UNIVERSIDAD PARA LA COOPERACION INTERNACIONAL
(UCI)

A PROJECT MANAGEMENT PLAN FOR A PROJECT ON INTEGRATING
CLIMATE CHANGE TOPICS IN PRIMARY SCHOOL SCIENCE CURRICULUM
(GRADES K - 6) IN SAINT LUCIA

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DEDICATION

I dedicate this thesis to my parents, my inspiration, my husband, my rock, and my sisters and brothers. This would not have been possible without your love, continuous support, and encouragement.

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ABSTRACT

The objective of the FGP is to integrate climate change topics into the Primary School Science Curriculum in Saint Lucia for Grades K-6 by developing a robust project management plan that adheres to the Project Management Institute's standards. The absence of climate change topics in the current curriculum highlights the need for integration. This is important, as it can help equip learners with the knowledge and skills they need to help build a more resilient Saint Lucian society, in the face of climate change challenges.

To achieve this objective, the FGP involves working with the Department of Education (DoE) to plan and initiate the project and to ensure that the integration process is efficient, effective, and successful. The FGP uses both qualitative and quantitative research methods, and a variety of research and project management tools such as expert judgement, data analysis, benchmarking, decomposition, bottom-up estimation, interviews, and surveys.

The outcome of the FGP project is the project management plan that includes ten (10) subsidiary management plans, utilising the FGP Charter and PMI's standards as guides. The plans aim to unify project processes, define project work, ensure timely completion within the budget, and meet relevant national, regional, and international quality standards. The plans also identify necessary products and services, strategies to engage stakeholders, disseminate project information, and manage project risks. A P5 impact analysis demonstrates the project's potential to mitigate sustainability risks and contribute to Saint Lucia's sustainability goals.

The FGP recommends building a strong project team within DoE, establishing a scope change control process, communicating the Schedule Management Plan, regularly monitoring project costs, providing the project team with quality management training, developing a resource calendar, implementing reporting templates and standard formats, utilising software for project and procurement risk management, and setting a procedure for managing stakeholder conflicts. These recommendations aim to harmonise project processes, minimize risks associated with scope creep, improve stakeholders' communications, and ensure effective stakeholder management.

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ABBREVIATIONS AND ACRONYMS

CAMDU	Curriculum and Material Development Unit
AC	Actual Cost
BAC	Budget at Completion
CC	Climate Change
CEO	Chief Education Officer
CO2	Carbon Dioxide
CPI	Cost Performance Index
CS	Civil Society
CV	Cost Variance
DEO	District Education Officer
DoE	Department of Education
DVRP	Disaster Vulnerability Reduction Project
EAC	Estimate at Completion
EEFs	Enterprise Environmental Factors
ESD	Education for Sustainable Development
EV	Earned Value
EVA	Earned Value Analysis
FGP	Final Graduation Project
GPE	Global Partner for Education
IT	Information Technology
K	Kindergarten
M&E	Monitoring and Evaluation
MoESISTV	Ministry of Education, Sustainable Development, Innovation, Science Technology and Vocational Training
NGOs	Non-Governmental Organizations
OBS	Organisational Breakdown Structure
OECS	Organization of Eastern Caribbean States
OERU	OECS Education Resource Unit
P5IA	P5 Impact Analysis
PESTLE	Political, Economic Sociological, Technological, Legal, Environmental
PM	Project Manager
PMBOK	Project Management Body of Knowledge
PMI	Project Management Institute
PMIS	Project Management Information System
PSC	Private Sector Companies
PV	Planned Value
RACI	Responsible-Accountable-Consult-Inform
RBS	Resource Breakdown Structure
RFP	Request for proposals
SDGs	Sustainable Development Go
SIDS	Small Island Developing States
SOW	Statement of Work
SPI	Schedule Performance Index
SV	Schedule Variance
SWOT	Strengths, Weaknesses, Opportunities, Threats

TBL	Triple Baseline
TCPI	To Complete Performance Index
TOR	Terms of Reference
UNEP	United Nation Environment Program
UNEPA	United States Environmental Protection Agency
UNESCO	United Nations Educational and Scientific Community Organization
UNFCCC	United Nations Framework Convention on Climate Change
USA	United States of America
VAC	Variance at Completion
WBS	Work Breakdown Structure
XCD	Eastern Caribbean Dollars

EXECUTIVE SUMMARY

Saint Lucia, like other Small Island Developing States (SIDS) is vulnerable to climate change – one of the major global challenges of the 21st century – which has negatively impacted the environment, human health and well-being, and the Saint Lucian economy. Equipping young learners with the knowledge, values, and skills to make informed decisions, and to take the appropriate actions to participate in more sustainable lifestyles and economies, will help to build a more climate-resilient Saint Lucian society.

The Primary School Science Curriculum in Saint Lucia for Grades K (Kindergarten) to 6 does not explicitly address climate change topics. A project management plan framed within the best practices of project management that employs the Project Management Institute's (PMI) standards, can achieve effective and efficient integration of climate change topics for Grades K to 6. While the Curriculum and Material Development Unit (CAMDU) within the Department of Education (DoE) is responsible for developing curriculum guides for primary education, it may not have the technical project management knowledge and skills to initiate a project of this complexity.

The general objective of the final graduation project (FGP) was to develop a project management plan that effectively integrated climate change topics into the Primary School Science Curriculum in Saint Lucia for Grades K to 6, using the Project Management Institute's (PMI) standards as a guide. The project management plan ensured robust treatment and integration of PMI's 10 project management knowledge areas, by developing the corresponding 10 subsidiary management plans. It also helped to adequately address the project management processes with the relevant outputs, using the appropriate project management tools and techniques. In this regard, the project management plan ensured the efficient, effective, and successful achievement of the general objective of the FGP.

The general objective of the FGP was attained through the achievement of the following specific objectives: to develop a Project Charter for approval and authorization to initiate the FGP; to explain the impact of regenerative or sustainable development on the project execution and deliverables; to create an integration management plan to integrate the various processes and project management activities; to create a scope management plan to account for all required work; to prepare a schedule management plan to ensure completion of the project within the agreed timeframe; to develop a cost management plan to ensure that project costs are within the budget; to create a quality management plan to describe the quality standards for meeting the requirements to integrate climate change topics in the Primary School Science Curriculum Grades (K-6); to prepare a resource management plan for the resources needed for successful completion of the project; to develop a communication management plan to describe the project's communication strategy for administration and dissemination of information; to produce a risk management plan to describe the project's risks, the risk management activities and monitoring strategies; to create a procurement management plan to acquire the products and services needed to meet the project deliverables; and to prepare a stakeholder engagement plan to identify the project stakeholders and the strategies needed for involvement in project decisions and activities.

The FGP used both qualitative and quantitative research methods. Quantitative methods were used to generalize from the analysis of the numerical data. Both primary and secondary sources of information were used. The primary sources of information were significant in elucidating the perspectives and perceptions of the stakeholders (DoE officials, principals, teachers, and students). These sources included document review, and content compiled from the interviews, focus group discussions, surveys, and questionnaires. The principal sources of secondary information included the PMBOK® (Project Management Body of Knowledge) Guide 6th and 7th Editions, international and national education publications on environmental education, the Organization of Eastern Caribbean States (OECS) Primary School Standard/Curriculum Guide for Natural Science, statistical reports, articles from journals and DoE documents. The research and project management tools used to collect the data to achieve the specific objectives of the FGP included expert judgement, interviews, data analysis, benchmarking, decomposition, and bottom-up estimation. Additionally, surveys and questionnaires were used which allowed the collection and analysis of numerical data related to the project's cost estimation to determine the budget and to facilitate quantitative risk to support risk response strategies.

The project management plan for "Integrating Climate Change Topics in the Primary School Science Curriculum in Saint Lucia for Grades K – 6" was successfully developed using the Project Management Institute's standards as a guide. The FGP Charter guided the development of the plan which provided a roadmap for the project through the 10 subsidiary management plans, including an analysis of regenerative and sustainable development impacts. Furthermore, the Integration Management Plan unified the project processes, while the Scope and Schedule Management Plans defined the work and ensured its timely completion. Cost and Quality Management Plans kept costs within budget and used relevant quality standards (DoE, OECS, USA). Moreover, the Resource and Procurement Management Plans identified necessary products and services. The Stakeholder and Communications Management Plans engaged stakeholders and disseminated relevant project information. The Risk Management Plan identified and managed project risks. Additionally, a P5 impact analysis demonstrated the project's capacity to mitigate sustainability risks and contribute to Saint Lucia's sustainability goals.

The FGP Charter could be improved by specifying exclusions, identifying project stakeholders and their roles, and establishing project success metrics. Additionally, to provide concise information on sustainability, it is recommended to analyse its impact on the project's scope, schedule, cost, quality, risks, and Procurement Management Plans. Building a strong project team within the DoE would help to harmonize the integration management plan, and stakeholders should be provided with an established scope change control process (as part of the Scope Management Plan). The Schedule Management plan should be communicated clearly to all stakeholders, and regular monitoring of project costs should be scheduled. The project team should receive training to produce high-quality deliverables, and a resource calendar should be developed to show resource availability over time. Developing reporting templates and standard formats can improve communication, and software can help manage project and procurement risks. Finally, establishing a set procedure for managing stakeholder conflicts would ensure effective stakeholder management.

1   INTRODUCTION

This chapter formally introduces the Final Graduation Project (FGP). It details the background of the research as it relates to the sponsoring organizations and the project context. It describes the problem under research, the potential solution, the research purpose, its benefits, and the reasons for executing the project. Moreover, it details the foundations that support it, as well as the general and the specific objectives of FGP.

1.1   Background

The climate change crisis is one of the major global challenges of the 21st century. It affects the environment, human health and well-being, livelihoods, culture, and the economic status of populations (PAHO, 2019). Saint Lucia, like other Small Island Developing States (SIDS) is vulnerable to climate change due to its small size, geographic location, its economic dependence on tourism and agriculture and other social, economic and health issues (GOSL, 2018). Investing in climate change education means that children leaving schools will be educated about the topic. Learners will be equipped with climate change knowledge and can make informed decisions. Furthermore, they can take the appropriate actions, acquire the necessary values and skills to participate in more sustainable lifestyles and economies, and build climate-resilient societies (Gibb, 2016).

Saint Lucia has made primary education compulsory for all children. Thus, children from the age of five (5) years are all required to attend school (Corporate Planning Unit [CPU], 2020). Consequently, all public primary schools fall under the remit of the Ministry of Education, Sustainable Development, Innovation, Science Technology and Vocational Training (MoESISTV), and under the responsibility of the Department of Education (DoE). The central role of the DoE is the effective management and administration of the Education Sector in Saint Lucia. The Curriculum and Material Development Unit (CAMDU) within the DoE is responsible for developing curricula guides for the primary and secondary schools (Saint Lucia – Ministry of Education, n.d.).

The Natural Science Curriculum Guides OECS Learning Standards Science, and Technology for Grades K to 6 does not explicitly address climate change topics and

concepts. However, Saint Lucia is not an isolated case. Globally, research suggests that the climate change topic is not well addressed in school curricula. Eilam (2022) suggests that the reason for such poor representation in school curricula is due to the limited conceptualization of the concept by educators (Eilam, 2022a). The teacher training and education programmes in Saint Lucia do not have environmental education and climate change programmes. However, the Government of Saint Lucia is aware of its importance and proposed integration of climate change in policies centred around the topic (UNESCO, 2022). In this regard, primary and secondary school teachers as well as district education officers, and principals, participated in a series of workshops towards a Climate Change Teachers Toolkit (Peter, 2017).

Eilam (2022), in his examination of school curricula and relevant studies, found two (2) types of approaches for the inclusion of climate change topics in curricula. The first was the cross-curriculum inclusion approach which is the most prominent approach. It involves subsuming climate change under other disciplinary subjects across the curriculum (Lehtonen et al., 2019; Schreiner et al., 2005, as cited in Eilam, 2022a). The second and less common approach is the non-disciplinary, or interdisciplinary approach (Lehtonen et al., 2019; Schreiner et al., 2005, as cited in Eilam, 2022). The cross-curriculum inclusion approach has three (3) streams:

1. Climate change concepts subsumed under the sustainability or environmental literacy and under different subjects - double subsumed.

2. Climate change concepts inclusion within one (1) or more subjects.

3. Climate change concepts spread across different subjects (Eilam, 2022a).

In the report entitled, "*Climate Change Education in National Curricula: A Scoping Review of Climate Change Epistemology, Educational Policies and Implementation*" (2022), the recommendation concerning the approach to climate change inclusion are, developing a climate change subject; and determining benchmarks and standards of achievement, as well as using assessments. The report suggests indicators should be identified for evaluation if the cross-curriculum program is used. Thus, appropriate data should be collected from principals, teachers, and students; and an evidence-based rationale for inclusion should be developed (Eliam, 2022b).

Eliam 's recommendations for the curriculum organization are:

- Developing a rationale for the climate change curriculum organisation and thematic progression across the Grades levels.

- Making climate change knowledge the focus and identifying domain-specific skills.

- Systematically organising content for effective learning of climate change concepts.

- Developing a thematic organisation of the climate change content.

- Identifying the key concepts in each theme.

- Developing progression points and achievement outcomes by themes and Grades levels.

- Planning for the thematic integration of concepts at specified progression points along the learning sequence and their necessary assessments.

- Considering the appropriateness of climate change concepts in relation to student Grades levels.

The recommendations related to teaching and learning are:

- Making teachers and teaching needs central to the climate change curriculum by cultivating teacher pedagogical content and professional identity in climate change education.

- Not only focusing on the teaching of knowledge and skills but also creating a rich environment for hands-on learning, including experiential learning, inquiry-based learning, and learning during social interactions with others.

Successful execution of a project to integrate climate change topics into the Primary School Science Curriculum in Saint Lucia will require technical knowledge of project management and skilled planning. Thus, a project management plan framed within the PMI standard will provide a comprehensive guide to help tailor the project activities. This plan will help to achieve the effective and efficient integration of climate change topics using the most appropriate approach. The project management plan will describe how the application and integration of the project management processes will be: executed, monitored, controlled, and closed to meet specific success criteria (PMI, 2021). It will consist of the project charter, ten (10) subsidiary management plans and a plan that details how sustainability will be incorporated into the project.

1.2   Statement of the problem

The Primary School Science Curriculum in Saint Lucia lacks effective integration of climate change topics. As a result, students lack important knowledge, skills, and values required to develop positive attitudes and behaviours to reduce the impact of the climate change crisis in Saint Lucia. There is a need for an effective project management plan that utilises a set of best practices in project management (the PMI standard). This plan will guide effective integrations of the climate change topics. Although CAMDU may have some project experience, they may need more technical project management knowledge and skills for effective and efficient execution to increase the probability of success.

As such the FGP hypothesised that effective integration of climate change topics in the Primary School Science Curriculum in Saint Lucia for Grades K to 6 is possible using best practices as stipulated in the PMI standard for project management. In order to test the hypothesis, the following research questions were formulated:

1.   How will the project management plan ensure effective integration of

2.   climate change topics in the Primary School Science Curriculum Grades (K-6) in Saint Lucia?

3.   What project management tools and techniques will be the most effective in

aligning the project management plan with the Ministry of Education's objectives and that of the other stakeholders?

4. What components of the project management plan will best address the factors that influence the effective integration of climate change topics in the Primary School Science Curriculum?

5. How will the project management plan incorporate sustainability concerning product and process management impacts, as well as the social, environmental, and economic impacts?

A review of the Primary School Science Curriculum for Grades K to 6 revealed that that climate change topics were not explicitly addressed. This was confirmed through an informal interview with an elementary school teacher in Saint Lucia. The teacher indicated that there was no explicit mention of climate change in the Primary School Science Curriculum, but that climate change was taught when teaching the concepts of weather and pollution K. Malaykhan (personal communication January 11, 2023). This limitation was not only evident in Saint Lucia. According to a recent United Nations Educational and Scientific Community Organization (UNESCO) survey of 100 countries, 40 % of the countries surveyed had minimal level of climate change content in their curriculum (UNESCO, 2021a). UNESCO supports countries in integrating climate change into education through its "Education for Sustainable Development" initiative. It views environmental education as essential in preparing societies to address the climate crises (UNESCO, 2021a). Another UNESCO survey reported that almost 95 % of teachers believed that it was "*important*" or "*very important*" to teach about climate change and its impacts (UNESCO, 2021c).

1.3 Purpose

The overarching objective of the FGP was to develop an effective and efficient project management plan. The purpose of the project management plan was to achieve the project's objective: "Integrating climate change topics in the Primary School Science Curriculum for Grades K to 6". The inclusion of climate change topics will greatly benefit

students. Climate change education will help learners understand the issues and provide them with the necessary tools and skills to make informed decisions and take the appropriate actions to participate in sustainable lifestyles and economies to build climate-resilient societies.

The hypothesis of the FGP – "Effective integration of climate change topics in the Primary School Science Curriculum in Saint Lucia for Grades K to 6 is possible using best practices as stipulated in the PMI standard for project management" – was tested through the research questions. Thus, the project management plan will ensure robust treatment and integration of the ten (10) project management knowledge areas to ensure successful achievement of the general objective. The project management plan will describe how the application and integration of these processes will be executed, monitored, controlled, and closed to meet the specific success criteria of the project. It will help to ensure that the project is completed within the stipulated time and budget, to the satisfaction of all the stakeholders, and provide guidance to the project management team for effective communication with stakeholders. Additionally, it will ensure that risks are identified and managed, that quality is built into the project, and that the objectives of the project are aligned with the vision of the Ministry of Education. Finally, the project management plan will help to adequately execute all the project management processes (activities) with the relevant outputs relying upon the appropriate project management tools and techniques (PMI, 2017a).

1.4   General objective

To develop a Project Management Plan, framed by the standards of the Project Management Institute, to effectively integrate climate change topics in the Primary School Science Curriculum in Saint Lucia.

1.5   Specific objectives

1.   To develop a Project Charter for the Final Graduation Project (FGP) with the relevant approvals to the project's existence.

2   To explain the impact of regenerative and sustainable development on the
     project execution and deliverables.

3   To create an integration management plan to integrate the various processes
     and project management activities from the start to the completion of the
     project.

4   To create a scope management plan accounting for the acceptance criteria,
     deliverables, exclusions, assumptions, and constraints, to ensure the
     inclusion of all required work for project's successful completion.

5   To prepare a schedule management plan to ensure project completion within
     the agreed timeframe.

6   To develop a cost management plan to ensure project costs are planned,
     structured, controlled, and within the project's budget.

7   To create a quality management plan to describe the quality standards for
     meeting the requirements for integrating climate change topics in Primary
     School Science Curriculum Grades (K-6)

8   To prepare a resource management plan to identify, acquire, and manage the
     resources needed for the successful completion of the project.

9   To develop a communications management plan to describe the project's
     communication strategy for administering and disseminating information
     based on stakeholders' needs.

10   To produce a risk management plan to describe the project's risks, the risk
     management activities and monitoring strategies.

11   To create a procurement management plan to acquire the products and
     services needed to meet the project deliverables.

12   To prepare a stakeholder engagement plan to identify the project

     stakeholders and the strategies needed for involvement in project decisions
     and activities.

2 THEORETICAL FRAMEWORK

2.1 Company/Enterprise framework

2.1.1 Company/Enterprise background

The Department of Education (DoE) is a government entity that falls under the remit of the MoESISTV. The central role of the department is the effective management and administration of the education sector in Saint Lucia as well as advancing creative and innovative thinking. This important role is achieved through collaboration within the various divisions, units, sub-units, and partner agencies. (About us, n.d.). The main functions of the DoE are to:

- advise and be the liaison on matters related to education.

- develop appropriate strategies, policies, regulations, and programmes, as well as supervise and monitor their implementation.

- provide support, administrative and financial management to the public entities in Saint Lucia.

- ensure the upkeep of quality concerning the operation of schools through proper supervision.

- support professional development of teachers and principals.

- develop national school curricula and syllabi.

- manage student assessment and examination, academic accreditation, and placement.

- develop an efficient system for collecting, analyzing, reporting, and disseminating data from the department (About us, n.d.).

The OECS has developed a Regional Education Strategy through consultation with the OECS Ministerial Forum with the mantra "*Every Learner Succeeds*". The Strategy details the educational priorities for the period 2012-2021. One of the seven (7) imperatives

of the Strategy is, "*to improve curriculum and strategies for assessment to meet the needs of all learners*". This implies that the curriculum is not a static document but can be improved to meet the changing and current needs of the learner. Like the Regional Educational Strategy, the Regional Standard for the primary Grades was developed through the consensus of the OECS countries and is the curriculum guide. It is a benchmark for quality learner outcomes in Mathematics, Science & Technology, History and Literacy as per the OECS Harmonized Primary Curriculum, and the Caribbean Primary Exit Assessment. The learning standards may be utilised in the development of learning objectives and learning indicators (Organization of Eastern Caribbean States [OECS], 2018).

2.1.2   Mission and vision statement

The DoE is committed to developing an education system where all learners have equal access to quality experiences that contribute to lifelong learning and a citizenry that can meaningfully contribute to the development of the country and the region. This aspiration as expressed in the mission and the vision statement of the department and is as follows:

Mission Statement

"*To enable all learners to realize their full potential in their fields of interest by facilitating affordable, equitable quality educational experiences that empower them with the knowledge, skills, and values conducive to achieving success in a 21st- century environment*" (About us, n.d.).

Vision Statement

"*An education system that shapes the development of a literate, numerate, skilled, life-long learner; one who is values-driven, globally adaptable and contributing meaningfully to the development of self, community, nation, and the region*" (About us, n.d.).

The long-term outcome of the project is aligned with both the mission and the vision of the DoE. In this regard, it proposes to produce a citizenry equipped with knowledge, skills, attitudes, and behaviours, that can lead to meaningful actions in addressing the climate change crisis in Saint Lucia.

2.1.3   Organisational structure

The Ministry of Education, Sustainable Development, Innovation, Science, Technology and Vocational Training is responsible for the education sector in Saint Lucia. All matters related to public primary education in Saint Lucia are handled by the MoE. Matters related to the primary school curriculum fall under the Curriculum and Material Development Unit (CAMDU). The Curriculum and Material Development Unit (CAMDU) is one of the many units in the DoE whose mission is to "*provide quality instructional support services for the promotion of life-long learning and the development of human resources*" (Saint Lucia - Ministry of Education, n.d.). The Unit develops curricula guides for the primary and secondary education levels including that for Science and Technology. In achieving its mission, the unit works with other units in the department (Figure 1).

The Primary School Climate Change Curriculum Integration Project will be led by the Science Curriculum Officer and other officers from CAMDU. Together with the key project stakeholders (as shown in Figure 2), they will make up the project structure and form the project team. Other relevant stakeholders from the ministry will be identified during the life cycle of the project. The project structure aligns well with that of the MoESISTV and will be conducted by the CAMDU subunit in the DoE. The strategic placement of the project will allow effective inter-ministerial and departmental collaborations and communication as well as with the relevant units or subunits within the DoE. Collaboration with the local community, parents, Non-Governmental Organizations (NGOs) and the national and regional partners will be through the public primary school – which represents an important part of the community.

Figure 1

Organisational Chart of the Relevant Ministry of Education, Related to the Research Topic

Note. Prepared by Author

Figure 2

Primary School Climate Change Curriculum Integration Project Structure

Note. Prepared by Author

2.1.4 Products offered

The Ministry of Education, Sustainable Development, Innovation, Science, Technology and Vocational Training through the CAMDU unit of the DoE, offers the following products under the Natural Science Curriculum Guides OECS Learning Standards Science and Technology:

- OECS Learning Standards Science and Technology Grades K
- OECS Learning Standards Science and Technology Grades 1-2
- OECS Learning Standards Science and Technology Grades 3-4
- OECS Learning Standards Science and Technology Grades 5-6
- OECS Learning Standards Science and Technology Full Document
- Natural Science & Technology Curriculum Guide Modules
- Apportioned Primary Science & Technology Curriculum-Kindergarten-REVISED
- Apportioned Primary Science & Technology Curriculum-Grades 1-REVISED
- Apportioned Primary Science & Technology Curriculum-Grades 2-REVISED
- Apportioned Primary Science & Technology Curriculum-Grades 3-REVISED
- Apportioned Primary Science & Technology Curriculum-Grades 4-REVISED
- Apportioned Primary Science & Technology Curriculum-Grades 5-REVISED
- Apportioned Primary Science & Technology Curriculum-Grades 6-REVISED

Funding for the CAMDU products is through the government of Saint Lucia and the local, regional and international partners. The Regional Education Strategy was implemented through Global Partner for Education (GPE)-funded Education Plan Development Grant (provided to the OECS countries). A portion of the grant was used to develop regional learning standards for primary school Grades (OECS, 2018).

2.2 Project management concepts

2.2.2 Project management principles

The Guide to the Project Management Body of Knowledge (PMBOK® Guide) (2021), outlines the 12 project management principles as: stewardship, team, stakeholders, value, system thinking, leadership, tailoring, quality, complexity, risk, adaptation and

resilience, and change. The principles provide guidance; however, their application depends on the organisation's, context, project deliverables, project team, stakeholders and other factors (PMI, 2021).

The principles are as follows:

1) *"Be a diligent, respectful, and caring steward*

2) *Create a collaborative project team environment*

3) *Effectively engage with stakeholders*

4) *Focus on value*

5) *Recognize, evaluate and respond to system interactions*

6) *Demonstrate leadership behaviours*

7) *Tailor based on context*

8) *Build quality into processes and deliverables*

9) *Navigate complexity*

10) *Optimize risk response*

11) *Embrace adaptability and resilience*

12) *Enable change to achieve the envisioned future state"* (PMI, 2021, p.23).

The following paragraphs explain each of these principles in turn and illustrate how they are operationalized in the project in accordance with the Project Management Standard (PMI, 2021).

- **Stewardship**

Stewardship has different aspects to its meaning. In this context, it means being entrusted to care for something, responsible planning, use and management of resources, and upholding values and ethics. Considering the principle of stewardship (both internal and external to the organization), the Primary School Climate Change Curriculum Integration Project's objectives are aligned with the mission and vision of the DoE and the expected long-term outcomes and value to the learner. Additionally, the commitment to respectful engagement will be built into the project and the project management plan through effective stakeholder management planning, communication, resource, and cost management planning. Thus, ensuring: stakeholder inclusivity, fair treatment, trustworthiness, compliance with regulations, proper compensation and accountability

related to finances and resources. Additionally, responsibility related to the incorporation of environmental sustainability will be used concerning the use of natural resources, for example, travel to collect data or engage project stakeholders. The expected long-term impact of the project on the community and the region will see fulfilment of human rights to ensure sustainable solutions to climate change, nationally and potentially in other OECS (PMI, 2021).

- **Team**

The principle of the team is about creating a positive, collaborative shared project environment that reflects the organisational cultures and guidelines. The team principal will be incorporated into the stakeholder and communication management plan and include opportunities for the team to meet and discuss roles and responsibilities, and project requirements during the initiation phase and the other relevant phases. Additionally, the tools and other techniques used in the project management plan and the project will foster collaborative team processes (PMI, 2021).

- **Stakeholders**

This principle refers to effective engagement of all stakeholders, considering they can negatively or positively impact the project performance and outcomes. Such impacts can occur through elements not limited to the scope, schedule, cost, culture, risk, and quality. Thus, stakeholders must be proactively engaged in the project. Stakeholder engagement is an essential element in the Primary School Climate Change Curriculum Integration Project and the project management plan. Therefore, effective communication tools and techniques (kick-off meetings, conflict management, status and progress reports, project website) will be employed throughout the project lifecycle (PMI, 2021).

- **Focus on value**

This principle relates to continuity concerning evaluating and aligning the project's objectives and outcomes to create and maximise the expected value. Both the project and the project management plan will include a project charter which will provide details on the project objectives, justifications, giving a better understanding of how the project will achieve its value in the short and long term (PMI, 2021).

- **Systems thinking**

This principle refers to the holistic view of the project's components. It is also necessary to examine how they interact internally and with the external systems. This principle is fundamental in the planning of the project management plan since the project system combines the culture of the DoE (CAMDU officials, district education officers), national and regional partners, teachers, principals, and parents. Consequently, appropriate techniques and tools will be used to establish a project system that creates a shared vision, language, and tools (communication media selection) to engage the project team to ensure that this system works (PMI, 2021).

- **Leadership**

This principle refers to the demonstrating effective leadership behaviours to support the team members to promote and contribute to project success and other positive project outcomes. Through effective leadership from the Science Curriculum Officer, the stakeholder and the communication management plans would help create a project environment that "*priortizes vision, motivation, enthusiasm, encouragement, and empathy*" (PMI, 2021, p.40). Some leadership techniques and skills that may be used include, focusing the team on the project's common agreed objective, articulating the project's vision and outcomes, generating consensus, overcoming the project challenges, negotiating, and resolving conflict, etc. (PMI, 2021).

- **Tailoring**

This principle is based on adapting to the unique context of the project, its objectives, stakeholders, and environment to determine the process needed to achieve the desired project outcomes. The project management plans will comprise 12 subsidiary management plans to achieve of the project objectives. Each management plan will be tailored by using the most appropriate techniques and tools that fit the project's unique characteristics and environment (PMI, 2021).

- **Quality**

This principle entails satisfying expectations, meeting project objectives, and accepting the project requirements. The quality management plan will incorporate metrics and acceptance criteria related to the quality dimensions. The UNESCO's "*Education for*

Sustainable Development" publication will be used to guide the integration of climate change in the Primary School Science Curriculum (PMI, 2021).

- **Navigate complexity**

The principle of complexity refers to the characteristics of the project or the environment that emerge from the interaction between the project elements, the project system or the environment. Complexity in a project is challenging to manage and control and can occur during the project lifecycle. The 12 subsidiary management plans will be developed of complexity that may affect the project's scope, communication, risk, and stakeholder conditions of the project (PMI, 2021).

- **Optimize risk response**

The principle of optimising risk response refers to identifying, evaluating, and responding to risk and opportunities during the project to maximize the positive impacts and minimise the negative ones. The risk management plan for the project will address the monitoring of overall project risks, including cost, time, and scope. Thus, it would include management strategies that reduce threats and promote opportunities. For example, the project will consist of plans to engage stakeholders to determine their risk appetite, develop and a risk threshold and identify appropriate risk responses (PMI, 2021).

- **Embrace adaptability and resilience**

This principle refers to the project's ability to respond to changing conditions, absorb impacts and recover from setbacks or failure and advance the project's work. Adaptability and resilience will be built into the project by incorporating feedback mechanisms in the plans, ensuring that the team is diverse with a broad skill set and range of experience, comprising regular monitoring of the project work and avenues for open transparent planning to engage all stakeholders (PMI, 2021).

- **Enable change to achieve the envisioned future state**

This principle refers to managing transitions from a current state to a future desired state. The project will embrace this principle by planning during stakeholder engagement and incorporating motivational approaches (PMI, 2021).

2.2.3 Project management domains

According to the Project Management Body of Knowledge (2021), a project performance domain is defined as "*a group of related activities that are critical for the effective delivery of project outcomes*" (PMI, 2021, p.7). There are eight (8) project performance domains (Refer to Figure 3). They are interactive, interrelated and interdependent. The domains which function simultaneously are present; but are different for each project. The activities undertaken in each performance domain are dependent on various factors of the project including organisational context, the nature of the project, the deliverables, and stakeholders. The following sub-sections explain the performance domains and how they relate to the Primary School Climate Change Curriculum Integration Project and the project management plan (PMI, 2021).

- **Stakeholder performance domain**

This domain addresses the activities and functions related to stakeholders resulting in positive working relationships with stakeholders and consensus on the project objectives. To effectively engage stakeholders of the project the following steps as stated in PMBOK (2021) will be utilised.

- Identify - The high-level stakeholders (Ministry of Education officials, district education officers and primary school principals) will be identified before the project team is formed

- Understand and analyse - The stakeholder management plan will include opportunities for confidential engagement of stakeholders to gain a better understanding of their perspectives and positions and analysis of stakeholder factors such as power, impact, influence using analysis tools.

- Prioritize - Analysis tools will be used to list the high-priority stakeholders- those with the most influence, power, and interest.

- Engage - The project will allow integration of the stakeholder management plan with the communication plan, detailing the communication tools and techniques used with stakeholders.

- Monitor - Tools to monitor the amount and effectiveness of stakeholder engagement will be incorporated in the project management plan and the project.

- **Team performance domain**

This domain addresses the activities and functions related to people who produce the deliverables of the project. Special emphasis will be placed on selecting the most appropriate management and leadership style for the project. Additionally, the project vision and stakeholder benefits will be showcased throughout the project lifecycle and opportunities for critical thinking, decision making and problem solving will be employed during the project (PMI, 2021).

- **Development approach and life cycle performance domain**

This domain addresses activities and functions related to the development approach (predictive, adaptive and hybrid), delivery cadence, and project lifecycle phase. The project will adopt a predictive development approach. This approach supports the level of stakeholder involvement anticipated, the fixed funding that would be available, the constraint of a fixed schedule in which to deliver the product, the certainty of the final requirement (deliverable), the fixed scope of the deliverable and the fact that the scope of the project is well understood and allows for upfront planning. With respect to the delivery cadence, there is a single delivery - the Primary School Science Curriculum set Grades K to 6, that integrates climate change topics and a project management plan to guide the project - which also supports the use of a predictive development approach. The predictive life cycle of the project facilitates the upfront intensive planning needed to achieve the objectives of the project (PMI, 2021).

- **Planning performance domain**

This domain addresses activities and functions related to organisation and coordination needed to deliver the project deliverables and outcomes. The project and the project management plan will have a project charter as the major initial project document that defines a coordinated plan to achieve the projects' deliverables (PMI, 2021).

- **Measurement performance domain**

This domain refers to the activities and functions related to assessing and maintaining the project performance. The project will use different measures to evaluate the performance, track utilisation of resources, work completed, and the budget, provide information to stakeholders and assess if the deliverables are on track. The metrics to be

used include baseline performance (Schedule variance, schedule performance index, cost variance, cost performance index), resources (planned resource cost compared to actual resource cost), and business value (cost-benefit ratio, net present value). Tools for presenting project information in different situations will include burn charts, Kanban board (PMI, 2021).

- **Delivery performance domain**

This domain refers to activities and functions related to expectations of meeting the project requirement, scope, and quality. The project will establish the processes for managing requirements, deliverables (work breakdown structure), resources, procurement, quality (cost of quality), scope (scope definition) as per the corresponding management plans (PMI, 2021).

- **Project work performance domain**

This domain refers to activities and functions related to establishing project processes and performing work enabling achievement of the deliverables and outcomes. The project will include reviewing processes for example retrospectives or lessons learned, maintaining the project team focus and attention (evaluation of short- and long-term projections for progress), communicating and engaging with the team and stakeholders, managing physical resources (planning, ordering, transporting, controlling etc.), conducting procurement and learning throughout the project (PMI, 2021).

- **Uncertainty performance domain**

This domain refers to activities and functions related to uncertainty as presented by threats and opportunities that the project team will explore, access and address. The project and management plan will incorporate environmental considerations in addressing risks (opportunities and threats) and responding to them. The strategies to respond to the risks will be aligned to the project budget, schedule, performance, and other relevant constraints. Additionally, mechanisms to leverage opportunities and identify and respond to risk will be integral to the project and project management plans.

Figure 3

Project Performance Domain

Note. Adapted from PMI (2021).

2.2.4 Predictive, adaptative and hybrid projects

PMBOK® Guide (2021) defines a development approach as "*the means used to create and evolve the product, service, or result during the project life cycle*" (PMI, 2022, p.35). A Project developmental approach "*organises the methods and tools of project management into project phases or processes in a standardised manner*" (Thesing et al., 2021, p.747). The three (3) commonly used development approaches are the predictive (traditional or waterfall), adaptive and hybrid approaches. These approaches can be viewed as existing on a spectrum (Figure 4). The following information details the characteristics of these three (3) developmental approaches and justifies the use of the selected approach in the project management plan and project.

Figure 4

Development Approaches

Note. Adapted from PMI (2021).

- **Predictive development approach**

Approaches that are driven by a sequential plan delivered in advance to reduce uncertainty and complexity and where execution is done in a single pass (PMI, 2017b). In the predictive life cycle or waterfall life cycle, planning occurs in advance in a sequential manner where one phase finishes before the next one begins (Figure 5). A full detailed plan must be delivered for the project team to know what to deliver and how. Thus, creating a high level of certainty around requirements, a stable team and low risk. With the predictive approach, the project success is achieved by restricting changes as much as possible (including requirement changes, project team members, and changing what the team delivers). Risks and costs are controlled and managed through detailed planning based on facts, assumptions, and articulation of constraints. Key stakeholders are involved at milestones in the process (Thesing et al., 2021).

Figure 5

Sample Predictive Life Cycle Approach

Note. Adapted from PMI (2021).

- **Adaptive development approach**

The adaptive approach covers a variety of frameworks or methods (e.g. Scrum, Kanban, ScrumBan, Crystal) and also fulfills the values and principles of the Agile Manifesto (PMI, 2017b). There is no planning or linear execution of the plan, but instead there is flexibility, using an incremental and iterative approach (Thesing et al., 2021; PMI, 2021), (refer to Figure 6). Thus, the approach is useful when there is a high level of uncertainty throughout the project. The approach uses a dynamic process with three (3) basic phases: start or identification of objectives, product development and the closing. The initial requirements can be modified or replaced, considering customer feedback, the environment, and unexpected events (PMI, 2021).

Figure 6

Life Cycle with Adaptive Development Approach

Note. Adapted from PMI (2021).

- **Hybrid development approach**

The hybrid development approach combines the predictive and adaptive approaches. It is useful in projects where deliverables are modular or where different teams can develop deliverables. On the spectrum, the hybrid approach tends to lean more towards the adaptive approach and as such the approach, which often uses an iterative or incremental approach (PMI, 2021).

- **Justification for selection of the predictive project developmental approach**

The project to develop the project management plan and the respective project would use a predictive development approach. The scope was determined at the beginning of the project with low likelihood of change, and the project risks will also be captured at that time. The nature of the project deliverables is not highly complex, requiring innovative solutions, constant stakeholder engagement, and many iterations. The aim is to deliver determined end products according to the project plan and scope. The timeline of the project management plan is fixed at three (3) months with a planned start and end date, and that of the project is fixed at 12 months. Closely related to the set timeline is the set budget, based on the cost estimation and the specified timeline. Another important factor is that the organisational structure of the sponsoring agency is hierarchical with a rigid reporting

structure. Clear procedures must be followed to ensure that the project adheres to the planned milestones. As such, there are levels of communication and collaboration among the team members, but this is against the background of the set plan and deliverables.

2.2.5   Project management

Project management is defined as "*the application of knowledge, skills, tools, and techniques to project activities to meet the project requirements*" (PMI, 2017a, p. 4). Project management is essential in executing projects; it allows efficient and effective execution through the application and integration of the appropriate project management processes (initiating, planning, executing, monitoring, controlling, and closing) (PMI, 2017a). The objectives of the Primary School Climate Change Curriculum Integration Project are aligned with the mission and vision of the DoE. The implementation of the project will assist the department in achieving its objectives, thus, demonstrating the utility of project management as a powerful tool (Meredith & Mantel, n.d.).

The DoE has experience executing projects in collaboration with its local regional and international partners. This experience and competency are known as project management competency or maturity and is a crucial factor that will increase the possibility of success of the project (Meredith & Mantel, n.d.).

2.2.6   Project management knowledge areas and processes

Processes are categorised by knowledge areas where according to PMBOK® Guide, (2017a), "*A knowledge area is an identified area of project management defined by its knowledge requirements and described in terms of its component processes, practices, inputs, outputs, tools and techniques*" (PMI, 2017a, p.23). From a project management perspective, the ten (10) knowledge areas, though interrelated, are defined separately (Refer to Chart 1).

Chart 1

The Knowledge Areas and Description (PMI, 2017a)

Knowledge Areas	Description
Project Integration Management	Includes the processes and activities to identify, define, combine, unify, and coordinate the various processes and project management activities within the process groups
Project Scope Management	Includes the processes that ensure all the work required to successfully complete the project is included
Project Schedule Management	Includes the processes required for timely completion of the project
Project Cost Management	Includes all the processes to ensure that the project is completed within the budget, i.e., planning, estimating, budgeting financing, funding, managing and controlling cost
Project Quality Management	Includes processes geared at meeting the stakeholder's expectations and involves quality policy regarding planning, managing, and controlling costs
Project Resource Management	Includes the processes to identify, acquire, and manage the resources needed for successful completion of the project
Project Communication Management	Includes processes required to ensure timely and appropriate planning, collection, creation, distribution, storage, retrieval, management control monitoring and ultimate disposition of project information
Project Risk Management	Processes involving conducting risk management and risk monitoring
Project Procurement Management	Processes necessary for purchases needed for the project (products and services)
Project Stakeholder Management	Process requires to identify people, groups or organization impacted by the project expectations and engaging stakeholders in project decisions and executions

Note. Prepared by the Author

2.2.7 Project life cycle

The project life cycle is the series of sequential, iterative, or overlapping phases a project goes through to achieve completion (PMI, 2017a). A project life cycle has phases related to the development of products or services and is called a development life cycle. Development life cycles can follow predictive, iterative, incremental, adaptive, or hybrid models. The project life cycle is managed through a series of project management processes (initiating, planning, executing, monitoring, and controlling, and closing), each of which has one or more outputs (which can be deliverables or outcomes) using project

management tools and techniques. These processes are connected by their outputs which can be the inputs to another process or a project deliverable (PMI, 2017a).

The phases of the project life cycle are starting (initiating/conceptualisation), planning (organising and preparing), implementing (executing/carrying out), and termination (close-out, ending) (Oguz, 2022). The phases are a set of related activities that result in the completion of one or more project deliverables. Phases can be characterised by attributes such as the name, number and duration of the phase, resource requirements (people, building, equipment) and criteria (entrance or exit) indicating the entrance or exit phase respectively (PMI, 2017a). The development approach and the delivery cadence as two key variables in determining the type and the number of project phases in the project life cycle. Examples of phases of a life cycle are feasibility, design, build, test, deploy and close. Phases often have exit criteria called a phase gate review for checking that the desired deliverable has been met before proceeding to the next gate (PMI, 2021). The movement to the respective phase may involve for example, specific approval documents, other documents or completed deliverables (PMI, 2017a).

The phases in which projects are divided are named according to the type of work done in the phase. These names include concept development, feasibility study, customer requirements, solution development, design, build, milestone review, and lesson learned. The project phases used in the Primary School Climate Change Curriculum Integration project will be based on the management needs of the project. These will provide insight into managing the project, provide adequate opportunities to analyse and assess performance and take necessary action in subsequent phases (PMI, 2017a).

PMI (2017) groups the project management processes into five (5) categories called process groups which allow the achievement of specific project objectives. The grouping is as follows:

1. Initiating process group
2. Planning Process group
3. Executing process group
4. Monitoring and Controlling process group, and
5. Closing process group.

The process groups are interdependent and depend on the type of project. Details of the process groups are as follows:

- Initiating Process Groups involves processes to define a new project or a new phase of s project through authorisation to start (includes creating the project charter and identifying the stakeholders)

- Planning Process Group are processes that establish and develop the project management plan (project scope, refine objectives, actions to achieve objectives).

- Executing Process Group are the processes involved in completing the work defined in the project management plan

- Monitoring and controlling process group involves processes needed to track, review, regulate and analyse the progress and performance of the project as it relates to the original plan; identifying and initiating changes in areas needed

- Closing Process Group involves processes related to completion, closure and handing over of the project, phase, or contract (PMI, 2017a).

The Primary School Climate Change Curriculum Integration project will incorporate all the process groups. However, the project management plan to achieve this project will only incorporate the initiation and the planning process groups.

2.2.8 Company strategy, portfolios, programs, and projects

The following sub-section details the business strategy, portfolio, program and projects and their importance to organisations. The section will also explain which of the groups the project falls under.

- **Business strategy**

"Business strategy" in Project Management refers to a company's plan of action to achieve its long-term goals and objectives through the completion of projects. It involves effective project governance to ensure that the project outcomes are aligned with the organisation's strategy. Effective governance allows directors and senior management to exercise effective oversight of projects ensuring that the business strategies are achieved and their benefits realized. Also, it involves making informed decisions about resource

allocation and continuously evaluating and adjusting the approach to ensure success. A well-defined business strategy that is strategically aligned to the project's goals and objectives facilitates growth if the key stakeholders are on board. Additionally, it helps to ensure that projects are aligned with the company's vision, mission, and values, and will contribute to the achievement of the company's overall goals and objectives (PM Network, 2016).

- **Programs**

According to *The Standard for Program Management* (2017) a program is defined as "*related projects, subsidiary programs, and program activities that are managed in a coordinated manner to obtain benefits not available from managing them individually*" (PMI, 2017c, p.3). As per the definition, managing projects, subsidiary programs and program activities serve to ensure that the strategies, work plans and program components are adapted to outcomes and changing conditions of the organization. The main purpose of programs is to deliver benefits to the sponsoring organization (s) presenting outcomes that are useful to the organizations as well as the beneficiaries. Such benefits may include enhancing the capabilities of the organization, facilitating Organisational change, creating, or maintaining the organization's assets (PMI, 2017c). High-level plans are used to manage and track the interdependencies and progress of the program components, and program plans guide the planning of the components. The scope of a program encompasses that of its program components. Programs benefit an organization by ensuring that delivery of the outputs and outcomes are coordinated and complementary. Programs can adjust to changes as necessary in order to optimize delivery. The success of a program is measured by its ability to deliver the intended benefits effectively and efficiently to the organization (PMI, 2017a).

- **Portfolio**

The *Standard for Portfolio Management* (2017) defines a portfolio as "*a collection of projects, programs, subsidiary portfolios, and operations managed as a group to achieve strategic objectives*" (PMI, 2017d, p.3). The components of the portfolio are quantifiable - can be identified, categorized, evaluated, prioritized, or authorized. Other attributes of the portfolio are that its components may or may not be related, may or may not be

independent or may or may not have related objectives. There is competition for resources concerning portfolio components. Consequently, organizations must balance the portfolio components with their circumstances. The key purpose of a portfolio is to achieve the organization's business strategies, and goals (PMI, 2017d). However, the scope of the organization's portfolio changes with its strategic objectives. The portfolio manager monitors internal and external changes, creates and maintains the necessary processes and communications and coordinates and manages the portfolio staff or program and project staff with responsibilities to the aggregate portfolios. The success of a portfolio is measured in terms of aggregate performance and the benefit realization of the portfolio (PMI, 2017a).

- **Projects**

PMBOK® Guide (2017a), defines a project as "*a temporary endeavor undertaken to create a unique product, service, or result*" (PMI, 2017a). From the definition the two (2) main attributes of a project are that the outcome is unique and they have a definite beginning and end. The unique outcome of a project is as a result the approach which would be based on the project objectives, the nature of work required, the stakeholders involved - their number, interest, influence - and the results to be achieved. The temporal nature of projects distinguishes it from the ongoing and repetitive nature of operations, since it has an assigned schedule with a completion date (Oguz, 2022). Another important and fundamental attribute of a project is that projects drive change. In the context of the Primary School Climate Change Curriculum Integration Project the long-term outcome at the primary school level is to effect change in knowledge, skills, behaviours, and attitudes that will result in actions towards adapting and building resilience to climate change impacts. Thus, this project is aimed at moving science education at the primary school level from its current state to the future state towards achieving the specific objectives of the project (PMI, 2017a). Figure 7 illustrates the transition of an organization from its current to future state via a project.

Figure 7

Organisational State Transition via a Project

Note. Adapted from PMI (2017a).

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

2.3.1   Current situation of the problem or opportunity in study

- Climate change in Saint Lucia

Climate change is more than an environmental threat for Small Island Developing States (SIDS); it affects human health and well-being, livelihoods, culture, and the economic status of these populations. The Caribbean Region is particularly vulnerable, and it accounted for 60 % of all climate-related disasters in SIDS between 1966 to 2015 (PAHO, 2019). Saint Lucia's vulnerability to climate change is exacerbated due to its small size, geographic location, economic dependence on tourism and agriculture and other social, economic and health issues. Historical data over the years suggests earlier rainy seasons, with more intense and longer periods of rainfall. It is projected that Saint Lucia will experience a rise in the mean annual temperature, an increase in the frequency of hot days and nights, warmer temperatures, a decrease in the yearly rainfall, an increase in the intensity of hurricanes as well as sea level rise (GOSL, 2018).

- **Curriculum and climate change**

Chart 2

Public Primary Schools in Saint Lucia

School	Grades	Age
Infant (Lower Primary)	K - 2	5 - 7
Primary (Junior Primary)	3 - 6	8 - 11
Combined (Infant and Junior Primary)	K - 6	5 - 11

Note. Adopted from Corporate Planning Unit (2020).

2.3.2 Previous research done for the topic in study

- Climate change and the education sector

The United Nations Environmental, Scientific, and Community, Organisation (UNESCO) views education as essential in preparing societies to address the climate change crisis. The organisation has supported countries integrating climate change into education through initiatives like Education for Sustainable Development (ESD) (UNESCO, 2021a). Thus, it important for Saint Lucia to invest in climate change education to address the climate change crisis. Education in climate change will help learners understand its causes to make informed decisions and take the appropriate actions, acquire the necessary values and skills to participate in more sustainable lifestyles and economies, and build climate-resilient societies (Gibbs, 2016).

A common thread of Article 6 of the United Nations Framework Convention on Climate Change (UNFCCC), Article 12 of the Paris Agreement and SDG target 4.7., is their support for education on climate change and its impacts to encourage action to address the climate change crisis. The 2030 Agenda includes specific goals on climate action - Goal 13 and Goal 4. Both these goals recognise the importance of quality education for sustainable development and responding to the climate change crisis (Gibbs, 2016).

2.3.3   Other theory related to the topic in study

- **Enterprise environmental factors**

Enterprise Environmental Factors (EEFs) are "*conditions, not under the immediate control of the project team, that influence, constrain, or direct the project, program, or portfolio*" (PMI, 2017a, p.38). These factors are beyond the control of the project team, and the sponsor organisation and can have a positive or negative effect on the project's success. Enterprise environmental factors can be internal (Organisational culture, structure and governance, infrastructure, resource availability, employee capability etc.) or external (social and cultural issues and influences, government or industry standards, legal restrictions, academic research) to the organization (Romanelli & Romanelli, 2022).

According to Romanelli and Romanelli (2022) the three (3) most recommended steps to address EEFs based on best practices in managing projects, are identifying the factors, assessing the factors, and planning for them. The overarching goal is to gain a clear understanding of the project environment to ensure that the project achieves its objectives.

There are several different methods for identifying EEFs and these may be formal and structured assessments or informal examinations. Common examples include performing a SWOT (Strengths, Weaknesses, Opportunities, Threats) analysis, PESTLE (Political, Economic Sociological, Technological, Legal, Environmental) analysis or generating a list of the EEFs. Additionally, each factor should be identified as internal or external to the sponsoring organization.

The second step in addressing EEFs in a project is to assess the identified factors. This process involves asking questions such as,

- Are the factors that will affect success, internal or external to the organization?

- Does the identified factor increase or decrease the chance of the project success?

Factors can also be rated as neutral (an item merely for consideration without any inherent direct positive or negative effect), stable (remains constant) or changing (likely to change during the project life cycle).

The final step in addressing EEFs in a project is to plan for the factors and their effects on the Project. The plan should be based on the assessment of the identified factors,

and the project managers are in the best position to plan for managing EFFs with the project team. Planning should include strategies to mitigate the negative factors and optimize the positive ones, thus increasing the chance for the success of the project. Factors likely to change throughout the life cycle of the project may be scheduled for reassessment as needed.

The project management plan will be affected by internal and external EEFs due to the nature of the topic and more importantly, because the sponsoring organization is a government institution. Among the more salient internal EEFs the factors related to organisational culture, structure and governance are relevant and must be assessed and addressed early in the project. This factor includes the "*vision, mission, values, beliefs, cultural norms, leadership style, hierarchy and authority relationships, Organisational style, ethics, and code of conduct*" (PMI, 2017a. p.38). While the vision, mission, values, and beliefs held by the Ministry of Education are closely aligned with the project's objectives, factors like the organisational style and authority relationships may warrant assessment since they can have a negative impact on the project. Likewise, external factors like social and cultural influences and issues including the political climate and perceptions will need in- depth assessment to prevent the project from being politicised or perceived in this manner leading to the failure of the project to meet its objectives.

3 METHODOLOGICAL FRAMEWORK

This chapter details the information sources, the research methods, the tools, the assumptions, the constraints and the deliverables that will be used in the elaboration of this chapter.

3.1 Information sources

An information source is defined as "anything that might inform a person about something or provide knowledge to somebody" (Sources of Information, 2018). Additionally, it can be considered as the origin or means of obtaining information. Information sources can be divided into two (2) broad categories; documentary sources and non-documentary sources (Refer to Figure 8). The FGP will use the documentary as primary and secondary sources of information.

Documentary sources are those sources that are published or recorded documents that provide knowledge. These sources are further divided into primary, secondary and tertiary sources (Sources of Information, 2018).

Figure 8

Types of Information Sources

Note. Sources of Information. (2018, October 16). Library & Information Science Network.

Figure 1, https://www.lisedunetwork.com/sources-of-information/

3.1.2   Primary sources

According to LibGuides (2018), primary sources of information are "first-hand documents that provide direct evidence" (LibGuides, 2018) on the subject and are usually created during the time of the event (s) for example, newspaper articles, correspondence, original research, reports, notes, diaries. Conversely, it can also include items created after the event that recount information, for example, autobiographies, and oral histories (LibGuides, 2018). Additionally, primary source documents represent the original or unfiltered ideas as in the first published records of research or description of new applications, interpretations or ideas. A primary source can also be the person that possesses direct knowledge of a situation or the one that created this knowledge (Sources of Information, 2018).

In the FGP, the primary sources of information are significant in elucidating the perspectives and perceptions of the stakeholders. These sources will contribute to the compilation of information towards achieving the specific objectives. Some of the primary sources of information relevant to the project are informal or formal interviews with DoE

officials, principals, teachers, students, and document review for example, assessment reports. Chart 3 is a summary that aligns the specific objectives with the primary sources of information that will be used.

3.1.3 Secondary sources

Secondary sources of information are "accounts written after the fact with the benefit of hindsight. They are interpretations and evaluations of primary sources" and "are not evidence, but rather a commentary on the discussion of evidence" (LibGuides, 2018). Secondary sources of information include bibliographies, commentaries, criticisms, essays or reviews, encyclopedias, and dictionaries.

The principal sources of secondary information for the FGP consist of documents that include the PMBOK® Guide 6th and 7th edition, international and national education publications on environmental education (UNESCO), OECS Primary School Standard/Curriculum Guide for Natural Science, statistical reports on stakeholder financing, and other documents on the processes and requirements of the DoE (Refer to Chart 3).

Chart 3

Information Sources

Objectives	Information sources	
	Primary	**Secondary**
1. To develop a Project Charter for the Final Graduation Project (FGP) with the relevant approvals to authorise the project's existence.	Project-related documentation from informal interviews with primary school teachers.	PMBOK Guide 6th and 7th edition; UNESCO publications on environmental education; OECS Primary School Standard/Natural Science Curriculum Guide Grades K to 6; stakeholder website reports and reviews.
2. To explain the impact of regenerative and sustainable development on the project execution and deliverables.	No primary sources to be used	United Nations Environment Program (UNEP) website; journal articles and white papers; PMBOK Guide 6th and 7th edition.
3. To create an integration management plan to integrate the various processes and project management activities from the start to the project's completion.	Project-related documentation from formal interviews with primary school teachers, DoE education officials, principals, and other key stakeholders.	PMBOK Guide 6th and 7th edition; UNESCO publications on environmental education; OECS Primary School Standard/Natural Science Curriculum Guide Grades K to 6; stakeholder website reports and reviews.
4. To create a scope management plan accounting for the acceptance criteria, deliverables, exclusions, assumptions, and constraints, to ensure inclusion of all required work for project's successful completion.	Project-related documentation from formal interviews with primary school teachers, DoE education officials, principals, and other key stakeholders.	PMBOK Guide 6th and 7th edition; UNESCO publications on environmental education; OECS Primary School Standard/Natural Science Curriculum Guide Grades K to 6; stakeholder website reports and reviews.
5. To prepare a schedule management plan to ensure completion of the project within the agreed timeframe.	Project-related documentation from formal interviews with primary school teachers, DoE education officials, principals, and other	PMBOK Guide 6th and 7th edition; UNESCO publications on environmental education; OECS Primary School Standard/Natural

Objectives	Information sources	
	Primary	**Secondary**
	key stakeholders.	Science Curriculum Guide Grades K to 6; stakeholder website reports and reviews.
6. To develop a cost management plan to ensure that project costs are planned, structured, controlled, and are within the project's budget.	Project-related documentation from formal interviews with primary school teachers, DoE education officials, principals, and other key stakeholders.	PMBOK Guide 6th and 7th edition; UNESCO publications on environmental education; OECS Primary School Standard/Natural Science Curriculum Guide Grades K to 6; stakeholder website reports and reviews.
7. To create a quality management plan to describe the quality standards for meeting the requirements for integrating climate change topics in Primary School Science Curriculum Grades (K-6).	Project-related documentation from formal interviews with primary school teachers, DoE education officials, principals, and other key stakeholders.	PMBOK Guide 6th and 7th edition; UNESCO publications on environmental education; OECS Primary School Standard/Natural Science Curriculum Guide Grades K to 6; stakeholder website reports and reviews.
8. To prepare a resource management plan to identify, acquire, and manage the resources needed for the project's successful completion.	Project-related documentation from formal interviews with primary school teachers, DoE education officials, principals, and other key stakeholders.	PMBOK Guide 6th and 7th edition; UNESCO publications on environmental education; OECS Primary School Standard/Natural Science Curriculum Guide Grades K to 6; stakeholder website reports and reviews.
9. To develop a communications management plan to describe the project's communication strategy for administering and disseminating information based on stakeholders' needs.	Project-related documentation from formal interviews with primary school teachers, DoE education officials, principals, and other key stakeholders.	PMBOK Guide 6th and 7th edition; UNESCO publications on environmental education; OECS Primary School Standard/Natural Science Curriculum Guide Grades K to 6; stakeholder website reports and reviews.
10. To produce a risk management plan to describe the project's risks,	Project-related documentation from formal interviews with	PMBOK Guide 6th and 7th edition; UNESCO publications on

Objectives	Information sources	
	Primary	**Secondary**
the risk management activities and monitoring strategies.	primary school teachers, DoE education officials, principals, and other key stakeholders.	environmental education; OECS Primary School Standard/Natural Science Curriculum Guide Grades K to 6; stakeholder website reports and reviews.
11. To create a procurement management plan to acquire the products and services needed to meet the project deliverables.	Project-related documentation from formal interviews with primary school teachers, DoE education officials, principals, and other key stakeholders.	PMBOK Guide 6th and 7th edition; UNESCO publications on environmental education; OECS Primary School Standard/Natural Science Curriculum Guide Grades K to 6; stakeholder website reports and reviews.
12. To prepare a stakeholder engagement plan to identify the project stakeholders and the strategies needed for involvement in project decisions and activities.	Project-related documentation from formal interviews with primary school teachers, DoE education officials, principals, and other key stakeholders.	PMBOK Guide 6th and 7th edition; UNESCO publications on environmental education; OECS Primary School Standard/Natural Science Curriculum Guide Grades K to 6; stakeholder website reports and reviews.

Note. Prepared by Author

3.2 Research methods

According to the University of Newcastle Library (2022), research methods are "*the strategies, processes or techniques utilised in the collection of data or evidence for analysis in order to uncover new information or create better understanding of a topic*" (University of Newcastle Library, 2022). The best methods to collect the data may depend on the topic or the subject matter, the type of data required, and what the data will be used for. There are different research methods, and each method uses different tools for data collection. The

two (2) main categories of research methods are Qualitative and Quantitative Research (University of Newcastle Library, 2022).

The project uses both categories of research; however, the qualitative method is primarily used to ensure an in-depth study of the topic in its natural context. The quantitative method serves to make the necessary generalizations from analysis of the numerical data used in the project. Chart 4 provides a summary of the research methods that will be used as it relates to the specific project objectives. The following subsections give more detail on each of these research methods.

3.2.1   Qualitative methods

Qualitative research includes "a *sequence of interpretative techniques that seek to describe, decode and translate concepts and/or phenomena instead of capturing the frequency of certain phenomena in society*" (Basias & Pollalis, 2018, p.96). Qualitative research is usually employed when an interpretation is needed, usually in a relatively new research area. It is generally used in the context of observation and investigation of phenomena and may use tools and techniques such as questionnaires, interviews, observation, focus groups, and document analysis during research (University of Newcastle Library, 2022; Basias & Pollalis, 2018). Important advantages of using qualitative research methods are that it facilitates in depth study of subject matters/phenomena and allows understanding of the nature and complexity of the phenomena it their natural setting (Basias & Pollalis, 2018).

3.2.2   Quantitative method

Quantitative research refers "to the systematic empirical investigation of phenomena through statistical and mathematical analysis and the processing and analysis of numerical data" (Basias & Pollalis, 2018, p.96). It facilitates uncovering patterns and trends and relationships among phenomena and making generalizations (University of Newcastle Library, 2022). Quantitative research is usually selected when the situation requires

analysis and processing of numerical data for verifying hypotheses and or testing a theory. Important advantages of using quantitative research are that the results are numerical, and it is easy to compare and analyse large amounts of numerical data (Basias & Pollalis, 2018). Quantitative tools include surveys and questionnaires, observation, document screening and experiments (University of Newcastle Library, 2022).

Chart 4

Research Methods

Objectives	Qualitative method	Quantitative method
1. To develop a Project Charter for the Final Graduation Project (FGP) with the relevant approvals to authorise the project's existence.	To facilitate collection of the perceptions and other descriptive information on the topic using the tool outlined in Chart 3.	
2. To explain the impact of regenerative and sustainable development on the project execution and deliverables.	To allow collection of information from various sources through document analysis	
3. To create an integration management plan to integrate the various processes and project management activities from the start to the project's completion.	To allow a holistic descriptive view of the combination of the different processes and project management activities through the collection of qualitative data	
4. To create a scope management plan accounting for the acceptance criteria, deliverables, exclusions, assumptions, and constraints, to ensure inclusion of all required work for project's successful completion. .	To allow the collection of qualitative data from the project stakeholders as it relates to the acceptance criteria, deliverables, exclusions, assumptions, and constraints. Also, to facilitate triangulation of data	
5. To prepare a schedule management plan to ensure the project's completion within the agreed	To allow the collection of qualitative data from the project stakeholders as it relates to the scheduling of project activities.	

Objectives	Qualitative method	Quantitative method
timeframe.		
6. To develop a cost management plan to ensure project costs are planned, structured, controlled, and are within the project's budget.	To allow the collection of qualitative data from the project stakeholders and through document analysis.	To allow the collection and analysis of numerical data related to project cost estimation towards determining the budget.
7. To create a quality management plan to describe the quality standards for meeting the requirements for integrating climate change topics in Primary School Science Curriculum Grades (K-6).	To allow the collection of qualitative data from the project stakeholders, through document analysis, and benchmarking. Also, to allow the triangulation of data.	
8. To prepare a resource management plan to identify, acquire, and manage the resources for the project's successful completion.	To allow the collection of qualitative data from the project stakeholders through document analysis, and benchmarking. Also, to allow the triangulation of data.	
9. To develop a communications management plan to describe the project's communication strategy for administering and disseminating information based on stakeholders' needs.	To allow the collection of qualitative data from the project stakeholders and triangulation of data.	
10. To produce a risk management plan to describe the project's risks the risk management activities and monitoring strategies.	To allow the collection of qualitative data from the project stakeholders using methods outlined in Chart 3, allow triangulation of data and to conduct qualitative risk analysis towards prioritisation of risks.	To facilitate quantitative risk analysis by quantifying the impact on the project (probabilistic evaluation of time and costs), to provide supporting quantitative risk information for risk response.
11. To create a procurement	To allow the collection of qualitative data from the	

Objectives	Qualitative method	Quantitative method
management plan to acquire the products and services needed to meet the project deliverables.	project stakeholders through methods detailed in Chart 3 and allow the triangulation of data.	
12. To prepare a stakeholder engagement plan to identify the project stakeholders and the strategies needed for involvement in project decisions and activities.	To allow collection of qualitative data from the project stakeholders through methods detailed in Chart 3 and allow the triangulation of data.	

Note. Prepared by Author

3.3 Tools

Tools are resources used to conduct project management processes (planning, initiating, executing, monitoring and controlling, and closing) projects. Tools can be digital, e.g., software or physical, and they help the project team manage the different knowledge areas of the project - scheduling, scope definition, resource management, risk management, communication, stakeholder management, procurement, cost management, quality management. Examples of project management tools include expert judgment, interviews, focus groups, data analysis, document review, project management Information system (PMIS), benchmarking, decomposition, and checklists. The choice of tools depends on the project's nature and requirements (PMI, 2017a). The FGP will employ a variety of tools as it relates to each of the project's specific objectives (Refer to Chart 5).

Chart 5

Tools

Objective	Tools
1. To develop a Project Charter for the Final Graduation Project (FGP) with the relevant approvals to authorise the project's existence.	Expert judgment, interviews, and document review
2. To explain the impact of regenerative and sustainable development on the project execution and deliverables	Document review
3. To create an integration management plan to integrate the various processes and project management activities from the start to the project's completion.	Expert judgment, data analysis, document review, interviews, PMIS
4. To create a scope management plan accounting for the acceptance criteria, deliverables, exclusions, assumptions, and constraints, to ensure inclusion of all required work for project's successful completion.	Expert judgment, interviews, document analysis, focus groups, questionnaires/surveys, benchmarking, decomposition
5. To prepare a schedule management plan to ensure completion of the project within the agreed timeframe.	Expert judgment, decomposition, alternative analysis, PMIS, analogous estimating, bottom-up estimating
6. To develop a cost management plan to ensure that project costs are planned, structured, controlled, and are within the project's budget.	Expert judgment, alternative analysis, three-point estimating, cost aggregation, historical information review, interviews
7. To create a quality management plan to describe the quality standards for meeting the requirements for integrating climate change topics in Primary School Science Curriculum Grades (K-6).	Expert judgment, benching marking, interviews, cost-benefit analysis, checklists, document analysis, cause-and-effect diagram, questionnaire

Objective	Tools
8. To prepare a resource management plan to identify, acquire, and manage the resources needed for the project's successful completion.	Expert judgment, bottom-up estimating, analogous estimating, assignment matrix, PMIS, pre-assignment
9. To develop a communications management plan to describe the project's communication strategy for administering and disseminating information based on stakeholders' needs.	Expert judgment, communication requirement analysis
10. To produce a risk management plan to describe the project's risks, the risk management activities and monitoring strategies.	Expert judgment, stakeholder analysis, interviews, SWOT analysis, document analysis, assumption and constraints analysis, risk probability impact assessment, risk characterisation, quantitative risk analysis, strategies for overall project risks, PMIS
11. To create a procurement management plan to acquire the products and services needed to meet the project deliverables.	Expert judgment, interviews, document analysis
12. To prepare a stakeholder engagement plan to identify the project stakeholders and the strategies needed for involvement in project decisions and activities.	Expert judgment, interviews, questionnaires, stakeholder analysis, document analysis, stakeholder mapping (power/interest grid, power/influence grid, impact/influence grid), prioritization/ranking

Note. Prepared by Author

3.4 Assumptions and constraints

An assumption is defined as a "factor in the planning process that is considered to be true, real or certain, without proof or demonstration" (PMI, 2021, p.235). A constraint is defined as a "limiting factor that affects the execution of a project, program, portfolio, or process" (PMI, 2021, p.237). Once the project assumptions and constraints are identified and assessed, they will then be incorporated into the project plan. The constraints are included in the form of "workarounds" to the mitigate impact by providing the means for the project to continue. Assumptions and known constraints are essential in project

management because they set the stage for project planning and execution. During the project, they will be used to define and shape tasks, schedules, resource assignments and budget allocations. In this regard, assumptions and constraints form a framework to manage uncertainty and provide a roadmap for how the project will proceed (Working with Project Assumptions and Constraints, 2020). Chart 6 details the assumptions and constraints relevant to each specific objective.

Chart 6

Assumptions and Constraints

Objectives	Assumptions	Constraints
1. To develop a Project Charter for the Final Graduation Project (FGP) with the relevant approvals to authorise the project's existence.	The Project Charter for the FGP will be approved with the relevant authorisation within the stipulated time.	Limited information to accurately estimate the cost and timelines to create the Project Charter.
2. To explain the impact of regenerative and sustainable development on the project execution and deliverables.	Regenerative and sustainable development apply to the project's execution and deliverables.	Lack of credible and up to date (from 2016-2023) bibliographical sources of information on regenerative and sustainable development to explain their impact on the project execution and deliverables.
3. To create an integration management plan to integrate the various processes and project management activities from the start to the project's completion.	The management approaches chosen in the integration management plan will ensure effective and efficient monitoring of the project's progress in meeting the project's objectives.	Inexperience on the part of the project team to adequately analyse and use the information to meet the project objectives.
4. To create a scope management plan accounting for the acceptance criteria, deliverables, exclusions, assumptions, and constraints, to ensure inclusion of all required work for project's successful completion.	The scope management plan captures the most important requirements agreed upon by the stakeholders for the successful execution of the project.	Lack of regional or international standards that can help to define the project scope.
5. To prepare a schedule management plan to ensure completion of the project within the agreed timeframe.	The estimated timeframe for the project activities is accurate and would help to complete the project on time.	Lack of important scheduling data for specific stakeholders due to unexpected engagements.
6. To develop a cost	The estimated costs for	Constant price hikes for

Objectives	Assumptions	Constraints
management plan to ensure that project costs are planned, structured, controlled, and within the project's budget.	the resources and services to complete the project are accurate.	material due to the continued high gas prices and inflation.
7. To create a quality management plan to describe the quality standards for meeting the requirements for integrating climate change topics in Primary School Science Curriculum Grades (K-6).	The project deliverables comply with the DoE's quality policy for Curriculum products.	Absence of quality standards for integrating climate change topics in Primary School Science Curriculum Grades (K-6).
8. To prepare a resource management plan to identify, acquire, and manage the resources needed for the project's successful completion.	The project team identified possesses the necessary competencies and free time to successfully complete the project.	Lack of a Science Curriculum Officer at the DoE to provide expertise in the subject area.
9. To develop a communications management plan to describe the project's communication strategy for for administering and disseminating information based on stakeholders' needs.	The communication channels identified for the administration and dissemination of information are effective and appropriate for the targeted stakeholders.	Restrictive organisational policies related to communicating with DoE officials, may delay quick access to these stakeholders.
10. To produce a risk management plan to describe the project's risks, the risk management activities and monitoring strategies.	Risk response strategies are effective in preventing project delays and cost overruns.	Planned school activities during the school term limit involvement of key stakeholders and can cause significant delays.
11. To create a procurement management plan to acquire the products and services needed to meet the project deliverables.	The required services are available when needed.	Restrictive Organisational policies related to the procurement of services may delay the project.

Objectives	Assumptions	Constraints
12. To prepare a stakeholder engagement plan to identify the project stakeholders and the strategies needed for involvement in project decisions and activities.	The key stakeholders will be interested in the project and will assist in achieving the project deliverables.	COVID-19 and unplanned school closures will limit stakeholder participation.

Note. Prepared by Author

3.5 Deliverables

According to PMI (2021), a deliverable is "any unique and verifiable product, result, or capability to perform a service that is required to be produced to complete a process, phase, or project (PMI, 2021, p.239). The deliverables that will be developed for the FGP are the FGP charter, content that explains the impact of regenerative and sustainable development on the project, and ten (10) subsidiary management plans (Refer to Chart 7).

Chart 7

Deliverables

Objectives	Deliverables
1. To develop a Project Charter for the Final Graduation Project (FGP) with the relevant approvals to authorise the project's existence.	Project Charter for the Final Graduation Project- will formally authorise the existence of the project.
2. To explain the impact of regenerative and sustainable development on the project execution and deliverables.	Content Chapter - will explain the impact of regenerative and sustainable development on the project.
3. To create an integration management plan to integrate the various processes and project management activities from the start to the project's completion.	Integration management plan – will combine the results of all the other process management areas, the various processes and project management activities within the process groups and give a holistic view of the FGP.
4. To create a scope management plan accounting for the acceptance criteria, deliverables, exclusions, assumptions, and constraints, to ensure inclusion of all required work for project's successful completion.	Scope management plan – will describe how the scope of the FGP will be defined, developed, monitored, controlled and validated.
5. To prepare a schedule management plan to ensure completion of the project within the agreed timeframe.	Schedule management – will establish the criteria and the activities for developing, monitoring, and controlling the FGP within the agreed timeframe.
6. To develop a cost management plan to ensure that project costs are planned, structured, controlled, and are within the project's budget.	Cost management plan - will ensure that the project costs will be planned, structured, and controlled to remain within the FGP's budget.
7. To create a quality management plan to describe the quality standards for meeting the requirements for integrating climate change topics in Primary School Science Curriculum Grades (K-6).	Quality management plan – will describe the quality standards for the FGP to meet the requirements for integrating climate change topics in the Primary School Science Curriculum Grades (K-6).
8. To prepare a resource management plan to identify, acquire, and manage the resources needed for the project's successful completion.	Resource management plan – will identify, acquire and manage the resources needed to successful completion of the FGP.

Objectives	Deliverables
9. To develop a communications management plan to describe the project's communication strategy for administering and disseminating information based on stakeholders' needs.	Communication management plan – will describe how, when, and by whom information will be administered and disseminated.
10. To produce a risk management plan to describe the project's risks, the risk management activities and monitoring strategies.	Risk management plan – will describe the FGP's risk, the risk management activities and monitoring strategies.
11. To create a procurement management plan to acquire the products and services needed to meet the project deliverables.	Procurement management plan – will describe how the products and services will be acquired for the FGP.
12. To prepare a stakeholder engagement plan to identify the project stakeholders and the strategies needed for involvement in project decisions and activities.	A stakeholder engagement plan – will be used to identify the project stakeholders and the strategies to ensure their involvement in the FGP.

Note. Prepared by Author

4   RESULTS

The general objective of the FGP was to develop a Project Management Plan to effectively integrate climate change topics in the Primary School Science Curriculum in Saint Lucia. Thus, the result of the FGP is the Project Management Plan which consists of the 10 subsidiary plans (including the project charter) aligned with the 10 knowledge areas and the five (5) project management processes as presented in the PMBOK® Guide (PMI, 2017). Each of the following subsections of the chapter details the development of the subsidiary plans in accordance with the specific objectives of the FGP.

4.1.   Integration Management Plan

The Integration Management Plan of the project unified all the activities and the processes of the project and gave an overview of the project, ensuring alignment of all its aspects. The processes that were used and would be used towards the development of the Integration Manage Plan are detailed in the following subsections.

4.1.1   Develop Project Charter

The Project Charter for the execution of the project entitled "Integrating Climate Change in the Primary School Science Curriculum in Saint Lucia for Grades K-6" (Chart 8) was developed by the author to fulfil specific objective one (1) of the FGP. The function of the charter was to formally authorise the existence of the project during the project initiation process and provide the project manager with a better understanding of the project, its context, purpose, objectives, expected results/outcomes and benefits (PMI, 2017).

The main inputs of the project charter were consideration of the OECS Learning Standards Science and Technology for Grades K-6 used to guide the Primary School Science Curriculum, as well as international science standards that addressed climate change topics. Another vital input that guided the development of the project charter was the policies of the DoE concerning the procedures for revising school curricula, reporting and decision-making methods. The two (2) significant tools/techniques used were informal interviews with the Science Curriculum Officer (Ag.), the Programme Director of a local

NGO (involved in science education at the primary school level), informal interviews with

primary school teachers, and a meeting with the Chief Curriculum Officer.

Chart 8

Primary School Climate Change Curriculum Integration Project Charter

Project Charter	
Date	**Name of Project**
September 01, 2023	Integrating Climate Change Topics in the Primary School Science Curriculum in Saint Lucia for Grades K - 6
Type of project:	Predictive/Waterfall
Knowledge areas/process groups	**Application area (Sector/Activity)**
Processes: Initiating, Planning, Executing, Monitoring and Controlling and Closing **Knowledge areas:** Integration Management, Scope Management, Schedule Management, Cost Management, Quality Management, Resource Management, Communication Management, Risk Management, Procurement Management, Stakeholder management.	Environmental Science Education
Tentative start date	**Tentative completion date**
September 01, 2023	September 30, 2025
Project objectives	

General objective
To integrate climate change topics in the Primary School Science Curriculum in Saint Lucia for Grades K - 6 over a 27-month period using a project management plan based on the Project Management Institute's Project Management Standard with a budget of 225, 060.00 USD.

Specific objectives
1. To determine the extent to which climate change topics are integrated and can be integrated into the Primary School Science Curriculum in Saint Lucia for Grades K - 6.
2. To determine the best approach and practices in climate change education to integrate climate change topics into the Primary School Science Curriculum in Saint Lucia for Grades K – 6.
3. To identify grade-level-appropriate climate change topics, content and learning resources.
4. To equip primary school teachers (K - 6) with the knowledge, skill, and resources to teach climate change topics.
5. To pilot test the revised Primary School Science Curriculum across Grades K-6 over a period of one school term.
6. To update the revised Primary School Science Curriculum based on the feedback from the pilot test.
7. To develop a monitoring and evaluation strategy for post-project implementation.

Project Charter

Justification or purpose of the project

The objective of the project - "Integrating Climate Change topics in the Primary School Science Curriculum in Saint Lucia for Grades K to 6," - is to address the urgent need for climate change education in Saint Lucia. Given Saint Lucia's vulnerability to climate change – due to its small size, geographic location, and its economic dependence on tourism and agriculture (GOSL, 2018), investing in climate change education is crucial in building a climate-resilient society. Through this project, learners will better understand the causes and effects of climate change, enabling them to make informed decisions and take appropriate actions. They will also acquire the necessary skills and values to participate in more sustainable lifestyles and economies (Gibbs, 2016), thus contributing to a more resilient Saint Lucian society.

The United Nations Educational, Scientific and Cultural Organization (UNESCO) views education as essential in preparing societies to address the climate change crisis. In 2021, UNESCO reported that only 53 % of the national curriculum of the 100 countries surveyed included climate change in their content and 40 % had a very minimal level of climate change content. In Saint Lucia, climate change topics are not adequately addressed in Primary School Curricula. Consequently, there is a critical need to prioritize climate change education in the Primary School Natural Science Curriculum. The absence of climate change topics in the curriculum and the lack of teacher training and education programmes that address environmental education and climate change, emphasises the urgent need for this project.

The project uses a project management plan based on the Project Management Institute's Project Management Standard, which is essential in ensuring the achievement of the project deliverables. The plan will help adequately execute all project management processes using the appropriate project management inputs, tools, and techniques. By integrating climate change topics in the Primary School Science Curriculum in Saint Lucia, this project will contribute to building a more climate-resilient Saint Lucian society.

Description of the product

- The **revised Primary School Science Curriculum for Grades K - 6** will include climate change topics relevant to Saint Lucia. It will be developed using local and international standards concerning the most appropriate inclusion strategy. Continuous engagement of local key stakeholders will ensure that the local context of climate change topics and impacts on Saint Lucia are captured.
- **Teaching and learning resources on climate change for teachers (Grades K - 6).** All teachers will have online access to teaching and learning resources on climate change.
- **Teacher training workshop on Climate change and reports.** All teachers from the eight (8) school districts will have access to training and resources through a teacher training workshop on climate change.
- **Pilot testing report.** A pilot test report will be developed after pilot testing of the revised Primary School Science Curriculum through the DoE.
- **Monitoring and evaluation strategy.** A monitoring and evaluation strategy will be developed for long-term use and evaluation of the performance of the revised Primary School Science Curriculum.

Assumptions

- The primary school teachers and principals, the Department of Education Officials and other stakeholders will support the project by participating in project activities.
- The principals and teachers are interested in learning about climate change and teaching climate change topics.
- The project is aligned to the Ministry of Education's vision for science

	Project Charter						
	education at the primary school level (Grades K - 6).						

education at the primary school level (Grades K - 6).
- The final budget of the project is an accurate costing of the project activities and needs.
- The primary school teachers are available to participate in the training workshop at the scheduled time.

Constraints
- The Ministry of Education plans to incorporate climate change topics into the Primary School Science Curriculum.
- There is no buy-in to the project at the level of the Department of Education.
- There is no buy-in to the project by some primary school principals and teachers.
- Only a small number of primary school teachers and principals in the close vicinity will be able to participate in in-person interviews/focus group discussions.
- Revision of the primary school curriculum is already in progress and does not include climate change topics.

Preliminary Identification of Risks
- If the primary school teachers are unavailable for interviews or focus group discussions due to scheduled school activities, then the project timeline may increase.
- If the primary school teachers are not available for the training workshops in the eight (8) districts due to examination preparation, then the project timeline may be increased.
- If the scope of the project is deemed too limited by the Department of Education Officials due to their own goals for climate change education, then there may be delays, increasing the time to complete the project.
- If there are unexpected school and business closures due to bad weather, then the project activities will be delayed increasing the time to complete the project.
- If there is an upsurge in COVID -19 cases in Saint Lucia due to the rapid circulation of the new variants, then there may be delays in executing the project activities.
- If the acting Science Curriculum Officer at the Ministry of Education is replaced due to the advertisement of the post, then there may be delays in completing tasks, increasing the time to complete the project.

WBS ID	Deliverable	Name of the resource	Unit	Amount USD	Unit cost	No. of Participants	Total cost USD
1.1.1	Project Management Plans	Internet & Power Stationary		$ 258.00			$ 258.00
1.1.2	Administration and reporting	CC Content Specialist		$ -			$ -
1.2.1	Report on treatment of CC and inclusion areas	CC Content Specialist with Team	days	$ 600.00	20		$12,000.00

WBS ID	Deliverable	Name of the resource	Unit	Amount USD	Unit cost	No. of Partici pants	Total cost USD
1.2.2	Two-day high- level meeting: discussion of report with key stakeholders	CC Content Specialist, Curriculum Specialist and other stakeholders	days	$ 400.00	2	2	$1,600.00
		Workshop venue rental	days	$ 207.00	2		$ 414.00
		Workshop Lunch and Break	days	$ 30.00	2	25	$1,500.00
1.2.3	Outline of CC topics/conte nt relevant for Grades K-6	Climate Change Content Specialist	days	$ 400.00	2		$ 800.00
1.3.1.1	Conduct of two-day working session	Workshop venue rental	days	$ 207.00	2		$ 414.00
		Workshop Lunch and Break	days	$ 30.00	2	25	$1,500.00
		CC Content Specialist and Curriculum Specialist and other stakeholders)	days	$ 400.00	2	2	$1,600.00
1.3.1.2	Developmen t of Draft Curriculum with CC topics and Grades K-6 relevant topics	Drafting Curriculum (CC Content Specialist with team)	days	$ 600.00	59		$35,400.0 0
1.3.2.1.1	Electronic review and comment by Education Districts	Online reviewing by Teachers and principals		$ -			$ -
1.3.2.1.2	Eight one-day meeting by Education District: finalisation of comments	Working session Lunch and Break	days	$ 30.00	8	25	$6,000.00

WBS ID	Deliverable	Name of the resource	Unit	Amount USD	Unit cost	No. of Participants	Total cost USD
1.3.2.1.3	Compiled report from 8 Districts	CC Content Specialist with team	days	$ 600.00	10		$6,000.00
1.3.2.2.1.	Conduct of one-day high-level meeting	One-day Lunch and Break	days	$ 30.00	8	25	$6,000.00
1.3.2.2.2	Updated Draft Curriculum	CC Content Specialist	days	$ 400.00	10		$4,000.00
1.3.2.3.1	Conduct of review and comment by DoE Officials (Updated Draft Curriculum)	DoE Officials	days	$ 0			$ 0
1.3.2.3.2	Updated Draft Curricum_ DoE	CC Content Specialist with team	days	$ 600.00	5		$3,000.00
1.3.2.4.1	Conduct of two-day Stakeholder Consensus Meeting	Stakeholder Consensus Meeting venue rental	days	$ 207.00	2		$ 414.00
		Stakeholder consensus session Lunch and Break	days	$ 30.00	2	25	$1,500.00
		CC Content Specialist & Curriculum Specialist	days	$ 400.00	2	2	$1,600.00
1.3.2.4.2	Revised Draft Curriculum	CC Content Specialist with team	days	$ 600.00	5	1	$3,000.00
1.4.1	Conduct of eight one-week training workshops by Education	CC training session: Lunch and Break	days	$ 30.00	10	50	$15,000.00

WBS ID	Deliverable	Name of the resource	Unit	Amount USD	Unit cost	No. of Participants	Total cost USD
	District	CC Content Specialist with team	days	$ 600.00	40	1	$24,000.00
1.4.2	Workshop Report	CC Content Specialist with team	days	$ 600.00	10	1	$ 6,000.00
1.5.1	Development of Online CC Resource Centre	Multimedia electronic resources		$4,000.00	1	1	$ 4,000.00
		IT specialist/Web designer	days	$ 400.00	35	1	$14,000.00
1.6.1	Two-day high- level meeting: on Pilot Testing Report	CC Content Specialist, Curriculum Specialist, DoE Officials	days	$6,000.00	2	25	$12,000.00
1.6.2	Updated Revised Draft Curriculum	CC content specialist, Curriculum specialist	days	$400.00	20	2	$16,000.00
1.7.1	Development of Monitoring and Evaluation Strategy (Specialist)	M&E Specialist	days	$ 400.00	20		$ 8,000.00
1.7.2	Review and dissemination of M&E Strategy	DoE Officials		$ -			$ -
					TOTAL		$186,000.00

Milestones schedule activities		
Activity Identifier	**Activity**	**End date**
MB	Project start	September 01, 2023
M1	Start of Project Administration and Reporting	September 01, 2023
M2	End of Project Administration and Reporting	September 30, 2025
	Development of Project Management Plans	September 14, 2023
	Development of report on treatment of CC and areas for inclusion in Curriculum	October 12, 2023

Milestones schedule activities		
Activity Identifier	**Activity**	**End date**
	Two-day high-level meeting: discussion of report with stakeholders	October 16, 2023
	Outline of CC Integration approach and Grades K-6 relevant topics	October 18, 2023
M3	End of review of Primary School Science Curriculum	October 18, 2023
	Conduct of two-day working session	October 20, 2023
	Development of Draft Curriculum with CC topics and Grades K-6 relevant topics	January 11, 2024
	Electronic review and comments by Education Districts	February 08, 2024
	Eight 1-day meeting by Education Districts: finalisation of comments	February 20, 2024
	Compiled Report from 8 Education Districts	March 05, 2024
	Conduct of one-day high-level meeting to discuss report towards update of Draft Curriculum	March 06, 2024
	Updated Draft Curriculum	March 20, 2024
	Conduct of review and comments by DoE Officials (Updated Draft Curriculum)	April 17, 2024
	Updated Draft Curricum_DoE	April 24, 2024
	Conduct of two-day Stakeholder Consensus Meeting to discuss Updated Draft Curriculum_DoE	April 26, 2024
M4	End of revision of Primary School Science Curriculum with CC integration	May 03, 2024
	Conduct of eight one-week training workshops by Education District	June 28, 2024
	Workshop report	July 12, 2024
M5	Completion of Teacher Training Workshop	July 12, 2024
	Development of Online CC Resource Centre	March 06 - April 23, 2024
M6	Approval of CC Resource Centre	April 23, 2024
M7	Start of DoE Pilot Test	September 24, 2024
M8	End of DoE Pilot Test	July 04, 2025
	Pilot Testing of revised curriculum (Activity not part of the project)	July 04, 2025
	Two-day high-level meeting on Pilot Testing Report	July 08, 2025
	Updated Revised Draft Curriculum	August 05, 2025
M9	Approval of CC Integration Curriculum	August 05, 2025
	Development of Monitoring & Evaluation Strategy	September 02, 2025
	Review and dissemination of M&E strategy	September 30, 2025
M10	Completion of Monitoring & Evaluation Strategy	September 30, 2025
ME	Close of project	September 30, 2025

	Relevant Historical Information

<table>
<tr><td></td><td colspan="2">The Ministry of Education, Sustainable Development, Innovation, Science, Technology, and Vocational Training (MoESISTV) holds the responsibility of overseeing the education sector in Saint Lucia. Within this ministry, the Department of Education (DoE) plays a central role in the effective management and administration of the sector. Its mission is to "provide quality instructional support services for the promotion of life-long learning and the development of human resources" (Saint Lucia - Ministry of Education, n.d.).

One of the many units within the DoE, is the Curriculum and Material Development Unit (CAMDU), whose role is to provide quality instructional support services to promote lifelong learning and human resource development. CAMDU develops curriculum guides for both primary and secondary education levels, including Science and Technology.

The Primary School Climate Change Curriculum Integration Project will be led by the Science Curriculum Officer and other officers from CAMDU. Together with key project stakeholders, they will form the project team. This strategic placement of the project within CAMDU allows for effective inter-ministerial and departmental collaborations and communication with relevant units, subunits, and departments within the MoESISTV.</td></tr>
</table>

	Identification of Stakeholders	

•	• Ministry of Education Officials:
	    o Permanent Secretary Department of Education
	    o Chief Education Officer (CEO)
	    o Curriculum Officer (Ag)
	    o District Education Officers (DEO)
	    o Chief Curriculum Officer
	• Climate Change Content Specialist and Team
	• Curriculum Specialist
	• Information Technology Specialist
	• Monitoring & Evaluation Specialist
	• Primary School Teachers (Grades K-6)
	• Primary School Principals
	• Parents
	• Parent-Teachers Associations
	• UNESCO Representative
	• Permanent Secretary Department of Sustainable Development
	• Environment and Sustainable Development Officers
	• Local Community groups
	• OECS Climate Change Lead
	• OECS Education Resource Unit (OERU)
	• Primary School Students (Grades K-6)
	• Non-Governmental Organization (NGO): Caribbean Waterways	

	Project Manager:	Signature:
	Name and title of the authorising person (facilitator):	Signature:

Note. Prepared by Author

4.1.2 Develop Project Management Plan

The general objective of the FGP is the project management plan. The inputs for the plan consisted of the FGP project charter, national science and technology learning

standard, as well as international science standards that addressed climate change topics. Additionally, the policies of the DoE related to the school curricula, documentation, and decision-making methods were inputs in the process. The main tools/techniques used for gathering information were informal interviews and meetings with key stakeholders.

4.1.3   Direct and Manage Project Work

The expected outputs of the process were the deliverables, the work performance data, the issue log consisting of any gaps, inconsistencies, or unexpected change requests, and document updates.

4.1.4   Manage Project Knowledge

Manage Project Knowledge process would allow improvement of the project outcomes through the executing process group. Among the main outputs of this process would be the lessons learnt register and updates to the project management plan.

4.1.5   Monitor and Control Project Work

The main tools and techniques that would be used are meetings, variance analysis, and root cause analysis. The output would be the work performance report, the project management plan updates, and the document updates.

4.1.6   Perform Integrated Change Control

The techniques that would be used in this process would include the decision-making method, and meetings. The significant outputs would be the project management updates and other document updates.

4.1.7   Close Project or Phase

The main inputs of this process for the project would be the project charter, the project management plan, the accepted deliverables, and the project documents (issue log, milestone lists, lessons learnt register, quality measures, risk measures and report, etc.). The two (2) main techniques that would be used in this process are 1) document analysis, including lessons learned and sharing of knowledge, and 2) a project close-out meeting to confirm acceptance of the deliverables and to validate that the exit criteria was met and formally signify the completion of the project. The expected output would be the document updates (where all project documents would be updated and finalised), the final deliverables of the project – the revised Primary School Science Curriculum, the teaching and learning resources on climate change for teachers (Grades K - 6), the climate change teacher training workshops and report, the pilot testing report and the monitoring and evaluation strategy - and the final project report on the project which would give a summary of the project's performance.

4.2   Scope Management Plan

The project Scope Management Plan is one of the subsidiary plans developed by the author to fulfil specific objective three (3) of the FGP. The plan's development involved the use of the scope management processes together with the relevant input, tools and techniques and the resulting outputs as summarised in Chart 9.

Chart 9

Primary School Climate Change Curriculum Integration Project Summary of the Scope

Management Processes, Input, Tools/Techniques and Outputs

Project Scope Management Processes	Input	Tools & Techniques	Outputs
Plan Scope	Project Charter, government and international standard, DoE policies and lessons learned from previous projects	Meeting with Chief Curriculum Officer	Requirements, scope
Collect Requirements	Project Charter, government and international standards, DoE policies and lessons learned from previous projects, Requirements scope	Interview, meeting with Chief Curriculum Officer, benchmarking	Requirement Traceability Matrix
Define Scope	Project Charter, Government and international standards, DoE policies and lessons learned from previous projects, requirements, scope	Data Analysis (used to evaluate ways to meet the requirements and the objectives identified in the charter)	Project Scope Statement
WBS	Government and international standards, DoE policies and lessons learned from previous projects, requirements, scope	Decomposition, top-down method	WBS dictionary
Validate Scope	Traceability matrix, requirements scope	Decision making	Work performance information on project progress
Control Scope	Traceability matrix, requirements, scope, DoE policies and lessons learned from previous	Variance analysis	Project document updates

Project Scope Management Processes	Input	Tools & Techniques	Outputs
	projects, work performance information on project progress		

Note. Prepared by Author

4.2.1 Plan Scope Management

The Project Charter was the significant input and provided detailed information on the purpose, assumptions, constraints and requirements that the project would achieve. Additionally, the meeting with the Chief Curriculum Officer provided valuable information concerning to alignment of the project requirements with that of the DoE and the lessons learned that can be incorporated into the project. The resulting information contributed to the development of the required scope of the project.

4.2.2 Collect Requirements

The project requirements were determined by using the project charter as a significant input, lessons learned, and international and national science standards. The requirements were information obtained from informal interviews and meetings with various stakeholders. Additionally, benchmarking of best practices in science education and integration of climate change topics in curricula was gathered and contributed to the development of the Requirement Traceability Matrix (Chart 10).

Chart 10

Primary School Climate Change Curriculum Integration Project Requirement Traceability Matrix

Project name	Integrating Climate Change Topics in the Primary School Science Curriculum in Saint Lucia for Grades K - 6				
Project Description	The objective of the project, "Integrating Climate Change topics in the Primary School Science Curriculum in Saint Lucia for Grades K to 6," is to address the urgent need for climate change education in Saint Lucia, given Saint Lucia's vulnerability to climate change. Through this project, learners will better understand of the causes and effects of climate change, enabling them to make informed decisions and take appropriate actions. They will also acquire the necessary skills and values to participate in more sustainable lifestyles and economies, contributing to a more resilient Saint Lucian society. The project uses a project management plan based on the Project Management Institute's Project Management Standard. The plan will help adequately execute all project management processes using the appropriate project management inputs, tools, and techniques.				
ID	**WBS ID**	**Requirement Description**	**Business Needs, Opportunities, Goals, Objectives**	**Project Objectives**	**WBS Deliverable**	**Stakeholders**
1	1.0	The project will be completed on time at the budgeted cost. It would be comparable to that used in other countries.	Successful achievement of the project objectives.	Timely, efficient and proper management of the project resources.	Project management plans	Curriculum Specialist, CC Content Specialist, DoE Officials, Principals, Teachers

Project name	Integrating Climate Change Topics in the Primary School Science Curriculum in Saint Lucia for Grades K - 6					
Project Description	The objective of the project, "Integrating Climate Change topics in the Primary School Science Curriculum in Saint Lucia for Grades K to 6," is to address the urgent need for climate change education in Saint Lucia, given Saint Lucia's vulnerability to climate change. Through this project, learners will better understand of the causes and effects of climate change, enabling them to make informed decisions and take appropriate actions. They will also acquire the necessary skills and values to participate in more sustainable lifestyles and economies, contributing to a more resilient Saint Lucian society. The project uses a project management plan based on the Project Management Institute's Project Management Standard. The plan will help adequately execute all project management processes using the appropriate project management inputs, tools, and techniques.					
ID	**WBS ID**	**Requirement Description**	**Business Needs, Opportunities, Goals, Objectives**	**Project Objectives**	**WBS Deliverable**	**Stakeholders**
2	1.2.1	There will be preliminary key stakeholder meetings and discussions on the climate change integration approach to integrate climate change topics in the science curriculum.	Improved knowledge, skills and behaviours of the students concerning climate change and its impacts.	Benchmarking concerning other successful science curricula that integrates climate change topics.	Report on implementing climate change integration into the science curriculum	Chief Curriculum Officer, Curriculum Officer (Ag), Other DoE Officials, CC Content Specialists, Curriculum Specialist Teachers and Principals

Project name	Integrating Climate Change Topics in the Primary School Science Curriculum in Saint Lucia for Grades K - 6					
Project Description	The objective of the project, "Integrating Climate Change topics in the Primary School Science Curriculum in Saint Lucia for Grades K to 6," is to address the urgent need for climate change education in Saint Lucia, given Saint Lucia's vulnerability to climate change. Through this project, learners will better understand of the causes and effects of climate change, enabling them to make informed decisions and take appropriate actions. They will also acquire the necessary skills and values to participate in more sustainable lifestyles and economies, contributing to a more resilient Saint Lucian society. The project uses a project management plan based on the Project Management Institute's Project Management Standard. The plan will help adequately execute all project management processes using the appropriate project management inputs, tools, and techniques.					
ID	WBS ID	Requirement Description	Business Needs, Opportunities, Goals, Objectives	Project Objectives	WBS Deliverable	Stakeholders
3	1.2.2	There will be close collaboration and inclusion of the key stakeholders in preliminary meetings and discussions.	Suitability of the climate change topics to the context of Saint Lucia.	Compliance with the policies of the DoE.	Climate change topics are integrated into the Primary School Science Curriculum from Grades K to 6.	Chief Curriculum Officer, Curriculum Officer (Ag), Other DoE Officials, CC Content Specialists, Curriculum Specialist Teachers and Principals
4	1.3.1.1	There will be a team set-up with the responsibility to develop lesson plans and identify objectives, content, resources and assesment activities related to climate	Improved teaching skills and knowledge of teachers concerning instruction on climate change topics.	Identification of Grades-level-appropriate climate change topics, content and learning resources.	Teacher training workshop report; well-equipped climate change learning resource centre for teachers.	Curriculum Officer (Ag), CC Content Specialists and team, Curriculum Specialist Teachers

Project name	Integrating Climate Change Topics in the Primary School Science Curriculum in Saint Lucia for Grades K - 6				
Project Description	The objective of the project, "Integrating Climate Change topics in the Primary School Science Curriculum in Saint Lucia for Grades K to 6," is to address the urgent need for climate change education in Saint Lucia, given Saint Lucia's vulnerability to climate change. Through this project, learners will better understand of the causes and effects of climate change, enabling them to make informed decisions and take appropriate actions. They will also acquire the necessary skills and values to participate in more sustainable lifestyles and economies, contributing to a more resilient Saint Lucian society. The project uses a project management plan based on the Project Management Institute's Project Management Standard. The plan will help adequately execute all project management processes using the appropriate project management inputs, tools, and techniques.				
ID	**WBS ID**	**Requirement Description**	**Business Needs, Opportunities, Goals, Objectives**	**Project Objectives**	**WBS Deliverable**	**Stakeholders**
		change topics for Grades K-6.				
5	1.6.1	There will be a pilot test of the revised curriculum with selected primary schools.	Ensure continuous monitoring and evaluation of its performance.	Pilot testing of the revised Primary School Science Curriculum across Grades K-6 over a period of one (1) school term.	Pilot testing report on the implementation of climate change integration science curriculum.	Chief Curriculum Officer, Curriculum Officer (Ag), Other DoE Officials, CC Content Specialists, Curriculum Specialist Teachers and Principals
6	1.7	There is a set strategy to update the revised science curriculum over time.	Ensure update of the Science Curriculum after monitoring and evaluation of it performance.	Updating of the revised Primary School Science Curriculum based on the feedback from the pilot test.	Monitoring and evaluation strategy	Chief Curriculum Officer, Curriculum Officer (Ag), Other DoE Officials, CC Content Specialists, Curriculum Specialist Teachers and Principals

Project name	Integrating Climate Change Topics in the Primary School Science Curriculum in Saint Lucia for Grades K - 6					
Project Description	The objective of the project, "Integrating Climate Change topics in the Primary School Science Curriculum in Saint Lucia for Grades K to 6," is to address the urgent need for climate change education in Saint Lucia, given Saint Lucia's vulnerability to climate change. Through this project, learners will better understand of the causes and effects of climate change, enabling them to make informed decisions and take appropriate actions. They will also acquire the necessary skills and values to participate in more sustainable lifestyles and economies, contributing to a more resilient Saint Lucian society. The project uses a project management plan based on the Project Management Institute's Project Management Standard. The plan will help adequately execute all project management processes using the appropriate project management inputs, tools, and techniques.					
ID	**WBS ID**	**Requirement Description**	**Business Needs, Opportunities, Goals, Objectives**	**Project Objectives**	**WBS Deliverable**	**Stakeholders**
7	1.7.1	There is documentation of the short and long-term impact of the revised climate change science curriculum on students.	Report on the impact of the curriculum on students' behaviour.	Developing a monitoring and evaluation strategy for post-project implementation.	Monitoring and evaluation strategy	Chief Curriculum Officer, Curriculum Officer (Ag), Other DoE Officials

Note. Prepared by Author

4.2.3 Define Scope

The resulting detailed Project Scope Statement was developed from the initial deliverables, assumptions, and constraints (Refer to Chart 11). The project scope would then be defined and described in more detail during the project planning when more information about the project would be available.

Chart 11

Primary School Climate Change Curriculum Integration Project Scope Statement

Project Name	Integrating Climate Change Topics in the Primary School Science Curriculum in Saint Lucia for Grades K - 6
Date	September 01, 2023

Project Objectives
General Objectives   To integrate climate change topics in the Primary School Science Curriculum in Saint Lucia for Grades K - 6 over a 27-months period using a project management plan based on the Project Management Institute's Project Management Standard with a budget of $225, 060.00 USD.   **Specific Objectives**   1. To determine the extent to which climate change topics are integrated and can be integrated in the Primary School Science Curriculum in Saint Lucia for Grades K - 6.   2. To determine the best approach and practices in climate change education to integrate climate change topics into the Primary School Science Curriculum in Saint Lucia for Grades K – 6.   3. To identify Grades-level-appropriate climate change topics, content and learning resources.   4. To equip primary school teachers (K - 6) with the knowledge, skill, and resources to teach climate change topics.   5. To pilot test the revised Primary School Science Curriculum across Grades K-6 over a period of one school term.   6. To update the revised Primary School Science Curriculum based on the feedback from the pilot test.   7. To develop a monitoring and evaluation strategy for post-project implementation.

Product Scope Definition
The revised Primary School Science Curriculum in Saint Lucia for Grades K to 6 will address climate change topics. It will be developed using local and international standards for the most appropriate inclusion strategy. Continuous engagement of local key stakeholders will ensure that the local context of climate change topics and impacts on Saint Lucia are captured. The teachers and all eight (8) school districts will have access to training and resources through a teacher training workshop on climate change and the creation of an online climate change teacher resource centre. A pilot test report will be developed after pilot testing of the revised Primary School Science Curriculum through the DoE. A monitoring and evaluation strategy will be developed for long-term use and evaluation of the performance of the revised Primary School Science Curriculum.

Project Requirements
1. The project will be completed on time at the budgeted cost and will be comparable to that used in other countries.   2. There will be preliminary key stakeholder meetings and discussions on the climate change integration approach to be used for integrating climate change topics in the science curriculum.   3. There will be close collaboration and inclusion of the key stakeholders in preliminary meetings and discussions.

Project Name	Integrating Climate Change Topics in the Primary School Science Curriculum in Saint Lucia for Grades K - 6
Date	September 01, 2023

4. There will be a team set-up responsible for developing lesson plans, identifying objectives, content, resources, and assessment activities related to climate change topics for Grades K-6.

5. There will be a pilot test of the revised curriculum with selected primary schools.
6. There is a set strategy to update the revised science curriculum over time.
7. There is documentation of the short and long-term impact of the revised climate change science curriculum on students.

Project Exclusions

1. The selection of the participating schools and implementation of the pilot test is not within the scope of the project.

2. The revised Primary School Science Curriculum will not be implemented during the project.

3. There is no monitoring and evaluation of the implementation of the revised Primary School Science Curriculum.

4. The effectiveness of the climate change teaching and learning resource centre will not be evaluated during the project.

5. The climate change teaching and learning resource centre will not be pilot tested once developed by the IT specialist.

6. There is no monitoring and evaluation strategy for the climate change teaching and learning resource centre.
7. Continuous teacher training workshops are not within the scope of the project.
8. The update of the revised Primary School Science Curriculum after the pilot test is not within the project's scope.

Project Deliverables

1. The revised Primary School Science Curriculum for Grades K - 6 which includes climate change topics.
2. Climate change teaching and learning resource centre for teachers (Grades K - 6).
3. Teacher Training Workshops on climate change and report
4. Pilot testing report.
5. Monitoring and evaluation strategy.

Project Acceptance Criteria

1. The revised Primary School Science Curriculum compliant with local and international educational standards for environmental science education and/or integrating climate change topics in curricula.

2. The revised Primary School Science Curriculum reflects the local context concerning climate change topics and impacts.

3. There was sufficient stakeholder engagement and input during all project phases.

4. The revised Primary School Science Curriculum was revised and updated after pilot testing over a school term and across Grades K-6
5. All reporting and documentation of the process have been completed.

Project Name	Integrating Climate Change Topics in the Primary School Science Curriculum in Saint Lucia for Grades K - 6
Date	September 01, 2023
	6. The climate change teaching and learning resource centre is easily accessible to all teachers, includes the local context and ensures that teachers use IT in lessons. 7. The climate change teacher training workshop agenda has been approved by the DoE Officials. 8. The pilot test report has been validated by DoE Officials 9. The monitoring and evaluation strategy is compliant with educational standards.

Note. Prepared by Author

4.2.4 Create Work Breakdown Structure (WBS)

The WBS provided a framework for the project deliverables (Refer to Figure 9). The inputs to the Create WBS process included product documents such as the project scope and the requirements documents. The decomposition technique was used to divide and subdivide the project scope and project deliverable into smaller parts. The WBS structure was created using a top-down approach where the major deliverables were used as the second level of decomposition for the climate change integration project. The output of the process was the scope baseline which included the project scope statement, the work packages, the WBS and the WBS dictionary. The WBS dictionary provided detailed deliverable, activity, and scheduling information about each component in the WBS (Refer to   Figure   10).

Figure 9

Primary School Climate Change Curriculum Integration Project Work Breakdown Structure (WBS)

Note. Prepared by Author

Chart 12

Primary School Climate Change Curriculum Integration Project Work Breakdown Structure Dictionary

WBS ID	Description of work	Owner/ Responsible Organization	Assumptions and Constraints	Milestones	Resources Required	Quality Metric	Cost	Schedule
1.1 Project Management								
1.1.1	Development of 10 subsidiary project management plans for inclusion of CC topics in the Primary School Science Curriculum	CC content specialist	The project management plans will guide effective integration of CC topics in the Primary School Science Curriculum	10 Completed subsidiary management plans	CC content specialist	# of approved subsidiary management plans	$ 258.00	October 14, 2023
1.1.2	Administration and reporting on project status and progress	CC content specialist	The project reports meet the standards of DoE. The project reports are approved by the DoE in a timely manner.	Project start and close	CC content specialist	# of DoE approved project reports	$ -	Weekly, Biweekly, Monthly
1.2 Review of Primary School Science Curriculum for Grades K-6								
1.2.1	Development of a report on treatment of CC and inclusion areas.	CC content specialist with team	There is agreement on the areas for inclusion in the curriculum. The curriculum is under review and CC is not part of the	Completed report	CC content specialist with team	# of completed reports	$12,000.00	October 12, 2023

			plan.					
1.2.2	Two-day high-level meeting: discussion of the report with stakeholders.	DoE Officials	There is agreement on the approach to the learning objectives and assessment activities for the revised curriculum. Any integration of CC topics would have to be done after the revision of the new curriculum.	High-level meeting outcomes related to integration approach, learning outcomes and assessment.	CC content specialist with the team, Curriculum specialist	# number of high-level meetings implemented	$ 3,514.00	October 16, 2023
1.2.3	Outline of CC Integration approach and Grades K-6 relevant topics	CC Content Specialist	There is acceptance of the outline for the integration of CC topics in the Science Curriculum on the part of the Primary School Teachers	Outline of CC Integration approach for Grades-6	CC Content Specialist, Curriculum Specialist	# of outlines developed	$ 800.00	October 18, 2023
1.3 Revised Primary School Science Curriculum with CC integration								
1.3.1.1	Conduct of two-day working session.	DoE	The primary school teachers are available to give their input in the direction of the	Meeting outcome related to input towards the	CC Content Specialist Curriculum Specialist	# of meetings of this nature implemented	$ 3,514.00	October 20, 2023

			revised curriculum for Grades K-6.	curriculum				
1.3.1.2	Development of draft curriculum with CC topics, and Grades K-6 topics.	CC content specialist with the team	The CC content specialist and the team will have all the resources needed to develop the draft curriculum.	Draft curriculum for stakeholder review	CC content specialist with the team, Curriculum specialist	# of draft curriculum for review	$36,000.00	January 11, 2024
1.3.2.1.1	Electronic review and comments by Education Districts.	CC content specialist	Principals and teachers from all districts have the time to review the draft document within the stipulated time.	Draft curriculum with comments from teachers and principals.	CC content specialist with the team, Curriculum specialist	# of draft curriculum with comments	$ -	February 08, 2024
1.3.2.1.2	Eight one-day meeting by Education Districts: finalization of comments.	CC content specialist and Curriculum Specialist	The education districts participants can come to consensus on the comments.	Summary of compiled comments from teachers and principals for each district.	CC content specialist and Curriculum Specialist	# of summaries of compiled comments	$ 6,000.00	February 20, 2024
1.3.2.1.3	Compiled report from eight districts	CC content specialist	The report can be compiled within the stipulated time.	Compiled report with consolidated comments from 8 districts.	CC content specialist with the team, Curriculum specialist	# of compiled reports	$ 6,000.00	March 05, 2024
1.3.2.2.1	Conduct of one-day high-level meeting	CC content Specialist Curriculum	The participants from all education Districts are	Meeting outcomes and decisions	CC content specialist with the team,	# of meetings of this nature implemented	$ 4,000.00	March 06, 2024

		Specialist	available to participate.	related to the improvement of the draft curriculum.	Curriculum specialist, DoE Officials			
1.3.2.2.2	Updated draft curriculum	CC content specialist	The draft curriculum can be updated within the stipulated time.	Updated draft curriculum	CC content specialist with team, Curriculum specialist	# of updated draft curriculum	$10,000.00	March 20, 2024
1.3.2.3.1	Conduct of review and comment by DoE Officials.	DoE Officials	DoE Officials are available to review and comment on the updated draft curriculum within the stipulated time.	Updated draft curriculum with comments	DoE Officials, CC Content Specialist	# of updated draft curriculum with DoE Officials' comments	$ 0	April 17, 2024
1.3.2.3.2	Updated draft curriculum_ DoE.	CC content specialist	The draft curriculum can be updated with the DoE official's comments within the stipulated time.	Updated draft curriculum with incorporation of DoE officials' comments.	CC content specialist with the team, Curriculum specialist	# of updated draft curricumum with DoE comments	$ 3,000.00	April 24, 2024
1.3.2.4.1	Conduct of two-day Stakeholder Consensus Meeting	DoE Officials, CC content Specialist, CC Specialist	There is participation by most of the key stakeholders	Meeting outcomes towards revising the curriculum	DoE Officials, CC content Specialist, CC Specialist other key stakeholders	# of meetings of this nature implemented	$ 3,514.00	April 26, 2024
1.3.2.4.2	Revised draft curriculum.	CC content specialist	There is consensus on the changes to the draft curriculum.	Completed revised draft curriculum report.	CC content specialist with team, Curriculum	# of completed revised draft curriculum	$ 6,514.00	May 03, 2024

					specialist			
1.4 CC Teacher training workshops for teachers (Grades K-6)								
1.4.1	Conduct of eight one-week training workshops by the Education District.	DoE and CC content specialist with the team	The teachers in each district are available to participate in the entire workshop during the stipulated times. Limited teacher participation in some education districts due to planned school activities.	Completed training workshop for eight (8) districts.	CC content specialist with the team, IT specialist	# of completed training workshop	$39,000.00	June 28, 2024
1.4.2	Workshop Report	CC content specialist with team	The workshop report can be completed within the stipulated time.	Completed consolidated workshop report.	CC content specialist with team	# of consolidated workshop reports	$ 6,000.00	July 12, 2024
1.5 Teaching and learning resources for teachers and students								
1.5.1	Development of Online CC Resource Centre.	IT specialist	The resource centre fits the intructional needs of the teachers.The teachers will be comfortable using the learning resource centre. Some teachers may lack the IT skills to effectively use the learning resource.	Developed online resource centre	IT specialist	# of resource centres developed	$16,000.00	April 23, 2024
1.6 Post pilot testing of revised Curriculum								

1.6.1	Two-day high-level meeting on pilot testing report.	DoE	The pilot testing of the revised curriculum can be tested at all grades in at least one school from each district. Schools are willing to fully participate in the pilot test for the duration of the stipulated period.	Completed pilot test report	CC content specialist with the team, Curriculum specialist	# of pilot test reports	$ 12,000.00	July 08, 2025
1.6.2	Updated Revised Draft Curriculum.	CC content specialist with the team	The feedback from the pilot test can be used to improve the revised curriculum.	Updated revised curriculum	CC content specialist with team	# of updated revised curriculum	$16,000.00	August 05, 2025
	1.7 Monitoring & evaluation strategy							
1.7.1	Development of M&E Strategy	M&E Specialist	The M&E strategy will be completed within the stipulated time.	Completed M&E strategy	M&E Specialist, DoE Officials	# of M&E Strategies developed	$8,000.00	September 02, 2025
1.7.2	Review and dissemination of M&E strategy.	Science curriculum officer	The M&E strategy will be reviewed and disseminated in the stipulated time.	Approved M&E strategy	M&E Specialist, Officials	# of M&E Strategies disseminated	$ -	September 30, 2025

Note. Prepared by Author

4.3   Schedule Management Plan

A summary of the schedule management processes, inputs, tools/techniques and outputs is given in Chart 13 and further detailed in the following subsections.

Chart 13

Summary of the Schedule Management Processes, Inputs, Tool/Techniques and Outputs of

the Primary School Climate Change Curriculum Integration Project

Project Schedule Management Processes	Input	Tools & Techniques	Output
Plan Schedule Management	Project Charter, Scope Management Plan	Meeting with DoE Officials	Schedule Management Plan
Define Activities	Project scope, DoE policies	Decomposition, meetings with key stakeholders	Activity list, Milestone list
Sequence Activities	Scope baseline, activity list, milestone list, DoE policies	Project Management Information System (PMIS) – Microsoft Project Professional (version 2019)	Project Schedule, Schedule Network Diagram
Estimate Activity Duration	Scope of work, project documents, DoE policies, lessons learned	Three-point estimates, meetings with DoE officials	Expected Activity Duration (Document update)
Develop Schedule	Scope baseline, the DoE policies, project documents	Critical path method	Project schedule Milestone schedule
Control Schedule	Management plans, project documents	Critical path method	Schedule forecasts, update of project management plans and project documents

Note. Prepared by Author

4.3.1   Plan Schedule Management

The major inputs used in the plan's development were the Project Charter and the

Scope Management Plan. Face-to-face meetings with DoE officials were the project's

technique used to development of the output – the Schedule Management Plan.

4.3.2   Define Activities

The inputs for this process included components of the project scope; the WBS, the

deliverables, the constraints, the assumptions, DoE policies regarding documentation and

reporting on activities and lessons learned concerning the scheduling of activities during the primary school term. The main technique used in the process was decomposition where the project scope and deliverables were broken up into activities needed to achieve the work package. The other technique used was a face-to-face meeting with the key stakeholders to assist in defining the activities. The two (2) outputs of this process were, 1) the activity list (Chart 14), which clearly detailed the schedule activities required on the project, 2) the milestone list (Chart 15) which identifies the milestones that represent significant events of the project (both contracted and optional) (PMI, 2017).

Chart 14

Primary School Climate Change Curriculum Integration Project Activity List

WBS ID	Work Package	Activity Name	Activity Description
1.1.1	Development of project management plans	Develop the project Charter	Develop the Project Charter to authorize the start of the project and resource allocation.
1.1.1	Development of project management plans	Develop the Integration Management Plan	Describes the processes and activities to identify, define, unify, and coordinate the project processes and management activities.
1.1.1	Development of project management plans	Develop the Scope Management Plan	Describes how the project scope will be defined, developed, monitored, controlled and validated.
1.1.1	Development of project management plans	Develop the Schedule Management Plan	Establishes the criteria for developing the project schedule.
1.1.1	Development of project management plans	Develop the Cost Management Plan	Describe how the cost will be planned, structured and controlled throughout the project.
1.1.1	Development of project management plans	Develop the Quality Management Plan	Describes how the policies, procedures and guidelines will be used to achieve quality deliverable.
1.1.1	Development of project management plans	Develop the Resource Management Plan	Describes how the project resources are acquired, allocated and controlled.
1.1.1	Development of project management plans	Develop the Communication Management Plan	Describes how, when and who administers and /or disseminate project information.
1.1.1	Development of project management plans	Develop the Risk Management Plan	Describes how the project risks management activity is structured and performed.
1.1.1	Development of project management plans	Development the Procurement Management Plan	Describes how the products and services will be sourced from outside.

WBS ID	Work Package	Activity Name	Activity Description
1.1.1	Development of project management plans	Development of the Stakeholder Management Plan	Identifies the strategies to promote stakeholder involvement and participation in decision-making and execution.
1.1.2	Administration and Reporting on project status and progress	Development of the project status and progress reports	Describes the project's monitoring and control activities and the relevant reporting that will be conducted
1.2.1	Development of report on the treatment of CC and inclusion areas	Review of Primary School Science Curriculum for Grades K-6	Develop a report on the current Primary School Science Curriculum identifying areas at the different Grades levels for inclusion of CC topics.
1.2.2	Two-day high-level meeting: discussion of report with key stakeholders	Review of Primary School Science Curriculum for Grades K-6	Conduct a 2-day high-level stakeholder meeting for discussion of the CC integration approach, learning objectives and assessment types.
1.2.3	Outline of the CC integration approach and Grades K-6 relevant topics	Review of Primary School Science Curriculum for Grades K-6	Develop an outline of the agreed integration approach for Grades K-6 relevant topics.
1.3.1.1	Conduct of two-day working session	Revised Primary School Science Curriculum with CC integration	Conduct two-day working sessions with stakeholders.
1.3.1.2	Development of draft curriculum with CC topics, learning objectives, content and resources relevant for Grades K-6	Revised Primary School Science Curriculum with CC integration	Develop a draft curriculum which includes the CC topics, learning objectives, content, and resources relevant for Grades K-6.
1.3.2.1.1	Electronic review and comments on by Education Districts	Revised Primary School Science Curriculum with CC integration	Review and add comments to the draft curriculum in the eight (8) education districts, virtually by the school principals and teachers.
1.3.2.1.2	Eight one-day meeting by Education Districts: finalisation of comments	Revised Primary School Science Curriculum with CC integration	Conduct a one-day meeting by districts to finalise the comments on the draft curriculum.
1.3.2.1.3	Compiled report from eight (8) districts	Revised Primary School Science Curriculum with CC integration	Develop a report on the feedback on the draft curriculum from the teachers and the principals from the 8 Education Districts.

WBS ID	Work Package	Activity Name	Activity Description
1.3.2.2.1	Conduct of one-day high-level meeting	Revised Primary School Science Curriculum with CC integration	Conduct a one-day high-level meeting to discuss feedback report from Education Districts.
1.3.2.2.2	Updated draft curriculum	Revised Primary School Science Curriculum with CC integration	Update the draft curriculum with the feedback from the principals and teachers from the 8 education districts.
1.3.2.3.1	Conduct of review and comment by DoE Officials	Revised Primary School Science Curriculum with CC integration	Review and comment on the updated Draft Curriculum by DoE Officials.
1.3.2.3.2	Updated draft curriculum_ DoE	Revised Primary School Science Curriculum with CC integration	Update the curriculum after review by DoE Officials.
1.3.2.4.1	Conduct of two-day Stakeholder Consensus Meeting	Revised Primary School Science Curriculum with CC integration	Conduct a two-day meeting for consensus of the stakeholders on the Revised Primary School Science Curriculum with CC integration.
1.3.2.4.2	Revised draft curriculum	Revised Primary School Science Curriculum with CC integration	Update the curriculum after the stakeholder consensus meeting to give the revised draft curriculum with CC integration.
1.4.1	Conduct of eight one-week training workshops by Education District	Teacher training workshops for teachers (Grades K-6)	Conduct 8 1-week teacher training workshops for primary school teachers Grades K-6.
1.4.2	Workshop Report	Teacher training workshops for teachers (Grades K-6)	Develop reports for the teacher training workshops.
1.5.1	Development of Online CC Resource Centre	Teaching and learning resources for teachers and students	Develop an online CC teaching and learning resource for teachers from Grades K-6.
1.6.1	Two-day high-level meeting on Pilot Testing Report	Post pilot testing of revised Curriculum	Develop a report on the implementation of the pilot test by the DoE.
1.6.2.	Updated Revised Draft Curriculum	Post pilot testing of revised Curriculum	Update the revised curriculum using information compiled from the pilot testing report.
1.7.1	Development of M&E strategy (Specialist)	Developing Monitoring & Evaluation Strategy	Develop the Monitoring and Evaluation Strategy

WBS ID	Work Package	Activity Name	Activity Description
1.7.2	Review and dissemination of M&E Strategy	Developing Monitoring & Evaluation Strategy	Review and disseminate the Monitoring and Evaluation strategy to stakeholders (by DoE).

Note. Prepared by Author

Chart 15

Primary School Climate Change Curriculum Integration Project Milestone List

Milestones (M) list		
Activity Identifier	**Activity**	**End date**
MB	Project start	September 01, 2023
M1	Start of Project Administration and Reporting	September 01, 2023
M2	End of Project Administration and Reporting	September 30, 2025
	Development of Project Management Plans	September 14, 2023
	Development of report on treatment of CC and areas for inclusion in Curriculum	October 12, 2023
	Two-day high-level meeting: discussion of report with stakeholders	October 16, 2023
	Outline of CC Integration approach and Grades K-6 relevant topics	October 18, 2023
M3	End of review of Primary School Science Curriculum	October 18, 2023
	Conduct of two-day working session	October 20, 2023
	Development of Draft Curriculum with CC topics and Grades K-6 relevant topics	January 11, 2024
	Electronic review and comments by Education Districts	February 08, 2024
	Eight 1-day meeting by Education Districts: finalisation of comments	February 20, 2024
	Compiled Report from 8 Education Districts	March 05, 2024
	Conduct of one-day high-level meeting to discuss report towards update of Draft Curriculum	March 06, 2024
	Updated Draft Curriculum	March 20, 2024
	Conduct of review and comments by DoE Officials (Updated Draft Curriculum)	April 17, 2024
	Updated Draft Curricum_DoE	April 24, 2024
	Conduct of two-day Stakeholder Consensus Meeting to discuss Updated Draft Curriculum_DoE	April 26, 2024
M4	End of revision of Primary School Science Curriculum with CC integration	May 03, 2024
	Conduct of eight one-week training workshops by Education District	June 28, 2024
	Workshop report	July 12, 2024
M5	Completion of Teacher Training Workshop	July 12, 2024
	Development of Online CC Resource Centre	March 06 - April 23, 2024
M6	Approval of CC Resource Centre	April 23, 2024
M7	Start of DoE Pilot Test	September 24, 2024
M8	End of DoE Pilot Test	July 04, 2025
	Pilot Testing of revised curriculum (Activity not part of the project)	July 04, 2025
	Two-day high-level meeting on Pilot Testing Report	July 08, 2025
	Updated Revised Draft Curriculum	August 05, 2025
M9	Approval of CC Integration Curriculum	August 05, 2025
	Development of Monitoring & Evaluation	September 02, 2025

Milestones (M) list		
Activity Identifier	**Activity**	**End date**
	Strategy	
	Review and dissemination of M&E strategy	September 30, 2025
M10	Completion of Monitoring & Evaluation Strategy	September 30, 2025
ME	Close of project	September 30, 2025

Note. Prepared by Author

4.3.3   Sequence Activities

The inputs to this process were the components of the scope statement (scope baseline), the activity list, the milestone list, and the DoE policies regarding documentation and reporting on activities and lessons learned concerning the scheduling of activities during the primary school term. The tool used for this process was the Microsoft Project Professional® (version 2019), a type of Project Management Information System (PMIS) that includes scheduling software. Microsoft Project Professional® (version 2019) was used to insert the logical relationships (dependencies) among the activities. The major output of the process was the Primary School Climate Change Curriculum Integration Project Schedule Network Diagram (Figure 10). This graphical representation of the logical relationships among the project schedule activities was created using Microsoft Project Professional® (version 2019) and gave the full project details.

Figure 10

Primary School Climate Change Curriculum Integration Project Schedule Network Diagram

Note. Prepared by Author

4.3.4 Estimate Activity Duration

The inputs of this process were information from, 1) the scope of work including, the resources, constraints related to duration, the schedule network analysis, 2) project documents which included the activity list, the assumptions, risks, and milestones list,, 3) the DoE policies regarding documentation and reporting on activities and performance metrics, 4) lessons learned concerning the scheduling of activities during the primary school term and calendar activities of DoE. The main technique used to accurately estimate the expected project duration was the three-point estimates that considered uncertainty and project risks in the duration estimate. The technique utilised three (3) estimates of duration; Most likely (tM) (based on the project resources, project expectations etc.), Optimistic (tO) (based on the best-case scenario for the activity, and Pessimistic (tP) (based on the worst-case scenario for the activity). The result was the expected duration, tE which was calculated from the triangular distribution formula: $tE = (tO + tM + tP)/3$ (Chart 16). The other techniques used were face to-face meetings with DoE officials regarding timing and activity duration. The output of the process was the update of the documents used to develop the duration including the resource availability.

Chart 16

Calculation of the Expected Project Duration Using Three-point Estimation

WBS ID	Project Activities	tO (Optimistic-)	tM (Most likely-)	tP (Pessimistic-)	tE (Expected duration)	Variance
	Project start	0	0	0	0.0	0
1.1.1	Development of Project Management Plans	5	10	20	10.8	6.3
1.2.1	Development of report on treatment of CC and areas for inclusion in Curriculum	15	20	30	20.8	6.3
1.2.2	Two-day high-level meeting: discussion of report with stakeholders	1.5	2	2.5	2.0	0.0
1.2.3	Outline of CC Integration approach and Grades K-6 relevant topics	1	2	5	2.3	0.4
1.3.1.1	Conduct of two-day working session	1.5	2	3	2.1	0.1
1.3.1.2	Development of Draft Curriculum with CC topics and Grades K-6 relevant topics	50	59	90	62.7	44.4
1.3.2.1.1	Electronic review and comments by Education Districts	15	20	40	22.5	17.4
1.3.2.1.2	Eight 1-day meeting by Education Districts: finalisation of comments	15	8	40	14.5	17.4
1.3.2.1.3	Compiled Report from	5	10	15	10.0	2.8

WBS ID	Project Activities	tO (Optimistic-)	tM (Most likely-)	tP (Pessimistic-)	tE (Expected duration)	Variance
	eight (8) Education Districts					
1.3.2.2.1	Conduct of one-day high-level meeting to discuss report towards update of Draft Curriculum	0.5	1	2	1.1	0.1
1.3.2.2.2	Updated Draft Curriculum	5	10	20	10.8	6.3
1.3.2.3.1	Review and comments by DoE Officials (Updated Draft Curriculum)	18	20	40	23.0	13.4
1.3.2.3.2	Updated Draft Curricum_DoE	3	5	10	5.5	1.4
1.3.2.4.1	Conduct of two-day Stakeholder Consensus Meeting to discuss Updated Draft Curriculum_ DoE	1.5	2	2.5	2.0	0.0
1.3.2.4.2	Revised Draft Curriculum	3	5	10	5.5	1.4
1.4.1	Conduct of eight one-week training workshops by Education District	35	40	80	45.8	56.3
1.4.2	Workshop report	8	10	15	10.5	1.4
1.5.1	Development of Online CC Resource Centre	25	35	50	35.8	17.4
1.6.1	Two-day high-level meeting on Pilot Testing Report	1.5	2	2.5	2.0	0.0
1.6.2	Updated Revised Draft Curriculum	18	20	50	24.7	28.4

WBS ID	Project Activities	tO (Optimistic-)	tM (Most likely-)	tP (Pessimistic-)	tE (Expected duration)	Variance
1.7.1	Development of Monitoring & Evaluation Strategy	15	20	55	25.0	44.4
1.7.2	Review and dissemination of M&E strategy	18	20	40	23.0	13.4
	Close of project	0	0		0.0	0.0
	TOTAL	260.5	323	622.5	362.5	278.8
					SD	16.7

Note. Prepared by Author

4.3.5   Develop Schedule

The input for this process involved the use of the scope baseline, the DoE policies regarding documentation and reporting on activities and performance metrics, lessons learned concerning the scheduling of activities during the primary school term and calendar activities of DoE and project documents such as activity lists, assumptions, duration of estimates, milestone list, project schedule network diagram. The technique used was the critical path method. This method was used to estimate the minimum project duration on the logical network paths within the schedule model. The process output was the project schedule (which linked activities with the planned dates, durations, milestones, and resources), and the milestone schedule. The project and milestone schedules are illustrated in Figure 11 and Chart 17 respectively.

Figure 11

Primary School Climate Change Curriculum Integration Project Schedule Presentation

#	Task Mode	Task Name	Duration	Start	Finish	Prede	Resource Names	Cost
25		1.3.2.3.1 Conduct of review and comment by DoE Officials (Updated Draft Curriculum)	20 days	Thu 3/21/24	Wed 4/17/24	23	DoE Officials	$0.00
26		1.3.2.3.2 Updated Draft Curriculum_DoE	5 days	Thu 4/18/24	Wed 4/24/24	25	CC Content Specialist and Team	$3,000.00
27		1.3.2.4 Stakeholder Consensus Meeting to discuss Updated Draft Curriculum_DoE	7 days	Thu 4/25/24	Fri 5/3/24			$6,514.00
28		1.3.2.4.1 Conduct of two-day Stakeholder Consensus Meeting	2 days	Thu 4/25/24	Fri 4/26/24	26,36	Two Lunch & Break[1] Venu Rental[1], CC Content Specialist and Team	$3,514.00
29		1.3.2.4.2 Revised Draft Curriculum	5 days	Mon 4/29/24	Fri 5/3/24	28	CC Content Specialist and Team	$3,000.00
30		End of Revision of Primary School Science Curriculum with CC Integration	0 days	Fri 5/3/24	Fri 5/3/24			$0.00
31		1.4 CC Teacher Training Workshops for Teachers (Grade K-6)	50 days	Mon 5/6/24	Fri 7/12/24			$45,000.00
32		1.4.1 Conduct of eight one-week training workshops by Education Districts	40 days	Mon 5/6/24	Fri 6/28/24	29	WS Lunch & Break CC Content Specialist and Team	$39,000.00
33		1.4.2 Workshop Report	10 days	Mon 7/1/24	Fri 7/12/24	32	CC Content Specialist and	$6,000.00
34		Completion of Teacher Training Workshops	0 days	Fri 7/12/24	Fri 7/12/24			$0.00
35		1.5 Teaching and Learning CC Resource Centre	35 days	Wed 3/6/24	Tue 4/23/24			$18,000.00
36		1.5.1 Development of Online CC Resource Centre	35 days	Wed 3/6/24	Tue 4/23/24	20	Multi media electronic hardware/softw IT	$18,000.00
37		Approval of Resource Centre	0 days	Tue 4/23/24	Tue 4/23/24			$0.00
38		Start of DoE Pilot Test	0 days	Mon 9/2/24	Mon 9/2/24			$0.00
39		End of DoE Pilot Test	0 days	Fri 7/4/25	Fri 7/4/25			$0.00
40		1.6 Post Pilot testing of Revised Draft Curriculum	22 days	Mon 7/7/25	Tue 8/5/25			$28,000.00
41		1.6.1 Two-day high-level meeting on Pilot Testing Report	2 days	Mon 7/7/25	Tue 7/8/25	33	Two Lunch & Break[1] Venu Rental[1],C	$12,000.00
42		1.6.2 Updated Revised Draft Curriculum	20 days	Wed 7/9/25	Tue 8/5/25	41	CC Content Specialist with	$16,000.00
43		Approval of CC Integration Curriculum	0 days	Tue 8/5/25	Tue 8/5/25			$0.00
44		1.7 Development of Monitoring & Evaluation Strategy	40 days	Wed 8/6/25	Tue 9/30/25			$8,000.00
45		1.7.1 Development of M&E Strategy (Specialist)	20 days	Wed 8/6/25	Tue 9/2/25	42	M&E Specialist	$8,000.00
46		1.7.2 Review and dissemination of M&E Strategy (DoE)	20 days	Wed 9/3/25	Tue 9/30/25	45	DoE Officials	$0.00
47		Completion of Monitoring & Evaluation Strategy	0 days	Tue 9/30/25	Tue 9/30/25			$0.00
48		Close of project	0 days	Tue 9/30/25	Tue 9/30/25			$0.00

Legend

Task		Inactive Summary	External Tasks
Split		Manual Task	External Milestone
Milestone		Duration-only	Deadline
Summary		Manual Summary Rollup	Critical
Project Summary		Manual Summary	Critical Split
Inactive Task		Start-only	Progress
Inactive Milestone		Finish-only	Manual Progress

Note. Prepared by Author using Microsoft Professional Projects Version 2019

Chart 17

Primary School Climate Change Curriculum Integration Project Milestone Schedule

Milestone Schedule				
Activity Identifier	**Activity Description**	**Project Schedule Timeframe**		
		2023	**2024**	**2025**
MB	Project Start	◊		
M1	Start of Project Administration and Reporting	◊		
M2	End of Project Administration and Reporting	◊		
M3	End of Review of Primary School Science Curriculum	◊		
M4	End of Revision Primary School Science Curriculum with CC integration		◊	
M5	Completion of Teacher Training Workshops		◊	
M6	Approval of Resource Centre		◊	
M7	Start of DoE Pilot Test		◊	
M8	End of DoE Pilot Test			◊
M9	Approval of CC Integration Curriculum			◊
M10	Completion of Monitoring and Evaluation Strategy			◊
ME	Close of project			◊

Note. Prepared by Author

4.3.6   Control Schedule

The inputs would include information from 1) components of management plans, schedule baseline, the scope baseline and, 2) project documents such as the lessons learned, project schedule, resource calendar. The technique that would be used is the critical path method which compares the progress along the critical path to help determine the schedule status. The output of the control schedule would be the schedule forecasts, update of project management plans (such as the schedule baseline) and project documents (such as lessons learned, project schedule, and resource calendars).

4.4   Cost Management Plan

A summary of the Project Cost Management processes, inputs, tools/techniques, and outputs is illustrated in Chart 18 and further detailed in the following subsections.

Chart 18

Summary of the Cost Management processes, inputs, tools/techniques and outputs of the Primary School Climate Change Curriculum Integration Project

Cost Management Processes	Input	Tools & Techniques	Output
Plan Cost Management	Project Charter, the schedule management plan and the budget-related policies and guidelines of the DoE	Meetings with DoE Officials	Cost Management Plan
Estimate Costs	The Scope Baseline, the project schedule document and the budget-related policies and procedures of the DoE.	Analogous and bottom-up estimating, reserve analysis	Project Cost Estimates
Determine Budget	The project cost estimates, project schedule, consideration of the project risks, and the budget-related policies and guidelines of the DoE.	Cost aggregation, reserve analysis	Cost Baseline
Control Costs	Cost baseline, the earned value analysis, cost control-related policies and monitoring and reporting policies of the DoE.	Data analysis techniques, earned value analysis (EVA), variance analysis, and trend analysis	Work performance information, cost forecast

Note. Prepared by Author

4.4.1   Plan Cost Management

The inputs for the Plan Cost Management process were the Project Charter, the Schedule Management Plan and the budget-related policies and guidelines of the DoE. The main technique used was meetings with DoE Officials to inform the Cost Management Plan, which was the output of the process.

4.4.2 Estimate Costs

The Estimate Costs process was used to estimate of the cost of the resources required to complete the Primary School Climate Change Curriculum Integration Project. These costs of resources included labour, materials, equipment, services, facilities, and contingency costs. The main inputs of the process were the Scope Baseline (including the WBS, WBS dictionary and the project Scope Statements), the project schedule document and the budget-related policies and guidelines of the DoE. The techniques used were analogous and bottom-up estimating and reserve analysis. The reserve analysis technique allowed the inclusion of contingency reserves/allowances in the cost estimates to account for cost uncertainty of the known unknowns of the project. The output of the process was the Project Cost Estimates included a quantitative assessment of costs and contingency for identified risks, and management reserve to account for any unplanned work (Chart 19 - 21).

Chart 19

Primary School Climate Change Curriculum Integration Activity Cost Estimates

WBS ID	Activity	Estimated Cost (USD)
1.1.1	Development of Project Management Plan	$258.00
1.1.2	Administration and Reporting	$0.00
1.2.1	Development of report on the treatment of CC & inclusion areas	$12,000.00
1.2.2	Two-day high-level meeting: discussion of the report with key stakeholders	$3,514.00
1.2.3	Outline of CC integration approach and Grades K-6 relevant topics	$800.00
1.3.1.1	Conduct of two-day working session	$3,514.00
1.3.1.1	Development of Draft Curriculum with CC topics and Grades K-6 relevant topics	$35,400.00
1.3.2.1.1	Electronic review and comments by Education Districts	$0.00
1.3.2.1.2	Eight one-day meeting by Education Districts: finalization of comments	$6,000.00
1.3.2.1.3	Compiled report from eight (8) Districts	$6,000.00
1.3.2.2.1	Conduct of one-day high-level meeting	$6,000.00
1.3.2.2.2	Updated Draft Curriculum	$4,000.00
1.3.2.3.1	Conduct of review and comment by DoE Officials (Updated Draft Curriculum)	$0.00
1.3.2.3.2	Updated Draft Curriculum_DoE	$3,000.00
1.3.2.4.1	Conduct of two-day Stakeholder Consensus Meeting	$3,514.00
1.3.2.4.2	Revised Draft Curriculum	$3,000.00
1.4.1	Conduct of eight one-week training workshops by Education Districts	$39,000.00
1.4.2	Workshop Report	$6,000.00
1.5.1	Development of Online CC Resource Centre	$18,000.00
1.6.1	Two-day high-level meeting on Pilot Testing Report	$12,000.00
1.6.2	Updated Revised Draft Curriculum	$16,000.00
1.7.1	Development of M&E Strategy (Specialist)	$8,000.00
1.7.2	Review and dissemination of M&E Strategy (DoE)	$0.00
TOTAL		$186,000.00

Note. Prepared by Author

WBS	Work Packages/Activity	Estimated Cost (USD)
1.5.1	Development of Online CC Resource Centre	$18,000.00
1.6	**Post Pilot testing of Revised Draft Curriculum**	**$28,000.00**
1.6.1	Two-day high-level meeting on Pilot Testing Report	$12,000.00
1.6.2	Updated Revised Draft Curriculum	$16,000.00
1.7	**Development of Monitoring & Evaluation Strategy**	**$8,000.00**
1.7.1	Development of M&E Strategy (Specialist)	$8,000.00
1.7.2	Review and dissemination of M&E Strategy (DoE)	$0.00

Note. Prepared by Author

4.4.3   Determine Budget

The project budget included the funds designated for the execution of the Primary School Climate Change Curriculum Integration Project, whilst the cost baseline is the project budget that includes contingency reserves and excludes management reserves. The inputs of the Determine Budget process were the scope baseline, the project cost estimates, the project schedule, the consideration of the project risks, and the budget-related policies and guidelines of the DoE.

The tools/techniques employed were cost aggregation (where cost estimates were aggregated by work packages for the WBS), and reserve analysis (which established the management reserve amount of the project budget reserved for unexpected work within the project scope). The main output for the Determine Budget process was the Cost Baseline (the summation of the budget for the different scheduled activities) Chart 21-22.

Chart 21

Primary School Climate Change Curriculum Integration Project Cost Baseline

WBS ID	Work Package	Work Package Estimate (USD)	Contingency Reserve (10%) (USD)	Cost Baseline (USD)
1.1	Project Management	$258.00	$25.80	$283.80
1.2	Review of Primary School Science Curriculum for Grades K-6	$16,314.00	$1,631.40	$17,945.40
1.3	Revised Primary School Science Curriculum with CC integration	$70,428.00	$7,042.80	$74,470.80
1.4	CC Teacher Training Workshops for Teachers (Grades K-6)	$45,000.00	$4,500.00	$49,500.00
1.5	Teaching and Learning CC Resource Centre	$18,000.00	$1,800.00	$19,800.00
1.6	Post Pilot testing of Revised Draft Curriculum	$28,000.00	$2,800.00	$30,800.00
1.7	Development of Monitoring & Evaluation Strategy	$8,000.00	$800.00	$8,800.00
	TOTAL	$186,000.00	$18,600.00	$204,600.00

Note. Prepared by Author

Chart 22

Summary Chart of the Project Cost Estimate, Cost Baseline, and Project Budget

Component	Amount (USD)
Cost Estimate	$186,000.00
Cost Baseline (Cost Estimate + Contingency)	$204,600.00
Management Reserve (10 % x Cost Baseline)	$20,460.00
Project Budget (Cost Baseline + Management Reserve)	$225,060.00

Note. Prepared by Author

4.4.4   Control Costs

The inputs that were used for the Control Cost concerning the required changes included the cost baseline, the earned value analysis, cost control-related policies and

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monitoring and reporting policies of the DoE. The data analysis techniques that will be used to control costs are the earned value analysis (EVA), variance analysis, and trend analysis. Chart 23 gives the definition of terms and the summary of the EV calculations that will be used in the EVA. Microsoft Project Professional (version 2019) will be utilised as a tool to monitor the planned value (PV), EV, and actual costs (AC) using qualitative and quantitative EVA for three (3) different scenarios – 20 %, 48 %, and 80 % completion of the project duration respectively as illustrated in Chart 24 and Chart 25. Additionally, this tool was used to display the graphical trends (S-Curve), as shown in Figure 13 for scenarios 3, and to forecast possible final project results related to these scenarios. The outputs of this process are the work performance information (using comparisons to the cost baseline) and cost forecast.

Chart 23

Earned Value Calculations Summary Table

Earned Value Analysis					
Abbreviation	**Name**	**Lexicon Definition**	**How Used**	**Equation**	**Interpretation of Result**
PV	Planned Value	The authorized budget assigned to scheduled work.	The value of the work planned to be completed to a point in time, usually the data date, or project completion.		
EV	Earned Value	The measure of work performed expressed in terms of the budget authorized for that work.	The planned value of all the work completed (earned) to a point in time, usually the data date, without reference to actual costs.	$EV = $ sum of the planned value of completed work	
AC	Actual Cost	The realized cost incurred for the work performed on an activity during a specific time period.	The actual cost of all the work completed to a point in time, usually the data date.		
BAC	Budget at Completion	The sum of all budgets established for the work to be performed.	The value of total planned work, the project cost baseline.		
CV	Cost Variance	The amount of budget deficit or surplus at a given point in time, expressed as the difference between the earned value and the actual cost.	The difference between the value of work completed to a point in time, usually the data date, and the actual costs to the same point in time.	$CV = EV - AC$	Positive = Under planned cost Neutral = On planned cost Negative = Over planned cost
SV	Schedule Variance	The amount by which the project is ahead or behind the planned delivery date, at a given point in time, expressed as the difference between the earned value and the planned value.	The difference between the work completed to a point in time, usually the data date, and the work planned to be completed to the same point in time.	$SV = EV - PV$	Positive = Ahead of Schedule Neutral = On schedule Negative = Behind Schedule
VAC	Variance at Completion	A projection of the amount of budget deficit or surplus, expressed as the difference between the budget at completion and the estimate at completion.	The estimated difference in cost at the completion of the project.	$VAC = BAC - EAC$	Positive = Under planned cost Neutral = On planned cost Negative = Over planned cost
CPI	Cost Performance Index	A measure of the cost efficiency of budgeted resources expressed as the ratio of earned value to actual cost.	A CPI of 1.0 means the project is exactly on budget, that the work actually done so far is exactly the same as the cost so far. Other values show the percentage of how much costs are over or under the budgeted amount for work accomplished.	$CPI = EV/AC$	Greater than 1.0 = Under planned cost Exactly 1.0 = On planned cost Less than 1.0 = Over planned cost
SPI	Schedule Performance Index	A measure of schedule efficiency expressed as the ratio of earned value to planned value.	An SPI of 1.0 means that the project is exactly on schedule, that the work actually done so far is exactly the same as the work planned to be done so far. Other values show the percentage of how much costs are over or under the budgeted amount for work planned.	$SPI = EV/PV$	Greater than 1.0 = Ahead of schedule Exactly 1.0 = On schedule Less than 1.0 = Behind schedule
EAC	Estimate At Completion	The expected total cost of completing all work expressed as the sum of the actual cost to date and the estimate to complete.	If the CPI is expected to be the same for the remainder of the project, EAC can be calculated using: If future work will be accomplished at the planned rate, use: If the initial plan is no longer valid, use: If both the CPI and SPI influence the remaining work, use:	$EAC = BAC/CPI$ $EAC = AC + BAC - EV$ $EAC = AC + Bottom\text{-}up\ ETC$ $EAC = AC + [(BAC - EV)/(CPI \times SPI)]$	
ETC	Estimate to Complete	The expected cost to finish all the remaining project work.	Assuming work is proceeding on plan, the cost of completing the remaining authorized work can be calculated using: Reestimate the remaining work from the bottom up.	$ETC = EAC - AC$ $ETC = $ Reestimate	
TCPI	To Complete Performance Index	A measure of the cost performance that must be achieved with the remaining resources in order to meet a specified management goal, expressed as the ratio of the cost to finish the outstanding work to the budget available.	The efficiency that must be maintained in order to complete on plan. The efficiency that must be maintained in order to complete the current EAC.	$TCPI = (BAC - EV)/(BAC - AC)$ $TCPI = (BAC - EV)/(EAC - AC)$	Greater than 1.0 = Harder to complete Exactly 1.0 = Same to complete Less than 1.0 = Easier to complete Greater than 1.0 = Harder to complete Exactly 1.0 = Same to complete Less than 1.0 = Easier to complete

Chart 24

Summary Results of Earned Value Management Qualitative and Quantitative Analysis for Three Scenarios (20 %, 48 %, 80% completion) of the Primary School Climate Change Curriculum Integration Project

Scenarios	Status Date	Qualitative (Time/Cost) Index				Quantitative Variance Index				Quantitative Index					
		PV	EV	AC	Interpretation	CV	CV Interpretation	SV	SV Interpretation	CPI	CPI Interpretation	SPI	SPI Interpretation	TCPI	TCPI Interpretation
Scenario 1 (20 % complete)	01/02/2024	$ 51,286	$ 38,238	$ 38,236	PV>EV - Delayed; AC < EV - Less than Planned Cost	$ 1.72	CV is Positive - Under Planned Cost	$ (13,048)	SV negative - Behind Schedule	1	CPI is 1 - On Planned Cost	0.75	Less than 1 - Behind Schedule	1.00	Equals 1 - Same to Complete
Scenario 2 (48 % complete	05/09/2024	$ 108,900	$ 76,040	$ 73,692	PV>EV - Delayed; AC < EV - Less than Planned Cost	$ 2,348.01	CV is Positive - Under Planned Cost	$ (32,859.99)	SV negative - Behind Schedule	1.03	CPI > 1 - Under Planned Cost	0.70	Less than 1 - Behind Schedule	0.98	Less than 1 - Easier to Complete
Scenario 3 (80 % complete)	08/05/2025	$ 182,400	$ 111,677	$ 107,962	PV>EV - Delayed; AC < EV - Less than Planned Cost	$ 3,714.58	CV is Positive - Under Planned Cost	$ (70,723)	SV Negative - Behind Schedule	1.03	CPI > 1 - Under Planned Cost	0.61	Less than 1 - Behind Schedule	0.95	Less than 1 - Easier to Complete

Note. Prepared by Author

Chart 25

Earned Value Management (EVM) Quantitative Forecast Analysis for Three Scenarios (20 %, 48 %, 80 % completion) of the Primary School Climate Change Curriculum

Integration Project

Scenarios	Status Date	Quantitative Forecast Index						
		EACt (BAC/SPI) / (BAC/days)	EACt Interpretation	EAC1 (BAC/CPI)	EAC1 Interpretation	EAC2 (AC + BAC – EV)	EAC2 Interpretation	BAC
Scenario 1 (20 % complete)	01/02/2024	431	Forecasted project duration over run of 108 days	$185,992	Forecasted a little less than estimated cost for completion	$185,998	Forecasted little less than estimated cost even with delay	$186,000
Scenario 2 (48 % complete	05/09/2024	461	Forecasted project duration over run of 138 days	$180,257	Forecasted less than estimated cost for completion	$183,652	Forecasted less than estimated cost even with delay	$186,000
Scenario 3 (80 % complete)	08/05/2025	530	Forecasted project duration over run of 256 days	$179,813	Forecasted less than estimated cost for completion	$182,285	Forecasted less than estimated cost even with delay	$186,000

Note. Prepared by Author

Figure 12

S-Curve Corresponding to 80 % Completion of the Primary School Climate Change

Curriculum Integration Project

Data				
Year	Quarter	EV (USD)	PV (USD)	AC (USD
2023	Q3	6600	6600	6600
	Q4	49758	49828	49828
Total		**49758**	**49828**	**49828**
2024	Q1	74358	89056	74428
	Q2	103456	146742	103562
	Q3	103456	149742	103562
	Q4	103456	149742	103562
Total		**103456**	**149742**	**103562**
2025	Q1	103456	149742	103562
	Q2	103456	149742	103562
	Q3	107856	182142	107962
2025		**107856**	**182142**	**107962**
Grand Total		**107856**	**182142**	**107962**

Note. Prepared by Author

4.5   Quality Management Plan

The Project Quality Management Plan described how the DoE's quality policies, procedures and guidelines were implemented in the Primary School Climate Change Curriculum Integration Project to meet the project and product requirements to achieve the

quality objectives of the stakeholders. A summary of the Quality Management processes inputs, tools/techniques and outputs is given in Chart 26 and further detailed in the following subsections.

Chart 26

Summary of the Quality Management Processes Inputs, Tool/Techniques, and Outputs of

the Primary School Climate Change Curriculum Integration Project

Quality Management Processes	Input	Tools & Techniques	Output
Plan Quality Management	Project Charter, project scope baseline, requirement traceability matrix, DoE regulations related to projects and the OECS standards for Science and Technology at the primary school level, international standards for environmental education and teaching climate change topics (at the primary school level), and DoE's quality management system, policies, procedures, and guidelines	Benchmarking, meeting (DoE Official), cost of Quality (teacher training workshop, high-level and consensus meetings, pilot test and the post pilot test revision of the curriculum)	Quality Management Plan, quality metrics and baseline,
Manage Quality	Quality metric and baseline, DoE's quality management system, policies, procedures, guidelines, and lessons learned from similar projects	Quality checklist, Continuous improvement plan, analysis of the project reports	Qualitative quality reports,
Control Quality	Quality metrics, any approved change request, the deliverables, the performance data, DoE quality standards, policies and guidelines, national, regional and international curriculum standards	Quality checklist, teacher questionnaires and surveys, retrospective meetings	Quality control measurements, the verified deliverables, work performance information

Note. Prepared by Author

4.5.1 Plan Quality Management

The major inputs used in the Plan Quality Management process were, the Project Charter, the project scope baseline, the requirement traceability matrix, enterprise environmental factors (i.e. DoE regulation related to projects and the OECS standards for Science and Technology at the primary school level and international standards for environmental education and teaching climate change topics at the primary school level), and DoE's quality management system, policies, procedures, and guidelines. Benchmarking was used as a data-gathering technique to compare the project practices and quality guidelines to that of the international community. Information was also collected from the Chief Curriculum Officer through a meeting which gave insight into DoE's quality needs and expectations of the project and its deliverables. The main data analysis technique used was the cost of quality concerning cost conformance. In this regard, preventative failure cost was built into the process - of integrating climate change in the science curriculum - through the teacher training workshop, the high-level meetings, and stakeholder consensus meetings. Additionally, the quality of the Revised Climate Change Integration Curriculum would be assessed through the pilot test followed by the post-pilot test revision of the curriculum.

The Plan Quality Management process outputs were the Quality Management Plan, and the quality metrics and baseline (Chart 27). The Quality Management Plan included components such as the national, regional, and international standards, the project quality objectives, the quality roles and responsibilities (Chart 28), the project deliverables/processes subject to quality review, the planned project quality control and quality management activities and the quality tools used during the project. The quality metric output described the attribute of the project deliverables and how the Control Quality process verified compliance. An important output component of the Plan Quality management process was determining and prioritising the key success factor related to quality (Chart 29).

Chart 27

Primary School Climate Change Curriculum Integration Project Quality Metric and Baseline

WBS ID	Quality Objective	Quality Metric	Metric Description	Expected outcome/Results	Measurement Frequency	Responsible
1.1 Project Management						
1.1.1	Develop of 10 subsidiary project management plans for inclusion of CC topics in the Primary School Science Curriculum using the principles PMBOK and PMI standards for project management.	# of approved subsidiary management plans	Ten (10) subsidiary project management plans for inclusion of CC topics in the Primary School Science Curriculum that reflects the principles PMBOK and PMI standards for project management.	Ten (10) completed subsidiary management plans	Scheduled date of October 14, 2023	CC Content Specialist/Project Manager
1.1.2	Administer and report on project status and progress using PMI methods tools and techniques.	# of DoE approved project reports	Administration and reporting on project status and progress complies with PMI standards and principles.	Project start close and progress reports	Weekly, Biweekly, Monthly	CC Content Specialist/Project Manager
1.2 Review of Primary School Science Curriculum for Grades K-6						
1.2.1	Develop the report on the treatment of CC and inclusion areas using the current Primary School Science Curriculum and current research on the inclusion of CC integration approaches and international CC science curricula.	# of completed reports	The report on the treatment of CC and inclusion is informed by the current Primary School Science Curriculum and current research on the inclusion of CC integration approaches and international CC science.	Completed report	Scheduled date of October 12, 2023	CC Content Specialist/Project Manager
1.2.2	Convene two-day high-level meeting based on the report with the key stakeholders.	# number of high-level meetings implemented	Two-day high-level meeting: discussion of the report with the key stakeholders.	Outcomes related to integration approach, learning outcomes and assessment.	Scheduled date of October 16, 2023	DoE Officials

WBS ID	Quality Objective	Quality Metric	Metric Description	Expected outcome/Results	Measurement Frequency	Responsible
1.2.3	Develop outline of CC Integration approach and Grades K-6 relevant topics using the outcomes of the high-level meeting report.	# of outlines developed	Outline of CC Integration approach and Grades K-6 relevant topics reflects the outcomes of the high-level meeting report.	Outline of CC Integration approach for Grades-6	Scheduled date of October 18, 2023	CC Content Specialist/Project Manager
1.3 Revised Primary School Science Curriculum with CC integration						
1.3.1.1	Conduct a two-day working session which includes principals, teachers, DoE representatives, Specialists, and other stakeholders.	# of meetings of this nature implemented	Two-day inclusive and participatory working session for stakeholders (principals, teachers, DoE representatives, Specialists).	Outcomes related to input (CC topics, CC Grades relevant topics, content, resources) towards the curriculum	Scheduled date of October 20, 2023	DoE
1.3.1.2	Develop a draft curriculum with CC topics, and Grades K-6 topics that reflect the local context, experience, and educational standards in environmental education.	# of draft curriculum for review	Draft curriculum with CC topics, and Grades K-6 topics that reflect the local context, experience, and educational standards in environmental education.	Draft curriculum for stakeholder review	Scheduled date of January 11, 2024	CC Content Specialist/Project Manager
1.3.2.1.1	Review and comments by teachers from all Grades from each Education Districts (electronically).	# of draft curriculum with comments	Electronic review and comments with by teachers from all Grades from each Education Districts (electronically).	Draft curriculum with comments from teachers and principals of the education districts.	Scheduled date of February 08, 2024	CC Content Specialist/ Project Manager
1.3.2.1.2	Conduct eight one-day meetings by Education Districts with teachers from all Grades for finalization of comments.	# of summaries of compiled comments	Eight one-day meeting by Education Districts with teachers from all Grades for finalization of comments.	Summary of compiled comments from teacher and principals for each district.	Scheduled date of February 20, 2024	CC content specialist, Curriculum Specialist

WBS ID	Quality Objective	Quality Metric	Metric Description	Expected outcome/Results	Measurement Frequency	Responsible
1.3.2.1.3	Compile summary report from eight districts with comments and changes.	# of compiled reports	Compiled report from eight districts which reflects comments from the teachers.	Compiled report with consolidated comments from 8 districts.	Scheduled date of March 05, 2024	CC content specialist
1.3.2.2.1	Conduct of a one-day high-level meeting to obtain consensus and finalize comments.	# of meetings of this nature implemented	One-day high-level meeting.	Meeting outcomes and decisions related to improvement of the draft curriculum.	Scheduled date of March 06, 2024	CC content Specialist Curriculum Specialist
1.3.2.2.2	Update draft curriculum to reflect the outcomes from the high level meeting	# of updated draft curriculum	Updated draft curriculum that reflects outcomes from high-level meetings.	Updated draft curriculum	Scheduled date of March 20, 2024	CC Content Specialist/Project Manager
1.3.2.3.1	Conduct of review and comment by DoE Officials.	# of updated draft curriculum with DoE Officials' comments	Review and comment by DoE Officials.	Updated draft curriculum with comments	Scheduled date of April 17, 2024	DoE Officials
1.3.2.3.2	Update draft curriculum_ DoE to reflect the contributions of the DoE Officials.	# of updated draft curriculum with DoE comments	Draft curriculum_ DoE that reflects the contributions of the DoE Officials.	Updated draft curriculum with the incorporation of DoE officials' comments.	Scheduled date of April 24, 2024	CC Content Specialist/Project Manager
1.3.2.4.1	Conduct of two-day Stakeholder Consensus Meeting inclusive of all key stakeholders.	# of meetings of this nature implemented	Two-day key Stakeholder Consensus Meeting	Meeting outcomes towards revising the curriculum	Scheduled date of April 26, 2024	DoE Officials

WBS ID	Quality Objective	Quality Metric	Metric Description	Expected outcome/Results	Measurement Frequency	Responsible
1.3.2.4.2	Revised draft curriculum that reflects the Saint Lucian context, experiences and climate change impacts on Saint Lucia an inclusive and participatory approach using regional and international standards as benchmarks.	# of completed revised draft curriculum	Revised draft curriculum that reflects the Saint Lucian context, experiences and climate change impacts on Saint Lucia an inclusive and participatory approach using regional and international standards as benchmarks.	Completed revised draft curriculum report.	Scheduled date of May 05, 2024	CC Content Specialist/Project Manager
1.4 CC Teacher training workshops for teachers (Grades K-6)						
1.4.1	Conduct of eight one-week training workshops with Education District that effectively increase knowledge and understanding of climate change concepts, it is useful to teachers.	# of completed training workshop	Eight one-week training workshops with Education District that are effectively increase knowledge and understanding of climate change concepts, it is useful to teachers.	Completed training workshop for eight (8) districts.	Scheduled date of June 28, 2024	DoE Officials
1.4.2	Workshop Report	# of consolidated workshop reports	Workshop Report	Completed consolidated workshop report.	Scheduled date of July 12, 2024	CC Content Specialist/Project Manager with team
1.5 Teaching and learning resources for teachers and students						
1.5.1	Develop Online CC Resource Centre for teachers that is user-friendly and includes up-to-date credible content, and activities and resources on climate change.	# of resource centres developed	Online CC Resource Centre for teachers that is user-friendly and includes up-to-date credible content, and activities and resources on climate change.	Online resource centre	Scheduled date of June 28, 2024	IT specialist
1.6 Post pilot testing of revised Curriculum						
1.6.1	Two-day high-level meeting on the pilot testing report that is comprehensive, giving specific feedback on each Grades (K-6).	# of pilot test reports	Two-day high-level meeting on pilot testing report that is comprehensive giving specific feedback on each Grades (K-6).	Completed pilot test report	Scheduled date of July 08, 2025	DoE

WBS ID	Quality Objective	Quality Metric	Metric Description	Expected outcome/Results	Measurement Frequency	Responsible
1.6.2	Update the Revised Draft Curriculum to reflect the outcomes and decisions of the meeting.	# of updated revised curriculum	Revised Draft Curriculum to reflect the outcomes and decisions of the meeting.	Updated revised curriculum	Scheduled date of August 05, 2025	CC Content Specialist/Project Manager with team
			1.7 Monitoring & evaluation strategy			
1.7.1	Develop of M&E Strategy that reflects the standards used in measuring the performance of educational curriculum.	# of M&E Strategies developed	M&E Strategy that reflects the standards used in measuring the performance of educational curriculum.	Completed M&E strategy	Scheduled date of September 02, 2025	M&E Specialist
1.7.2	Review of M&E strategy by the DoE.	# of M&E Strategies disseminated	Review and dissemination of M&E strategy by DoE.	Approved M&E strategy	Scheduled date of September 30, 2025	DoE Officials

Note. Prepared by Author

Chart 28

Primary School Climate Change Curriculum Integration Project Quality Roles and

Responsibilities

Role	Quality Responsibilities
CC Content Specialist/Project Manager	To execute the projects, ensuring that the standards are followed, and that the expectations of the stakeholders are met regarding the quality. Streamline information processing needed for decision making, communicating progress, and reaching difficult decisions to ensure the quality of the products and process; work with other stakeholders towards compilation and revision of the Primary School Science Curriculum.
CC Content team	Consists of the senior primary school teachers, Science Curriculum Officer whose responsibility is compiling the draft curriculum/updating the draft curriculum, using the comments from reports and inputs from working sessions with stakeholders to reflect their expectations, and requirements and follow the national, regional, and international standards.
Curriculum Specialist	To ensure the educational standards are followed throughout the process of revision of the curriculum as well as adhering to policies, regulation, and guidelines of the DoE.
DoE Officials (Permanent Secretary, Chief Education Officer, Chief Curriculum Officer, Science Curriculum Officer, District Education Officers)	To ensure that the policies, regulations, and guidelines of the DoE are adhered to throughout the life cycle of the project. Additionally, the project processes and the products follow regional and international standards where the process is inclusive and participatory, involving collaboration with all key stakeholders, and the department guides the process ensuring the quality metrics are met concerning the project processes and products.
Information Technology Specialist	To develop the climate change electronic resource centre for teachers, which adheres to international standards and the policies, regulations, and guidelines of DoE.
Monitoring & Evaluation Specialist	To develop a monitoring and evaluation strategy to evaluate the long-term performance of the revised Primary School Science Curriculum which adheres to international standards and the policies, regulations, and guidelines of DoE for reporting on curricula.
Caribbean Waterways (NGO)- Programme Director	To provide input in the process in revising the Primary School Science Curriculum to integrate climate change topics concerning instruction in environmental education.
Private Sector Companies (PSC)	To verify that their needs and expectations related to sensitisation and awareness are met and to provide input in the process of revising the Primary School Science Curriculum to integrate climate change topics.

Role	Quality Responsibilities
Civil Society (CS)	To verify that their needs and expectations related to sensitisation and awareness are met and to provide input in the process of revising the Primary School Science Curriculum to integrate climate change topics.
OECS Education Resource Unit (OERU)	To represent the input of the OECS region and ensure compliance to the regional standards for science education and to provide input in revising the Primary School Science Curriculum to integrate climate change topics.
Primary School Teacher Grades K-6	To actively participate in the process of compilation, revision, pilot testing and post pilot testing review of the Primary School Science Curriculum to integrate climate change topics.
Primary School Principals	To actively participate in the compilation, revision, pilot testing and post-pilot testing review of the Primary School Science Curriculum to integrate climate change topics.
Parent-Teacher Association	To provide input in the process of revising the Primary School Science Curriculum to integrate climate change topics.
UNESCO Representatives	To represent UNESCO and provide information in the process and the products regarding compliance with international standards for instruction in environmental education.
Permanent Secretary Department of Sustainable Development	To provide feedback in the process of revising the Primary School Science Curriculum to integrate climate change topics.
Environment and Sustainable Development Officers	To provide input in the process of revising the Primary School Science Curriculum to integrate climate change topics.
Local Community groups	To provide input in the process of revising the Primary School Science Curriculum to integrate climate change topics.
Primary School Students	To give their feedback on their beliefs and perceptions on the need for instruction on climate change topics and give their views on its use in the classroom.

Note. Prepared by Author

Chart 29

Primary School Climate Change Curriculum Integration Project Factors related to Quality

Factor	Factor Definition
Use of an inclusive and participatory approach to the process	The process of integrating climate change into the Primary School Science Curriculum includes input and active participation of teachers of Grades K-6, primary school principals, DoE officials, national and regional stakeholders and other key stakeholders.
Consideration of successful Regional and International approaches to integrating of climate change topics in the Primary School Science Curriculum	The process of integrating climate change into the Primary School Science Curriculum involves the use of successful Regional and International approaches to integrating climate change topics in the Primary School Science Curriculum.
Adherence and use of effective science/environmental science education standards and climate change Science Curriculum	The process of integrating climate change into the Primary School Science Curriculum adherence to and uses effective science/environmental science education standards and climate change Science Curricula.
User-friendly resource centre with credible content on climate change	The climate change resource centre for teachers is user-sfriendly and include up-to-date credible content, activities and resources on climate change.
Effective teacher training workshop on climate change	The climate change teacher training workshop is effective in increasing knowledge and understanding of climate change concepts. It is helpful to teachers.
Comprehensive and Grades-specific feedback from the pilot testing report	The pilot test report is comprehensive giving specific feedback on each Grades (K-6).
Adherence of the monitoring and evaluation strategy to the standards used in measuring performance of educational curricula	The monitoring and evaluation strategy reflects the standards used in measuring the performance of educational curricula.

Note. Prepared by Author

4.5.2   Manage Quality

The main inputs to the Manage Quality process were the quality metric and baseline and the DoE's quality management system, policies, procedures, guidelines, and lessons learned from similar projects. The quality activity matrix (Chart 30) was set up to establish activities (both management and control) aimed at ensuring that the requirements of the project are met and that quality management is conducted systematically throughout the project lifecycle. The quality checklist tool (Chart 31) was used as part of a data-gathering technique to verify that the list of requirements was satisfied. Data analysis techniques through the analysis of the various project reports during the high-level meetings with either DoE Officials or other stakeholders were used to ensure that quality objectives/requirements were satisfied. The quality improvement plan will be used to continuously analyse and evaluate opportunities for improvement on the process and the project product.

The primary outputs of the Manage Quality process would be the qualitative quality reports which would include quality management issues that would have surfaced, the recommendations for process and product improvements, and corrective actions and recommendations.

Chart 30

Primary School Climate Change Curriculum Integration Project Quality Activity Matrix

ID	WBS ID	Deliverable	Requirement Description	Manage and Control Activities	Frequency	Responsible
1	1	Project management plans	The project will be completed on time at the budgeted cost and would be comparable to that used in other countries	Manage	Project Start	CC Content Specialist/Project Manager, DoE Officials,
				Control	Weekly	CC Content Specialist/Project Manager
2	1.2.1	Report on the implementation of climate change integration science curriculum	There will be preliminary key stakeholder meetings and discussions on the climate change integration approach to be used for integrating climate change topics in the science curriculum	Manage	Once	CC Content Specialist/Project Manager, DoE Officials,
				Control	Once	
3	1.2.2	Climate change topics integrated in the Primary School Science Curriculum from Grades K to 6	There will be close collaboration and inclusion of the key stakeholders in preliminary meetings and discussions	Manage	Throughout the revision process	Chief Curriculum Officer, Curriculum Officer (Ag), Other DoE Officials, CC Content Specialists, Curriculum Specialist Teachers and Principals
				Control	Throughout the revision process	
4	1.3.1.1	Teacher training workshop report; Well-equipped climate change learning resource centre for teachers	There will be a team set-up with the responsibility to develop lesson plans, identify objectives, content, resources and assessment activities related to climate change topics for	Manage	Once	Curriculum Officer (Ag), CC Content Specialists and team, Curriculum Specialist Teachers
				Control	Once	

ID	WBS ID	Deliverable	Requirement Description	Manage and Control Activities	Frequency	Responsible
			Grades K-6			
5	1.6.1	Pilot testing report on the implementation of climate change integration science curriculum	There will be a pilot test of the revised curriculum with selected primary schools	Manage	Once	Chief Curriculum Officer, Curriculum Officer (Ag), Other DoE Officials, CC Content Specialists, Curriculum Specialist Teachers and Principals
				Control	Once	
6	1.7.1	Monitoring and evaluation strategy	There is a set strategy to update the revised science curriculum over time	Manage	Once	Chief Curriculum Officer, Curriculum Officer (Ag), Other DoE Officials, CC Content Specialists, Curriculum Specialist Teachers and Principals
				Control	Once	
7	1.7.1	Monitoring and evaluation strategy	There is documentation of the short and long-term impact of the revised climate change science curriculum on students	Manage	Once	Chief Curriculum Officer, Curriculum Officer (Ag), Other DoE Officials
				Control	Once	

Note: Prepared by Author

Chart 31

Primary School Climate Change Curriculum Integration Project Quality Checklist

WBS ID	Activity	Quality Criteria	Achievement		Comments/ Follow-up
			Yes	No	
1.1 Project Management					
1.1.1	Development of Project Management Plan	Ten (10) completed subsidiary management plans that reflect the principles PMBOK and PMI standards for project management.			
1.1.2	Administration and Reporting	Project start close and progress reports			
1.2 Review of Primary School Science Curriculum for Grades K-6					
1.2.1	Development of report on treatment of CC & inclusion areas	Completed report on treatment of CC topics in current Primary School Science research on inclusion of CC integration approaches			
1.2.2	Two-day high-level meeting: discussion of report with key stakeholders	Outcomes related to integration approach, learning outcomes.			
1.2.3	Outline of CC integration approach and Grades K-6 relevant topics	Outline of CC Integration approach and Grades K-6 relevant topics			
1.3.1.2	Development of Draft Curriculum with CC topics and Grades K-6 relevant topics	Draft curriculum with CC topics, and Grades K-6 topics that reflect the local context, experience, and educational standards in environmental education.			
1.3.2.1.1	Review, Comments and Reporting on Draft Curriculum by Districts	Draft curriculum with comments from teachers and principal the education districts.			

WBS	Activity	Quality Criteria	Achievement		Comments/
1.3.2.1.2	Eight one-day meeting by Education Districts: finalization of comments	Summary of compiled comments from teachers and principals of each district.			
1.3.2.1.3	Compiled report from eight (8) Districts	Compiled report with consolidated comments from eight (8) districts.			
1.3.2.2.1	Conduct of a one-day high-level meeting to obtain consensus and finalize comments.	Meeting outcomes and decisions related to improvement of the draft curriculum			
1.3.2.2.2	Updated Draft Curriculum	Updated draft curriculum that reflects outcomes of meetings.			
1.3.2.3.1	Conduct of review and comment by DoE Officials (Updated Draft Curriculum)	Updated draft curriculum with comments from DoE Officials			
1.3.2.3.2	Updated Draft Curriculum_DoE	Draft curriculum_ DoE with compiled comments from DoE Officials.			
1.3.2.4.1	Conduct of two-day Stakeholder Consensus Meeting	Meeting outcomes from Stakeholder Consensus			
1.3.2.4.2	Revised Draft Curriculum	Completed revised draft curriculum with Saint Lucian context, experiences and climate change impacts on Saint Lucia with evidence of benchmarking.			
1.4 CC Teacher training workshops for teachers (Grades K-6)					
1.4.1	Conduct of eight one-week training workshops by Education Districts	Completed training workshop for eight (8) districts.			
1.4.2	Workshop Report	Completed consolidated workshop report.			
1.5 Teaching and learning resources for teachers and students					

WBS	Activity	Quality Criteria	Achievement		Comments/
1.5.1	Development of Online CC Resource Centre.	Online CC Resource Centre for teachers with user friendly interface, up -to - date credible content, activities, and resources on climate change.			
1.6 Post-pilot testing of revised Curriculum					
1.6.1	Two-day high-level meeting on Pilot Testing Report.	Completed pilot test report. That is comprehensive with specific feedback on each Grades (K-6).			
1.6.2	Updated Revised Draft Curriculum.	Updated Revised Draft Curriculum with outcomes and decisions of the meeting.			
1.7 Monitoring & evaluation strategy					
1.7.1	Development of M&E Strategy (Specialist)	Completed M&E Strategy			
1.7.2	Review and dissemination of M&E Strategy (DoE).	DoE approved M&E strategy			

Note. Prepared by Author

4.5.3   Control Quality

The inputs for the Control Quality process would include the quality metrics, any approved change request, the deliverables, the performance data, DoE quality standards, policies, and guidelines, and national, regional, and international curriculum standards. The tools that would be used includes the quality checklist, teacher questionnaires and surveys to collect data, and retrospective meetings to discuss the execution of components of the Primary School Climate Change Curriculum Integration Project.

The expected output of the Control Quality process would include the quality control measurements, the verified deliverables, and work performance information.

4.6   Resource Management Plan

A summary of the Resource Management Plan processes inputs, tool/techniques and outputs is given in Chart 32 and further detailed in the following subsections.

Chart 32

Summary of the Resource Management processes inputs, tool/techniques, and outputs of

the Primary School Climate Change Curriculum Integration Project

Resource Management Processes	Input	Tools & Techniques	Output
Plan resource Management Process	Project Charter, Quality Management Plan, scope baseline, human and physical resource policies and procedures of the DoE	Project Organisational Breakdown Structure (OBS) Resource Breakdown Structure (RBS), Responsible-Accountable-Consult-Inform (RACI) chart, meetings	Resource Management Plan
Estimate Activity Resources	Scope baseline, activity list, cost estimate, DoE's policies and procedures related to staffing and obtaining supplies and equipment	Bottom-up estimating, Analogous estimating and planning	Resource requirements
Acquire Resources	project schedule, resource requirement, DoE policies and procedures for acquiring, allocating, and assigning resources to the project	Decision-making techniques	Physical resource assignment, the project team assignment,
Develop Team	Project schedule, the DoE human resource management relate to hiring, termination, performance reviews, and the team's geographic distribution	Colocation, virtual teams, use of communication technology email/chat, training, meetings, individual and team assessments	Performance assessment
Manage Team	Team performance assessment	conflict management, decision making	Documents updates

Resource Management Processes	Input	Tools & Techniques	Output
Control Resources	Resource assignment, project schedule, resource breakdown structure, work performance data and DoE's policies regarding resource control and assignment	Problem solving	Work performance information

Note. Prepared by Author

4.6.1   Plan Resource Management

The inputs for the Plan Resource Management process were the Project Charter, the Quality Management Plan, the scope baseline, and both human and physical resource policies and procedures of the DoE. The tools and techniques used in this process were the project OBS (Organisational breakdown structure of DoE's teams related to the projects activities/work packages) Figure 14, the RBS (to illustrate the hierarchical relationship among the human and physical resources to enable effective planning, managing, and controlling the project work) Figure 15, the RACI chart (a type of assignment matrix that allows clear assignment of roles and responsibilities among the human resources) Chart 33, and meetings to plan human resource management. The output of the process was the Resource Management Plan.

Figure 13

Primary School Climate Change Curriculum Integration Project Organisational Breakdown Structure

Note. Prepared by Author

Figure 14

Primary School Climate Change Curriculum Integration Project Resource Breakdown Structure

Note. Prepared by Author

Chart 33

Primary School Climate Change Curriculum Integration Project RACI Chart

WBS ID	Activity	People										
		CC Content Specialist/ PM	CC content team	Curriculum Specialist	DoE Designated Official	Primary School Principals	Primary School Teachers	Information Technology Specialist	Monitoring & Evaluation Specialist	OECS Education Resource Unit (OERU)	UNESCO Represent atives	Other Stakehold er representa tives
1.1.1	Development of Project Management Plan	R	C	C	A	C	C	C	C	C	C	C
1.1.2	Administration and Reporting	R	C	C	A	C	C	I	I	I	I	I
1.2.1	Development of the report on treatment of CC & inclusion areas	R	I	C	A	C	C	I	I	C	C	C
1.2.2	Two-day high-level meeting: discussion of report with key stakeholders	R	I	C	A	C	C	I	I	C	C	C

WBS ID	Activity	People										
		CC Content Specialist/ PM	CC content team	Curriculum Specialist	DoE Designated Official	Primary School Principals	Primary School Teachers	Information Technology Specialist	Monitoring & Evaluation Specialist	OECS Education Resource Unit (OERU)	UNESCO Representatives	Other Stakeholder representatives
1.2.3	Outline of CC integration approach and Grades K-6 relevant topics	C	I	R	A	C	C	I	I	I	I	I
1.3.1.1	Conduct of two-day working session	R	C	C	A	C	C	C	C	C	C	C
1.3.1.2	Development of Draft Curriculum with CC topics and Grades K-6 relevant topics	R	C	C	A	C	C	I	I	C	C	C
1.3.2.1.1	Review, Comments and Reporting on Draft Curriculum by Districts	R	C	C	A	C	C	C	I	I	I	I

WBS ID	Activity	People										
		CC Content Specialist/ PM	CC content team	Curriculum Specialist	DoE Designated Official	Primary School Principals	Primary School Teachers	Information Technology Specialist	Monitoring & Evaluation Specialist	OECS Education Resource Unit (OERU)	UNESCO Representatives	Other Stakeholder representatives
1.3.2.1.2	Eight one-day meeting by Education Districts: finalisation of comments	R	C	C	A	C	C	I	I	I	I	I
1.3.2.1.3	Compiled report from eight (8) Districts	R	C	C	A	C	C	I	I	I	I	I
1.3.2.2.1	Conduct of a one-day high-level meeting to obtain consensus and finalise comments.	R	C	C	A	C	C	I	I	C	C	C
1.3.2.2.2	Updated Draft Curriculum	R	C	C	A	C	C	I	I	I	I	I
1.3.2.3.1	Conduct of review and comment by DoE Officials (Updated Draft Curriculum)	A	C	C	R	I	I	I	I	I	I	I

WBS ID	Activity	People										
		CC Content Specialist/ PM	CC content team	Curriculum Specialist	DoE Designated Official	Primary School Principals	Primary School Teachers	Information Technology Specialist	Monitoring & Evaluation Specialist	OECS Education Resource Unit (OERU)	UNESCO Representatives	Other Stakeholder representatives
1.3.2.3.2	Updated Draft Curriculum_DoE	R	C	C	A	I	I	I	I	I	I	I
1.3.2.4.1	Conduct of two-day Stakeholder Consensus Meeting	R	C	C	A	C	C	C	C	C	C	C
1.3.2.4.2	Revised Draft Curriculum	R	C	C	A	C	C	I	I	C	C	C
1.4.1	Conduct of eight one-week training workshops by Education Districts	R	C	C	A	C	C	I	I	I	I	I
1.4.2	Workshop Report	R	C	C	A	C	C	I	I	I	I	I
1.5.1	Development of Online CC Resource Centre.	I	I	C	A	C	C	R	C	C	C	C
1.6.1	Two-day high-level meeting on Pilot Testing Report.	C	C	C	R, A	C	C	C	C	I	I	I

WBS ID	Activity	People										
		CC Content Specialist/ PM	CC content team	Curriculum Specialist	DoE Designated Official	Primary School Principals	Primary School Teachers	Information Technology Specialist	Monitoring & Evaluation Specialist	OECS Education Resource Unit (OERU)	UNESCO Representatives	Other Stakeholder representatives
1.6.2	Updated Revised Draft Curriculum.	R	C	C	A	C	C	I	I	C	C	I
1.7.1	Development of M&E Strategy (Specialist)	I	I	I	A	C	C	I	R	C	C	C
1.7.2	Review and dissemination of M&E Strategy (DoE).	C	C	C	R, A	C	C	I	I	I	I	I
R = Responsible (execution of the task/deliverable) A = Accountable (overall ownership & decision-making authority) C = Consult I = Inform												

Note. Prepared by Author

4.6.2   Estimate Activity Resources

The Estimate Activity Resource process input was the scope baseline, activity list, cost estimate, and DoE's policies and procedures related to staffing and obtaining supplies and equipment. The tools and techniques used were bottom-up estimating, analogous estimating and planning meetings to determine the resource needs for the project. The main outputs of the process were the resource requirements.

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4.6.3   Acquire Resources

The inputs for the process were the project schedule, resource requirement, DoE policies and procedures for acquiring, allocating, and assigning resources to the project. The decision-making technique was the main technique used to acquire and allocate the project resources using selection criteria such as availability, cost, ability, experience in the field, knowledge, and skills. The outputs of the Acquire Resource process were the physical resource assignment and the project team assignment.

4.6.4   Develop Team

The input to the Develop Team process would be the project schedule and the DoE human resource management related to hiring, termination, performance reviews, and the team's location in Saint Lucia. The tools and techniques that would be used are colocation, virtual teams, use of communication technology such as video and audio conferencing, email/chat, training, meetings, and individual and team assessments. The main output of this process would be the team performance assessment.

4.6.5   Manage Team

The main input in the process would be the team performance assessment whilst the tools and techniques would be conflict management and decision making. The main output would be the project documents updates.

4.6.6   Control Resources

The key input for the process would be the resource assignment, the project schedule, the RBS, work performance data and DoE's policies regarding resource control and assignment. The main technique would be problem- solving to help solve problems that may arise during the Control Resource process. The main output of the process would be the work performance information which gives details on the progress of the work concerning the resource requirements, allocation, and utilisation across the project activities (revealing any gaps in the availability of the resources).

4.7   Communication Management Plan

A summary of the Communication Management Plan processes inputs, tools/techniques and outputs is given in Chart 34 and further detailed in the following subsections.

Chart 34

Summary of the Communication Management Processes Inputs, Tool/Techniques, and

Outputs of the Primary School Climate Change Curriculum Integration Project

Communication Management Processes	Input	Tools & Techniques	Output
Plan Communication Management	Project Charter, Resource Management Plan, requirement document, DoE policies, and guidelines related to communicating information to the project stakeholders, ethics and procedures for use of media	Stakeholder communication requirement analysis, communication technology, communication models, communication methods, the stakeholder engagement assessment matrix, meetings	Communication Management Plan
Manage Communication	Resource Management Plan, DoE communication channels, tools, and systems, DoE guidelines for exchange, storage, retrieval and communication of information, DoE policies and guidelines related communicating information to stakeholders, ethics and procedures for use of media	Communication technology and methods, electronic communications management (email, video conferencing websites), social media management (Facebook, Twitter, online communities etc.), project reporting and meetings	Performance reports, deliverable status reports, schedule progress, presentations, DoE project reports and presentations
Monitor Communications	Resource Management Plan, project communications, DoE guidelines for exchange, storage, retrieval and communication of information, DoE	Meetings (face-to-face, virtual), communication with the public, the community, and the media	Performance information

Communication Management Processes	Input	Tools & Techniques	Output
	policies and guidelines related to communicating information, ethics and procedures for use of media		

Note. Prepared by Author

4.7.1 Plan Communication Management

The inputs for the Plan Communication Management process were the Project Charter, the resource management plan, the requirement document, DoE policies, guidelines related to communicating information to the project stakeholders, ethics, and procedures for using media. The tools and techniques used in the process were stakeholder communication requirement strategy (Chart 35) (defined by examining the type and value of information needed), communication technology (appropriate to the information exchange and collaboration needs for stakeholders), communication models (relevant in developing appropriate communication strategies and plans for person-to-person or small group communications), communication methods (to share information relevant to project stakeholders), the stakeholder communication matrix (Chart 36), and meetings (both virtual and in-person). The main output of the Plan Communication Process was the Communication Management Plan.

Chart 35

Primary School Climate Change Curriculum Integration Project Stakeholder

Communication Requirement Strategy

Stakeholder	Communication Interests	Communication Strategy
CC Content Specialist/Project Manager	• Ensuring that quality is monitored and controlled • Meeting the expectation of the stakeholders • Achieving project deliverables within the budget and timeframe • Streamlining communication of appropriate information to the relevant stakeholders for decision making/action • Reporting and communicating project status, performance and achievement • Coordinating input of stakeholders towards inclusion of CC topics in Primary School Science Curriculum and other processes	• Providing monthly progress reports, quarterly performance report, achievement reports concerning deliverables • Providing meeting reports based outcomes and decisions • Communicating relevant project information at meetings to public, key stakeholders, DoE Officials, and using various methods of technology • Communicating project status, performance and achievement
CC Content team	• Ensuring that the quality of the deliverables is upheld • Participating in the compilation and revision of the curriculum • Achieving project deliverables within the budget and timeframe	• Working in close collaboration with the CC Content Specialist/Project Manage towards inclusion of CC topics in Primary School Science Curriculum and other
Curriculum Specialist	• Ensuring that the processes and the products of the project adhere to international, regional and national standards for development of Curricula	• Use of meetings and different reporting techniques • Informed of project scope, project developments and status through different communication methods, technology
DoE Officials (Permanent Secretary, Chief Education Officer, Chief Curriculum Officer, Science Curriculum Officer, District Education Officers)	• Ensuring that the project scope is adequate • Ensuring that quality is monitored and controlled • Meeting the expectation of international partners • Ensuring inclusivity and input of stakeholders in the process • Achieving project deliverables within the budget and the timeframe • Communicating the appropriate project information to the relevant stakeholders for decision making/action at given times during the project cycle • Communicating project status, progress, and performance to stakeholders • Making informed decisions towards inclusion of CC topics in Primary School Science Curriculum • Conducting meetings with stakeholders to initiate the project,	• Informed of project scope, project developments and status through different communication methods • Share project information with media, public, government officials, sponsoring agency and other stakeholders (national, regional, international) using mass, social media, meetings • Meetings with stakeholders, internal team • Use of various methods of communication technology for communication with stakeholders

Stakeholder	Communication Interests	Communication Strategy
	gain consensus on project process/products, gain feedback, end project, etc. • Conducting short- and long-term evaluation of the product • Ensuring long-term sustainability of the product	
Information Technology Specialist	• Developing a user-friendly online platform with up-to-date, credible resources on climate change to support instruction and learning for primary school teachers and students.	• Meetings on the requirement for developing resource centre and feedback • Informed of project scope, project developments and status through different communication methods
Monitoring & Evaluation Specialist	• Developing the M&E Strategy that reflects the standards used in measuring the performance of educational curriculum	• Informed of project scope, project developments and status through different communication methods • Meetings on the requirement for developing resource centre and feedback
Caribbean Waterways (NGO)- Programme Director	• Supporting the development of the revised curriculum by participating in consultations	• Meetings, emails and information through social media and mass media
Private Sector Companies (PSC)	• Knowing the short- and long-term outcomes of the products and the benefits to society and the students	• Meetings, emails and information through social media and mass media
Civil Society (CS)	• Knowing the short- and long-term outcomes of the products and the benefits to society and the students	• Meetings, emails and information through social media and mass media
OECS Education Resource Unit (OERU)	• Ensuring that the project scope is adequate • Ensuring that quality is monitored and controlled • Ensuring that the product adheres to national and international and OECS standards	• Informed of project scope and developments • Meetings, emails, and copied in progress reports.
Primary School Teacher Grades K-6	• Ensuring that the project scope is adequate • Ensuring that quality is monitored and controlled • Ensuring that the product adheres to national and international and OECS standards • Ensuring inclusion and participation in the process of revising the curriculum	• Meetings, emails, and copied in progress reports • Informed of project scope and developments
Primary School Principals	• Ensuring that the project scope is adequate • Ensuring that quality is monitored and controlled • Ensuring that the product adheres to national and international and OECS standards • Ensuring inclusion and participation in the process of revising the curriculum	• Meetings, emails, and copied in progress reports • Informed of project scope and developments

Stakeholder	Communication Interests	Communication Strategy
Parent -Teacher Association	• Knowing the short- and long-term outcomes of the products and the benefits to society and the students	• Knowing the short- and long-term outcomes of the products and the benefits to society and the students • Meetings, information through social media and mass media
UNESCO Representatives	• Ensuring that the project scope is adequate • Ensuring that quality is monitored and controlled • Ensuring that the product adheres to national and international and OECS standards	• Informed of project scope and developments • Meetings, emails, and copied in progress reports.
Permanent Secretary Department of Sustainable Development	• Ensuring that the project scope is adequate • Ensuring that quality is monitored and controlled	• Informed of project scope and developments • Meetings, emails are copied in progress reports.
Environment and Sustainable Development Officers	• Ensuring that the project scope is adequate • Ensuring that quality is monitored and controlled	• Informed of project scope and developments • Meetings, emails are copied in progress reports
Local Community groups	• Knowing the short- and long-term outcomes of the products and the benefits to society and the students	• Meetings, emails and information through social media and mass media
Primary School Students	• Knowing the short- and long-term outcomes of the products	• Meetings, emails and information through social media and mass media

Note. Prepared by Author

Chart 36

Primary School Climate Change Curriculum Integration Project Stakeholder

Communication Matrix

Communication Type	Audience	Description/ Purpose	Frequency	Owner	Channel
Personal Communication	CC Content Team, Curriculum Specialist	Frequent communication	Daily	CC Content Specialist/Project Manager	Telephone calls, Email, in-person, video conferencing
	CC Content Team, Curriculum Specialist, OECS Education Resource Unit (OERU), UNESCO Representatives, Permanent Secretary Department of Sustainable Development, Caribbean Waterways (NGO)- Programme Director, IT Specialist, M&E Specialist	Project kick-off/overview	Once	DoE Officials, CC Content Specialist/Project Manager	Meeting, Streaming online
	CC Content Team, Curriculum Specialist, OECS Education Resource Unit (OERU), UNESCO Representatives, Permanent Secretary Department of Sustainable Development, Caribbean Waterways (NGO)- Programme Director, IT	2-day high level meeting-report discussion	Once	DoE Officials	Meeting

Communication Type	Audience	Description/ Purpose	Frequency	Owner	Channel
	Specialist, M&E Specialist				
	Primary School Teacher Grades K-6, Primary School Principals, Environment and Sustainable Development Officers, CC Content Team, Curriculum Specialist, Waterways (NGO)-Programme Director, CC Content Team	2-day working session	Once	DoE Officials	Meeting
	Primary School Teacher Grades K-6, Primary School Officials	Eight one-day Education District Meetings	Once	CC Content Specialist/P roject Manager, Curriculum Specialist	Meeting
	CC Content Team, Curriculum Specialist, OECS Education Resource Unit (OERU), UNESCO Representati ves, Permanent Secretary Department of Sustainable Development , Caribbean Waterways	One-day high level meeting	Once	CC Content Specialist/P roject Manager, Curriculum Specialist, DoE Officials	Meeting, online option

Communication Type	Audience	Description/ Purpose	Frequency	Owner	Channel
	(NGO)- Programme Director, IT Specialist, M&E Specialist				
	All Stakeholders	Two-day stakeholder consensus meeting	Once	DoE Officials	Meeting
	Primary School Teacher Grades K-6, Primary School Principals, DoE Officials	Eight 1-week training workshop	Once	DoE Officers, CC Content Specialist/P roject Manager, IT specialist	Meeting
	CC Content Team, Curriculum Specialist, OECS Education Resource Unit (OERU), UNESCO Representati ves, Permanent Secretary Department of Sustainable Development , Caribbean Waterways (NGO)- Programme Director, IT Specialist, M&E Specialist	Two-day high-level meeting on Pilot Testing Report	Once	DoE Officials	Meeting, Online option
	Private Sector Companies (PSC), Civil Society (CS), Primary School Teacher Grades K-6, Primary School Principals, Parent - Teacher Association, Environment	Project kick-off/overview	Once	CC Content Specialist/P roject Manager	Community Meeting, Streaming online

Communication Type	Audience	Description/ Purpose	Frequency	Owner	Channel
	and Sustainable Development Officers, Local Community groups, Primary School Students, CC Content Team, Curriculum Specialist, DoE Officials, Caribbean Waterways (NGO)- Programme Director				
	Private Sector Companies (PSC), Civil Society (CS), Primary School Teacher Grades K-6, Primary School Principals, Parent - Teacher Association, Environment and Sustainable Development Officers, Local Community groups, Primary School Students, CC Content Team, Curriculum Specialist, DoE Officials, Caribbean Waterways (NGO)- Programme Director	Project kick-off/overview	Once	CC Content Specialist/Project Manager	Community Meeting, Streaming online
Reports	DoE Officials/Proj	Updates on project issues	Bi-weekly	CC Content Specialist/P	Emails, Meetings

Communication Type	Audience	Description/ Purpose	Frequency	Owner	Channel
	ect Sponsor, CC Content Team, Curriculum Specialist			roject Manager	
	DoE Officials/Project Sponsor	Updates on project finances and performance	Monthly	CC Content Specialist/Project Manager	Email
	DoE Officials/Project Sponsor,	Progress Reports	Monthly	CC Content Specialist/Project Manager	Email
	CC Content Team, Curriculum Specialist, OECS Education Resource Unit (OERU), UNESCO Representatives, Permanent Secretary Department of Sustainable Development, Caribbean Waterways (NGO)-Programme Director, IT Specialist, M&E Specialist	Progress Reports	Monthly	CC Content Specialist/Project Manager	Email
	DoE Officials, OECS Education Resource Unit (OERU), UNESCO Representatives, Permanent Secretary Department of Sustainable Development, Caribbean Waterways (NGO)-Programme Director, IT Specialist,	Project reports	Throughout project lifecycle	CC Content Specialist/Project Manager	Email

Communication Type	Audience	Description/ Purpose	Frequency	Owner	Channel
	M&E Specialist				
Project Announcements	All Stakeholders	Project Completion Report	Once	DoE Officials, CC Content Specialist/Project Manager	Email
	CC Content Team, Curriculum Specialist	Schedule reminders	Weekly	CC Content Specialist/Project Manager	Email
	Private Sector Companies (PSC), Civil Society (CS), Primary School Teacher Grades K-6, Primary School Principals, Parent - Teacher Association, Environment and Sustainable Development Officers, Local Community groups, Primary School Students, CC Content Team, Curriculum Specialist, DoE Officials, Caribbean Waterways (NGO)- Programme Director	Project details including outcomes and benefits	As often as required	DoE Media operator	Radio, Television, Social Media

Communication Type	Audience	Description/ Purpose	Frequency	Owner	Channel
Presentations	DoE Officials, CC Content Team, Curriculum Specialist	Completed project status update	Monthly	CC Content Specialist/Project Manager	Meeting, Video conference
	CC Content Team, Curriculum Specialist, OECS Education Resource Unit (OERU), UNESCO Representatives, Permanent Secretary Department of Sustainable Development, Caribbean Waterways (NGO)-Programme Director, IT Specialist, M&E Specialist	Project Overview/ Buy-In	Once	DoE Officers, CC Content Specialist/Project Manager	Conference, Video conference
	Private Sector Companies (PSC), Civil Society (CS), Primary School Teacher Grades K-6, Primary School Principals, Parent - Teacher Association, Environment and Sustainable Development Officers, Local Community groups, Primary School Students, CC Content Team, Curriculum	Project kick-off/overview	Once	CC Content Specialist/Project Manager	Community Meeting

Communication Type	Audience	Description/ Purpose	Frequency	Owner	Channel
	Specialist, DoE Officials, Caribbean Waterways (NGO)- Programme Director of Community				
Reviews and Meetings	CC Content Team, Curriculum Specialist	Meetings to review project status	Monthly	CC Content Specialist/Project Manager	Planning meeting
	CC Content Team, Curriculum Specialist	Schedule reminders and notices	Daily / Weekly	CC Content Specialist/Project Manager	Email, Collaboration apps, e.g. Google Hangouts, WhatsApp
Reminders and Notices	All Stakeholders	Groundbreaking Ceremony ceremony	Once	CC Content Specialist/Project Manager	In-person
Ceremony	All Stakeholders	Project Completion Reporting and Hand-over ceremony	Once	DoE Officers, CC Content Specialist/Project Manager	In-person

Note. Prepared by Author

4.7.2   Manage Communications

The inputs of the Manage Communications process were the Resource Management Plan, the established communication channels (Chart 37), tools, and systems used by DoE, DoE guidelines for exchange, storage, and retrieval as well as communication of information, and DoE culture, policies, guidelines related communicating information to the project stakeholders, ethics, procedures for the use of media. The tools and techniques were communication technology and methods, electronic communications management through email, video conferencing and use of websites, use of social media management through Facebook, Twitter, online communities etc., project reporting and meetings. The output of the process would be the project's communications, such as performance reports, deliverable status reports, schedule progress, presentations, and DoE project reports and presentations.

Chart 37

Primary School Climate Change Curriculum Integration Project Established

Communication Channels

Source	Level 1-Communication Channel	Level 2 - Communication Channel	Actions
Government and Other Agencies /Organizations Issues	Communicate with CC Content Specialist/Project Manager	Evaluation of issue and communication with CC Curriculum Specialist, CC Content Team	Attempt to resolve the issue, ensuring all parties are satisfied with the way forward.
DoE/Sponsor Issues	Communicate with CC Content Specialist/Project Manager	Evaluation of issue and communication with CC Curriculum Specialist, CC Content Team	Attempt to resolve the issue, ensuring that all parties are satisfied with the proposed course of action/decision.
CC Content Team Issues, Curriculum Specialist	Communicate with CC Content Specialist/Project Manager	Team meeting	Attempt to resolve issues internally through mediation.
Project Issues	Communicate with CC Content Specialist/Project Manager and/or DoE/Sponsor	Evaluation of issue and communication with Curriculum Specialist, CC Content Team	Move to resolve the issue, ensuring that all parties are reasonably satisfied with the way forward.
Policy Related Issues	Communicate with CC Content Specialist/Project Manager and/or DoE/Sponsor	Evaluation of issue and communication with Curriculum Specialist, CC Content Team, OERU, UNESCO, and relevant authorities, to gain clarity and guidance on the way forward.	Attempt to resolve the issue, ensuring that all parties are satisfied with the proposed actions/decisions.
School and Community-Based Issue	Communicate with CC Content Specialist/Project Manager and/or DoE/Sponsor and community towards identifying common ground and space for compromise and negotiation.	Evaluation of issues and communication with the CC Content Specialist/Project Manager, DoE/Sponsor and community.	Move to resolve the issue, ensuring that all parties are satisfied with the way forward.

Note. Prepared by Author

4.7.3   Monitor Communications

The inputs of the Monitor Communications process would be the Resource Management Plan, project communications, DoE guidelines for exchange, storage, and retrieval as well as transmission of information, and DoE policies, guidelines related to communicating information to the project stakeholders, ethics, and procedures for the use of media. The main tools and techniques that would be used in this process are meetings (face-to-face or virtual), and communication with the public, the community, and the media (mass media, social media). The main output would be work performance information.

4.8   Risk Management Plan

A summary of these processes, inputs, tools/techniques, and outputs of the Risk Management Plan is given in Chart 38 and further detailed in the following subsections.

Chart 38

Summary of the Risk Management processes inputs, tools/techniques, and outcomes of the

Primary School Climate Change Curriculum Integration Project

Risk Management Processes	Input	Tools & Techniques	Output
Plan Risk Management	Project Charter, risk threshold set by the DoE, the project's authority levels for decisions related to risks, DoE's categorization, and definition of risks, DoE policies related to the project risks	Internal team meetings, key stakeholder meetings	Risk Management Plan
Identify Risks	Schedule Management Plan, Cost Management Plan, Quality Management Plan, Resource Management Plan, Scope baseline, Schedule baseline, Cost baseline, cost estimates, requirements documents	Brainstorming, interviews, analysis of the project documents, meetings	Risk register
Perform Qualitative Risk Analysis	Risk register, information from similar projects conducted by DoE	Interviews with DoE officials and other stakeholders, meetings, risk probability and impact assessment, risk characterization	Updated risk register
Perform Quantitative Risk Analysis	Scope baseline, schedule baseline, cost baseline, milestone list, resource requirements, risk register	Interviews with DoE officials	Updated project documents
Plan Risk Responses	Cost baseline, project schedule, risk register	Interviews with stakeholders, strategies for threats and opportunities	Updated risk register and other project documents
Implement risk responses	Risk register	Expert judgement	Update of relevant project documents

Risk Management Processes	Input	Tools & Techniques	Output
Monitor risks	Risk register	Meetings with stakeholders	Work performance information, update of the risk register and other project document

Note. Prepared by Author

4.8.1 Plan Risk Management

The main inputs for the Plan Risk Management Process were the Project Charter, the risk threshold set by the DoE as the project sponsor, the project's authority levels for decisions related to risks, DoE's categorization, and definition of risks as well as their policies related to the project risks. The tools and techniques used were internal team meetings as well as meetings with key stakeholders. The major output of the Plan Risk Management process would be the Risk Management Plan which included the risk strategy, methodology, roles and responsibilities, the risk categories (where the individual project risks were grouped using a risk breakdown structure (RBS) (Chart 39), the definition of the risk probability and impacts (Chart 40, Chart 41 respectively) and the probability impact matrix (Figure 16).

Chart 39

Primary School Climate Change Curriculum Integration Project Risk Breakdown Structure

RBS Level 0	RBS Level 1	RBS Level 2
0. All Sources of Primary School Climate Change Curriculum Integration Project Risks	1. Project Management Risks	1.1 Financial resources and planning
		1.2 Communication and Reporting
		1.3 Monitoring & Evaluation
		1.4 Sustainability of Revised Science Curriculum
		1.5 Decision-Making Mechanism
		1.6 Scheduling of Project Activities
		1.7 Stakeholder Resource Availability
	2. Technical Risks	2.1 Software Estimates, Availability
		2.2 IT Infrastructure at the Primary Schools
		2.3 Hardware at Primary Schools
		2.6 Performance & User Experience
	3. Leading & Organisational Risks	3.1 Leadership Responsibility
		3.2 Impact on School Activities
		3.3 Lines of Authority
		3.4 Quality Management Processes
		3.5 Project Organisational Resource Availability
	4. External Risks	4.1 Environmental/Weather
		4.2 Policies and Regulations
		4.3 Primary School Environment
		4.4 Country/Societal Factors
		4.5 Governmental Priorities

Note. Prepared by Author

Chart 40

Primary School Climate Change Curriculum Integration Project Probability Rating Scale

Probability Scale	Probability Descriptors
Very high probability	Almost certain, will occur
High probability	Probable/likely to occur
Medium probability	Occasional
Low probability	Remote/unlikely, but possible
Very low probability	Improbable/rare, can assume event will not occur

Note. Prepared by Author

Chart 41

Primary School Climate Change Curriculum Integration Project Impact Rating Scale

Level of Impact	Impact Descriptors	Impact on Project Objectives		
		Time	Cost	Quality
Catastrophic (Very high)	Detrimental impact	> 6 months	> $100,000	Catastrophic impact on the overall functionality
Critical (High)	Major/severe impact	3 - 6 months	< $100,000	Critical impact on overall functionality
Significant (Moderate)	Moderate impact	1 - 3 months	< $60,000	Significant impact on some functionality
Minor (Low)	Minimum impact	1 week - 1 month	< $20,000	Minor impact on some functionality
Insignificant (Very low)	Negligible impact, not detectable	< 1 week	No change / $0 - $2,000.00	No changes to functionality

Note. Prepared by Author

Figure 15

Probability and Impact Matrix used for Scoring Primary School Climate Change Curriculum Integration Project Risks (Opportunities and Threats)

	Threats					Opportunities					
Very High 0.90	0.05	0.09	0.18	0.36	0.72	0.72	0.36	0.18	0.09	0.05	Very High 0.90
High 0.70	0.04	0.07	0.14	0.28	0.56	0.56	0.28	0.14	0.07	0.04	High 0.70
Medium 0.50	0.03	0.05	0.10	0.20	0.40	0.40	0.20	0.10	0.05	0.03	Medium 0.50
Low 0.30	0.02	0.03	0.06	0.12	0.24	0.24	0.12	0.06	0.03	0.02	Low 0.30
Very Low 0.10	0.01	0.01	0.02	0.04	0.08	0.08	0.04	0.02	0.01	0.01	Very Low 0.10
	Very Low 0.05	Low 0.10	Moderate 0.20	High 0.40	Very High 0.80	Very High 0.80	High 0.40	Moderate 0.20	Low 0.10	Very Low 0.05	
			Negative Impact					Positive Impact			

(Probability axis on both left and right; Negative Impact and Positive Impact as horizontal axes.)

Risk Rank (Probability x Impact): Low (0.01 - 0.07), Medium (0.08 – 0.20), High (0.24 – 0.72)

Note. Adapted from PMI (2017a).

4.8.2   Identify Risks

The inputs to the Identify Risks Process included several plans (Schedule Management Plan, Cost Management Plan, Quality Management Plan, Resource Management Plan), project baselines (the scope baseline, the schedule baseline, and the cost baseline), and project documents (cost estimates, requirements documents). The tools and techniques of the Identify Risks process were data gathering techniques such as brainstorming and interviews, analysis of the project documents, and meetings. The main output of the Identify Risks process was the risk register which depicted the results of the Perform Qualitative Risk Analysis, Plan Risk Responses, Implement Risk Responses, and Monitor Risks (Chart 42).

Chart 42

Primary School Climate Change Curriculum Integration Project Risk Register

RBS Code	Cause	Risk Description	Reference	WBS	Probability	Impact	Rank (P x I)	Response	Preventive Actions	Contingency Plan	Reserves		Trigger	Responsible
											Time (days)	Money (USD)		
1.1	Lack of timely budget approval for the project	If there is a problem in securing the finances for the project due to lack of timely budgetary approval then the project will not be able to begin at the scheduled time.	Start of the project.	1.1	0.7	0.8	0.56	Mitigate	Contemplate non-government sources for co-funding different components of the project				Delay in disbursement of required project funds	DoE
2.2	Drops in internet connectivity at the Primary Schools	If there are missed class sessions due to drops in the internet connectivity at some Primary Schools then pilot testing of the draft curriculum would be delayed.	During pilot testing of the Curriculum to access and use CC resources.	1.6	0.5	0.2	0.1	Accept		Arrange wireless internet hotspots routers (MiFi) for use when there is a drop in the service		$2,000		CC Content Specialist/Project Manager, DoE Officials

RBS Code	Cause	Risk Description	Reference	WBS	Probability	Impact	Rank (P x I)	Response	Preventive Actions	Contingency Plan	Reserves		Trigger	Responsible
											Time (days)	Money (USD)		
2.3	Lack of functioning computers in computer lab	If the Primary Schools labs are not in use due to non-functional computers then the pilot testing would be delayed, and there would be an increased cost to repair the computers.	During pilot testing of the Curriculum, CC resources for whole-class instruction.	1.6	0.5	0.2	0.1	Accept		Conduct preliminary inventory checks of the participating schools and provide them with sufficient Laptops for the duration of the pilot test.				CC Content Specialist/Project Manager, DoE Officials
2.6	Lack of adequate training of teachers to use online resources for CC instruction	If teachers cannot use online resources in teaching CC topics using the draft curriculum due a lack of sufficient training, then there will be a delay in the completing activity.	During pilot testing of the Curriculum, use CC resources for whole-class instruction.	1.6	0.7	0.4	0.28	Mitigate	Provide teachers with additional training and resources.		10	$4,000	Teachers' feedback during project initiation/kick-off	CC Content Specialist/Project Manager, IT Specialist
3.1	Lack of availability of DoE officials	If DoE officials cannot lead high-level meetings and oversight of project activities due to other engagements then there will	During all the phases of the project life cycle.	1.2, 1.3, 1.4, 1.5, 1.6, 1.7	0.7	0.4	0.28	Mitigate	Designate other DoE officials as substitutes when key officials are unavailable				DoE Officials' responsiveness to reminders and other communications	DoE officials

RBS Code	Cause	Risk Description	Reference	WBS	Probability	Impact	Rank (P x I)	Response	Preventive Actions	Contingency Plan	Reserves Time (days)	Reserves Money (USD)	Trigger	Responsible
		be delays in the time for completion of the project.												
3.4	Inadequate quality check measures	If the draft curriculum reveals major inadequacies after the pilot test due to inadequate quality check measures, then the revision of the curriculum would take more time, delaying the time for completion of the project and increasing the project cost.	After the pilot testing phase.	1.3, 1.6	0.3	0.4	0.12	Accept		Allocate extra time in the plan for the revision of the curriculum after the pilot test	20	$16,000	Discussions and concerns by stakeholders during the consensus and review meetings	CC Content Specialist/Project Manager, DoE Officials
3.5	Lack of availability of project consultants	If project meetings and activities cannot occur due to lack of availability of the project consultants then	During all the phases of the project life cycle.	1.1, 1.2, 1.3, 1.4, 1.5, 1.6, 1.7	0.7	0.2	0.14	Mitigate	Identify other suitably qualified consultants that have provided reliable					CC Content Specialist/Project Manager, DoE Officials

RBS Code	Cause	Risk Description	Reference	WBS	Probability	Impact	Rank (P x I)	Response	Preventive Actions	Contingency Plan	Reserves Time (days)	Reserves Money (USD)	Trigger	Responsible
		there will be delays in time for completion of the project activities and the project as a whole.							service in the past					
4.1	Bad weather conditions	If there are unexpected school and business closures due to bad weather, then the project activities will be delayed increasing the time to complete the project.	During all the phases of the project life cycle where activities coincide with bad weather conditions.	1.2, 1.3, 1.4, 1.5, 1.6, 1.7	0.5	0.1	0.05	Accept		1. Modify the times for meetings and other project activities. 2. Record all lost time, especially those of the specialists to make the case for recouping the lost days.	20	$8,000	Weather forecasts for inclement/ extreme weather conditions	CC Content Specialist/Project Manager
4.2	Advertisement of Curriculum Officer post	If the acting Science Curriculum Officer at the Ministry of Education is replaced due to the advertisement of the post, then there may be delays in completing project activities	During all the phases of the project life cycle.	1.2, 1.3, 1.4, 1.5, 1.6, 1.7	0.7	0.2	0.14	Mitigate	Identify other DoE officials that will work with the replacement to complete the project role and respossibilities				Communication from DoE officials	DoE officials

RBS Code	Cause	Risk Description	Reference	WBS	Probability	Impact	Rank (P x I)	Response	Preventive Actions	Contingency Plan	Reserves Time (days)	Reserves Money (USD)	Trigger	Responsible
		which will increase the time to complete the project.												
4.3	Scheduled Primary School activities	If the primary school teachers are not available for the training workshops in the 8 districts, due to scheduled school activities, then the project timeline may be increased to accommodate their participation.	During all the phases of the project life cycle.	1.3, 1.4, 1.6	0.7	0.4	0.28	Mitigate	1. Identify one alternative primary school teacher from each Grades to participate in the workshop. 2. Facilitate the online stream and recording of the workshops for all the districts. 3. Facilitate both virtual and in-person participation in the district training workshops (blended approach).				Changes to school term timetable	CC Content Specialist/Project Manager, DoE Officials

RBS Code	Cause	Risk Description	Reference	WBS	Probability	Impact	Rank (P x I)	Response	Preventive Actions	Contingency Plan	Reserves		Trigger	Responsible
											Time (days)	Money (USD)		
4.4	Rapid circulation of the new COVID-19 variants	If there is an upsurge in the COVID -19 cases in Saint Lucia due to the rapid circulation of the new COVID-19 variants, then there may be delays in executing the project activities.	During all the phases of the project life cycle.	1.1, 1.2, 1.3, 1.4, 1.5, 1.6, 1.7	0.5	0.2	0.1	Mitigate	1. Identify other individuals to cover the roles and responsibilities of the project team if an individual contracts COVID -19. 2. Include a stipulation in the project teams' contract that in cases of illness, their roles and responsibilities will be covered by others to prevent project delays.				Announcements from the Ministry of Health, Regional and International Health Agencies	CC Content Specialist/Project Manager, DoE Officials
					Project General Risk		**0.20**	**Total Amount of Contingency Reserves:**			**111**	**$30,000**		

Risk Rank

 Low   Medium   High

Note. Prepared by Author

4.8.3 Perform Qualitative Risk Analysis

The Perform Qualitative Risk Analysis process was used to prioritise the project risks by assessing their probability of occurrence and their impact. This risk analysis process allowed the identification of the high-priority risks for further action (Chart 42).

The main inputs for this process were the risk register and information from similar projects conducted by DoE in the past. The main tools and techniques were interviews with DoE officials and other stakeholders to gather information, meetings, risk probability and impact assessment for data analysis and risk characterization. The main output of the Perform Qualitative Risk Analysis process was the update to the risk register.

4.8.4 Perform Quantitative Risk Analysis

The Perform Quantitative Risk Analysis process allowed the quantification of the project risks concerning the project's objectives in terms of supporting risk response planning (Chart 42). The main inputs of this process were the project baselines (scope baseline, schedule baseline, cost baseline), and project documents (milestone list, resource requirements, risk register). The main technique used in the process was interviews with stakeholders. The main output of the Perform Quantitative Risk Analysis process was the update of documents (risk register).

4.8.5 Plan Risk Responses

The inputs used in this process were the cost baseline, project schedule, and the risk register. The main tools and techniques used were interviews with stakeholders as a data gathering technique, and strategies for risks (e.g., Mitigate, Accept). The strategies that would be applied for risks for the Primary School Climate Change Curriculum Integration Project are detailed in Chart 42. The main output of the Plan Risk Responses were updates to the project documents and plans e.g., the risk register.

4.8.6   Implement Risk Responses

The main input of the process would be the risk register and the main technique would be expert judgement. The main output of the process would be the update of the relevant project documents.

4.8.7   Monitor Risks

The input to the process would be the project risk register while the tools and techniques would be meetings with stakeholders. The output of the Monitor Risks process would be information on the work performance, update of the risk register and other project documents.

4.9   Procurement Management Plan

A summary of the Procurement Management Plan processes inputs, tool/techniques and outputs is given in Chart 43 and further detailed in the following subsections.

Chart 43

Summary of the Procurement Management Processes Inputs, Tool/Techniques, and Outputs

of the Primary School Climate Change Curriculum Integration Project

Procurement Management Processes	Input	Tools & Techniques	Output
Plan Procurement Management	Project Charter, scope management plan, quality management plan, resource management plan scope baseline, milestone list, the requirements traceability matrix, resource requirements, the risk register, sellers used by the DoE in past projects, national regulatory requirements for local labour or sellers and national legal advice on procurements from DoE, DoE's formal procurement policies, procedures, and guidelines, DoE's preapproved seller lists, and contracts	Expert judgement from DoE, market research, make-or-buy analysis, DoE source selection analysis, meetings with bidders	Procurement Management Plan, procurement strategy, bid documents (RFP), source selection criteria, make-or-buy decisions, Terms of Reference (TOR)/Statement of Work (SOW)
Conduct Procurement Process	Scope Management Plan, Communication Management Plan, Risk Management Plan, cost baseline, project schedule, requirements documentation, risk register, bid documents, source selection criteria, TOR/SOW, seller proposal, national regulatory requirements for local labour or sellers, national legal advice on procurements from DoE, DoE's formal procurement policies, procedures, and guidelines, DoE preapproved seller	Expert judgement, (from DoE procurement staff), advertising of seller opportunities, bidder conferences	Selection of the sellers, contract agreements, changes/updates to the project management plans, cost and schedule baselines, project document updates, DoE process asset update

Procurement Management Processes	Input	Tools & Techniques	Output
	lists, and contracts types		
Control Procurement process	Risk Management Plan, schedule baseline, milestone list, quality reports, requirements documentation, requirements traceability matrix, risk register, agreements, procurement documentation, sellers' work performance information, DoE policies	Expert judgement, performance reviews, inspection of sellers' project deliverables	Close procurement notice to the sellers, work performance information, update of the relevant project documents, project management plans, procurement documents, update of DoE process assets documents (payment schedule, request, procurement file)

Note. Prepared by Author

4.9.1   Plan Procurement Management

The inputs for the process included the Project Charter, the project management plans (Scope Management Plan, Quality Management Plan, Resource Management Plan scope baseline), project documents (the milestone list, the requirements traceability matrix, resource requirements, the risk register), sellers used by the DoE in past projects, the terms and conditions for products, services, as employed by DoE, national regulatory requirements for local labour or sellers and national legal advice on procurements from the DoE procurement team (which will conduct the procurement for the Primary School Climate Change Curriculum Integration Project). Other important inputs included the DoE's formal procurement policies, procedures, and guidelines, DoE's preapproved seller lists, and the types of contracts DoE employs for such products and services (where the main ones used are fixed-priced contracts). The project will employ fixed-priced contracts since the scope of work is well-defined and risks are manageable. Additionally, the fixed-priced contracts allow for control of the budget and allocation of resources accordingly since a fixed total price is given for specific product or services.

Several tools and techniques were used and these were,

1. Expert judgement from DoE

2. Data gathering techniques including market research

3. The make-or-buy analysis technique is where decisions were made regarding whether project activities would be best achieved by the project team or from outside sources. An important consideration was planning for limited financing of the project.

4. DoE source selection analysis for selection of goods and services included

    a. general and technical qualification and experience only (seller).

    b. fixed budget where the available budget was disclosed to the invited sellers

5. Meetings with bidders helped determine how to manage and monitor the procurement.

The outputs of the Plan Procurement Management process were the

1. Procurement Management Plan (Chart 44) which included

    a. The timetable of key procurement activities,

    b. Procurement metrics to be used to manage contracts

    c. Roles and responsibilities related to procurement (Chart 45)

    d. Risk management issues and strategies to address the risks (Chart 46)

    e. Constraints and assumptions that could affect planned procurements (Chart 47).

2. Procurement strategy where DoE used buyer/services provider with no subcontracting as the delivery method with fixed-price contract type (specifically firm fixed price) and information on procurement phases including performance indicators and milestones for monitoring

3. Bid documents (Request for proposal- RFP)

4. Source selection criteria

5. Make-or-buy decisions

6. The terms of reference (TOR) used in contracting project services developed from the project scope baseline or the Statement of Work (SOW)

Chart 44

Primary School Climate Change Curriculum Integration Project Procurement Plan

WBS	Resources & Related Activities	Cost Breakdown (USD)	Total Cost (USD)	Procurement Methods	Contract Type	Procurement Document	Terms of Reference/ Statement of Work	Procurement Metric	Launch Process	Contract Signature Date	Contract Close Date	Needed by
	CC Content Specialist		$ 76,000	Competitive bidding	Firm-fixed price	Request for Proposal	TOR	Delivery on time, Quantity received	April 01, 2023	September 01, 2023	September 30, 2025	September 01, 2023
1.2.1	Develop report on treatment of CC & inclusion areas	$ 8,000										
1.2.2	Conduct two-day high-level meeting: discussion of report with key stakeholders	$ 800										
1.3.1.1	Conduct of two-day working session	$ 800										
1.3.1.2	Develop Draft Curriculum with CC topics and Grades K-6 relevant topics	$ 23,600										
1.3.2.1.3	Compile report from 8 Districts	$ 6,000										

WBS	Resources & Related Activities	Cost Breakdown (USD)	Total Cost (USD)	Procurement Methods	Contract Type	Procurement Document	Terms of Reference/ Statement of Work	Procurement Metric	Launch Process	Contract Signature Date	Contract Close Date	Needed by
1.3.2.2.2	Update Draft Curriculum	$ 4,000										
1.3.2.3.2	Update Draft Curriculum_DoE	$ 2,000										
1.3.2.4.2	Revise Draft Curriculum	$ 2,000										
1.3.2.4.1	Conduct two-day Stakeholder Consensus Meeting	$ 800										
1.4.1	Conduct eight one-day training workshop by Educational District	$ 16,000										
1.4.2	Workshop report	$ 4,000										
1.6.2	Update Revised Draft Curriculum	$ 8,000										
	CC Curriculum Specialist		$ 11,200	Competitive bidding	Firm-fixed price	Request for Proposal	TOR	Delivery on time, Quantity received	April 01, 2023	September 01, 2023	September 30, 2025	September 01, 2023
1.2.2	Two-day high-level meeting: discussion of report with key stakeholders	$ 800										
1.3.1.1	Conduct of two-	$ 800										

WBS	Resources & Related Activities	Cost Breakdown (USD)	Total Cost (USD)	Procurement Methods	Contract Type	Procurement Document	Terms of Reference/ Statement of Work	Procurement Metric	Launch Process	Contract Signature Date	Contract Close Date	Needed by
	day working session											
1.3.2.4.1	Conduct of two-day Stakeholder Consensus Meeting	$ 800										
1.6.2	Update Revised Draft Curriculum	$ 8,000										
1.2.3	Outline CC integration approach and Grades K-6 relevant topics	$ 800										
	IT Specialist		$ 14,000	Competitive bidding	Firm-fixed price	Request for Proposal	TOR	Delivery on time, Quantity received	December 01, 2023	May 08, 2024	June 28, 2024	May 08, 2024
1.5.1	Develop Online CC Resource Centre	$ 14,000										
	M&E Specialist		$ 8,000	Competitive bidding	Firm-fixed price	Request for Proposal	TOR	Delivery on time Quantity received	March 01, 2025	August 06, 2025-	September 30, 2025	August 06, 2025-
1.7.2	Develop M&E Strategy	$ 8,000										
	CC content Team		$ 29,800	N/A	N/A	N/A	TOR	Delivery on time Quantity	July 01, 2023	September 01, 2023	September 30, 2025	September 01, 2023

WBS	Resources & Related Activities	Cost Breakdown (USD)	Total Cost (USD)	Procurement Methods	Contract Type	Procurement Document	Terms of Reference/ Statement of Work	Procurement Metric	Launch Process	Contract Signature Date	Contract Close Date	Needed by
								received				
1.2.1	Development of report on treatment of CC & inclusion areas	$ 4,000										
1.3.1.2	Development of Draft Curriculum with CC topics and Grades K-6 relevant topics	$ 11,800										
1.3.2.1.3	Compiled report from 8 Districts	$ 2,000										
1.3.2.3.2	Updated Draft Curriculum_DoE	$ 1,000										
	Revised Draft Curriculum	$ 1,000										
1.3.2.4.2	Conduct eight one-day training workshop by Education District	$ 8,000										
1.4.2	Works Report	$ 2,000										
	IT Resources Centre Material		$ 4,000	Quotation	N/A	Request for Quotation	N/A	Delivery on time, Low cost	August 01, 2023			November 01, 2023

WBS	Resources & Related Activities	Cost Breakdown (USD)	Total Cost (USD)	Procurement Methods	Contract Type	Procurement Document	Terms of Reference/ Statement of Work	Procurement Metric	Launch Process	Contract Signature Date	Contract Close Date	Needed by
1.5.1	Development of online CC Resource Centre	$ 4,000										
1.1.1	**Internet & power**	$ 258	$ 258	Direct negotiations	N/A	N/A	N/A	Quantity received, Low cost	October 01, 2023			September 01, 2023
	Workshop/Meeting Venue Facilities		$ 828	Quotation	N/A	Request for Quotation	N/A	Quantity received				
1.3.1.1	Conduct of two-day working session	$ 414								September 01, 2023		October 06, 2023
1.3.2.4.1	Conduct of two-day Stakeholder consensus meeting	$414								March 01, 2024		April 29, 2024
	Catering Break & Lunch		$ 31,600	Quotation	N/A	Request for Quotation	N/A	Delivery on time Quantity received, Low cost				
1.2.2	Two-day high-level meeting: discussion of report with key stakeholders	$ 1,500								September 02, 2024		October 02, 2023
1.3.1.1	Conduct of two-day working session	$ 1,500								September 06, 2024		October 06, 2023

WBS	Resources & Related Activities	Cost Breakdown (USD)	Total Cost (USD)	Procurement Methods	Contract Type	Procurement Document	Terms of Reference/ Statement of Work	Procurement Metric	Launch Process	Contract Signature Date	Contract Close Date	Needed by
1.3.2.1.2	Eight one-day meeting by Educatiom District:finalization of comments	$ 6,000								Noveber 29, 2024		January 29, 2024
1.3.2.2.1	Conduct of one-day high-level meeting	$ 6,000								February 11, 2014		March 11, 2024
1.3.2.4.1	Conduct of two-day Stakeholder consensus meeting	$ 1,600								March 29, 2024		April 29, 2024
1.4.1	Conduct of eight one-week training workshops by Education Districts	$ 15,000								April 08, 2024		May 08, 2024

Note. Prepared by Author

Chart 45

Primary School Climate Change Curriculum Integration Project Procurement Roles and

Responsibilities

Role	Responsibility
Project Sponsor	Provides overall leadership ensuring that the procurement requirements are achieved.
	Ensures that any approved changes have been incorporated into the procurement documents in a timely manner.
	Reviews and approves procurement documents.
Project Manager	Ensures the overall management of the project and that Procurement Management activities are executed according to the Procurement Plan.
	Ensures there are sufficient resources to execute the Procurement Management Plan and that the activities are performed in a timely manner within the stipulated budget.
Procurement Manager (DoE Procurement Team)	Reports to the Project Manager.
	Overall responsibility for managing the processes and activities of the Procurement Management Plan, procurement management and the procurement documents.
	Ensures the Procurement process is organized, managed, and controlled and any issues are identified and resolved quickly.
	Contributes to developing the Procurement documents.
Procurement Team DoE	Assists the Project Manager and Procurement Manager in the capturing, verifying, and communicating project procurement requirements.
	Handles procuring of contract activities • solicitations • contacting potential sellers • developing/reviewing TOR/SOW • coordinating funds for contracts • distributing signed executed contracts to relevant parties • coordinating final approval of contracts • advising on DoE's procurement policies and regulations • handling and processing of invoices
Ministry of Education Procurement Unit	Audits procurements as necessary.

Note. Prepared by Author

Chart 46

Primary School Climate Change Curriculum Integration Project Procurement Risks, Risks

Management Strategies

Procurement Risks	Probability	Impact	Procurement Risk Management Strategy
If the RFP is issued to bidders at different times due to poor planning by the procurement team then some bidders will have an unfair advantage.	Low	High	Mitigate to reduce the probability of occurrence by Issuing RFP at the same time and for the online advertisement, the RFP will be available for download at the same time.
If the project specialists are not procured in the stipulated time due to external factors then the procurement process will be greatly delayed.	Medium	High	Escalate to the Project Sponsor for a decision on how to proceed with the procurement.
If the seller schedule is unrealistic concerning the procurement activities due to prevailing national factors then there will be a delay in the procurement of products and services.	Low	High	Mitigate the probability of occurrence by ensuring that a realistic schedule is developed through research of external national factors.
If the procurement cost for the sellers (Specialists) is too low compared to international and regional costing then there will be little to no interest, delaying the procurement process.	Low	High	Escalate to the Project Sponsor for a decision on how to proceed with the procurement.
If the IT resources needed for the setup of the resource centre is not available at the scheduled time due to supply chain issues, shortages or shipping delays then the procurement process will be delayed.	High	Medium	Mitigate the probability of occurrence by monitoring the potential for supply chans/shipping issues and advancing the launch as necessary.
If IT resources do not meet the specified requirements due to errors on the part of the seller then the procurement process will be delayed.	Low	Medium	Mitigate the occurrence by ensuring that quality specifications are highlighted to the seller in procuring the IT resources.

Procurement Risks	Probability	Impact	Procurement Risk Management Strategy
If the bids submitted do not meet the minimum quality requirement due to failure to attract the most qualified sellers then the procurement process will be delayed.	Medium	High	Mitigate the occurrence by ensuring that the advertisement is precise and targets highly competent sellers.

Note Prepared by Author

Chart 47

Primary School Climate Change Curriculum Integration Project Constraints and Assumptions

Procurement Constraints	Procurement Assumptions
The project schedule is not flexible and all the procurement activities including contract administration and fulfilment must be completed within the stipulated project schedule.	The day-to-day equipment and services for running of the project will be available through DoE's existing provisions (office space, stationary, laptops, online document repository, projectors, printers, teleconferencing and video conferencing services).
The contingency and management reserves may not be applied to procurement activities.	All procurement activities and contract awards support the project scope.
	All procurement activities will be performed and managed with the current DoE Procurement Team, and no additional staff will be hired to support the procurement activities on the project.

Note. Prepared by Author

4.9.2 Conduct Procurement

. The inputs for the Conduct Procurement process would be project management plans (the Scope Management Plan, the Communication Management Plan, Risk Management Plan, and the cost baseline), project documents (project schedule, the requirements documentation, risk register), and the procurement documents (bid documents, source selection criteria, TOR/SOW). Other necessary inputs are the seller

proposal, enterprise environmental factors (national regulatory requirements for local labour or sellers and national legal advice on procurements from DoE), and DoE process assets (DoE's formal procurement policies, procedures, and guidelines, DoE pre-approved seller lists, and the types of contracts employed for such activities).

The tools and techniques that would be used include expert judgement (from DoE procurement staff), advertising of seller opportunities for the project using public advertising on the DoE webpage, and bidder conferences facilitating engagement with sellers before proposal submittal. The outputs of the Conduct Procurement Process would be the selection of the sellers to provide the products/services for the project, the contract agreements, changes/updates to the project management plans, cost and schedule baselines, project document updates and DoE process asset update (related to the list of prospective and pre qualified sellers for the project, information on relevant seller experience).

Under the Conduct Procurement process, all the products and services to be procured for the Primary School Climate Change Curriculum Integration Project will be under firm-fixed price contracts. The project team will work with the DoE procurement staff/team to define product/service particulars and required delivery dates. The Request for Proposal (RFP) will solicit bids from various sellers to procure the products/services within the stipulated time frame and under the firm fixed price contract once the seller is selected.

4.9.3   Control Procurement

The inputs for the Control Procurement process would be the Risk Management Plan, the schedule baseline, the project documents (milestone list, quality reports, requirements documentation, requirements traceability matrix, risk register), the agreements, the procurement documentation, the sellers' work performance information and DoE policies.

The tools and techniques that would be used are expert judgement concerning DoE procurement team, performance reviews to analyse sellers' performance against their agreement and inspection of sellers' project deliverables. The outputs of the Control Procurement process would be the close procurement notice to the sellers (indicating formal completion of the contract), work performance information, update of the relevant

project documents, project management plans, procurement documents, and update of DoE process assets documents (payment schedule, request, and procurement file) for the Primary School Climate Change Curriculum Integration Project.

4.10   Stakeholder Management Plan

A summary of the Stakeholder Management Plan processes inputs, tools/techniques and outputs is given in Chart 46 and further detailed in the following subsections.

Chart 48

Summary of the Stakeholder Management Processes, Inputs, Tool/Techniques, and Outputs

of the Primary School Climate Change Curriculum Integration Project

Stakeholder Management Processes	Input	Tools & Techniques	Output
Identify Stakeholder	Project Charter, Communication Management Plan, DoE's stakeholder register from similar project, information on lessons learnt regarding the involvement of stakeholders, meeting and data representation techniques (power/interest grid, power/influence grid, impact/influence grid)	Brainstorming, stakeholder analysis, analysis of documentations from similar previous projects	Stakeholder register, updates to the Communication Management Plan, Risk Management Plan, and updates to the risk register
Plan Stakeholder Engagement	Project Charter, Resource Management Plan, Communication Management Plan, Risk management Plan, risk register, project schedule, DoE policies and procedures for use of media, ethics, and security, risk, change, and data management	Stakeholder engagement assessment matrix, meetings	Stakeholder Engagement Plan
Manage Stakeholder Engagement	Communication Management Plan, Risk Management plan, project register, DoE policies and procedures for use of media, ethics, and security, risk, change, and data management	Meeting, communication skills, interpersonal skills	Updates to the Communication plan and the stakeholder register
Monitor Stakeholder Engagement	Communication Management Plan, Resource Management Plan, risk register, stakeholder register, work performance data, DoE policies and procedures for use of media, ethics, security, risk, change, and data management	Stakeholder analysis, stakeholder engagement assessment matrix, communication, and interpersonal skills, meetings	Work performance information, update of the project management plans and the project documents

Note. Prepared by Author

4.10.1 Identify Stakeholders

The Identify Stakeholder process identified the project stakeholders and documented information and the characteristics that could impact the project (interests, influence, involvement, and interdependencies, etc.,)(Chart 49).

The inputs for the Identify Stakeholders process were the Project Charter, the Communication Management Plan, those parties that would be given agreements, DoE's stakeholder register from similar projects, and information on lessons learnt regarding the involvement of stakeholders. Other inputs were meetings and data representation techniques (power/interest matrix – Chart 50, Figure 17) which allowed the grouping of stakeholders concerning their power/level of authority, and level of interest in the project's outcomes and capacity to influence the project outcomes or cause changes to the project plans and execution.

The main tools and techniques used in this process were brainstorming as a data gathering technique, stakeholder analysis related to their characteristics - Organisational positions, project roles, expectations, attitudes, etc., and analysis of documentation from similar previous projects. The main output of the process was the Stakeholder Register (Chart 51), updates to project management plans (Communication Management Plan, Risk Management Plan), and updates to the risk register.

Chart 49

Primary School Climate Change Curriculum Integration Project Stakeholder List and

Engagement Strategy

Stakeholder	Interest	Strategy
Project Manager	To support the inclusion of Climate Change topics in the Primary School Curriculum towards formal education in climate change through management of the team, the project's stakeholders, and other resources in keeping with the project scope, schedule and budget.	Play a leading role in engaging the community, DoE officials and other stakeholders through teacher training workshops and meetings.
CC Content Specialist	To support the inclusion of Climate Change topics in the Primary School Curriculum towards formal education in the area.	Play a leading role in engaging the community, DoE officials and other stakeholders through teacher training workshops and meetings.
CC Content team	To support the inclusion of Climate Change topics in the Primary School Curriculum towards formal education in the area.	Report on the curriculum integration process at each phase of the project under the guidance of the CC Content Specialist /Project Manager.
Curriculum Specialist	To ensure that the approach towards the inclusion of Climate Change topics in the Primary School Curriculum is appropriate and aligns with principles of curriculum development.	Share research on the most effective strategies with the stakeholders to guide the development of the curriculum in the Saint Lucian context.
DoE Officials (Permanent Secretary, Chief Education Officer, Chief Curriculum Officer, Science Curriculum Officer, District Education Officers)	To equip primary school students Grades K-6 with the knowledge, skill, values and behaviours to take action in building a Climate resilient Saint Lucian society. To develop a revised Primary School Science Curriculum that effectively integrates climate change topics and is relevant to the Saint Lucian context.	Create an inclusive and paticipatory environment for inclusion of climate change topics in the science curriculum through collaborations, partnerships and meetings with all stakeholders.
Information Technology Specialist	To develop a Climate Change resource centre that is both teacher and student friendly and create an online community for teaching CC topics.	Use open source and pre-paid sources of online resources to design a user-friendly learning and instructional resource for teachers and students.

Stakeholder	Interest	Strategy
Monitoring & Evaluation Specialist	To develop an effective short- and long-term monitoring and evaluation strategy to ensure that the revised curriculum is performing as planned and to update the document as necessary with new feedback.	Use current relevant research to develop a relevant and effective M&E strategy for monitoring the impact of the integrated curriculum.
Caribbean Waterways (NGO)- Programme Director	To share the experiences and learning resources used by Caribbean Waterways in teaching environmental education to Primary School students.	Collaborate with DoE Officials and the CC Content Specialist/Project Manager at meetings to plan and create an effective teacher training workshop.
Private Sector Companies (PSC)	To ensure that students are equipped with the necessary knowledge and skills to participate in the advancement of the Saint Lucian Society.	Participate in stakeholder meetings.
Civil Society (CS)	To ensure that students are equipped with the necessary knowledge and skills to contribute to the advancement of the Saint Lucian Society.	Participate in stakeholder meetings.
OECS Education Resource Unit (OERU)	To ensure that countries in the OECS share common ground concerning equipping primary school students Grades K-6 with the knowledge, skill, values and behaviours to take action in building a Climate resilient OECS.	Collaborate with DoE Officials and the CC Content Specialist/Project Manager at meetings to plan and create an effective curriculum that integrates climate change topics.
Primary School Principals	To ensure that the school environment is conducive for authentic experiences in climate change. To support and ensure that the curriculum is effective in instruction on climate change topics and that teachers are well equipped to implement the curriculum.	Participate in stakeholder meetings and work closely with DoE Officials, CC Content Specialist/Project Manager and Curriculum Specialist
Parent - Teacher Association	To ensure that students are equipped with the necessary knowledge and skills to contribute to the advancement of the Saint Lucian Society.	Participate in stakeholder meetings.
UNESCO Representatives	To promote international cooperation and partnerships with the DoE in science education by supporting Climate Change educational programmes in the country.	Collaborate with DoE Officials and the CC Content Specialist/Project Manager at meetings to plan and create an effective curriculum that integrates climate change topics.

Stakeholder	Interest	Strategy
Permanent Secretary Department of Sustainable Development	To support the DoE with respect to climate change resources and current credible information.	Collaborate with DoE Officials and the CC Content Specialist/Project Manager at meetings to plan and create an effective curriculum that integrates climate change topics.
Environment and Sustainable Development Officers	To support the DoE with respect to climate change resources and current credible information.	Collaborate with DoE Officials and the CC Content Specialist/Project Manager at meetings to plan and create an effective curriculum that integrates climate change topics.
Local Community groups	To ensure that students are equipped with the necessary knowledge and skills to participate in the advancement of the Saint Lucian Society.	Participate in stakeholder meetings.
Primary School Students	Have fun while learning skills, acquiring knowledge, and participating in activities and lessons on climate change.	Give feedback during the implementation (pilot test) of the revised curriculum.

Note. Prepared by Author

Chart 50

Primary School Climate Change Curriculum Integration Project Stakeholder Classification

and Power/Interest Chart

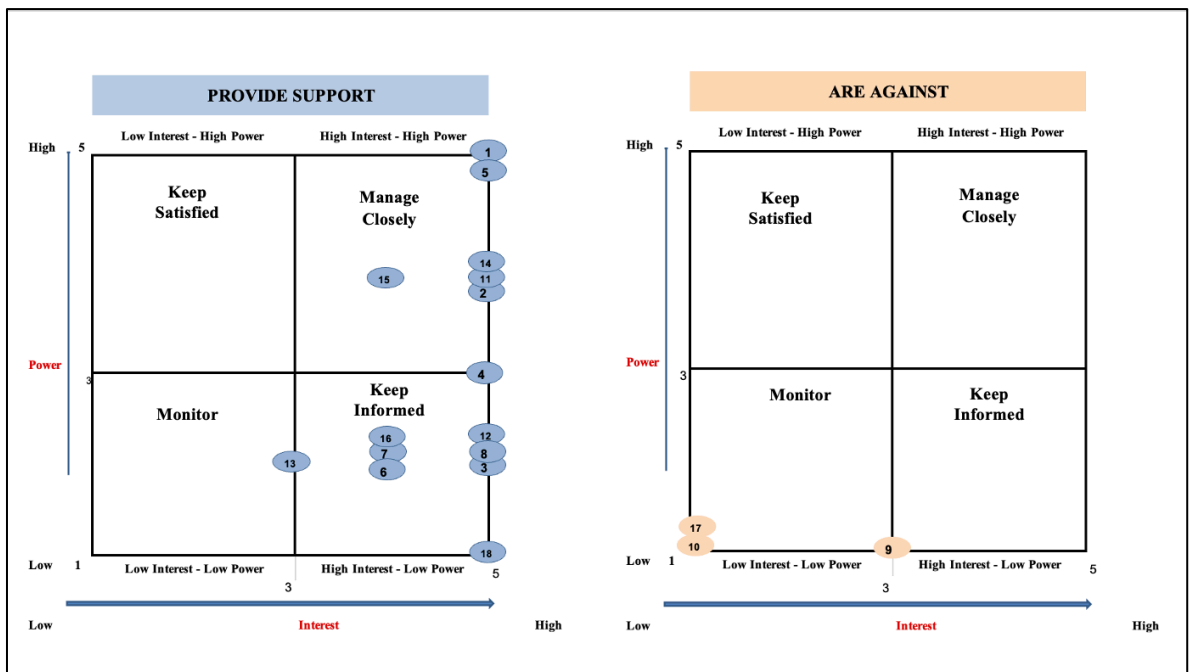| Stakeholder ID	Stakeholder Name	Position (+ in favour; - against)	Interest (Low (1) – High (5))	Power (Low (1) – High (5))
1	Project Manager	+	5	5
2	CC Content Specialist	+	5	4
3	CC Content team	+	5	2
4	Curriculum Specialist	+	5	3
5	DoE Officials (Permanent Secretary, Chief Education Officer, Chief Curriculum Officer, Science Curriculum Officer, District Education Officers)	+	5	5
6	Information Technology Specialist	+	4	2
7	Monitoring & Evaluation Specialist	+	4	2
8	Caribbean Waterways (NGO)- Programme Director	+	5	2
9	Private Sector Companies (PSC)	–	3	1
10	Civil Society (CS)	–	1	1
11	OECS Education Resource Unit (OERU)	+	5	4
12	Primary School Principals	+	5	3
13	Parent -Teacher Association	+	3	2
14	UNESCO Representatives	+	5	4
15	Permanent Secretary Department of Sustainable Development	+	4	4
16	Environment and Sustainable Development Officers	+	4	2
17	Local Community groups	–	1	1
18	Primary School Students	+	5	1

Note. Prepared by Author

Figure 16

Primary School Climate Change Curriculum Integration Project Stakeholder Classification and Power/Interest Matrix

Note. Prepared by Author

Chart 51

Primary School Climate Change Curriculum Integration Project Stakeholder Register

ID	Stakeholders	Functional Area	Roles /Responsibilities	Main Expectations	Major Requirements	Influence	Impact
1	Project Manager	Project Management and Implementation	Consult with internal and external stakeholders; Monitor and control project activities; Execute meetings and project activity to the inclusion of Climate Change topic in the Primary School Curriculum, Manage the team, the project's stakeholders, and other resources in keeping with the project scope, schedule and budget.	Achieve the project deliverables and objectives within the budget and the stipulated time	Provision of a sound and well-maintained infrastructural systems as per building codes and all other regulatory codes related to maintenance and servicing of railway systems. Approvals and authorization from sponsors to undertake project activities.	High	High
2	CC Content Specialist	Environmental/ Technical	To conduct meeting with stakeholders towards the inclusion of Climate Change topic in the Primary School Science Curriculum; Report on the review of the current Primary School Science Curriculum, conduct of the teachers' training workshops and other activities; Work closely with the CC Content Team, the Curriculum Specialist and the DoE officials to develop, review and revise the integrated curriculum during the project cycle.	Coordinate the development of the Primary School CC Integrated Science Curriculum. Facilitate meetings with stakeholders for inclusion in the development process.	Cooperation and support from sponsors, partners and other stakeholders.	High	High
3	CC Content	Educational/	Work directly with the CC Content	Support the CC Content	Updates on the status of the	Medium	Medium

ID	Stakeholders	Functional Area	Roles /Responsibilities	Main Expectations	Major Requirements	Influence	Impact
	team	Technical	Specialist to develop, review and revise the integrated curriculum during the project cycle.	Specialist towards developing of the Primary School CC Integrated Science Curriculum.	project		
4	Curriculum Specialist	Educational/ Technical	Work directly with the CC Content Specialist and the DoE Officials to develop an outline for the integrated curriculum, conduct the teacher training workshop and support other stakeholder activities, including review of the revised curriculum; Direct the approach towards the inclusion of Climate Change topics in the Primary School Curriculum adhering to the principles of curriculum development.	Direct the approach towards the development of the Primary School CC Integrated Science Curriculum. Support the CC Content Specialist to facilitate meetings with stakeholders for inclusion in the development process.	To provide a proposal and feasibility report on the design of the airport's structure and other project requirements.	High	High
5	DoE Officials (Permanent Secretary, Chief Education Officer, Chief Curriculum Officer, Science Curriculum Officer, District Education Officers)	Sponsor/Executing agency	Establish collaborations and partnerships with the stakeholders; Provide overall oversight and authority on the project; To engage stakeholders in the development, review and revision of the integrated curriculum; To develop a revised Primary School Science Curriculum that effectively integrates climate change topics and is relevant to the Saint Lucian context.	Provide leadership on the overall Project towards the developing the Primary School CC Integrated Science Curriculum. Use an inclusive and participatory approach to engage stakeholders	Need to approve all relevant documentation for the commencement of the project. Continuous updates on the project and its progress. Cooperation and support from partners and other stakeholders.	High	High

ID	Stakeholders	Functional Area	Roles /Responsibilities	Main Expectations	Major Requirements	Influence	Impact
6	Information Technology Specialist	Information Technology	To develop an online climate change resource centre that is both teacher and student friendly and create an online community for teaching CC topics.	Develop a user-friendly online climate change resource centre.	To have the computer software and hardware needed to develop a user-friendly online CC resource centre, in the stipulated time.	Medium	Medium
7	Monitoring & Evaluation Specialist	Technical	To develop an effective short- and long-term monitoring and evaluation strategy to ensure that the revised curriculum is performing as planned and to update the document as necessary with new feedback.	Develop an effective short- and long-term monitoring and evaluation strategy.	Access to the Primary School CC Integrated Science Curriculum.	Medium	Medium
8	Caribbean Waterways (NGO)- Programme Director	Educational/ Technical	To provide technical and educational expertise in the teaching of environmental science topics at the Primary school level; To share the experiences and learning resources, including programmes developed by Caribbean Waterways for Primary School environmental education.	Contribute to the development of the Primary School CC Integrated Science Curriculum.	Design and installation of high-quality materials/systems to withstand natural disasters. A completed, structurally sound airport that does not sink or is destroyed by natural disasters.	Medium	Medium
9	Private Sector Companies (PSC)	Economic/ Business	To ensure that the business sector needs and impacts are addressed in the development of the integrated Primary School Science Curriculum.	Informed on the project activities and economic benefits.	Information about the project and the project impacts in terms of short, intermediate and long-term impact on the lives and livelihood of the residence (socio-economic impact) and the environment	Low	Low
10	Civil Society (CS)	Socio- Economic	To express their approval/rejection of the project, its approach and curriculum in light of the positive	Informed on the project activities, and socio-economic benefits.	Detailed information on the city strategy/plan for development; Information on	Low	Low

ID	Stakeholders	Functional Area	Roles /Responsibilities	Main Expectations	Major Requirements	Influence	Impact
			expected long-term impacts concerning business and the economy of Saint Lucia.		the socio-economic and cultural factors of the city, information on the state of the environment and transportation service.		
11	OECS Education Resource Unit (OERU)	Technical	To provide technical assistance support and share expertise and experience in the area towards the developing the integrated climate change primary school curriculum; To ensure that the OECS share common ground concerning the approach used to execute the project.	Contribute to the development of the Primary School CC Integrated Science Curriculum.	Regular updates on the progress of the project	High	Medium
12	Primary School Principals	Educational/ Technical	To directly participate in the development review and testing of the integrated Primay School Science Curriculum.	Facilitate the development of the Primary School CC Integrated Science Curriculum and the other project deliverables	Support, collaboration and partnership with stakeholders	High	High
13	Parent - Teacher Association	Educational	To express their approval/rejection of the project, its approach, and curriculum in light of the positive expected long-term impacts concerning business and the economy of Saint Lucia.	To contribute to the process and receive the benefits to students and the community.	Continuous updates and communication on the project	Low	Medium
14	UNESCO Representatives	Technical	To provide technical assistance support and share expertise and experience in the area towards the development of the integrated climate change primary school	Contribute to the development of the Primary School CC Integrated Science Curriculum.	Regular updates on the progress of the project	High	Medium

ID	Stakeholders	Functional Area	Roles /Responsibilities	Main Expectations	Major Requirements	Influence	Impact
			curriculum; To collaborate and partner with the DoE in science education by supporting Climate Change educational programmes in the country.				
15	Permanent Secretary Department of Sustainable Development	Environmental/ Technical	To support the DoE concerning climate change resources and current credible information.	Contribute to the development of the Primary School CC Integrated Science Curriculum.	Coordination of meetings to support of the development of the Primary School CC Integrated Science Curriculum.	Medium	Medium
16	Environment and Sustainable Development Officers	Environmental/ Technical	To support the DoE concerning climate change resources and current credible information.	Contribute to the development of the Primary School CC Integrated Science Curriculum.	Coordination of meetings to support of the development of the Primary School CC Integrated Science Curriculum.	Low	Medium
17	Local Community groups	Socio- Economic	To express their approval/rejection of the project, its approach, and curriculum in light of the positive expected long-term impacts concerning business and the economy of Saint Lucia.	To be informed on the project and its benefits to the local community.	Continuous updates and communication on the project	Low	Low
18	Primary School Students	Educational	Have fun while learning skills, acquiring knowledge, and participating in activities and lessons on climate change.	Learn about climate change in the formal school setting	An effective, context-driven curriculum for teaching climate change topics in a meaningful manner.	Low	High

Note. Prepared by Author

4.10.2 Plan Stakeholder Engagement

The inputs for the Plan Stakeholder Engagement process were the Project Charter, project management plans (Resource Management Plan, Communication Management Plan, Risk Management Plan, project documents (risk register, project schedule), and DoE policies and procedures for use of media, ethics, and security as well as those for risk, change, and data management. The main tools and techniques used were data representation through the stakeholder engagement assessment matrix (Chart 52) and meetings. The output of the Plan Stakeholder Engagement was the Stakeholder Engagement Plan.

Chart 52

Primary School Climate Change Curriculum Integration Project Stakeholder Engagement

Assessment Matrix

ID	Stakeholder	Unaware	Resistant	Neutral	Supportive	Leading
1	Project Manager					C, D
2	CC Content Specialist					C, D
3	CC Content team				C, D	
4	Curriculum Specialist					C, D
5	DoE Officials (Permanent Secretary, Chief Education Officer, Chief Curriculum Officer, Science Curriculum Officer, District Education Officers)					C, D
6	Information Technology Specialist				C	D
7	Monitoring & Evaluation Specialist				C	D
8	Caribbean Waterways (NGO)- Programme Director				C, D	
9	Private Sector Companies (PSC)		C		D	
10	Civil Society (CS)		C		D	
11	OECS Education Resource Unit (OERU)				C, D	
12	Primary School Principals				C, D	
13	Parent - Teacher Association			C	D	
14	UNESCO Representatives				C, D	

ID	Stakeholder	Unaware	Resistant	Neutral	Supportive	Leading
15	Permanent Secretary Department of Sustainable Development				C, D	
16	Environment and Sustainable Development Officers			C	D	
17	Local Community groups	C			D	
18	Primary School Students			C	D	
D = Desired level of engagement				**C = Current level of engagement**		

Note. Prepared by Author

4.10.3 Manage Stakeholder Engagement

The inputs of the Manage Stakeholder Engagement process are the project management plans (Communication Management Plan, Risk Management plan), the project register, and DoE policies and procedures for the use of media, ethics, and security as well as those for risk, change, and data management. The tools and techniques to be used are meetings, communication skills (informal and formal conversations, meetings) and interpersonal skills (negotiation, conflict management, cultural and political awareness). The main outputs are updates to the Communication Management plan and the stakeholder register.

4.10.4 Monitor Stakeholder Engagement

The inputs of the Monitor Stakeholder Engagement process are the project management plans (Communication Management Plan, Resource Management Plan, project documents (such as the risk register and the stakeholder register), work performance data and DoE policies and procedures for the use of media, ethics, and security as well as those for risk, change, and data management. The tools and techniques of the process are stakeholder analysis, data representation concerning the stakeholder engagement assessment matrix, communication, and interpersonal skills as well as meetings. The output

of the Monitor Stakeholder Engagement is a work performance information update of the project management plans and the project documents.

5   CONCLUSIONS

1. The project charter for the Final Graduation Project received the relevant approval to authorize the project's existence. The FGP charter gave a concise overview of the project and served as a reference point throughout the project to evaluate its performance. It defined the purpose, the general and specific objectives, and clarified the project's scope. The Project Charter identified the stakeholders and established the project assumptions, constraints, risks, budget, timeline, and resources. It outlined the theoretical and methodological framework of the project and further detailed the project's approach to validating its impact on sustainability concerning the project's products and processes.

2. The impact of regenerative and sustainable development on the project execution and deliverables was evident concerning sustainability in the P5 categories of the FGP product, its process, the people (social impact), the planet (environmental impact), and prosperity (economic impacts). Additionally, there was a direct alignment of the projects' product to almost all the SDGs. The P5 impact analysis based on the P5 standard showed that the FGP had the capacity to reduce and or mitigate any negative sustainability impacts (risks) in all the P5 categories and that there was the potential for increased benefits of the project to society, the environment, and its contribution to Saint Lucia's sustainability goals.

3. The Integration Management Plan unified the various processes and project management activities from the start to the completion. These processes included the development of the Project Charter (for the execution of the Primary School Climate Change Curriculum Integration Curriculum Project in Saint Lucia for Grades K-6), the development of the Project Management Plan (a consolidation of all the projects plans that established the project's basis and how it would be performed), management of all project deliverables and new knowledge towards

improvements of the project outcomes, monitoring and control of project work and in so doing performing integrated change control, and the closure of the project with the release of the project resources.

4. The Scope Management Plan defined all the work required to effectively integrate climate change topics into the Primary School Science Curriculum towards its successful completion. It accounted for the requirements concerning the stakeholders, their needs, opportunities, goals, and objectives. Additionally, it accounted for the scope statement which included the acceptance criteria, the deliverables, and exclusions. The WBS provided a framework for the project deliverables which was further detailed using the WBS dictionary. The latter of which outlined the assumptions and constraints, the quality metric and the scheduling of each WBS component.

5. The Schedule Management Plan prepared for the Primary School Climate Change Curriculum Integration Project would ensure the timely completion of the project. It defined the activities required to achieve the deliverables through the decomposition of the work packages into scheduled activities including the project milestones. An important aspect of the plan that contributed to its potential efficiency was the logical sequencing of work to show the relationships among the project activities. This was achieved using Microsoft Project Professional® (version 2019) to create the project network diagram. The plan also incorporated the three-point estimate for the expected project duration which was 547 days (SD 16.8 days) and a schedule model of the project (generated using Microsoft Project Professional®).

6. The Cost Management Plan ensured that all project costs were planned, structured, controlled, and were within the project's budget (cost baseline + management reserves) of $225, 060 USD. It incorporated the cost estimates of resources at both the activity levels and the work package level accounting for uncertainty through the contingency reserve (cost baseline). The plan included an earned value analysis

(EVA) of three (3) scenarios – 21 %, 48 %, and 80 % completion – and gave an insight into both the qualitative and quantitative analysis of the project's performance as well as the project forecasts using the three (3) scenarios.

7. The Quality Management Plan described the quality standards for meeting the requirements for integrating climate change topics in Primary School Science Curriculum Grades (K-6). The plan was meaningful and relevant since the quality standards used came from DoE, the OECS standards for Science and Technology and international standards for environmental education and teaching climate change topics at the primary school level. Benchmarking allowed the comparison of the project practices to the quality guidelines of the international community. The Chief Curriculum Officer contributed insight into DoE's quality needs and expectations. Preventative failure measures would be achieved through teacher training workshops, and high-level stakeholder consensus meetings whilst the quality of the product would be assessed through the pilot test.

8. The Resource Management Plan developed allowed the identification, acquisition and management of the resources needed for the successful completion of the Primary School Climate Change Curriculum Integration Project. An important component of the plan which enabled effective planning, managing, and the potential to control the project work, was the Resource Breakdown Structure which illustrated the hierarchical relationship among the human and physical resources. The assignment of individual roles and responsibilities within the RBS was achieved using a RACI chart. The Resource Management enabled tracking of the project team's performance, providing feedback, resolving issues, and managing changes during the lifecycle of the project. Additionally, it enabled monitoring of both planned and unplanned uses of the resources with corrective action undertaken as necessary.

9. The Communications Management Plan described the project's communication strategy for administering and disseminating information based on stakeholders' needs. The plan targeted the diverse stakeholders in a timely manner through the communication strategy and stakeholder communication matrix. The plan ensured the efficient and effective flow of appropriate information between the project team and the relevant stakeholders throughout the Primary School Climate Change Curriculum Integration Project through the development of an established communication channel.

10. The Risk Management Plan described the Primary School Climate Change Curriculum Integration Project risks, the risk management activities and monitoring strategies. The plan incorporated the risk categories which allowed the identification and grouping of risk using a risk breakdown structure. Risks were prioritized by assessing the probability of occurrence and their impact using the risk probability and impact rating scales respectively. A probability impact matrix was used to quantify the risk. The information was compiled in the risk register and included in the plan. The risk register also included potential response and relevant risk response strategies (preventative action, contingency) as well as reserves concerning time and cost.

11. The Procurement Management Plan described the acquisition of the products and services needed to meet the project deliverables. The plan would allow decision-making related to the products/goods and services for the Primary School Climate Change Curriculum Integration Project. Apart from the activities and the related resources the plan included the timetable of key procurement activities, the procurement metrics to be used to manage contracts, the roles and responsibilities related to procurement, the risk management issues and strategies to address the risks and the constraints and assumptions that could affect planned procurement.

12. The Stakeholder Engagement Plan identified the project stakeholders and the strategies needed for involvement in project decisions and activities. The plan included the stakeholder list and strategies to engage the stakeholders concerning their interests, the stakeholder classification regarding their support for the project, and stakeholder power and interest. The stakeholder register included the stakeholder roles and responsibilities, influence, and impact. The plan also included an assessment of the desired level of engagement and the current level of engagement of the stakeholders.

6   RECOMMENDATIONS

1. The FGP Charter serves as a roadmap for the implementation of the project, and it was the first step in the project management process. Some recommended improvements to the FGP Charter are,

    a. Specifying what was excluded in the project to help clarify and define the scope of the project.

    b. Preliminary identification of the project stakeholders (internal and external) as well as their roles in the project.

    c. Establishing the project success metrics which would help clarify how the project would meet its objectives and how progress would be tracked.

2. One recommendation to demonstrate the impact of regenerative and sustainable development on the project execution and deliverables is,

    a. Analyzing the impact of sustainability on the scope, schedule, cost, quality, risks, and Procurement Management Plans of the project, considering the activities and resources that should be incorporated, how the project baselines would be affected and how changes to the control management component would ensure sustainability.

3. The integration management process seeks to harmonize all the activities of the Primary School Climate Change Curriculum Integration project to ensure that they work together effectively. One means of improving the project Integration Management Plan is to establish a strong project team within the DoE. Consequently, there should be careful selection of team members based not only on their skills, experience, and interests but also on their availability. The Integration Management Plan should include details on their roles and responsibilities throughout the lifecycle of the project and their expected contributions to other project management plans (quality, communication, etc.,). Additionally, the plan should include how each team member will work together.

4. The Scope Management Plan is an important element of the project management plan that defines, documents, and controls the scope of the project. One means of improving the Scope Management Plan of the Primary School Climate Change

Curriculum Integration project is to provide stakeholders with an established scope change control process. This process will include how change requests should be submitted, the criteria for evaluation for approval and the responsible person.

5. The Schedule Management Plan is critical to the timely completion of the Primary School Climate Change Curriculum Integration project due to the highly unpredictable environment in which the project is based. Consequently, one measure that can improve the implementation of this plan is to ensure that all the stakeholders understand the plan and their roles and responsibilities. In this regard, effective and consistent communication is essential which would ensure that stakeholders are kept informed of the project's progress and any changes to the project's schedule.

6. The Cost Management Plan for the Primary School Climate Change Curriculum Integration project was used to plan, structure and control costs. One means of improving this plan is to establish and schedule regular monitoring of the project's costs at different points in the project (using project management software). This would help to identify potential deviations from the budget, allowing for corrective action to be taken and making informed decisions about the allocation of resources.

7. The Quality Management Plan of the Primary School Climate Change Curriculum Project ensured that the deliverables were compliant to DoE quality policies, procedures, and guidelines as well as other regional and international standards. One means of improving the plan is to provide training to the project team on quality management principles, techniques, and tools to ensure that they are better equipped to produce high-quality project deliverables.

8. The Resource Management plan is an important management plan of the Primary School Climate Change Curriculum Project ensuring effective management and allocation of the project resources. One means of improving the plan is to make use of a resource calendar to show the availability of resources over time. This would help to avoid scheduling conflicts, especially with the DoE officials and primary school teachers and ensure that they are available when needed.

9. The Communication Management plan of the Primary School Climate Change Curriculum Project was developed to manage communication of project information effectively and efficiently. One means of improving the plan is to develop templates and standard formats for the different types of reporting, and other project communication. This would ensure the project information is communicated in a clear and consistent manner.

10. The Risk Management Plan for the Primary School Climate Change Curriculum Project can be improved by using risk management software tools to help with identifying, analyzing, and managing the project risks.

11. The Procurement Management Plan for the Primary School Climate Change Curriculum Project could be improved by using a risk management software tool that would help identify the procurement management risk to prevent delays in acquiring products and services for the project.

12. The Stakeholder Management Plan to be used in the Primary School Climate Change Curriculum Project could be improved by establishing a set procedure for managing stakeholder conflicts and ensuring that the needs and expectations of all the stakeholders are addressed.

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

This chapter details the project's approach to validating its impact on sustainability throughout the project and concerning the project's products. This approach would support the achievement of the United Nations' Sustainable Development Goals (SDGs) and targets relevant to the project (Refer to Chart 53).

According to the United States Environmental Protection Agency (USEPA) (2018), "to pursue sustainability is to create and maintain the conditions under which humans and nature can exist in productive harmony to support present and future generations". P5 concerning project sustainability stands for Product, Process, People, Planet, and Prosperity. The P5 concepts and its categories (ontology) support the alignment of projects with sustainability by focusing on the potential impacts of the project's activities, results, and outcomes on the five (5) "P" areas (P5). It incorporates the traditional perspective of the triple constraint (cost, time, scope), the triple baseline (TBL), and other perspectives expanding on these to include the impacts of products and processes on sustainability. The project products refer to its characteristics and design while the project processes refer to the project management- oriented, product-oriented, and support-oriented processes (GPM Global, 2019).

A P5 Impact Analysis (P5IA) was conducted according to the "*GPM ® P5™ Standard for Sustainability in Project Management*". The P5 Impact analysis as illustrated in the following Charts (54 - 57) was based on the P5 standard. It allowed the identification, the definition, and the prioritization of the sustainability impacts of the project with the purpose of detailing the steps needed to

- Decrease or mitigate any negative sustainability impacts (risks) and to increase the positive impacts (benefits) of the project to society, the environment, and the project's value.

- Improve any of the project's expected benefits.

- Contribute to the DoE's sustainability goals (GPM Global, 2019; Carboni et al., 2018).

The P5IA as illustrated in Charts 54 - 57 was performed by identifying both internal and external events that could occur during the project and/or the lifespan of the project's products. This was conducted for each of the five (5) categories – process, product, planet (environment), people (social), and profitability (economic). A description of the causes of each event and its sustainability impact was then outlined. The sustainability impacts were then rated - by assigning scores that ranged from 1 to 5 – based on the magnitude of the impact it had on sustainability. The potential responses to minimize the negative impact and maximize the positive ones were then identified. Finally, the impact scores were re-rated based on the assumption that the responses identified were implemented (GPM Global, 2019).

The summary of the P5IA for the project's product and processes are summarized in Charts 54 - 57 below according to the P5 categories.

- **Process and Products**

The processes and products category of sustainability refers to the decisions related to the characteristics of the project and the project management practices that may impact the people, the planet, and prosperity. The subcategories of the processes are, effectiveness of project processes, efficiency of project processes and fairness of project processes. That of the project product is, lifespan of the project and servicing the project (GPM Global, 2019). (Refer to Chart 54).

- **People (Social) Impacts**

The people (social) category of sustainability refers to the impacts of the project's products and activities on people, society, and communities. The emphasis in this case is on ethical operations, nurturing and sustaining mutually beneficial relationships with stakeholders such as employees, customers, suppliers, and the community. The subcategories are labour practices and decent work, society and customers, human rights, and ethical behaviour (GPM Global, 2019). (Refer to Chart 55).

- **Planet (Environmental) Impacts**

The planet (environmental) category of sustainability refers to the impacts of the project's products and activities on ecosystems including land, air, and water (non-living components) and flora, fauna, and people (living components). The emphasis is

on preserving, restoring, and improving ecosystems. The subcategories are transport, energy, land, air, and water, and consumption (GPM Global, 2019). (Refer to Chart 56).

- **Prosperity (Economic) Impacts**

The prosperity (economic) category of sustainability refers to the impacts of the project's products and activities on the finances of the project's stakeholders. The main emphasis of this category is to maximize the positive returns for the project stakeholders. The subcategories are, business case analysis, business agility, and economic stimulation (GPM Global, 2019). (Refer to Chart 57).

The results of the P5IA showed that the positive responses or the benefits of the project as it relates to impacts concerning the project processes and product, people, the environment, and prosperity.

Chart 53

The Sustainable Development Goals Relevant to the Project

Relevant Sustainable Development Goals (SDGs)			
SDG	SDG title	Target	Target description
1	No Poverty	4	"By 2030, ensure that all men and women, in particular the poor and the vulnerable, have equal rights to economic resources, as well as access to basic services, ownership and control over land and other forms of property, inheritance, natural resources, appropriate new technology and financial services, including microfinance"
4	Quality Education	3	"By 2030, ensure equal access for all women and men to affordable and quality technical, vocational and tertiary education, including university"
		7	"By 2030, ensure that all learners acquire the knowledge and skills needed to promote sustainable development, including, among others, through education for sustainable development and sustainable lifestyles, human rights, gender equality, promotion of a culture of peace and non-violence, global citizenship and appreciation of cultural diversity and of culture's contribution to sustainable development"
5	Gender Equality	1	"End all forms of discrimination against all women and girls everywhere"
6	Clean Water and Sanitation	4	"By 2020, Substantially increase water-use efficiency across all sectors and ensure sustainable withdrawals and supply of freshwater to address water scarcity and substantially reduce the number of people suffering from water scarcity"
		B	"Support and strengthen the participation of local communities in improving water and sanitation management."
7	Affordable and Clean Energy	2	"By 2030, increase substantially the share of renewable energy in the global energy mix"
8	Decent Work and Economic Growth	7	"Take immediate and effective measures to eradicate forced labour, end modern slavery and human trafficking and secure the prohibition and elimination of the worst forms of child labour, including recruitment and use of child soldiers, and by 2025 end child labour in all its forms"
9	Industry Innovation and Infrastructure	5c	"Significantly increase access to information and communications technology and strive to provide universal and affordable access to the Internet in least developed countries by 2020"

Relevant Sustainable Development Goals (SDGs)			
SDG	SDG title	Target	Target description
10	Reduced Inequalities	3	"Ensure equal opportunity and reduce inequalities of outcome, including by eliminating discriminatory laws, policies and practices and promoting appropriate legislation, policies and action in this regard"
		4	"Adopt policies, especially fiscal, wage and social protection policies, and progressively achieve greater equality"
11	Sustainable Cities and Communities	A	"Support positive economic, social and environmental links between urban, peri-urban and rural areas by strengthening national and regional development planning"
12	Responsible Production and Consumption	4	"By 2020, achieve the environmentally sound management of chemicals and all wastes throughout their life cycle, in accordance with agreed international frameworks, and significantly reduce their release to air, water and soil in order to minimize their adverse impacts on human health and the environment"
		5	"By 2030, substantially reduce waste generation through prevention, reduction, recycling and reuse"
		6	"Encourage companies, especially large and transnational companies, to adopt sustainable practices and to integrate sustainability information into their reporting cycle"
		7	"Promote public procurement practices that are sustainable, in accordance with national policies and priorities"
13	Climate Action		"Take urgent action to combat climate change and its impacts"
14	Life Below Water	2	"By 2020, sustainably manage and protect marine and coastal ecosystems to avoid significant adverse impacts, including by strengthening their resilience, and take action for the restoration in order to achieve healthy and productive oceans"
15	Life on Land	1	"By 2020, ensure the conservation, restoration and sustainable use of terrestrial and inland freshwater ecosystems and their services, in particular forests, wetlands, mountains, and drylands, in line with obligations under international agreements"
17	Partnership for the Goals	10	"Promote a universal, rules-based, open, non-discriminatory and equitable multilateral trading system under the World Trade Organization, including through the conclusion of negotiations under its Doha Development Agenda"

Note: Adapted from GPM Global. (2019). *The GPM® P5™ Standard for Sustainability in Project Management. GPM Global.*

Chart 54

P5 Analysis of the Project's Impacts on Processes and Products

P5 Category			Description (Cause)	Potential Impact	Impact Score Before	Proposed Response	Impact Score After	Change
	Subcategory							
		Element						
2.1	**Product Impacts**							
	2.1.1	Lifespan of the product	The curriculum is used used in schools on a trial basis	Stakeholders have mixed satisfaction levels with elements of the curriculum	3	Ensure that the curriculum is based on international/regional benchmarks and is fully endorsed by the DoE	5	2
	2.1.2	Servicing of product	There is review and monitoring built in the project	Stakeholders are unsatisfied with elements of the curriculum	4	Setup feedback and comment blogs and forum as part of the review for draft documents; use of surveys, questionnaires for feedback toward continual improvement of the project; Set up a trial or pilot use of the curriculum at different Grades levels.	5	1
2.2	**Process (Project Management) Impacts**							

2.2.1	Effectiveness of project processes	Different approaches to inclusion/integration of climate change topics in curricula	Some of the approaches to inclusion/integration of climate change topics in the curriculum are not compatible with the education system in Saint Lucia and its context	4	Ensure the use of management plans in all 10 knowledge areas to guide the execution of the project; Make use of benchmarking from International and Regional bodies and research to support approach to inclusion of climate change topics in the project	5	1
2.2.2	Efficiency of project processes	No established procedure for conduct /or participation in project at the unit (CAMDU)	Project delays due to lack of communication of project permissions and endorsement at the Ministry level	4	Ensure the use of management plans in all 10 knowledge areas to guide the execution of the project; Ensure that the strategic value of the project is well communicated to the Ministry officials and there committed/endorsement is secured in writing	5	1
2.2.3	Fairness of project processes	Recommendation by CAMDU to use previous suppliers in the project	CAMDU may appear to favor particular suppliers	3	Abide by procurement policy of the DoE, Ensure transparency in project procedures	4	1
			Product and Process Average	**4.2**		**4.8**	**0.2**

5 = Strongly agree   4 = Agree   3 = Neutral   2 = Disagree   1 = Strongly disagree

Chart 55

P5 Analysis of People (Social) Impacts

Category			Area	Description (Cause)	Potential Impact	Impact Score Before	Proposed Response	Impact Score After	Change
	Subcategory								
		Element							
3	**People (Social) Impacts**								
	3.1	**Labor Practices and Decent Work**							
		3.1.1 Employment and staffing	Process	Insufficient staff	Existing staff of the CAMDU may not have technical knowledge and project management skills, or knowledge of the topic	4	Invite staff from the sustainable development department (with both project management experience and are knowledgeable on climate change to be part of the project team; have an onboarding session with new and existing staff.	5	1

Category			Area	Description (Cause)	Potential Impact	Impact Score Before	Proposed Response	Impact Score After	Change
	Subcategory								
		Element							
	3.1.2	Training and education	Process/ Product	Lack of staff with training and education in curriculum matters, climate change topics, project management	Limited contribution to advancement of project and producing a meaningful and useful product	4	Ensure that the project team has a variety of stakeholders	5	1
	3.1.3	Organisational learning	Process/ Product	Great potential for Organisational learning during planning and development of subsidiary management plans	There is no transmission of technical knowledge to the unit and the DoE	3	The project management plans and tools will be made available and accessible to the DoE staff	5	2
	3.1.4	Diversity and equal opportunity	Process	More females than males make up the project team	The large number of female participants will discourage potential male participants	3	More men will be approached and encouraged to participate in the project	4	1
	3.1.5	Local competence development	Process/ Product	Staff trained at the onboarding project session may transfer, leave or retire during the lifespan of the project	DoE may not have the institutional knowledge to sustain the review, evaluation and update of the curriculum document	3	DoE, CAMDU, Sustainable development and other units can ensure that there are representatives from DoE throughout the lifespan of the project	5	2

Category			Area	Description (Cause)	Potential Impact	Impact Score Before	Proposed Response	Impact Score After	Change
	Subcategory								
		Element							
3.2	Society and Customers								
	3.2.1	Community support	Process	Lack of sufficient community members in the form of parents on the project team	Community/parents are unaware of the work being done on the curriculum	4	Engage the community during all the phases of the project through, meetings/consultations on the benefits related to improvements in livelihood and train and hire the community to particpate	5	1
	3.2.2	Market communications and advertising	Process/ Product	Miscommunication about project and negative feedback	Project can lack support from community/parents and other principals and teachers	2	Correct any miscommunication about the project. Have town hall meetings, inform school population, visit homes and inform on sustainable project benefits	4	1
3.3	Human Rights								

Category			Area	Description (Cause)	Potential Impact	Impact Score Before	Proposed Response	Impact Score After	Change
	Subcategory								
		Element							
		3.3.1 Non-discrimination	Process	Project team is unbalanced concerning the ratio of males to females	A demotivated project team who feel underrepresented.	1	All potential members of the project team are selected based on qualification and experience.	4	3
		3.3.2 Voluntary labor	Process	Political biases regarding support behind the project	Selective to certain organizations or groups	2	Ensure voluntary participation/assistance accessible to all adults as an educational platform	5	3
	3.4	**Ethical Behavior**							
		3.4.1 Procurement practices	Process	Tendency to purchase cheaper products	Poor quality goods may be procured	1	Ensure that quality standards are met for goods	5	4
					People Average	**2.7**		**4.7**	**2.0**

5 = Strongly agree   4 = Agree   3 = Neutral   2 = Disagree   1 = Strongly disagree

Note. Adapted from *GPM P5 Impact Analysis Version 3.0.1, GPM Global.* http://creativecommons.org/licenses/by/4.0/

Chart 56

P5 Analysis of Planet (Environmental) Impacts

Category			Area	Description (Cause)	Potential Impact	Impact Score Before	Proposed Response	Impact Score After	Change
	Subcategory								
		Element							
4	**Planet (Environmental) Impacts**								
	4.1	**Transport**							
		4.1.1	Local procurement	Process/ Product	Lack of local suppliers that have sustainability built into products and services	Procurement of material and services that are not suitably made or certified	3	Purchase materials only from certified local companies that are sustainably conscious in service and products	5	2
		4.1.2	Digital communication	Process	Many meeting/consultations for project update	Reduced frequent traveling reducing petroleum consumption but limit building personal relationships	4	Use of virtual interviews with individual stakeholders and video conferencing for group discussions; Use in-person meetings with influential/powerful stakeholder	5	1

				Product	Large amount of project knowledge management needs including project reporting	Reduce the need for using paper-based project reporting; Unreliable internet service and limited access to services and basic knowledge to effectively use services	4	Set up project website for dissemination of project reports; Use of online shared documents using simple widely used programmes/platforms (Google)	5	1
		4.1.3	Traveling and commuting	Process	Increased commuting and travel for consultations and/or engagement with stakeholders	Increased use petroleum (vehicle), increase in CO_2 emission and carbon footprint of project,	4	Use of video conferencing for group discussions /consultations; Restrict in-person interviews /consultation with important stakeholders using central venues; Use of virtual (online/ telephone) surveys and questionnaire; Coordinate and plan meetings simultaneously so as to reduce the need to travel	5	1

		4.1.4	Logistics	Process/ Product	Increased coordination of project phases, resources and equipment	Mismanagement of resources	3	Proper planning and use of human resources, resources, available funds and equipment (project management plans)	5	2
				Process/ Product	Many companies will provide resources, equipment and services needed	The remote companies will use more fuel and produce more pollution	3	Prioritize companies that are close	5	2
	4.2	**Energy**								
		4.2.1	Energy consumption	Process	Consultations with stakeholders will include in-person interviews, focus group discussions	Increased use of venues with air conditioning, lighting needs require the indirect use of fossil that will increase the carbon footprint of the project	3	Use venues for consultations that have natural lighting and is in the open air e.g. office garden, parks or office spaces with natural lighting and windows	5	2
				Product	Make draft copies of integrated Primary School curriculum available to stakeholders	Increased use of energy and resources for printing hard copies of document	3	Use DoE website to give access to draft Primary School Curriculum for Grades K - 6 to avoid printing of documents	5	2

		4.2.2	CO2 emissions	Process	Increased CO2 emission directly during travel/ commuting, indirectly during power consumption and generation of solid waste	Reduced CO2 emissions and carbon footprint of project	4	Efficient coordination and planning of the project activities, related to travel /commuting, use of material and equipment	5	1
		4.2.3	Clean energy return	Process	Lack of recycling of waste generated during project (paper, plastic bottles)	Potential pollution and adding to landfill waste	3	Ensure collection of recyclable waste during consultations, especially if facilities are not provided at the venues	5	2
		4.2.4	Renewable energy	Process/ Product	Addresses issues of renewable energy as strategies to adapt and build resilience to climate change	Not many Local examples of the use of renewable energy locally	3	Include regional examples and create list of local examples of the use of renewable energy	5	2
	4.3	**Land, Water, and Air**								
		4.3.1	Biological diversity	Process/Product	Addresses issues of local biodiversity of plants and animals and the links to climate change	Teachers unable to effectively teach climate change topics due to lack of teaching resources, knowledge and training	3	Build in teacher training and workshops on climate change topics as part of the stakeholder engagement	5	2

		4.3.2	Water and air quality	Process/Product	Addresses issues of water and air quality and links to climate change and health	Teachers unable to effectively teach climate change topics due to lack of teaching resources, knowledge and training	4	Build in teacher training and workshops on climate change topics as part of the stakeholder engagement	5	1
		4.3.3	Water consumption	Process/ Product	Address issues of water security, including availability and quality related to climate change	Teachers unable to effectively teach climate change topics due to lack of teaching resources, knowledge and training	4	Build in teacher training and workshops on climate change topics as part of the stakeholder engagement	5	1
		4.3.4	Sanitary water displacement	Process/ Product	Address issues of sanitation and water reuse related to climate change	Teachers unable to effectively teach climate change topics due to lack of teaching resources, knowledge and training	4	Build in teacher training and workshops on climate change topics as part of the stakeholder engagement	5	1
	4.4	**Consumption**								

		4.4.1	Recycling and reuse	Process	Consultations with stakeholders will include in-person interviews, focus group discussions	Increased use of bottled water, single use plastics from lunch/break receptacles	4	Encourage use of reusable/refillable water bottles, use of paper cups; environmentally friendly recyclable and or reuseable receptacles for lunch/break	5	1
		4.4.2	Disposal	Process	Improper disposal of plastic and other waste at consultation venues	Pollution of land and water sources	3	Collection of plastic and other recyclable waste, collection of organic waste for compost	5	2
		4.4.3	Contamination and pollution	Product	Address the issue of contamination and pollution related to climate change	Teachers unable to effectively teach climate change topics due to lack of teaching resources, knowledge and training	4	Build in teacher training and workshops on climate change topics as part of the stakeholder engagement	5	1
		4.4.4	Waste generation	Process	Lack of proper waste receptacles for disposal of different types of waste	Increased generation of paper, plastic and organic waste	4	Collection of plastic and other recyclable waste, collection of organic waste for compost	5	1

				Process/ Product	Address the issue of waste and climate change	Teachers unable to effectively teach climate change topics due to lack of teaching resources, knowledge and training	3	Build in teacher training and workshops on climate change topics as part of the stakeholder engagement	5	2
						Planet Average	**3.5**		**4.9**	**1.4**

5 = Strongly agree   4 = Agree   3 = Neutral   2 = Disagree   1 = Strongly disagree

Note: Adapted from *GPM P5 Impact Analysis Version 3.0.1, GPM Global*. http://creativecommons.org/licenses/by/4.0/

Chart 57

P5 Analysis Prosperity (Economic) Impacts

Category			Area	Description (Cause)	Potential Impact	Impact Score Before	Proposed Response	Impact Score After	Change
	Subcategory								
		Element							
5	**Prosperity (Economic) Impacts**								
	5.1	**Business Case Analysis**							
		5.1.3 Direct financial benefits		Lack of immediate benefits to students	Reduced support to continue using new curriculum	3	Engage students in community action towards showcasing and applying classroom learning	5	2
		5.1.4 Return on investment		Little/No immediate return on investment in the initial years	Returns may not be easily quantified in the short term and may raise questions related to the project's performance over time	4	Develop both quantitative and qualitative methods to performance of the projects to make the returns more visible	5	1

Category			Area	Description (Cause)	Potential Impact	Impact Score Before	Proposed Response	Impact Score	Change
		5.1.5	Benefit-cost ratio		Benefits of the project may not be felt immediately	Misconceptions related to the success and failure of the project	2	Ensure that the metrics for the project regarding the benefits and costs should be clearly communicated to stakeholders	4	2
	5.2	**Business Agility**								
		5.2.1	Flexibility/optionality		The competing interest in the project may require reevaluation of some requirements	Delay in coming to consensus among the stakeholders	2	Apply value analysis or similar techniques to new meet requirements	4	1
		5.2.2	Business flexibility		Lack of proper risk management to mitigate or create benefits	Delay in project, increase project cost, or scope	2	Ensure a proper risk management plan and look for creative ways to create project benefits	5	3
	5.3	**Economic Stimulation**								
		5.3.2	Indirect benefits		Unexpected benefits may materialize during the project	Delay in project, increase project cost, or scope	3	Ensure that the risks and opportunities of the project are continuously reviewed	4	1
					Prosperity Average	**3.2**		**4.2**	**1.0**

5 = Strongly agree   4 = Agree   3 = Neutral   2 = Disagree   1 = Strongly disagree

Note. Adapted from *GPM P5 Impact Analysis Version 3.0.1, GPM Global*. http://creativecommons.org/licenses/by/4.0/

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APPENDICES

Appendix 1: FGP Charter

CHARTER OF THE PROPOSED
FINAL GRADUATION PROJECT (FGP)

1. Student name

Kim Meonia Newton

2. FGP name

A Project Management Plan for a Project on Integrating Climate Change Topics in the Primary School Science Curriculum (Grades K-6) in Saint Lucia

3. Application Area (Sector or activity)

Environmental Science Education

4. Student signature

5. Name of the Graduation Seminar facilitator

Mr. Carlos Brenes Mena

6. Signature of the facilitator

7. Date of charter approval

February 26, 2023

8. Project start and finish date

January 09, 2023	July 03, 2023

9. Research question

1. How will the project management plan ensure effective integration of climate change topics in the Primary School Science Curriculum Grades (K-6) in Saint Lucia?
2. What project management tools and techniques will be the most effective in aligning the project management plan with the Ministry of Education's objectives and that of the other stakeholders?
3. What components of the project management plan will best address the factors that influence the effective integration of climate change topics in the Primary School Science Curriculum?
4. How will the project management plan incorporate sustainability concerning product and process management impacts as well as the social, environmental, and economic impacts?

10. Research hypothesis

Effective integration of climate change topics in the Primary School Science Curriculum in Saint Lucia Grades (K-6) is possible using the PMI standard for developing a project management plan.

11. General objective

To develop a Project Management Plan, framed by the standards of the Project Management Institute, to effectively integrate climate change topics in the Primary School Science Curriculum in Saint Lucia

12. Specific objectives

1. To develop a Project Charter for the Final Graduation Project (FGP) with the relevant approvals to authorise the project's existence.
2. To explain the impact of regenerative and sustainable development on the project execution and deliverables.
3. To create an integration management plan to integrate the various processes and project management activities from the start to the project's completion.
4. To create a scope management plan accounting for the acceptance criteria, deliverables, exclusions, assumptions, and constraints, to ensure the inclusion of all required work for project's successful completion.
5. To prepare a schedule management plan to ensure project completion within the agreed timeframe.
6. To develop a cost management plan to ensure project costs are planned, structured, controlled, and within the project's budget.
7. To create a quality management plan to describe the quality standards for meeting the requirements for integrating climate change topics in Primary School Science Curriculum Grades (K-6)
8. To prepare a resource management plan to identify, acquire, and manage the resources needed for the project's successful completion.
9. To develop a communications management plan to describe the project's communication strategy for administering and disseminating information based on stakeholders' needs.
10. To produce a risk management plan to describe the project's risks, the risk management activities and monitoring strategies.
11. To create a procurement management plan to acquire the products and services needed to meet the project deliverables.
12. To prepare a stakeholder engagement plan to identify the project stakeholders and the strategies needed for involvement in project decisions and activities.

13. FGP purpose or justification

The Guide to Project Management Body of Knowledge (PMBOK® Guide) (2017), defines project management as "*the application of knowledge, skills, tools, and techniques to project activities to meet the project requirements*" (Project Management Institute [PMI], 2017a, p. 8). The PMBOK® Guide also highlights that project management is achieved "*through the appropriate application and integration of the project management processes identified for the project*" (PMI, 2017a, p. 8). The project management plan is the document that describes how the application and integration of these processes will be executed, monitored, controlled, and closed to meet the specific success criteria of the project (PMI, 2021). A project management Plan framed within the PMI standard is necessary to achieve effective and efficient integration of important climate change topics in the Primary School Science Curriculum (Grades K to 6) in Saint Lucia. This project management plan will be guided by a set of good

practices as stipulated in the PMI standard for project management.

The United Nations Educational, Scientific and Cultural Organization (UNESCO) reported that only 53 % of the national curriculum of the 100 countries surveyed included climate change in their content and 40 % had a very minimal level of content (The United Nations Educational, Scientific and Cultural Organization [UNESCO], 2021a). An informal interview with an elementary school teacher from Saint Lucia revealed that the Primary School Science Curriculum did not explicitly address the concept of climate change, however the teacher indicated that climate change may be taught when teaching the concepts of weather and pollution K. Malaykhan (personal communication January 11, 2023). According to UNESCO (2021a), climate change education should be a core curriculum component in every country (UNESCO, 2021a). They recommended that *Environmental learning should be integrated across the curriculum, with a holistic pedagogy that goes beyond an exclusive cognitive knowledge focus and aims to engage students socially and emotionally and in action-oriented learning and participation*" (UNESCO, 2021b, p.10). Undertaking a project of this magnitude in Saint Lucia can be successfully achieved through a project management plan framed within the PMI standard.

In this regard, the PMI standard will provide a comprehensive guide to help tailor the project management plan to achieve the overarching objective of the project - integrating climate change topics in the Primary School Science Curriculum (Grades K - 6). The project management plan will ensure robust treatment and integration of the 10 project management knowledge areas - Project Integration Management, Project Scope Management, Project Schedule Management, Project Cost Management, Project Quality Management, Project Resource Management, Project Communications Management, Project Risk Management, Project Procurement Management, Project Stakeholder Management - to ensure a greater possibility of the successful achievement of the project deliverables. The knowledge areas will define the knowledge requirements and will describe the component processes, practices, inputs, outputs, tools, and techniques needed for the project. As such, the project management plan will help to ensure that the project is completed within the stipulated time and budget, to the satisfaction of all the stakeholders, and provide guidance to the project management team for effective communication with stakeholders. It will ensure that risks are identified and managed, that quality is built into the project and that the objectives of the project are aligned to the vision of the Ministry of Education. Finally, the project management plan will be important in helping to adequately execute all the project management processes (activities) with the relevant outputs using the appropriate project management tools and techniques (PMI, 2017a).

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

1. Graduation Seminar
   1.1 FGP Deliverables
       1.1.1 Appendix 1: Charter
             1.1.1.1 Charter Items 1-22
       1.1.2 Appendix 4: Preliminary Bibliography
       1.1.3 Appendix 2: WBS
       1.1.4 Chapter 2: Theoretical Framework
             1.1.4.1 Company/Enterprise Framework
             1.1.4.2 Project Management Concepts
             1.1.4.3 Other Applicable Theory/Concepts
       1.1.5 Chapter 3: Methodological Framework
             1.1.5.1 Information Sources
             1.1.5.2 Research Methods
             1.1.5.3 Tools

1.1.5.4   Assumptions and Constraints
1.1.5.5   Deliverables
1.1.6 Chapter 1: Introduction
1.1.7 Chapter 7: Validation of FGP concerning the Regenerative and
Sustainable Development
1.1.8 Appendix 3: FGP Schedule
1.1.9 Abstract and Executive Summary
1.1.10 List of References and Indexes
1.2 Graduation Seminar Approval
2. Tutoring Process
2.1 Tutor
2.2 Adjustment of Previous Chapters
2.3 Chapter 4: Development (Results)
2.3.1 Project charter for the FGP with the relevant approvals
2.3.2 Impact of regenerative and sustainable development on the project
execution and deliverables
2.3.3 Integration management plan
2.3.4 Scope management plan
2.3.5 Schedule management plan
2.3.6 Cost management plan
2.3.7 Quality management plan
2.3.8 Resource management plan
2.3.9 Communication management plan
2.3.10 Risk management plan
2.3.11 Procurement management plan
2.3.12 Stakeholder engagement plan
2.4 Chapter 5: Conclusions
2.5 Chapter 6: Recommendations
3. Reading by reviewers
3.1 Reviewers assignment required
3.1.1 Assignment of 2 reviewers
3.1.2 Communication
3.1.3 FGB submission to reviewers
3.2. Reviewer's work
3.2.1 Reviewer 1
3.2.1.1 FGP Reading Reader 1
3.2.1.2 Reader 1 report
3.2.2 Reviewer 2
3.2.2.1 FGP Reading Reader 2
3.2.2.2 Reader 2 report
4. Adjustments
4.1 Report for reviewers
4.2 FGP Adjustment Updates
4.3 Second review by reviewers
5. Presentation to board of examiners
5.1 Final review by board
5.2 FGP Grades report

15. FGP budget

WBS - ID	Work packages	Description	Category	Cost USD	Quantity	Rate	Total Cost

1	Graduation Seminar	1.1.2 PMI student membership for Appendix 4 Preliminary Bibliographical Research	Service	$32	1	year	$32
		1.1.1.1 Charter Item 1- 20 (Transportation for field interviews and collaboration with stakeholders)	Transport	$37	2	month	$74
		1.1.5.1 Chapter 3 - Information sources					
		1.1.1.1 Charter Item 1- 20 (Internet and Telephone access for communication with stakeholders)	Service	$92	2	month	$184
5	Presentation to Board of Examiners	Procure Philologist to review FGP	Service	$55	1		$55
		FGP Printing (Bond No. 20 paper)	Service	$44	2		$88
		FGP Binding	Service	$55	2		$110
		Shipping of FGP to UCI Costa Rica	Service	$110	1		$110
						Total	**$653**

16. FGP planning and development assumptions

- The primary school teachers and principals, and the Ministry of Education Officials will support the project management plan to integrate climate change topics in the Primary School Science Curriculum (Grades K to 6).
- The project management plan is aligned to the Ministry of Education's vision for science education at the primary school level (Grades K to 6).
- The tutoring process, the reading of the FGP by the reviewers and the adjustment and the defense to the Board of Directors can be completed within the stipulated four (4) months.
- The cost of the Final Graduation Project will remain within the estimated budget.

17. FGP constraints

- Lack of a Science Curriculum Officer at the Ministry of Education to advise on the Primary School Science Curriculum and science education in Saint Lucia.
- The Ministry of Education has their own plans for incorporating climate change topics into the Primary School Science Curriculum.
- There is no buy-in to the project at the level of the Ministry of Education.
- There is no buy-in to the project by some of the Primary School Principal and Teachers.
- Only a small number of Primary School Teachers and Principals in the close vicinity will be able to participate in in-person interviews/focus group discussions.

18. FGP development risks

- If the Primary School Teachers are not available for interviews or focus group discussions due to scheduled school activities, then the project timeline may increase.
- If the scope of the project is deemed too limited by the Ministry of Education officials due to limited time to execute the project, then there may be a delay in collecting project data increasing the time to complete the project.
- If there are unexpected school and business closures due to bad weather, then the project data collection activities will be delayed increasing the time to complete the project.
- If there is an upsurge in the COVID -19 cases in Saint Lucia due to the rapid circulation of the new variant, then there may be delays in the execution of the project activities.

19. FGP main milestones

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

Deliverable	Finish estimated date
Introduction to Graduation Seminar	09 January, 2023
1.1.1 Appendix 1 - FGP Charter	24 February, 2023
1.1.2 Appendix 4 - Preliminary Bibliography	13 January, 2023
1.1.3 Appendix 2 - WBS	20 January, 2023
1.1.4 Chapter 2 - Theoretical Framework	03 February, 2023
1.1.5 Chapter 3 - Methodological Framework	10 February, 2023
1.1.6 Introduction	17 February, 2023
1.1.7 Chapter 7 -Validation of FGP concerning the Regenerative and Sustainable Development	17 February, 2023
1.1.8 Appendix 3 – FGP Schedule	17 February, 2023
1.1.9 Abstract Executive Summary	24 February, 2023
1.1.10 List of References and Indexes	24 February, 2023
Signing and Approval of FGP Charter	03 March, 2023
1.2 Graduate Seminar Approval	03 March, 2023
2.3 Chapter 4 - Development (Results)	21 April, 2023
2.4 Chapter 5 - Conclusions	28 April, 2023
2.5 Chapter 6 - Recommendations	05 May, 2023
Tutor Approval	26 May, 2023

3.2.2.1 Reviewer 1 Approval	09 June, 2023
3.2.2.2 Reviewer 2 Approval	09 June, 2023
4.2 FGP Adjustment Update	20 June, 2023
Second Review Approval	23 June, 2023
5.2 FGP Grades Report	30 June, 2023
FGP End	03 July, 2023

20. Theoretical framework

20.1 State of the "matter"

In 2021, the United Nations Educational, Scientific and Cultural Organization (UNESCO) reported that only 53 % of the national curriculum of the 100 countries surveyed included climate change in their content, and 40 % had a very minimal level of content (The United Nations Educational, Scientific and Cultural Organization [UNESCO], 2021a). UNESCO views education as essential in preparing societies to address the climate change crisis (UNESCO, 2021a). They recommend that environmental learning should be integrated across the curriculum and that the focus should not only be on knowledge but also on engaging the learner socially and emotionally and in action-oriented learning and participation (UNESCO, 2021b).

Climate change topics and concepts are not explicitly addressed in the Science and Technology Standards/Science and Technology Curriculum Guide. At an informal interview with an elementary school teacher from Saint Lucia, she noted that the Primary School Science Curriculum did not explicitly address the concept of climate change. The teacher indicated that climate change might be taught when teaching the concepts of weather and pollution K. Malaykhan (personal communication January 11, 2023). It was noted that although the Grades 5 Learning Standards for Social Studies covered climate change, the focus was limited and concentrated only on the knowledge domain (UNESCO, 2022).

The government of Saint Lucia recognizes the need for training teachers in climate change, however, teacher training and education programmes do not explicitly address environmental education and climate change. The Government proposes to integrate climate change into teacher training through policies centred around the topic. To this end, primary and secondary school teachers, district education officers, and principals, participated in a series of workshops for the revised 2010 Climate Change Teachers Toolkit (Peter, 2017).

It is important for the Government of Saint Lucia to invest in formal climate change education to address the climate change crisis. Education in climate change will help produce a citizenry that can make informed decisions and take the appropriate actions, to participate in more sustainable lifestyles and economies, and build climate-resilient societies. A project management plan and project guided by a set of good practices as stipulated in the PMI standard for project management will be effective and efficient in integrating important climate change topics in the Primary School Science Curriculum (Grades K to 6) in Saint Lucia.

20.2 Basic conceptual framework

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

- Project management plan
- Project management
- Sustainable and Regenerative Development
- Environmental education
- Curriculum
- Integration Management Plan,

• Scope Management Plan
• Schedule Management Plan
• Cost Management Plan
• Quality Management Plan
• Resource Management Plan
• Communications Management Plan
• Risk Management Plan
• Procurement Management Plan
• Stakeholder Management Plan
• Project Charter
• Work Breakdown Structure
• Enterprise Environmental Factors
• Project Management Tool and Techniques
• Project Management Process Groups
• Project Management Knowledge Areas
• Project Life Cycle
• Predictive Developmental Approach
• Project Manager
• Organisational Structure
• Project Work Performance Domain
• Quality Metrics
• Requirements
• Requirement Traceability Matrix
• Stakeholders
• Stakeholder Analysis
• Stakeholder Register
• SWOT Analysis
• PESTLE Analysis

21. Methodological framework

Objective	Name of deliverable	Information sources	Research method	Tools	Restrictions
1. To develop a Project Charter for the Final Graduation Project (FGP) with the relevant approvals to authorize the project's existence.	FGP Charter	Secondary: PMBOK Guide 6th and 7th edition; UNESCO publications; OECS Curriculum guides (Grades K-6); Stakeholder website reports and reviews

Primary: Project-related documentation from interviews | Qualitative: Interview documentation; written information analysis | Expert judgment, interviews, document review | Limited information to accurately estimate cost and timelines. |
| 2.To explain | Content | Secondary: | Qualitative: | Document | Limited |

Objective	Name of deliverable	Information sources	Research method	Tools	Restrictions
the impact of regenerative and sustainable development on the project execution and deliverables.	Chapter	UNEP website; journal articles and white papers; PMBOK Guide 6th and 7th edition Primary: None	Written information analysis	review	credible and up-to-date (2016-2023) sources on the subject.
3.To create an integration management plan to integrate the various processes and project management activities from the start to the project's completion.	Integration management plan	Secondary: PMBOK Guide 6th and 7th edition; UNESCO publications; OECS Curriculum guides (Grades K-6); Stakeholder website reports and reviews Primary: Project-related documentation from interviews	Qualitative Written information analysis	Expert judgment, data analysis, document review, interviews, PMIS	Inexperience of the project team to adequately analyse and use information.
4.To create a scope management plan accounting for the acceptance criteria, deliverables, exclusions, assumptions, and constraints, to ensure inclusion of all required work for project's	Scope management plan	Secondary: PMBOK Guide 6th and 7th edition; UNESCO publications; OECS Curriculum guides (Grades K-6); Stakeholder website reports and reviews Primary: Project-	Qualitative: Written information analysis	Expert judgment, interviews, document analysis, focus groups, questionnaire/survey, benchmarking, decomposition	Lack of regional or international standards.

Objective	Name of deliverable	Information sources	Research method	Tools	Restrictions
successful completion.		related documentation from interviews			
5.To prepare a schedule management plan to ensure completion of the project within the agreed timeframe.	Schedule management plan	Secondary: PMBOK Guide 6th and 7th edition; UNESCO publications; OECS Curriculum guides (Grades K-6); Stakeholder website reports and reviews Primary: Project-related documentation from interviews	Qualitative: Written information analysis	Expert judgment, decomposition, alternative analysis, PMIS, analogous estimating, bottom-up estimating	Lack of scheduling data for some key stakeholders.
6.To develop a cost management plan to ensure that project costs are planned, structured, controlled, and are within the project's budget.	Cost management plan	Secondary: PMBOK Guide 6th and 7th edition; UNESCO publications; OECS Curriculum guides (Grades K-6); Stakeholder website reports and reviews Primary: Project-related documentation from interviews	Qualitative: Written information analysis Quantitative: Numerical data analysis	Expert judgment, alternative analysis, three-point estimating, cost aggregation, historical information review, interviews	Constant price hikes for materials.
7.To create a quality management	Quality management plan	Secondary: PMBOK Guide 6th	Qualitative: Written information	Expert judgment, benchmark	Absence of Quality standards

Objective	Name of deliverable	Information sources	Research method	Tools	Restrictions
plan to describe the quality standards for meeting the requirements for integrating climate change topics in Primary School Science Curriculum Grades (K-6).		and 7th edition; UNESCO publications; OECS Curriculum guides (Grades K-6); Stakeholder website reports and reviews Primary: Project-related documentation from interviews and questionnaires	analysis	ing, interviews, cost-benefit analysis, checklist, document analysis, effect diagram, questionnaire	related to the subject.
8.To prepare a resource management plan to identify, acquire, and manage the resources needed for the project's successful completion.	Resource management plan	Secondary: PMBOK Guide 6th and 7th edition; UNESCO publications; OECS Curriculum guides (Grades K-6); Stakeholder website reports and reviews Primary: Project-related documentation from interviews	Qualitative: Written information analysis	Expert judgment, bottom-up estimating, analogous estimating, assignment matrix, PMIS, pre-assignment	Lack of the Science Curriculum Officer (key stakeholder from DOE).
9.To develop a communications management plan to describe the project's communicati	Communication management plan	Secondary: PMBOK Guide 6th and 7th edition; UNESCO publications; OECS Curriculum	Qualitative: Written information analysis	Expert judgment, communication requirement analysis	Restrictive Organisational policies related to communication with DoE personnel.

Objective	Name of deliverable	Information sources	Research method	Tools	Restrictions
on strategy for administering and disseminating information based on stakeholders' needs.		guides (Grades K-6); Stakeholder website reports and reviews Primary: Project-related documentation from interviews			
10.To produce a risk management plan to describe the project's risks, the risk management activities and monitoring strategies.	Risk management plan	Secondary: PMBOK Guide 6th and 7th edition; UNESCO publications; OECS Curriculum guides (Grades K-6); Stakeholder website reports and reviews Primary: Project-related documentation from interviews	Qualitative: Written information analysis Quantitative: Numerical data analysis	Expert judgment, stakeholder analysis, interviews, SWOT analysis, document analysis, assumptions and constraints analysis, risk probability impact assessment, risk characterization, quantitative risk analysis, risk characterization, quantitative risk analysis, strategies for overall project risk, PMIS	Planned school activities during the term limits availability of key stakeholders.
11.To create a procurement management plan to acquire the products and	Procurement management plan	Secondary: PMBOK Guide 6th and 7th edition; UNESCO publications;	Qualitative: Written information analysis	Expert judgment, interviews, document analysis	Restrictive Organisational policies related to procurement of services.

Objective	Name of deliverable	Information sources	Research method	Tools	Restrictions
services needed to meet the project deliverables.		OECS Curriculum guides (Grades K-6); Stakeholder website reports and reviews

Primary: Project-related documentation from interviews | | | |
| 12.To prepare a stakeholder engagement plan to identify the project stakeholders and the strategies needed for involvement in project decisions and activities. | Stakeholder management plan | Secondary: PMBOK Guide 6th and 7th edition; UNESCO publications; OECS Curriculum guides (Grades K-6); Stakeholder website reports and reviews

Primary: Project-related documentation from interviews and questionnaires | Qualitative: Written information analysis | Expert judgment, interviews, questionnaires, stakeholder mapping, prioritisation/ranking | COVID-19 and unplanned school closure will limit stakeholder participation. |

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

The project's approach to validating its impact on sustainability with respect to the project's products and processes will make the use of the P5 Impact Analysis (P5IA). This approach will support the achievement of the relevant United Nations' Sustainable Development Goals (SDGs) which will include,

- SDG # 1 (No Poverty),
- SDG# 4 (Quality Education),
- SDG# 5 (Gender Equity),
- SDG #6, (Clean Water and Sanitation),
- SDG #7 (Affordable and Clean Energy),
- SDG #8 (Decent Work and Economic Growth),
- SDG#9 (Industry Innovation and Infrastructure),
- SDG #10 (Reduced Inequalities),
- SDG #11 (Sustainable Cities and Communities),
- SDG #12 (Responsible production and Consumption),
- SDG #13 (Climate Action), SDG #14 (Life Below Water),
- SDG #15 (Life on Land), and
- SDG #17 (Partnership for the Goals)

The P5 Impact Analysis (P5IA) will be conducted according to the "*GPM ® P5™ Standard for Sustainability in Project Management*". It will allow the definition and the prioritization of the sustainability impacts of the project on the society, the environment and the project's value. The P5IA will detail the steps needed to mitigate sustainability impact risks and to increase those related to the project benefits; improve the project's expected benefits and contribute to the DoE's sustainability goals (GPM Global, 2019; Carboni et al., 2018).
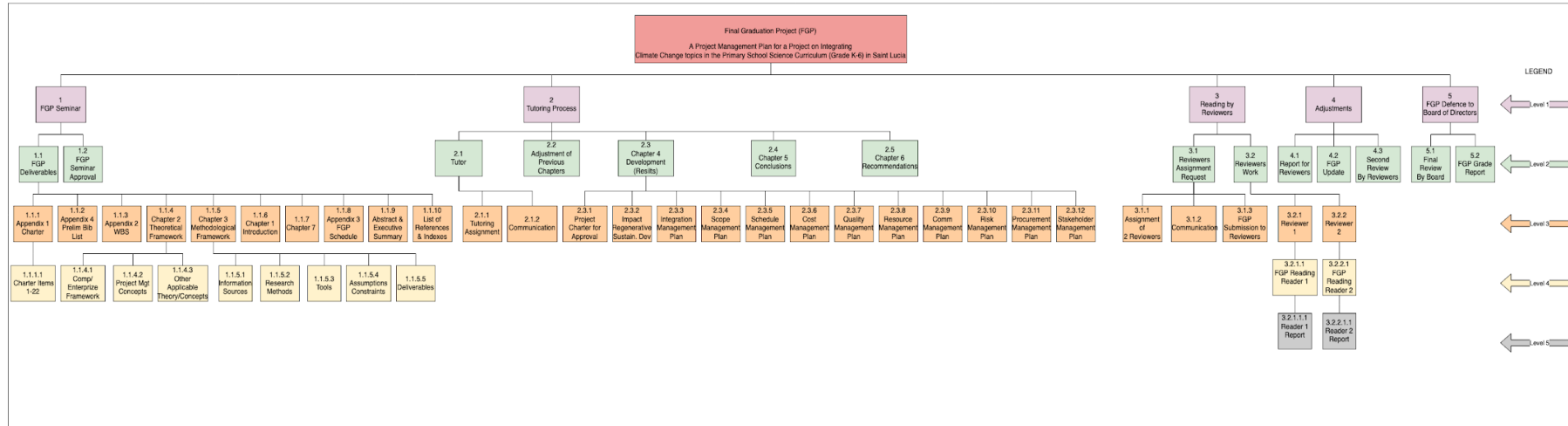
The P5IA will be performed by identifying events that could occur during the project and/or the lifespan of the project's products. The analysis will be conducted for each of the five (5) categories – processes, products, planet (environment), people (social), profitability (economic) - using a description of the causes of each event and outlining its sustainability impact. The events will be initially rated based on the potential sustainability impact, then re-rated based on the assumption that the responses identified (to maximize or minimize impacts) would have been implemented (GPM Global, 2019).

The processes and products category of sustainability refers to the decisions related to the characteristics of the project and the project management practices that may impact the people, the planet, and prosperity. The relevant subcategories of the processes that will be considered in the analysis will include effectiveness of the project processes, efficiency of project processes and fairness of project processes. The relevant subcategories of the project product will include the life span of the project and servicing the project.

The people (social) category of sustainability refers to the impacts of the project's products and activities on people, society, and communities. The subcategories that will be considered in the analysis will include the society and customers, human rights, and ethical behaviour. The planet (environmental) category of sustainability refers to the impacts of the project's products and activities on ecosystems. The subcategories that will be considered will include transport, energy, land, air, and water, and consumption. Finally, the prosperity (economic) category of sustainability refers to the impacts of the project's products and activities on the finances of the project's stakeholders. The subcategories that will be considered will include business case analysis and business agility (GPM Global, 2019).

The results of the P5IA will show the positive impacts or benefits and the negative impacts that should be maximized or mitigated respectively. Thus, the project team will have key actionable information to justify changes to the project activities in socially, environmentally, and fiscally responsible ways.

Appendix 2: FGP WBS

Appendix 3: FGP Schedule

ID	Task Mode	Task Name	Duration	Start	Finish
1		Final Graduation Project	126 day	Mon 1/9/23	Mon 7/3/23
2		FGP Start	0 days	Mon 1/9/23	Mon 1/9/23
3		**1. Graduation Seminar**	40 days	Mon 1/9/23	Fri 3/3/23
4		**1.1 FGP Deliverables**	35 days	Mon 1/9/23	Fri 2/24/23
5		**1.1.1 Appendix 1: Charter**	35 days	Mon 1/9/23	Fri 2/24/23
6		1.1.1.1 Charter items 1-10	5 days	Mon 1/16/23	Fri 1/20/23
7		1.1.1.2 Charter items 11-12	5 days	Mon 1/23/23	Fri 1/27/23
8		1.1.1.3 Charter item 13-19	5 days	Mon 1/30/23	Fri 2/3/23
9		1.1.1.4 Charter item 20	5 days	Mon 2/6/23	Fri 2/10/23
10		1.1.1.5 Charter Item 21	5 days	Mon 2/13/23	Fri 2/17/23
11		1.1.1.6 Charter item 22	5 days	Mon 2/20/23	Fri 2/24/23
12		1.1.2 Appendix 4: Preliminary Bibliography	5 days	Mon 1/9/23	Fri 1/13/23
13		1.1.3 Appendix 2: WBS	5 days	Mon 1/16/23	Fri 1/20/23
14		1.1.4 Chapter 2: Theoretical Framework	5 days	Mon 1/30/23	Fri 2/3/23
15		1.1.5 Chapter 3: Methodological Framework	5 days	Mon 2/6/23	Fri 2/10/23
16		1.1.6 Chapter 1: Introduction	5 days	Mon 2/13/23	Fri 2/17/23
17		1.1.7 Chapter 7: Validation RD /SD	5 days	Mon 2/13/23	Fri 2/17/23
18		1.1.8 Appendix 3: FGP Schedule	5 days	Mon 2/13/23	Fri 2/17/23
19		1.1.9 Abstract & Executive Summary	5 days	Mon 2/20/23	Fri 2/24/23
20		1.1.10 List of References & Indexes	5 days	Mon 2/20/23	Fri 2/24/23
21		1.2 Graduation Seminar Approval	0 days	Fri 3/3/23	Fri 3/3/23
22		**2. Tutoring Process**	55 days	Mon 3/13/23	Fri 5/26/23
23		2.1 Tutor	0 days	Mon 3/13/23	Mon 3/13/23
24		2.2 Adjustment to Previous Chapters	5 days	Mon 3/13/23	Fri 3/17/23
25		**2.3 Chapter 4: Development (Results)**	30 days	Mon 3/13/23	Fri 4/21/23
26		2.3.3 Integration Mgt Plan	3 days	Mon 3/13/23	Wed 3/15/23
27		2.3.4 Scope Mgt Plan	3 days	Thu 3/16/23	Mon 3/20/23
28		2.3.5 Schedule Mgt Plan	3 days	Tue 3/21/23	Thu 3/23/23
29		2.3.6 Cost Mgt Plan	3 days	Fri 3/24/23	Tue 3/28/23
30		2.3.7 Quality Mgt Plan	3 days	Wed 3/29/23	Fri 3/31/23
31		2.3.8 Resource Mgt Plan	3 days	Mon 4/3/23	Wed 4/5/23
32		2.3.9 Communication Mgt Plan	3 days	Thu 4/6/23	Mon 4/10/23
33		2.3.10 Risk Mgt Plan	3 days	Tue 4/11/23	Thu 4/13/23
34		2.3.11 Procurement Mgt Plan	3 days	Fri 4/14/23	Tue 4/18/23
35		2.3.12 Stakeholder Eng Plan	3 days	Wed 4/19/23	Fri 4/21/23
36		2.4 Chapter 5: Conclusion	5 days	Mon 4/24/23	Fri 4/28/23
37		2.5 Chapter 6: Recommendations	5 days	Mon 5/1/23	Fri 5/5/23
38		Philologist Review End	0 days	Fri 5/19/23	Fri 5/19/23
39		FGP Tutor Approval	0 days	Fri 5/26/23	Fri 5/26/23
40		**3. Reading by Reviewers**	10 days	Mon 5/29/23	Fri 6/9/23
41		**3.1 Reviewers Assignment**	5 days	Mon 5/29/23	Fri 6/2/23
42		3.1.1 Assignment of 2 Reviewers	2 days	Mon 5/29/23	Tue 5/30/23

ID	Task Mode	Task Name	Duration	Start	Finish
43		3.1.2 Communication	2 days	Wed 5/31/23	Thu 6/1/23
44		3.1.3 FGP Submission to Reviewers	1 day	Fri 6/2/23	Fri 6/2/23
45		**3.2 Reviewer's Work**	**5 days**	**Mon 6/5/23**	**Fri 6/9/23**
46		**3.2.1 Reviewer 1**	**5 days**	**Mon 6/5/23**	**Fri 6/9/23**
47		3.2.1.1 FGP Reading Reader 1	4 days	Mon 6/5/23	Thu 6/8/23
48		3.2.1.2 Reader 1 Report	1 day	Fri 6/9/23	Fri 6/9/23
49		**3.2.2 Reviewer 2**	**5 days**	**Mon 6/5/23**	**Fri 6/9/23**
50		3.2.2.1 FGP Reading Reviewer 2	4 days	Mon 6/5/23	Thu 6/8/23
51		3.2.2.2 Reader 2 Report	1 day	Fri 6/9/23	Fri 6/9/23
52		FGP First Review Approval	0 days	Fri 6/9/23	Fri 6/9/23
53		**4. Adjustments**	**10 days**	**Mon 6/12/23**	**Fri 6/23/23**
54		4.1 Report for Reviewers	3 days	Mon 6/12/23	Wed 6/14/23
55		4.2 FGP Adjustment Update	4 days	Thu 6/15/23	Tue 6/20/23
56		4.3 Second Review by Reviewers	3 days	Wed 6/21/23	Fri 6/23/23
57		FGP Second Review Approval	0 days	Fri 6/23/23	Fri 6/23/23
58		**5. Presentation to Board of Examiners**	**5 days**	**Mon 6/26/23**	**Fri 6/30/23**
59		5.1 Final Review by Board	2 days	Mon 6/26/23	Tue 6/27/23
60		5.2 FGP Grade Report	3 days	Wed 6/28/23	Fri 6/30/23
61		FGP End	0 days	Mon 7/3/23	Mon 7/3/23

Appendix 4: Preliminary bibliographical research

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Chart A 1

Preliminary bibliographical research list with details on contribution to Final Graduation Project (FGP)

Bibliography list	Contribution to FGP
Asana. (n.d.). *Qué es la gestión de recursos y cómo comenzar • Asana*. Asana. Retrieved August 16, 2021, and translated from https://asana.com/es/resources/resource-management-plan	This source will give information on developing an effective resource management plan, including the benefits of a resource management plan, steps in its creation, and best practices.
Carboni, J., Duncan, W., Gonzalez, M., Milsom, P., & Young, M. (2018). *Sustainable project management: The GPM reference guide* (2nd edition). GPM Global.	This source will inform the project management plan, ensuring that it incorporates sustainability concerning product and process management impacts as well as the social, environmental, and economic impacts.
*Caribbean action plan on health and climate change;2019—PAHO/WHO	Pan American Health Organization*. (n.d.). Retrieved January 14, 2023, from https://www.paho.org/en/documents/caribbean-action-plan-health-and-climate-change-2019	This source will give background information on the impact of the climate change crisis not only as an environmental threat to Small Island Developing States (SIDS), but also as a threat to the livelihood, the economy, and the social fabric of communities.
United Nations Educational Scientific Cultural Organization. (2021a). *Getting every school climate-ready, how countries are integrating climate change issues in Education.* Paris, France: UNESCO. https://unesdoc.unesco.org/ark:/48223/pf0000379591?posInSet=1&queryId=30983fc8-bf41-4c0f-b901-75f8a7f280a5	This source will give contextual and background information on UNESCO's perspective related to education and addressing the climate crisis and educational initiatives like Education for Sustainable Development. The reference gives survey statistics on integrating of climate change into the school curriculum.
Gibb, N. (2016). *Getting climate ready*. UNESCO Publishing.	This source will give background information on the importance of education for sustainable development and the role of education in responding to the climate change crisis.
Gibbons, L. V. (2020). Regenerative—The new sustainable? *Sustainability*, *12*(13), 5483.	The source will be useful in the FGP chapter on regenerative and sustainable development.
GPM Global. (2019). *The GPM® P5™ standard for sustainability in project management*. (V.2.0). GPM Global.	This source will inform the project management plan, ensuring that it incorporates sustainability concerning product and process management impacts as well as the social, environmental, and economic impacts.
Government of Saint Lucia. (2018). *Saint Lucia's national adaptation plan stocktaking, climate risk and vulnerability assessment report*. Government of Saint Lucia.	This source will be used for contextual information, including statistics on the climate change crisis in Small Island Developing States (SIDS) and Saint Lucia's vulnerability and actions related to education as adaptation initiatives.

Bibliography list	Contribution to FGP
United Nations Educational Scientific Cultural Organization. (2021b). *Learn for our planet: a global review of how environmental issues are integrated in education.* Paris, France: UNESCO. https://unesdoc.unesco.org/ark:/48223/pf00003 77362?posInSet=1&queryId=5fabe0bf-690c-4753-9715-70bd372b5121	This source will give information supporting the integration of climate change topics in the curriculum. The source can also be useful in the FGP chapter on regenerative and sustainable development.
Müller, E. (2018). Regenerative development in higher education: Costa Rica's perspective. In N. W. Gleason (Ed.), *Higher Education in the Era of the Fourth Industrial Revolution* (pp. 121–144). Springer Singapore. https://doi.org/10.1007/978-981-13-0194-0_6	This source will provide supporting information on education for regenerative and sustainable development and will be useful in the FGP chapter on the field of regenerative and sustainable development.
United Nations Educational Scientific Cultural Organization. (2021c). *Teachers have their say: Motivation, skills and opportunities to teach education for sustainable development and global citizenship* Paris, France: UNESCO. https://unesdoc.unesco.org/ark:/48223/pf00003 79914	This source will give supporting background information (survey statistics) on the importance of integrating climate change topics in the curriculum.
Pacagnella, A. C., da Silva, S. L., Pacífico, O., de Arruda Ignacio, P. S., & da Silva, A. L. (2019). Critical success factors for project manufacturing environments. *Project Management Journal*, *50*(2), 243–258. https://doi.org/10.1177/8756972819827670	This source will support information related to the critical success criteria for project performance.
Project management: The start of the project journey. (n.d.). Project Management: The Start of the Project Journey. Retrieved January 13, 2023, from https://www.open.edu/openlearn/money-business/leadership-management/project-management-the-start-the-project-journey/money-business/leadership-management/project-management-the-start-the-project-journey	This source will be used for background information on project management including why manage a project, promoting project success and the project lifecycle.
Project Management Institute. (2017). *A guide to the project management body of knowledge / Project Management Institute (PMBOK® Guide)* (Sixth edition). Project Management Institute.	This source will be used extensively throughout the FGP to give information on PMI standards for effective and efficient project management, including guidance on developing the project management plan; explaining the project processes and knowledge areas; developing the respective plans for the relevant knowledge areas; justifying and identifying project management tools and techniques in the FGP; describing the critical success criteria and its impact on performance/project success.

Bibliography list	Contribution to FGP
Project Management Institute. (2021). *The standard for project management and a guide to the project management body of knowledge (PMBOK® Guide)* (Seventh edition). Project Management Institute, Inc.	This source will be used extensively throughout the FGP to give information on PMI standards for effective and efficient project management including guidance on delivering value concerning the project products; explaining the project management principles in the context of the objectives of the project management plan; explaining the project performance domains most relevant to the objectives of the project.
Ravindra Savaram. (2017, March 15). Project Management Tools and Techniques. Mindmajix; Mindmajix.https://mindmajix.com/project-management-tools-and-techniques	This source will be used to identify and justify the use of specific tools and techniques in the FGP.
*Saint Lucia's National Adaptation Plan (NAP) 2018-2028	United Nations Development Programme*. (n.d.). UNDP. Retrieved January 14, 2023, from https://www.undp.org/latin-america/publications/saint-lucias-national-adaptation-plan-nap-2018-2028	This source will be used for contextual information on the important role of climate change education as an adaptation initiative in Saint Lucia.

Note. *Prepared by Author*

Appendix 5: Philological Dictum

<div style="border:1px solid black; padding:1em;">

ABEGAIL JEAN-JOSEPH
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Castries, Saint Lucia

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May 09, 2023

Academic Advisor
Masters Degree in Project Management (MPM)
Universidad Para La Cooperación International
Avenida 15, Calle 35
Barrio Escalante
SAN JOSE 10101, Costa Rica

Dear Academic Advisor,

Re: Through Review and Proof Reading of Final Graduation Project submitted by Kim Meonia Newton in partial fulfilment of the requirement for the Masters Project Management (MPM) Degree

I hereby confirm that Kim Meonia Newton has made all the corrections to the Final Graduation Project document as I have advised. In my opinion the document meets the literary and linguistic standards expected of a student for a degree at the masters level.

Sincerely,

Abegail Jean-Joseph

</div>

Appendix 6: Philologist's Credentials

THE UNIVERSITY OF THE WEST INDIES

Abegail Jean Joseph

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

BACHELOR OF EDUCATION LANGUAGE EDUCATION (LITERACY STUDIES)

with
Second Class Honours (Upper Division)

July 1, 2016
DATE

VICE-CHANCELLOR

UNIVERSITY REGISTRAR

This Document is not valid unless it bears the University's seal