UNIVERSIDAD PARA LA COOPERACION INTERNACIONAL
(UCI)

PÉREZ ZELEDÓN COMMUNITY SEED BANK PROJECT MANAGEMENT PLAN

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DEDICATION

I dedicate this project document to my friends, family, and local farmers practicing organic farming in Costa Rica. This project would not have been possible without the combined individual efforts of everyone who continued to inspire and motivate me over the project's culmination. I am dedicated to my grandfather, Mr. Willie C. Myles, for his wisdom and "knowledge of the old way," so I will never forget the farmers' footsteps that led me to where I am today.

ACKNOWLEDGMENTS

I acknowledge Mr. Braulio Hernandez Fernandez and Mr. Minor Mora for their friendship and expertise in Costa Rican plants and farming. Without their time, patience, and assistance, my research would have been vastly underrepresented. A special acknowledgment to Mr. Diego Vargas Guillén and Ms. Felicia Rodríguez González, from Semillas Plantae, for their invaluable knowledge, which helped to shape the project management plan. Thank you to my tutor Sophia Maria Crawford for her patience and guidance.

ABSTRACT

This document aims to develop a project management plan for creating a community seed bank in Pérez Zeledón to enhance and improve local farmers' ability to store, exchange, and conserve vital crop and agricultural seeds. Rising climate change and unpredictable weather have begun to affect farmers in the Southern Zone regarding crop planting. A return to more traditional farming methods, such as permaculture, is needed, and seed banks in the community enable these practices to flourish. The final product of this project consists of a research study to create a community seed bank. This study consists of the final deliverables of the project that contain the management plans for scope, schedule, costs, quality, resources, communications, risks, procurement, and stakeholders. The research process consists of an analytical-synthetic methodology and the guide provided by the Project Management Institute.

As a result of the project, it is recommended that local communities in the Southern Zone create community seed banks or alternatives for seed conservation and exchange. Rising costs of seeds needed for seasonal planting are a continual challenge for local farmers trying to sustain a living. As climate changes continue, different methods will be required to keep food crops viable and protect critical seeds. More research on farming and climate impacts is needed in rural areas like the Southern Zone.

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ABBREVIATIONS AND ACRONYMS

- CEPAL: Comisión Económica para América Latina y el Caribe
- CIKD: Canadian Institute of Knowledge Development
- COVID: Coronavirus disease
- CSB: Community Seed Bank
- CSBP: Community Seed Bank Project
- FGP: Final Graduation Project
- GMO: Genetically Modified Organism
- IICA: Inter-American Institute for Cooperation on Agriculture
- IMD: International Institute for Management Development
- MAG: Ministerio de Agricultura y Ganadería de Costa Rica
- PMBOK: Project Management Body of Knowledge
- PRI: Permaculture Research Institute
- PVDF: Polyvinylidene Difluoride
- SDG: Sustainable Development Goal
- UMN: University of Minnesota
- UNFCCC: United Nations Framework Convention on Climate Change
- UN: United Nations
- UT: University of Tennessee

EXECUTIVE SUMMARY

The investigation of community seed bank initiatives was an effort to empower the local community in the Southern Zone (Pérez Zeledón) to manage seeds as a collective group of experienced farmers. The community seed bank (CSB) serves as an exchange point for local farmers and ensures that heirloom seeds of distinct types continue to flourish. Emphasis is placed on the exchange and distribution of local varieties of food crops (bean, maize, and rice). The project management plan was created to outline the process for successfully creating the CSB in Pérez Zeledón.

The Costa Rica government has seed banks operating with private organization support to facilitate germplasm conservation and research. More efforts to support local seed conservation and distribution should be supported and enhanced locally to include community seed banks that support permaculture and traditional farming methods. The lack of community organization is concerning, whereas national governments need to be faster and more willing to guide for addressing the climate effects the local population is facing.

The project management plan's purpose was to create a CSB within the Southern Zone of Costa Rica (Pérez Zeledón). The specific research sought to provide further information regarding the farming conditions of the Southern Zone as impacted by the effects of COVID-19 and climate change. The hypothesis for the final graduation project is whether a project management plan can be created to build a CSB in Pérez Zeledón following CSB community principles. The Final Graduation Project's general objective was to develop a project management plan for creating the Pérez Zeledón CSB that complies with conservatory standards. The specific objectives were: to create the project charter for the purpose of facilitating key elements for the development of the project management plan, to build a project scope management plan that will achieve the techniques and procedures that define the parameters of the project and manage them to ensure fulfillment according to stakeholder requirements, to create a schedule management plan, which will include methods, processes and procedures that will influence the dedication and management of the time allotted to project activities and ensure its completion within budget, to elaborate a cost management plan that will serve as a model for effective management of project costs including realistic budget forecasts, financial resources flow, monetary performance, budget control and monitoring and finalize the project within budget, to build a project quality management plan which will arrange the processes and procedures that will communicate the definition of criteria/ indicators for quality measures and guarantee satisfactory expectations of the project stakeholders, to develop a resource management plan which empowers the reference framework for the organization and allocation of resources according to the expectations and requirements of the project, to build a communication plan to ensure appropriate stakeholders' engagement through prompt and appropriate access to information throughout the project design and implementation processes, to create a risk

management plan that will provide the approaches and methods of risk management in the implementation of the project, and to reduce negative impacts on the outcomes of the project, to develop a procurement management plan that will define the approaches, procedures and processes that will ensure that the right materials are accessible to the project as required, utilizing green procurement methods, to produce a stakeholder management plan that will establish the methods and paths facilitating the commitment of team members who can influence up and down the chain, the outcomes of the project, to elaborate a project management plan that successfully balances the social, environmental, and economic aspects of the community seed bank project (CSBP), by using resources to improve the community's welfare. The utilized approach builds an abundance of the local support network needed for future agricultural advancement.

The project used an analytical-synthetic methodology that consisted of primary source scholarly journal articles and structured/field interviews. Secondary sources included books, articles, and legal reviews. Inductive and deductive reasoning were used to synthesize the information collected, and root-cause analyses were developed. The Guide for Project Management was used as a best practice for formulating the final project management plan.

Two relevant conclusions were drawn after constructing the CSBP. The first is that community engagement is required to create buy-in for this type of project. Healthy, affordable food is always desired in any culture or community. The CSB helps to produce organic food through its seeds, and an involved community will help the seed bank flourish through seed storage and distribution by local farmers. The second conclusion is that a local architect contracted to design the seed bank structure requires understanding and education about alternative construction methods, such as straw-bale and earthbag. The project will further the interest in Costa Rica towards organic farming while practicing regenerative and sustainable construction methods. As climate uncertainty continues, projects such as the multipurpose seed bank will help to foster green community-based solutions to problems such as locally produced food.

In addition to the conclusions, a few recommendations would best serve to increase the effectiveness and success of the project. Firstly, a combined research effort between UCR, MAG PZ, and Semillas Plantae regarding the percentage of farms in the Brunca region that produce crops with foreign seeds vs. native seeds. Such research is essential in determining the amount of foreign food dependency and the amount of local food independence. More research is needed between the local architecture process and regenerative/sustainable building methods. There is a plethora of online research on these building methods in Europe and the United States. The building designs contracted for this project were designed by an American. Understanding the current building capabilities within the Brunca region would benefit the community if and when people pursue regenerative/sustainable building methods.

1 INTRODUCTION

1.1. Background

As climate change continues to impact the agriculture security of many countries negatively, leaders at all levels continue to scramble for solutions. Many proposed strategies, such as national climate legislation and policy, are created at senior levels of national governments. Whereas this is an essential endeavor for senior government officials and lawmakers to address, it is equally important for local communities and citizens to take equal action. The CSBP management plan aims to create a local solution for distributing and exchanging local crop seeds within the Brunca region of Costa Rica. Costa Rica has maintained four CSBs since as early as 1942. The CSBs continue to conserve and research germplasm with the help of private international organizations such as the Inter-American Institute for Cooperation on Agriculture (IICA) and Centro Agronómico Tropical de Investigación y Enseñanza (CATIE). Little to no organizations exist for community seed purposes, and various debates on seed legislation in Costa Rica have produced an environment where seed conservation at the local level is left to the underground. Seed banks have remained a staple practice for organic subsistence farmers practicing traditional methods such as permaculture farming. Traditional farmers in Costa Rica may continue to conserve seeds after every harvest, but available research does not confirm or deny this claim. It is therefore required to interview local farmers to determine seed conservation methods, any existing community seed banks, investigation of traditional farming practices

(Permaculture), the current legal stance on seed banks outside of the four government-acknowledged organizations, and the practical need for creating a central CSB within Pérez Zeledón, Costa Rica. The problem regarding seed conservation efforts will be explored by carrying out the necessary research.

1.2. Statement of the problem

The research and creation of the CSBP management plan are in response to the growing concern about climate change and related adverse effects on the environment. The government of Costa Rica has seed banks that operate with private organization support to facilitate germplasm conservation and research. More efforts to support local seed and germplasm conservation should be supported and enhanced locally to include CSBs that support permaculture traditional farming methods.

Concerns regarding climate change involve the effects of permaculture farming (subsistence) vs. commercial farming and whether one method should be increased over the other. In this regard, the government of Costa Rica has not made a national-level decision on Genetically Modified Organisms (GMOs) which some organizations argue would be the preferred product to cultivate versus subsistence farming. Currently, GMOs are allowed in 19 out of the 81 cantons in Costa Rica. The remaining 62 cantons do not allow GMOs. The ambiguity concerning GMOs is just a small example of the lack of a cohesive plan to address the agricultural challenges in Costa Rica.

An area of opportunity exists within the Southern Zone, specifically in Pérez Zeledón, where local farmers already have organizations such as Unión de Semilleros del Sur, which has been a regional leader in the production and conservation of bean and maize seeds (Vernooy et al., 2015).

1.3. Purpose

The project management plan will facilitate the creation of a community seed bank (CSB) within the Brunca region of Costa Rica (Pérez Zeledón). The specific research that will be carried out will seek to provide further information regarding the farming conditions of the Southern Zone as impacted by the effects of COVID-19 and climate change. The hypothesis behind this final graduation project is whether a project management plan can be created to create a Pérez Zeledón that will follow community seed bank principles.

The creation of the project management plan for a community seed bank in Pérez Zeledón is being carried out to bridge the gap between the national government and the canton governments in Costa Rica. Methods for seed cultivation and conservation at a local level require an updated analysis to provide the local Southern Zone population the keys to successfully adapt and overcome the persistent climate changes they currently face. The benefits of the research, analysis, and the completed project management plan are an updated guide for developing a community seed bank in the Brunca region that includes local inputs and current data regarding traditional farming methods. This plan will build upon

the foundation of other organizations, such as CATIE and IICA, that work as government advisors for Costa Rica at the national level.

1.4. General objective

To develop a project management plan for creating the Pérez Zeledón community seed bank that complies with conservatory standards.

1.5. Specific objectives

1. To create the project charter to elaborate critical elements for developing the project management plan.
2. To build a project scope management plan to achieve the techniques and procedures that define the project's parameters and manage them to ensure fulfillment according to stakeholder requirements.
3. To create a schedule management plan, which will include methods, processes, and procedures that will influence the dedication and management of the time allotted to project activities and ensure its completion within budget.
4. To elaborate a cost management plan that will serve as a model for effective management of project costs, including realistic budget forecasts, financial resources flow, monetary performance, budget control and monitoring and finalizing the project within budget.
5. To build a project quality management plan which will arrange the processes and procedures that will communicate the definition of criteria/ indicators for quality measures and guarantee satisfactory expectations of the project stakeholders.

6. To develop a resource management plan which empowers the reference framework for the organization and allocation of resources according to the expectations and requirements of the project.

7. To build a communication plan to ensure appropriate stakeholders' engagement through prompt and proper access to information throughout the project design and implementation processes.

8. To create a risk management plan that will provide the approaches and methods of risk management in implementing the project and reduce negative impacts on the project's outcomes.

9. To develop a procurement management plan that will define the approaches, procedures and processes that will ensure that the suitable materials are accessible to the project as required. Green procurement methods will be prioritized and utilized.

10. To produce a stakeholder management plan that will establish the methods and paths facilitating the commitment of team members who can influence the project's outcomes up and down the chain.

11. To elaborate a project management plan that successfully balances the community seed bank project's social, environmental, and economic aspects by using resources to improve the community's welfare. This approach will build an abundance of the local support network needed for future agricultural advancement.

2 THEORETICAL FRAMEWORK

2.1 Company/Enterprise framework

2.1.1 Company/Enterprise background

Within Costa Rica, two organizations work domestically and internationally towards collecting, conserving, researching, and distributing seeds (germplasm).

The first organization is the Inter-American Institute for Cooperation on Agriculture (IICA), headquartered in Turrialba, Costa Rica. IICA specializes in supporting the agriculture efforts of Inter-American Member States to achieve agricultural development and rural welfare.

IICA provides cooperation services through close and permanent work with its 34 Member Countries. IICA's most valuable asset is its close relationship with its work's beneficiaries. IICA has broad experience in technology and innovation for agriculture, agricultural health, food safety and quality, international agricultural trade, family farming, rural development, natural resource management, and the bioeconomy. Costa Rica contributes to IICA while maintaining a close regional partnership with the Centro Agronómico Tropical de Investigación y Enseñanza (CATIE).

CATIE is also located in Turrialba, Costa Rica, and manages the CATIE Botanical Gardens and the Orthodox Seed Germplasm Bank. The CATIE Botanical Gardens have maintained a forest seed bank since 1967, developing new alternatives for

managing watershed systems, techniques for diversified management of forests and natural resource reserves, conservation methods, community management of natural resources, and improved production systems for small and medium scale farmers. The Orthodox Seed Germplasm Bank was established in July 1976 to primarily combat the growing loss of diversity of some of the most important crops in the Mesoamerican region. One of the main tasks of the bank is to locate, collect, conserve, characterize, and distribute the germplasm (seeds) of plants that, due to their attributes, are considered of priority interest to strengthen and ensure the food sovereignty of the region, in addition to providing oriented scientific knowledge to the optimization of the conservation of species of importance for food and agriculture. Combined with the forest seed bank of the botanical gardens, the Orthodox Seed Germplasm Bank contributes to the significant conservation of regional seeds in Costa Rica.

2.1.2 Mission and vision statements

Table 1

Mission Statements and Strategic Visions of Seed Conservation Banks within Costa Rica

Agency	Mission Statements and Strategic Priorities
Inter-American Institute for Cooperation on Agriculture (IICA)	**Mission**: *"Our mission is to encourage, promote and support Member States in their efforts to achieve agricultural development and rural well-being through international technical cooperation of excellence"* (IICA, 2022) **Strategic Vision:** *"Our vision is to be a modern and efficient institution supported by a platform of human resources and processes that are capable of mobilizing the knowledge available in the region and around the world, with the aim of achieving a competitive, inclusive and sustainable agriculture sector that takes advantage of opportunities to contribute to economic growth and development as well as to foster greater rural well-being and sustainable management of its natural capital"* (IICA, 2022)

Centro Agronómico Tropical de Investigación y Enseñanza (CATIE)	**Mission**: *"Promote Inclusive Green Development, through scientific knowledge and the training of new leaders, managing ecosystems, landscapes, and food systems, which with their permanence favor the sustainable well-being of populations in the tropics of Latin America and the Caribbean"* (CATIE, 2022) **Strategic Vision**: "CATIE positioned as a benchmark in research for development, education, and innovation at the service of the peoples of the tropics of Latin America and the Caribbean, seeking a balance between the use and protection of landscapes, ecosystems and production systems that are part of sustainable well-being and the health of people, as well as of all forms of life that are part of the planet" (CATIE, 2022)

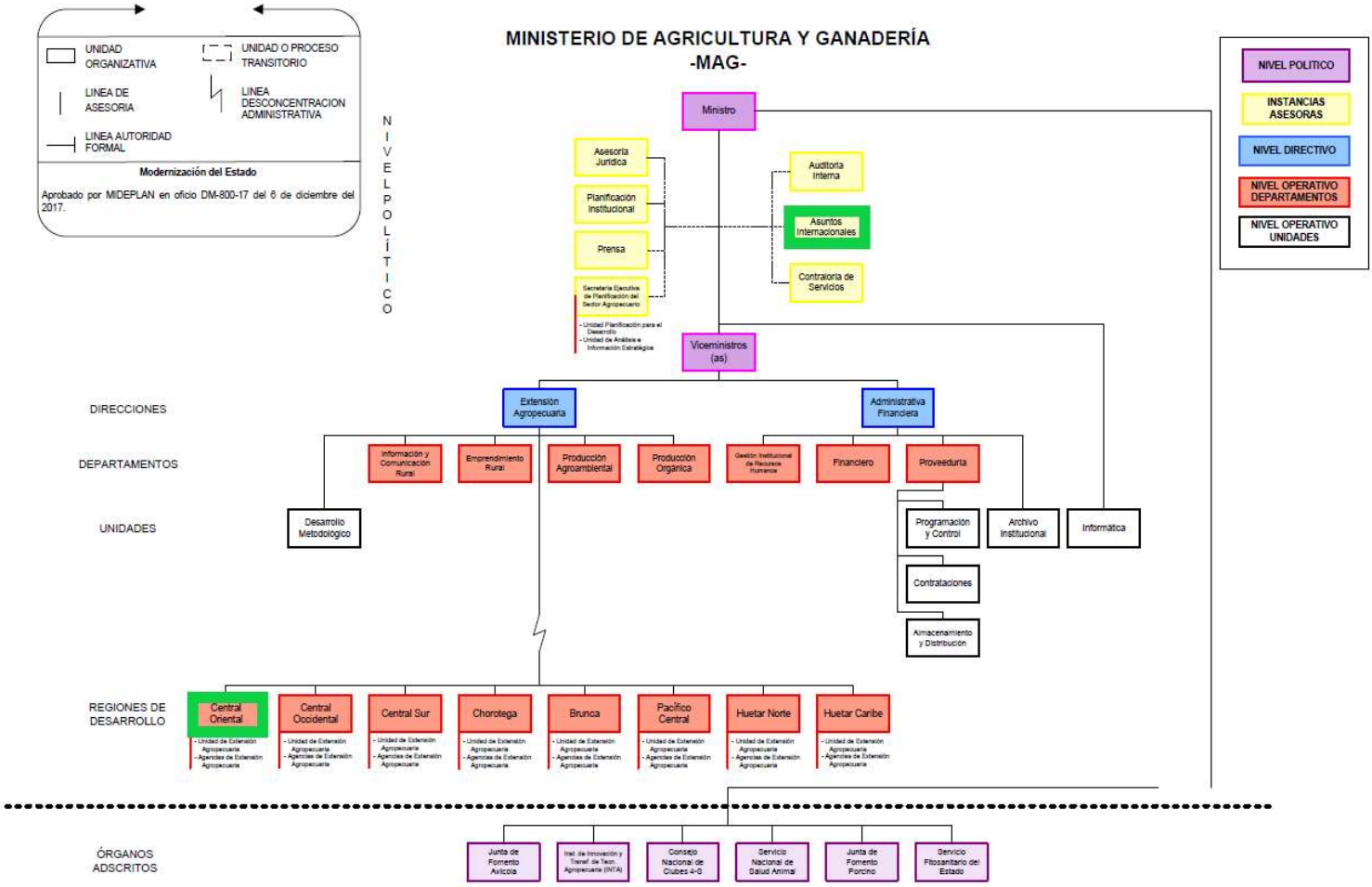
Note. Adapted from *"Guardians" of America's seeds acquired state-of-the-art expertise in germbanks,* by IICA, 2018 and *Orthodox Seed Germplasm Bank,* by CATIE, 2019.

2.1.3 Organizational structure

Within the Costa Rican Ministerio de Agricultura y Ganadería de Costa Rica (MAG), international organizations committed to Agriculture work to support the mission of MAG. Within MAG, international organizations work as advisory bodies to create dialogue regarding agriculture. Additionally, regional directors manage regional agribusiness sectors. IICA and CATIE are global organizations with regional responsibilities in the central region and therefore are represented as operating departments. The project management plan for developing a community seed bank in Pérez Zeledón will utilize the framework and knowledge of seed conservation to create the seed bank. Decades of expertise and experience are crucial in the project's development and legal policy.

Figure 1

Organizational structure of the Ministerio de Agricultura y Ganadería de Costa Rica



Note. IICA and CATIE organizations are represented by the sections bordered in green. Adapted from Decreto 40863-MAG, La Gaceta 28, alcance n.33 del 14 de febrero del 2018 by Department of Agriculture and Cattle Raising, 2018, Government of Costa Rica.

2.1.4 Products Offered

As the state agency responsible for agriculture, the mission of the MAG is to "Promote the dignification of rural families of small and medium-sized producers in rural territories, promoting the development of technical and business management capacities in productive systems and agricultural organizations, which promote competitiveness, equity and social, economic and environmental sustainability of agricultural activity" (MAG, 2022)

IICA produces technological and innovative solutions for agriculture, including food safety and quality, international agricultural trade, family farming, rural development, natural resource management, and the bioeconomy. Recently, IICA donated 500 monographs and 24 periodicals of literature to Italy regarding coffee as a crop, good production practices, and the bean's origin.

CATIE: The Botanical Gardens Forest seed bank develops new alternatives for managing watershed systems, techniques for diversified management of forests and natural resource reserves, conservation methods, community management of natural resources, and improved production systems for small and medium-scale farmers. The Orthodox Seed Germplasm Bank locates, collects, conserves, characterizes, and distributes the germplasm (seeds) of plants that, due to their attributes, are considered of priority interest to strengthen and ensure the food sovereignty of the region, in addition to providing oriented scientific knowledge to

the optimization of the conservation of species of importance for food and agriculture.

The CSB will benefit from the previous support, knowledge, and research provided by MAG, IICA, and CATIE to enable the development of the community seed bank project (CSBP).

2.2 Project Management Concepts

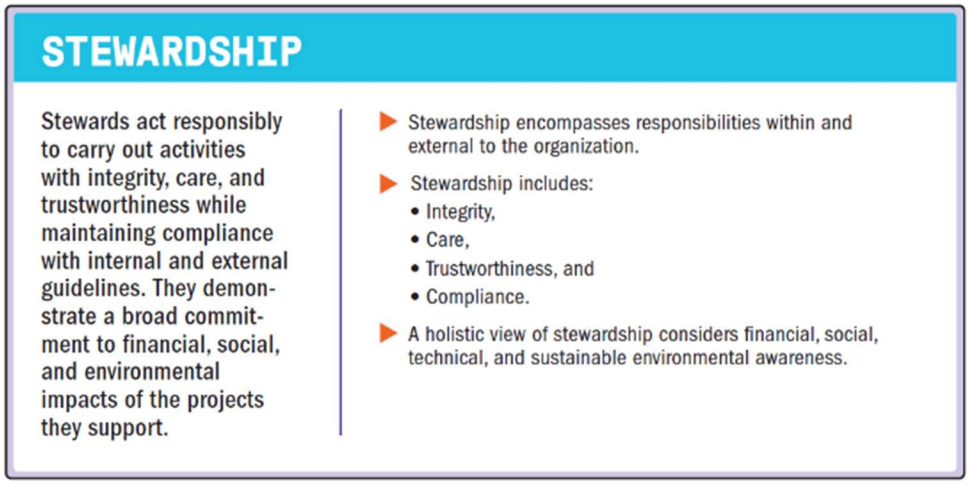
The PMBOK Guide defines project management principles as 12 principles that provide guidance for effective project management (PMBOK guide 7th edition, 2021, p, 21). The following figures highlight each principle and the related impact on the project.

2.2.1 Project

Principles of project management

Figure 2

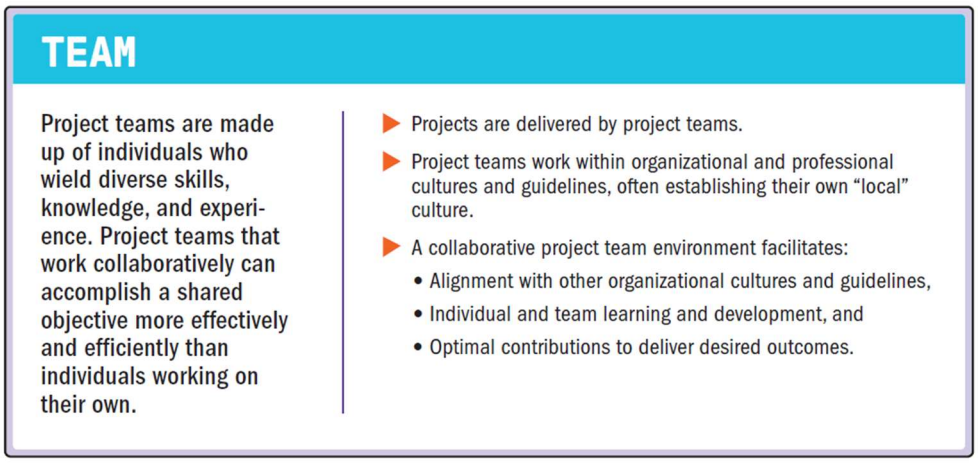
Stewardship principle



Note. Adapted from PMBOK guide 7th edition, 2021, p.24

Figure 3

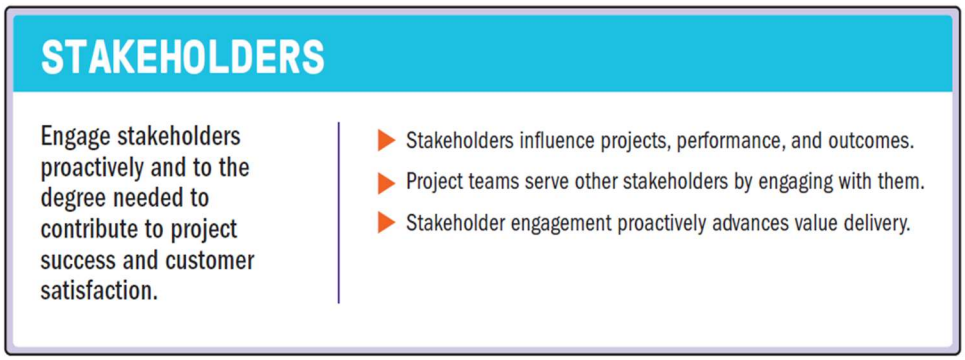
Team principle



Note. Adapted from PMBOK guide 7th edition, 2021, p.28

Figure 4

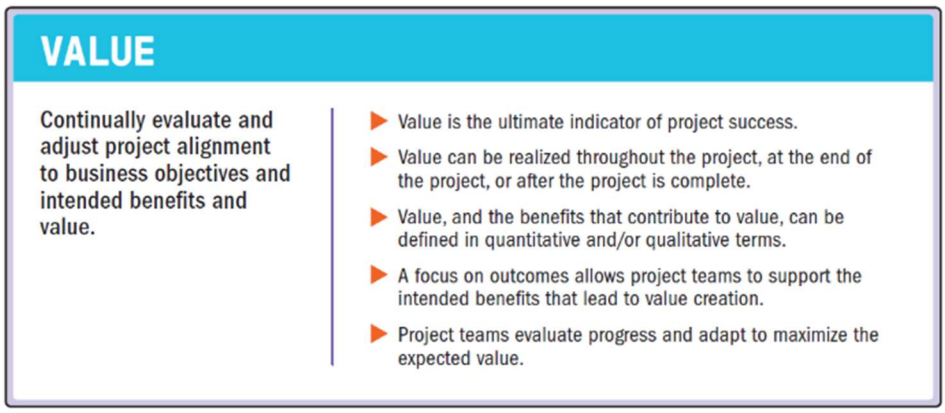
Stakeholder principle



Note. Adapted from PMBOK guide 7th edition, 2021, p.31

Figure 5

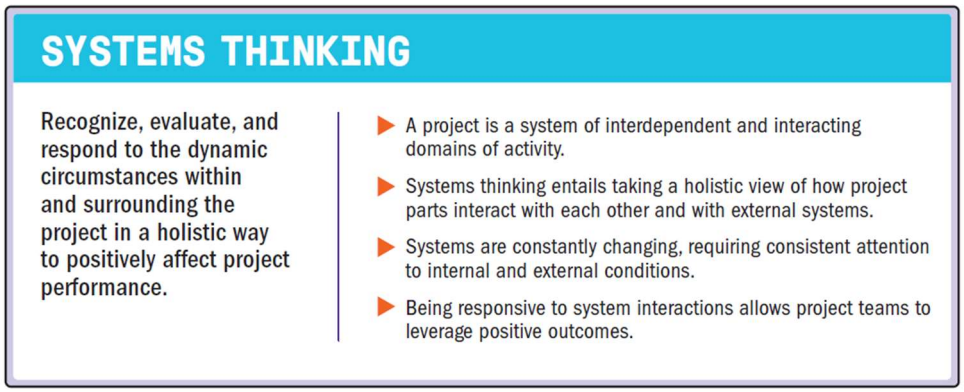
Value principle



Note. Adapted from PMBOK guide 7th edition, 2021, p.34

Figure 6

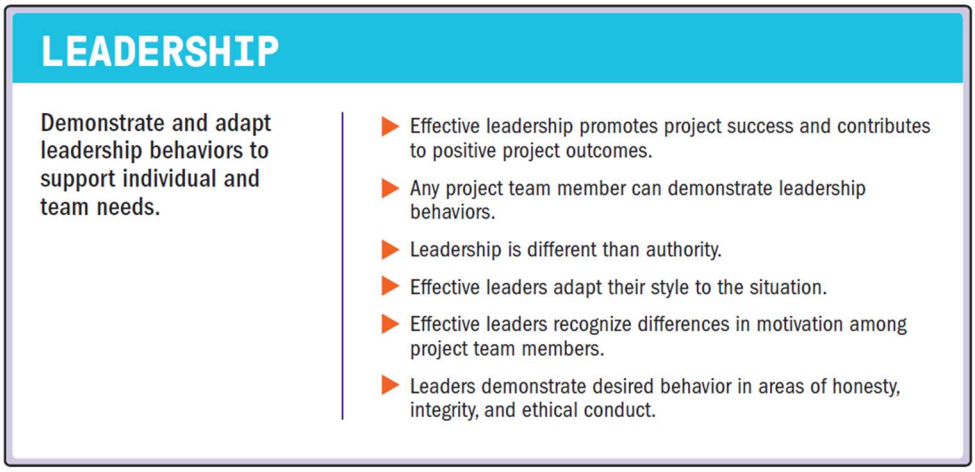
System thinking principle



Note. Adapted from PMBOK guide 7th edition, 2021, p.37

Figure 7

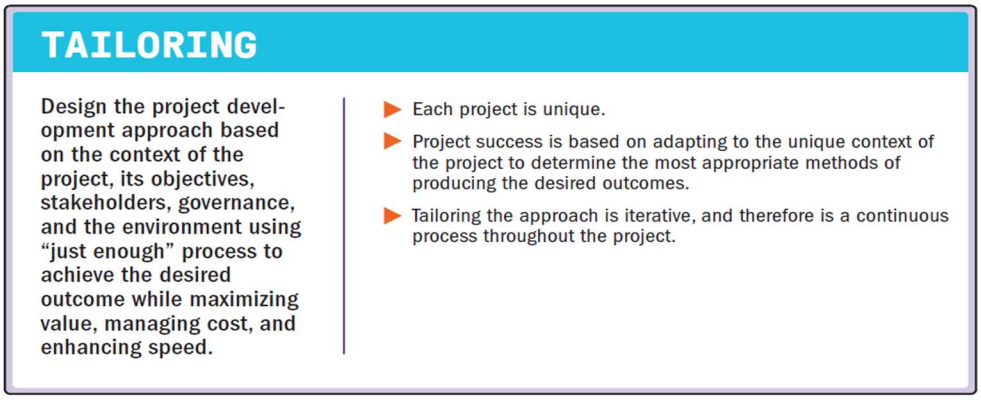
Leadership principle



Note. Adapted from PMBOK guide 7th edition, 2021, p.40

Figure 8

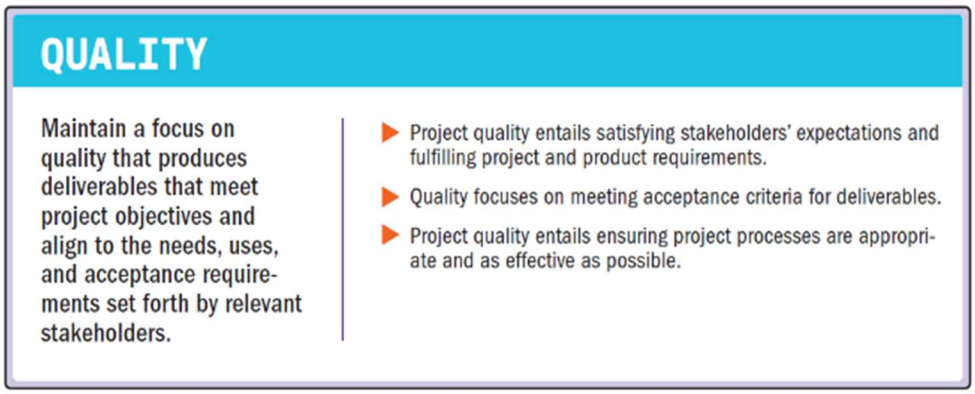
Tailoring principle



Note. Adapted from PMBOK guide 7th edition, 2021, p.44

Figure 9

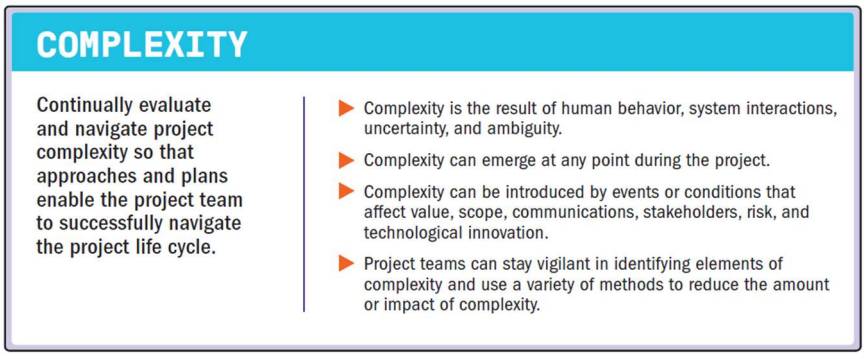
Quality principle



Note. Adapted from PMBOK guide 7th edition, 2021, p.47

Figure 10

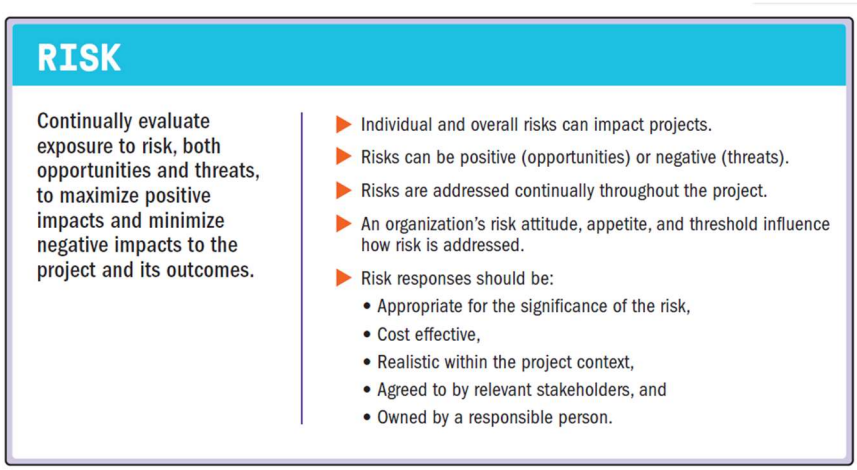
Complexity principle



Note. Adapted from PMBOK guide 7th edition, 2021, p.50

Figure 11

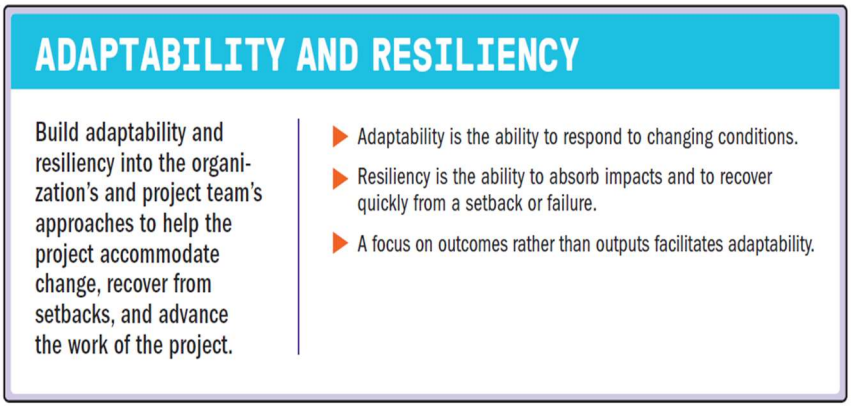
Risk principle



Note. Adapted from PMBOK guide 7th edition, 2021, p.53

Figure 12

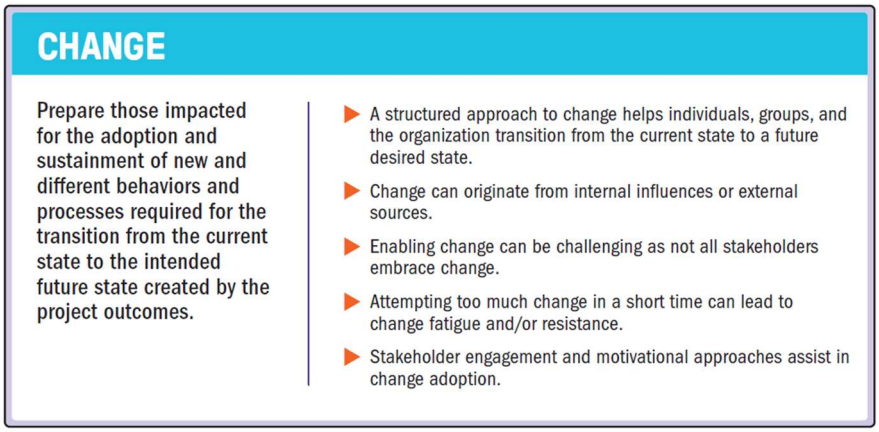
Adaptability and resiliency principle



Note. Adapted from PMBOK guide 7th edition, 2021, p.55

Figure 13

Change principle



Note. Adapted from PMBOK guide 7th edition, 2021, p.58

In summary, the project will utilize all the project management principles during the project's lifecycle. The project manager will act as a steward of project resources to manage the project successfully. The team comprises the project manager's support network to enable transportation and other related resources. The project's stakeholders include the university and the agricultural community in Pérez Zeledón, which will benefit from the work performed. The project manager uses systems thinking, tailoring, and leadership to overcome project obstacles. Quality, complexity, and risk are applicable principles as the project will be evaluated for quality, and the project manager must balance the research's complexity with risk vs. reward criteria. Finally, the adaptability and resilience of the project manager will be measured by the project deliverables and stakeholder feedback. The result is necessary changes to meet the final project deliverable.

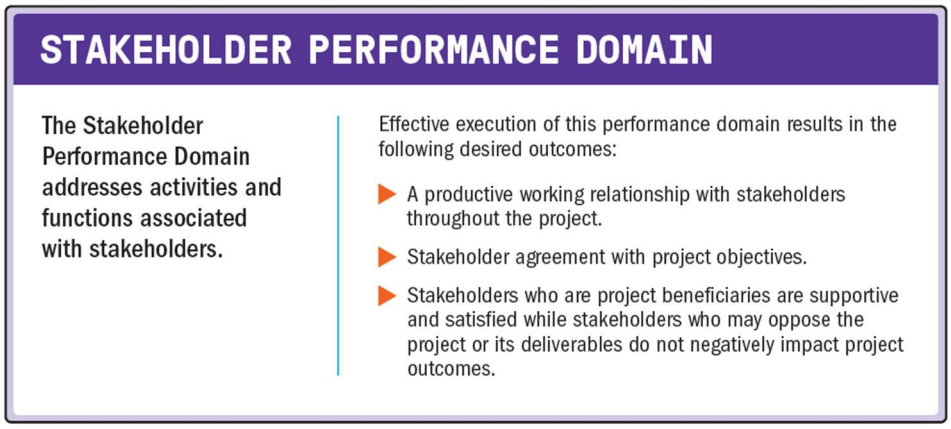
2.2.2 Project management

Project performance domains

According to the PMBOK Guide, project performance domains are “a group of related activities that are critical for the effective delivery of project outcomes.” (PMBOK guide 7th edition, 2021, p.102) The eight project domains are further clarified in the figures below.

Figure 14

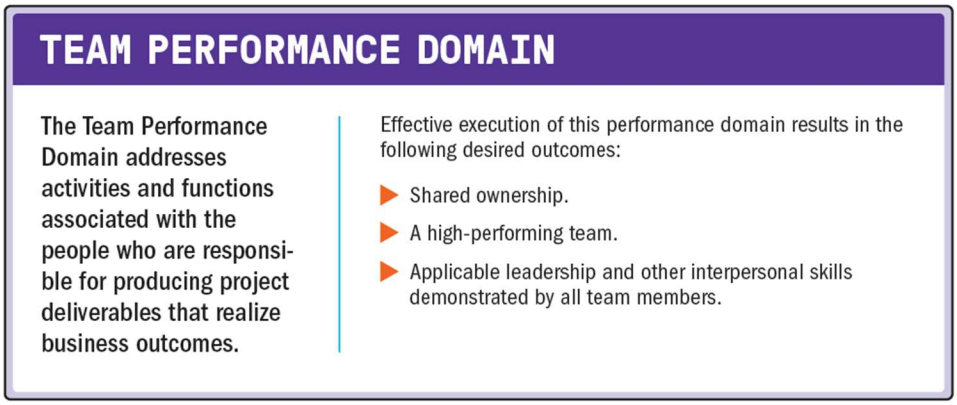
Stakeholder performance domain



Note. Adapted from PMBOK guide 7th edition, 2021, p.8

Figure 15

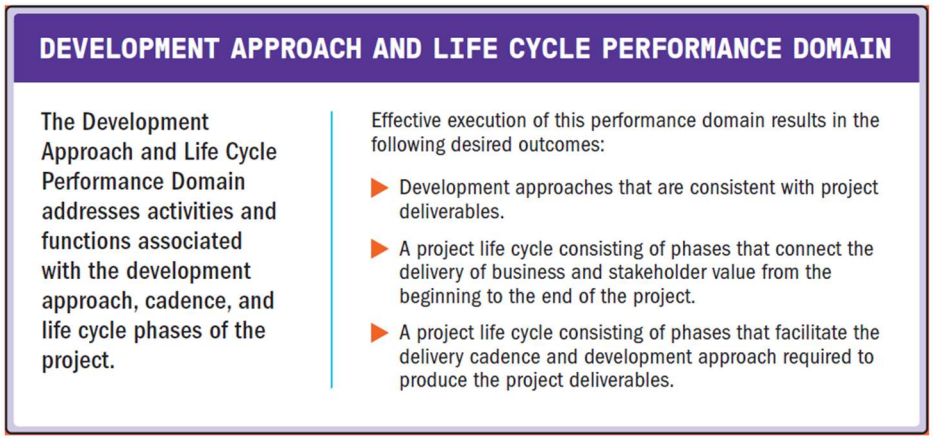
Team performance domain



Note. Adapted from PMBOK guide 7th edition, 2021, p.16

Figure 16

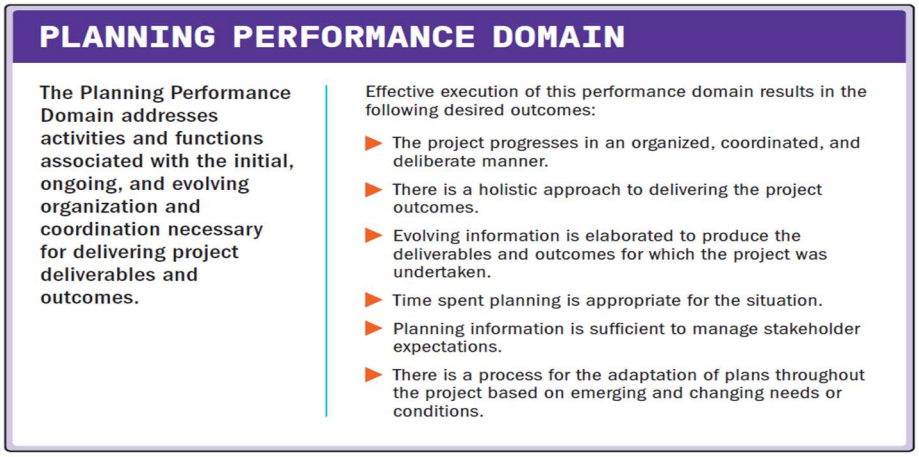
Development approach and life cycle domain



Note. Adapted from PMBOK guide 7th edition, 2021, p.32

Figure 17

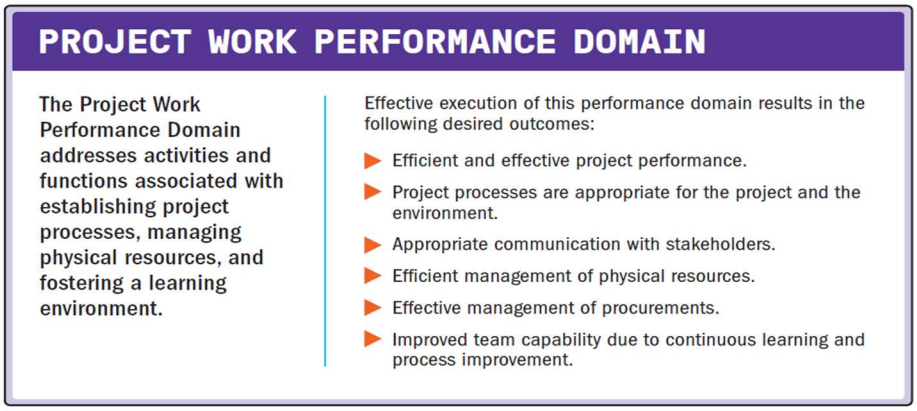
Planning performance domain



Note. Adapted from PMBOK guide 7th edition, 2021, p.51

Figure 18

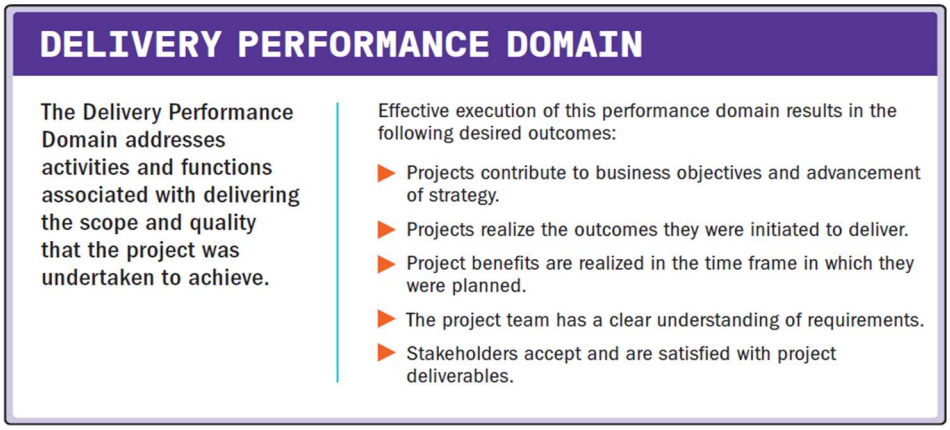
Project work performance domain



Note. Adapted from PMBOK guide 7th edition, 2021, p.69

Figure 19

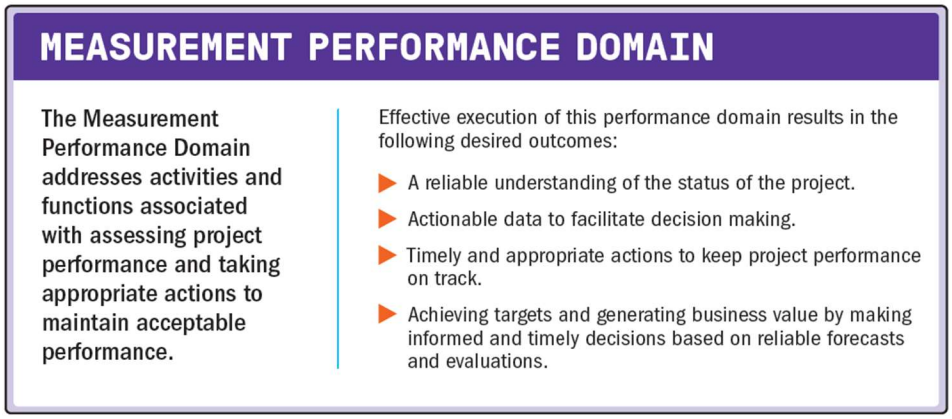
Delivery performance domain



Note. Adapted from PMBOK guide 7th edition, 2021, p.80

Figure 20

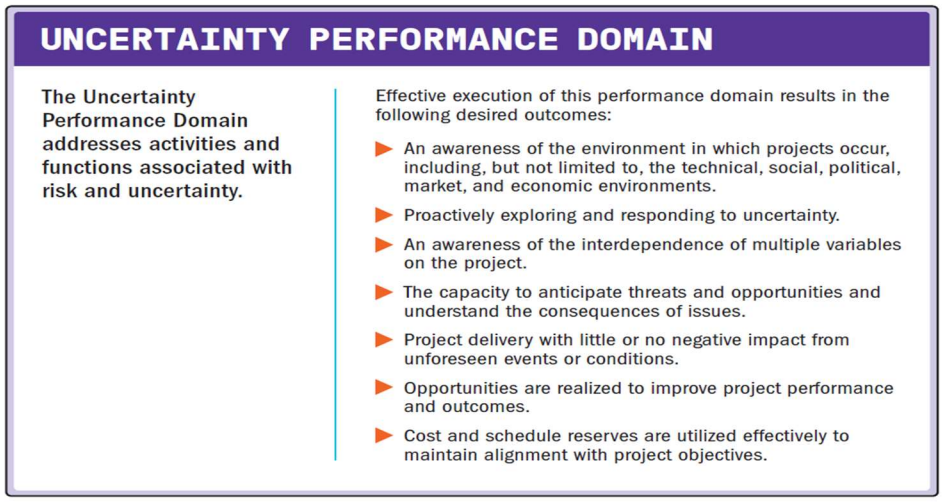
Measurement performance domain



Note. Adapted from PMBOK guide 7th edition, 2021, p.93

Figure 21

Uncertainty performance domain



Note. Adapted from PMBOK guide 7th edition, 2021, p.116

The eight project domains serve as benchmarks for the project to measure its success. All of the desired outcomes from each of the eight performance domains are the goal at project completion. The project will transition through all domains, and the project manager is charged with ensuring the desired outcomes to consider the project a success.

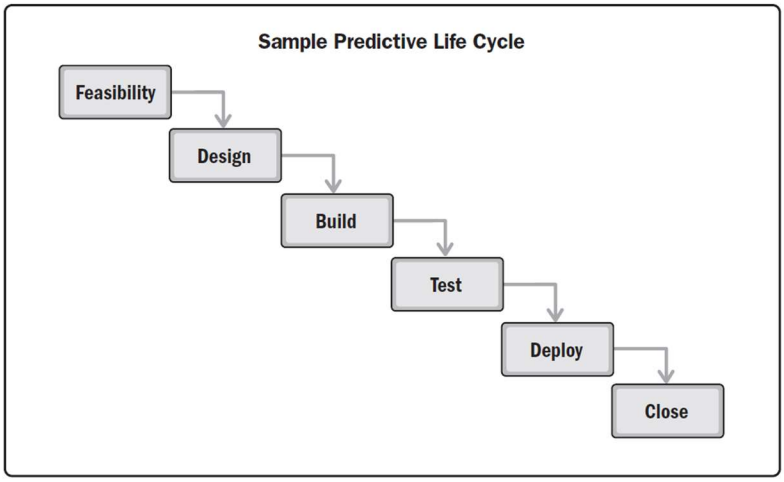
2.2.3 Project life cycle

Main characteristics of predictive, adaptive, and hybrid projects

The project life cycle refers to predictive, adaptive, and hybrid projects. Projects are generally grouped based on which life cycle the project operates within. These three development approaches are described as a spectrum with increasing iterative and incremental projects being adaptive in nature and described as hybrid life cycles. For this project, the predictive life cycle will be used. The predictive life cycle model is appropriate for this Project due to the linear nature of designing a project management plan.

Figure 22

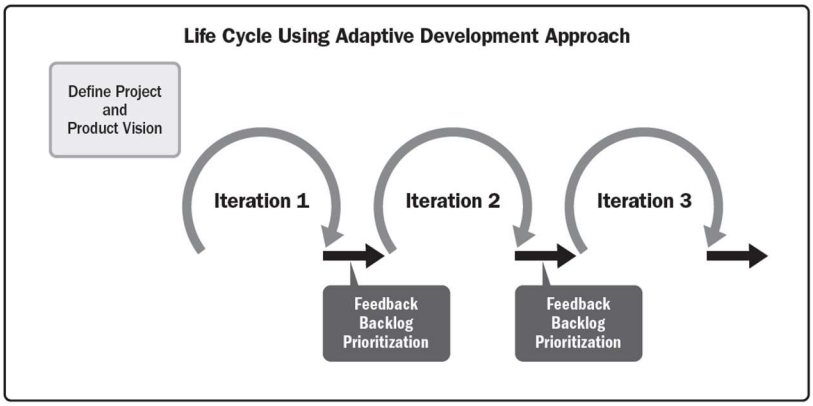
Example of a predictive project life cycle



Note. From PMBOK guide 7th edition, 2021, p.43

Figure 23

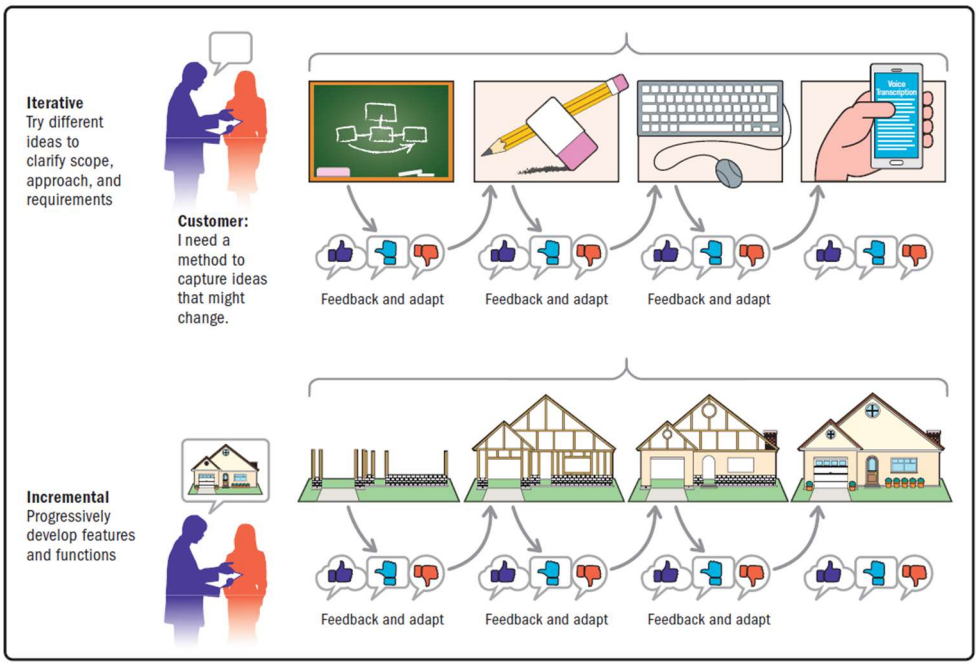
Example of an adaptive life cycle



Note. From PMBOK guide 7th edition, 2021, p.45

Figure 24

Example of a hybrid project life cycle



Note. From PMBOK guide 7th edition, 2021, p.37

Hybrid project lifecycles typically use either iterative or incremental approaches.

2.2.4 Project management processes

Administration of projects includes efforts to drive the direction and management of projects to complete all objectives. Because managing projects cannot be improvised (IPAG, 2021), specific steps are taken to manage project efforts. Typical key steps include designing, planning, execution, control, closure, and reviewing (Brown, 2022). The concepts of directing and managing projects take a step further into actions taken; these include:

1. Producing the project deliverables by executing the project management plan.
2. Instigating the approved changes, detecting corrective and preventive actions, and detecting repairs.
3. Implementing the planned methods, processes, and standards.
4. Producing and distributing status information (Brown, 2022)

Lastly, when administrating projects, project managers are responsible for “managing all phases of projects, including managing, and overseeing activities of various groups of internal and external stakeholders, personnel, and vendors” (UT, 2021). The combined actions of directing and managing aspects of project management contribute to the administration of the overall project.

2.2.5 Project management knowledge areas

Project management knowledge areas are “identified areas of project management defined by their knowledge requirements and described in terms of their component processes, practices, inputs, outputs, tools, and techniques” (PMBOK guide 6th edition, p.61). This project will focus on the following knowledge areas.

i Project Integration Management

ii Project Scope Management

iii Project Schedule Management

iv Project Cost Management

v Project Quality Management

vi Project Resource Management

vii Project Communications Management

viii Project Risk Management

ix Project Procurement Management

x Project Stakeholder Management

A detailed list of knowledge areas that will be used to develop the project management plan can be found in **Chart 2**.

Chart 2

Map of Project Management Process Groups and Knowledge Areas

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

Note. Adapted from *A Guide to the Project Management Body of Knowledge (PMBOK® Guide)* (6th ed., p. 25), by Project Management Institute, 2017, Project Management Institute, Inc. Copyright 2017 by Project Management Institute, Inc. Permission not sought.

2.2.6 Define project life cycles

Project lifecycles are "step-by-step frameworks of best practices used to shepherd a project from its beginning to its end. They provide project managers a structured way to create, execute, and finish a project." (Coursera, 2022). Project lifecycles include the steps required for project managers to manage a project from start to finish successfully. These steps entail 5 phases: initiating, planning, executing, mentoring/controlling, and closing. (Adobe, 2022). A project is characterized as following through these cycles to complete the objectives and deliver all deliverables. "The project life cycle is just a way of describing the life of a project from cradle to grave" (Ashton, 2022).

Figure 25

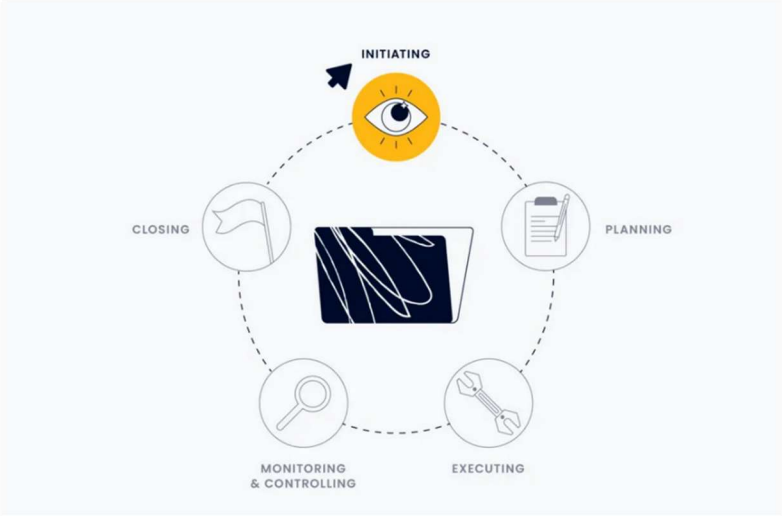
Five Phases of project life cycle

Note. From Digital Project Manager (Ashton, 2022)

Within the MAG organization, it is evident that projects adhere to and follow through with the general project lifecycle model. Considering that MAG is a government organization within Costa Rica, there is evidence of the cradle-to-grave nature of project lifecycle development. Evidence of this project management effort was displayed in the Inter-American Institute of Agricultural Sciences (IICA), created in 1942 by Law 29 of the Costa Rican government. For smaller-scale projects of the local variety, the general project lifecycle model is used to transition a project through all five stages.

Figure 26

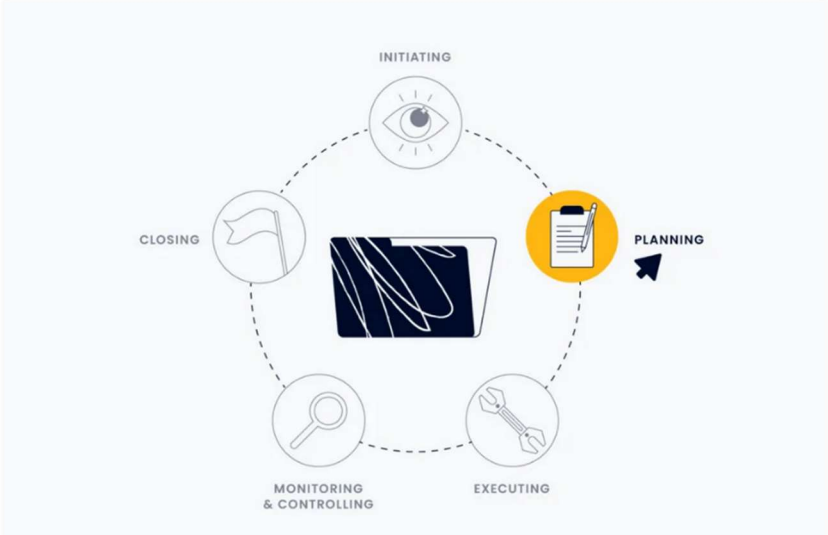
Initiation Phase of project life cycle



Note. From Digital Project Manager (Ashton, 2022)

Figure 27

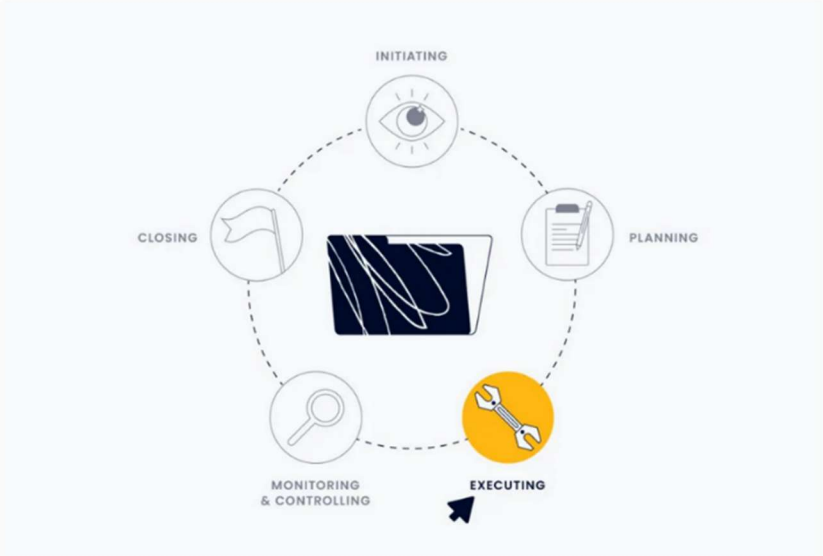
Planning Phase of project life cycle



Note. From Digital Project Manager (Ashton, 2022)

Figure 28

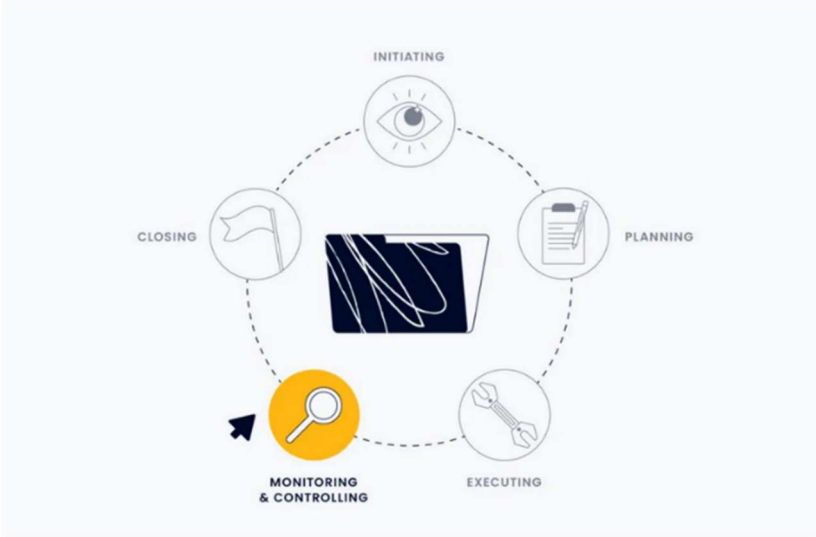
Executing Phase of project life cycle



Note. From Digital Project Manager (Ashton, 2022)

Figure 29

Monitoring/Controlling Phase of project life cycle



Note. From Digital Project Manager (Ashton, 2022)

Figure 30

Closing Phase of project life cycle

Note. From Digital Project Manager (Ashton, 2022)

For the creation of this project, the five-stage lifecycle model is appropriate and will be utilized. As referenced by Ashton, the five-stage lifecycle model is a step-by-step process. Creating the project management plan for the community seed bank will involve step-by-step instruction and coordination that will deliver the promised objective, a project management plan. The creation of the project charter serves as the first stage of project initiation. Project planning is further executed in stage 2, the development of the charter during the research graduation seminar. The third stage consists of the graduation course, where the project management plan is executed in its final formation. Stage 4 consists of the evaluation and feedback from the course evaluators that are characteristic of the monitoring and controlling phase. Lastly, stage five is the closing phase, which is the final presentation of the completed project management plan and the final deliverable.

2.2.7 Business strategy, portfolio, programs, and projects

Business strategy is defined as a clear set of plans, actions, and goals that outlines how a business will compete in a particular market, or markets, with a product or number of products or services" (IMD.org, 2021). Typical strategic traits include being flexible, adaptable, and anchored in up-to-date research. The business strategy is the overarching framework in which project management professionals manage projects, programs, and portfolios.

A project can be defined as "a temporary endeavor undertaken by a company or organization (such as the creation of a new product, service, or result)" (Joubert, 2020).

A program is "a group of projects that are similar or related to one another, and which are often managed and coordinated as a group instead of independently" (Joubert, 2020).

A portfolio is "a group of different programs and/or projects within the same organization, which may be related or unrelated to one another" (Joubert, 2020).

Within a project management organization, projects are embedded within programs. Portfolios are made up of programs.

The project objective for creating the project management plan belongs within the realm of a project. Once created, the project management plan for the community seed bank can be utilized as a part of the overarching program for agriculture conservation within the MAG. Lastly, the MAG is part of the greater Costa Rican agriculture conservation portfolio.

2.3 Other applicable theories/concepts related to the project topic

2.3.1 COVID-19 Pandemic, Climate Change, and the Current State

The environment and related aspects are burdened as the world continues to experience the effects of the climate emergency. The increased magnitude of extreme weather has affected crop yields and seeds for harvest. Climate change and reduced yields of in-season plants (due to changes in farming practices and weather patterns) have left regional crops behind the previous year's output. A side effect has been the low yield of heirloom seeds and regional crops previously grown for generations. As the world looks towards the future, it must also look to answers contained in the past by creating and maintaining community seed banks. Research has been ongoing with extensive interest in seed conservation since the 1950s in Costa Rica. Costa Rica has been at the forefront of the battle against climate change. Unfortunately, other crises, such as the COVID-19 pandemic, take priority over climate change as time passes. Farmers must continue to find solutions to the crop yield issue and maintain their physical health to plant and harvest crops. As farming has become primarily commercialized, certain crops have dominated the market and pushed others to the wayside.

As part of the project field research, Mr. Diego Vargas Guillén was interviewed concerning the work of his company, Semillas Plantae. Mr. Vargas described a lack of local seed usage and how many commercial and family farms are purchasing seed from vendors with contracts with the United States and Europe. The State of the Nation report further substantiated using foreign seed vendors:

"Costa Rica is the Central American country with the greatest dependence on corn and bean imports. Between 2000 and 2018, this dependence went from 64% to 99.4% in corn, from 0.5% to 54.5% in rice, and from 65% to 79.6% in beans (Cepal, 2020)." Thus, a documented trend is increased dependence on foreign food sources to produce food locally. Semillas Plantae intends to reverse this trend by sourcing and distributing organically grown food crops and seeds for Costa Rica, using permaculture and sustainable methods.

Additionally, his business partner Ms. Felicia Rodríguez González, is a contributing company member, working on her organic family farm. She also explained that a shift has occurred within Costa Rican culture that has taken the focus of farming away for many and thus placed a dependence on commercial farms and methods to produce food. At Semillas Plantae, efforts are being made to practice organic, permaculture farming methods using local Costa Rican food seeds and having quality seeds for distribution nationwide.

Additionally, the rise in GMO crop production has created uncertainty in the agriculture market. The Costa Rican government has not provided a national response regarding the legality of the harvest and sale of GMO crops. This decision has been left in the hands of the individual cantons to regulate. Lastly, no labeling is required for GMO foods in markets, nor GMO seeds, which results in further uncertainty. In response, 62 out of 81 cantons have continued to share traditional (heirloom) seeds and practice organic farming methods in response to standing national seed laws. These 62 cantons are transgenic-free, indicating the

lack of GMO crops grown. In the face of increasing climate change and unpredictable weather, more organization and support are needed for local farmers to keep up with production the traditional way. The national government is also under pressure from local farmers to support loans to keep farmers farming. The impact of the COVID-19 pandemic exacerbated the situation where low-income and struggling farmers relied on government assistance to get by. Uncertainty continues regarding this issue; further support and development are required to spur change and improvement. The current debate and challenge for rural farmers are subsistence vs. plantation farming. More farmers are reorganizing their farms to adapt to the number of changes in weather and access to outside resources.

2.3.2 Summary of additional concepts

Additional concepts related to the creation of community seed banks include traditional farming, Genetically Modified Organisms (GMOs), and Climate change (specifically unpredictable weather). These concepts directly impact the success of crops raised from seed to harvest. Additionally, in the rural Southern Zone of Costa Rica, local farmers, predominantly indigenous peoples, are more affected by these issues.

2.3.2.1 Traditional Farming and GMOs

Traditional farming practitioners argue that traditional farming (Permaculture) is more sustainable and a better way forward than GMO methods of agriculture.

Permaculture design is "based on a set of ethics and principles that help guide the designer to consider all elements when designing a system" (Rancho Mastatal, 2022). In contrast, GMOs focus on genetically modifying organisms to yield better satisfactory results for pest resistance and the genetic quality of the product. The primary contention between the two methods is GMOs' unknown/unmeasured impacts on the environment and the human body. The debate between GMOs and traditional farming has been ongoing. Focusing on recent efforts in Costa Rica regarding the issue, many farmers are turning to traditional methods to solve the agriculture problems they are experiencing. An example includes farm reorganization, such as "reorganizing the layout of the farm and stopping the mixing up the crops so as to use the land more efficiently and make it easier to harvest" (Rodriquez, 2019). The majority opinion amongst the individual cantons in Costa Rica is to keep Costa Rica a haven for sustainable and organic living, with 62 cantons banning the practice of GMO farming.

By the canton of Pérez Zeledón practicing organic, sustainable agriculture practices such as Permaculture farming, initiatives such as community seed banks are supported under this framework. By design, collecting and sharing seeds is a part of permaculture's definition of "integrating land, resources, people, and the environment through mutually beneficial synergies" (PRI, 2022).

2.3.2.2 Climate change and unpredictable weather

The related concept of climate change and unpredictable weather impacts farmers' efforts to maintain agriculture successfully. The UN defines climate change as "a change in climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable periods of time" (UNFCCC, 1992). Unpredictable weather patterns result from climate change and impact local farmers in Costa Rica. An indigenous farmer from the Yorkin Indigenous Reserve in the Southern Zone, Maura Lupario, states, "There are changes (weather) now. If we sow on the dates we used to, the rain comes early, and we can no longer collect on time. You can't be sure anymore" (Rodriquez, 2019). These local impacts affect the usability of shared, collected, and conserved seeds due to the reliance on the climate for crop growth. Understanding the interconnected nature of climate change and its impacts on seed conservation that leads to crop growth and harvesting is essential. The research will be crucial to creating the community seed bank project management plan.

2.3.3 Additional theories

2.3.3.1 Climate change theory and community seed banks

The climate change theory directly impacts the success or failure of agriculture. The community seed bank project management plan supports agriculture's sustainable, regenerative nature to limit the human carbon footprint contributing to climate change.

2.3.3.2 GMO food production and community seed banks

The project's foundation is based on organic seed cultivation, conservation, and sharing. These methods do not support the commercialization of agricultural products that are a part of the GMO production cycle.

2.3.3.3 Permaculture principles and community seed banks

Permaculture practices integrate land, resources, people, and the environment through mutually beneficial synergies, creating a closed loop that does not produce waste (PRI, 2022). Collecting seeds for a community seed bank is a process inherent to permaculture design.

3 METHODOLOGICAL FRAMEWORK

The methodological framework describes how the project will carry out the work. The framework includes the basic definitions of the research concepts. Research concepts are defined and structured for the reader to understand the background structure of the research methods. This section provides a roadmap for how the research was performed, gathered, and synthesized to produce the final project deliverable, project management plan.

3.1 Information sources

Information sources are "information or evidence that informs the reader as to whether the author is reporting information that is firsthand or conveying experiences of others" (UMN, 2022). Information sources can be categorized into primary, secondary, and tertiary.

3.1.1 Primary sources

Primary sources are "records of events or evidence as they are first described or actually happened without any interpretation or commentary" (UMN, 2022). The primary sources that will be used to research this project are scholarly journal articles on seed conservation, climate change, GMOs, and Costa Rican agricultural policies. Field interviews will also be accomplished at a local seed bank for firsthand information. The field

interviews will support the sustainable and regenerative development theme behind the community seed bank project management plan.

3.1.2 Secondary sources

Secondary sources "offer an analysis or restatement of primary sources and they often try to describe or explain primary sources" (UMN, 2022). The main secondary sources used to develop the research are books, articles, and legal reviews related to seed conservation and agriculture policies in Costa Rica. Using secondary sources will support the theme of sustainability behind the community seed bank project management plan.

Chart 3

Information sources

Source: Author of Study, 2023

Objectives	Information sources	
	Primary	**Secondary**
1. To create the project charter for the purpose of elaborating key elements for the development of the project management plan.	Scholarly journal articles, field interviews	Books, articles, and law reviews
2. To build a project scope management plan that will achieve the techniques and procedures that define the parameters of the project and manage them to ensure fulfillment according to stakeholder requirements.	Scholarly journal articles	Books and articles
3. To create a schedule management plan, which will include methods, processes and procedures that will influence the dedication and management of the time allotted to project activities and	Scholarly journal articles	Books and articles

ensure its completion within budget.		
4. To elaborate a cost management plan that will serve as a model for effective management of project costs including realistic budget forecasts, financial resources flow, monetary performance, budget control and monitoring and finalize the project within budget.	Scholarly journal articles	Books and articles
5. To build a project quality management plan which will arrange the processes and procedures that will communicate the definition of criteria/ indicators for quality measures and guarantee satisfactory expectations of the project stakeholders.	Scholarly journal articles, field interviews	Books, articles, and law reviews
6. To develop a resource management plan which empowers the reference framework for the organization and allocation of resources according to the expectations and requirements of the project.	Scholarly journal articles	Books, articles, law reviews
7. To build a communication plan to ensure appropriate stakeholders' engagement through prompt and appropriate access to information throughout the project design and implementation processes.	Scholarly journal articles and field interviews	Books and articles
8. To create a risk management plan that will provide the approaches and methods of risk management in the implementation of the project, and to reduce negative impacts on the outcomes of the project.	Scholarly journal articles and field interviews	Books, articles, law reviews
9. To develop a procurement management plan that will define the approaches, procedures and processes that will ensure that the right materials are accessible to the	Scholarly journal articles and field interviews	Books, articles, and law reviews

project as required. Green procurement methods will be prioritized and utilized.		
10. To produce a stakeholder management plan that will establish the methods and paths facilitating the commitment of team members who can influence up and down the chain, the outcomes of the project.	Scholarly journal articles	Books, articles, and law reviews
11. To elaborate a project management plan that successfully balances the social, environmental, and economic aspects of the community seed bank project, by using resources to improve the community's welfare. This approach utilized will build abundance of the local support network needed for future agricultural advancement.	Scholarly journal articles and field interviews	Books, articles, and law reviews

3.2 Research methods

Research methods are "the ways in which the researcher collects the data for their research project. They consist of quantitative, qualitative, and mixed research methods" (Tiffin University, 2022).

3.2.1 Quantitative method: Structured interviews will be conducted. This is "a common research method in market research because the data can be quantified. The method is strictly designed for little "wiggle room" in the interview process so that the data will not be skewed" (Tiffin University, 2022).

3.2.2 Qualitative method: Participant observation will be utilized to gain information on local farming communities in Costa Rica Southern zone. The researcher "interacts directly with the participants to get a better understanding of the research topic. This is a common research method when trying to understand another culture or community" (Tiffin University, 2022).

Secondary data analysis (Inductive-deductive) will be utilized to gather data on the research topic. Secondary analysis is "the use of existing research data to find answer to a question that was different from the original work" (Szabo & Strang, 1997). The inductive analysis will focus on the climate and GMO-related research on seed conservation and agricultural impacts. The deductive analysis will focus on conclusions about the results found. The governmental and environmental factors influence the community seed bank project, and this analysis will provide needed insight into the multifaceted problem.

Chart 4

Research methods

Source: Author of Study, 2023

Objectives	**Research methods**		
	Quantitative-Structured interviews	Qualitative-Participant observation	Qualitative-Inductive-Deductive
1. To create the project charter for the purpose of elaborating key elements for the development of the project management plan.			Inductive analysis was utilized to compile previous background data on the topics of agricultural practices, challenges, changes, and developments.
2. To build a project scope management plan that will achieve the techniques and procedures that define the parameters of the project and manage them to ensure fulfillment according to stakeholder requirements.	Structured interviews were undertaken to solidify knowledge of community seed banks and local indigenous farming methods.	Observations from the field were taken to gather data on seed bank practices and indigenous farming methods.	Inductive and deductive analysis was completed on research findings to formulate the scope management plan.
3. To create a schedule management plan, which will include methods, processes and procedures that will influence the dedication and management of the time allotted to project activities and ensure its completion within budget.	Structured interviews were undertaken to solidify knowledge of community seed banks and local indigenous farming methods.	Observations from the field were taken to gather data on seed bank practices and indigenous farming methods.	Inductive and deductive analysis was completed on research findings to formulate the schedule management plan.
4. To elaborate a cost management plan that will serve as a model for effective management of project costs including realistic budget forecasts, financial resources flow, monetary performance, budget control and monitoring and finalize the project within budget.	Structured interviews were undertaken to solidify knowledge of community seed banks and local indigenous farming methods.	Observations from the field were taken to gather data on seed bank practices and indigenous farming methods.	Inductive and deductive analysis was completed on research findings to formulate the cost management plan.

5. To build a project quality management plan which will arrange the processes and procedures that will communicate the definition of criteria/ indicators for quality measures and guarantee satisfactory expectations of the project stakeholders.			Inductive and deductive analysis was completed on research findings to formulate the quality management plan.
6. To develop a resource management plan which empowers the reference framework for the organization and allocation of resources according to the expectations and requirements of the project.			Inductive and deductive analysis was completed on research findings to formulate the resource management plan.
7. To build a communication plan to ensure appropriate stakeholders' engagement through prompt and appropriate access to information throughout the project design and implementation processes.	Structured interviews were undertaken to solidify knowledge of community seed banks and local indigenous farming methods.	Observations from the field were taken to gather data on seed bank practices and indigenous farming methods.	Inductive and deductive analysis was completed on research findings to formulate the communication management plan.
8. To create a risk management plan that will provide the approaches and methods of risk management in the implementation of the project, and to reduce negative impacts on the project's outcomes.	Structured interviews were undertaken to solidify knowledge of community seed banks and local indigenous farming methods.	Observations from the field were taken to gather data on seed bank practices and indigenous farming methods.	Inductive and deductive analysis was completed on research findings to formulate the risk management plan.
9. To develop a procurement management plan that will define the approaches, procedures and processes that will ensure that the suitable materials are accessible to the project as	Structured interviews were undertaken to solidify knowledge of community seed banks and local indigenous farming methods.	Observations from the field were taken to gather data on seed bank practices and indigenous farming methods.	Inductive and deductive analysis was completed on research findings to formulate the procurement management plan.

required. Green procurement methods will be prioritized and utilized.			
10. To produce a stakeholder management plan that will establish the methods and paths facilitating the commitment of team members who can influence the project's outcomes up and down the chain.	Structured interviews were undertaken to solidify knowledge of community seed banks and local indigenous farming methods.	Observations from the field were taken to gather data on seed bank practices and indigenous farming methods.	Inductive and deductive analysis was completed on research findings to formulate the stakeholder management plan.
11. To elaborate a project management plan that successfully balances the community seed bank project's social, environmental, and economic aspects by using resources to improve the community's welfare. This approach will build an abundance of the local support network needed for future agricultural advancement.	Structured interviews were undertaken to solidify knowledge of community seed banks and local indigenous farming methods.	Observations from the field were taken to gather data on seed bank practices and indigenous farming methods.	Inductive and deductive analysis was completed on research findings to formulate the project management plan.

3.3 Tools

The project utilized numerous tools to assist with developing the project objectives. The three most commonly used tools were Checklists, Interviews, and Document analysis. The checklist used for the project was a quality requirements checklist. The quality requirements checklist contained a summary of the project scope and detailed each quality requirement aligned with the project. A yes or no statement was selected for compliance/non-compliance, and an action plan section was

provided for actions taken. Using this checklist, the project management team and stakeholders could track the project scope's construction progress. An example of the interview format conducted was an unstructured interview method. The interviews were conducted with pre-arranged questions about seed storage, conservation, germplasm, etc. However, the interview format was left unstructured to provide relevant background information between the interviewer and interviewee. This interview format was critical because the nature of the project in Pérez Zeledón was uncommon, and both the interviewer and interviewee were not experts on the project's main objective (creating a community seed bank). Lastly, the same interview method was utilized to interview the construction experts.

The data obtained through the interviews were then analyzed by triangulating the data between the construction team and agriculture expert responses. This method corroborated, illuminated, and broadened the data to ensure proper attention to detail in the facility's building to seed storage specifications.

Research tools are "devices or instruments used to collect data, they are used to measure a variable or to collect the information needed to answer a research question" (CIKD, 2019).

Chart 5

Tools

Source: Author of Study, 2023

Objectives	Tools
1. To create the project charter for the purpose of elaborating key elements for the development of the project management plan.	Checklists, interviews, document analysis, root cause analysis
2. To build a project scope management plan that will achieve the techniques and procedures that define the parameters of the project and manage them to ensure fulfillment according to stakeholder requirements.	Benchmarking, interviews, mind maps
3. To create a schedule management plan, which will include methods, processes and procedures that will influence the dedication and management of the time allotted to project activities and ensure its completion within budget.	Alternatives analysis, earn value analysis, simulation
4. To elaborate a cost management plan that will serve as a model for effective management of project costs including realistic budget forecasts, financial resources flow, monetary performance, budget control and monitoring and finalize the project within budget.	Bottom-up estimating, Historical information review.
5. To build a project quality management plan which will arrange the processes and procedures that will communicate the definition of criteria/ indicators for quality measures and guarantee satisfactory expectations of the project stakeholders.	Cost benefit analysis, process analysis
6. To develop a resource management plan which empowers the reference framework for the organization and allocation of resources according to the expectations and requirements of the project.	Hierarchy charts and RAM
7. To build a communication plan to ensure appropriate stakeholders' engagement through prompt and appropriate access to information throughout the project design and implementation processes.	Stakeholder engagement assessment matrix

8. To create a risk management plan that will provide the approaches and methods of risk management in the implementation of the project, and to reduce negative impacts on the outcomes of the project.	Probability and impact matrix, SWOT analysis, decision tree
9. To develop a procurement management plan that will define the approaches, procedures and processes that will ensure that the right materials are accessible to the project as required. Green procurement methods will be prioritized and utilized.	Market research, proposal evaluation
10. To produce a stakeholder management plan that will establish the methods and paths facilitating the commitment of team members who can influence up and down the chain, the outcomes of the project.	Stakeholder analysis, prioritization ranking
11. To elaborate a project management plan that successfully balances the social, environmental, and economic aspects of the community seed bank project, by using resources to improve the community's welfare. This approach utilized will build abundance of the local support network needed for future agriculture advancement.	Project management information system (PMIS)

3.4 Assumptions and constraints

Assumptions are "things that we believe to be true and which we therefore build into the project plan" (Abernathy, 2016). Constraints are "things that we know to be true, and which must be accounted for in the plan so that we can work around them" (Abernathy, 2016). The project contains both assumptions and constraints relevant to the parameters of the project background. The chart below will discuss these in further detail.

Chart 6

Assumptions and constraints

Source: Author of Study, 2023

Objectives	Assumptions	Constraints
1. To create the project charter for the purpose of elaborating key elements for the development of the project management plan.	The project charter will be created before all other subsidiary documents.	There is limited availability of project stakeholders for the development of the project charter initially. The project charter will require a secondary review during the scope management phase.
2. To build a project scope management plan to achieve the techniques and procedures that define the project's parameters and manage them to ensure fulfillment according to stakeholder requirements.	Three months is sufficient to complete the project Information to develop the Project Scope Management Plan will be accessible The prices of materials will remain stable for the next four months The project goal is clear and specific	Limited time: (Only three months allocated to the development of the PMP). Limited human resources (Only the project manager is working on all deliverables).
3. To create a schedule management plan, which will include methods, processes, and procedures that will influence the dedication and management of the time allotted to project activities and ensure its completion within budget.	The Project Manager has all the required skills.	The project will be executed during the dry and rainy season. Due to inclement and extreme weather events, project work will have to schedule enough time.
4. To elaborate a cost management plan that will serve as a model for effective management of project costs, including realistic budget forecasts, financial resources flow, monetary performance, budget control, and monitoring and finalizing the project within budget.	The cost management plan is thorough enough to maintain project cost efficiency.	The budget for the project is $220,000.

Objectives	Assumptions	Constraints
5. To build a project quality management plan which will arrange the processes and procedures that will communicate the definition of criteria/ indicators for quality measures and guarantee satisfactory expectations of the project stakeholders.	A quality management plan will be developed thoroughly, covering the co-constraints of cost and scope.	No universal standard for community seed bank quality. The stakeholders set the standard of quality.
6. To develop a resource management plan which empowers the reference framework for the organization and allocation of resources according to the expectations and requirements of the project.	The required resources for the project are available. Each resource will have enough time budgeted.	Winter weather affects travel through the Southern Zone, limiting resource procurement.
7. To build a communication plan to ensure appropriate stakeholders' engagement through prompt and proper access to information throughout the project design and implementation processes.	Communication goals are clearly defined regarding communication between the project team and project stakeholders. All project stakeholders will understand the communication plan.	Language barrier, lack of English translators, reliance on translator applications.

Objectives	Assumptions	Constraints
8. To create a risk management plan that will provide the approaches and methods of risk management in the project's implementation and reduce negative impacts on the project's outcomes.	The project risks are clearly identified. A risk assessment will be completed to analyze all identified risks. A contingency plan will be created to mitigate project risks. Project risks will be monitored throughout the project lifecycle.	Lack of expertise in the research field regarding seed bank storage. Lack of current examples; community seed bank storage facilities.
9. To develop a procurement management plan that will define the approaches, procedures, and processes to ensure that the suitable materials are accessible to the project as required. Green procurement methods will be prioritized and utilized.	The roles and responsibilities of the procurement management plan are clearly defined. A schedule for operations is created. Procurement criteria and workflow are created A vendor management process is established	Shipping and customs charges and timelines for materials outside Costa Rica create difficulties in seed bank creation.

Objectives	Assumptions	Constraints
10. To produce a stakeholder management plan that will establish the methods and paths facilitating the commitment of team members who can influence the project's outcomes up and down the chain.	Stakeholders are identified and involved early in the project. Updates to the stakeholder register will occur regularly. Transparency exists amongst the project team and stakeholders; the stakeholder management plan is easily accessible. Priorities are clear and concise; easily understood by all stakeholders.	Preparation for the holiday season limits the commitment of stakeholders during the project lifecycle.
11. To elaborate a project management plan that successfully balances the community seed bank project's social, environmental, and economic aspects by using resources to improve the community's welfare. This approach will build an abundance of the local support network needed for future agricultural advancement.	Community involvement is adequate for creating the project management plan. Community resources are available to create the project management plan. The need exists for creating the community seed bank project management plan.	Business Constraint- Competition with seed vendors for profit that sell GMO and plant grafts limit community interest in a community seed bank.

3.5 Deliverables

Projects produce deliverables. Deliverables are "the completed results of project activities. They can range in size and number, varying on the project. They are agreed upon by the project management team and stakeholders during the project planning phase" (Simmons, 2020).

Chart 7

Deliverables

Source: Author of Study, 2023

Objectives	Deliverables
1. To create the project charter for the purpose of elaborating key elements for the development of the project management plan.	Creation of Project Charter. The Project charter contains the community seed bank project management plan framework.
2. To build a project scope management plan to achieve the techniques and procedures that define the project's parameters and manage them to ensure fulfillment according to stakeholder requirements.	Scope Management Plan. Contains the pertinent details for the scope and depth of the community seed bank project.
3. To create a schedule management plan, which will include methods, processes, and procedures that will influence the dedication and management of the time allotted to project activities and ensure its completion within budget.	Schedule Management Plan. Contains the details concerning the project's schedule.
4. To elaborate a cost management plan that will serve as a model for effective management of project costs, including realistic budget forecasts, financial resources flow, monetary performance, budget control, and monitoring and finalizing the project within budget.	Cost Management Plan. Contains the details concerning the project's related costs.
5. To build a project quality management plan which will arrange the processes and procedures that will communicate the definition of criteria/ indicators for quality measures and guarantee satisfactory expectations of the project stakeholders.	Quality Management Plan. Contains the details concerning the quality of the project.
6. To develop a resource management plan which empowers the reference framework for the organization and allocation of resources according to the expectations and requirements of the project.	Resource Management Plan. Contains the framework of resources required for the project.
7. To build a communication plan to ensure appropriate stakeholders' engagement through prompt and proper access to information throughout the project design and implementation processes.	Build a Communication Plan. Contains the details of the communication network for the project.
8. To create a risk management plan that will provide the approaches and methods of risk management in the implementation of the project and reduce negative impacts on the project's outcomes.	Risk Management Plan. Contains the details of the associated risks of the project.
9. To develop a procurement management plan that will define the approaches, procedures, and processes to ensure that the suitable materials are accessible to the project as required. Green procurement methods will be prioritized and utilized.	Procurement Management Plan. Contains the details of the approaches used to procure resources for the project.

10. To produce a stakeholder management plan that will establish the methods and paths facilitating the commitment of team members who can influence the project's outcomes up and down the chain.	Stakeholder Management Plan. Contains information regarding the stakeholders or the project.
11. To elaborate a project management plan that successfully balances the community seed bank project's social, environmental, and economic aspects by using resources to improve the community's welfare. This approach will build an abundance of the local support network needed for future agricultural advancement.	Project Management Plan. The completed deliverable for the project.

4. RESULTS

4.1 Project Management Plan

As highlighted by the Project Management Body of Knowledge 7th edition, business need is a critical foundation upon which a project is based. When a project is undertaken, "the business needs originate with preliminary business requirements, which are reflected in the project charter or other authorizing documents." (PMBOK, 7th edition, pg. 35).

The project charter document contains the following information: Business case, objectives, requirements, general description, risks, assumptions and constraints, schedule summary, budget, deliverables, project manager, stakeholder, and project sponsor. The project charter development requires various techniques that facilitate the collected data and exchange of ideas, considering meetings as a primary source of information.

This project details the project management plan for a local company, Millás Semillas, SA, located in Pérez Zeledón, Costa Rica, to create a community seed bank on their farm in partnership with the sponsor company, Semillas Plantae.

Semillas Plantae does not have a specific project charter template or historical information related to the development of projects, nor a formal project management team or a project management office; it was necessary to develop a project charter document that can be used as a guide to further Millás Semillas implementations within Semillas Plantae's processes.

The project's first objective is to create and develop a Project Charter that the project will utilize to organize and regulate all project activities.

Document Tracking (Project Charter)

General Information

	Information
Document Id	*001-MSSB-PC*
Document Owner	*Millás Semillas, S.A.*
Issue Date	*March 14, 2023*
Last Saved Date	*March 14, 2023*
File Name	*Project Charter*

Change Control

Version	**Issue Date**	**Changes**
1.0	*March 14, 2023*	*None*

Approvals

Role	**Name**	**Signature©**	**Date**
Project Sponsor	*Lic. Roger Montero Solís*		

Project Manager	*Ian Spencer Myles*		

4.1.1 Project Charter

MILLÁS SEMILLAS	**Project Charter**	
Version 1.0	Document ID: 001-MSSB-PC	03/24/2024

Project Name:	Development of a Community Seed Bank, Pérez Zeledón
Company Name:	Millás Semillas S.A
Date	March 24, 2024

Business Case

Millás Semillas, SA, located in Pérez Zeledón, Costa Rica, is an organic farm that produces and distributes native Costa Rican crops and seeds. The farm produces 10 acres of Maiz criollo corn, 10 acres of Arroz Pilado, and 20 acres of beans: 10 acres of Guaymí and 10 acres of Bribrí, respectively.
The 40-acre farm focuses on networking and development with the partner company, Semillas Plantae SA, located in San Jose. Currently, there is a limited production of native corn, bean, and rice seeds in the Brunca region, and no sole producer or distributor of these crop seeds. Millás Semillas has established a Project Management Plan to create a Community Seed Bank on the 40-acre farm in Pérez Zeledón to fulfill the need. In partnership with Semillas Plantae Seed Bank, the community seed bank in Pérez Zeledón will be able to contribute to the Costa Rican seed network that Semillas Plantae is a key member of. The PMP for the community seed bank in Pérez Zeledón will utilize regenerative and sustainable construction methods.

Objective

To develop a project management plan for creating the Pérez Zeledón community seed bank that enhances the organic seed distribution in Costa Rica.

Specific Objectives

-To create a seed bank based on regenerative architecture principles.
-To design a seed bank that is powered by solar power.
-To develop a collective seed network with Costa Rica partners, Semillas Plantae.

Stakeholders

Direct Stakeholders	Indirect Stakeholders
– Millás Semillas, S.A. – Semillas Plantae – MAG, Pérez Zeledón – Local farmers in Costa Rica	– Customers – Millás Semillas and Semillas Plantae S.A staff – Solar power design manufacturer – Blueprint design manufacturer

Preliminary Scope

The project entails the creation of a community seed bank in Pérez Zeledón that uses regenerative and sustainable construction methods. The seed bank will provide seed distribution networks in the Brunca region and enable the distribution of 3 critical crop seeds for Costa Rica.

Requirements

- The Seed Bank should be accessible via local private and public roads.
- The Seed Bank should be constructed near an available water source (a free-flowing river).
- The Seed Bank should be constructed with regenerative methods, including Straw-bale.
- The Seed Bank should be constructed with sustainable construction methods, including solar power via roof-mounted solar panels.
- The Seed Bank should be capable of storing seeds cultivated at Finca Millás within a climate-controlled structure, ideally a temp-controlled industrial refrigerator (2).
- The Seed Bank should contain indoor plumbing and electrical outlets rated for water and power loads.
- The Seed Bank should be constructed on private land owned by Millás Semillas, SA, and registered with the Municipality of Pérez Zeledón for agribusiness.
- The Seed Bank should be built with a passing safety inspection by a certified engineer in Costa Rica.
- The Seed Bank should be accessible to services to include a hospital, police, fire, and gas station.

Assumptions

- There is complete information on constructing a Seed Bank with sustainable and regenerative building methods.
- All the equipment utilized in construction is new and operational.
- The construction company can build the Seed Bank to the blueprint specifications.
- Once the Seed Bank is constructed, a certified Engineer can inspect and certify the building's safety.
- All materials, equipment, and manpower are readily available.

Constraints

- There is no option for increasing the building construction cost beyond the total Project Budget.
- Unpredictable weather in the Brunca region, caused by climate change, can negatively impact the construction Schedule.
- Due to COVID-19, the construction of the Seed Bank could be impacted due to ill workers.

Risk

- Construction might be delayed if the weather in the Brunca region is not agreeable.
- If the temperature-controlled refrigerators are not in stock, the ability to store the seeds will be delayed.
- If the solar power equipment is not in stock, the ability to power the facility Will be delayed.

Budget

Cost Estimate	$194,754.62
Cost Baseline	$199,381.90
Total Project Budget	$218,857.36

Milestones		
Name	**Start Date**	**Finish Date**
Project Management	**07/10/2023**	**09/08/2023**
Procurement	**09/11/2023**	**11/13/2023**
Land Registration	**11/14/2023**	**11/20/2023**
Facility Safety	**11/21/2023**	**11/30/2023**
Facility Accessibility	**12/01/2023**	**01/11/2024**
Design Architecture	**01/12/2024**	**11/27/2024**
Construction	**11/28/2024**	**06/25/2025**

Project Approval		
Position	**Name**	**Signature**
Project Manager	Ian Spencer Myles	
Project Sponsor	Lic. Roger Montero Solís	

4.1.2 Business Case

The Community Seed Bank Project is being created to fulfill the need in the Brunca region for an organic seed distributor. The farm Finca Millás in Pérez Zeledón is a 40-acre farm that produces organic corn, beans, and rice that are staples of the Costa Rican diet. This new project endeavor to create a Community Seed Bank will help to store and further distribute the organic seeds from the farm. Finca Millás is owned and operated by Millás Semillas SA, a seed distributor. Organic seeds can be distributed throughout Costa Rica with the seed company Semillas Plantae. The seed bank also will function as a community seed bank and can hold local crop seeds in a central location. The seed bank project will utilize sustainable and regenerative construction methods with multiple functions. The seed bank will be constructed with solar panels and a stand-alone battery supply system. This power system will power the two industrial refrigerators that store the seeds.

The solar panels will also be connected to a small water heater and a water tank that can supply the building with hot water for the kitchen and bathroom. The

outside of the seed back will include roof gutters connected to a 100,000-liter water tank that will hold rainwater. This water collection will supply rainwater for irrigation during the dry season, as needed. In this manner, the seed bank will have multiple design aspects to assist the farm and crop/seed production overall.

4.1.3 Change Management Process

All project changes must follow the change management process: request, impact analysis, approve/or deny, implement change, review/document. This process defines the steps the project team and sponsor must follow to request a change. **Error! Reference source not found.** shows the change management process.

Figure 31

Change Management Process

Note. From 8 Elements of an Effective Change Management Process (Ramos, 2023)

Request for Change: All requests must be made using the change request format.

Impact Analysis: The requested changes are identified by analyzing the project parameters to include time, quality, requirements, cost, scope, issues, resources, deliverables, and customer inputs.

Approve or Deny: Once the analysis is complete, the project sponsor provides the resolution, either approval or denial. All requests submitted must be documented within the change request format.

Implement Change: If the changes are approved, the project team implements the approved changes.

Review and Reporting: Implemented changes must be tracked, and updates or advancements must be reported daily to the project manager.

Storage Information: Once the change management process is completed, results must be documented within the change request format and saved as a project document.

Appendix 4: Change Request Format contains the format used to document and track changes within the project.

4.2 Project Scope Management

Project Scope Management is the collection of processes that ensure all work required for the Community Seed Bank project and excludes all non-required work. Utilizing the Scope Management Plan, the Project Manager and Project team describe how the project scope will be defined, validated, and controlled.

Document Tracking (*Scope Management Plan*)

General Information

	Information
Document Id	*003-MSSB-SMP*
Document Owner	*Millás Semillas, S.A.*
Issue Date	*March 24, 2024*
Last Saved Date	*March 24, 2024*
File Name	*Scope Management Plan*

Change Control

Version	**Issue Date**	**Changes**
1.0	*March 24, 2024*	*Release*

Approvals

Role	**Name**	**Signature©**	**Date**
Project Sponsor	*Lic. Roger Montero Solís*		
Project Manager	*Ian Spencer Myles*		

4.2.1 Scope Management Plan

	**Scope Management Plan**	
Version 1.0	Document ID: 003- MSSB-SCMP	03/24/2023

Scope Statement

The project scope statement defines the work that will be carried out.

The statement clarifies what work will and will not be performed to clarify project responsibilities and roles.

A clear project scope statement is critical for the scope management plan and an efficient design and executed project.

Project Requirements

Requirements for the project are compiled based on the project management needs and the construction requirements. The chart below details the associated requirements:

Requirements
– Project duration does not exceed two years
– Project budget total is $220,000.00
– Monthly progress report submitted
– Change request requires sponsors' approval
– Quarterly presentation due
– Sponsors' approval is required for designs
– Staffing
– Facility is centrally located for community access

– Facility has truck access
– Facility has disability structures (ramps)
– Facility is at least 300m2 in size
– Facility can hold a blank number of species of seeds
– Facility has enough storage for crop seeds and other plant seeds
– Roof contains solar panels for power storage
– Roof constructed to facilitate accessories such as solar panels and water tanks
– Facility is powered by a solar generator
– Solar generator can be configured for off-grid/on-grid electrical connection
– Sizeable water tanks for collecting rainwater
– Irrigation system connected to water tanks

The full list of activities, including the construction activities, are listed in the Requirements traceability Matrix below.

Figure 32

Requirements Traceability Matrix

REQUIREMENTS TRACEABILITY MATRIX

PROJECT MANAGER:	Ian Spencer Myles	PROJECT ID:	001-MSSB-PC
PROJECT SPONSOR:	Lic. Roger Montero Solís	PROJECT TITLE:	Development of a Community Seed Bank, Pérez Zeledón

REQUIREMENT INFORMATION					RELATIONSHIP TRACEABILITY			
ID	CATEGORY	REQUIREMENT	PRIORITY	SOURCE	BUSINESS OBJECTIVE	DELIVERABLE(S)	VERFICATION	VALIDATION
REQ-001	Mandatory	The Seed Bank should be accessible via local private and public roads.	High	Customer	The Seed Bank needs access to paved roads for transport and delivery of	Building Blueprints	Verified with building blueprints by Architect and Project Manager.	Monthly Status Report meeting
REQ-002	Mandatory	The Seed Bank should be constructed near an available water source (a free-flowing river).	High	Customer	The Seed Bank requires water access year round.	Building Blueprints	Verified with building blueprints by Architect and Project Manager.	Monthly Status Report meeting
REQ-003	Mandatory	The Seed Bank should be constructed with regenerative and sustainable construction methods, including Straw-bale.	High	Customer	The Seed Bank is required to be built with regenerative and sustainable methods.	Building Blueprints	Verified with building blueprints by Architect and Project Manager.	Monthly Status Report meeting
REQ-004	Mandatory	The Seed Bank should be capable of storing seeds cultivated at Finca Millás within a climate-controlled structure, ideally a temp-controlled industrial refrigerator (2).	High	Customer	The Seed Bank requires seed storage in a climate controlled environment.	Temperature controlled refrigerators (2)	Verified with building blueprints by Architect and Project Manager.	Monthly Status Report meeting
REQ-005	Mandatory	The Seed Bank should contain indoor plumbing and electrical outlets rated for water and power loads.	High	Customer	Workers in the Seed bank require electrical and water access.	Indoor plumbing and electrical outlets	Verified with building blueprints by Architect and Project Manager.	Monthly Status Report meeting
REQ-006	Mandatory	The Seed Bank should be constructed on private land owned by Millás Semillas, SA, and registered with the Municipality of Pérez Zeledón for agribusiness.	High	Customer	The Seed Bank requires building permission from the municipality of Pérez Zeledón.	Building permit issued by Pérez Zeledón Municipality	Verified by Project Manager and Sponsor	Monthly Status Report meeting
REQ-007	Mandatory	The Seed Bank should be built with a passing safety inspection by a certified engineer in Costa Rica.	High	Customer	The Seed Bank is required to pass a safety inspection.	Signed safety inspection by certified Costa Rican engineer	Verified with building inspector (Engineer) and Project Manager	Monthly Status Report meeting
REQ-008	Mandatory	The Seed Bank should be accessible to community services to include a hospital, police, fire, and gas station.	Medium	Customer	The Seed Bank needs community access since the facility is available for community use.	Building Blueprints	Verified with building blueprints by Architect and Project Manager.	Monthly Status Report meeting
REQ-009	Mandatory	Project duration does not exceed two years.	High	Customer	The customer requires the Seed Bank to be constructed in 2 years time.	Schedule Management Plan	Verified by Project Manager and Sponsor	Monthly Status Report meeting
REQ-010	Mandatory	Project budget total is $220,000.00.	High	Sponsor	The Sponsor has a budget of $220,000 for the project.	Cost Management Plan	Verified by Project Manager and Sponsor	Monthly Status Report meeting
REQ-011	Mandatory	Monthly progress report submitted	Low	Project Manager	The Project Manager is responsible to submitt monthly reports.	Monthly progress report	Verified by Project Manager	Monthly Status Report meeting
REQ-012	Mandatory	Change request requires sponsors' approval	High	Sponsor	Change requests require the Project Sponsors approval	Change request form	Verified by Project Manager and Sponsor	Monthly Status Report meeting

REQ-013	Mandatory	Quarterly presentation due	Low	Sponsor	The Sponsor requires a Quarterly meeting when applicable, by the Project Manager.	Quarterly presentation using monthly progress report summaries	Verified by Project Manager and Sponsor	Monthly Status Report meeting
REQ-014	Mandatory	Sponsors' approval is required for designs	High	Sponsor	Building designs are required to be approved by the Sponsor.	Building Blueprints	Verified with building blueprints by Architect and Project Manager.	Monthly Status Report meeting
REQ-015	Mandatory	Adequate Staffing available	High	Project Manager	The Project Manager is responsible for staffing to ensure project success.	Resource Management Plan	Verified by Project Manager	Monthly Status Report meeting
REQ-016	Mandatory	Facility has truck access	High	Customer	The Seed Bank requires truck access for maintenance and construction.	Building Blueprints	Verified with building blueprints by Architect and Project Manager.	Monthly Status Report meeting
REQ-017	Mandatory	Facility has disability structures (ramps)	High	Customer	The Seed Bank needs ramps for handicapped people.	Building Blueprints	Verified with building blueprints by Architect and Project Manager.	Monthly Status Report meeting
REQ-018	Mandatory	Facility is at least 300m2 in size	High	Customer	The Seed Bank needs to fit on the 300m2 plot on Finca Millas.	Building Blueprints	Verified with building blueprints by Architect and Project Manager.	Monthly Status Report meeting
REQ-019	Mandatory	Roof contains solar panels for power storage	High	Customer	Solar panles are required for solar power collection of the Seed Bank.	Building Blueprints	Verified with building blueprints by Architect and Project Manager.	Monthly Status Report meeting
REQ-020	Mandatory	Roof constructed to facilitate accessories such as solar panels and water tanks	High	Customer	The roof needs specialty construction to support solar panels.	Roof constructed to facilitate accessories such as solar panels and water	Verified with building blueprints by Architect, Construction lead and Project Manager.	Monthly Status Report meeting
REQ-021	Mandatory	Facility is powered by a solar generator	High	Customer	Solar generator is need to convert solar energy to electricity the the Seed Bank will use for power.	Building Blueprints	Verified with building blueprints by Architect and Project Manager.	Monthly Status Report meeting
REQ-022	Mandatory	Solar generator can be configured for off-grid/on-grid electrical connection	Medium	Customer	The Seed Bank needs backup capability in case of power outage.	Resource Management Plan	Verified with building blueprints by Architect, Construction lead and Project Manager.	Monthly Status Report meeting
REQ-023	Mandatory	Sizeable water tanks for collecting rainwater	Medium	Customer	Water tanks are required for storing rain water.	Building Blueprints	Verified with building blueprints by Architect and Project Manager.	Monthly Status Report meeting
REQ-024	Mandatory	Irrigation system connected to water tanks	Medium	Customer	The irrigation system is connected to the water tanks to provide a backup source of irrigated water for crops on the farm.	Building Blueprints	Verified with building blueprints by Architect, Construction lead and Project Manager.	Monthly Status Report meeting

Note. Own work. (Myles, 2023)

Define Scope

The PM and project team compiled and detailed the project scope requirements throughout the scope management process. By collecting the requirements, the PM and team defined the project's parameters and what is included and not included in the community seed bank project. This process is critical in developing the project, as any omissions or mistakes could negatively impact or delay the project. Given the inherent uncertainty involved with a project of this type, specific steps will be taken to provide changes to the project scope, including change requests that any project stakeholders may submit. All changes will be

documented, accepted, rejected, or returned, pending additional justification or revision.

Project exclusions

The project contains relevant exclusions related to the design and execution of the project by the PM and project team. The PM is not employed by a PMO or government organization specializing in agribusiness. The management and research of the project team will include stakeholders from the agricultural, construction, and municipal sectors to provide the necessary scope details. The community seed bank project is a theoretical project that individuals may undertake in the future; however, no current plans exist by the PM to create the community seed bank, as mentioned above. The research provided in this document establishes a possible project management plan for creating a community seed bank.

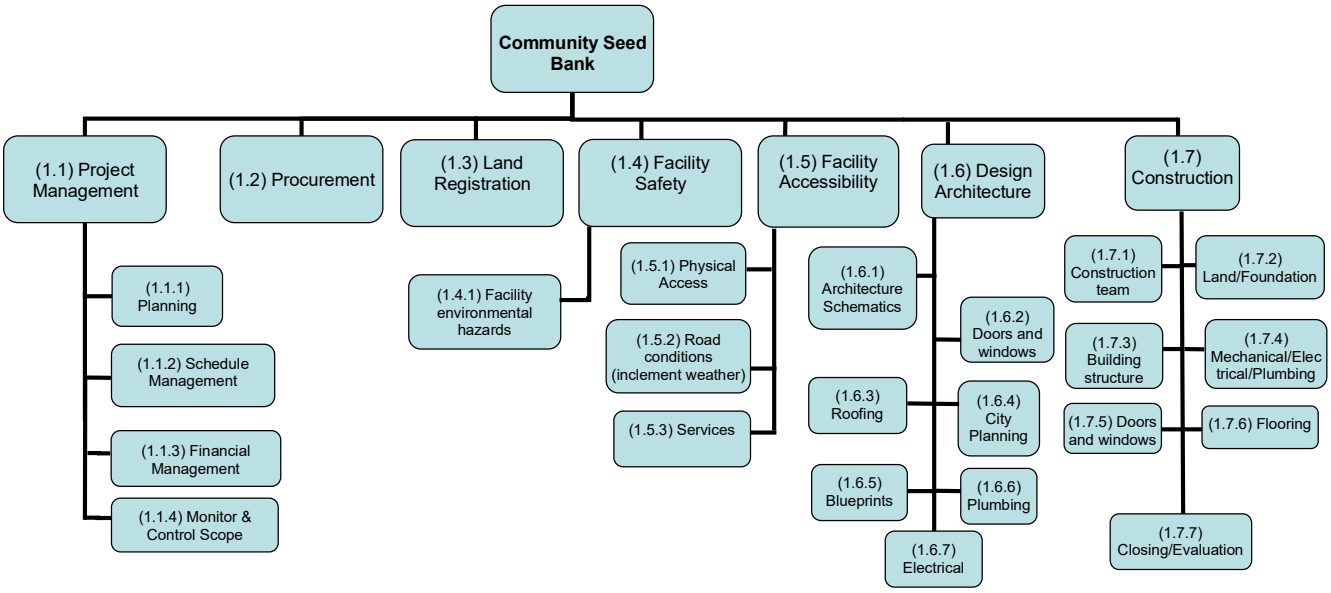
Create WBS

The WBS is a visual breakdown of a project into all relevant smaller components. The community seed bank project is divided into smaller, more manageable segments for delivery in the project lifecycle. The WBS lists the deliverables required during the project's lifecycle to ensure success.

The Work Breakdown Structure (WBS) and Work Breakdown Structure Dictionary are critical tools in scope management. The WBS compiles project deliverables and works into smaller, more manageable components.

Figure 33

WBS



Note. Own work. (Myles, 2023)

Project WBS dictionary

The WBS dictionary provides detailed clarification of the WBS tasks, actions, and deliverables. It is closely tied to the scope and displays project milestones such as deliverables, time, cost, etc.

Chart 8

WBS dictionary

Source: Author of Study, 2023

WBS ID	Task Name	Description of Work	Deliverables	Resources	Budget
1	Community Seed Bank Construction				$ 218,857.36
1.1	Project Management			PM, Sponsor, Stakeholders, Project Team	
1.1.1	Planning	Planning and coordinating all project activities throughout the project life	Project Management Plan	PM, Sponsor, Stakeholders, Project Team	
1.1.2	Schedule Management	Scheduling project activities, assigning tasks to the timeline with dates, controlling the project schedule	Project Schedule/Gantt Chart	PM and Project team	
1.1.3	Financial Management	Monitor financial expenses throughout the project life.	Financial report	PM and Project Team	
1.1.4	Monitor & Control Scope	Align and organize team meetings to document project activities, craft	Project plan documents (status reports)	PM and Project Team	

WBS ID	Task Name	Description of Work	Deliverables	Resources	Budget
		reports, and arrange presentations for stakeholders			
1.2	Procurement	Selection process for architecture and construction companies	Contract terms	PM, Municipal Agro Oficina, P.Z.	$5,819.99
1.3	Land Registration	Verification and registration of land ownership with the Municipality	Property title and deed	PM, Sponsor, Municipality representative, Lawyers, and Notary public	$1,070.71
1.4	Facility Safety	Security assessment of facility area	Security assessment report	PM, Sponsor, Security consultant	$3,000
1.4.1	Facility environmental hazards	Disaster risk assessment of facility location	Disaster risk assessment report	PM, Sponsor, Disaster Risk assessor, Insurance assessor	
1.5	Facility Accessibility				$3,800
1.5.1	Physical Access	Assessment of road conditions and potential hazards	Facility accessibility report	PM, Sponsor, Municipality Road experts	
1.5.2	Road conditions (inclement weather)	Road conditions assessment performed by a civil engineer	Geotechnical engineering report	PM, Sponsor, Municipality Road experts	
1.5.3	Services	Map of basic services in the area (hospital/clinic/fire department/water	Map of services	PM, Sponsor, Municipality P.Z.	

WBS ID	Task Name	Description of Work	Deliverables	Resources	Budget
		department) in proximity to the facility			
1.6	Design Architecture	Deliver technical specifications and drawings of the facility to enable construction	Architectural designs of the facility	PM, Sponsor, Stakeholders, Construction team	$5,843.20
1.6.1	Architecture Schematics	Drawings of the facility	Architectural drawings of the facility	PM, Sponsor, Stakeholders and Construction team	
1.6.2	Doors and windows	Technical documents detailing windows and door positioning	Window and door plans	PM, Sponsor, Stakeholders and Construction team	
1.6.3	Roofing	Roofing design plan including details on dimensions, ventilation, drainage, solar panel setup	Roofing plan	PM, Sponsor, Stakeholders and Construction team	
1.6.4	City Planning	Technical drawing providing details of construction that will be used for contract bidding	Architectural drawings	PM, Sponsor, Stakeholders and Construction team	
1.6.5	Blueprints	Written plan for facility design used during project construction		PM, Sponsor, Stakeholders and Construction team	
1.6.6	Plumbing	Specifications for the plumbing network of the facility	The plumbing plan documents and technical drawings	PM, Sponsor, Stakeholders and Construction team	

WBS ID	Task Name	Description of Work	Deliverables	Resources	Budget
1.6.7	Electrical	Specifications for the electrical network and solar power installation	Electrical plan technical drawings	PM, Sponsor, Stakeholders and Construction team	
1.7	Construction	Construction phase of the project	Work competition report	PM, Sponsor, Stakeholders and Construction team	$175,220.72
1.7.1	Construction team	The process of organizing the construction team, including the areas of carpentry, engineers, electricians, and plumbers, all tasks are assigned to each team member	Organization of the project team	PM, Sponsor, Stakeholders and Construction team	$85,540.80
1.7.2	Land/Foundation	Process of preparing the land for site construction	Facility foundation completion report	PM, Sponsor, Stakeholders and Construction team	
1.7.3	Building structure	Construction of the facility to include all buildings based on blueprints and technical drawings	Facility construction reports	PM, Sponsor, Stakeholders and Construction team	$31,228.66
1.7.4	Mechanical/Electrical/Plumbing	The process of developing the mechanical, electrical, and plumbing plans for installing mechanical	Solar, electrical wiring and plumbing installed.	PM, Sponsor, Stakeholders and Construction team	$54,836.85

WBS ID	Task Name	Description of Work	Deliverables	Resources	Budget
		structures, solar power, and plumbing.			
1.7.5	Doors and windows	Installation of all doors and windows for the facility.	Windows and doors installed.	PM, Sponsor, Stakeholders and Construction team	
1.7.6	Flooring	The flooring plan and design.	Completion of flooring installation.	PM, Sponsor, Stakeholders and Construction team	
1.7.7	Closing/Evaluation	Project completion and customer evaluation	Completion reports and customer evaluation reports.	PM, Sponsor, Stakeholders and Construction team	

Validate Scope

The validation scope process will occur throughout the project. Scope validation will occur through analysis of the project throughout the lifecycle. Techniques of analysis will include analyzing work listed in the WBS with work completed to determine if any milestones were missed. An additional review will be completed to analyze the requirements lists to confirm completed work listed in the WBS is reflective of project requirements. A compiled results list will be completed and presented to all project sponsors via monthly meetings. The project team and stakeholders will facilitate site visits to the project site after each completed phase of project construction to certify the work. Lastly, key stakeholders and project sponsors will provide formal acceptance in written form after each projection milestone. If changes are required, changes requests can be submitted. Any approved changes will be documented in the issues log and conducted throughout the change control process. A sample template below will illustrate how stakeholders will format the issues.

Chart 9

Issue Log of the Community Seed Bank Project

Source: Author of Study, 2023

Issues ID	Date identified	Identified by	Details of issues & effects	Specific actions and resolutions	Agreed owner	Date for completion

Control Scope

Control Scope is the process of monitoring the status of the project and the product scope while managing changes within the scope baseline. This process critically analyzes items considered in project implementation and the resulting product. It also details what should be avoided to maintain the project schedule with achieved objectives. The project team will use variance and trend analysis (planned vs. actual) to monitor and control the project and product progress, ensuring the project scope is on track. The possibility for changes is inherent during this process. The PM will maintain proper management and control to ensure sufficient project flow. Disciplined decision-making skills will ensure essential changes are made, and non-essential changes are denied.

Roles and Responsibilities

Each project management activity contains essential roles and responsibilities for the project lifecycle. Below is a detailed list of the community seed bank project roles and responsibilities.

Chart 10

Roles and responsibilities in Scope Management

Source: Author of Study, 2023

Name	Roles	Responsibilities
Ian Spencer Myles	Project Manager	a. Measures and verifies the project scope. b. Promotes scope change requests. c. Promotes impact assessments of the scope change requests. d. Organizes and facilitates scheduled change control meetings. e. Communicates outcomes of the scope change requests. f. Updates project documents upon approval of all scope changes.
Municipal Agro Oficina, P.Z. (Lic. Roger Montero Solís)	Project Sponsor	a. Participates in defining change requirements b. Approves or denies scope change requests as required. c. Evaluates the need for scope change requests. d. Accepts completed project deliverables
Construction team, Agriculture specialist	Project Team	a. Define and Participate in change resolutions.

		b. Evaluate proposed scope changes and communicate with the project manager as required.
Mayor, Municipality, community agencies	Stakeholders	a. Authorized to propose scope changes. b. Will abide by and execute change request orders issued by the Project Manager

Product deliverables and acceptance criteria

The project deliverables and acceptance criteria are the final deliverables, and the project team and stakeholders manage the criteria. A detailed list of community seed bank project acceptance criteria is included below.

Chart 11

Project acceptance criteria

Source: Author of Study, 2023

Criteria ID	Criteria Categories	Description
Crit 1	Safety	The facility is located in an area with few environmental dangers (flooding, heavy winds, mudslides).
Crit 2	Land registry (legal ownership)	The facility is legally registered with the Municipality in Pérez Zeledón.
Crit 3	Facility accessibility	The facility is accessible to trucks/commercial vehicles transporting resources and other services such as EMS, fire, and police. Standard services are located on the ground floor; restroom facilities are accessible. Handrails must be placed on both sides of the ramp or stairs. Entry/exit systems to maintain traffic flow. The facility is located close to social services (hospitals, clinics). The facility is considerate of inclement weather issues (e.g., mudslides, water-saturated roads during the winter season).
Crit 4	Facility accommodations	The facility size should be no smaller than 300m2. The building can accommodate 100 people max. The 300m2 area excludes kitchen facilities, shared spaces, offices, and restrooms.
Crit 5	Roof construction	The roofing sheets will be a 24-gauge standing seam, finished in PVDF paint.

Crit 6	Power/Electrical	The electrical system will be designed to incorporate solar power to produce and store enough energy to power the facility. A solar generator will store and produce electrical power from the solar panel on the roof. Traditional electrical equipment will include cabling, wiring, ducting and accessories, conduits, trenches, manholes, hand holes, power outlets, light fittings, switches, earthing systems, lightning arrester systems, etc. Waterproof switches will be included and distributed where applicable.
Crit 7	Doors/Windows	All doors shall be hardwood panel/metal reinforced doors. The facility's main entry and the windows shall be jalousie metal design.
Crit 8	Water/Plumbing	The facility has access to a freshwater source (free-flowing stream, river, dique, etc.) The facility has pumps and tanks for water reserves in case of emergency. Include a solar panel heater for hot water in the kitchen and restroom.
Crit 9	Sanitation	The restroom will be attached to a composting toilet system. Compost developed over time from the restroom system will then be used as fertilizer for other agribusinesses in the Southern Zone.

Project constraints

The Community Seed Bank project contains the following constraints. The total project costs should not exceed $220,000, and the whole time for project completion should not exceed two years.

Project assumptions

The following assumptions are believed true for the project:

1. The cost of materials will remain throughout the project timeline.
2. The project Scope will not change drastically during the project lifecycle.
3. Stakeholders will be committed to the project, and resources will be available to complete the project successfully.

4.3 Project Schedule Management

The project's schedule management will follow the 5 phases of project schedule management per the PMBOK guide 7th edition. In addition to defined and sequenced project activities, the project schedule will be drafted using MS Project to include activity duration and a wholly developed project schedule.

Plan Schedule Management

Using the Work Breakdown Structure developed in the Scope Management Plan, the project schedule will similarly use the same WBS. Tasks will be individually managed at the task level. MS project software will illustrate the WBS into a project schedule, including all tasks, activities, and durations. The Project Manager will ensure that the Schedule coincides with the 2-year timeline per the Scope Management Plan. Overall, this plan details how the project team will utilize the project resources and monitor and control changes.

Schedule Management Approach

The schedule will be designed through MS Project, allowing the Project Manager to manage project activities. The project sponsor and all stakeholders will consider

the Schedule official once agreed upon. The Schedule will allow for changes only through the change control process and review by all stakeholders.

Document Tracking (*Schedule Management Plan*)

General Information

	Information
Document Id	*004- MSSB-SHMP*
Document Owner	*Millás Semillas, S.A.*
Issue Date	*March 24, 2024*
Last Saved Date	*March 24, 2024*
File Name	*Schedule Management Plan*

Change Control

Version	Issue Date	Changes
1.0	*March 24, 2024*	*Release*

Approvals

Role	Name	Signature©	Date
Project Sponsor	*Lic. Roger Montero Solís*		
Project Manager	*Ian Spencer Myles*		

4.3.1 Schedule Management Plan

MILLÁS SEMILLAS	**Schedule Management Plan**	
Version 1.0	Document ID: 004- MSSB-SHMP	03/24/2024

Roles and Responsibilities

The project's schedule management will follow the 5 phases of project schedule management per the PMBOK guide 7th edition. In addition to defined and sequenced project activities, the project schedule will be drafted using MS Project to include activity duration and a wholly developed project schedule. The chart below details the roles and responsibilities of the combined project team.

Chart 12

Roles and responsibilities

Source: Author of Study, 2023

Name	Role	Responsibilities
Ministerio de Agricultura y Ganadería de Costa Rica (MAG), Pérez Zeledón -Lic. Roger Montero Solís	Project Sponsor	• Participates in defining change requirements. • Approves or denies scope change requests as required. • Evaluates the need for scope change requests. • Accepts completed project deliverables. •
Ian Spencer Myles	Project Manager	• Measures and verifies the project scope. • Promotes scope change requests. • Promotes impact assessments of the scope change requests. • Organizes and facilitates scheduled change control meetings. • Communicates outcomes of the scope change requests. • Updates project documents upon approval of all scope changes.
Construction team, Agriculture specialist	Project Team	• Define and participate in change resolutions.

		• Evaluate proposed scope changes and communicate with the project manager as required.
Mayor, Municipality, community agencies	Stakeholders	• Authorized to propose scope changes. • Will abide by and execute change request orders issued by the Project Manager.

Activities Definition, Sequence, and Duration

A list of activities to be implemented under the project was developed from the project WBS. The list was used to sequence the project activities and establish a timeline of activities. Expert judgment was used to determine the sequence and duration of activities. The list of activities also considered the project cycle's essential activities, including planning, implementation of activities, monitoring, and evaluation to ensure the completion of project activities. Activities are listed under the Project Schedule created in MS Project.

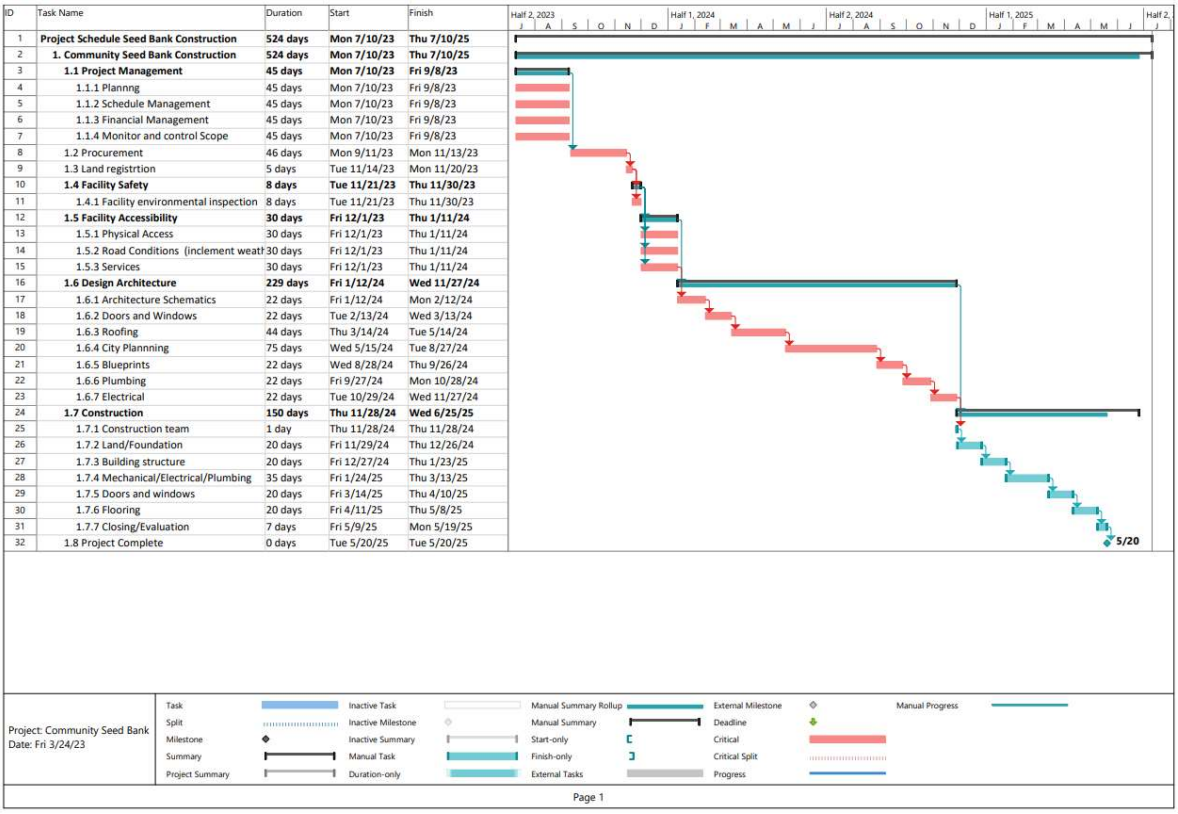
Develop Schedule

This process consists of compiling and evaluating information related to activity arrangement, activities durations, resources, and schedule constraints to create the project schedule. The Construction Seed Bank Project schedule has been developed through MS Project. Details of the project schedule can be obtained in the Construction Seed Bank Schedule **Chart 13**.

Chart 13

Construction Seed Bank Schedule

Source: Author of Study, 2023



ID	Task Name	Duration	Start	Finish
1	**Project Schedule Seed Bank Construction**	**524 days**	**Mon 7/10/23**	**Thu 7/10/25**
2	**1. Community Seed Bank Construction**	**524 days**	**Mon 7/10/23**	**Thu 7/10/25**
3	**1.1 Project Management**	**45 days**	**Mon 7/10/23**	**Fri 9/8/23**
4	1.1.1 Plannng	45 days	Mon 7/10/23	Fri 9/8/23
5	1.1.2 Schedule Management	45 days	Mon 7/10/23	Fri 9/8/23
6	1.1.3 Financial Management	45 days	Mon 7/10/23	Fri 9/8/23
7	1.1.4 Monitor and control Scope	45 days	Mon 7/10/23	Fri 9/8/23
8	1.2 Procurement	46 days	Mon 9/11/23	Mon 11/13/23
9	1.3 Land registrtion	5 days	Tue 11/14/23	Mon 11/20/23
10	**1.4 Facility Safety**	**8 days**	**Tue 11/21/23**	**Thu 11/30/23**
11	1.4.1 Facility environmental inspection	8 days	Tue 11/21/23	Thu 11/30/23
12	**1.5 Facility Accessibility**	**30 days**	**Fri 12/1/23**	**Thu 1/11/24**
13	1.5.1 Physical Access	30 days	Fri 12/1/23	Thu 1/11/24
14	1.5.2 Road Conditions (inclement weath	30 days	Fri 12/1/23	Thu 1/11/24
15	1.5.3 Services	30 days	Fri 12/1/23	Thu 1/11/24
16	**1.6 Design Architecture**	**229 days**	**Fri 1/12/24**	**Wed 11/27/24**
17	1.6.1 Architecture Schematics	22 days	Fri 1/12/24	Mon 2/12/24
18	1.6.2 Doors and Windows	22 days	Tue 2/13/24	Wed 3/13/24
19	1.6.3 Roofing	44 days	Thu 3/14/24	Tue 5/14/24
20	1.6.4 City Plannning	75 days	Wed 5/15/24	Tue 8/27/24
21	1.6.5 Blueprints	22 days	Wed 8/28/24	Thu 9/26/24
22	1.6.6 Plumbing	22 days	Fri 9/27/24	Mon 10/28/24
23	1.6.7 Electrical	22 days	Tue 10/29/24	Wed 11/27/24
24	**1.7 Construction**	**150 days**	**Thu 11/28/24**	**Wed 6/25/25**
25	1.7.1 Construction team	1 day	Thu 11/28/24	Thu 11/28/24
26	1.7.2 Land/Foundation	20 days	Fri 11/29/24	Thu 12/26/24
27	1.7.3 Building structure	20 days	Fri 12/27/24	Thu 1/23/25
28	1.7.4 Mechanical/Electrical/Plumbing	35 days	Fri 1/24/25	Thu 3/13/25
29	1.7.5 Doors and windows	20 days	Fri 3/14/25	Thu 4/10/25
30	1.7.6 Flooring	20 days	Fri 4/11/25	Thu 5/8/25
31	1.7.7 Closing/Evaluation	7 days	Fri 5/9/25	Mon 5/19/25
32	1.8 Project Complete	0 days	Tue 5/20/25	Tue 5/20/25

The Schedule Management Plan elaborated in this document can only be altered through the change management process at the request of the project sponsor. Requirements must be documented and authorized by the project manager and project sponsor. If the Change Request Format is not submitted, changes will not proceed, and the project manager will have the sole right to refuse changes. Once the change is required and fulfills requirements, the project sponsor will have two working days to approve or deny changes. All change requests will be documented, and approval of requests depends on request priority. The approval or rejection of requests will be weighed upon the overall effect on project completion.

Project Activities

Chart 14

Project Activities

Source: Author of Study, 2023

WBS	Task Name	Duration	Start	Finish	Predecessors
1	Community Seed Bank Construction	524 days	07/10/2023	07/10/2025	
1.1	**Project Management**	**45 days**	**07/10/2023**	**09/08/2023**	
1.1.1	Planning	45 days	07/10/2023	09/08/2023	
1.1.2	Schedule Management	45 days	07/10/2023	09/08/2023	
1.1.3	Financial Management	45 days	07/10/2023	09/08/2023	
1.1.4	Monitor and control Scope	45 days	07/10/2023	09/08/2023	
1.2	**Procurement**	**46 days**	**09/11/2023**	**11/13/2023**	**3**
1.3	**Land Registration**	**5 days**	**11/14/2023**	**11/20/2023**	**8**
1.4	**Facility Safety**	**8 days**	**11/21/2023**	**11/30/2023**	**9**
1.4.1	Facility Environment Inspection	8 days	11/21/2023	11/30/2023	9
1.5	**Facility Accessibility**	**30 days**	**12/01/2023**	**01/11/2024**	**10**

WBS	Task Name	Duration	Start	Finish	Predecessors
1.5.1	Physical Access	30 days	12/01/2023	01/11/2024	10
1.5.2	Road Conditions (inclement weather)	30 days	12/01/2023	01/11/2024	10
1.5.3	Services	30 days	12/01/2023	01/11/2024	10
1.6	**Design Architecture**	**229 days**	**01/12/2024**	**11/27/2024**	**12**
1.6.1	Architecture Schematics	22 days	01/12/2024	02/12/2024	15
1.6.2	Doors & Windows	22 days	02/13/2024	03/13/2024	17
1.6.3	Roofing	44 days	03/14/2024	05/14/2024	18
1.6.4	City Planning	75 days	05/15/2024	08/27/2024	19
1.6.5	Blueprints	22 days	08/28/2024	09/26/2024	20
1.6.6	Plumbing	22 days	09/27/2024	10/28/2024	21
1.6.7	Electrical	22 days	10/29/2024	11/27/2024	22
1.7	**Construction**	**150 days**	**11/28/2024**	**06/25/2025**	**16**
1.7.1	Construction team	1 day	11/28/2024	11/28/2024	23
1.7.2	Land/Foundation	20 days	11/29/2024	12/26/2024	25
1.7.3	Building structure	20 days	12/27/2024	01/23/2025	26
1.7.4	Mechanical/Electrical/Plumbing	35 days	01/24/2025	03/13/2025	27
1.7.5	Doors and windows	20 days	03/14/2025	04/10/2025	28
1.7.6	Flooring	20 days	04/11/2025	05/08/2025	29
1.7.7	Closing/Evaluation	7 days	05/09/2025	05/19/2025	30
1.8	**Project Complete**	**0 days**	**05/20/2025**	**05/20/2025**	31

Schedule Control

Once the project begins, the project team members are responsible for reporting to the project manager on the completion of their assigned activities. Setbacks in achieving the activity due date will require a change request, from the team member responsible for the activity, including rectifying actions that will be performed to accomplish the project's schedule, which must be in accordance with the project work breakdown structure.

The project sponsor will utilize the communication framework per the roles and responsibilities. The project sponsor will have access to monitor the current status through an updated version of the Gantt diagram created in the MS Project.

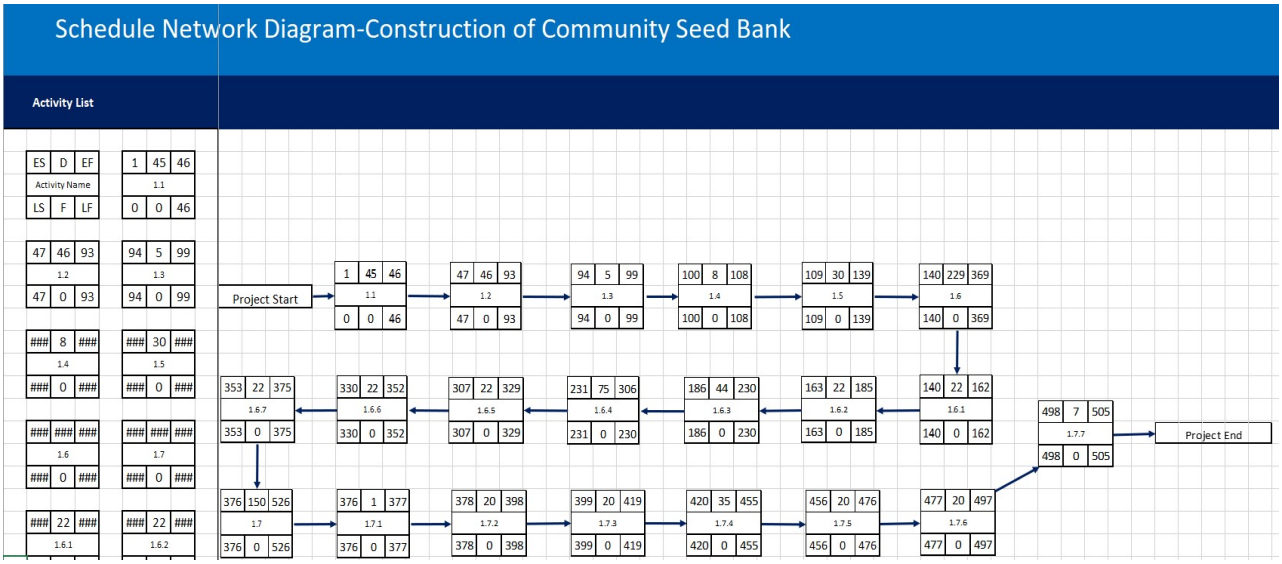
The project manager and his team will accomplish the following activities to ensure the project development is within the margins of the project schedule baseline.

1. Determine the current status of all project activities.
2. Analyze and shape factors that could cause schedule changes.
3. Identify if the schedule has been altered, and report to the project's sponsors.
4. Oversee changes if and when they occur.

A schedule network diagram will be used as an additional tool for schedule control. The project activities from **Chart 14** are presented in the schedule network diagram.

Figure 34

Schedule Network Diagram



Note. Own work. (Myles, 2023)

Reserve Analysis

The project schedule development includes a reserve for the public holidays each year in December. The added 30 days were provided to account for the holiday and the rainy season experienced in Pérez Zeledón, known for heavy rains. Due to the unpredictable rainy season, the design phase and construction of the project are scheduled to occur around the holiday month of December. Most construction and design timelines occur after January and provide optimal weather and working conditions.

Chart 15

Reserve Analysis

Source: Author of Study, 2023

WBS	Description	Duration	Extra Time	Total
1.2	Procurement	36 Days	+10 Days	46 Days
1.3	Land Registration	3 Days	+2 Days	5 Days
1.7	Construction	120 Days	+30 Days	150 Days

Planned Progress

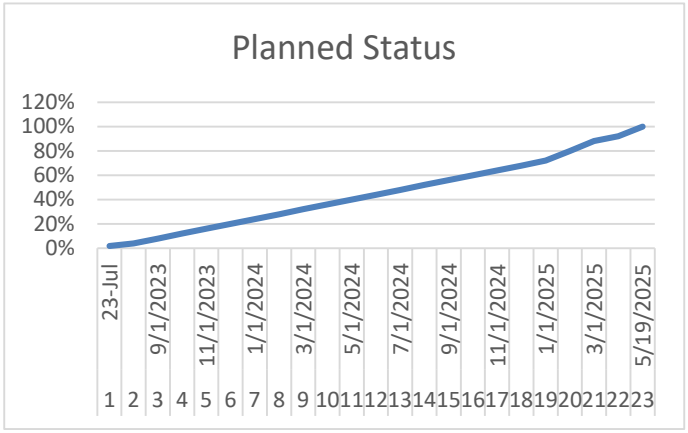
Project updates and activities involving the project will be covered in monthly status meetings. Due to the scheduled timeline of 2 years to complete the project, monthly meetings will suffice for accomplishing a schedule review. The activities list and project schedule created in MS Project will be a focal point for the monthly meetings. Project updates and activities related to project development will be reported monthly using the "monthly report" that can be seen in the Appendix. The report utilizes the following graph of the planned activities that will be matched against the fundamental advances of the project. **Chart 16** shows the planned progress during the developed months of the project.

Chart 16

Project Planned Progress

Source: Author of Study, 2023

Month	Date	Planned Status
1	23-Jul	2%
2	23-Aug	4%
3	9/1/2023	8%
4	10/1/2023	12%
5	11/1/2023	16%
6	12/1/2023	20%
7	1/1/2024	24%
8	2/1/2024	28%
9	3/1/2024	32%
10	4/1/2024	36%
11	5/1/2024	40%
12	6/1/2024	44%
13	7/1/2024	48%
14	8/1/2024	52%
15	9/1/2024	56%
16	10/1/2024	60%
17	11/1/2024	64%
18	12/1/2024	68%
19	1/1/2025	72%
20	2/1/2025	80%
21	3/1/2025	88%
22	4/1/2025	92%
23	5/19/2025	100%



4.4 Project Cost Management

Creating a seed bank in Pérez Zeledón primarily involves building and labor costs. Project Management costs associated with land assessment, safety, and design architecture are estimated based on each item's average. Lastly, the average for construction materials is calculated. Labor for a construction team is calculated based on the average size team to complete the building construction and each worker's pay rate. Any variation of project costs in the cost management plan will require a change request form to be submitted through the change control process. The project sponsor will have the authority to approve or reject the request.

Document Tracking (*Cost Management Plan*)

General Information

	Information
Document Id	*005-MSSB-CMP*
Document Owner	*Millás Semillas S.A.*
Issue Date	*March 24, 2023*
Last Saved Date	*March 24, 2023*
File Name	*Cost Management Plan*

Change Control

Version	Issue Date	Changes
1.0	*March 24, 2023*	*Release*

Approvals

Role	Name	Signature©	Date
Project Sponsor	*Lic. Roger Montero Solís*		
Project Manager	*Ian Spencer Myles*		

4.4.1 Cost Management Plan

	**Cost Management Plan**	
Version 1.0	Document ID: 005-MSSB-CMP	03/24/2023

Project Cost

The project costs will be sponsored solely by the MAG office in Pérez Zeledón, Costa Rica. The MAG is sponsoring the project as a public endeavor to support and increase the local farmers' capability to produce organic, native seeds and crops. Millás Semillas S.A. owns the farm upon which the CSB will be built. Millás Semillas S.A. will be responsible for receiving the building permit and approval from the municipality. Semillas Plantae is a non-financial stakeholder in the project, mainly as a business partner with Millás Semillas S.A. The MAG and Millás Semillas S.A. will agree on the construction company that is affordable and experienced in project construction.

Project Cost Estimation

Creating a Seed Bank in Pérez Zeledón primarily involves building and labor costs. Project Management costs associated with land assessment, safety, and design architecture are estimated based on each item's average. Lastly, the average for

construction materials is calculated. Labor for a construction team is calculated based on the average salary of a Costa Rican construction worker. A quantitative assessment was carried out to determine the cost of all activities included in the WBS. Three-point estimating was performed to calculate the labor costs.

Most Likely (cM): This cost is calculated as the actual effort for work and duration. The average salary of a construction worker in Costa Rica is $1,497.60 per month.

Optimistic (cO): This is the optimum scenario for labor, considering a lower salary of $1,021.44 per month is utilized.

Pessimistic (cP): This is the least optimum scenario because the highest salary level of a construction worker is $1,664.64 per month.

Knowing the defined costs of each option, the expected cost (cE) is obtained by using a beta distribution formula:

$$cE = \frac{cO + 4 \cdot cM + cP}{6}$$

A construction worker gets a monthly payment based on a typical Costa Rica company pay schedule. Per the Labor Code of Costa Rica 1943, Section 136, the ordinary day shift cannot exceed eight hours per day with a defined work week of 6 days. A regular schedule equals a maximum of 192 hours per month. **Chart 17**

shows the cost per hour based on the Most Likely, Optimistic, and Pessimistic Scenarios.

Chart 17

Construction Team Cost Scenarios

Source: Author of Study, 2023

Scenario	Salary per month	Hours Per Month	Cost per hour
Most Likely	$1,497.6	192 hr.	$7.80
Optimistic	$1,021.44	192 hr.	$5.32
Pessimistic	$1,664.64	192 hr.	$8.67
Expected	**$ 1,445.76**	**192 hr.**	**$7.53**

$$cE = \frac{cO + 4 \cdot cM + cP}{6} = \frac{5.32 + 4 \cdot 7.80 + 8.67}{6} = \$7.53$$

After the Expected Costs were determined for a construction worker per month, the total labor cost needs to be calculated. An average construction team size for a small house is 12-26 workers. Given that this building is smaller than average, the project utilized a scale of 9, 12, and 26 workers for the construction team. This team includes the workers required to complete the project as detailed in the WBS. Using the information from **Chart 18**, the chart below details the average expected project costs for the construction team labor.

Chart 18

Expected Construction Team Labor Costs

Source: Author of Study, 2023

Scenario	Expected Salary per month	Months worked	Expected Salary cost for project
9 workers	$13,011.84	5	$65,059.20
12 workers	$17,349.12	5	$86,745.60
26 workers	$37,589.76	5	$187,948.8
Average Expected project costs for construction labor	**$17,108.16**	**5**	**$ 85,540.80**

After the costs for Construction labor were identified, the remaining costs for the WBS were calculated. Local companies were consulted on the average prices for each item.

Cost Estimate

Chart 19

Project Cost Estimate

Source: Author of Study, 2023

WBS	Task Name	Duration	Most Likely	Optimistic	Pessimistic	Expected Cost
1	**Community Seed Bank Construction**	**524 days**	**$164,678.52**	**$172,536.39**	**$337,277.30**	**$194,754.62**
1.1	**Project Management**	**45 days**	**$0**	**$0**	**$0**	**$0**
1.1.1	Planning	45 days	$0	$0	$0	$0
1.1.2	Schedule Management	45 days	$0	$0	$0	$0
1.1.3	Financial Management	45 days	$0	$0	$0	$0
1.1.4	Monitor and control Scope	45 days	$0	$0	$0	$0
1.2	**Procurement**	**46 days**	**$5,819.99**	**$3,703.63**	**$7,936.35**	**$5,819.99**
1.3	**Land Registration**	**5 days**	**$1,066.80**	**$813.18**	**$1,343.88**	**$1,070.71**
1.4	**Facility Safety**	**8 days**	**$3,000**	**$2,000**	**$4,000**	**$3,000**
1.4.1	Facility Environment Inspection	8 days	$0	$0	$0	$0
1.5	**Facility Accessibility**	**30 days**	**$3500**	**$1800**	**$7000**	**$3800**
1.5.1	Physical Access	30 days	$1000	$800	$2000	$ 1,133.33

WBS	Task Name	Duration	Most Likely	Optimistic	Pessimistic	Expected Cost
1.5.2	Road Conditions (inclement weather)	30 days	$2500	$1000	$5000	$ 2,666.66
1.5.3	Services	30 days	$0	$0	$0	$0
1.6	**Design Architecture**	**229 days**	**$5,796.93**	**$3,295.62**	**$8,575.91**	**$5,843.20**
1.6.1	Architecture Schematics	22 days	$0	$0	$0	$0
1.6.2	Doors & Windows	22 days	$0	$0	$0	$0
1.6.3	Roofing	44 days	$0	$0	$0	$0
1.6.4	City Planning	75 days	$0	$0	$0	$0
1.6.5	Blueprints	22 days	$0	$0	$0	$0
1.6.6	Plumbing	22 days	$0	$0	$0	$0
1.6.7	Electrical	22 days	$0	$0	$0	$0
1.7	**Construction**	**150 days**	**$145,494.80**	**$160,923.96**	**$308,421.16**	**$175,220.72**
1.7.1	Construction team	1 day	$65,059.20	$86,745.60	$187,948.80	$ 85,540.80
1.7.2	Land/Foundation	20 days	$0	$0	$0	$0
1.7.3	Building structure	20 days	$25,612	$32,015	$52,909	$31,228.66
1.7.4	Mechanical/Electrical/Plumbing	35 days	$54,823.60	$42,163.36	$67,563.36	$54,836.85
1.7.5	Doors and windows	20 days	$0	$0	$0	$0
1.7.6	Flooring	20 days	$0	$0	$0	$0
1.7.7	Closing/Evaluation	7 days	$0	$0	$0	$0
1.8	**Project Complete**	**0 days**	**$0**	**$0**	**$0**	**$0**

Contingency Reserve Cost Analysis

The contingency reserve is the budget amount determined to cover all uncertain costs that may appear as the project advances. **Chart 20** shows the calculation of the project contingency reserve. The calculation is based on the

contingency schedule reserve, shown in **Chart 15,** to cover known unknowns that might affect the project. For instance, rework or chances of being unable to work on the project due to competing work or others given assignments to the construction company. Procurement and Land Registration are calculated using the average Costa Rican Business Administrator PayScale. Average=$3,446.38 /month; this is $17.94 per hr./192 hours per month. The following chart calculates the total Land Registration, Contingency reserve using the same salary data in the prior chart.

Chart 20

Contingency Reserve

Source: Author of Study, 2023

WBS	Description	Duration	Extra Time	Most Likely	Optimistic	Pessimistic	Expected Cost
1.2	Procurement	36 Days	+10 Days	$ 1,435.20	$ 673.60	$ 2,261.60	$1,446
1.3	Land Registration	3 Days	+2 Days	$ 287.04	$ 134.72	$ 452.32	$ 1,735.20
1.7	Construction	120 Days	+30 Days	$1,497.60	$1,021.44	$1,664.64	$ 1,446.08
Total			**+42 Days**	**$ 3,219.84**	**$ 1,829.76**	**$ 4,378.56**	**$ 4,627.28**

Management reserve

The management reserve is the budget within the cost baseline to respond to any delay or unforeseen work within the project scope when, as in this case, it is equal to 10% over the estimated project's cost.

$$Management\ Reserve = cE \cdot 10\% = \$194{,}754.62 \cdot 10\% = \$19{,}475.46$$

Project's Budget.

The cost related to the project's development is shown in **Chart 21.**

Chart 21

Project Costs

Source: Author of Study, 2023

Construction of Community Seed Bank	
Project Management	**$0**
Procurement	**$5,819.99**
Land Registration	**$1,070.71**
Facility Safety	**$3,000**
Facility Accessibility	**$3,800**
Design Architecture	**$5,843.20**
Construction	**$175,220.72**
Cost Estimate	**$ 194,754.62**
Contingency Reserve	**$** 4,627.28
Cost Baseline	**$ 199,381.90**
Management Reserve	$19,475.46
Total Project Budget	**$ 218,857.36**

Cost Control Process

Due to the importance of achieving the project development within an established timeframe and cost, the project manager and project sponsor will follow and

assess the activities as they are completed. Emphasis will be on the defined dates in this plan. The Earned Value Analysis (EVA) will measure the project's schedule completion and related cost to accurately estimate each activity's completion and maintain the cost within the budget. The following terms are necessary to understand EVA:

- **Planned Value (P.V.):** The authorized budget assigned to complete the activities.
- **Earned Value (E.V.)**: Measure of work performed expressed in terms of the budget authorized.
- **Actual Cost (A.C.)**: The current job performance cost during a specific time.
    1. (Project Management Institute, 2017, p. 261)

To obtain these values and make the Earned Value Analysis, formulas such as the Schedule Variance, Cost Variance, and Earned Value are necessary. Additionally, the following indicators such as Schedule Performance Index and Cost Performance Index will be monitored using **Chart 22,** which analyzes the cost expenses over time, as they are calculated using the following formulas:

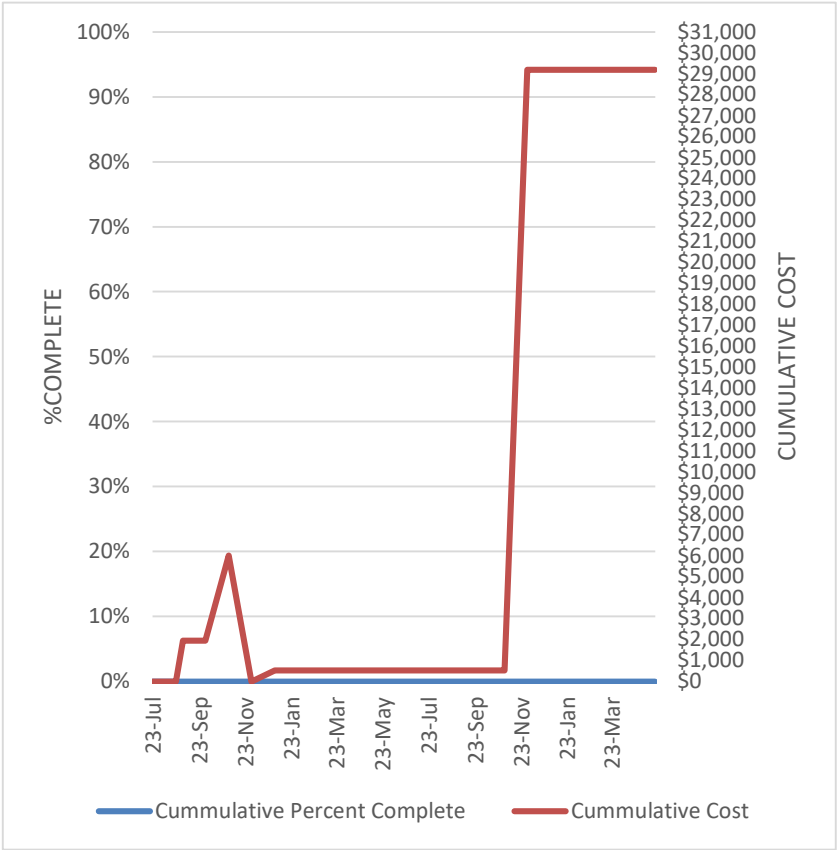
$$Schedule\ Variance = SV = EV - PV$$
$$Cost\ Variance = CV = EV - AC$$
$$Schedule\ Performance\ Index = SPI = \frac{EV}{PV}$$
$$Cost\ Performance\ Index = CPI = \frac{EV}{AC}$$

Chart 22

Planned Value

Source: Author of Study, 2023

Month	Date	Planned Value
1	Jul-23	$0
2	Aug-23	$0
3	9/1/2023	$1,940
4	10/1/2023	$1,940
5	11/1/2023	$6,010.70
6	12/1/2023	$0.00
7	1/1/2024	$531.20
8	2/1/2024	$531.20
9	3/1/2024	$531.20
10	4/1/2024	$531.20
11	5/1/2024	$531.20
12	6/1/2024	$531.20
13	7/1/2024	$531.20
14	8/1/2024	$531.20
15	9/1/2024	$531.20
16	10/1/2024	$531.20
17	11/1/2024	$531.20
18	12/1/2024	29,203.45
19	1/1/2025	29,203.45
20	2/1/2025	29,203.45
21	3/1/2025	29,203.45
22	4/1/2025	29,203.45
23	5/19/2025	29,203.45



Performance Index Response

Based on results from Schedule Performance Index and Cost Performance Index, the project manager will be able to determine the project's current status and generate contingency plans, as required. Using the SPI and CPI monitoring tool, as detailed in **Chart 23**, the project manager may need to apply changes or corrective actions to ensure project success.

Chart 23

Project SPI/CPI Monitoring

Source: Author of Study, 2023

Indicator	SPI/CPI Value
Green	Value equal 1
Yellow	Values between 0.8 and 1 or values between 1 and 1.2
Red	Values below 0.8 or above 1.2

Cost Management Plan, Change Process

The Cost Management Plan defined in this document can only be changed through the change management process requested by the project sponsor. Requirements must be documented and authorized by the project manager and project sponsor. When the Change Request Format is not submitted, changes will not occur, and the project manager will have solely the right to refuse the changes. Once the change is required and fulfills all requirements, the project sponsor will have two working days to approve or deny changes. All change requests should

be documented, and approval depends on the request priority and how the approval/denial can affect the project's completion.

Roles and Responsibilities

Chart 24

Cost Roles and Responsibilities

Source: Author of Study, 2023

Name	Role	Responsibilities
Lic. Roger Montero Solís	Project Sponsor	Approves any cost additions
Ian Spencer Myles	Project Manager	Ensures project completion on schedule and includes all activities listed in the plan
Construction team	Construction	Develops the project with current resources

4.5 Project Quality Management

Quality is incorporated within the project development to satisfy the stakeholder's requirements and the project's goals. The Quality Management Plan includes the quality requirements and the acceptable criteria of those requirements and project deliverables to demonstrate compliance. This plan consists of a document to assess all the project's requirements through the Quality Control Template by defining fitting with expected standards and functionality.

Document Tracking (*Quality Management Plan*)

General Information

	Information
Document Id	*006-MSSB-QMP*
Document Owner	*Millás Semillas S.A.*
Issue Date	*March 31, 2023*
Last Saved Date	*March 31, 2023*
File Name	*Quality Management Plan*

Change Control

Version	**Issue Date**	**Changes**
1.0	*March 31, 2023*	*Release*

Approvals

Role	**Name**	**Signature©**	**Date**
Project Sponsor	*Lic. Roger Montero Solís*		
Project Manager	*Ian Spencer Myles*		

4.5.1 Quality Management Plan

MILLÁS SEMILLAS	**Quality Management Plan**	
Version 1.0	Document ID: 006-MSSB-QMP	03/31/2023

Project Quality

Project quality refers to accomplishing all the characteristics and requirements established by the project sponsor and other stakeholders defined within the project charter.

Quality Metrics

For the project's development, it is necessary to measure the Cost Performance Index and Schedule Performance Indexes monthly, report to the project sponsor during the monthly meeting, and use Appendix 6: Monthly Report. More information about the project's indicators can be found in **Chart** .

Chart 25

Quality Metrics

Source: Author of Study, 2023

Metrics	Indicator Scale
CPI	0.9<X<1.1
SPI	0.9<X<1.1
Change Request Attention	<=3 days
Project Satisfaction	>98%
CV	>=0
S.V.	>=0

Chart describes the project requirements and acceptable criteria that the project manager must inspect, confirming its achievement using Appendix 8 on assessing project deliverables and helping to confirm whether stakeholders' requirements are fulfilled.

Roles and Responsibilities

Chart 26

Quality Roles and Responsibilities

Source: Author of Study, 2023

Name	Role	Responsibilities
Lic. Roger Montero Solís	Project Sponsor	• Approved quality changes. • Accept completed project deliverables.
Ian Spencer Myles	Project Manager	• Oversees the Quality Management Plan. • Project quality control. • Ensures that project requirements are accomplished. • Schedules monthly meetings and quarterly presentations.
Construction team	Construction	• Handle process to ensure quality. • Ensures the construction requirements are followed. • Makes sure that each construction phase is accomplished. • Manages construction team members for quality craftsmanship.

Quality Management Plan, Change Process

The Quality Management Plan defined in this document can only be changed through the change management process, as described in the project management section, and requested by the project sponsor. Requirements must be authorized and documented by the project manager and project sponsor. If the Change Request Format is not submitted, changes will not occur, and the project manager will have the sole right to refuse changes. Once the change is required and fulfills requirements, the project sponsor will have three business days to approve or deny any changes. All change requests should be documented, and

their approval depends on the priority and how its approval or denial can affect the project's completion.

Quality Control

To ensure quality control, the project's team must use the following template to assess each requirement, verifying compliance with the acceptance criteria defined in **Chart** . Quality Control must execute each requirement once the project deliverables or conditions have been completed.

Quality Control documents can be found in Appendix 8 and must be completed by the project manager.

Quality Control Process

1. Project deliverables are being developed.
2. Once each deliverable or requirement is categorized as completed, it is reported to the Project Manager.
3. If the deliverable or requirement reported meets the acceptance criteria defined in **Chart** , the deliverable is accepted. If not, it will be returned for correction.
4. Update the project progress.
5. Each requirement or deliverable assessment must be recorded using the Quality Control 007- MSSB -QMP that can be found within the Appendix 8: Quality Control

Quality Acceptable Criteria

Chart 27

Quality Acceptable Criteria

Source: Author of Study, 2023

Project Name:	Construction of Community Seed Bank
Project Objective:	To develop a project management plan for creating the Pérez Zeledón community seed bank that enhances the organic seed distribution in Costa Rica.

I.D.	Requirement Description	Requested by	Responsible	Acceptable Criteria	Additional Comments
1	Safety	Project sponsor	Project Manager	The facility is located in an area that has few environmental dangers (flooding, heavy winds, mudslides)	
2	Land registry (legal ownership)	Project sponsor	Project Manager	The facility is legally registered with the Municipality in Pérez Zeledón	
3	Facility accessibility	Project sponsor	Project Manager	The facility is accessible to trucks/commercial vehicles transporting resources and other services such as EMS, fire, and police. Common services located on the ground floor; restroom facilities are accessible.	

I.D.	Requirement Description	Requested by	Responsible	Acceptable Criteria	Additional Comments
				Handrails must be placed on both sides of the ramp or stairs. Entry/exit systems to maintain traffic flow. The facility is located close to social services (hospitals, clinics). The facility is considerate of inclement weather issues (e.g., mudslides, water-saturated roads during the rainy season).	
4	Facility accommodations	Project sponsor	Project Manager	The facility size should be no smaller than 300m2. The building can accommodate 100 persons max. The 300m2 area excludes kitchen facilities, shared spaces, offices, and restrooms.	
5	Roof construction	Project sponsor	Construction Team	The roofing sheets will be 24-gauge standing seam, finished in PVDF paint.	
6	Power/Electrical	Project sponsor	Construction Team	The electrical system will be designed to incorporate solar power to produce and store enough energy to power the	

I.D.	Requirement Description	Requested by	Responsible	Acceptable Criteria	Additional Comments
				facility. A solar generator can store and produce electrical power from the solar panel from the roof. Traditional electrical equipment will include cabling, wiring, ducting and accessories, conduits, trenches, manholes, hand holes, power outlets, light fittings, switches, earthing systems, lightning arrester systems, etc. Waterproof switches will be included and distributed where applicable.	
7	Doors/Windows	Project sponsor	Construction Team	All doors shall be hardwood panel/metal reinforced doors. The facility's main entry and exit doors will have louvers installed at the top to allow for sufficient airflow and rain protection. The windows shall be jalousie metal design.	
8	Water/Plumbing	Project sponsor	Construction Team	The facility has access to a freshwater source (free-	

I.D.	Requirement Description	Requested by	Responsible	Acceptable Criteria	Additional Comments
				flowing stream, river, dique, etc.) The facility has pumps and tanks for water reserves in case of emergency. Solar panel heater for hot water in kitchen and restroom facilities.	
9	Sanitation	Project sponsor	Construction Team	The restroom will be attached to a composting toilet system. Compost developed over time from the restroom system will be fertilizer for other nonfood agribusinesses in the Southern Zone.	

4.6 Project Resource Management

The project resource management plan functions to provide that all personnel requirements are managed effectively within the triple constraints of schedule, cost, and scope. This plan has been designed to use local resources sourced from Pérez Zeledón and coordinated with the help of the MAG, P.Z. office. Physical resources for the project will be sourced and delivered, within Costa Rica, to the greatest extent possible. All labor and technical work will be performed by local manpower.

Document Tracking (*Resource Management Plan*)

General Information

	Information
Document Id	*008-MSSB-RMP*
Document Owner	*Millás Semillas S.A.*
Issue Date	*April 07, 2023*
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File Name	*Resource Management Plan*

Change Control

Version	Issue Date	Changes
1.0	*April 07, 2023*	*Release*

Approvals

Role	Name	Signature©	Date
Project Sponsor	*Lic. Roger Montero Solís*		
Project Manager	*Ian Spencer Myles*		

4.6.1 Resource Management Plan

MILLÁS SEMILLAS	**Resource Management Plan**	
Version 1.0	Document ID: 008-MSSB-RMP	04/07/2023

Project Resources

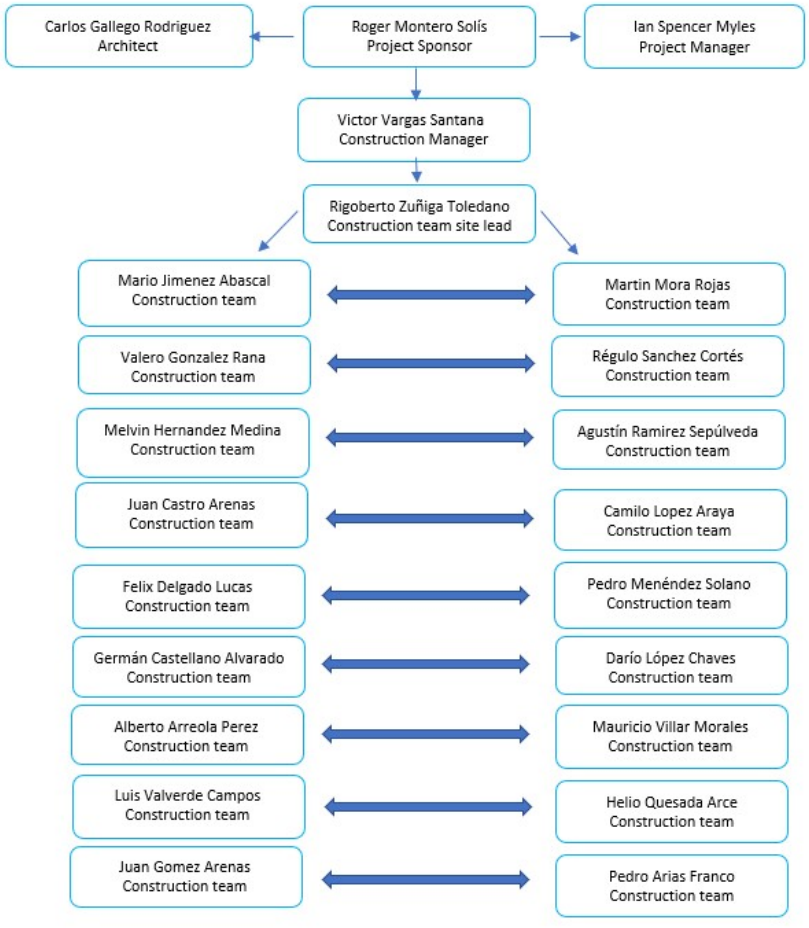
Are referenced as all the resources needed to attain the project standards.

Project Team

The following figure details the roles of the project staff that will be used in the project; it also confirms the line of command within the project and how communication will be performed.

Figure 35

Project Team



Note. Own work. (Myles, 2023)

Activity Resources Estimation

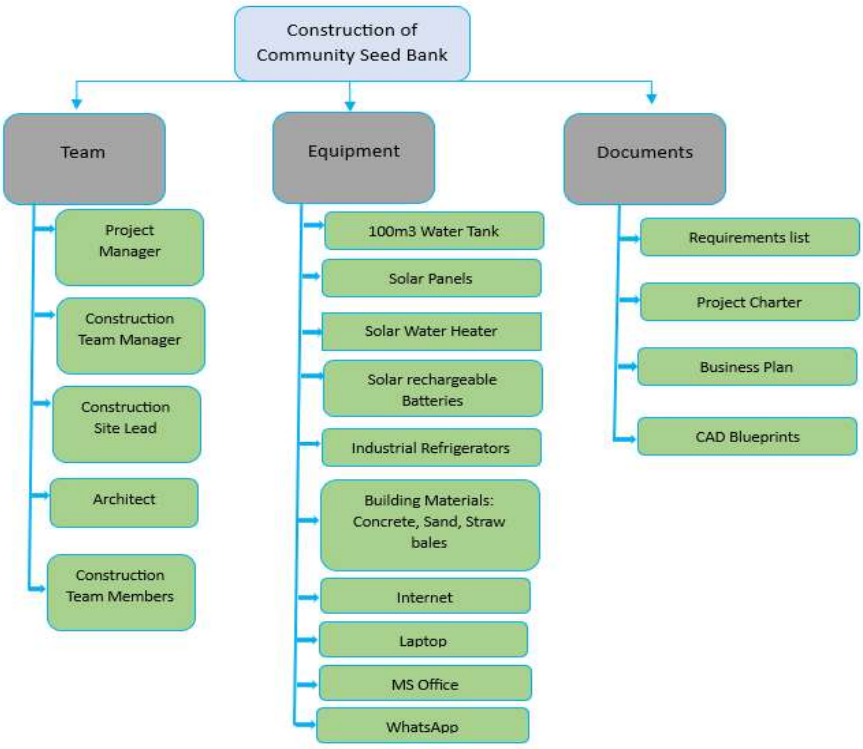
This process quantifies team resources, material equipment, and supplies needed to perform the project. The resource estimation is made using the Bottom-Up estimating process listed in **Chart 8,** in combination with Microsoft Project capability. Resources were included in each work package and produced an automatic report. The report details the hours required for each resource and lists where the resource will be used. This information can be seen in **Chart 28** Resources Estimation.

Resources Breakdown Structure

The organizational depiction below categorizes all the resources needed to develop the project during its life cycle. Figure 16 exhibits the Resource Breakdown structure of the project.

Figure 16

Resource Breakdown Structure



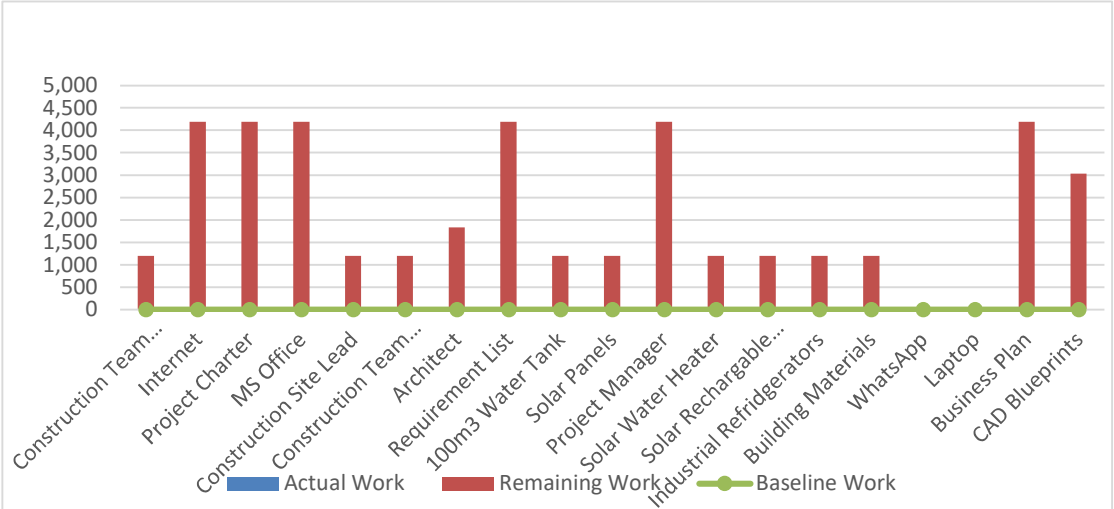
Note. Own work. (Myles, 2023)

Chart 28

Resources Estimation

Source: Author of Study, 2023

	Category	Start	Finish	Remaining Work
Construction Team Manager	Team	11/28/2024	06/25/2025	1,200 hrs
Internet	Equipment	07/10/2023	07/10/2025	4,192 hrs
Project Charter	Documents	07/10/2023	07/10/2025	4,192 hrs
MS Office	Equipment	07/10/2023	07/10/2025	4,192 hrs
Construction Site Lead	Team	11/28/2024	06/25/2025	1,200 hrs
Construction Team Members	Team	11/28/2024	06/25/2025	1,200 hrs
Architect	Team	01/12/2024	11/27/2024	1,832 hrs
Requirement List	Documents	07/10/2023	07/10/2025	4,192 hrs
100m3 Water Tank	Equipment	11/28/2024	06/25/2025	1,200 hrs
Solar Panels	Equipment	11/28/2024	06/25/2025	1,200 hrs
Project Manager	Team	07/10/2023	07/10/2025	4,192 hrs
Solar Water Heater	Equipment	11/28/2024	06/25/2025	1,200 hrs
Solar Rechargeable Batteries	Equipment	11/28/2024	06/25/2025	1,200 hrs
Industrial Refrigerators	Equipment	11/28/2024	06/25/2025	1,200 hrs
Building Materials	Equipment	11/28/2024	06/25/2025	1,200 hrs
WhatsApp	Equipment	07/10/2023	07/10/2025	-
Laptop	Equipment	07/10/2023	07/10/2025	-
Business Plan	Documents	07/10/2023	07/10/2025	4,192 hrs
CAD Blueprints	Documents	01/12/2024	06/25/2025	3,032 hrs



Assumption of Estimation

- The project team has internet connectivity at all times.
- The construction phases will utilize local materials as indicated in the cost management plan.
- The resource estimate is based on an 8hr work week, Monday-Friday, excluding national holidays.
- A personal laptop or smartphone with WhatsApp is available to all team leads.
- The necessary project equipment will be procured during the procurement phase, and the costs of resources are based on these amounts.
- The project will finish in June 2025 but is scheduled until July 2025 as a schedule reserve.

Team Development

The project team will consist of the following personnel resources. Construction professionals are charged with overall construction and building safety. Two project specialists will consist of agribusiness advisors for the placement of the building. A solar specialist will be contracted to provide solar and related equipment. Due to the interdisciplinary approach, effective communication skills will be required to accomplish the project. The project manager will ensure that the following process is conducted:

Team Interpersonal Communication Management

Collective communication platform: Project information will be communicated through email and WhatsApp.

Video conference capability: This capability will be necessary due to weather interference. Team members across Pérez Zeledón and Costa Rica must communicate virtually.

Email and WhatsApp chat: Daily communication between team members and the project manager must be accomplished. WhatsApp is the most viable option because it is widely used in Costa Rica.

Staff Acquisition and Release

The staff needed in this project is composed of the current company's employees and does not require hiring new members. Once the project starts, the team must focus its actions on the project development. Nevertheless, it will be possible to attend other activities due to any emergency or company requirement. Each member will be released of responsibility as the project finishes, returning to their former roles.

Training Requirements

The project will require all team members to be certified and current within their respective disciplines. The certification documents will be authenticated as a condition of the project contract before the project start.

Meetings

Meetings will be organized to discuss project performance and conflict resolution topics. The project team will meet on the Zoom or WhatsApp platform. The project manager will determine the meeting length. Weekly meetings will be between team

members during the construction phases. All team leads will attend monthly meetings.

Resource Management Plan, Change Process

The Resource Management Plan defined in this document can only be changed through the change management process at the request of the project sponsor. Requirements must be documented and authorized by the project manager and project sponsor. If the Change Request Format is not submitted, changes will not occur, and the project manager will have the sole right to refuse changes. Once the change request is submitted, the project sponsor will have two working days to approve or deny changes. All change requests should be documented, and successful approval depends on the priority and impact upon the project's completion.

Roles and Responsibilities

Roles and responsibilities during the project life cycle are listed in **Chart 29**.

Chart 29

Resources Management Roles and Responsibilities

Source: Author of Study, 2023

Name	Role	Responsibilities
Lic. Roger Montero Solís	Project Sponsor	• Approve changes in scope. • Evaluate the need for scope changes. • Accept project deliverables. • Approve schedule changes. • Evaluate the need for schedule changes. • Accept project deliverables. • Approve each advance in the schedule plan. • Approves any cost addition. • Approved quality changes • Approve changes and communication channels. • Approves any resources needing procurement.
Ian Spencer Myles	Project Manager	• Facilitates project change requests. • Approve changes in scope. • Organize and facilitate schedule change control. • Facilitates project change requests. • Request to project sponsor to approve schedule changes. • Organize and facilitate schedule change control. • Communication outcomes of schedule change requests. • Communication of advances in the project activities of scope change requests. • Ensures that the project accomplishes the schedule and activities within the plan. • Oversight of the Quality Management Plan. • Ensures that quality control is completed. • Ensures that project requirements are fulfilled. • Schedule meetings for testing processes. • Prepare Final presentation of project review. • Schedule Online Meetings. • In charge of quotations of software, hardware, or services.
Victor Vargas Santana	Construction Manager	• Participate in change process analysis. • Validate if scope changes can be applied. • Propose scope changes. • Document any delay in the project activities.

Name	Role	Responsibilities
		• Request schedule changes. • Update the calendar activities. • Use the company's resources. • Facilitate processes to ensure quality. • Ensures that platform requirements are followed. • Document all fulfilled requirements. • Provide frequent communications flow related to project updates. • Generate reports related to project status.
Rigoberto Zuñiga Toledano	Construction Site Lead	• Participate in change process analysis. • Document any delay in the project activities. • Request schedule changes. • Update the calendar activities. • Use the company's resources. • Facilitate processes to ensure quality • Document all fulfilled requirements. • Provide frequent communications flow related to project updates. • Generate reports related to project status.
Carlos Gallego Rodriguez	Architect	• Validate if scope changes can be applied. • Propose scope changes. • Document any delay in the project activities. • Request schedule changes. • Update the calendar activities. • Use the company's resources. • Facilitate processes to ensure quality. • Ensures that platform requirements are followed. • Ensures that each project phase is complete. • Document all fulfilled requirements. • Provide frequent communications flow related to project updates. • Generate reports related to project status.

Responsibility Assignment Matrix

Chart details the project work responsibilities from work package level 1. The categories are as follows:

R: Responsible

A: Accountable

C: Consult

I: Inform

Chart 30

Responsibility Assignment Matrix (RAM)

Source: Author of Study, 2023

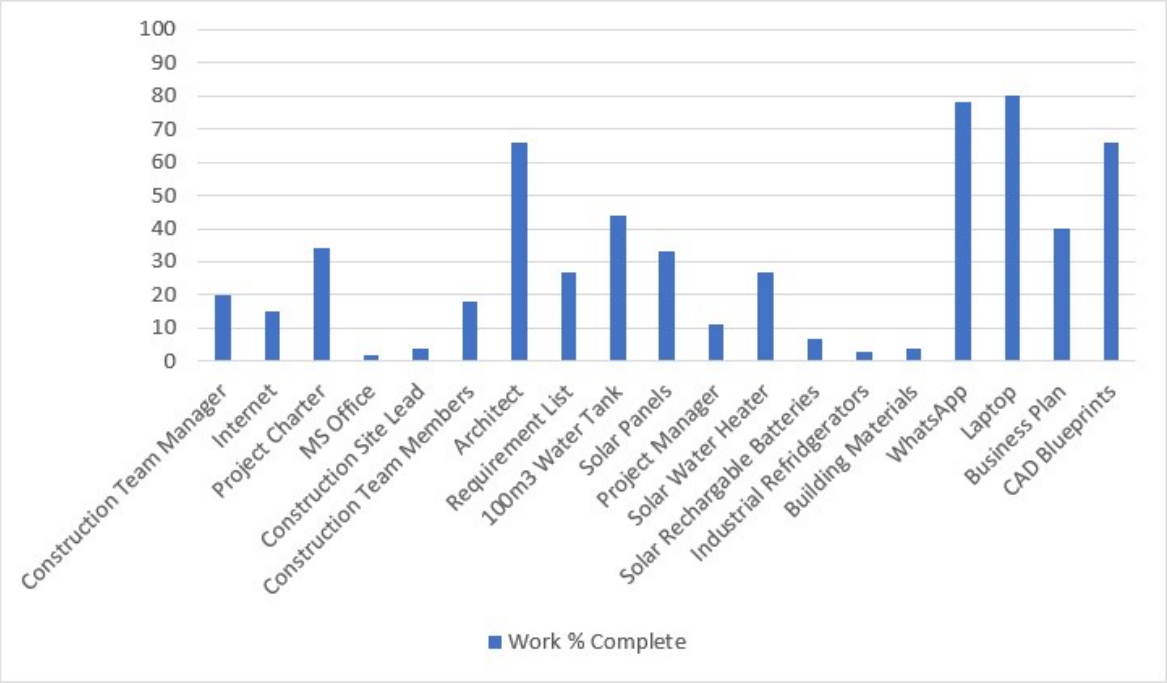
RACI Chart	Team Member				
Activity	Ian	Roger	Carlos	Victor	Rigoberto
Project Management	R	A	C	I	I
Procurement	A	R	C	I	I
Land Registration	R	A	I	I	I
Facility Safety	A	I	I	R	A
Facility Accessibility	C	I	I	R	A
Design Architecture	C	I	R	C	C
Construction	A	I	C	R	R

Resource Control

The resource control process will be performed daily as the project evolves, utilizing MS Project. The Resource Overview report will be generated and display the percentage of work done via the work resources. **Figure** highlights an example work status report.

Figure 37

Work Status Example



Note. Own work. (Myles, 2023)

4.7 Project Communication Management

The communication management plan illustrates the authorized and formal communication channels where all project stakeholders and staff can communicate and remain informed. The pertinent information stakeholders need is secured and can be shared through attainable media. The advantage of the communication management plan is that it constitutes the appropriate project communication activities and the information needed by all project team members.

Document Tracking (*Communication Management Plan*)

General Information

	Information
Document Id	*009-MSSB-CMP*
Document Owner	*Millás Semillas S.A.*
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Change Control

Version	Issue Date	Changes
1.0	*April 14, 2023*	*Release*

Approvals

Role	Name	Signature©	Date
Project Sponsor	*Lic. Roger Montero Solís*		
Project Manager	*Ian Spencer Myles*		

4.7.1 Communication Management Plan

MILLÁS SEMILLAS	**Communication Management Plan**	
Version 1.0	Document ID: 009-MSSB-CMP	04/14/2023

Project Communication

The following plan details the authorized communication flow between the team members and other stakeholders to ensure the proper compilation, creation, dissemination, and verification of information within the project.

Roles and Responsibilities

Chart 31

Communication Management Roles and Responsibilities

Source: Author of Study, 2023

Name	Role	Responsibilities
Lic. Roger Montero Solís	Project Sponsor	• Approved quality changes. • Accept completed project deliverables.
Ian Spencer Myles	Project Manager	• Oversees the Quality Management Plan. • Project quality control. • Ensures that project requirements are accomplished. • Schedules monthly meetings and quarterly presentations.
Construction team	Construction	• Handle process to ensure quality. • Ensures the construction requirements are followed. • Makes sure that each construction phase is accomplished. • Manages construction team members for quality craftsmanship.

Stakeholders Identification requirements

Chart shows the communication requirements organized by the project's stakeholders.

Chart 32

Stakeholders Communication Requirements

Source: Author of Study, 2023

Stakeholders	Name	Key Concerns	Communication Method	Frequency	Contact Information
Project Sponsor	Lic. Roger Montero Solís	Status Reports, virtual meetings, project phases, budget, schedule, risk monitoring.	Email, Zoom, WhatsApp, Phone Calls, Face to face	Weekly	RMontSol@gmail.com
Construction Manager	Victor Vargas Santana	Status Reports, virtual meetings, project phases, budget, schedule, risk monitoring.	Email, Zoom, WhatsApp, Phone Calls, Face to face	Weekly	VicVarSanta@gmail.com
Project Manager	Ian Spencer Myles	Status Reports, virtual meetings, project phases, budget, schedule, risk monitoring.	Email, Zoom, WhatsApp, Phone Calls, Face to face	Weekly	ISMyles@gmail.com
Construction Site Lead	Rigoberto Zuñiga Toledano	Status Reports, virtual meetings, project phases, budget, schedule, risk monitoring.	Email, Zoom, WhatsApp, Phone Calls, Face to face	Weekly	RigoZuniT@gmail.com
Architect	Carlos Gallego Rodriguez	Status Reports, virtual meetings, project phases,	Email, Zoom, WhatsApp,	Weekly	CarGalleR@gmail.com

Stakeholders	Name	Key Concerns	Communication Method	Frequency	Contact Information
		budget, schedule, risk monitoring.	Phone Calls, Face to face		

Communication Matrix

Chart 33

Communication Matrix

Source: Author of Study, 2023

Project Name:	Development of a Community Seed Bank, Pérez Zeledón
Project Objective:	To develop a project management plan for creating the Pérez Zeledón community seed bank that enhances the organic seed distribution in Costa Rica.

I.D.	Deliverable	Description	Delivery Method	Frequency	Responsible	Audience
1	Project updates	Regular communication	Telephone Calls, Emails, WhatsApp	Need basis	Project Manager	Project Sponsor, Project Manager
2	Reports	Project Status	Email	Weekly	Project Manager	Project Sponsor, Project Manager
3	Presentations	Project review	Emails, Virtual Meetings	Once the project has finished.	Project Manager	Project Sponsor
4	Reviews and Meetings	Project Status	Emails, Virtual Meetings	Weekly, Monthly	Project Manager	Project Sponsor, I.T. Department

Communication Standards

The communication process used within the project will operate in a continuous path between message senders and recipients. All the information shared through official means will be held in confidence as proprietary information and will not be publicly available.

The message sender will also confirm that all information was received and properly understood. The benchmark for this conformation includes, but is not limited to:

- **Communication capability**: Aspects such as clarity of intent when sharing information, effective leadership, and followership behaviors.
- **Feedback**: Information requested through the official communication channels must be responded to within 24 hours. Communication within the project team and with other project stakeholders is a collaborative endeavor.
- **Presentations**: Weekly and monthly reports are the official medium to share information related to project evolution. This information must be secured within the MS SharePoint extension and shared through encrypted email using Gmail.

Communication requirements Analysis

Communication channels must be available to facilitate the requirements of the five main stakeholders involved in the project. The following formula (Kumthekar,

2020) is used to calculate the required amount of communication channels for the project:

$$\boldsymbol{Channels = N * (N - 1) / 2. = \frac{5(5-1)}{2} = 10}$$

Authorized communication channels

Email: via Gmail will be used to communicate and share project information. Key topic elements include progress, updates, equipment orders, changes, and meetings. All result data will be transmitted using the personal emails assigned to team members. The official project communication with all external stakeholders will be through encrypted email.

Written material: Includes the physical documentation exchanged between stakeholders such as the project manager and architect, etc. Limited information will be exchanged in written format, as email will be the primary communication method.

Mobile devices: This communication method facilitates the exchange of information between the project team and other stakeholders using Wi-Fi-enabled devices. The project will require all team leaders to have a mobile device capable of messaging with WhatsApp. Other apps like Gmail and Google Workspaces will also help access MS Project documents.

Virtual meetings: Zoom will be the trusted platform to communicate with all project stakeholders. The mobile device capability will also pair well with sessions hosted via computer. This communication media will be used to avoid face-to-face meetings that cannot occur due to weather or feasibility.

Monitoring Communication

Meetings will be used to collect and facilitate project information flow between the project team and stakeholders. During sessions, the project team will analyze the communication effectiveness of the project, respond to any stakeholder requests, and respond to project needs that may arise during the month. Meetings will be held virtually or in person. The project's first phase will have monthly meetings, and during the construction phases, meetings will be weekly. Meeting frequency depends on moving parts in the later stage of the project and utilizing everyone's time best.

Meetings: To share information, support the actions defined in the communication plan, or even solve problems. Meetings will effectively transmit instructions, share thoughts, and find solutions to issues that may exist within the project. Meetings will be split between:

- **Weekly Meetings**: This meeting is used to share project updates and to request information related to project needs. Will be accomplished during the Construction phase.
- **Monthly Meetings**: This meeting is performed by the Project Manager, Project Sponsor, and stakeholders. Its objective is to exchange information related to

project execution, financial matters, conflicts/resolution, possible delays, and change request submissions.

Project Reporting

Reporting contains project information on crucial baselines and critical indicators required to make informed decisions.

Monthly Report: Records agreements established during meetings. They are formalized through a report summarizing the meeting and will be shared through email. The change process must formalize changes to these reports or formats. (See Appendix 6: Monthly Report)

Project Report: Information concerning the project will be captured using MS Project and will be included within the report as detailed below (See Appendix 7: Project Report):

- **Cost overview**: Displays the summary of the project's cost, remaining cost, and % of completion.
- **Burndown**: Displays how much work has been accomplished and how much remains to be completed.
- **Task burndown**: Displays how many tasks have been completed and how many more are pending.
- **Progress vs. Cost Status**: Progress made versus cost spent over time.
- **Completion percentage**: Status of all high-level tasks.
- **Late Tasks**: Tasks that are past the scheduled due date.
- **Upcoming tasks**: Status of tasks starting the following week.
- **Remaining Task:** Status of remaining tasks due in the current week.
- **Earned Value**: Value based on the project status date.
- **Variance over Time**: Cost and schedule variance for the project based on status date.
- **Indices overtime**: Cost and Schedule Performance Indexes for the project based on the status date.
- **Resource Status**: Work status of all work resources.
- **Work Status**: Percentage of work accomplished by all the works resources.

Communication Management Plan, Change Process

The Communication Management Plan defined in this document can only be changed through the change management process and requested by the project sponsor. Requirements must be documented and authorized by the project

manager and project sponsor. When the Change Request Format is not utilized/submitted, changes will not proceed, and the project manager will have the sole right to refuse changes. Once the change is required and fulfills requirements, the project sponsor will have two working days to approve or deny changes. Any change request should be documented, and its approval depends on the priority and how its approval or denial can affect the project's completion.

4.8 Project Risk Management

Project risks were identified during the project charter creation, and some risks were added during the project plan development. The Risk Management Plan (RMP) includes the risk that can affect the certainty of the project development. Additionally, the qualitative analysis was performed for each of the identified risks in order to know the likelihood of each risk occurring. Moreover, this analysis adds a response plan targeting those risks with high probabilities of occurrence.

Due to the project size, taking a more detailed approach to risk management and evaluation is unnecessary since the risk management plan covers the project's needs.

The risk management plan highlights all the areas that can affect the project development while recognizing each main risk updated at any stage of the project life cycle.

Document Tracking (*Risk Management Plan*)

General Information

	Information
Document Id	*010-MSSB-RMP*
Document Owner	*Millás Semillas S.A.*
Issue Date	*April 21, 2023*
Last Saved Date	*April 21, 2023*
File Name	*Risk Management Plan*

Change Control

Version	Issue Date	Changes
1.0	*April 21, 2023*	*Release*

Approvals

Role	Name	Signature	Date
Project Sponsor	*Lic. Roger Montero Solís*		
Project Manager	*Ian Spencer Myles*		

4.8.1 Risk Management Plan

MILLÁS SEMILLAS	**Risk Management Plan**	
Version 1.0	Document ID: 010-MSSB-RMP	04/21/2023

Identifying Risk

The process of identifying risk is first done during the project charter development. Still, it can be updated in all project phases and through the change management process. Risk can be added or deleted, depending on the change scenarios while developing the project. The risk register format is found in Appendix 9: The Risk Register must be updated with risks that can appear during the project development.

Chart 34

Risk Breakdown Structure

Source: Author of Study, 2023

RBS Level 0	RBS Level 1	RBS Level 2	RBS Level 3
Project Risk	1. Management Risk	1.1 Project Management	1.1.1 Experience
		1.2 Organization	1.2.1 Logistics 1.2.2 Budgeting
		1.3 Communication	1.3.1 Communication channels
	2. External Risk	2.1 Municipality	2.1.1 Legality
	3. Technical Risk	3.1 Defined Requirements	3.1.1 Project Scope
		3.2 Technology	3.2.1 Solar capability 3.2.2 Electricity connection 3.2.3 Water connection
	4. Commercial Risk	4.1 Customers	4.1.1 Customer Requirements
		4.2 Vendors	4.2.1 Competition

Risk Management Plan, Change Process

The Risk Management Plan defined in this document can only be altered through the change management process and requested solely by the project sponsor. Requirements must be documented and authorized by the project manager and project sponsor. If the Change Request format is not utilized, changes will not occur, and the project manager will have the right to refuse changes. Once the change is submitted, the project sponsor will have two working days to approve or deny the request. All change requests will be documented, and approval depends on the priority of the change and its effect on project completion.

Risk Analysis

Quantitative Analysis

Quantitative analysis is the process of using statistical and mathematical modeling to understand a given task's behavior. In the case of the community seed bank project (CSBP), quantitative analysis will not be needed due to the untechnical nature of the project. Qualitative analysis will be used instead as the primary risk analysis tool.

Qualitative Analysis

Each project risk will be analyzed using qualitative analysis and the following scale, provided in the Probability and Impact Matrix.

Chart 35

Qualitative Risk Analysis Classification

Source: Author of Study, 2023

			IMPACT				
			In Significant	Less Significant	Potentially Significant	Significant	Very significant
			LOW →				HIGH
		Scores	1	2	3	4	5
HIGH ↕ LOW	PROBABILITY	5	5	10	15	20	25
		4	4	8	12	16	20
		3	3	6	9	12	15
		2	2	4	6	8	10
		1	1	2	3	4	5

Risk Response

Based on the results of the qualitative analysis applied to each risk, the project manager will use the following chart to take the actions required to respond to each risk.

Chart 36

Risk Response

Source: Author of Study, 2023

Priority	Score	Strategy	Description
Very High Risk	$x \geq 15$	Escalate Transfer	Depending on the situation, these risks will be elevated to the project sponsor or contracted to an expert for resolution.
High risk	$9 < x < 15$	Address	These risks must also be addressed but are not prioritized as highly as in the Very High-Risk category.
Medium Risk	$4 < x < 8$	Mitigate	It is necessary to define corrective actions to reduce the probability and impact of these risks.
Low Risk	$x \leq 3$	Accept	No action will be taken.

Risk Monitoring and Controlling

Risk monitoring and controlling will be performed weekly or at the project manager's discretion. This process mainly aims to monitor the project's current risk status and determine any impending harm toward project development. The project team will track risk capacities in conjunction with weekly meetings. Identified risks will be registered and assessed in the Risk Register Template (See Appendix 9: Risk Register).

The project manager is responsible for ensuring that the risk case is assessed weekly, during the weekly meetings, and reported through the monthly report.

Within the weekly review, current risk responses will be analyzed to verify the effectiveness of project risk mitigation tactics.

Risk Identified

Project Name:	Development of a Community Seed Bank, Pérez Zeledón
Project Objective:	To develop a project management plan for the creation of the Pérez Zeledón community seed bank that enhances the organic seed distribution in Costa Rica

Chart 37

Risks Identified

Source: Author of Study, 2023

RBS Code	Cause	Risk	Consequence
1.1.1	Staffing shortages	Lack of experienced team members.	Decline in quality of project construction.
1.2.1	Weather and lack of supplies	Logistics shortfall	Construction and project materials do not reach the project site.
1.2.2	Outdated cost estimates	Over budgeting	The project goes over budget.
1.3.1	Slow response times	Ineffective communication channels	Project mistakes and schedule mismanagement.
2.1.1	Municipality politics	Building legality	Building permit not approved by scheduled deadline.
3.1.1	Construction add ons	Overextended project scope	The project doesn't meet the requirements.
3.2.1	Incompatible solar materials	Ineffective solar capability	Solar capability diminished.
3.2.2	Uncalculated electrical needs	Ineffective electrical connection	Electrical capability diminished.
3.2.3	Uncalculated water needs	Ineffective water connection	Water capability diminished.

RBS Code	Cause	Risk	Consequence
4.1.1	Community farmers don't use seed bank	Customer requirements not met	Lack of community usage of the seed bank.
4.2.1	Another business creates a seed bank	Business competition	Lack of local income generated by the seed bank.

Qualitative Analysis

Project Name:	Development of a Community Seed Bank, Pérez Zeledón
Project Objective:	To develop a project management plan for the creation of the Pérez Zeledón community seed bank that enhances the organic seed distribution in Costa Rica

Chart 38

Risk Qualitative Analysis

Source: Author of Study, 2023

RBS Code	Cause	Risk	Consequence	Probability	Impact	PxI
1.1.1	Staffing shortages	Lack of experienced team members.	Decline in quality of project construction.	1	5	5
1.2.1	Weather and lack of supplies	Logistics shortfall	Construction and project materials do not reach the project site.	4	2	8
1.2.2	Outdated cost estimates	Over budgeting	Project goes over budget.	3	5	15
1.3.1	Slow response times	Ineffective communication channels	Project mistakes and schedule mismanagement.	4	3	12
2.1.1	Municipality politics	Building legality	Building permit not approved by schedule deadline.	1	5	5
3.1.1	Construction add ons	Overextended project scope	Project doesn't meet the requirements.	1	5	5
3.2.1	Incompatible solar materials	Ineffective solar capability	Solar capability diminished.	1	5	5

RBS Code	Cause	Risk	Consequence	Probability	Impact	PxI
3.2.2	Uncalculated electrical needs	Ineffective electrical connection	Electrical capability diminished.	1	5	5
3.2.3	Uncalculated water needs	Ineffective water connection	Water capability diminished.	1	5	5
4.1.1	Community farmers don't use seed bank	Customer requirements not met	Lack of community usage of the seed bank.	3	3	9
4.2.1	Another business creates a seed bank	Business competition	Lack of local income generated by the seed bank.	2	4	8

Risk Responses

Project Name:	Development of a Community Seed Bank, Pérez Zeledón
Project Objective:	To develop a project management plan for the creation of the Pérez Zeledón community seed bank that enhances the organic seed distribution in Costa Rica

Chart 39

Critical Risk Responses

Source: Author of Study, 2023

RBS Code	Cause	Risk	Consequence	PxI	Response
1.2.2	Outdated cost estimates	Over budgeting	Project goes over budget	15	Achieve a positive relationship with outside vendors supplying materials for the project. This will deepen communication flow and trust in the business relationship and ensure accurate and timely budget quotes. Ensure through initial project meetings that prospective vendors are aware of the project schedule and budget to provide accurate quotes.
1.3.1	Slow response times	Ineffective communication channels	Project mistakes and schedule mismanagement	12	Enable strong communication with the project team and stakeholders by 1. Developing a thorough communication plan. 2. Ensure the project team is properly trained with the tools they will be using for the project such as email, Microsoft products, text, and video calls. 3. Use interactive two-way communication methods, not just emails. 4. Use nonverbal skills in meetings to enhance

RBS Code	Cause	Risk	Consequence	PxI	Response
					communication. 5. Plan project meetings thoroughly to mitigate lost time and improve efficiency.
4.1.1	Community farmers don't use seed bank	Customer requirements not met	Lack of community usage of the seed bank	9	The project manager and project team need to be active in the community in which the Seed Bank is being built. Being active in local farm festivals, clubs, and the municipality will provide an awareness of the community needs and this input will enhance the design phase of the project. By direct and frequent engagement with the farms in the canton, realistic requirements for the Seed Bank will be identified and thus an accurate project budget for the design will be enabled.

4.9 Project Procurement Management

A Procurement Management Plan has been created based on the project stakeholder's directions. The project will utilize contracted work for procurement as Millás Semillas does not have inherent materials and resources for the project construction. Due to the project's complexity, the procurement process requires research of three quotes for work to be assessed and approved. The Procurement Management Plan determines the best contracts for acquiring goods and services based on the stakeholders' requirements.

Document Tracking (*Procurement Management Plan*)

General Information

	Information
Document Id	*011-MSSB-PMP*
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Change Control

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1.0	*April 28th, 2023*	*Release*

Approvals

Role	Name	Signature	Date
Project Sponsor	*Lic. Roger Montero Solís*		
Project Manager	*Ian Spencer Myles*		

4.9.1 Procurement Management Plan

MILLÁS SEMILLAS	**Procurement Management Plan**	
Version 1.0	Document ID: 011-MSSB-PMP	04/29/2023

Procurement Plan Purpose

The primary function of the procurement management plan is to provide information associated with the procurement process and the choice of resources, goods, and services as required.

Procurement Statement

The procurement process defined in this plan can be used to acquire building materials, solar materials, plumbing materials, and construction companies needed to develop the project.

Estimate Cost

Chart 40

Estimate Resources Cost

Source: Author of Study, 2023

Type	Description	Cost
Building materials	Building (Straw-bale, concrete, etc.)	$0
Solar materials	Solar (panels, heater, etc.)	$0
Plumbing materials	Plumbing (water tank, tubing)	$0
Construction companies	Labor	$0

Procurement Description

On a case-by-case basis, additional materials can be procured and will only be facilitated and authorized through the change management plan approved by the project sponsor. This process will be carried out with local companies and include a mandatory minimum of three price quotations.

Procurement Management Plan, Change Process

The Procurement Management Plan defined in this document can only be altered through the change management process at the request of the project sponsor. Requirements must be authorized and documented by the project manager and project sponsor. If the Change Request format is not utilized, changes will not occur, and the project manager will have the right to refuse changes. Once the change is submitted, the project sponsor will have two working days to approve or deny the request. All change requests will be documented, and approval depends on the priority of the change and its effect on project completion.

Performance Metrics for Procurement Activities

Chart details the evaluation of services, goods, or product vendors and will be used for assessment and decision-making:

Chart 41

Performance Metrics

Source: Author of Study, 2023

Vendor	Product Quality	Delivery Time	Documentation Quality	Development		Cost Unit	Total
				Cost	Time		
1							
2							
3							

Scale:

1- Unsatisfactory

2- Sufficient

3- Outstanding

The procurement process will proceed with selecting the product/service/ provider attaining the highest score based on **Chart 41**.

Procurement Team Roles and Responsibilities

Chart 42

Procurement Management Roles and Responsibilities

Source: Author of Study, 2023

Name	Role	Responsibilities
Lic. Roger Montero Solís	Project Sponsor	• Approves all resources that need procurement.
Ian Spencer Myles	Project Manager	• Charged with quotations of materials and companies.
Victor Vargas Santana	Construction team manager	• Specify technical requirements of building/solar/plumbing materials and manpower.

4.10 Project Stakeholder Management

The stakeholder management plan fulfills the need of identifying all stakeholders of the project. The stakeholders are further categorized by distinct types, such as direct and indirect stakeholders. Direct stakeholders refer to those who are directly involved with the project work and development. Indirect stakeholders are those who benefit, and are affected or related to the project deliverables, but do not have any direct authority within the project.

The stakeholder management plan increases the likelihood of project success, when recognizing worthiness of each of the stakeholders and their influence, power, and impact within the project. The correct procedure to manage each stakeholder might make difference between a successful or failed project.

Document Tracking (*Stakeholder Management Plan*)

General Information

	Information
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Approvals

Role	Name	Signature	Date
Project Sponsor	*Lic. Roger Montero Solís*		
Project Manager	*Ian Spencer Myles*		

4.10.1 Stakeholder Management Plan

MILLÁS SEMILLAS	**Stakeholder Management Plan**	
Version 1.0	Document ID: 012- MSSB -STMP	05/04/2023

Project Stakeholders

Project Stakeholders are those individuals or entities who can be affected by the project development and any decisions or outcomes of the project. The stakeholders have been categorized into two groups, direct and indirect stakeholders, as exhibited in **Chart 43**.

Chart 43

Stakeholder Classification

Source: Author of Study, 2023

Direct Stakeholders	Indirect Stakeholders
• Project Sponsor • Construction Manager • Project Manager • Construction Site Lead • Construction Team members • Architect	• Customers • Semillas Plantae S.A. • Municipality Pérez Zeledón

Stakeholder Responsibility

The direct stakeholders are listed within **Chart 44**, where each stakeholder's responsibility and authority are stated.

Chart 44

Stakeholder Responsibility

Source: Author of Study, 2023

Name	Organization	Job Title	Responsibility and Authority
Lic. Roger Montero Solís	Ministerio de Agricultura y Ganadería de *Costa Rica (MAG), Pérez Zeledón*	Project Sponsor	In charge of the approval of changes, support, and receiving deliverables of the project.
Victor Vargas Santana	V y Z Construcción	Construction Manager	Responsible for the correct and complete construction of the project.
Rigoberto Zuñiga Toledano	V y Z Construcción	Construction Site Lead	Responsible for the correct and complete construction of the project. Deputy to the Construction Manager.
Mario Jimenez Abascal	V y Z Construcción	Construction Team Member	Responsible for the correct and complete construction of the project. Responds to Site Lead.
Martin Mora Rojas	V y Z Construcción	Construction Team Member	Responsible for the correct and complete construction of the project. Responds to Site Lead.
Valero Gonzalez Rana	V y Z Construcción	Construction Team Member	Responsible for the correct and complete construction of the project. Responds to Site Lead.
Régulo Sanchez Cortés	V y Z Construcción	Construction Team Member	Responsible for the correct and complete construction of the project. Responds to Site Lead.
Melvin Hernandez Medina	V y Z Construcción	Construction Team Member	Responsible for the correct and complete construction of the project. Responds to Site Lead.
Agustín Ramirez Sepúlveda	V y Z Construcción	Construction Team Member	Responsible for the correct and complete construction of the project. Responds to Site Lead.
Juan Castro Arenas	V y Z Construcción	Construction Team Member	Responsible for the correct and complete construction of the project. Responds to Site Lead.
Camilo Lopez Araya	V y Z Construcción	Construction Team Member	Responsible for the correct and complete construction of the project. Responds to Site Lead.

Name	Organization	Job Title	Responsibility and Authority
Felix Delgado Lucas	V y Z Construcción	Construction Team Member	Responsible for the correct and complete construction of the project. Responds to Site Lead.
Pedro Menéndez Solano	V y Z Construcción	Construction Team Member	Responsible for the correct and complete construction of the project. Responds to Site Lead.
Germán Castellano Alvarado	V y Z Construcción	Construction Team Member	Responsible for the correct and complete construction of the project. Responds to Site Lead.
Darío López Chaves	V y Z Construcción	Construction Team Member	Responsible for the correct and complete construction of the project. Responds to Site Lead.
Alberto Arreola Pérez	V y Z Construcción	Construction Team Member	Responsible for the correct and complete construction of the project. Responds to Site Lead.
Mauricio Villar Morales	V y Z Construcción	Construction Team Member	Responsible for the correct and complete construction of the project. Responds to Site Lead.
Luis Valverde Campos	V y Z Construcción	Construction Team Member	Responsible for the correct and complete construction of the project. Responds to Site Lead.
Helio Quesada Arce	V y Z Construcción	Construction Team Member	Responsible for the correct and complete construction of the project. Responds to Site Lead.
Juan Gomez Arenas	V y Z Construcción	Construction Team Member	Responsible for the correct and complete construction of the project. Responds to Site Lead.
Pedro Arias Franco	V y Z Construcción	Construction Team Member	Responsible for the correct and complete construction of the project. Responds to Site Lead.
Carlos Gallego Rodriguez	Gallegos Arquitectura	Architect	Designs and develops the building architecture drawings to specifications. Responsible to the Project Manager.
Ian Spencer Myles	Millás Semillas	Freelance Project Manager	Project Management plans and consultancy related to project functionality.

Stakeholder Register

This project document is used to register any new stakeholder, which includes the following information (see **Chart 45**):

- **ID**: A sequential number starting from number one that must be assigned to identify each stakeholder.
- **Stakeholder**: The description in name (or organization) identified that must be registered within the chart.
- **Functional Area**: The area where the stakeholder is engaged.
- **Roles-Responsibilities:** Description of the activities of each stakeholder and assigned roles that are identified.
- **Main expectations:** Stakeholders' expectations of the project's deliveries.
- **Major requirements:** Stakeholders' specific requirements related to the project.
- **Influence-Impact:** The level of influence each stakeholder has and the possible impact on the project development.

Additional comments: Any comments that can improve the description of each stakeholder.

Stakeholder Management Plan, Change Process

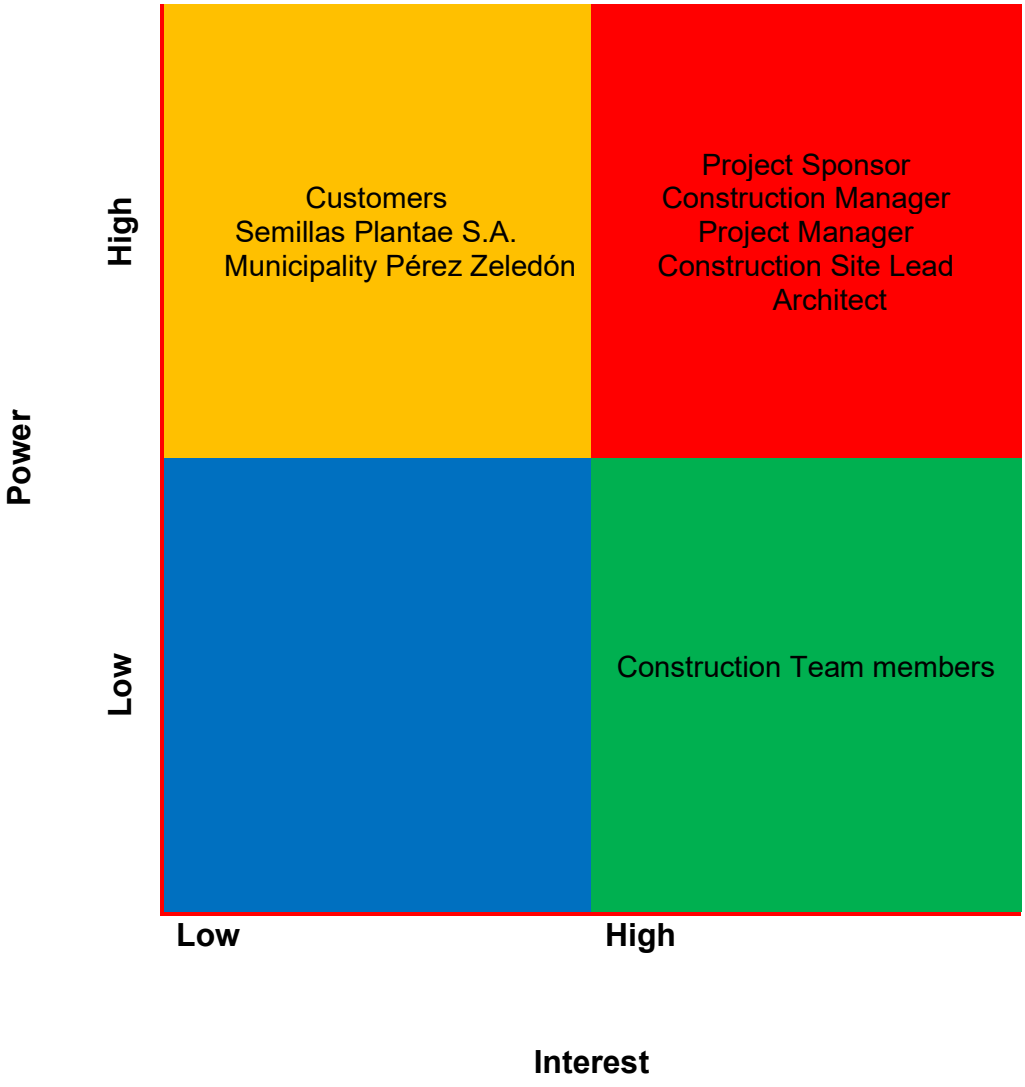
The Stakeholder Management Plan defined in this document can only be altered through the change management process at the request of the project sponsor. Requirements must be authorized and documented by the project manager and project sponsor. If the Change Request format is not utilized, changes will not occur, and the project manager will have the sole right to refuse changes. Once the change is submitted, the project sponsor will have two working days to approve or deny the request. All change requests will be documented, and approval depends on the priority of the change and its effect on project completion.

Power Interest Matrix

Chart 38 is used to group the stakeholders according to their authority (power) level within the project and their corresponding level of concern (interest) related to the project completion.

Figure 38

Power Interest Graph



Note. Own work. (Myles, 2023)

Stakeholder register

Project Name:	Development of a Community Seed Bank, Pérez Zeledón.
Project Objective:	To develop a project management plan for creating the Pérez Zeledón community seed bank that enhances the organic seed distribution in Costa Rica.

Chart 45

Stakeholder Register

Source: Author of Study, 2023

ID	Stakeholders	Functional Area	Roles-Responsibilities	Main Expectations	Major Requirements	Power-Interest	Additional Comment
1	Lic. Roger Montero Solís	Project Sponsor	Project Sponsor, who authorizes the project change management process, approves the deliverables and project closure.	Financial funding is promptly available and sourced for the project, and all objectives are met.	Construction of the seed bank will be delivered on time and within the defined costs.	High/High	Project Sponsor
2	Victor Vargas Santana	Construction	Construction Team Manager-Responsible for managing all project construction processes.	Materials are available for the project work within the triple constraints.	Construction materials and funding are available for the project.t	High/High	

ID	Stakeholders	Functional Area	Roles-Responsibilities	Main Expectations	Major Requirements	Power-Interest	Additional Comment
3	Rigoberto Zuñiga Toledano	Construction	Construction Site Lead-accountable for all project construction processes.	Materials are available for the project work within the triple constraints.	Construction materials and funding are available for the project.	High/High	
4	Construction Team	Construction	Team members-Responsible for all construction tasks.	Funding and scheduled time are available to complete project construction.	Construction materials and funding are available for the project.	Low/High	
5	Carlos Gallego Rodriguez	Design	Architect-Responsible for the design process needed for project construction.	Funding and time are available to complete the architecture survey.	Funding is available to complete architectural drawings.	High/High	
6	Ian Spencer Myles	Project Management	Project Manager-Responsible for coordinating all project work to achieve the project objectives.	Financial funding is promptly available and sourced for the project, and all objectives are met.	Construction of the seed bank will be delivered on time and within the defined costs.	High/High	Project Manager

ID	Stakeholders	Functional Area	Roles-Responsibilities	Main Expectations	Major Requirements	Power-Interest	Additional Comment
7	Customers	Others	None	Community seed bank stores organic seeds.	Seed storage and distribution.	Low/High	
8	Semillas Plantae S.A.	Sales	None	Community seed bank stores organic seeds.	Seed storage and distribution.	Low/High	
9	Municipality Pérez Zeledón	Others	None	Community seed bank stores organic seeds.	The system matches with information shown within the invoice sales.	Low/High	

Power interest Matrix

Chart 46

Stakeholder's Power Interest Matrix

Source: Author of Study, 2023

Stakeholders		Classification (Low/High)		Comments
ID	Name	Power	Interest	
1	Lic. Roger Montero Solís	High	High	Project Sponsor. High power towards the project as the primary financial source—increased interest in project success as the regional director (MAG).
2	Victor Vargas Santana	High	High	Construction Manager. Point lead for all building construction. High power and interest as his company is paid to construct the seed bank.
3	Rigoberto Zuñiga Toledano	High	High	Construction Site Lead. Like his supervisor, Victor Vargas Santana, Rigoberto oversees the construction site and the Construction team.
4	Construction Team	Low	High	All 18 members. Low power as they carry out the physical construction. They have a high interest in project success as they are paid to complete the contracted work.
5	Carlos Gallego Rodriguez	High	High	Architect. Responsible in the planning stage for correct building blueprints. High power and interest because of the importance of his work.
6	Ian Spencer Myles	High	High	Project Manager. Works for Millás Semillas farm. Has high power and interest as a project manager directing all project work. He ensures the community seed bank fulfills all Millás Semillas and Semillas Plantae requirements.

Stakeholders		Classification (Low/High)		Comments
ID	Name	Power	Interest	
7	Customers	Low	High	Local customers have low power due to a lack of direct involvement in project construction/design—high interest due to their expected seed bank use.
8	Semillas Plantae S.A.	Low	High	Partner farm with Millás Semillas. Has low power to influence the project but is intensely interested in the market potential for distributing seeds in the Southern Zone when the project is finished (high interest).
9	Municipality Pérez Zeledón	Low	High	The municipality has a high interest in the project as the local director is the project sponsor—low power to influence the project directly as an organization (Low power). Power is held in the position of Lic. Roger Montero Solís.

5 CONCLUSIONS

After the development of all project objectives, the following conclusions were realized regarding the project:

1) The established project management plan details all essential elements to accomplish the project. The project management plan was critical in developing the project due to the overlap of local stakeholders. The project benefits from the organization and structure of the project management plan to carry out the planning and construction required for the project.

2) The Scope management plan details the project's parameters and includes the project's exclusions. The project is designed as a theoretical project that can be achieved in the future, given the support of the local municipality in Pérez Zeledón, Costa Rica, and the funds required. The scope management plan provides the needed depth of the project and can be adjusted when the project is ready for execution.

3) The schedule management plan details the project schedule needed to complete the community seed bank (CSB) construction. The schedule for the project was drafted to include two years, Monday through Friday work weeks, and 8 hours per day work. Because of the historical data regarding rainfall, the project was built around the rainy season and included optimal

timing to complete all planning and construction requirements. Because of the project's complexity, more time was allocated in the planning phase to develop the architectural requirements for constructing the seed bank using the straw-bale method. Lastly, additional CAD architectural drawings will be purchased and utilized in designing the seed bank. These factors explain the length of the planning phase of the project schedule.

4) The project's cost management plan details the project's planned cost. Due to the specialists needed for the project, solar and water specialists, special attention was given to the estimated cost for the different construction components. The solar company researched was Purasol, with a proven track record for solar panels, water heaters, and off-grid solar systems. The water tank specialist, RQL CR, was researched to build the 100 m3 tank. The costs were computed using three-point estimation.

5) The quality management plan details elaborate on the project's various quality requirements. Quality specifics were crucial for the sustainable/regenerative properties of the seed bank. The seed bank construction required a standalone water tank with rain gutters that supply rainwater to the tank. Additionally, the roof required solar panels, a water heater, and a small hot water tank for the seed bank's restroom and kitchen area. The community seed bank has several features that make the

building multipurpose. The building is designed to serve as an office space (Millás Semillas S.A.), a solar power collection point for the seed bank refrigerators, and a drip irrigation system connected to the gutter rain catchment system and 100m3 water tank from the roof. These three elements were essential for the project to reach the required quality level.

6) The resources management plan for the project construction detailed the specific staff and material resources required. The staff resources required include the 20-member construction team for the project. This estimate was researched and deemed adequate to build a small house-sized building (300m2). Additionally, the plan includes the five primary stakeholders as the responsible parties to ensure that all resources for the project are secured and provided.

7) The community seed bank project (CSB) contains a detailed communication management plan that focuses heavily on communication between the various project stakeholders. The plan emphasizes mobile communication methods such as WhatsApp, email, and Zoom capabilities. Additionally, in-person meetings are planned at a minimum, monthly, to discuss the pertinent project details. Meeting intervals increase to weekly during the construction phase of the project because the majority of the project resources will be involved during this phase.

8) The risk management plan covered the specific objective regarding the risk involved in the project. Using qualitative analysis, the main risks that the project faces are overbudgeting, slow communication timeframes between the Project Manager and team, and lack of community usage of the seed bank. Three solutions were created to mitigate these three risks. They include updating project materials costs, communicating the critical importance of communication during the project initiation phase, and increasing community engagement regarding using the seed bank. It is vital that the construction team contracted for this project understands the objectives and contributes qualified and dependable workers. Lastly, community engagement through the project manager and the Municipality P.Z. office is crucial for the buy-in from the local farmers to utilize the community seed bank (CSB) space for seed storage and distribution.

9) The community seed bank project (CSBP) is designed to blend green and conventional construction methods. The green techniques chosen for the project include constructing the seed bank 300m2 structure using the straw-bale method. The straw-bale method utilizes a building method that uses bales of straw as structural elements for building construction. Additionally, the earthbag construction method was researched as well. The earthbag method utilizes local soil as a building material to provide a

cheap yet abundant alternative to other building materials such as concrete. A pre-designed CAD architecture schematic is purchased and utilized in the architecture design phase of the project by a local contract architect. Within the procurement management plan, the specifics of the building plans are solidified by the construction manager to enable a smooth construction phase of the project.

10) The community seed bank construction project (CSBP) contains many diverse stakeholders. The Stakeholder management plan facilitates the need to categorize all stakeholders (direct vs. indirect) and to highlight the degrees of power and influence. The stakeholder management plan establishes the formal commitment of all stakeholders towards project success. Primarily due to the contract nature of the project involving a freelance project manager hired on behalf of Millás Semillas S.A. to manage the project work, the majority of the direct stakeholders have both high power and influence over project success. Also, the contracted architect and construction team will provide the critical labor for the project. The project utilized a power interest matrix to detail to all stakeholders where each stakeholder is involved in the project regarding project responsibility. This transparency will create a united team and enhance the cooperation of all stakeholders to achieve a successful project outcome.

11) The entire project management plan was created to balance the seed bank construction's social, environmental, and economic aspects. Extensive research was conducted to provide context for the feasibility of building the seed bank in the Brunca region. The social elements researched involved more community involvement in food production. The environmental concerns examined included climate change, global warming, and weather unpredictability. Lastly, the economic issue explored focused on the cost of food production using organic methods and locally grown, native stable crops such as corn, beans, and rice. The project business case described that Finca Millás Semillas S.A. would produce native Costa Rican beans, rice, and corn, which are staples of the Costa Rican diet. In the late 20th century, staple food crop seeds (beans, rice, and corn) began to be purchased by commercial Costa Rican farmers through distribution channels/contracts of the MAG because it was deemed a cheaper method than purchasing locally produced crop seed in Costa Rica and has since left local organic crop seeds not to be bought or grown by farmers. The result of this business model involves a heavy reliance on European and American seeds, which Costa Rican farmers then use for cultivation. The local farmers' ability to purchase Costa Rica seeds has become eroded and has thus decreased crop diversity. The community seed bank project (CSBP) is associated with Semillas Plantae, a Costa Rican company based in San Jose with three farms focused on producing

Costa Rican crop seeds. The community seed bank (CSB) in Pérez Zeledón will function as a hub in the Brunca region to produce the vital corn, beans, and rice from the area. Additionally, the seed bank will partner with the local farm network to increase the camaraderie and emphasize local farming methods, storage, and distribution of seeds in the region. By operating in this way, the project will continue to advocate for organic/permaculture farming, Costa Rican food production, and regenerative/sustainable practices.

6 RECOMMENDATIONS

Several areas of concern were identified as the Final Graduation Project was developed. The recommendations below include further research on organic food production, regenerative building, and farmer community involvement.

1. The project manager should increase the dialogue with MAG Pérez Zeledón., and Lic Roger Montero S. regarding organic farming practices in P.Z., Costa Rica. Research provided by Semillas Plantae indicates that many food crops grown in Costa Rica are derived from seeds purchased from the United States and Europe. This shift in food origin takes away from the Costa Rican farmers' ability and success to produce food in Costa Rica without the reliance on outside contracts and foreign spending on foreign crop seeds. More efforts between the MAG P.Z. office and the project manager can highlight the exact details of this problem.

2. The project manager and construction manager should research more regenerative building methods. The project consulted the earthbag architecture plans created by Dr. Owen Geiger, who passed away recently in 2018. More research on regenerative building experts in Costa Rica is needed to understand the capability of building in this environment fully.

3. Millás Semillas S.A. and Semillas Plantae S.A. are recommended to hold a seed expo cooperative in San Isidro, Pérez Zeledón. An expo cooperative will increase the engagement between the two agribusinesses and formalize bonds before creating the community seed bank project (CSB) in Pérez Zeledón. Currently, there is little voice surrounding this topic in the Brunca region.
4. The project manager and Semillas Plantae are further recommended to research food production models between commercial and organic farmers. Semillas Plantae is a pioneer in organic farming, with three farms contributing to seed production. More research is needed to network and account for the remaining organic farms, especially in a post-pandemic world that disrupts many processes and businesses.

5. In partnership with Universidad de Costa Rica (UCR), the project manager will research local food crops produced with organic farming methods from Costa Rican-produced seeds. This partnership will provide a baseline for organic farming research concerning native food crops in the Brunca region.

6. The project manager leads a combined research effort between UCR, MAG, and Semillas Plantae regarding the total percentage of food crops produced in Costa Rica (foreign origin) and the portion grown in Costa Rica

from native food seeds. The proposed project uses the independent efforts of the project manager, MAG, and Semillas Plantae and combines them to produce this much-needed report and data.

7. It is recommended that the project manager completes a study of Brunca region farmers to analyze how climate change affects local farmers. A sample size of the largest local farms would help determine the effects to harvest and distribution to local markets.

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

The creation and execution of the community seed bank's project (CSBP) management plan is in response to the greater need for seed conservation efforts at the local level. Increased climate changes, such as unpredictable weather events, cause disruptions in farmers' timelines for planting and harvesting. The community seed bank project (CSBP) is undertaken as a method of regenerative development to bring crop seed post-harvest back into the cycle as seed for future crops and is repeated when practicing traditional techniques such as permaculture farming. Permaculture contrasts commercial agriculture, where national/federal seed producers purchase seeds season after season. By maintaining a community seed bank, seeds from every harvest are reinvested back in the farming cycle at the local level and contribute to the organic nature of permaculture farming, thus, creating a more sustainable environment at the local level.

The effects of designing the community seed bank (CSB) are aligned with sustainability due to the grassroots initiative to create the project. The project manager is a local citizen practicing organic farming and desires to network with other residents to tackle the climate issues affecting seed conservation. The seed bank impacts all local farmers considering seeds are essential to crop harvesting. The project aims to address the

inefficiencies in acquiring quality seeds without purchasing from government-sponsored sale organizations that may or may not be selling GMO seed products. The project also aims to increase the fair distribution of organic, local seeds for harvest by providing a seed bank accessible to the farmers in the Southern Zone. The social and environmental issues related to organic, local seed distribution are collectively addressed by the community seed bank managing the local seed network. The economic impact of relying on outside companies and agencies is negated by the community taking responsibility for managing seeds in a sustainable and regenerative way, considering the number of sustenance farms in the Southern Zone. Many farmers are turning away from commercial farming methods due to irregular weather patterns and a move to maximize crop harvest potentials while saving on farming expenses.

The project is related to the U.N. SDGs #12 and #15. The 12th SDG is the responsible consumption and production of food supplies. The immediate goal is to ensure sustainable consumption and production patterns. By creating the community seed bank (CSB), local farmers in the Southern Zone are empowered to practice and meet this SDG by practicing sustainable harvesting and seed collection methods in the seed bank. The 12th SDG ensures that seeds are not wasted by being discarded and are instead collected locally, which reduces the carbon footprint in

transportation waste. The 15th SDG is to protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and biodiversity loss (U.N., 2022). According to the U.N., "90% of global deforestation is due to agricultural expansion" (U.N., 2022). By practicing community seed collection with the local seed bank, the local community is practicing permaculture farming methods that inherently seek to reduce agriculture expansion.

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9 APPENDICES

Appendix 1: FGP Charter

CHARTER OF THE PROPOSED FINAL GRADUATION PROJECT (FGP)

1. Student name

Ian Spencer Myles

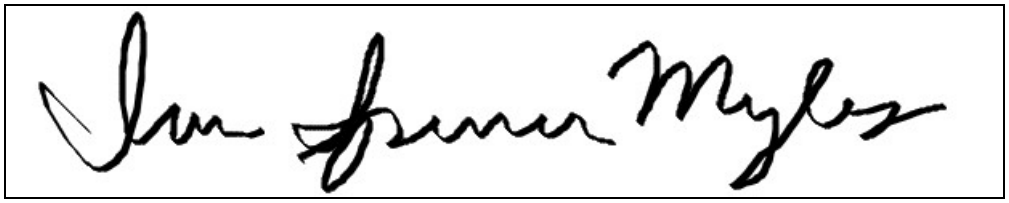
2. FGP name

Pérez Zeledón Community Seed Bank Project Management Plan

3. Application Area (Sector or activity)

Agriculture (Conservation)

4. Student signature



5. Name of the Graduation Seminar facilitator

Professor Carlos Brenes

6. Signature of the facilitator

7. Date of charter approval

July 30th, 2022

8. Project start and finish date

September 19th, 2022	June 2nd, 2023

9. Research question

What elements are necessary to facilitate the design and construction of a community seed bank that complies with germplasm conservatory standards?

10. Research hypothesis

Can a project management plan be created for the design and construction of a community seed bank in Pérez Zeledón, Costa Rica which will follow germplasm conservation standards?

11. General objective

General objective: To develop a project management plan for creating the Pérez Zeledón community seed bank that complies with conservatory standards.

12. Specific objectives

Specific Objectives:

1. To create the project charter to elaborate key elements for developing the project management plan.
2. To build a project scope management plan to achieve the techniques and procedures that define the project's parameters and manage them to ensure fulfillment according to stakeholder requirements.
3. To create a schedule management plan, which will include methods, processes, and procedures that will influence the dedication and management of the time allotted to project activities and ensure its completion within budget.
4. To elaborate a cost management plan that will serve as a model for effective management of project costs, including realistic budget forecasts, financial resources flow, monetary performance, budget control, and monitoring and finalizing the project within budget.
5. To build a project quality management plan which will arrange the processes and procedures that will communicate the definition of criteria/

indicators for quality measures and guarantee satisfactory expectations of the project stakeholders.

6. To develop a resource management plan which empowers the reference framework for the organization and allocation of resources according to the expectations and requirements of the project.
7. To build a communication plan to ensure appropriate stakeholders' engagement through prompt and proper access to information throughout the project design and implementation processes.
8. To create a risk management plan that will provide the approaches and methods of risk management in implementing the project and reduce negative impacts on the project's outcomes.
9. To develop a procurement management plan that will define the approaches, procedures, and processes to ensure that the suitable materials are accessible to the project as required. Green procurement methods will be prioritized and utilized.
10. To produce a stakeholder management plan that will establish the methods and paths facilitating the commitment of team members who can influence the project's outcomes up and down the chain.
11. To elaborate a project management plan that successfully balances the community seed bank project's social, environmental, and economic aspects by using resources to improve the community's welfare. This approach will build an abundance of the local support network needed for future agricultural advancement.

13. FGP purpose or justification

Costa Rica contains a large diversity of flora and fauna, with a national government and population that honors and respects the environment. Costa Rica is a global leader in regenerative development and management, with 2/3rds of current energy production derived from hydropower, overall yielding 100% energy output from renewable sources. In addition to focusing on energy production, Costa Rica practices a concentrated effort toward agriculture contributing to 7% of the country's GDP in 2022. With the socio-economic focus of Costa Rica on agriculture, it is evident that climate change is a concerning threat and challenge to Costa Rica's environmental development. One specific area is farming and germplasm. As climate change continues to affect countries worldwide, Costa Rica remains susceptible, if not actively proactive, towards regenerative agriculture conservation. The Centro Agronómico Tropical de Investigación y Enseñanza (CATIE) Botanical Gardens were founded in 1942 with the mission of special conservation of rare plants to include economic and crop seed banks. Since 1942, three other seed banks were created in Costa Rica as far south as Las Cruces near the Panama border. This final graduation project (FGP) aims to create a project management plan to establish a community seed bank within Pérez Zeledón. By creating a community seed bank in Pérez Zeledón, the southern region of Costa Rica will benefit from a community effort to preserve and regenerate seeds in the area. From the two seed bank locations in Cartago to the seed bank in Las Cruces, there is a gap of 395km in the Southern Zone that does not have a recognized seed conservation effort. By establishing a community seed bank in the heart of the Southern Zone (Pérez Zeledón), local networking can develop and enrich the conservation efforts of local farmers in the region. Additionally, a focused effort on regenerative development and green technologies will be utilized to offset harmful environmental impacts. The long-term benefit is a model community seed bank with local networks of farmers contributing to the conservation and distribution of rare, endangered, and crop seeds for the benefit of Costa Rica.

Description of the product:

The Project Management Plan for creating the community seed bank in the municipality of Pérez Zeledón. It will include all subsidiary plans: 1. Project Charter, 2. Scope Management Plan, 3. Schedule Management Plan, 4. Cost Management Plan, 5. Quality Management Plan, 6. Resource Management Plan, 7. Communication Management Plan, 8. Risk Management Plan, 9. Procurement Management Plan, and 10. Stakeholder Management Plan. The Project Management Plan will adhere to the PMBOK guide 7th edition guidance and include sustainable and regenerative methodologies.

14. Work Breakdown Structure (WBS).

1. FGP
    1.1 FGP profile
        1.1.1 Introduction
        1.1.2 Theoretical framework
        1.1.3 Methodological framework
        1.1.4 Preliminary bibliographical research
        1.1.5 Annexes (FGP schedule, FGP WBS, FGP Charter)
    1.2 FGP development
        1.2.1 Creation of Project Charter
            1.2.1.1 Elaborate key elements for the Project Management Plan.
        1.2.2 Build Scope Management Plan
            1.2.2.1 Create Techniques and procedures of the scope management plan
            1.2.2.2 Define parameters of the scope management plan
            1.2.2.3 Clarify fulfillment of stakeholder requirements
        1.2.3 Create Schedule Management Plan
            1.2.3.1 Detail methods, process, and procedures for a schedule management plan
        1.2.4 Elaborate Cost Management Plan
            1.2.4.1 Create budget forecasts
            1.2.4.2 Create financial resource flow
            1.2.4.3 Create a monetary performance report
            1.2.4.4 Create budget control and monitoring report
        1.2.5 Build Quality Management Plan
            1.2.5.1 Detail processes and procedures in the communications plan
        1.2.6 Develop a Resource Management Plan
            1.2.6.1 Detail resource management plan according to resource allocation and project requirements
        1.2.7 Build Communication Plan
        1.2.8 Create a Risk Management Plan
            1.2.8.1 Define approaches and methods of risk management work
        1.2.9 Develop a Procurement Management Plan
            1.2.9.1 Define approaches, procedures, and processes of procurement
            1.2.9.2 Prioritize green procurement methods
        1.2.10 Produce Stakeholder Management Plan
            1.2.10.1 Establish methods and paths to facilitate stakeholder teamwork
        1.2.11 Elaborate Project Management Plan

1.2.11.1 Design work that includes a balanced framework of local resources
1.2.11.2 Design local support networks
1.2.12 Conclusions
1.2.13 Recommendations
1.2.14 Reference lists
1.2.15 Annexes
1.2.16 Tutor approval for reading.
1.3 Reader's review.
1.4 Board of examiners evaluation

15. FGP budget

The total budget will be $500 to cover copies, shipping fees, internet service provider, and transportation costs for interviews.

16. FGP planning and development assumptions

1. Information regarding seed banks in Costa Rica is readily accessible.
2. Access to germplasm conservation standards will be non-restrictive, with no limitations for educational use.
3. Each week, research time will be 20hrs during the FGP development process.
4. Transportation will be available to conduct in-country interviews with Costa Rican seed banks.

17. FGP constraints

1. Limited manpower: only the project manager is working on all plans.
2. Limited time to develop the project management plan (3 months, including the December holiday).
3. Funds are unavailable to visit and interview all 4 Costa Rican Seed Banks.
4. The closest model community Seed bank in Nicaragua: La Labranza no. 2, will not be a part of the interview analysis.

18. FGP development risks

1. An intense hurricane late in the season might delay field work consisting of interviews, which might delay the deliverable development.
2. Increasing tensions regarding the United States and its involvement in global conflicts might personally affect the project manager due to personal matters involving immigration which might delay the development of deliverables.
3. Ongoing cases of the COVID-19 virus could impact more restrictions and delay interviews, which might delay deliverable development.
4. Language barriers between the local population and the project manager might delay data processing times for field research.

19. FGP main milestones

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

Deliverable	**Finish estimated date**
1.1 FGP profile	September 4, 2022
1.1.1 Introduction	July 24, 2022
1.1.2 Theoretical framework	August 14, 2022
1.1.3 Methodological framework	August 21, 2022
1.1.4 Preliminary bibliographical research	August 28, 2022
1.1.5 Annexes (FGP schedule, FGP WBS, FGP Charter)	September 4, 2022
1.2 FGP development	January 12, 2023
1.2.1 Creation of Project Charter	September 23, 2022
1.2.1.1 Elaborate key elements for the Project Management Plan.	September 23, 2022
1.2.2 Build Scope Management Plan	December 5, 2022
1.2.2.1 Create Techniques and procedures of the scope management plan	December 5, 2022
1.2.2.2 Define parameters of the scope management plan	December 5, 2022
1.2.2.3 Clarify fulfillment of stakeholder requirements	December 5, 2022

*Compile Nursery interview data/edits	December 5, 2022
1.2.3 Create Schedule Management Plan	December 5, 2022
1.2.3.1 Detail methods, process, and procedures for the schedule management plan	December 5, 2022
1.2.4 Elaborate Cost Management Plan	March 24, 2023
*Seed bank research data completed	March 24, 2023
1.2.4.1 Create budget forecasts	March 24, 2023
1.2.4.2 Create financial resource flow	March 24, 2023
1.2.4.3 Create a monetary performance report	March 24, 2023
1.2.4.4 Create budget control and monitoring report	March 24, 2023
1.2.5 Build Quality Management Plan	March 31, 2023
1.2.5.1 Detail processes and procedures in the communications plan	March 31, 2023
1.2.6 Develop a Resource Management Plan	April 7, 2023
*Construction research interviews and data compiled	April 7, 2023
1.2.6.1 Detail resource management plan according to resource allocation and project requirements	April 7, 2023
1.2.7 Build Communication Plan	April 14, 2023
*Finish construction data and edits	April 14, 2023
1.2.8 Create a Risk Management Plan	April 21, 2023
1.2.8.1 Define approaches and methods of risk management work	April 21, 2023
1.2.9 Develop a Procurement Management Plan	April 28, 2023
1.2.9.1 Define approaches, procedures, and processes of procurement	April 28, 2023
1.2.9.2 Prioritize green procurement methods	April 28, 2023
1.2.10 Produce Stakeholder Management Plan	May 5, 2023
1.2.10.1 Establish methods and paths to facilitate stakeholder teamwork	May 5, 2023
1.2.11 Elaborate Project Management Plan	May 12, 2023
1.2.11.1 Design work that includes a balanced framework of local resources	May 12, 2023
1.2.11.2 Design local support networks	May 12, 2023
1.2.12 Conclusions	May 19, 2023
1.2.13 Recommendations	May 19, 2023
1.2.14 Reference lists	May 19, 2023
1.2.15 Annexes	May 19, 2023

1.2.16 Tutor approval for reading.	June 2, 2023
1.3 Reader's review.	June 5, 2023
1.4 Board of examiners evaluation	July 3, 2023

20. Theoretical framework

20.1 Estate of the "matter."

In the wake of continued changes in the environment regarding climate change, attitudes toward traditional farming practices have increased. Inherent traditional farming practice is the collection/conservation of seeds amongst farmers and is the initial definition of a community seed bank. Permaculture practitioners believe in the synchronous nature of seed-to-crop farming without synthetic herbicides and fertilizers. To increase crop success, farmers are moving towards permaculture and away from plantation farming. The added problem is the extreme weather fluctuations that make it difficult for farmers to plant and harvest on a consistent schedule. Methods that increase success are tested daily to mitigate these issues, with signs of success. Indigenous farmers in the Southern Zone have begun exclusively practicing permaculture methods out of the need to survive the increased changes. There is also increased pressure on the Costa Rican government to take an official stance on climate change and sanction GMO farming. Currently, individual cantons are charged with how to proceed regarding this agriculture crisis. Organizations such as the private institution IICA and CATIE exist that research seeds for conservation. These institutions serve in advisory roles to the Ministry of Agriculture and Cattle Raising (MAG). To date, no formal decision has been made by the national government on endorsing GMO crops to be widely cultivated and sold. The lack of a government decision on GMO crops is similar to uncharted territory for endorsing community seed banks. Community seed banks serve as the collective center of subsistence farming, where communities come together to trade and conserve organic seeds of various varieties of crops. Costa Rica maintains four government and private organization-endorsed seed banks for research purposes, primarily in the central valley. No community seed bank endeavor exists in the Southern Zone, specifically in Pérez Zeledón. Increased traditional methods such as community seed banks are crucial in the sustainability and regenerability of agricultural resources as a significant effort to combat global climate change. Research on the benefits and costs of traditional farming vs. GMO farming is ongoing. Currently, Costa Rica prides itself as a nation that is a global leader in green energy and similar conservation of natural resources.

20.2 Basic conceptual framework

Basic concepts: Climate change Genetically Modified Organisms (GMO) Community Seed Bank Permaculture Subsistence farming Commercial farming

21. Methodological framework

Objective	Name of deliverable	Information sources	Research method	Tools	Restrictions
1. To create the project charter to elaborate key elements for developing the project management plan.	Project Charter	Primary: Scholarly journal articles, field interviews Secondary: Books, articles, and law reviews	Qualitative-Inductive-Deductive	Checklists, interviews, document analysis, root cause analysis	The project charter has to be completed in one week.
2. To build a project scope management plan to achieve the techniques and procedures that define the project's parameters and manage them to ensure fulfillment according to stakeholder requirements.	Scope Management Plan	Primary: Scholarly journal articles Secondary: Books, articles	Quantitative-Structured interviews Qualitative-Participant observation Qualitative-Inductive-Deductive	Benchmarking, interviews, mind maps	Limited time: (Only three months allocated to the development of the PMP). Limited human resources (Only the project manager is working on all plans).
3. To create a schedule management plan, which will include methods, processes, and procedures that will influence the dedication and	Schedule Management Plan	Primary: Scholarly journal articles Secondary:	Quantitative-Structured interviews Qualitative-Participant observation	Alternatives analysis, earned value analysis, simulation	Limited time: (Only three months allocated to the development of the PMP).

management of the time allotted to project activities and ensure its completion within budget.		Books, articles	Qualitative-Inductive-Deductive		Limited human resources (Only the project manager is working on all plans).
4. To elaborate a cost management plan that will serve as a model for effective management of project costs, including realistic budget forecasts, financial resources flow, monetary performance, budget control, and monitoring and finalizing the project within budget.	Cost Management Plan	Primary: Scholarly journal articles Secondary: Books, articles	Quantitative-Structured interviews Qualitative-Participant observation Qualitative-Inductive-Deductive	Bottom-up estimating, Historical information review.	Limited time: (Only three months allocated to the development of the PMP). Limited human resources (Only the project manager is working on all plans).
5. To build a project quality management plan which will arrange the processes and procedures that will communicate the definition of criteria/ indicators for quality measures and guarantee satisfactory expectations of the project stakeholders.	Quality Management Plan	Primary: Scholarly journal articles, filed interviews Secondary: Books, articles, and law reviews	Qualitative-Inductive-Deductive	Cost-benefit analysis, process analysis	Limited time: (Only three months allocated to the development of the PMP). Limited human resources (Only the project manager is working on all plans).

6. To develop a resource management plan which empowers the reference framework for the organization and allocation of resources according to the expectations and requirements of the project.	Resource Management Plan	Primary: Scholarly journal articles Secondary: Books, articles, and law reviews	Qualitative-Inductive-Deductive	Hierarchy charts and RAM	Limited time: (Only three months allocated to the development of the PMP). Limited human resources (Only the project manager is working on all plans).
7. To build a communication plan to ensure appropriate stakeholders' engagement through prompt and appropriate access to information throughout the project design and implementation processes.	Communication Management Plan	Primary: Scholarly journal articles and field interviews Secondary: Books, articles	Quantitative-Structured interviews Qualitative-Participant observation Qualitative-Inductive-Deductive	Stakeholder engagement assessment matrix	Limited time: (Only three months allocated to the development of the PMP). Limited human resources (Only the project manager is working on all plans).
8. To create a risk management plan that will provide the approaches and methods of risk management in the implementation of the project and reduce negative impacts on the project's outcomes.	Risk Management Plan	Primary: Scholarly journal articles, field interviews Secondary: Books, articles, and law reviews	Quantitative-Structured interviews Qualitative-Participant observation Qualitative-Inductive-Deductive	Probability and impact matrix, SWOT analysis, decision tree	Limited time: (Only three months allocated to the development of the PMP). Limited human resources (Only the

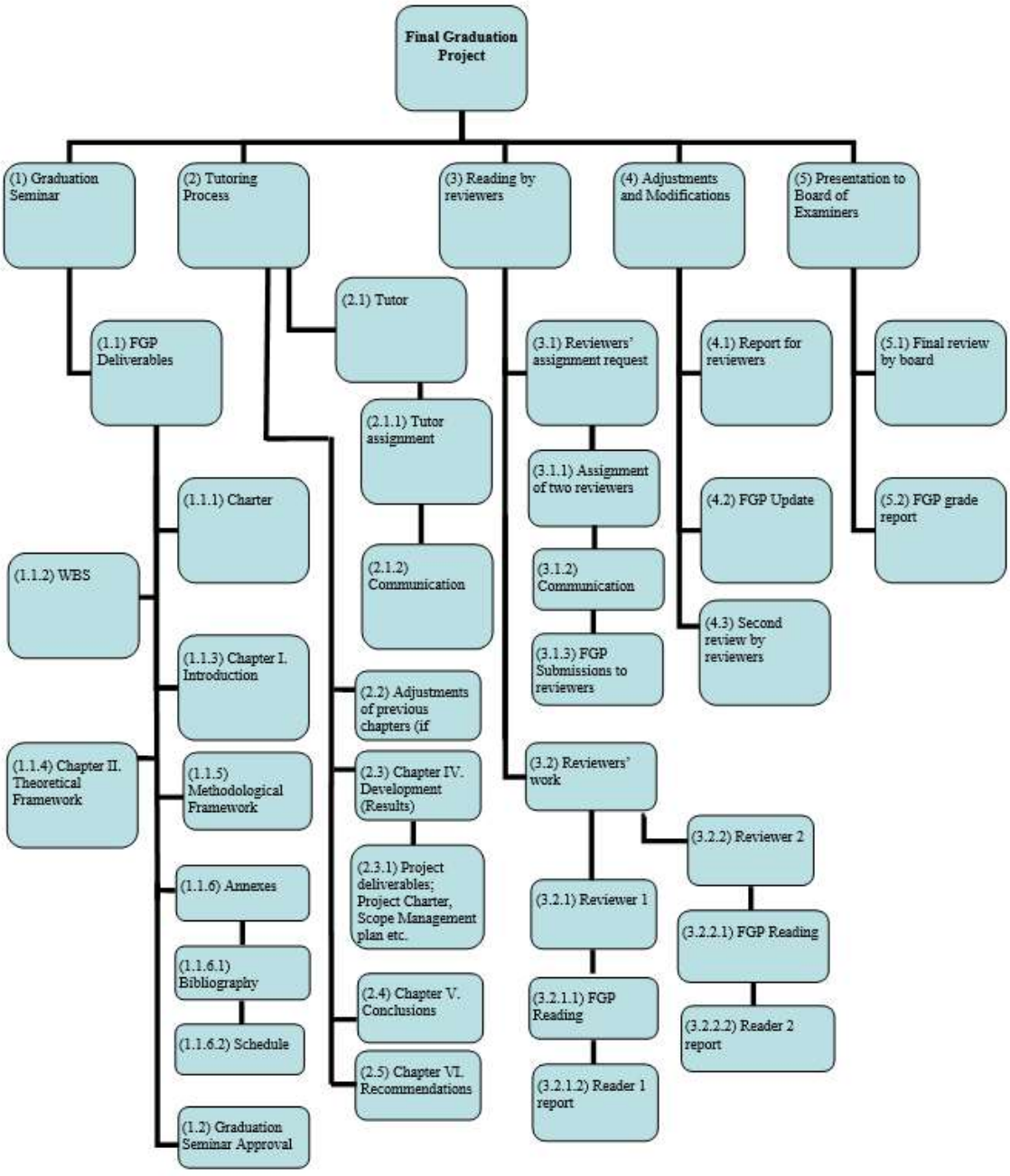
					project manager is working on all plans).
9. To develop a procurement management plan that will define the approaches, procedures, and processes to ensure that suitable materials are accessible to the project as required. Green procurement methods will be prioritized and utilized.	Procurement Management Plan	Primary: Scholarly journal articles, field interviews Secondary: Books, articles, and law reviews	Quantitative-Structured interviews Qualitative-Participant observation Qualitative-Inductive-Deductive	Market research, proposal evaluation	Limited time: (Only three months allocated to the development of the PMP). Limited human resources (Only the project manager is working on all plans).
10. To produce a stakeholder management plan that will establish the methods and paths facilitating the commitment of team members who can influence the project's outcomes up and down the chain.	Stakeholder Management Plan	Primary: Scholarly journal articles Secondary: Books, articles, and law reviews	Quantitative-Structured interviews Qualitative-Participant observation Qualitative-Inductive-Deductive	Stakeholder analysis, prioritization ranking	Limited time: (Only three months allocated to the development of the PMP). Limited human resources (Only the project manager is working on all plans).
11. To elaborate a project management plan that successfully balances the community seed	Project Management Plan	Primary: Scholarly journal articles, field interviews	Quantitative-Structured interviews	Project management information system (PMIS)	Limited time: (Only three months allocated to the

bank project's social, environmental, and economic aspects by using resources to improve the community's welfare. This approach will build an abundance of the local support network needed for future agricultural advancement.		Secondary: Books, articles, and law reviews	Qualitative-Participant observation Qualitative-Inductive-Deductive		development of the PMP). Limited human resources (Only the project manager is working on all plans).

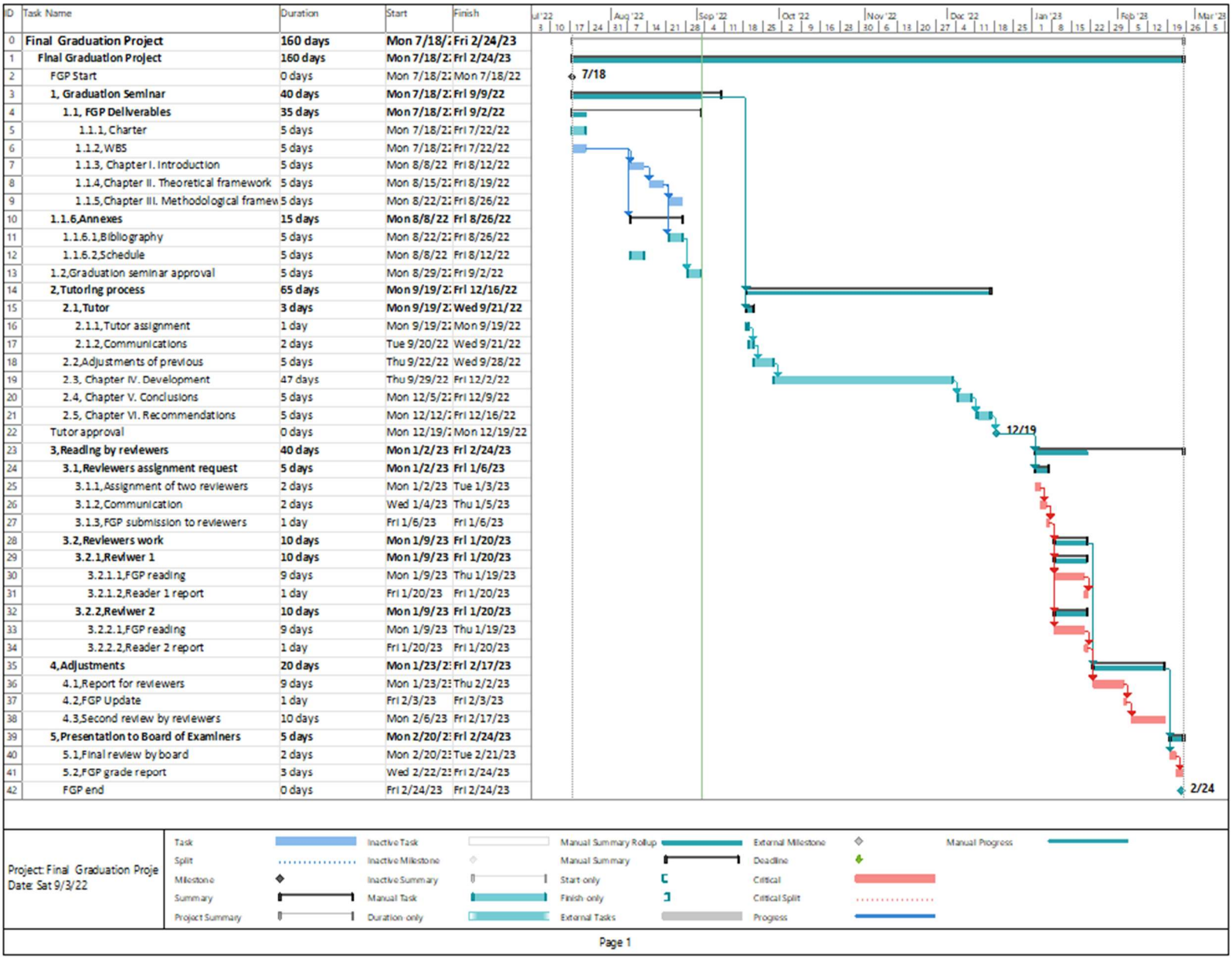
22. Validation of the work in the field of regenerative and sustainable development.

The project management plan for creating the community seed bank (CSB) in Pérez Zeledón will comply with regenerative and sustainable development concepts. For regenerative development, the seed bank will conserve crop seeds that the local farmers in the Southern Zone will manage. Additionally, the farmers will ensure that waste does not occur by discarded seeds left over from harvest. Lastly, the local farmers will trade and redistribute the seeds to be planted, grown, and harvested to ensure the regenerative nature of local agriculture in the Southern Zone. Regarding sustainability, the community seed bank (CSB) provides a sustainable solution for farmers concerning acquiring seeds for the planting season. A non-sustainable alternative presently is purchasing government-sponsored seeds at government rates. As climate change continues to disrupt the agriculture market in Costa Rica, buying seeds may become too expensive, and the quality of the seeds is questionable due to GMO seed and crop cultivation in Costa Rica which is not 100% regulated at the national level. Therefore, the community seed bank infrastructure offers a traditional solution to the problem by empowering the local farmers to network, collect, share, and manage their seeds. These impacts are aligned with the intent of the U.N. SDGs 12 and 15 regarding sustainable land and resource usage and sustainable production and consumption patterns. Sustainability and regenerative development indicators are the measures of local farmer involvement with crop volumes before and after the transition to the community seed bank model. Measurements that can be taken are the yield of crops harvested, various levels of crops, farming and maintenance costs by farmers, and savings by farmers regarding seed purchases.

Appendix 2: FGP WBS



Appendix 3: FGP Schedule



ID	Task Name	Duration	Start	Finish
0	**Final Graduation Project**	**160 days**	**Mon 7/18/2**	**Fri 2/24/23**
1	**Final Graduation Project**	**160 days**	**Mon 7/18/2**	**Fri 2/24/23**
2	FGP Start	0 days	Mon 7/18/2	Mon 7/18/22
3	**1, Graduation Seminar**	**40 days**	**Mon 7/18/2**	**Fri 9/9/22**
4	**1.1, FGP Deliverables**	**35 days**	**Mon 7/18/2**	**Fri 9/2/22**
5	1.1.1, Charter	5 days	Mon 7/18/2	Fri 7/22/22
6	1.1.2, WBS	5 days	Mon 7/18/2	Fri 7/22/22
7	1.1.3, Chapter I. Introduction	5 days	Mon 8/8/22	Fri 8/12/22
8	1.1.4, Chapter II. Theoretical framework	5 days	Mon 8/15/2	Fri 8/19/22
9	1.1.5, Chapter III. Methodological framew	5 days	Mon 8/22/2	Fri 8/26/22
10	**1.1.6,Annexes**	**15 days**	**Mon 8/8/22**	**Fri 8/26/22**
11	1.1.6.1,Bibliography	5 days	Mon 8/22/2	Fri 8/26/22
12	1.1.6.2,Schedule	5 days	Mon 8/8/22	Fri 8/12/22
13	1.2,Graduation seminar approval	5 days	Mon 8/29/2	Fri 9/2/22
14	**2,Tutoring process**	**65 days**	**Mon 9/19/2**	**Fri 12/16/22**
15	**2.1,Tutor**	**3 days**	**Mon 9/19/2**	**Wed 9/21/22**
16	2.1.1,Tutor assignment	1 day	Mon 9/19/2	Mon 9/19/22
17	2.1.2,Communications	2 days	Tue 9/20/22	Wed 9/21/22
18	2.2,Adjustments of previous	5 days	Thu 9/22/22	Wed 9/28/22
19	2.3, Chapter IV. Development	47 days	Thu 9/29/22	Fri 12/2/22
20	2.4, Chapter V. Conclusions	5 days	Mon 12/5/2	Fri 12/9/22
21	2.5, Chapter VI. Recommendations	5 days	Mon 12/12/	Fri 12/16/22
22	Tutor approval	0 days	Mon 12/19/	Mon 12/19/22
23	**3,Reading by reviewers**	**40 days**	**Mon 1/2/23**	**Fri 2/24/23**
24	**3.1,Reviewers assignment request**	**5 days**	**Mon 1/2/23**	**Fri 1/6/23**
25	3.1.1,Assignment of two reviewers	2 days	Mon 1/2/23	Tue 1/3/23
26	3.1.2,Communication	2 days	Wed 1/4/23	Thu 1/5/23
27	3.1.3,FGP submission to reviewers	1 day	Fri 1/6/23	Fri 1/6/23
28	**3.2,Reviewers work**	**10 days**	**Mon 1/9/23**	**Fri 1/20/23**
29	**3.2.1,Reviwer 1**	**10 days**	**Mon 1/9/23**	**Fri 1/20/23**
30	3.2.1.1,FGP reading	9 days	Mon 1/9/23	Thu 1/19/23
31	3.2.1.2,Reader 1 report	1 day	Fri 1/20/23	Fri 1/20/23
32	**3.2.2,Reviwer 2**	**10 days**	**Mon 1/9/23**	**Fri 1/20/23**
33	3.2.2.1,FGP reading	9 days	Mon 1/9/23	Thu 1/19/23
34	3.2.2.2,Reader 2 report	1 day	Fri 1/20/23	Fri 1/20/23
35	**4,Adjustments**	**20 days**	**Mon 1/23/2**	**Fri 2/17/23**
36	4.1,Report for reviewers	9 days	Mon 1/23/2	Thu 2/2/23
37	4.2,FGP Update	1 day	Fri 2/3/23	Fri 2/3/23
38	4.3,Second review by reviewers	10 days	Mon 2/6/23	Fri 2/17/23
39	**5,Presentation to Board of Examiners**	**5 days**	**Mon 2/20/2**	**Fri 2/24/23**
40	5.1,Final review by board	2 days	Mon 2/20/2	Tue 2/21/23
41	5.2,FGP grade report	3 days	Wed 2/22/2	Fri 2/24/23
42	FGP end	0 days	Fri 2/24/23	Fri 2/24/23

Appendix 4: Change Request Format

MILLÁS SEMILLAS	**Change Request Format**	
Version 1.0	Document ID: 002-MSSB-CRF	03/24/2023

Project Name:			
Requested by:			
Issue Date:		**Change ID**	

Change Request (Please explain the reasons why change requesting):	
Expected impact:	**Priority**
	High ( )
	Medium ( )
	Low ( )

Areas Affected	
Integration	Resources
Scope	Communication
Schedule	Risk
Cost	Procurement
Quality	Stakeholders

Comments

Resolution	**Final Status**
	Approved ( )
	Denied ( )
Project Manager Signature:	Date:
Decision Maker Signature:	Date:

Appendix 5: Document Tracking

Document Tracking (*Document Name*)

General Information

	Information
Document Id	*Insert document I.D.*
Document Owner	*Millás Semillas, S.A.*
Issue Date	*Insert Date*
Last Saved Date	*Insert Date*
File Name	*Insert Document Name (same as above)*

Change Control

Version	Issue Date	Changes
1.0	*Insert date*	*Detail Changes*

Approvals

Role	Name	Signature	Date
Project Sponsor	*Insert P.S. Name*	*Insert Digital Signature*	*Insert date*
Project Manager	*Insert PM Name*	*Insert Digital Signature*	*Insert date*

Appendix 6: Monthly Report

MILLÁS SEMILLAS	**Monthly Report**	
Version 1.0	Document ID: 013-MSSB-MR	03/24/2023

Project Name:	
Issued by:	
Issue Date:	

CPI		**% Project Complete**		**AC**	
SPI		**Planned Completion**		**CV**	

Description of Monthly updates
Reasons for Delays
Corrective Actions
Other information

Meeting Participants	
Name	**Signature**

Appendix 7: Project Report

MILLÁS SEMILLAS	**Project Report**	
Version 1.0	Document ID: 015-MSSB-PR	03/24/2023
Project Name:	Construction of Community Seed Bank	
Project Objective:	To develop a project management plan for creating the Pérez Zeledón community seed bank that enhances the organic seed distribution in Costa Rica.	

COST OVERVIEW

MON 7/10/23 - THU 7/10/25

COST
$0.00

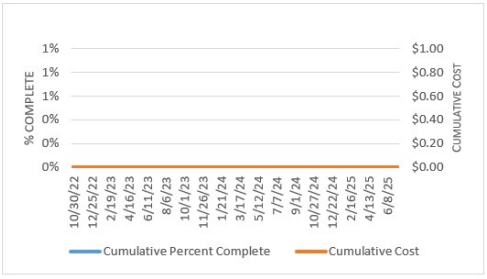
REMAINING COST
$0.00

% COMPLETE
0%

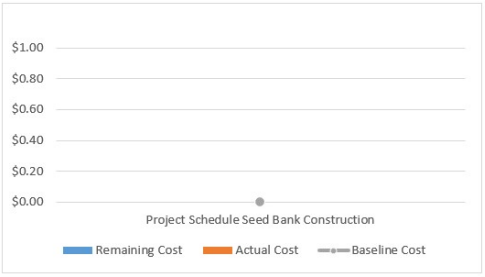
COST STATUS

Name	Actual Cost	Remaining Cost	Baseline Cost	Cost	Cost Variance
Project Schedule Seed Bank Construction	$0.00	$0.00	$0.00	$0.00	$0.00

PROGRESS VERSUS COST

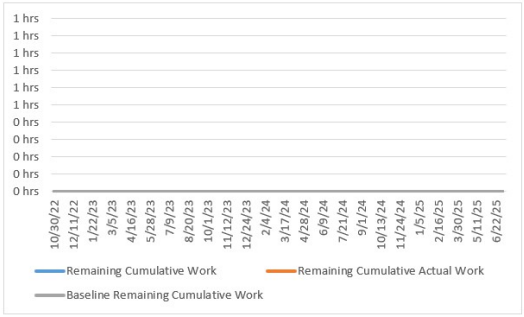


COST STATUS



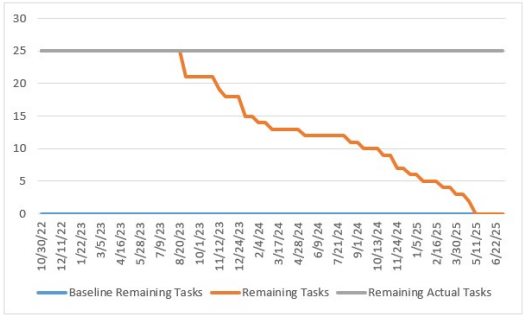
Mon 7/10/23 - Thu 7/10/25

BURNDOWN



WORK BURNDOWN

Shows how much work you have completed and how much you have left. If the remaining cumulative work line is steeper, then the project may be late. Is your baseline zero?

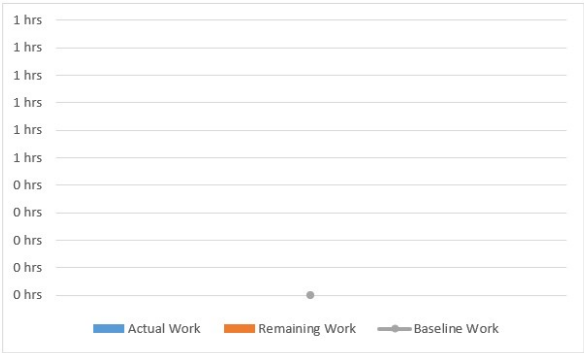


TASK BURNDOWN

Shows how many tasks you have completed and how many you have left. If the remaining tasks line is steeper, then your project may be late.

RESOURCE OVERVIEW

RESOURCE STATS



WORK STATUS

RESOURCE STATUS

Name	Start	Finish	Remaining Work

Late Task

Name	Start	Finish	Duration	%Complete	Resource Names

Tasks starting soon

Name	Resource Names	Start	Finish	Work

Issue Date:	
Reported by:	
Received by	

Appendix 8: Quality Control

MILLÁS SEMILLAS	**Quality Control**	
Version 1.0	Document ID: 007-MSSB-QC	03/31/2023

Project Name:	Construction of Community Seed Bank		
Project Objective:	To develop a project management plan for creating the Pérez Zeledón community seed bank that enhances the organic seed distribution in Costa Rica.		
Date		**Inspection No.**	

Requirement id	

Description	**Acceptable Criteria**

Findings	**Resolution**
	Approved ◯
	Rejected ◯

Comments	
Supervised by:	PM approval:

Appendix 9: Risk Register

MILLÁS SEMILLAS	**Risk Register**	
Version 1.0	Document ID: 014-MSSB-RR	03/24/2023

Project Name:	Construction of Community Seed Bank			
Project Objective:	To develop a project management plan for creating the Pérez Zeledón community seed bank that enhances the organic seed distribution in Costa Rica.			
Status:	Approved ( )	Denied ( )	**Change ID:**	

Please describe the risk found in the following table.

RBS Code	Cause	Risk	Consequence	Probability	Impact	PxI

Please assess the risk based on the results obtained in PxI and compare them within the following table.

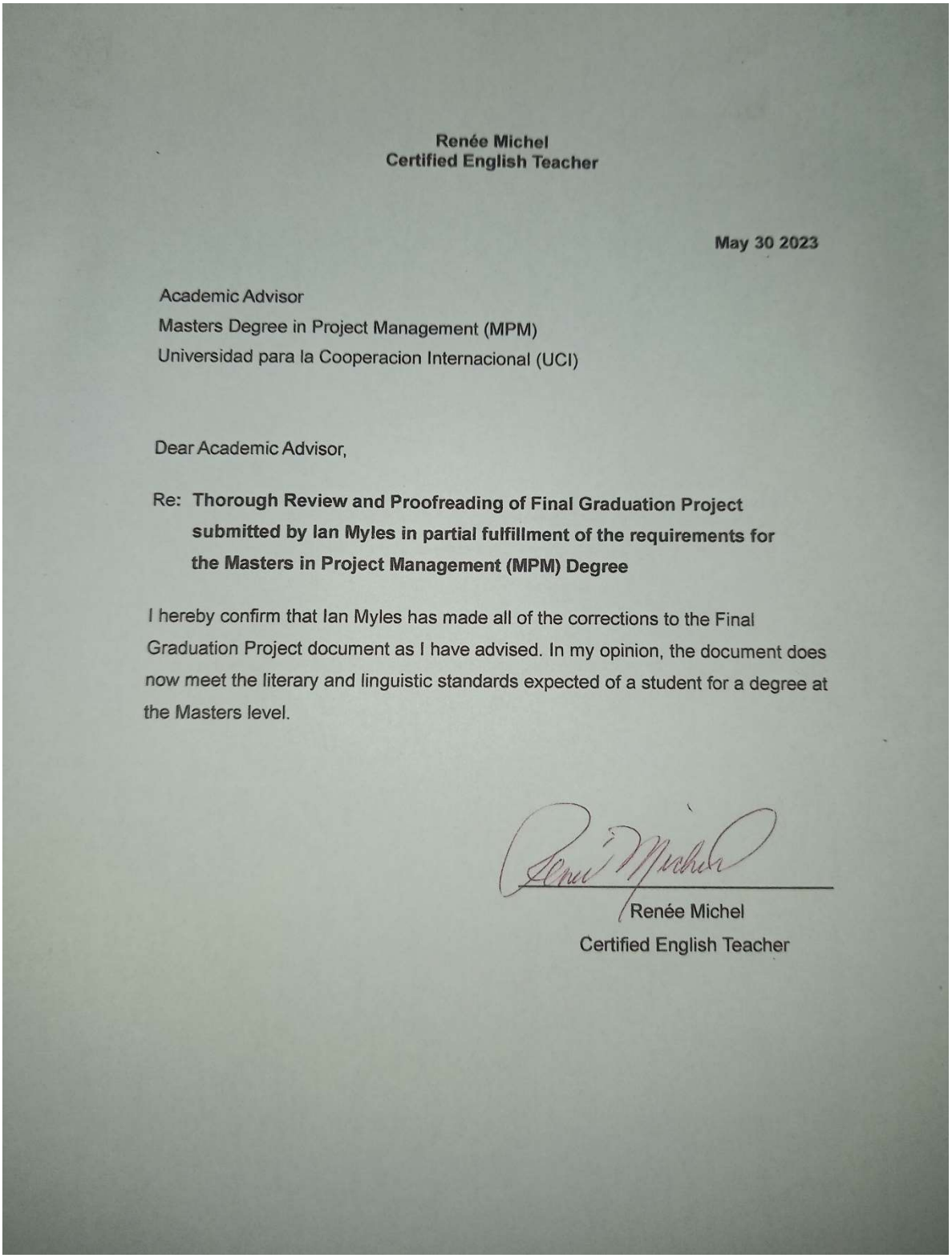
Priority	Score	Strategy	Description
Very High Risk	$x \geq 15$	Escalate Transfer	The risk will be elevated to the project sponsor or contracted to an expert for resolution, depending on the situation.
High risk	$9 < x < 15$	Address	These risks must also be addressed but are not prioritized as high as very high-risk category.
Medium Risk	$4 < x < 8$	Mitigate	It is necessary to define corrective actions to reduce the probability and impact of these risks.
Low Risk	$x \leq 3$	Accept	No action will be taken.

Does the risk require planning a response:	Yes	No
If yes, please describe the response proposed:		

Appendix 10: Project Management Plans and Tracking Documents

Document ID	Document Name	Date	Version
001-MSSB-PC	*Project Charter*	*March 24, 2024*	*1.0*
002-MSSB-CRF	*Change Request Format*	*March 24, 2024*	*1.0*
003-MSSB-SMP	*Scope Management Plan*	*March 24, 2024*	*1.0*
004-MSSB-SHMP	*Schedule Management Plan*	*March 24, 2024*	*1.0*
005-MSSB-CMP	*Cost Management Plan*	*March 24, 2024*	*1.0*
006-MSSB-QMP	*Quality Management Plan*	*March 31, 2023*	*1.0*
007-MSSB-QC	*Quality Control*	*March 31, 2023*	*1.0*
008-MSSB-RMP	*Resource Management Plan*	*April 07, 2023*	*1.0*
009-MSSB-CMP	*Communication Management Plan*	*April 14, 2023*	*1.0*
010-MSSB-RMP	*Risk Management Plan*	*April 21, 2023*	*1.0*
011-MSSB-PMP	*Procurement Management Plan*	*April 28th, 2023*	*1.0*
012-MSSB-STMP	*Stakeholder Management Plan*	*May 05, 2023*	*1.0*
013-MSSB-MR	*Monthly Report*	*March 24, 2024*	*1.0*
014-MSSB-RR	*Risk Register*	*March 24, 2024*	*1.0*
015-MSSB-PR	*Project Report*	*March 24, 2024*	*1.0*

Appendix 11: Certificate of Review



Renée Michel
Certified English Teacher

May 30 2023

Academic Advisor
Masters Degree in Project Management (MPM)
Universidad para la Cooperacion Internacional (UCI)

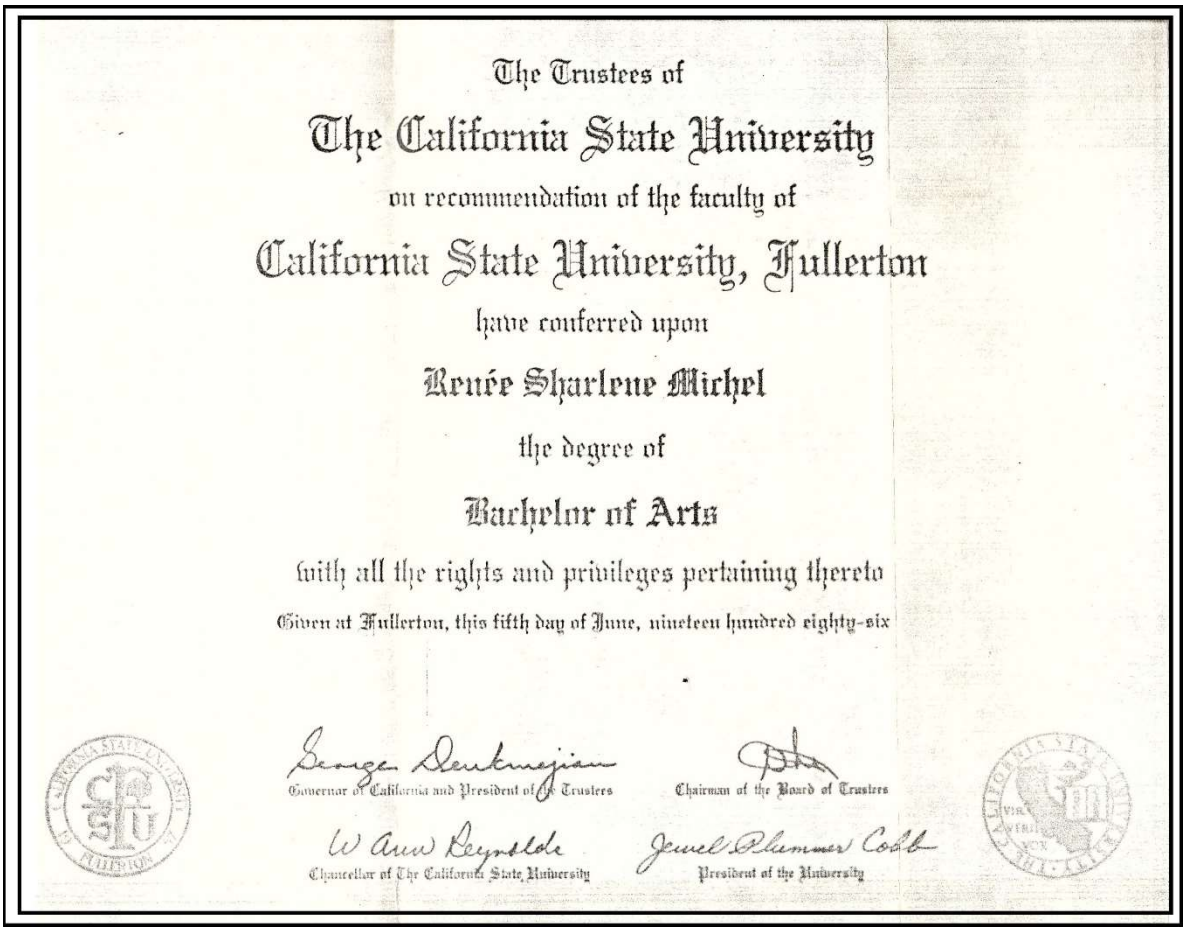
Dear Academic Advisor,

Re: **Thorough Review and Proofreading of Final Graduation Project submitted by Ian Myles in partial fulfillment of the requirements for the Masters in Project Management (MPM) Degree**

I hereby confirm that Ian Myles has made all of the corrections to the Final Graduation Project document as I have advised. In my opinion, the document does now meet the literary and linguistic standards expected of a student for a degree at the Masters level.

Renée Michel
Certified English Teacher

Appendix 12: Linguistic Credentials



The Trustees of

The California State University

on recommendation of the faculty of

California State University, Fullerton

have conferred upon

Renée Sharlene Michel

the degree of

Bachelor of Arts

with all the rights and privileges pertaining thereto

Given at Fullerton, this fifth day of June, nineteen hundred eighty-six

George Deukmejian
Governor of California and President of the Trustees

Chairman of the Board of Trustees

W Ann Reynolds
Chancellor of The California State University

Jewel Plummer Cobb
President of the University

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Renee Michel

has successfully completed all program requirements of

Teaching English to Speakers of Other Languages
Teaching English as a Second Language
Teaching English as a Foreign Language

This intensive 60-hour TESOL/TESL/TEFL Teacher Training Certification Course includes: lesson planning, classroom management techniques, skills development (grammar, pronunciation, listening, speaking, reading, and writing), teaching strategies, teaching multi-level classes, and a teaching practicum.

R. Dawson — *May 7, 2017*
Chairman

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310-820-2359 or 1-800-779-1779
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R. Dawson *July 31, 2017*
Chairman

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