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Computer Science Department

Course Project
Global Issues and Solutions

Final Project
Promoting Sustainable Agriculture in Burkina Faso

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The desire for a future without
poverty



Table of Contents

1	Project Work Plan and Budget Matrix.....	4
2	Introduction.....	5
2.1.	Statement of the problem.....	5
2.2.	Objectives.....	6
2.2.1.	General objectives.....	6
2.2.2.	Specific objectives	6
3	Project	7
3.1.	Activities	7
3.1.1.	Baseline survey.....	7
3.1.2.	Training program.....	7
3.1.3.	Technical assistance and support.....	11
3.1.4.	Demonstration plots.....	12
3.1.5.	Monitoring and evaluation.....	12
3.2.	Project outcomes	13
3.2.1.	Positive outcomes	13
3.2.2.	Negative outcomes.....	14
4	Conclusions.....	15
5	List of references	16

1 Project Work Plan and Budget Matrix

PROJECT TITLE:	Promoting Sustainable Agriculture in Burkina Faso
PROJECT DURATION:	January 2024 – January 2026
PROBLEM STATEMENT:	Prevalent use of unsustainable agricultural practices and their impact on food security.
PROJECT OBJECTIVE STATEMENT:	Improve food security and livelihoods of farmers by promoting sustainable agriculture practices that are environmentally friendly and increase crop yields.
ROOT CAUSES:	Poverty

Activity	Output	Date of implem	Person Responsible	Budget	Budget Source
Conduct a baseline survey to access the current knowledge and practices of farmers regarding sustainable agriculture	Baseline survey report	Month 1-2	Research Coordinator	\$10,000	Project funds (NGO)
Develop and implement a training program on sustainable agriculture practices, including agroforestry, conservation, agriculture, integrated pest management, climate-smart practices	Training program report	Month 3-8	Training Coordinator	\$100,000	Project funds (NGO)
Establish demonstration plots to showcase sustainable agriculture practices	Demonstration plot report	Month 6-11	Agriculture Coordinator	\$50,000	Project funds (NGO)
Conduct monitoring and evaluation to assess the impact of the project	Monitoring and evaluation report	Month 12-24	Monitoring and Evaluation Officer	\$50,000	Project funds (NGO)
Personnel(Project Manager, project Coordinator, Technical Advisor, Monitoring and Evaluation Officer)		Month 1-24	Project Manager	\$100,000	Project funds (NGO)
Supplies and Materials(Training materials, Farm equipment, and tools, Seeds and seedlings, and Other supplies)	Supplies and materials report	Month 1-24	Logistics Coordinator	\$90,000	Project funds (NGO)
Technical assistance and Support(Technical assistance for farmers, Support for agroforestry and conservation agriculture activities, Support for integrated pest management activities)	Technical assistance and support report	Month 1-24	Technical Advisor	\$100,000	Project funds (NGO)
TOTAL				\$500,000.00	

2 Introduction

Burkina Faso is a landlocked country located in West Africa, bordered by six countries. The country is strategically located that places it within the West African Economic and Monetary Union (UEMOA) and Economic Community of West African States (ECOWAS).

Burkina Faso is one of the poorest countries in the world, with a Human Development Index(HDI) ranking of 183 out of 189 countries. With a population of over 20 million people, more than 40% of the population lives below the poverty line.

2.1. Statement of the problem

The agricultural sector is vital to the country's economy employing over 80% of the population and contributing to over 30% of the GDP.

However, Burkina Faso is facing several challenges that are hindering its efforts to achieve sustainable agriculture. The majority of the farmers still use traditional agricultural practices such as slash-and-burn farming, overgrazing, and deforestation, which contribute to soil erosion, land degradation, and low productivity in the country. This leads to food insecurity and a lack of economic opportunities for farmers, particularly in rural areas.

Burkina Faso is also affected by climate change, which has led to increased temperatures, unpredictable rainfall patterns, and more frequent and severe weather events such as floods, droughts, and desertification. These changes have had significant impacts on the country's agricultural sector, which is the main source of livelihood for the majority of the population.

In addition to those agricultural challenges, Burkina Faso is also facing numerous other challenges, including political instability, a weak economy, and social inequality.

2.2. Objectives

2.2.1. General objectives

- The project's general objectives are to promote sustainable agriculture in Burkina Faso using a **specific sustainable development strategy** of integrating agroforestry, soil fertility, crop diversification, conservation agriculture, integrated pest management, and climate-smart agricultural practices. The project **will focus** on developing and implementing a training program on sustainable agriculture practices, technical assistance and support to adopt sustainable agriculture practices, and establishing demonstration plots to showcase sustainable agriculture

2.2.2. Specific objectives

- To increase food security, improve farmers' livelihoods, and conserve natural resources.

3 Project

The project will commence on January 2024 and will conclude in January 2026.

The project will be managed by a team of experienced professionals and will be delivered in collaboration with local partners and stakeholders.

3.1. Activities

3.1.1. Baseline survey

In the first two months of the project, a baseline survey will be conducted to assess the current knowledge and practices of farmers regarding sustainable agriculture. Will be designed a questionnaire and interviews to collect data on a range of topics related to agriculture, including land use, crop and livestock production, agricultural inputs, access to markets, and household income and expenditure. The survey report will help also to identify the specific needs and challenges facing farmers in the region. The research coordinator will be responsible for conducting the survey, and the cost of the survey will be \$10,000, which will be funded by the project.

3.1.2. Training program

Based on the findings of the baseline survey, a training program on sustainable agriculture practices will be developed and implemented. The training program will cover a range of topics, including soil fertility

management, crop diversification, agroforestry, conservation agriculture, and integrated pest and disease management, as well as climate-smart agriculture practices such as rainwater harvesting, and drought-resistant crop varieties. The training will include classroom-based training, on-farm demonstrations, and practical sessions.

- **Soil fertility:** To promote soil fertility farmers will be encouraged to test their soil for nutrient deficiencies, pH levels, and organic matter content. This will help farmers identify the specific nutrients that their soil lacks, and they can add them accordingly. Farmers will be trained as well on the proper use of fertilizers, including the selection of appropriate fertilizers, application rates, timing, and placement.
- **Crop diversification:** Farmers will be trained on how to select suitable crops for their farming systems. They will be encouraged to choose crops that complement each other, such as planting legumes alongside cereals to fix nitrogen in the soil, as well as training on the benefits of inter-cropping (planting 2 or more crops together in the same field) for better use of space, reduce pest and disease pressure, and increased soil fertility. It will be given guidance on how to design the inter-cropping systems. Farmers will be encouraged **to add value** (processing crops into higher-value products, such as flour, oil, or juice) to their crops and will be given guidance on how to access markets for their products.
- **Agroforestry:** The farmers will be trained in how to integrate suitable tree species into their agricultural systems, for example, such as shade, timber, fruits, or fodder. They will be trained in how to **design** (for example crop-livestock-tree systems), **manage** (practices such as pruning, thinning, and coppicing), and **maintain** (prevent pests and diseases) the agroforestry systems.

The farmers will be also encouraged to add value to their tree products. By implementing agroforestry practices, farmers can improve soil health, increase crop productivity, and enhance biodiversity, which leads to sustainable and resilient farming systems.

- **Conservation agriculture:** There are some key areas where the farmers will be trained such as **minimizing soil disturbance** during planting, weeding, and harvesting, like no-till or reduced tillage, to avoid soil erosion and maintain soil structure; **soil cover** farmers will be encouraged to use crop residues or cover crops to provide soil cover to maintain soil moisture and prevent erosion; **crop rotation** farmers will be encouraged to rotate different crops in sequence on the same piece of land to avoid soil depletion; **integrated weed management** farmers will be trained on how to manage weeds without damaging soil health, the includes using manual weeding and hoeing to reduce the use of herbicides; **crop residue management** farmers will be trained how to handle, store and incorporate residues into the soil to provide organic matter and improve soil fertility.
- **Integrated pest and disease management:** this aspect of promoting sustainable agriculture helps to reduce the use of pesticides, protect beneficial insects, and maintain biodiversity. Farmers will be trained in **pest and disease identification**. This includes recognizing the signs and symptoms of pests and diseases and distinguishing them from other disorders. They will also be trained in the biology and behavior of pests and diseases. Farmers will be trained on how to use **cultural methods** to prevent pest and disease infestations. This includes practices such as crop rotation, inter-cropping, and using resistant crop varieties. They will also be trained on how to maintain good **hygienic practices**, such as cleaning tools and equipment, to prevent the spread of pests and diseases. Farmers will also be

trained on how to use **biological control methods** to manage pests and diseases, which include the use of natural enemies, such as predators and parasitoids to control pests; as well as to encourage beneficial insects, such as pollinators, to increase biodiversity on their farms. Farmers will be trained on how to use pesticides **safely and effectively**, understand the proper application rates and timing, and how to store and dispose of them safely. They will be also trained on the potential risks and side effects of pesticide use and the importance of using alternative methods of pest and disease control. Farmers will be trained on **scouting and monitoring** their crops to detect early signs of pests and diseases and how to use decision-making tools, such as economic thresholds, to determine when to use pest and disease control methods.

- **Climate-smart agriculture practices** are important for promoting sustainable agriculture in Burkina Faso, given the country's vulnerability to climate change such as erratic rainfall, prolonged droughts, and increased temperature. The two key climate-smart practices included in the training program activity for the project are **rainwater harvesting** and the use of **drought-resistant crop varieties**.

Rainwater harvesting involves collecting and storing rainwater runoff for future use, especially during dry spells. It can be done using simple techniques such as small-scale dams, ponds, or trenches to capture and store rainwater. The water can be used for irrigation, watering livestock, and domestic use. In the training program activity, farmers will be trained on the principles of rainwater harvesting, including site selection, design, construction, and maintenance of rainwater harvesting systems. They will learn how to calculate the amount of water they can harvest, how to integrate rainwater harvesting into their farming practices, and how to manage and maintain the system to ensure its sustainability.

Drought-resistant crop varieties: they are designed to resist water scarcity and have been developed through traditional breeding or genetic modification. They have traits such as deep root systems, the ability to store water, and the capacity to withstand high temperatures, making them suitable for areas with low rainfall. Farmers will be trained on how to identify and use drought-resistant crop varieties that are suitable for their specific location and soil type.

The training program will be developed in collaboration with local partners and stakeholders and will be delivered by a team of experienced trainers. The training program will be implemented within eight months, by the training coordinator and it will cost \$100,000, which will cover the cost of training materials and trainers' fees

3.1.3. Technical assistance and support

Based on the identified needs of the farmers, technical assistance and support programs will be developed. These programs will include training workshops and on-farm coaching. The training workshops will provide farmers with the necessary skills and knowledge to adopt sustainable farming practices. The project will also introduce low-cost technologies such as drip irrigation, solar-powered water pumps, and portable weather stations that can help farmers make informed decisions on crop management. The project will support the formation of farmer groups and cooperatives to enable farmers to access markets and value-added opportunities. This activity will be implemented over a period of 12 months and the budget for it will be \$100,000.

3.1.4. Demonstration plots

The project will establish in selected villages demonstration plots to showcase sustainable practices to farmers. The field demonstrations will provide farmers with practical experience in modern farming technologies such as access to improved seeds, fertilizers, and other inputs. These plots will serve as a practical example of how sustainable agriculture practices can be implemented on a larger scale and demonstrate the techniques and technologies involved in sustainable agriculture. The demonstration plots will be established by the agriculture coordinator in collaboration with local farmers and will serve as a learning and training resource for the wide community. These plots will be established within a period of 11 months. The budget for the demonstration plots will be \$50,000, which will cover the cost of seeds, seedlings, farm equipment, and tools.

3.1.5. Monitoring and evaluation

This activity aims on one hand to monitor and document the observed climate changes and their impact to create a better understanding of the ongoing processes and the expected future changes. On the other hand, to measure the success of the project we will track the following indicators: the adoption of sustainable agriculture practices by the farmers; the increase in productivity and income of farmers; job creation; reduction in environmental impacts. The monitoring and evaluation report will be completed within 24 months of the project, and it will provide critical information on the impact of the project. The cost of this activity will be \$50,000 and will be funded by the project funds.

In addition to the above activities, the project will also involve hiring personnel, including a project manager, project coordinator, technical advisor, and monitoring and evaluation officer. The personnel will be responsible for coordinating and implementing the various activities of the project. The cost of personnel will be \$100,000 and will be funded by the project funds.

The project will also require supplies and materials, including training materials, farm equipment and tools, seeds and seedlings, and other supplies. The logistic coordinator will be responsible for procuring the supplies and materials, and the supplies and material report will be completed within 24 months of the project. The cost of supplies and materials will be \$90,000 and will be funded by the project funds.

3.2. Project outcomes

3.2.1. Positive outcomes

- **Increased agricultural productivity and food security:** The adoption of sustainable agriculture practices is expected to increase agricultural productivity and food security in the project area. The project will target at least 10,000 small-scale farmers, and it is estimated that their agricultural productivity will increase by 50%.
- **Improved resilience to climate change:** The adoption of climate-smart agriculture practices is expected to improve the resilience of small-scale farmers to climate change.
- **Improved livelihoods:** The project is expected to improve the livelihoods of small-scale farmers by increasing their income through improved agricultural productivity and access to markets and value-added opportunities.

- **Environmental conservation:** The project is expected to promote environmental conservation through the adoption of sustainable agriculture practices such as conservation agriculture, agroforestry, and soil moisture conservation techniques.

3.2.2. Negative outcomes

- **Dependence on external support:** There is a risk that small-scale farmers may become dependent on external support from the project, particularly in terms of inputs and technologies. To mitigate this risk, the project will work with local agricultural extension officers to ensure that the training is relevant to the local context and that the inputs and technology provided are appropriate and affordable.
- **Market risks:** There is a risk that the project may not be able to establish sustainable market linkages for small-scale farmers, particularly in the face of global market volatility. To mitigate this risk, the project will work with local partners to establish local market linkages and value-added opportunities.

4 Conclusions

The proposed project will help promote sustainable agriculture among smallholder farmers in Burkina Faso. By implementing a training program, providing technical assistance and support, and establishing demonstration plots, farmers will be able to adopt sustainable agriculture practices, which will lead to increased agricultural productivity, improved food security, and reduced environmental degradation not just for people now but also for future generations. The project will contribute to the development of the country and increase its score on the Human Development Index.

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