaining high-quality seeds, including issues with seed purity and germination rates, can affect the success of the cultivation Lack of skilled labor in rural areas can

Objectives	Assumptions	Constraints
	farmers and distributors.	lead to delays in cultivation and harvesting activities
To create a detailed project schedule management plan that outlines all tasks, milestones, and deadlines, ensuring timely completion of all project phases from seed cultivation to distribution.	It's expected to have done one trial with that methodology to have proof of the yields it can produce.	Find a suitable location to do all the practices precisely in order to obtain the optimum results.
To develop a comprehensive Project Cost Management plan that estimates all project costs, monitors expenditures, and ensures the project remains within the allocated budget.	There is sufficient market demand for the hybrid melon, ensuring that the produce will be sold at a profitable price.	limited access to credit and financial resources can prevent farmers from investing in necessary inputs such as seeds, fertilizers, and equipment
To establish quality standards and control measures through Project Quality Management for the cultivation and distribution processes, ensuring the hybrid melon seeds meet the desired quality and performance criteria.	Climate Suitability: The regions selected for cultivation have the appropriate climate conditions (temperature, rainfall, humidity) for growing the hybrid melon. Soil Quality: The soil in the cultivation areas is fertile and well-suited for melon growth, with necessary nutrients	Inefficiencies in the supply chain, such as delays in input delivery and the presence of counterfeit products, can disrupt the cultivation process.

Objectives	Assumptions	Constraints
	and proper pH levels.	
To identify, acquire, and manage all necessary resources, including personnel, equipment, and materials, to ensure efficient and effective project execution through the development of a Project Resource Management Plan.	Farmers are willing to adopt the new hybrid melon variety and follow recommended cultivation practices.	Difficulty in obtaining high-quality seeds, including issues with seed purity and germination rates, can affect the success of the cultivation
To develop a Project Communications Management plan that ensures timely and effective dissemination of project information to all stakeholders, including farmers, suppliers, and project team members.	Farmers are willing to adopt the new hybrid melon variety and follow recommended cultivation practices.	
Project Risk Management: To identify potential project risks, assess their impact, and develop mitigation strategies to minimize their effect on the project's success.	Farmers receive proper training and support on best practices for cultivating the hybrid melon.	imited access to credit and financial resources can prevent farmers from investing in necessary inputs such as seeds, fertilizers, and equipment
To establish procurement processes for acquiring necessary goods and services, ensuring timely and cost-effective procurement aligned with project requirements detailed within Project Procurement Management.	Necessary resources such as seeds, fertilizers, water, and labor are readily available and affordable for farmers.	Inefficiencies in the supply chain, such as delays in input delivery and the presence of counterfeit products, can disrupt the cultivation process

Objectives	Assumptions	Constraints
To identify all project stakeholders, analyze their needs and expectations, and develop strategies for effective stakeholder engagement and management throughout the project lifecycle.	It's likely that farmers will agree to give interviews and feedbacks regarding the benefits of the variety.	A few researches and information will be available regarding different varieties in the country.

Note. Assumptions and constraints for FGP. Own work.

3.5 Deliverables

The results you hope to obtain at the conclusion of your project are known as project deliverables. There may be one or many deliverables for your project, but knowing exactly what you're aiming for can help your team prioritize and work together to complete the most crucial tasks first. Establishing your project deliverables will be made easier by your objectives. There are two different kinds of deliverables, and the kind of project you're working on will determine which one you're aiming for. (Martins, 2024).

According to Martins (2024), the two type of project deliverables are:

External deliverable – Anything you create for clients, such as a new feature or product, a social media or marketing campaign, or a sales presentation, is an example of an external deliverable. Deliverables from other sources will assist you in gaining and retaining customers.

Internal deliverable – Is something that helps your business but might not have an immediate effect on your clients. This covers items such as a quarterly budget report or a workplace training course.

Table 5 Deliverables (Source: Author of Study)

Objectives	Deliverables
To develop a cohesive Project Integration Management: that incorporates all aspects of the cultivation and distribution of the hybrid melon Sanson Gold (svmf5675) seed, ensuring alignment with the overall project goals and stakeholder expectations.	Project Integration Management Plan
To define and document the project scope, including detailed deliverables, boundaries, and acceptance criteria, to ensure all project activities are aligned with the cultivation and distribution objectives.	Project Scope
To create a detailed project schedule management plan that outlines all tasks, milestones, and deadlines, ensuring timely completion of all project phases from seed cultivation to distribution.	Project Schedule, Gantt Chart, Work breakdown structure
To develop a comprehensive Project Cost Management plan that estimates all project costs, monitors expenditures, and ensures the project remains within the allocated budget.	Project Cost Breakdown
To establish quality standards and control measures through Project Quality Management for the cultivation and distribution processes, ensuring the hybrid melon seeds meet the desired quality and performance criteria.	Questionnaires, Quality Management Checklist, Quality Assurance Certificate Act
To identify, acquire, and manage all necessary resources, including personnel, equipment, and materials, to ensure efficient and effective project execution through the development of a Project Resource Management Plan.	Resource Application and Approval
To develop a Project Communications Management plan that ensures timely and effective dissemination of project information to all stakeholders, including farmers, suppliers, and project team members.	Communication Matrix based on the Power-Interest Data.
Project Risk Management: To identify potential project risks, assess their impact, and develop mitigation	Risk Assessment Matrix

strategies to minimize their effect on the project's success.	
To establish procurement processes for acquiring necessary goods and services, ensuring timely and cost-effective procurement aligned with project requirements detailed within Project Procurement Management.	Procurement Plan based on the Cost Management Plan
To identify all project stakeholders, analyze their needs and expectations, and develop strategies for effective stakeholder engagement and management throughout the project lifecycle.	Stakeholder Management Plan

4 RESULTS

This section aims to provide ten subsidiary project management plans to guide the implementation of this project. The section encompasses all the details relevant to introduction of Hybrid Melon Seeds through company trials, farmer education and subsequent cultivation.

4.1 Integration Management Plan

4.1.1 Develop Project Charter

A project charter is a formal document delineating the project's purpose, scope, stakeholders, objectives, and comprehensive plan. This document is designed to guide all subsequent decisions and actions. Essentially, this project charter outlines the project's roadmap and communicates project details, resources, and execution. This initial plan is the foundation for all the nine subsequent plans, helping keep the project on track and aligned with its original and intended goals. In this section, the project charter definition is created using a template created to fit the requirements for the Prosser Fertilizer Co. Ltd.

Table 6 Project Charter (Source: Author of the Study)

PROJECT CHARTER: GENERAL PROJECT INFORMATION DESCRIBE THE PROBLEM OR ISSUE, GOALS, OBJECTIVES, AND DELIVERABLES OF THIS PROJECT	
PROBLEM OR ISSUE	Despite the introduction of the Hybrid Melon Sanson Gold (SVMF5675) seed, farmers remain reluctant to purchase it from the company. This hesitation stems from commercial farmers' aversion to the risks associated with cultivating a new variety, which could potentially result in financial losses.
PURPOSE OF PROJECT	The purpose of the "Distribution and Education of the Melon Hybrid Seeds" project is to enhance melon cultivation practices among local

	farmers by introducing high-quality hybrid seeds and providing comprehensive education on effective farming techniques.
BUSINESS CASE	Effective melon cultivation involves several critical steps to ensure successful growth and yield. Below is a detailed scope management plan for the seed trial: 1. **Land Preparation**: The process begins with site selection, choosing an appropriate location with well-drained soil. The land is then ploughed, and beds are formed, each 3 meters wide, ensuring adequate height for proper drainage. To prevent weed growth, plastic mulch can be used, or manual control methods can be employed. Enhancing soil nutrients is crucial, which can be achieved by applying organic fertilizer or planting legumes post-harvest to increase soil organic matter. 2. **Seedling Production**: Seeds are sown in trays containing peat moss, which aids in germination. Seedlings are carefully monitored to prevent pest damage and are gradually introduced to sunlight. Transplanting occurs 12-15 days after sowing, with the soil kept moist and the process ideally done in the early morning or evening to reduce plant stress. 3. **Planting Space**: Proper spacing is maintained with 1.5 meters between plants and 1 meter between rows. Soil pH is managed to stay between 6.0 and 6.5, with lime added if necessary to adjust pH levels. 4. **Transplanting**: Before transplanting, beds are irrigated for about an hour to soften the soil. Transplanting is done in the early morning or evening to minimize stress on the plants. Seedlings are carefully lifted from trays, holes 1-2 inches deep are dug, and the plants are gently placed and surrounded with soil, which is then pressed down lightly.

	5. **Irrigation**: Drip irrigation is recommended to ensure even crop development and reduce disease risk. Plants are watered early in the morning and late in the afternoon for about 2 hours. Irrigation is reduced before and during the ripening period to maintain sugar content and prevent fruit rot. 6. **Weed Control**: Manual weed control is preferred to avoid disturbing melon roots. Chemical control can be used with shields to protect plants, but it should be avoided when plants are fully developed. Polythene or organic mulches are also effective in controlling weeds and enhancing soil warmth. 7. **Fertilization**: Balanced nutrients are essential for melon growth, with complete fertilizers (14-36-12 and 18-18-18) supporting growth and fruit development. Nitrogen management is crucial to prevent overgrowth and delayed flowering. Adequate potash is needed during flowering and fruit development stages.
GOALS / METRICS	**<u>GOALS</u>** 1. **Successful Land Preparation**: Ensure all selected sites are well-prepared with proper drainage and minimal weed growth. 2. **Optimal Seedling Production**: Achieve high germination rates and healthy seedling growth. 3. **Efficient Transplanting**: Transplant seedlings with minimal stress and high survival rates. 4. **Effective Irrigation**: Implement drip irrigation to ensure even crop development and reduce disease risk. 5. **Comprehensive Weed Control**: Maintain weed-free beds using manual, chemical, or mulching methods. 6. **Balanced Fertilization**: Provide adequate nutrients to support growth and fruit development. 7. **High Yield and Quality**: Achieve high yields of melons with optimal sugar content and minimal fruit rot.

8. **Farmer Training**: Equip local farmers with the knowledge and skills needed for effective melon cultivation.

METRICS

1. **Land Preparation:**
   - Percentage of sites with proper drainage.
   - Reduction in weed growth (measured by weed count per square meter).
2. **Seedling Production:**
   - Germination rate (percentage of seeds that germinate).
   - Health of seedlings (measured by growth rate and pest damage incidence).
   - Transplanting:
   - Survival rate of transplanted seedlings.
   - Time taken for seedlings to establish (measured by growth rate post-transplant).
3. **Irrigation:**
   - Consistency of soil moisture levels.
   - Reduction in disease incidence (measured by number of diseased plants).
4. **Weed Control:**
   - Weed density (measured by weed count per square meter).
   - Effectiveness of different weed control methods (manual, chemical, mulching).
5. **Fertilization:**
   - Nutrient levels in soil (measured by soil tests).
   - Growth rate and health of plants (measured by plant height and leaf color).
6. **Yield and Quality:**
   - Total yield of melons (measured in kilograms per hectare).

	• Sugar content of melons (measured by Brix level). • Incidence of fruit rot (measured by percentage of affected fruits). **7. Farmer Training:** 1. Number of training sessions conducted. 2. Farmer attendance and participation rates. 3. Improvement in farmer knowledge and practices (measured by pre- and post-training assessments).
EXPECTED DELIVERABLES	1. Detailed project management plan 2. Site selection and land preparation guidelines 3. Seedling production protocols 4. Transplanting schedules and techniques 5. Irrigation plans and systems 6. Weed control strategies 7. Fertilization schedules and methods 8. Training materials for local farmers 9. Distribution plan for the hybrid melon seeds
DEFINE THE PROJECT SCOPE AND SCHEDULE	
WITHIN SCOPE	1. **Improve Crop Yield and Quality**: By distributing superior melon hybrid seeds, the project seeks to increase the yield and quality of melon crops, ensuring better productivity and profitability for farmers. 2. **Educate Farmers on Best Practices**: Through workshops and training sessions, the project will equip farmers with the knowledge and skills needed to implement advanced cultivation techniques, including land preparation, seedling production, transplanting, irrigation, weed control, and fertilization.

	3. **Promote Sustainable Farming**: The project emphasizes sustainable farming practices that enhance soil health, reduce environmental impact, and ensure long-term agricultural productivity. 4. **Facilitate Market Access**: By developing a robust distribution strategy, the project aims to connect farmers with markets, enabling them to sell their produce effectively and achieve better economic outcomes.		
OUTSIDE OF SCOPE	1. Any activities not directly related to the cultivation and distribution of the hybrid melon Sanson Gold (svmf5675) seed. 2. Marketing and sales activities beyond the initial distribution plan.		
TENTATIVE SCHEDULE	**KEY MILESTONE**	**START**	**FINISH**
	1.Project Initiation	Fri 07/02/25	Tue 18/03/25
	2.Planning	Wed 19/03/25	Fri 04/04/25
	3.Site Selection and Land Preparation	Mon 07/04/25	Mon 09/06/25
	Add organic fertilizer to prepare the soil.	Tue 10/06/25	Tue 10/06/25
	4.Seedling Production	Fri 07/02/25	Fri 13/06/25
	5.Transplanting	Fri 07/03/25	Fri 14/03/25
	6.Irrigation Setup	Mon 17/03/25	Tue 25/03/25
	7.Weed Control	Wed 26/03/25	Tue 15/04/25
	8.Fertilization	Mon 31/03/25	Mon 07/04/25
	9.Training and Collaboration	Mon 14/04/25	Fri 02/05/25

	10.Distribution	Mon 05/05/25	Fri 30/05/25
	12.Project Closing	Fri 07/02/25	Thu 05/06/25

DEFINE THE PROJECT RESOURCES AND COSTS	
PROJECT TEAM	1. Project Manager 2. Agricultural Specialist/ Agronomist 3. Local Farmers 4. Distribution Coordinator/ Sales Officer 5. Quality Control Officer 6. Stakeholders (e.g., Company Executives, Local Government Officials)
SUPPORT RESOURCE	1. General Manager 2. Sales Officers 3. Farmers

DEFINE THE PROJECT BENEFITS AND CUSTOMERS	
KEY STAKEHOLDERS	1. Farmers 2. Agriculture Experts 3. Managing Director of Prosser Fertilizer Co. Ltd.
FINAL CUSTOMER	1. Agricultural Farmers
EXPECTED BENEFITS	1. Equip local farmers with the knowledge and skills needed for effective melon cultivation. 2. Increase Sales for the Prosser Fertilization Co. Ltd

DESCRIBE PROJECT RISKS, CONSTRAINTS, AND ASSUMPTIONS	
RISKS	1. **Weather Variability**: Unpredictable weather conditions, such as droughts or heavy rains, could affect crop growth and yield.

	2. **Pest and Disease Outbreaks**: Infestations or diseases could damage seedlings and plants, reducing overall productivity. 3. **Farmer Participation**: Low participation rates from farmers could impact the project's reach and effectiveness. 4. **Resource Availability**: Limited availability of resources such as quality seeds, fertilizers, and irrigation equipment could hinder project implementation. 5. **Market Fluctuations**: Changes in market demand and prices for melons could affect the economic viability of the project. 6. **Logistical Challenges**: Difficulties in distributing seeds and materials to remote areas could delay project activities. 7. **Regulatory Changes**: Changes in agricultural policies or regulations could impact project operations.
CONSTRAINTS	1. **Budget**: The project must operate within the allocated budget of BZD 76,000. 2. **Time**: The project must be completed within the specified timeframe, including all phases from initiation to closure. 3. **Scope**: The project scope is defined and must be adhered to, including all activities related to land preparation, seedling production, transplanting, irrigation, weed control, fertilization, and farmer training. 4. **Quality Standards**: The project must meet the established quality standards for seed germination, plant health, crop yield, and farmer satisfaction.
ASSUMPTIONS	1. **Farmer Willingness**: Farmers are willing to participate in the project and adopt the recommended cultivation practices. 2. **Resource Availability**: Quality seeds, fertilizers, and irrigation equipment will be available as needed.

	3. **Technical Support**: Agronomists and technical experts will be available to provide guidance and support throughout the project. 4. **Stable Market Conditions**: Market demand and prices for melons will remain stable, ensuring economic viability for farmers. 5. **Regulatory Stability**: Agricultural policies and regulations will remain stable, allowing for uninterrupted project activities. 6. **Effective Training**: Training sessions will effectively equip farmers with the knowledge and skills needed for successful melon cultivation. 7. **Community Support**: The local community will support the project, facilitating smooth implementation and collaboration.

APPROVAL PROCESS			
Prepared by:	Denivar Chan	Date:	
Approved By	Project Sponsor	Date:	

4.2 Project Scope Management Plan

A project scope management plan is a comprehensive document that outlines how a project will be executed, monitored, and controlled. It serves as a guide for project management teams by detailing the processes, methodologies, and practices to be used throughout the project lifecycle. For this project, scope management will be the sole responsibility of the Project Manager. The scope for this project is defined by the Scope Statement, Work Breakdown Structure (WBS), and WBS Dictionary. The Project Manager, Sponsor, and Stakeholders will establish and approve documentation for measuring project scope which includes deliverable quality checklists and work performance measurements. Proposed scope changes may be initiated by the Project Manager, stakeholders, or any member of the project team. All change requests will be submitted as change orders to the Project Manager who will then evaluate the requested scope change.

4.2.1 Define Scope

The Project Scope outlines the requirements for the agronomist's seed trial, farmer's educative workshops, and the subsequent distribution strategy from the company which are critical elements of the scope plan also depicted in the Work Breakdown Structure in Figure 5.

Table 7 PROJECT SCOPE (Source: Author of the Study)

PROJECT SCOPE Cultivation and Distribution of Hybrid Melon Sanson Gold (svmf5675) Seed in Belize	
PROJECT OBJECTIVE:	To develop a detailed project management plan for the cultivation and distribution of the hybrid melon Sanson Gold (svmf5675) seed in Belize, in collaboration with local farmers, aimed at enhancing agricultural productivity, increasing company profitability, and ensuring sustainable agricultural practices.

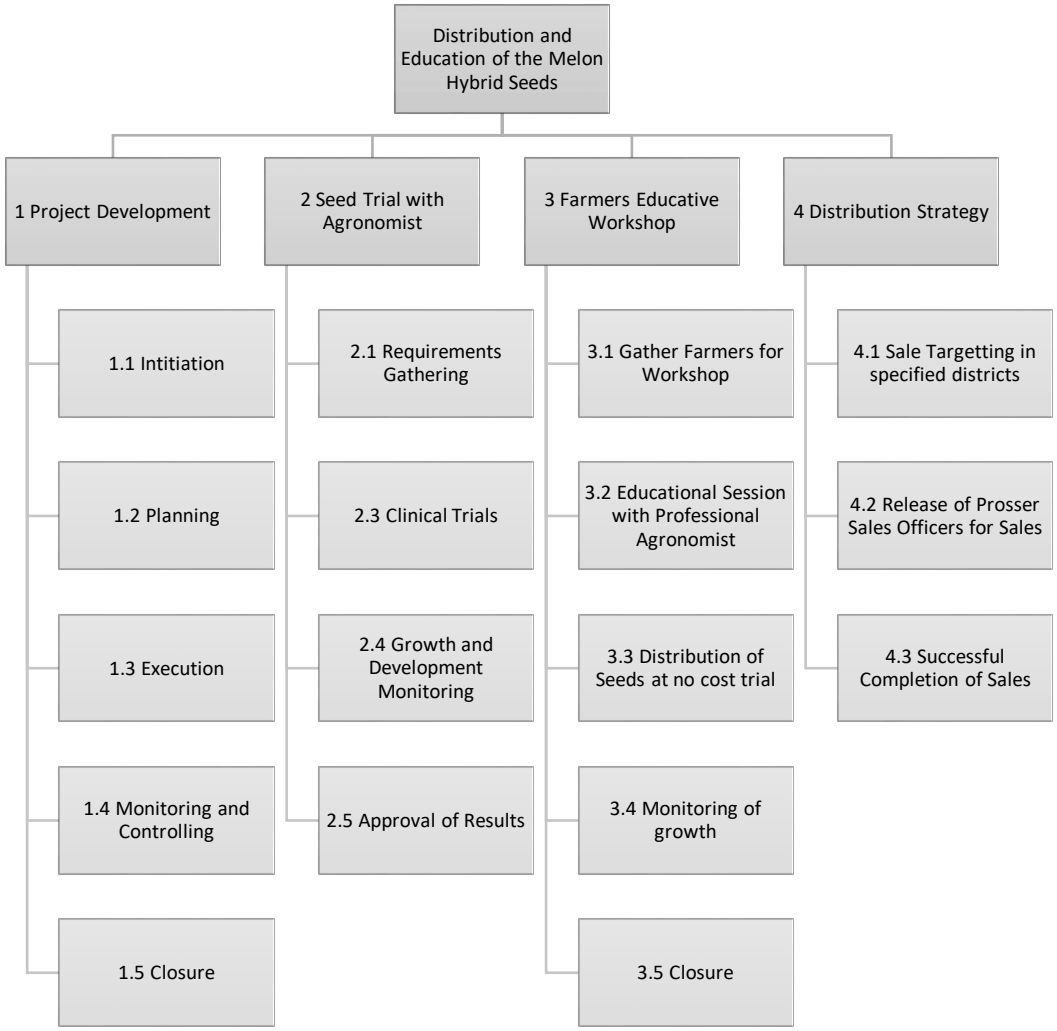
SCOPE STATEMENT	The project involves the cultivation and distribution of the hybrid melon Sanson Gold (svmf5675) seed in Belize. This includes site selection, land preparation, seedling production, transplanting, irrigation, weed control, and fertilization. The project will collaborate with local farmers to implement sustainable agricultural practices, improve productivity, and increase profitability.
SCOPE MANAGEMENT APPROACH	**Scope Definition:** Clearly define the project deliverables, including detailed plans for each stage of melon cultivation and distribution. **Scope Verification:** Regularly review and verify the project scope with stakeholders to ensure alignment with project objectives. **Scope Control:** Implement a change control process to manage any changes to the project scope, ensuring they are documented and approved by stakeholders.
SCOPE VERIFICATION	Regularly review and verify the project scope with stakeholders to ensure alignment with project objectives.
SCOPE CONTROL	Implement a change control process to manage any changes to the project scope, ensuring they are documented and approved by stakeholders.
DEFINE DETAILS	
PROJECT DELIVERABLES	10. Detailed project management plan 11. Site selection and land preparation guidelines 12. Seedling production protocols 13. Transplanting schedules and techniques 14. Irrigation plans and systems 15. Weed control strategies 16. Fertilization schedules and methods 17. Training materials for local farmers 18. Distribution plan for the hybrid melon seeds

OUTSIDE OF SCOPE	1. Any activities not directly related to the cultivation and distribution of the hybrid melon Sanson Gold (svmf5675) seed. 2. Marketing and sales activities beyond the initial distribution plan.

WORK BREAKDOWN STRUCTURE (WBS)	**Work Breakdown Structure (WBS)**
	• **1 Distribution and Education of the Melon Hybrid Seeds**
	  • **1.1 Project Development**
	  • **1.1 Intitiation**
	  • **1.2 Planning**
	  • **1.3 Execution**
	  • **1.4 Monitoring and Controlling**
	  • **1.5 Closure**
	  • **2.1 Seed Trial with Agronomist**
	  • **2.1 Requirements Gathering**
	  • **2.3 Clinical Trials**
	  • **2.4 Growth and Development Monitoring**
	  • **2.5 Approval of Results**
	  • **3.1 Farmers Educative Workshop**
	  • **3.1 Gather Farmers for Workshop**
	  • **3.2 Educational Session with Professional Agronomist**
	  • **3.3 Distribution of Seeds at no cost trial**
	  • **3.4 Monitoring of growth**
	  • **3.5 Closure**
	  • **4.1 Distribution Strategy**
	  • **4.1 Sale Targetting in specified districts**
	  • **4.2 Release of Prosser Sales Officers for Sales**
	  • **4.3 Successful Completion of Sales**

4.2.2 Work Breakdown Structure

Figure 6 Work Breakdown Structure (Source: Author of the Study)



4.2.3 WBS Dictionary

Table 8 WBS DICTIONARY (Source: Author of the Study)

Level	WBS Code	WBS Name	Description/Definition	Budget (BZD$)	Resources
0	1	Distribution and Education of the Melon Hybrid Seeds		4,000	Project Team,
1	1.1	Project Development	Managing all aspects of the project lifecycle.		Project Manager, Project Team
1	1.1	Initiation	Define project goals, scope, and stakeholders.		Project Manager, Stakeholders
1	1.2	Planning	Develop project plans, schedules, and resource allocations.		Agronomist, QA, Project Manager
1	1.3	Execution	Implement project plans and manage resources.		Agronomist, QA, Project Manager
1	1.4	Monitoring and Controlling	Track project progress and make necessary adjustments		Agronomist, QA, Project Manager
1	1.5	Closure	Finalize all project activities and document lessons learned.		Agronomist, QA, Project Manager
2	2.2	Seed Trial with Agronomist			Agronomist, QA, Project Manager
2	2.1	Requirements Gathering	Collect and document agronomic requirements for trials.	2,000	Agronomist, QA, Project Manager
2	2.2	Clinical Trials	Conduct trials to test seed performance.	8,000	Agronomist, QA, Project Manager
2	2.3	Growth and Development Monitoring	Observe and record seed growth and development.	4,000	Agronomist, QA, Project Manager
2	2.3	Approval of Results	Review and approve trial results for further action.	2,000	Agronomist, QA, Project Manager

Level	WBS Code	WBS Name	Description/Definition	Budget (BZD$)	Resources
3	3.1	Farmers Educative Workshop			Agronomist, QA, Project Manager
3	3.2	Gather Farmers for Workshop	Organize and invite farmers to participate.	3,000	Agronomist, QA, Project Manager
3	3.3	Educational Session with Professional Agronomist	Conduct training sessions on seed usage and benefits.	5,000	Agronomist, QA, Project Manager
4	4.4	Distribution of Seeds at no cost trial	Provide seeds to farmers for trial purposes.	4,000	Agronomist, QA, Project Manager
4	4.1	Monitoring of growth	Track the growth and development of seeds distributed to farmers.		Agronomist, QA, Project Manager
4	4.2	Closure	Conclude the workshop and gather feedback from participants.	2,000	Developers
4	4.3	Distribution Strategy			Sales officer, Project Manager
4	4.4	Sale Target in specified districts	Identify and target districts for seed sales.	1,500	Branch manager, project Manger
4	4.5	Release of Prosser Sales Officers for Sales	Deploy sales officers to promote and sell seeds.	2,000	Sales Officer, Project Manager
4	4.6	Successful Completion of Sales	Achieve sales targets and document sales performance.		Project Manager, Branch manager

4.2.4 Roles And Responsibilities

These roles and responsibilities ensure that each aspect of the project is managed effectively, contributing to the overall success of the cultivation and distribution of the hybrid melon Sanson Gold (svmf5675) seed in Belize.

Table 9 Roles & Responsibilities in Scope Management

Role	Responsibilities
Project Manager	- Oversee the entire project, ensuring it stays on track and within scope.
	- Develop and maintain the project management plan.
	- Facilitate communication between stakeholders and team members.
	- Manage scope changes through a formal change control process.
	- Conduct regular progress reviews and ensure project deliverables meet quali ty standards.
Agricultural Specialist	- Provide expertise on best practices for melon cultivation.
	- Develop guidelines for site selection, land preparation, seedling production, transplanting, irrigation, weed control, and fertilization.
	- Train local farmers on sustainable agricultural practices.
	- Monitor field activities to ensure compliance with project plans.
Local Farmers	- Participate in training sessions and implement the provided guidelines.
	- Prepare land, produce seedlings, transplant, irrigate, control weeds, and fertil ize as per the project plan.
	- Provide feedback on the effectiveness of the training and implementation pr ocesses.
	- Collaborate with the project team to ensure successful cultivation and distrib ution of hybrid melon seeds.
Distribution Coordinator	- Develop and execute the distribution plan for the hybrid melon seeds.
	- Coordinate with local farmers and other stakeholders to ensure timely distrib ution.
	- Monitor the distribution process and address any logistical issues.

Role	Responsibilities
	- Maintain records of seed distribution and track the performance of the distri buted seeds.
Quality Control Officer	- Ensure all project activities meet the required quality standards.
	- Conduct regular inspections and audits of the cultivation and distribution pro cesses.
	- Identify and address any quality issues promptly.
	- Document quality control findings and report them to the project manager.
Stakeholders (e.g., Company Executives, Farmers,Agronomists)	- Provide strategic direction and support for the project.
	- Review and approve the project management plan and any scope changes.
	- Ensure alignment of the project with broader organizational and community goals.
	- Facilitate collaboration between the project team and external partners.

4.3 Schedule Management Plan

4.3.1 Introduction

This schedule management plan outlines the key components necessary to manage the project schedule effectively.

4.3.2 Schedule Management Approach

Schedule Development will require the use of project management software such as Microsoft Project to create a detailed project schedule, including all tasks, milestones, and deadlines. The schedule will establish a baseline date to track project progress and performance which subsequently allows for the implementation of a process for monitoring and controlling the project schedule, including creating regular updates and adjustments as needed.

4.3.3 Roles and Responsibilities

Table 10 Roles & Responsibilities in Schedule Management

Role	Responsibilities
Project Manager	- Develop and maintain the project schedule.
	- Monitor progress and manage schedule changes.
Agricultural Specialist	- Provide input on task durations and dependencies related to agricultural activities.
Local Farmers	- Adhere to the project schedule.
	- Report any delays or issues.
Distribution Coordinator	- Ensure timely distribution of seeds according to the schedule.
Quality Control Officer	- Monitor adherence to the schedule.
	- Report any deviations.

4.3.4 Schedule Development

The schedule is developed by the Project Manager carefully curating and sequencing all identified tasks from the stakeholders. The project manager will list all tasks required to complete the project, including site selection, land preparation, seedling production, transplanting, irrigation setup, weed control, fertilization, training, and distribution. Equally allowing for the determination of task order and identified dependencies, as well as the Estimated duration of each task based on historical data and expert judgment. Assign resources to each task, ensures and plans for the availability and capacity that each team member requires to meet key milestones, such as completion of land preparation, seedling production, transplanting, and distribution, for the purpose of this project the schedule is further elaborated in Figure 6 below.

4.3.5 Schedule Baseline

The schedule baselines must foremost obtain approval of the baseline schedule from stakeholders. The project manager needs to document the baseline schedule and communicate it to all project team members to use the baseline sched3ule to track project progress and performance.

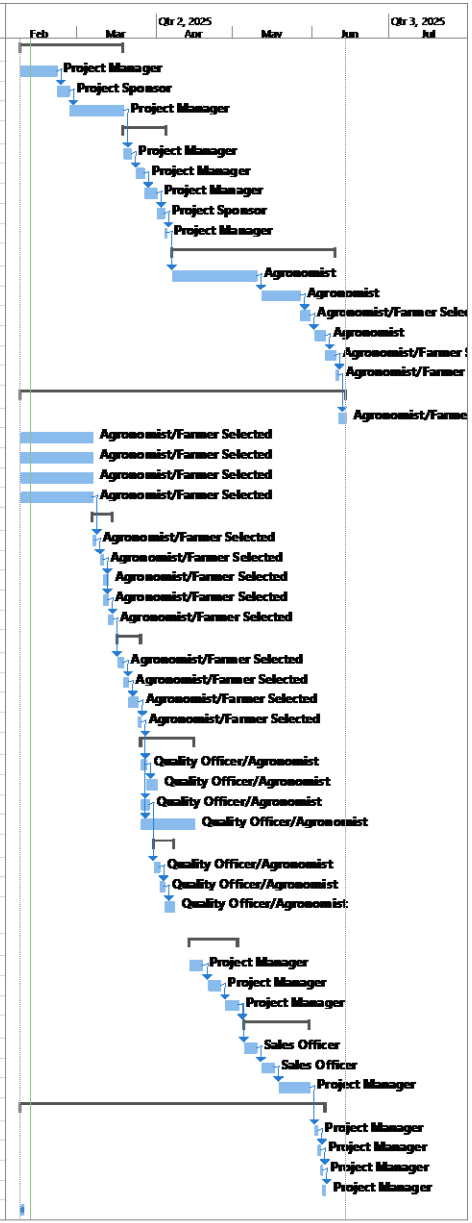
4.3.6 Schedule Control

The project will require regular monitoring of project progress against the baseline schedule. As well as to update the schedule as needed to reflect actual progress and any changes to analyze variances between planned and actual progress to identify causes and corrective actions. The team implements a formal change control process to manage schedule changes, including documentation and approval.

4.3.7 Project Schedule

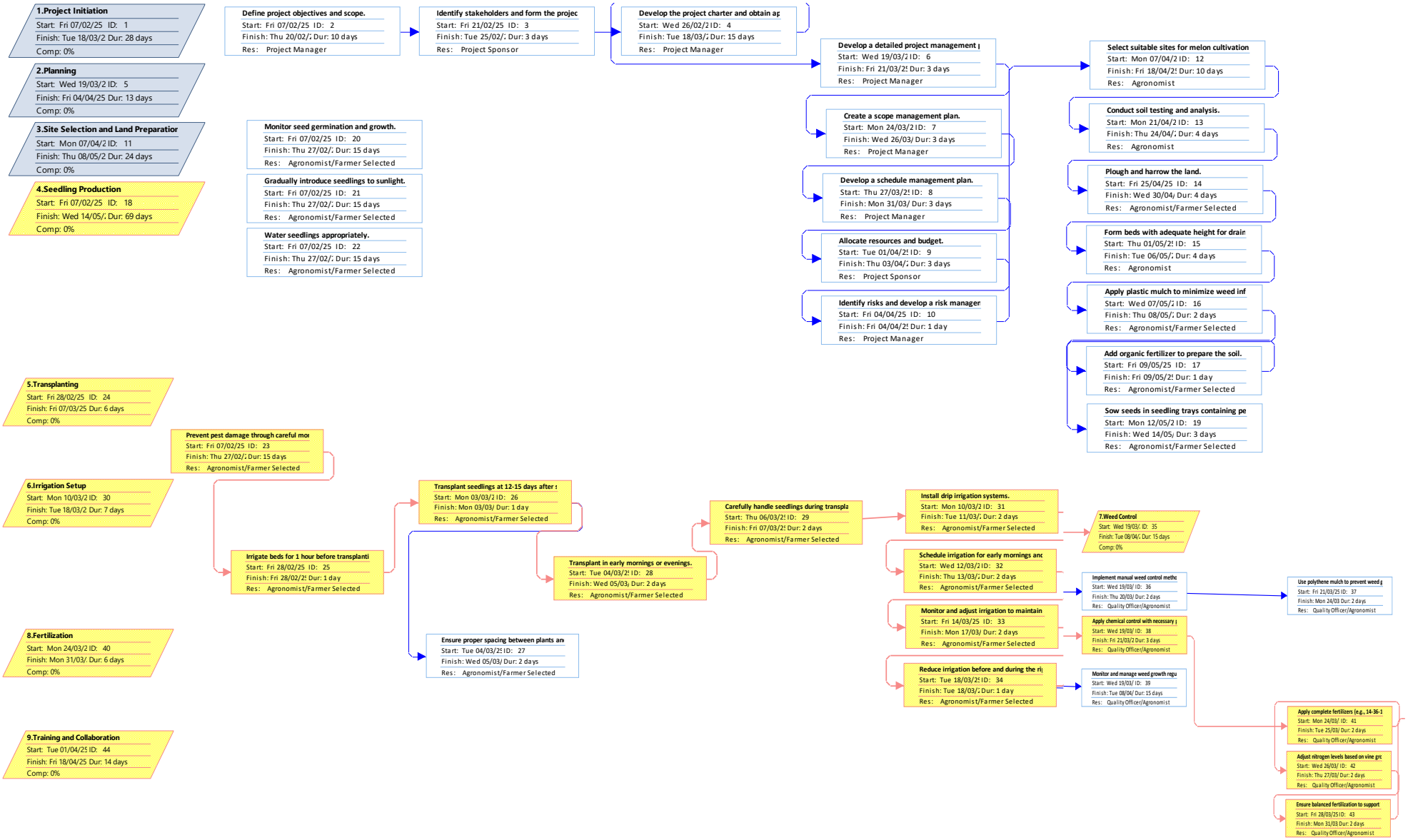
Figure 7 Project Schedule & Gantt Chart (Source: Author of the Study)

ID	Task Mode	Task Name	Duration	Start	Finish	Predecessors	Resource Names
1		**1.Project Initiation**	**28 days**	**Fri 07/02/25**	**Tue 18/03/25**		
2		Define project objectives and scope.	10 days	Fri 07/02/25	Thu 20/02/25		Project Manager
3		Identify stakeholders and form the project team.	3 days	Fri 21/02/25	Tue 25/02/25	2	Project Sponsor
4		Develop the project charter and obtain approval.	15 days	Wed 26/02/25	Tue 18/03/25	3	Project Manager
5		**2.Planning**	**13 days**	**Wed 19/03/25**	**Fri 04/04/25**		
6		Develop a detailed project management plan.	3 days	Wed 19/03/25	Fri 21/03/25	4	Project Manager
7		Create a scope management plan.	3 days	Mon 24/03/25	Wed 26/03/25	6	Project Manager
8		Develop a schedule management plan.	3 days	Thu 27/03/25	Mon 31/03/25	7	Project Manager
9		Allocate resources and budget.	3 days	Tue 01/04/25	Thu 03/04/25	8	Project Sponsor
10		Identify risks and develop a risk management plan.	1 day	Fri 04/04/25	Fri 04/04/25	9	Project Manager
11		**3.Site Selection and Land Preparation**	**46 days**	**Mon 07/04/25**	**Mon 09/06/25**		
12		Select suitable sites for melon cultivation.	25 days	Mon 07/04/25	Fri 09/05/25	10	Agronomist
13		Conduct soil testing and analysis.	11 days	Mon 12/05/25	Mon 26/05/25	12	Agronomist
14		Plough and harrow the land.	4 days	Tue 27/05/25	Fri 30/05/25	13	Agronomist/Farmer Selected
15		Form beds with adequate height for drainage.	4 days	Mon 02/06/25	Thu 05/06/25	14	Agronomist
16		Apply plastic mulch to minimize weed infestation.	2 days	Fri 06/06/25	Mon 09/06/25	15	Agronomist/Farmer Selected
17		Add organic fertilizer to prepare the soil.	1 day	Tue 10/06/25	Tue 10/06/25	16	Agronomist/Farmer Selected
18		**4.Seedling Production**	**91 days**	**Fri 07/02/25**	**Fri 13/06/25**		
19		Sow seeds in seedling trays containing peat moss.	3 days	Wed 11/06/25	Fri 13/06/25	17	Agronomist/Farmer Selected
20		Monitor seed germination and growth.	20 days	Fri 07/02/25	Thu 06/03/25		Agronomist/Farmer Selected
21		Gradually introduce seedlings to sunlight.	20 days	Fri 07/02/25	Thu 06/03/25		Agronomist/Farmer Selected
22		Water seedlings appropriately.	20 days	Fri 07/02/25	Thu 06/03/25		Agronomist/Farmer Selected
23		Prevent pest damage through careful monitoring.	20 days	Fri 07/02/25	Thu 06/03/25		Agronomist/Farmer Selected
24		**5.Transplanting**	**6 days**	**Fri 07/03/25**	**Fri 14/03/25**		
25		Irrigate beds for 1 hour before transplanting.	1 day	Fri 07/03/25	Fri 07/03/25	23	Agronomist/Farmer Selected
26		Transplant seedlings at 12-15 days after sowing.	1 day	Mon 10/03/25	Mon 10/03/25	25	Agronomist/Farmer Selected
27		Ensure proper spacing between plants and rows.	2 days	Tue 11/03/25	Wed 12/03/25	26	Agronomist/Farmer Selected
28		Transplant in early mornings or evenings.	2 days	Tue 11/03/25	Wed 12/03/25	26	Agronomist/Farmer Selected
29		Carefully handle seedlings during transplanting.	2 days	Thu 13/03/25	Fri 14/03/25	28	Agronomist/Farmer Selected
30		**6.Irrigation Setup**	**7 days**	**Mon 17/03/25**	**Tue 25/03/25**		
31		Install drip irrigation systems.	2 days	Mon 17/03/25	Tue 18/03/25	29	Agronomist/Farmer Selected
32		Schedule irrigation for early mornings and afternoons.	2 days	Wed 19/03/25	Thu 20/03/25	31	Agronomist/Farmer Selected
33		Monitor and adjust irrigation to maintain optimal soil moisture.	2 days	Fri 21/03/25	Mon 24/03/25	32	Agronomist/Farmer Selected
34		Reduce irrigation before and during the ripening period.	1 day	Tue 25/03/25	Tue 25/03/25	33	Agronomist/Farmer Selected
35		**7.Weed Control**	**15 days**	**Wed 26/03/25**	**Tue 15/04/25**	34	
36		Implement manual weed control methods.	2 days	Wed 26/03/25	Thu 27/03/25	34	Quality Officer/Agronomist
37		Use polythene mulch to prevent weed growth.	2 days	Fri 28/03/25	Mon 31/03/25	36	Quality Officer/Agronomist
38		Apply chemical control with necessary precautions.	3 days	Wed 26/03/25	Fri 28/03/25	34	Quality Officer/Agronomist
39		Monitor and manage weed growth regularly.	15 days	Wed 26/03/25	Tue 15/04/25	34	Quality Officer/Agronomist
40		**8.Fertilization**	**6 days**	**Mon 31/03/25**	**Mon 07/04/25**		
41		Apply complete fertilizers (e.g., 14-36-12, 18-18-18).	2 days	Mon 31/03/25	Tue 01/04/25	38	Quality Officer/Agronomist
42		Adjust nitrogen levels based on vine growth.	2 days	Wed 02/04/25	Thu 03/04/25	41	Quality Officer/Agronomist
43		Ensure balanced fertilization to support flowering and fruit development.	2 days	Fri 04/04/25	Mon 07/04/25	42	Quality Officer/Agronomist
44		**9.Training and Collaboration**	**15 days**	**Mon 14/04/25**	**Fri 02/05/25**		
45		Conduct training sessions for local farmers.	5 days	Mon 14/04/25	Fri 18/04/25		Project Manager
46		Provide guidelines and best practices for melon cultivation.	5 days	Mon 21/04/25	Fri 25/04/25	45	Project Manager
47		Facilitate collaboration between farmers and project team.	5 days	Mon 28/04/25	Fri 02/05/25	46	Project Manager
48		**10.Distribution**	**20 days**	**Mon 05/05/25**	**Fri 30/05/25**	47	
49		Develop a distribution plan for the hybrid melon seeds.	5 days	Mon 05/05/25	Fri 09/05/25	47	Sales Officer
50		Coordinate with local farmers for seed distribution.	5 days	Mon 12/05/25	Fri 16/05/25	49	Sales Officer
51		Monitor and document the distribution process.	10 days	Mon 19/05/25	Fri 30/05/25	50	Project Manager
52		**12.Project Closing**	**86 days?**	**Fri 07/02/25**	**Thu 05/06/25**		
53		Finalize project deliverables.	1 day	Mon 02/06/25	Mon 02/06/25	51	Project Manager
54		Obtain stakeholder approval.	1 day	Tue 03/06/25	Tue 03/06/25	53	Project Manager
55		Document lessons learned.	1 day	Wed 04/06/25	Wed 04/06/25	54	Project Manager
56		Close the project and release resources.	1 day	Thu 05/06/25	Thu 05/06/25	55	Project Manager
57			1 day?	Fri 07/02/25	Fri 07/02/25		



4.3.8 Schedule Network Diagram

Figure 8 Schedule Network Diagram (Source: Author of the Study)



4.3.9 Tools and Techniques

Software tools (e.g., Microsoft Project, Jira) to develop, maintain, and update the project schedule. Microsoft assisted in the development of the Gantt Charts and schedule Network Diagram to visualize the project schedule and track progress. Additional techniques used include Earned Value Management (EVM) to measure project performance and progress.

4.3.10 Reporting of Schedule Progress

- **Progress Reports:** Provide regular progress reports to stakeholders, including updates on task completion, milestones, and any schedule variances via detailed project report shared by the project manager.
- **Meetings:** Conduct regular project meetings to review schedule status and address any issues or delays promptly.
- **Communication:** Ensure clear and consistent communication with all project team members regarding schedule updates and changes via regular team meetings either virtual or in person as identified in the communication plan.

4.4 Cost Management Plan

4.4.1 Cost Management Approach

This plan provides a structured approach to managing the costs associated with the project, ensuring that it remains on budget while achieving its objectives. The cost estimation takes into consideration the following activities:

- **Seed Procurement**: Cost of purchasing Sanson Gold seeds.
- **Land Preparation**: Costs for plowing, leveling, and preparing the land.
- **Planting**: Labor costs for planting seeds.
- **Irrigation**: Installation and maintenance of irrigation systems.
- **Fertilizers and Pesticides**: Purchase and application costs.
- **Harvesting**: Labor costs for harvesting melons.
- **Storage and Distribution**: Costs for storage facilities and transportation to markets.
- **Training and Capacity Building**: Costs for training local farmers on best practices.
- **Sustainability Initiatives**: Investments in sustainable practices like organic farming and water conservation.

The budgeting forecast also considers the following:

- **Initial Budget**: Detailed breakdown of all estimated costs.
- **Contingency Fund**: Allocation for unforeseen expenses.
- **Funding Sources**: Grants, loans, company funds, and contributions from local farmers.

Table 11 Micro Cost Estimation Breakdown

Tools/Materials	Unit	Quantity	Prices per 1 unit	Total Cost
Seeds		500	$0.28	$140
Fertilizer	Bag	8	$80	$640
Insecticide	Litre	8	$85	$680

Herbicide	Litre	7	$65	$455
Irrigation system	Feet		$500	$500
Manual Labour	Persons	3	$45	$135
Shovel		3	$25	$150
Pick axe		2	$30	$110
Water pump		1	$900	$900
Gasoline	Gallons	60	14	$840
Spray tank		2	$120	$240
Land preparation	Tractor hrs	2	$80	$160
Transportation	Trip	8	$100	$800
Total operating expense				$5,750
Yield/500 seeds	Lbs.	1700		
Market Price/ lbs	lbs.		$1.60	$1.60

Figure 9 Cost S Curve (Source: Author of the Study)

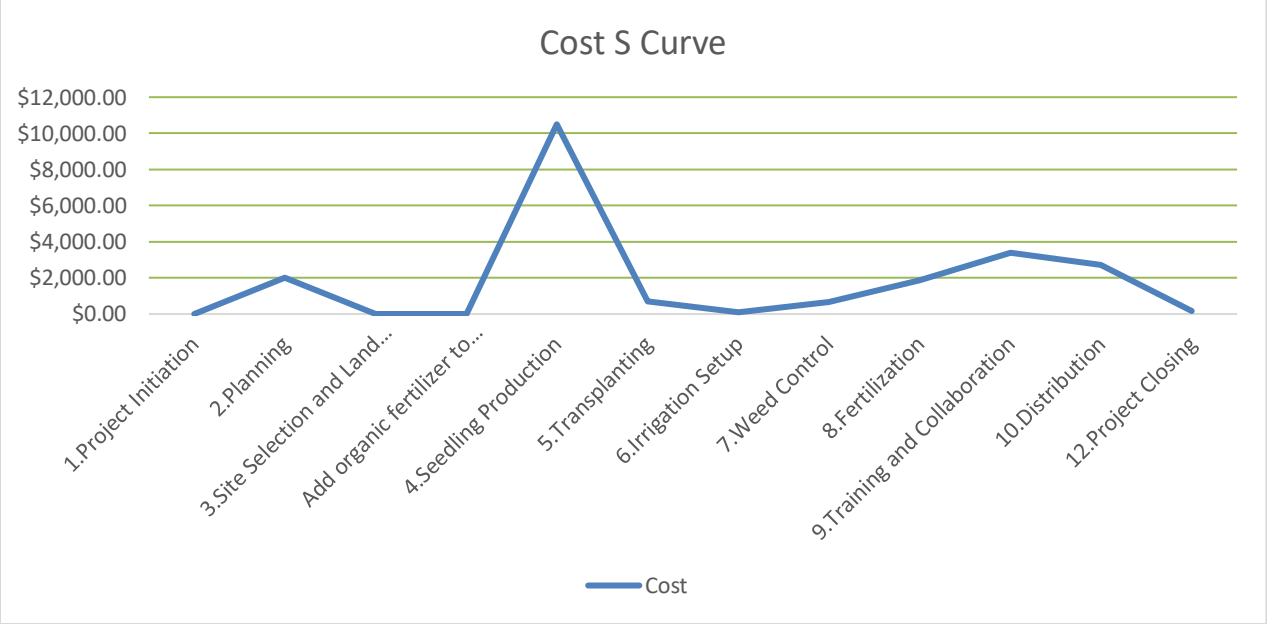


Figure 5 Total Cost Estimation

ID	Task Mode	Task Name	Duration	Start	Finish	Predecessors	Resource Names	Cost	Earned Value Method	Actual Cost
1		**1.Project Initiation**	**28 days**	**Fri 07/02/25**	**Tue 18/03/25**			**$0.00**	**% Complete**	$0.00
2		Define project objectives and scope.	10 days	Fri 07/02/25	Thu 20/02/25		Project Manager	$0.00	sical % Complete	$0.00
3		Identify stakeholders and form the project team.	3 days	Fri 21/02/25	Tue 25/02/25	2	Project Sponsor	$0.00	sical % Complete	$0.00
4		Develop the project charter and obtain approval.	15 days	Wed 26/02/2	Tue 18/03/25	3	Project Manager	$0.00	% Complete	$0.00
5		**2.Planning**	**13 days**	**Wed 19/03/2**	**Fri 04/04/25**			**$2,000.00**	**% Complete**	$0.00
6		Develop a detailed project management plan.	3 days	Wed 19/03/2	Fri 21/03/25	4	Project Manager	$2,000.00	% Complete	$0.00
7		Create a scope management plan.	3 days	Mon 24/03/2	Wed 26/03/25	6	Project Manager	$0.00	% Complete	$0.00
8		Develop a schedule management plan.	3 days	Thu 27/03/2	Mon 31/03/25	7	Project Manager	$0.00	% Complete	$0.00
9		Allocate resources and budget.	3 days	Tue 01/04/2	Thu 03/04/25	8	Project Sponsor	$0.00	% Complete	$0.00
10		Identify risks and develop a risk management plan.	1 day	Fri 04/04/25	Fri 04/04/25	9	Project Manager	$0.00	% Complete	$0.00
11		**3.Site Selection and Land Preparation**	**24 days**	**Mon 07/04/**	**Thu 08/05/25**			**$0.00**	**% Complete**	$0.00
12		Select suitable sites for melon cultivation.	10 days	Mon 07/04/2	Fri 18/04/25	10	Agronomist	$0.00	% Complete	$0.00
13		Conduct soil testing and analysis.	4 days	Mon 21/04/2	Thu 24/04/25	12	Agronomist	$0.00	% Complete	$0.00
14		Plough and harrow the land.	4 days	Fri 25/04/25	Wed 30/04/25	13	Agronomist/Farm	$0.00	% Complete	$0.00
15		Form beds with adequate height for drainage.	4 days	Thu 01/05/2	Tue 06/05/25	14	Agronomist	$0.00	% Complete	$0.00
16		Apply plastic mulch to minimize weed infestation.	2 days	Wed 07/05/2	Thu 08/05/25	15	Agronomist/Farm	$0.00	% Complete	$0.00
17		Add organic fertilizer to prepare the soil.	1 day	Fri 09/05/25	Fri 09/05/25	16	Agronomist/Farm	$0.00	% Complete	$0.00
18		**4.Seedling Production**	**69 days**	**Fri 07/02/25**	**Wed 14/05/25**			**$10,500.00**	**% Complete**	$0.00
19		Sow seeds in seedling trays containing peat moss.	3 days	Mon 12/05/2	Wed 14/05/25	17	Agronomist/Farm	$0.00	% Complete	$0.00
20		Monitor seed germination and growth.	15 days	Fri 07/02/25	Thu 27/02/25		Agronomist/Farm	$4,000.00	% Complete	$0.00
21		Gradually introduce seedlings to sunlight.	15 days	Fri 07/02/25	Thu 27/02/25		Agronomist/Farm	$4,000.00	% Complete	$0.00
22		Water seedlings appropriately.	15 days	Fri 07/02/25	Thu 27/02/25		Agronomist/Farm	$2,000.00	% Complete	$0.00
23		Prevent pest damage through careful monitoring.	15 days	Fri 07/02/25	Thu 27/02/25		Agronomist/Farm	$500.00	% Complete	$0.00
24		**5.Transplanting**	**6 days**	**Fri 28/02/25**	**Fri 07/03/25**			**$700.00**	**% Complete**	$0.00
25		Irrigate beds for 1 hour before transplanting.	1 day	Fri 28/02/25	Fri 28/02/25	23	Agronomist/Farm	$0.00	% Complete	$0.00
26		Transplant seedlings at 12-15 days after sowing.	1 day	Mon 03/03/2	Mon 03/03/25	25	Agronomist/Farm	$700.00	% Complete	$0.00
27		Ensure proper spacing between plants and rows.	2 days	Tue 04/03/2	Wed 05/03/25	26	Agronomist/Farm	$0.00	% Complete	$0.00
28		Transplant in early mornings or evenings.	2 days	Tue 04/03/2	Wed 05/03/25	26	Agronomist/Farm	$0.00	% Complete	$0.00
29		Carefully handle seedlings during transplanting.	2 days	Thu 06/03/2	Fri 07/03/25	28	Agronomist/Farm	$0.00	% Complete	$0.00
30		**6.Irrigation Setup**	**7 days**	**Mon 10/03/**	**Tue 18/03/25**			**$80.00**	**% Complete**	$0.00
31		Install drip irrigation systems.	2 days	Mon 10/03/2	Tue 11/03/25	29	Agronomist/Farm	$80.00	% Complete	$0.00
32		Schedule irrigation for early mornings and afternoons.	2 days	Wed 12/03/2	Thu 13/03/25	31	Agronomist/Farm	$0.00	% Complete	$0.00
33		Monitor and adjust irrigation to maintain optimal soil moisture.	2 days	Fri 14/03/25	Mon 17/03/25	32	Agronomist/Farm	$0.00	% Complete	$0.00
34		Reduce irrigation before and during the ripening period.	1 day	Tue 18/03/2	Tue 18/03/25	33	Agronomist/Farm	$0.00	% Complete	$0.00
35		**7.Weed Control**	**15 days**	**Wed 19/03/**	**Tue 08/04/25**	34		**$650.00**	**% Complete**	$0.00
36		Implement manual weed control methods.	2 days	Wed 19/03/2	Thu 20/03/25	34	Quality Officer/A	$0.00	% Complete	$0.00
37		Use polythene mulch to prevent weed growth.	2 days	Fri 21/03/25	Mon 24/03/25	36	Quality Officer/A	$150.00	% Complete	$0.00
38		Apply chemical control with necessary precautions.	3 days	Wed 19/03/2	Fri 21/03/25	34	Quality Officer/A	$0.00	% Complete	$0.00
39		Monitor and manage weed growth regularly.	15 days	Wed 19/03/2	Tue 08/04/25	34	Quality Officer/A	$500.00	% Complete	$0.00
40		**8.Fertilization**	**6 days**	**Mon 24/03/**	**Mon 31/03/25**			**$1,850.00**	**% Complete**	$0.00
41		Apply complete fertilizers (e.g., 14-36-12, 18-18-18).	2 days	Mon 24/03/2	Tue 25/03/25	38	Quality Officer/A	$350.00	% Complete	$0.00
42		Adjust nitrogen levels based on vine growth.	2 days	Wed 26/03/2	Thu 27/03/25	41	Quality Officer/A	$1,500.00	% Complete	$0.00
43		Ensure balanced fertilization to support flowering and fruit development	2 days	Fri 28/03/25	Mon 31/03/25	42	Quality Officer/A	$0.00	% Complete	$0.00
44		**9.Training and Collaboration**	**14 days**	**Tue 01/04/2**	**Fri 18/04/25**			**$3,400.00**	**% Complete**	$0.00
45		Conduct training sessions for local farmers.	5 days	Mon 14/04/2	Fri 18/04/25		Project Manager	$1,500.00	% Complete	$0.00
46		Provide guidelines and best practices for melon cultivation.	5 days	Tue 01/04/2	Mon 07/04/25	43	Project Manager	$600.00	% Complete	$0.00
47		Facilitate collaboration between farmers and project team.	5 days	Tue 08/04/2	Mon 14/04/25	46	Project Manager	$1,300.00	% Complete	$0.00
48		**10.Distribution**	**20 days**	**Tue 15/04/2**	**Mon 12/05/25**	47		**$2,700.00**	**% Complete**	$0.00
49		Develop a distribution plan for the hybrid melon seeds.	5 days	Tue 15/04/2	Mon 21/04/25	47	Sales Officer	$2,000.00	% Complete	$0.00
50		Coordinate with local farmers for seed distribution.	5 days	Tue 22/04/2	Mon 28/04/25	49	Sales Officer	$500.00	% Complete	$0.00
51		Monitor and document the distribution process.	10 days	Tue 29/04/2	Mon 12/05/25	50	Project Manager	$200.00	% Complete	$0.00
52		**12.Project Closing**	**4 days**	**Tue 13/05/2**	**Fri 16/05/25**			**$150.00**	**% Complete**	$0.00
53		Finalize project deliverables.	1 day	Tue 13/05/2	Tue 13/05/25	51	Project Manager	$0.00	% Complete	$0.00
54		Obtain stakeholder approval.	1 day	Wed 14/05/2	Wed 14/05/25	53	Project Manager	$0.00	% Complete	$0.00
55		Document lessons learned.	1 day	Thu 15/05/2	Thu 15/05/25	54	Project Manager	$0.00	% Complete	$0.00
56		Close the project and release resources.	1 day	Fri 16/05/25	Fri 16/05/25	55	Project Manager	$150.00	% Complete	$0.00

4.4.2 Cost Control

Cost control involves regularly tracking expenses against the budget to ensure financial oversight, identifying and addressing any deviations through variance analysis, and implementing cost-saving measures without compromising the quality of the project. This comprehensive approach ensures that the project remains financially viable and within budget constraints which will be disseminated to the project team through two methods Monthly and quarterly reports on project progress and financial status and in keeping detailed records of all expenses, activities, and outcomes.

Figure 6 Cost Control (Source: Author of the Study)

PROJECT NAME	
PROJECT MANAGER	

PROJECT COSTS	ACTUAL COSTS
$ -	$ -

		PROJECT QUANTITY			ACTUAL QUANTITY					
Item/task	Description	Units	Unit type (kg/ square ft./etc)	$/unit	Units	Unit type (kg/ square ft./etc)	$/unit	Project cost	Actual cost	Recommendations
CATEGORY										
Task/Item				$ -			$ -	$ -	$ -	
Task/Item				$ -			$ -	$ -	$ -	
Task/Item				$ -			$ -	$ -	$ -	
Task/Item				$ -			$ -	$ -	$ -	
TOTAL								$ -	$ -	

4.5 Quality Management Plan

4.5.1 Quality Management Introduction

This Quality Management Plan ensures that the project delivers high-quality outcomes, meets its objectives, and continuously improves to achieve the best results for melon cultivation. This plan outlines the quality standards, quality assurance, and quality control processes to be implemented for the clinical trials and proper education to farmers.

4.5.2 Quality Management Approach

The quality management responsibility falls within the Project Managers and Quality Officer's jurisdiction. Although Prosser Fertilizer Company Ltd does not have in its capacity the quality officer, a project team member was identified to review independently the germination process of the seedling along with the agronomist. The criteria to follow included the four subject matters highlighted below:

1. **High Germination Rates**: Achieve a germination rate of at least 90% for the hybrid seeds.
2. **Healthy Seedlings**: Ensure that 95% of seedlings are healthy and free from pests and diseases.
3. **Optimal Transplant Survival**: Attain a survival rate of 90% for transplanted seedlings.
4. **Farmer Satisfaction**: Ensure that 90% of participating farmers are satisfied with the training and support provided.

The Quality Standards were reviewed in the following field criteria:

1. **Seed Quality**: Use certified hybrid seeds with high germination potential and resistance to common pests and diseases.

2. **Soil Quality**: Ensure soil pH levels are between 6.0 and 6.5 and that the soil is well-drained and nutrient rich.
3. **Irrigation**: Implement drip irrigation systems to maintain consistent soil moisture and reduce disease risk.
4. **Weed Control**: Use effective weed control methods to maintain weed-free beds.
5. **Fertilization**: Apply balanced fertilizers to support healthy plant growth and fruit development.

The assigned quality assurance officer was required to provide comprehensive training to farmers on best practices for melon cultivation, including land preparation, seedling production, transplanting, irrigation, weed control, and fertilization. Develop and implement SOPs for all key processes to ensure consistency and adherence to quality standards. As well as, to regularly monitor and evaluate project activities to ensure compliance with quality standards and identify areas for improvement.

4.5.3 Requirement Prioritization Matrix

Requirement	Priority Level	Rationale
High Germination Rates	High	Essential for ensuring successful seedling production and overall yield.
Healthy Seedlings	High	Critical for plant health and survival during transplanting.
Optimal Transplant Survival	High	Key to achieving high crop yield and reducing plant loss.
Consistent Crop Yield	High	Directly impacts the project's success and farmer profitability.
Farmer Satisfaction	Medium	Important for project acceptance and future participation.
Seed Quality	High	Fundamental to achieving high germination rates and healthy seedlings.
Soil Quality	High	Vital for plant growth and development.
Irrigation	High	Ensures even crop development and reduces disease risk.
Weed Control	Medium	Important for maintaining plant health and reducing competition.

Fertilization	High	Necessary for providing balanced nutrients to support growth.
Training and Education	High	Essential for equipping farmers with the knowledge and skills needed.
Standard Operating Procedures (SOPs)	Medium	Important for ensuring consistency and adherence to quality standards.
Monitoring and Evaluation	High	Crucial for tracking progress and making necessary adjustments.
Seed Testing	High	Ensures high germination rates and seed quality.
Soil Testing	High	Verifies soil pH levels and nutrient content.
Plant Health Monitoring	High	Detects pests, diseases, and nutrient deficiencies early.
Yield Measurement	High	Measures crop yield to ensure it meets targets.
Farmer Feedback	Medium	Provides insights for continuous improvement.
Feedback Loop	Medium	Important for gathering input and identifying areas for improvement.
Review and Update	Medium	Ensures the Quality Management Plan remains relevant and effective.

Priority Levels:

- **High**: Critical to the project's success and must be addressed with top priority.
- **Medium**: Important but can be addressed after high-priority requirements.

This matrix helps prioritize the requirements to ensure that the most critical aspects of the project are addressed first, leading to successful outcomes.

4.5.4 Quality Control Measures

- **Seed Testing**: Conduct germination tests on seed batches to ensure high germination rates.
- **Soil Testing**: Perform soil tests to verify pH levels and nutrient content.
- **Plant Health Monitoring**: Regularly inspect seedlings and plants for signs of pests, diseases, and nutrient deficiencies.
- **Yield Measurement**: Measure crop yield to ensure it meets the target of 20 tons per hectare.

- **Farmer Feedback**: Collect feedback from farmers to assess their satisfaction with the training and support provided.

Figure 12 Melon Hybrid SVMF5675 Growth Stages

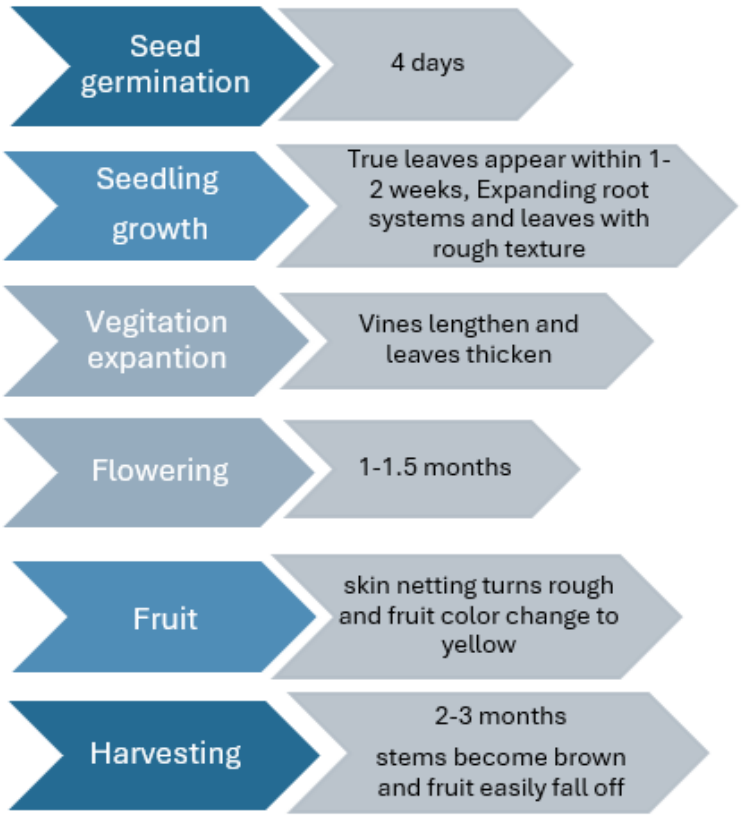


Table 12 Characteristics of the SVMF5675 Seed (Source: Author of Study)

	Characteristics	**SVMF5675**
1.	Leaf	
	Shape	reniform
	Lobes	Shallowly lobed
	Color	Medium green

	Length (mm)	116.5
	Width (mm)	160.7
	Surface	Scabrous
2.	Plant	
	Inflorescence (at full flowering)	Monoecious
	Habit	Vine
3.	Fruit	
	Shape	oval
	Length (at edible maturity) (cm)	18.3
	Diameter (at edible maturity) (cm)	15.9
	Surface (at edible maturity)	netted
	Abscission (at edible maturity)	Overripe
4.	Flesh	
	Color near cavity (at edible maturity)	Orange
	Color in center (at edible maturity)	Orange
	Color near rind (at edible maturity)	Orange
	Aroma	Strong
5.	Seed Cavity	
	Length (mm)	115.5
	Width (mm)	64.9
6.	Rind	
	Net presence	abundant
	Net distribution	Covers entire fruit
	Coarseness	Medium coarseness

Texture	Hard
Primary color (at edible maturity)	Yellow green
Net color (at edible maturity)	Gray white
Primary color (at full maturity)	Yellow green
Net color (at full maturity)	Gray white

Note: Characteristics of the variety. Extracted from Prosser Fertilizer & Agrotec Company Ltd. archives.

The table above delineates various developmental characteristics of the melon plant. The leaves exhibit a kidney-shaped morphology and are superficially lobed, presenting rounded projections. The leaf surface is scabrous, indicating a rough texture. The average dimensions of the leaves are approximately 116.5 mm in length and 160.7 mm in width. The plant is identified as monoecious, meaning it bears both male and female flowers on the same individual.

Regarding the fruits, they typically measure around 18.3 cm in length and 15.9 cm in diameter, with a net-like pattern covering the surface. The seed cavity, which houses the embryo, measures approximately 115.5 mm in length and 64.9 mm in width. The embryo is crucial for the initial development of the roots, leaves, and stem. The rind of the fruit is characterized by medium coarseness, indicating a rough outer skin.

The agronomist and the quality assurance officer were tasked with overseeing and ensuring the quality of the hybrid melon seeds. The melons' sizes were measured and compared to those of locally produced varieties typically grown by farmers. The agronomist visited each collaborating farmer during the trials to weigh the melons at harvest time.

Another aspect of comparison was the shelf life of the fruits post-harvest, which is crucial for marketability as it determines how long the fruit remains in good condition. Customers also expressed a preference for melons with a longer shelf life. The hybrid melon seeds demonstrated

a shelf life of approximately 15 days or more. To ascertain the duration the fruits remained in good condition, the agronomist stored several melons in a controlled environment for observation. Additionally, the hybrid melon seeds were evaluated for their resistance to pests and diseases. They exhibited resistance to Fusarium disease, the Tomato Yellow Leaf Curl Virus (TYLCV), and fruit rot. The hybrid melons were also unaffected by aphids, a common pest. The other melon varieties used in the Caribbean for comparison included *Cucumis melo* var. *cantalupensis*, *C. melo* var. *reticulatus*, and *Cucumis melo* var. *inodorus*.

Table 13 Characteristics of Melon Variations (Source: Author of Study)

Varieties	**Average fruit weight**	**Characteristics**	**Harvest days**	**Shelf life**	**Seed germination**
Cucumis melo var. cantalupensis	3 - 4 lbs.	Sweet flesh with ribbed, smooth or scaly rind.	65 - 70 days	5-15 days	3-5 days
Cucumis melo var. reticulatus	5 - 8 lbs.	Netted rind and musky sweet orange flesh.	76-90 days	5-7 days	4-5 days
Cucumis melo var. inodorus	2.5 lbs.	Thick smooth or warty rind and white flesh.	65 days	3 days	3-5 days

The table above highlights several melon varieties commonly cultivated in the Caribbean and neighboring regions. Among these, the hybrid melon Sanson Gold (SVMF5675) exhibited a

slightly higher fruit weight compared to the others. Specifically, while the other varieties averaged a weight of 8 pounds, the Sanson Gold melons weighed between 9 and 10 pounds. The rind of the Sanson Gold melon was entirely netted.

The germination period for all varieties was within a favorable range, with Sanson Gold germinating in approximately 4 days, and the other varieties germinating within 3 to 5 days. In terms of shelf life, Cucumis melo var. cantalupensis demonstrated the most variability, ranging from 5 to 15 days. The Sanson Gold variety, however, had a shelf life extending from 15 to 20 days.

4.5.5 Roles and Responsibilities:

- **Project Manager**: Oversee the implementation of the Quality Management Plan and ensure that quality standards are met.
- **Agronomists**: Provide technical expertise and support in seed testing, soil testing, and plant health monitoring.
- **Training Coordinators**: Develop and deliver training programs for farmers.
- **Quality Control Inspectors**: Conduct regular inspections and tests to ensure compliance with quality standards.

4.5.6 Continuous Improvement:

- **Feedback Loop**: Establish a feedback loop to gather input from farmers, agronomists, and other stakeholders to identify areas for improvement.
- **Review and Update**: Regularly review and update the Quality Management Plan to incorporate lessons learned and best practices.

4.6 Project Risk Management

The project posed many risks identified with the costs of materials used for the production and clinical trial practices. A risk is an uncertain event that has a positive or negative effect on project objectives. Negative risks are identified as threats and positive risks are called opportunities (Project Management Institute, 2021). Risk management plans indicate how risks are characterized and prioritized. In the stages of risk management, a risk break down structure (RBS), probability and impact scales, and a probability and impact matrix to identify and evaluate project risks was done.

4.6.1 Risk Breakdown structure (RBS)

RBS LEVEL 0	RSB LEVEL 1	RBS LEVEL 2
PROJECT RISK MANAGEMENT	1. Project Management Risk	1.1 Lack of local expertise in managing crop production
		1.2 Communication complications with stakeholders due to language barriers and phone signals.
		1.3 Inadequate project oversight because of remote areas.
	2. Planning Risk	2.1 Farms not suitable for local environmental conditions (flooding)
		2.2 Location changes
	3. Production Risk	3.1 Difficulty in accessing production sites
		3.2 Adverse weather conditions
	4. Safety Risk	4.1 Potential exposure to harmful chemicals
		4.2 Failure to comply with safety regulations and standards
	5. Eco-friendly Risk	5.1 Pollution or contamination of the environment during crop production.
		5.2 Inappropriate handling of waste.
	6. Legal and Regulatory Risk	6.1 Comply with regulations set by authorities
	7. Transportation Risk	7.1 Transportation delays
	8. Technical Risk	8.1 Technology failures

RBS LEVEL 0	RSB LEVEL 1	RBS LEVEL 2
		8.2 Inadequate testing of methods
	9. Economic Risk	9.1 Variations in material costs

4.6.2 Probability and Impact Scale

Risk probability scales:

Ranking	Description
1 – Very Low	Hardly to happen
2 – Low	Most likely not to happen
3 – Medium	Occasionally to happen
4 – High	Issue frequently to happen
5 – Very High	Issue that will always happen

Impact Probability scales:

Ranking	Description
1 – Very Low	Minor changes in the project goals
2 – Low	Essential changes in the project goals
3 – Medium	Vital changes in the project goals are needed
4 – High	Unsatisfactory changes in the project
5 – Very High	Risked changes in the project objectives

PxI Scale:

The risks' categorizations are green, yellow and red. Low impacting and occurring rarely are green risks. In the yellow risks, prioritization and aggressive actions should be applied. In red risks, the

projects require mitigation because they cause high impact. The positive risks are opportunities that are obtained with the benefits.

Probability	Threats					Opportunities					Probability
5 - Very High	5	10	15	20	25	25	20	15	10	5	5 - Very High
4 - High	4	8	12	16	20	20	16	12	8	4	4 - High
3 - Medium	3	6	9	12	15	15	12	9	6	3	3 - Medium
2 - Low	2	4	6	8	10	10	8	6	4	2	2 Low
1 - Very Low	1	2	3	4	5	5	4	3	2	1	1 - Very Low
	1	2	3	4	5	5	4	3	2	1	
	Impact (Threats)					Impact (Opportunities)					

Scales:

15 to 25	Red		Mitigate
7 to 14	Yellow		Avoid
1 to 6	Green		Admit

Table 14 Risk Register (Source:Auhtor of Study)

Risk ID	Risk	Cause	Level of risk	Consequences	Probability	Impact	PXI	Response	Trigger	Owner	Strategy
R0101	Lack of expertise in managing crop production	Lack of training programs	Medium	Project delays, quality compromised,	5	1	5	Medium	Limited education opportunities in the agriculture sector	Project management team	Avoid
R0102	Communication complications with stakeholders due to language barriers and phone signals.	differences in native languages and remote areas	Medium	miscommunications	3	2	6	Medium	Misinterpretations	Project management team	Avoid
R0103	Inadequate project oversight because of remote areas.	remote location	High	leads to delays and miscommunication	5	2	10	Medium	Weather conditions affecting transportation to remote areas	Project management team	Avoid
R0201	Farms not suitably for local environmental conditions (flooding)	failure to consider the impact storms	High	Damages to the plants and production	4	4	16	High	The team ignores historical floods data	Agronomist	Mitigate
R0202	Location changes	Limited communication and	Low	Leads to delays and miscommunication	3	2	6	Low	Due to the roads and remote areas the initial plan changes	Project management team	Admit

		transportation issues									
R0301	Difficulty in accessing production sites	transportation issues	High	project delays and miscommunication	3	5	15	Medium	Heavy rains cause floods and make vehicles have complications	Agronomist	Avoid
R0302	Adverse weather conditions	Floods	High	Delay the progress of production and sometimes causes a big loss	4	5	20	High	An unexpected rain that caused floods	Project management team	Mitigate
R0401	Potential exposure to harmful chemicals	improper handling or disposal of hazardous materials	Low	Long-term health complications	3	2	6	Medium	Inappropriate trainings in handling chemicals	Agronomist and farmers	Avoid
R0402	Failure to comply with safety regulations and standards	Lack of enforcement	Medium	Increase incidents, injuries and long-term health complications	3	3	9	Medium	Lack of safety regulations enforced	Agronomist and farmer	Avoid
R0501	Pollution or contamination of the environment during crop production	Chemicals spills and washed away, improper waste management	High	Soil pollution and water pollution of nearby water sources	3	5	15	High	Chemicals spills due to inappropriate handling	Farmers and project management team	Mitigate
R0502	Inappropriate handling of waste	Inadequate waste management practices	Low	Environmental pollution and health	5	1	5	Low	Limited waste disposal sites	Project management	Admit

				hazards for nearby residents						team and Farmers	
R0601	Comply with regulations set by authorities	Lack of awareness	Low	Project delays	2	2	4	Low	Changes in government administration	Project management team	Admit
R0701	Transportation delays	Underdeveloped roads	Medium	Project delays and cost overruns	6	2	12	Medium	A road is under maintenance and remote areas	Project management team	Avoid
R0801	Technological failures	Equipment malfunction	Medium	Project delays, and an increment in costs due to repair	4	2	8	Medium	Knapsack sprayers and other type of sprayer stop being operational	Project management team	Avoid
R0802	Inadequate testing of methods	May result from budget constraints	Medium	Project delays and increased costs	2	4	8	Medium	Budget cuts leading to limit testing	Project management team	Avoid
R0901	Variations in material costs	Global and local market conditions	High	Unexpected increase in materials	4	4	16	High	Adverse currency fluctuations can lead to budget overruns	Project management team	Mitigate

4.7 Communication Management Plan

4.7.1 Introduction

This communication plan ensures that all stakeholders are kept informed and engaged throughout the project, facilitating smooth execution and collaboration. The project manager ensures timely and accurate information sharing among all stakeholders. This assists with the facilitation of collaboration and coordination between project team members and local farmers. The communication plan also provides updates on project progress, milestones, and any issues or changes.

4.7.2 Communication Management Approach

Given the different levels of stakeholder engagement within this project, the communication approach ranged according to the hierarchy or power & interest which is elaborated on Table 13 below. This matrix ensures that each stakeholder group receives the appropriate level of communication based on their power and interest in the project.

Table 15 Power Interest Matrix (Source: Author of the Study)

Stakeholder	Power	Interest	Management Strategy	Communication Strategy
Company Management	High	High	Engage closely and manage actively	Regular detailed updates, strategic meetings, and involvement in key decision-making.
Project Team	High	High	Engage closely and manage actively	Daily stand-up meetings, project management tools (e.g., Trello, Asana), and progress reports.
Local Farmers	Medium	High	Keep informed and involved	Bi-monthly training sessions, regular feedback collection, and community meetings.
Agricultural Experts	Medium	High	Keep informed and involved	Monthly technical meetings, detailed reports, and collaborative workshops.

Suppliers	Medium	Medium	Keep satisfied	Regular updates on supply needs, quarterly performance reviews, and contract negotiations.
Government Agencies	High	Medium	Keep satisfied	Compliance reports, formal meetings, and periodic updates on project progress.
Community Members	Low	High	Keep informed	Quarterly newsletters, community forums, and social media updates.
Customers/Consumers	Low	Medium	Monitor	Marketing campaigns, product updates, and customer satisfaction surveys.
Environmental Groups	Medium	Medium	Keep satisfied	Environmental impact reports, sustainability initiatives updates, and engagement meetings.
Media	Low	Low	Monitor	Press releases, media briefings, and occasional interviews.

4.7.3 Communication Methods

Regular team meetings, stakeholder meetings, and farmer training sessions were organized to ensure effective communication and collaboration. Monthly progress reports, financial reports, and quality control reports were generated to keep all parties informed of the project's status. Regular email updates were sent to stakeholders, complemented by quarterly newsletters to provide comprehensive updates. Workshops and training sessions were conducted for capacity building and knowledge sharing. Additionally, surveys and feedback forms were used to collect input from farmers and other stakeholders, ensuring their voices were heard and considered in the project's development.

- **Weekly Team Meetings**: Every Monday at [Insert Time].
- **Monthly Progress Reports**: First week of each month.
- **Quarterly Newsletters**: At the end of each quarter.
- **Farmer Training Sessions**: Bi-monthly or as needed.
- **Stakeholder Meetings**: Quarterly or as required.

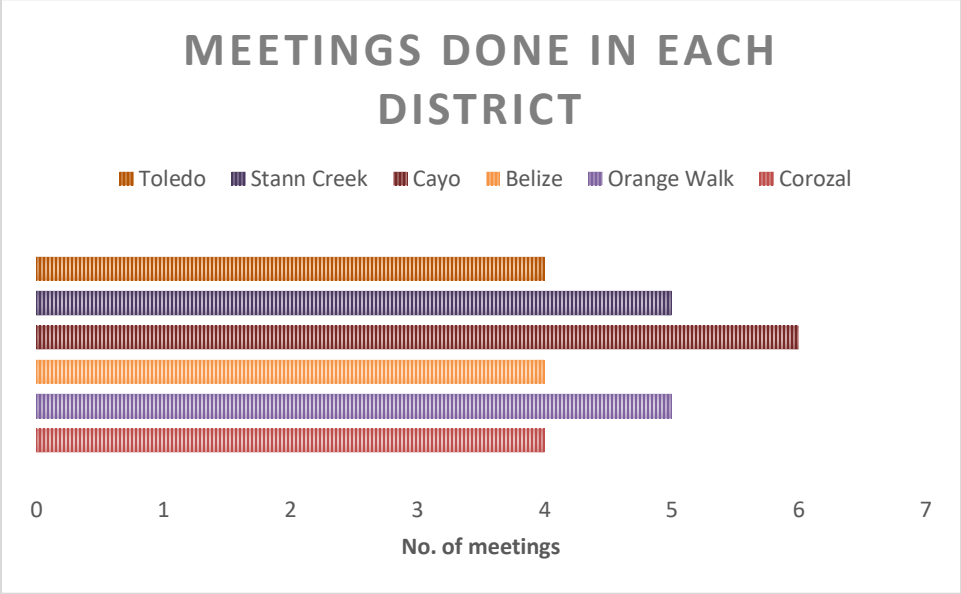
4.7.4 Communication Roles and Responsibilities

Role	Responsibilities
Project Manager	- Oversee all communication activities, ensure timely dissemination of information.
	-Regularly collect feedback from stakeholders through surveys and meetings.
	- Prepare and distribute reports, newsletters, and updates.
Agricultural Specialist	- Adhere to the project schedule. -Maintain records of all communication, including meeting minutes, reports, and emails.
Local Farmers	- Report findings and suggestions
	- Participate in training sessions, provide feedback.
Quality Control Officer	- Report any deviations through communication channel.
	-Share findings

The agronomist organized meetings to discuss the new melon seed variety, providing a comprehensive explanation of all procedures and practices. Initial trials conducted with selected farmers demonstrated the effectiveness of the practice guide provided by the company. This guide was first tested by the company's agronomist to ensure the farming method was correctly implemented and achieved the desired outcomes.

At harvest time, the agronomist recorded yield data, which was used to inform other farmers about the profitability during meetings. Additionally, a questionnaire was conducted in one of the meetings to gather updates from the field and feedback from the farmers.

Figure 13 Meetings Scheduled Per District (Source: Author of the Study)



In the above chart the number of meetings organized by the agronomist can be identified. In every district of the country meetings were conducted to inform farmers about the new variety. In the districts of Belize, Corozal and Toledo only 4 meetings were carried out. The Orange Walk and Stan Creek districts have 5 meetings each that have been organized. Cayo had the most meetings held for spreading information on the Sanson Gold melon seed. The project manager and quality assurance officer distributed a questionnaire at the end of the monitoring period, annexed at the end of this document, to collect feedback from farmers and seek the possibility of sales.

The results obtained are summarized in the table below:

Questions	Yes	No	Recommendations
Were the leaves wrinkle-free?	14	1	Do different variety trials
Are the plants healthy?	15	0	Careful monitoring
Is the environment for the plants enough to obtain space to grow?	13	2	Have more field days and meetings
Was there presence of beneficial insects?	8	7	Do more trials with other farmers
Is the fruit color precise?	15	0	Be cautious when walking in between plants

Are the plants free from diseases?	15	0	Continued monitoring of plant and leaves
Was there good management of weed control?	12	3	Be careful when waling in between plants and when doing weed control
Were plants well irrigated?	14	1	Try growing in a greenhouse
Are the fruits well formed?	15	0	Invite farmers more often to monitor the production development
Are the fruit's weight favorable?	15	0	Careful monitoring
Is the shelf life of the fruit optimum	15	0	Be careful when walking in between plants
Would you like to try the new variety	15	0	Have more field days

The table above presents the questions included in the questionnaire distributed in San Antonio Village, Cayo District. A total of 15 questionnaires were disseminated during the meeting to gather feedback from the farmers. The primary concerns raised by the farmers pertained to spacing, weed management, and the presence of beneficial insects. It is imperative to provide more information about beneficial insects to the farmers, as their current knowledge on the subject is limited. This will help avoid confusion and enhance their understanding. Additionally, the farmers offered recommendations for improving the meetings and trials.

The agronomist was responsible for recording the production data from the farmers participating in the trials. This data was utilized during meetings and presentations, as well as during visits to both new and previously unvisited farmers. The objective was to attract more customers and increase sales of the new variety. The agronomist could substantiate the methodology due to the successful yields obtained in prior trials. Gaining the trust of new and unvisited farmers is challenging; therefore, continuous farm visits and the presentation of solid evidence are essential. During the farm trials, the agronomist frequently visited the farmers to monitor production and was present during the harvest to accurately record the yields produced by each farmer.

Five farmers received 500 seeds to commence the trials. Only farmers 2 and 5 had a yield below 1700 pounds. The farmer 1, 3 and 4 did obtain the expected yields for the variety. The total average that was attained by the 5 farmers for the trials was 1700 pounds.

Figure 14 Trial Results for the Melon Hybrid SVMF5675

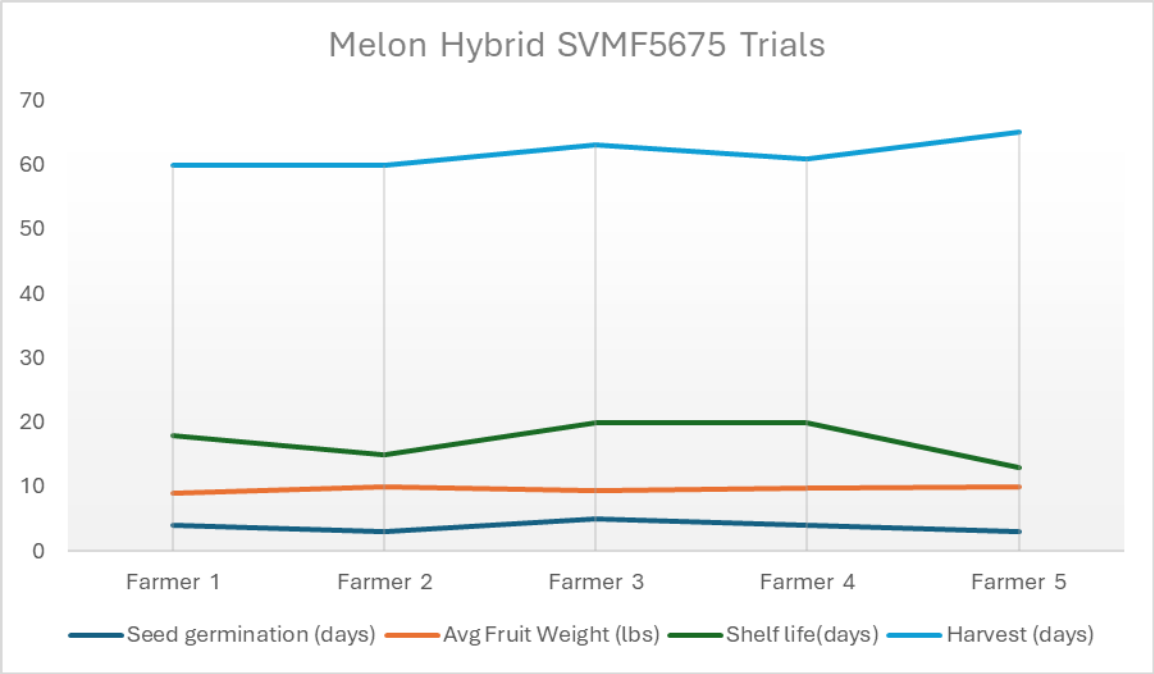


Figure 11 depicts the collaboration of five farmers with the company to conduct the trials. The seed germination period ranged from 2 to 5 days, as indicated in the graph. Additionally, the farmers produced well-formed fruits, each weighing between 9 and 10 pounds. The shelf life of the melon was observed to be 15 days or longer. The harvest period for this variety commenced approximately 60 to 65 days after planting.

Sustainability Practices

- **Water Conservation**: Use of smart irrigation systems to reduce water usage.
- **Soil Health**: Regular soil testing and use of organic fertilizers.

- **Pest Management**: Integrated pest management practices to minimize chemical use.

Dry weather is favorable for melons, and they can grow in most areas if the diseases and pests are properly controlled. With the help of the methodological practice the seeds germinated at approximately 4 days. The seedlings should be strong and healthy measuring approximately 4 to 5 cm in height. The seedlings will also pose a greenish color indicating it is healthy and strong. The leaves have a well-formed oval shape. The seedlings should be ready to transplant at approximately 12 to 15 days after sowing having 2 to 3 leaves. The leaves were without any wrinkles or curled indicating it is healthy and free from any pests' infestations. The roots of the seedlings were 2 inches in length approximately indicating a strong plant. The vines of the melon reach at an average spread of 0.9 to 1.9 m^2. The varieties of the melon hybrid plant grew up to have a weight of approximately 9 lbs. each. Melon fruits should develop a flesh color free from decay and bruises.

4.8 Stakeholder Management Plan

4.8.1 Introduction

This stakeholder management plan ensures that all stakeholders are effectively engaged and informed throughout the project, facilitating smooth execution and collaboration in accordance to their level of interest.

I. Internal Stakeholders: Project team, company management, agricultural experts.

II. External Stakeholders: Local farmers, suppliers, government agencies, community members, customers/consumers, environmental groups, media.

4.8.2 Stakeholder Analysis

Power-Interest Matrix: Categorize stakeholders based on their level of power and interest in the project.

- High Power, High Interest: Company management, project team.
- High Power, Medium Interest: Government agencies.
- Medium Power, High Interest: Local farmers, agricultural experts.
- Medium Power, Medium Interest: Suppliers, environmental groups.
- Low Power, High Interest: Community members.
- Low Power, Medium Interest: Customers/consumers.

4.8.3 Stakeholder Engagement Strategies

Based on the Power – Interest Matrix shared n Figure 13 belo, the team developed engagement strategies as follows:

I. High Power, High Interest: Engage closely and manage actively through regular detailed updates, strategic meetings, and involvement in key decision-making processes.
II. High Power, Medium Interest: Keep satisfied with compliance reports, formal meetings, and periodic updates on project progress.
III. Medium Power, High Interest: Keep informed and involved through bi-monthly training sessions, regular feedback collection, and community meetings.
IV. Medium Power, Medium Interest: Keep satisfied with regular updates on supply needs, quarterly performance reviews, and contract negotiations.

V. Low Power, High Interest: Keep informed with quarterly newsletters, community forums, and social media updates.

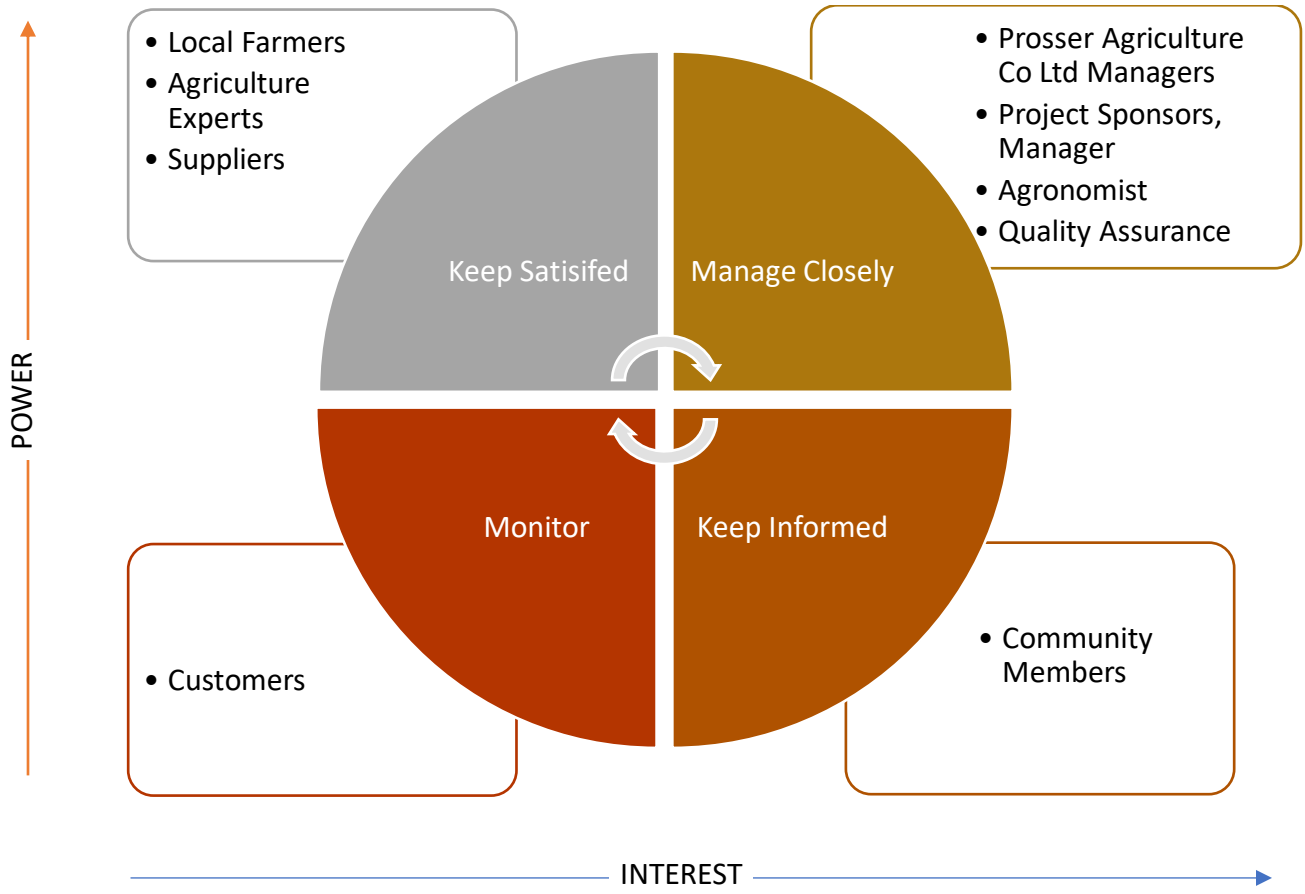
VI. Low Power, Medium Interest: Monitor through marketing campaigns, product updates, and customer satisfaction surveys.

VII. Low Power, Low Interest: Monitor with press releases, media briefings, and occasional interviews.

Table 16 Stakeholder Roles & Responsibilities

Role	Responsibilities
Project Manager	- Oversee stakeholder engagement and communication activities. -Make necessary adjustments to the stakeholder management plan based on feedback and project progress.
	- Prepare and distribute reports, newsletters, and updates
Agricultural Specialist	- Participate in training sessions, provide feedback.
Local Farmers	- Provide feedback on product quality and satisfaction.
	- Engage in community forums and provide feedback.
Distribution Coordinator	- Ensure timely delivery of materials and resources.
Quality Control Officer	- Monitor environmental impact and provide recommendations.
	- Report any deviations.

Figure 15 Power- Interest Matrix



4.8.4 Stakeholder Responsibilities

Table 17 Stakeholder Engagement Planning Guide

Consider the questions when planning	**Planning communication**
Who needs information?	The farmers need all the information.
What information does each stakeholder need?	The farmers and the company need information about the variety including benefits, and approximate budget.

Why should information be shared with stakeholders?	Information needs to be shared in order to have everyone understand everything about the project and it will help in making decisions.
What is the best way to provide information?	Through meetings and a field day.
When and how often is information needed?	Information is needed every time stakeholders have doubts and questions.
Who has the information needed?	The agronomist and the company have all the information.

5 CONCLUSIONS

In conclusion, the comprehensive evaluation of the hybrid melon project has demonstrated significant advancements in melon cultivation, particularly in terms of quality, yield, and resistance to pests and diseases. The hybrid melon Sanson Gold (SVMF5675) has shown superior performance compared to other local varieties, with notable attributes such as higher fruit weight, extended shelf life, and robust resistance to common agricultural challenges. These characteristics make it a promising option for farmers in the Belize and surrounding regions. The collaborative efforts between agronomists, quality assurance officers, and local farmers have been instrumental in achieving these results. The rigorous monitoring and quality assurance processes have ensured the consistent performance of the hybrid melon seeds, while the active involvement of farmers has provided valuable insights and feedback for continuous improvement. The project's success underscores the importance of integrating scientific research with practical agricultural practices to enhance crop productivity and sustainability.

Furthermore, the project's focus on addressing market demands, such as longer shelf life and disease resistance, aligns with consumer preferences and market trends. By promoting the benefits of hybrid melons, including their nutritional value and environmental advantages, the project has the potential to impact both the agricultural sector and the broader community positively.

Moving forward, it is recommended to continue refining the hybrid melon seeds, expanding farmer training programs, and fostering strong stakeholder engagement. By building on the project's achievements and addressing any remaining challenges, the hybrid melon initiative can contribute to a more resilient and prosperous agricultural landscape.

6 RECOMMENDATIONS

1. **Quality Monitoring and Assurance:** Continue rigorous monitoring of the hybrid melon seeds by the agronomist and quality assurance officer to ensure consistent quality and performance. Implement regular quality checks at various stages of growth and post-harvest to maintain high standards.
2. **Farmer Collaboration:** Strengthen relationships with local farmers by providing them with training and resources to optimize the cultivation of hybrid melons. Encourage farmers to share feedback and observations to improve future trials and seed development.
3. **Market Analysis and Shelf Life:** Conduct a detailed market analysis to understand consumer preferences and demand for melons with longer shelf lives prior to the Prosser Fertilize Company Ltd. purchasing any variation of seeds for supply to the market. Promote the hybrid melons' extended shelf life (15-20 days) as a key selling point to attract customers and retailers.
4. **Pest and Disease Management:** Highlight the hybrid melons' resistance to Fusarium disease, TYLCV Virus, and fruit rot in marketing materials to reassure farmers and buyers. Develop integrated pest management strategies to further protect the crops from aphids and other potential threats.
5. **Variety Comparison and Improvement:** Continue comparing the hybrid melons with other local varieties to identify areas for improvement and potential advantages. Use the data collected to refine and enhance the hybrid melon seeds for better yield, quality, and resistance.

6. **Sustainability and Environmental Impact:** Collaborate with environmental groups to ensure sustainable farming practices are followed. Promote the environmental benefits of using disease-resistant and high-yield hybrid melons.
7. **Stakeholder Engagement:** Maintain open communication with all stakeholders, including company management, government agencies, local farmers, suppliers, and community members. Use the Power-Interest Matrix to prioritize and address the concerns and interests of each stakeholder group effectively.
8. **Consumer Education:** Educate consumers about the benefits of hybrid melons, including their nutritional value, longer shelf life, and resistance to diseases. Use various marketing channels to reach a wider audience and increase awareness. Conduct thorough needs assessments to understand the specific challenges and requirements of farmers in different regions. Tailor training programs to address these identified needs and gaps.

Throughout the feedback and reviews, it is determined that the hybrid melon Sanson Gold must be trialed on other seasons to study their resistance to other pests and weather conditions. Trials enable farmers to thoroughly examine the differences between what they currently know in addition to what is more effective for them to produce.

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

I. The project aligns with several Sustainable Development Goals (SDGs), including Goal 12: Responsible Consumption and Production. One of the advantages of this melon variety is its resistance to various pests and fungi, such as Fusarium, TYLCV Virus, Fruit Rot, and Aphids. This resistance reduces the need for chemical pesticides, thereby minimizing the impact on beneficial insects and the environment.

II. Additionally, the project supports Goal 14: Life Below Water. The reduced use of chemicals decreases the risk of runoff contamination, which can pollute streams and rivers, making the water unsuitable for consumption and harming aquatic fauna. Thus, minimizing chemical usage helps mitigate water pollution.

III. Improper disposal of chemical containers by farmers can lead to land and water pollution, adversely affecting surrounding wildlife. The project aims to educate farmers on proper waste disposal practices to prevent such environmental hazards.

IV. Quality Education is integral to the project, as agronomists will provide guidance on waste management and sustainable farming practices. This education will help farmers adopt safer and more environmentally friendly methods.

V. Good Health and Well-being is another critical aspect. Farmers may neglect to use protective gear, risking long-term health issues. Farm visits will emphasize the importance of safety equipment when applying chemicals, ensuring farmers' health and reducing their reliance on chemical inputs.

VI. A P5 impact analysis was conducted to assess the project's effects on People, Planet, Prosperity, and Product, among other factors. The project's objective is to propose a cultivation methodology that supports sustainability and regenerative practices, involving stakeholders and reducing chemical usage.

VII. In terms of regenerative development, the project will address environmental, social, economic, and cultural dimensions. It aims to minimize environmental impacts through sustainable practices, incorporate stakeholder feedback, explore economic development opportunities, and integrate cultural practices into the cultivation methodology.

The hybrid melon project holds significant promise for advancing sustainable development in the agricultural sector. By introducing a high-yield, disease-resistant melon variety, the project addresses critical challenges faced by farmers, such as crop losses due to pests and diseases. The extended shelf life of the hybrid melons not only meets market demands but also reduces food waste, contributing to more efficient resource use. Additionally, the project's emphasis on farmer training and collaboration fosters knowledge transfer and capacity building, empowering local communities to adopt sustainable farming practices. This holistic approach not only enhances agricultural productivity and economic resilience but also supports environmental sustainability by promoting practices that minimize chemical inputs and preserve soil health. Overall, the hybrid melon project exemplifies how innovative agricultural solutions can drive sustainable development, benefiting both people and the planet.

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APPENDICES

Appendix 1: FGP Charter

CHARTER OF THE PROPOSED

FINAL GRADUATION PROJECT (FGP)

1. Student name

Denivar Felix Chan

2. FGP name

Project Management Plan for the Strategic Implementation of Hybrid Melon Sanson Gold (SVMF5675) Seed in Belize

3. Application Area (Sector or activity)

Construction / Medicine / Banking / etc. Agriculture Sector

4. Student signature

5. Name of the Graduation Seminar facilitator

Ms. Paula Villalta

6. Signature of the facilitator

7. Date of charter approval

7/07/2024

8. Project start and finish date

00/00/2024	00/00/2024

Research question

Will the project management plan assist in obtaining positive results towards farmers with the new seeds being tested and will it increase the company's profitability?

9. Research hypothesis

Hybrid Melon Sanson Gold (SVMF5675) seeds planted and managed with the project management plan will ensure optimal agricultural practices, fruits will have a longer shelf life, and weigh up to 8 lbs. per fruit.

10. General objective

To develop a detailed project management plan for the cultivation and distribution of the hybrid melon Sanson Gold (svmf5675) seed in Belize, in collaboration with local farmers, aimed at enhancing agricultural productivity, increasing company profitability, and ensuring sustainable agricultural practices.

11. Specific objectives

1. To develop a cohesive Project Integration Management: that incorporates all aspects of the cultivation and distribution of the hybrid melon Sanson Gold (svmf5675) seed, ensuring alignment with the overall project goals and stakeholder expectations. 2. To define and document the project scope, including detailed deliverables, boundaries, and acceptance criteria, to ensure all project activities are aligned with the cultivation and distribution objectives.

3. To create a detailed project schedule management plan that outlines all tasks, milestones, and deadlines, ensuring timely completion of all project phases from seed cultivation to distribution.
4. To develop a comprehensive Project Cost Management plan that estimates all project costs, monitors expenditures, and ensures the project remains within the allocated budget.
5. To establish quality standards and control measures through Project Quality Management for the cultivation and distribution processes, ensuring the hybrid melon seeds meet the desired quality and performance criteria.
6. To identify, acquire, and manage all necessary resources, including personnel, equipment, and materials, to ensure efficient and effective project execution through the development of a Project Resource Management Plan.
7. To develop a Project Communications Management plan that ensures timely and effective dissemination of project information to all stakeholders, including farmers, suppliers, and project team members.
8. Project Risk Management: To identify potential project risks, assess their impact, and develop mitigation strategies to minimize their effect on the project's success.
9. To establish procurement processes for acquiring necessary goods and services, ensuring timely and cost-effective procurement aligned with project requirements detailed within Project Procurement Management.

10. To identify all project stakeholders, analyze their needs and expectations, and develop strategies for effective stakeholder engagement and management throughout the project lifecycle.

12. FGP purpose or justification

The project for the cultivation of the Hybrid Melon Sanson Gold (SVMF5675) is essential to obtain positive outcomes and enhance knowledge to farmers. Presently the seeds aren't known very well by farmers which they have many questions about its quality and product. By creating a project management plan for the cultivation of the seeds, the goal is to recommend farmers into implementing the procedures or practices for that specific melon seeds, ensuring favorable results in their harvests.

The project management plant for cultivation is to assist farmers in a new practice management that will make sure they obtain the proper yields. Farmers implementing the practices will be able to receive visits by the agronomist for more assistance. By implementing the entire methodology farmers will obtain yields of 1700 lbs. per 500 plants. Also, after following the cultivation procedures and being able to harvest the fruits

it will have a shelf life of more than 14 days which will be favorable to farmers for the market vending.

13. 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. FGP

1.1 Graduation Seminar

1.1.1 Graduation Seminar approval

1.2 FGP Deliverables

1.2.1 Charter
1.2.2 Preliminary bibliographical research
1.2.3 WBS
1.2.4 Theoretical Framework
1.2.5 Methodological Framework
1.2.6 Introduction
1.2.7 Executive Summary
1.2.8 Annexes (FGP schedule, FGP WBS, FGP Charter)

1.3 Tutoring Process

1.3.1 Tutor Assignment

1.3.2 Communication

1.3.3 Modifications if needed

1.4 FGP development

1.4.1 To develop a Project Integration Management.

1.4.2 To define and document the project scope.

1.4.3 Create a project schedule management plan.

1.4.4 To develop a Project Cost Management Plan.

1.4.5 Project Quality Management.

1.4.6 To develop a Project Resource Management Plan

1.4.7 To develop a Project Risk Management

1.4.8 Project Procurement Management

1.4.9 Stakeholder Management through the project lifecycle

1.4.10 Conclusions

1.4.11 Recommendations

1.4.12 Reference lists

1.4.13 Annexes

1.4.14 Tutor approval for reading.

1.5 Reader's review.

1.5.1 Reviewers requests for improvement

1.5.2 Communication

1.5.3 FGP submission to reviewer

1.6 Adjustments

1.6.1 Report for reviewer

1.6.2 FGP update

1.7 Board of examiners evaluation.

1.7.1 Final Review by board

1.7.2 FGP grade report

14. FGP budget

1. Travel: $75 USD
2. Printing: $90 USD
3. Materials: $71 USD
4. Miscellaneous: $30 USD

Total: $266 USD

15. FGP planning and development assumptions

1. The required information will be available to the farmers.
2. The farmers will be able to have good communication with te company in cases of emergency or doubts.
3. The company agronomist will dedicate approximately 15 hours per week for farm visits.
4. During the visits the agronomist will give feedbacks to all the questions the farmers have.

5. The company will require feedbacks about all the farms.

16. FGP constraints

1. The project must be completed within three to four months.
2. The company will be limited with two agronomists available for farm visits.
3. Determining the project schedule may present some complications when consulting the farmers and arranging the dates and time for the farm visits.
4. Depending on whether prices turn out to be greater or lower, defining the expenses that the farmers require for the process may change.

FGP development risks

1. Unpredicted weather conditions may affect the farmers in their cultivation causing losses in yields.
2. Unexpected health problems that the farmers will face will interfere with their ability to finish the tasks required.
3. The agronomist's unanticipated health issues may cause delays in farm visits.
4. The company's key staff will have to evaluate the proposed cultivation methodology and determine whether or not to approve it.

17. FGP main milestones

Deliverable	Finish estimated date
1.1 Graduation Seminar	July 02nd, 2024
1.1.1 Graduation Seminar Approval	July 05nd, 2024

1.2 FGP Deliverables	August 19th, 2024
1.2.1 Charter	July 15th, 2024
1.2.2 Preliminary Bibliographical Research	July 15th, 2024
1.2.3 WBS	July 15th, 2024
1.2.4 Theoretical Framework	July 29th, 2024
1.2.5 Methodological Framework	August 05th, 2024
1.2.6 Introduction	August 12th, 2024
1.2.7 Executive Summary	August 19th, 2024
1.2.8 Annexes	August 19th, 2024
1.3 Tutoring Process	August 19th, 2024
1.3.1 Tutor Assignment	August 19th, 2024
1.3.2 Communication	August 19th, 2024
1.3.3 Modifications if Needed	August 19th, 2024
1.4 FGP Development	July 15th, 2024
1.4.1 Project Integration Management	July 15th, 2024
1.4.2 Define & Document the Project Scope	July 15th, 2024
1.4.3 Project Schedule Management Plan	July 15th, 2024
1.4.4 Project Cost Management Plan	August 16th, 2024
1.4.5 Project Quality Management	August 16th, 2024
1.4.6 Project Resource Management Plan	August 16th, 2024
1.4.7 Project Risk Management	August 19th, 2024
1.4.8 Project Procurement Management	August 20th, 2024

1.4.9 Stakeholder Management Through Project Lifecycle	August 20th, 2024
1.4.6 Conclusions	August 19th, 2024
1.4.7 Recommendations	August 19th, 2024
1.4.8 Reference Lists	August 19th, 2024
1.4.9 Annexes	August 19th, 2024
1.4.10 Tutor Approval for Reading	August 19th, 2024
1.5 Readers review	August 19th, 2024
1.5.1 Reviewers Request for Improvement	August 19th, 2024
1.5.2 Communication	August 19th, 2024
1.5.3 FGP Submission to Reviewer	August 19th, 2024
1.6 Adjustments	August 19th, 2024
1.6.1 Report or Reviewer	August 19th, 2024
1.6.2 FGP Update	August 19th, 2024
1.7 Board of examiners evaluation	August 30th, 2024
1.7.1 Final Review by Board	August 30th, 2024
1.7.2 FGP Grade Report	August 30th, 2024

18. Theoretical framework

18.1 Estate of the "matter"

The company is responsible of bringing new products that will benefit the farmers (Prosser Fertilizer & Agrotec Co LTD). With the Hybrid Melon Sanson Gold (SVMF5675) seed brought, farmers aren't convinced of purchasing it at the company.

The reason in commercial farming is that they don't want to take a risk of dealing with all the cultivation and end up settling for a loss. Climate change may affect any cultivation if not properly handled (Sundareswaran, Choudhury, Vanitha & Yadava, 2023). In the country of Belize there is no specific methodology for the cultivation of the melon Sanson Gold seed. The methodology will assist farmers in handling the cultivation more precise and effective to obtain positive outcomes.

The company took measures and sent the agronomist to visit farmers to recommend the seeds and give them more information about it. Improvement in sales were being made but not the expected results from the company. Seed trials will be required to be done by the company to increase the number of customers by having them see the results. Trials are required because old varieties aren't available or dissatisfaction with the production which indicates farmers to try a new variety and increase the production in the country. Farmers seek seed quality, because it is the reason for a positive agriculture where the seed properly germinates and produce a vigorous seedling guaranteeing high productions (Yadav et al., 2023).

18.2 Basic conceptual framework

List of the basic concepts to be included in the document.
Hybrid Melon Sanson Gold (SVMF5675)
Commercial Farming
Methodology
Cultivation
Climate Change
Seed trials
Seed quality

19. Methodological framework

Objective	Name of deliverable	Information sources	Research method	Tools	Restrictions

To develop a cohesive Project Integration Management: that incorporates all aspects of the cultivation and distribution of the hybrid melon Sanson Gold (svmf5675) seed, ensuring alignment with the overall project goals and stakeholder expectations.	Project Integration Management Plan	Secondary: PMBOK Guide 7th edition, articles & lecturer notes Primary: Interviews, meetings with farmers and data, email	Quantitative: information from past researches examined Qualitative: Engaging in participant observations Mixed: use the qualitative findings to design experiments and surveys that test the identified variables	Meetings, expert judgement, data gathering/ feedbacks	Need good communication with all stakeholders, lack of skilled labor, Challenges in reaching markets
To define and document the project scope, including detailed deliverables, boundaries, and acceptance criteria, to ensure all project activities are aligned with the cultivation and distribution objectives.	Project Scope	Secondary: PMBOK Guide 7th edition, articles, journals & agriculture lecturer notes Primary: Meetings, & data	Quantitative: Information from pre-existing data will be analyzed Qualitative: Information of costs will be used Mixed: information & data from past/present researches	Microsoft Word	Good communication is needed to get feedbacks from stakeholders, lack of skilled labor difficulty in obtaining high quality seeds.
To create a detailed project schedule management plan that outlines all tasks, milestones, and deadlines, ensuring timely completion of all project phases from seed cultivation to distribution.	Project Schedule, Gantt Chart, Work breakdown structure	Secondary: PMBOK Guide 7th edition, Primary: Interviews, meetings, photographs, & lessons learnt	Quantitative: Data from interviews, meetings & feedbacks Qualitative: Information from past & present researches Mixed: Use the qualitative findings to design experiments & surveys that test the identified variables	Microsoft Project, Jira Project Management Tool	Find a suitable location to do all the practices precisely

To develop a comprehensive Project Cost Management plan that estimates all project costs, monitors expenditures, and ensures the project remains within the allocated budget.	Project Cost Breakdown	Secondary: Articles, Journals Primary: Interviews, meetings, photographs, data	Quantitative: Assessing the cost-effectiveness of different cultivation & distribution methods Qualitative: Conducting interviews & gather detailed information on experiences Mixed: Use the qualitative findings to design experiments & surveys that test the identified variables	Microsoft Project	Limited access to credit & financial resources can prevent farmers from investing.
To establish quality standards and control measures through Project Quality Management for the cultivation and distribution processes, ensuring the hybrid melon seeds meet the desired quality and performance criteria.	Questionnaires, Quality Management Checklist, Quality Assurance Certificate Act	Secondary: PMBOK Guide, PMI, Database, Internet & public database Primary: Interviews, meetings, photographs, data, email	Quantitative: Use statistical tools to analyze data collected including regression analysis, ANOVA, & multivariate analysis Qualitative: Focus groups, qualitative risk assessment Mixed: Use the qualitative findings to design experiments & surveys that test the identified variable		Inefficiencies in the supply chain, such as delays in input delivery and the presence of counterfeit products
To identify, acquire, and manage all necessary resources, including personnel, equipment, and materials, to ensure efficient and effective project execution through the development of a Project Resource Management Plan.	Resource Application and Approval	Secondary: PMBOK Guide, PMI, Database, Internet, Publica database Primary: Meetings, discussions	Quantitative: Use standardized measurement protocols Qualitative: Engaging in participant observation Mixed: Collect both quantitative & qualitative data. Compare & contrast the findings from both methods.	Google Workspace: For document creation, sharing, & collaboration. Dropbox: for secure	Difficulty in obtaining high quality seeds, including issues with seed purity

				file storage & sharing.	
To develop a Project Communications Management plan that ensures timely and effective dissemination of project information to all stakeholders, including farmers, suppliers, and project team members.	Communication Matrix based on the Power-Interest Data	Secondary: PMBOK Guide, PMI, Database, Internet, public database Primary: Interviews, meetings, data, email	Quantitative: Distributing structured surveys to gather data Qualitative: Conducting in depth interviews with farmers, distributors and consumers to gather information Mixed: PM will start with qualitative interviews to identify key factors, follow with quantitative surveys to measure their prevalence.	Meetings, expert judgement data gathering/feedback researches	Good communication
Project Risk Management: To identify potential project risks, assess their impact, and develop mitigation strategies to minimize their effect on the project's success.	Risk Assessment Matrix	Secondary: PMBOK Guide, PMI, database, internet, public database Primary: Existing budget requests with team	Quantitative: Implementing large-scale field trials to compare the performance of Sanson Gold with other melon varieties Qualitative: Analyze stories and narratives from farmers & distributers to obtain information	Meetings Expert judgement Data gathering	Limited access to credit & financial resources
To establish procurement processes for acquiring necessary goods and services, ensuring timely and cost-effective procurement aligned	Procurement Plan based on the Cost Manage	Secondary: PMBOK Guide, PMI, database, internet, public database	Quantitative: Data from interviews, meetings & feedbacks. Information from past researches. Evaluating the efficiency of the supply chain from	Meetings, expert judgement, data gathering & analysis feedbacks	Inefficiencies in the supply chain, such as delays in input delivery &

with project requirements detailed within Project Procurement Management.	ment Plan	Primary: Revision of existing company procurement & warehouse processes	seed production to market distribution. Qualitative: Analyzing stories and narratives to obtain information on the hybrid melon Mixed: Information and data from past & present research.		the presence of counterfeit products
To identify all project stakeholders, analyze their needs and expectations, and develop strategies for effective stakeholder engagement and management throughout the project lifecycle.	Stakehol der Manage ment Plan	Secondary: seed articles & journals Primary: Interviews, meetings, photographs, data	Quantitative: Data from interviews, meetings & feedbacks. Information from past researches. Qualitative: Use past and present information from interviews and feedbacks from growth processes Mixed: Information and data from past & present researches.	Meetings/in terviews, expert judgement, data gathering, feedbacks	A few researches and information will be available.

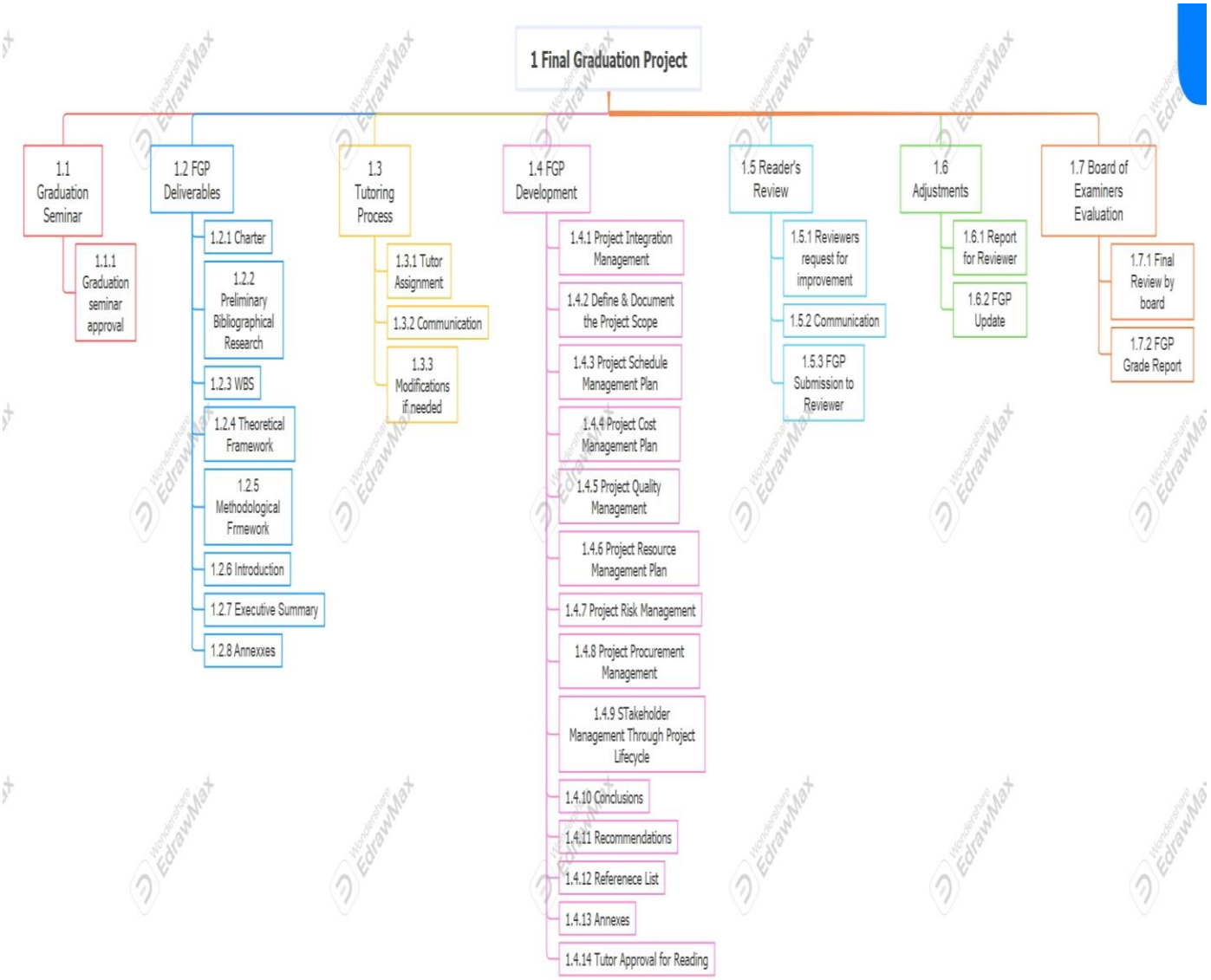
20. Validation of the work in the field of the regenerative and sustainable development.

The methodology cultivation of the Hybrid Melon Sanson Gold (SVMF5675) seed embodies an assurance to regenerative and sustainable development. In the practice that will be proposed farmers will be taken into consideration to make is optimal for them. One of the benefits of this variety is that they are susceptible to a number of pests and fungi. This will help the farmer to stop using more chemicals which may affect beneficial

insects and the environment. The farmers pockets will be alleviated due to low required chemicals for protecting the cultivation.

The project is in alignment with some SDGs, they include Goal 12 Responsible consumption and Production, Goal 14 Life Below Water, Goal 6 Clean Water and Sanitation, Goal 4 Quality Education and Goal 3 Good Health and Well-being. The project aims to decrease the environmental effects by implementing favorable practices, have the stakeholders give their feedbacks, find ways to develop the economic sector and get ideas from cultural practices to do the methodology.

Appendix 2: FGP WBS



Appendix 3: FGP Schedule

ID	Task Name	Start	Finish	Duration
1	**1.1 Graduation Seminar**	**2024-06-28**	**2024-07-02**	**3.0 d.**
2	1.1.1 Graduation Seminar Approval	2024-07-02	2024-07-05	4.0 d.
3	**1.2 FGP Deliverables**	**2024-07-02**	**2024-08-19**	**35.0 d.**
4	1.2.1 Charter	2024-07-09	2024-07-15	5.0 d.
5	1.2.2 Preliminary Bibliographical Research	2024-07-09	2024-07-15	5.0 d.
6	1.2.3 WBS	2024-07-09	2024-07-15	5.0 d.
7	1.2.4 Theoretical Framework	2024-07-23	2024-07-29	5.0 d.
8	1.2.5 Methodological Framework	2024-07-30	2024-08-05	5.0 d.
9	1.2.6 Introduction	2024-08-06	2024-08-12	5.0 d.
10	1.2.7 Executive Summary	2024-08-13	2024-08-19	5.0 d.
11	1.2.8 Annexes	2024-08-13	2024-08-19	5.0 d.
12	**1.3 Tutoring Process**	**2024-07-02**	**2024-08-19**	**35.0 d.**
13	1.3.1 Tutor Assignment	2024-07-08	2024-08-19	31.0 d.
14	1.3.2 Communication	2024-07-08	2024-08-19	31.0 d.
15	1.3.3 Modifications if Needed	2024-07-08	2024-08-19	31.0 d.
16	**1.4 FGP Developement**	**2024-07-09**	**2024-07-15**	**5.0 d.**
17	1.4.1 Project Integration Management	2024-07-08	2024-07-15	6.0 d.
18	1.4.2 Define & Document the Project Scope	2024-07-08	2024-07-15	6.0 d.
19	1.4.3 Project Schedule Management Plan	2024-07-08	2024-07-15	6.0 d.
20	1.4.4 Project Cost Management	2024-07-08	2024-08-16	30.0 d.
21	1.4.5 Project Quality Management	2024-07-08	2024-08-16	30.0 d.
22	1.4.6 Project Resource Management Plan	2024-07-08	2024-08-16	30.0 d.
23	1.4.7 Project Risk Management	2024-07-08	2024-08-19	31.0 d.
24	1.4.8 Project Procurement Management	2024-07-08	2024-08-20	32.0 d.
25	1.4.9 Stakeholder Management Through Project Lifecycle	2024-07-08	2024-08-20	32.0 d.
26	1.4.10 Conclusions	2024-08-12	2024-08-19	6.0 d.
27	1.4.11 Recommndations	2024-08-12	2024-08-19	6.0 d.
28	1.4.12 Reference List	2024-08-12	2024-08-19	6.0 d.
29	1.4.13 Annexes	2024-08-12	2024-08-19	6.0 d.
30	1.4.14 Tutor Approval for Reading	2024-08-12	2024-08-19	6.0 d.
31	**1.5 Readers Review**	**2024-08-12**	**2024-08-19**	**6.0 d.**
32	1.5.1 Reviewers Request for Improvement	2024-08-12	2024-08-19	6.0 d.
33	1.5.2 Communication	2024-08-12	2024-08-19	6.0 d.
34	1.5.3 FGP Submission to Reviewer	2024-08-12	2024-08-19	6.0 d.
35	**1.6 Adjustments**	**2024-08-12**	**2024-08-19**	**6.0 d.**
36	1.6.1 Report or Reviewer	2024-08-12	2024-08-19	6.0 d.
37	1.6.2 FGP Update	2024-08-12	2024-08-19	6.0 d.
38	**1.7 Board of examiners evaluation**	**2024-08-20**	**2024-08-30**	**9.0 d.**
39	1.7.1 Final Review by Board	2024-08-20	2024-08-30	9.0 d.
40	1.7.2 FGP Grade Report	2024-08-20	2024-08-30	9.0 d.

Appendix 4: Preliminary bibliographical research

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