



ECONOMIC AND FINANCIAL ANALYSIS REPORT

Climate Proofing Food Production Investments in Imbo and
Moso Basins Project in the Republic of Burundi.

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3rd August, 2020

International Fund for Agricultural Development,
Nairobi, Kenya

Dear Sir/Madam,

**RE: ECONOMIC AND FINANCIAL ANALYSIS FOR CLIMATE PROOFING FOOD
PRODUCTION INVESTMENTS IN IMBO AND MOSO BASINS PROJECT IN THE
REPUBLIC OF BURUNDI**

As part of the project proposal for Climate Proofing Food Production Investments in Imbo and Moso Basins Project in the Republic of Burundi, we are pleased to submit our Economic and Financial Analysis report.

Sincerely,

Phoebe Owiti
Partner

Evelyn Shikwe
Partner

LIST OF ABBREVIATIONS

BC.....	Benefit Cost Ratio
BIF.....	Burundian Franc
EFA.....	Economic Financial Analysis
GCF.....	Green Climate Fund
IRR.....	Internal Rate of Return
NDC.....	Nationally Determined Contributions
NPV.....	Net Present Value
US\$.....	United States Dollar

1 INTRODUCTION

This section outlines the purpose of this report and supporting analysis, relevant background and context, the scope and the approach adopted in undertaking the required analytical work.

1.1 Document Purpose

The purpose of this report is to provide an evidence based analysis of **Climate Proofing Food Production Investments in Imbo and Moso Basins Project in the Republic of Burundi**. Its role is to assist in the definition of investment criteria. The analysis is purely ex-ante i.e. all benefits and costs are based on estimates of future values.

1.2 Background

The Climate Proofing Food Production Investments in Imbo and Moso Basins Project (the Project) aims at upscaling activities prioritized in Burundi's Nationally Determined Contributions (NDC) and which are successfully increasing resilience of local population to the negative impacts of climate change.

The Project activities target to transform the current agro-ecological land and water management practices in the upper and mid-catchments of the Imbo and Moso basins (15,000 ha) towards more sustainable and productive land use practices. This will in turn reduce siltation and flooding risks of the irrigation schemes downstream, and safeguard corresponding investments.

1.3 Scope and Approach

The scope of the analysis was to provide a response to two key questions:

- i. To what extent does the Project represent a cost effective alternative to the current business as usual situation?
- ii. To what extent do the projected benefits to be achieved by the Project justify the costs suggested and represent the value for money in the long term?

To answer these questions, we undertook an independent assessment of the proposed Project's financial and economic impacts through computation of the expected Net Present Value (NPV), Internal Rate of Return (IRR) and the Benefit Cost Analysis using Benefit Cost (BC) Ratio.

This analysis was largely based on the Project's logical framework, the description of the Project as provided in the project documents and the financial data obtained from the projected budget. We also relied on desk reviews of prevailing data on economic indices in Burundi (i.e. prices of rice and Treasury Bill interest rate).

1.4 Key Assumptions

This analysis was premised on the following key assumptions:

- i. The yield of rice was assumed to grow incrementally to 75,000 tonnes per year eventually – As defined in the *E4: Needs of Recipient* section of the Green Climate Fund (GCF) Funding Proposal document.
- ii. Yield of rice before and during the implementation of the Project was assumed to be 60% of its optimal capacity (i.e. 75,000 tonnes). This is as a result of poor soil and water management practices over the years.
- iii. Self-consumption of rice was assumed to be 25% of the production yield.
- iv. Post-harvest losses were assumed to be 15% of the production yield.
- v. Price of rice in Burundi was assumed to be US\$ 1,050 per tonne (BIF 2,000 per kilo and hence BIF 2 Million per tonne). This was derived from various publications on current food prices in Burundi.
- vi. Operating Costs of the rice farms i.e. the costs of seed, fertilizers and chemicals were assumed to be US\$ 500 per tonne of rice.

- vii. Project operating labour costs were assumed to be 25 man days per de-silting cycle. This is labour mostly engaged in desilting the canals.
- viii. Discount Rate was assumed to be 15% per annum. This corresponds with the prevailing Treasury Bill Rate in Burundi as provided by the Bank of Burundi. The model also assumed a Social Discount Rate of 9% per annum.
- ix. IFAD provided funding of amount US\$ 21,727,000 was assumed to be granted in the first year of the project.
- x. Project Economic Life was assumed to be 20 years as provided in the GCF Funding Proposal document.
- xi. Research costs of US\$ 30,000 was assumed to be a sunk cost and therefore irrelevant in the analysis.

2 FINANCIAL ANALYSIS

2.1 Financial Net Present Value (FNPV)

This is the sum of all benefits less costs obtained at a given discount rate in present value terms. Essentially, it is the difference between the present value of cash inflows and the present values of cash outflows over a period of time.

2.1.1 Decision criteria

Outcome	Decision
If NPV is positive	Accept
If NPV is zero	Indifference
If NPV is negative	Reject

2.1.2 Project Analysis

The NPV of the Project at 15% discount rate was determined to be **US\$ 2,196,495**.

2.2 Financial Internal Rate of Return (FIRR)

This is the yield or profitability of a project based on discounted cash flow analysis. The IRR is the discount rate at which the streams of costs and benefits result in a nil Net Present Value. The rate of return is then compared with the market rate of interest to determine whether or not the proposed project should be undertaken.

2.2.1 Decision Criteria

Outcome	Decision
If IRR > Cost of Capital ¹	Accept
If IRR = Cost of Capital	Indifference
If IRR < Cost of Capital	Reject

¹ We applied the prevailing Treasury Bill Rate in Burundi of 1.5% (also the discounting rate)

2.2.2 Project Analysis

The IRR of the Project was determined to be **18%**.

2.3 Benefit Cost Ratio (BC)

The BC Ratio is an appraisal technique used to select a project assuming known/constant benefits. The costs to achieve the benefits are expressed as a ratio to the benefits. It can also be defined as the relationship between relative costs and benefits of a proposed project.

2.3.1 Decision Criteria

Outcome	Decision
If $BC > 1$	Accept
If $BC = 1$	Indifference
If $BC < 1$	Reject

2.3.2 Project Analysis

The Financial BC Ratio of the Project was determined to be **1.15**.

3 ECONOMIC ANALYSIS

3.1 Economic Net Present Value (ENPV)

This is the sum of all economic benefits less costs obtained at a given social discount rate in present value terms. Essentially, it is the difference between the present value of cash inflows and the present values of cash outflows over a period of time.

3.1.1 Project Analysis

The ENPV of the Project at a Social Discount Rate of 9% was determined to be **US\$ 3,094,125**.

3.2 Economic Internal Rate of Return (EIRR)

This is the yield or profitability of a project based on discounted cash flow analysis. The EIRR is the discount rate at which the streams of costs and benefits result in a nil Net Present Value. The rate of return is then compared with the market rate of interest to determine whether or not the proposed project should be undertaken.

3.2.1 Project Analysis

The EIRR of the Project was determined to be **12%**.

3.3 Benefit Cost Ratio (BC)

The BC Ratio is an appraisal technique used to select a project assuming known/constant benefits. The costs to achieve the benefits are expressed as a ratio to the benefits. It can also be defined as the relationship between relative costs and benefits of a proposed project.

3.3.1 Project Analysis

The Economic BC Ratio of the Project was determined to be **1.19**.

3.4 Sensitivity Analysis

The Project's economic viability was assessed for sensitivity to variables in revenues and costs. In particular, the viability was assessed against the following:

- **Decrease in revenues** - It was determined that if the project revenues decreased by 10% then the project would cease to be viable.
- **Increase in costs** - If the project costs increase by 10% then the project would cease to be viable.
- **Delays in project revenues** - If the project's revenue stream delays by one (1) year then the project would cease to be viable.

The table below illustrates the sensitivity of the project:

Sensitivity Analysis			
Indicator	ENPV (US\$)	EIRR	BCR
Benefits Reduction			
2%	1,629,947	10%	(13.86)
10%	(4,226,765)	5%	1.51
Cost Increases			
5%	289,533.96	9%	2.17
10%	(3,917,353)	6%	1.61
Revenue Delays			
1 year	(16,475,390)	3%	1.433

4 CONCLUSION

The analysis presented in this report, at this conceptual stage, demonstrate that the **Project is viable** i.e. there is likely to be a significant improvement in outcomes for the farming communities in Imbo and Moso Basins. While the Project is cost-heavy at the onset, the benefits far outweigh the project outlay.

This finding is supported by the results of the quantitative analysis which shows a positive Net Present Values for both the financial and economic analyses. The Internal Rate of Return of both the financial and economic analyses were greater than the applied discount rates. In addition, the Benefit Cost Ratio of both analyses were greater than 1

5 INHERENT LIMITATIONS

In preparing this analysis report, we had access to information provided in the Project Logical Framework, the accompanying detailed budget and a number of publicly available information. We endeavoured to indicate within this report the sources of information provided. We have placed reliance on those sources of information and thus have not sought to independently verify the accuracy, reliability and completeness of the information.

A detailed Economic and Financial Analysis (EFA) is hinged upon availability of relevant data – especially regarding economic and social impacts of the project. This analysis was constrained for sufficient data in this regard.

Any findings and recommendations contained in this report are premised on our reasonable professional judgement based on information that was available. Should the project elements, external factors and assumptions change then the findings and recommendations contained herein may no longer be appropriate.

6 ANNEXES

6.1 Project Cash Flows

	Item	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6-20
Benefit	Revenue as a consequence of the project	-	-	-	-	78,750,000	78,750,000
Output 1.1	Co-creation workshops to develop catchment management plans	(2,500)	(5,000)	-	-	-	-
	Training workshop on the implementation of the plans	-	(2,500)	-	-	-	-
	Establishment of demonstration farms	(15,000)	(25,000)	(35,000)	-	-	-
	Establishment of tree nurseries	-	(30,000)	(52,500)	-	-	-
	Development of farm level soil and water conservation structures	-	(1,250,000)	(2,500,000)	(1,250,000)	-	-
	Tree planting campaigns	(25,000)	(37,500)	(50,000)	(37,500)	-	-
Output 1.3	Innovation challenge award scheme on SLM practices and produce thereof established	-	(17,000)	(12,000)	(7,000)	-	-
	Business incubations	-	(22,000)	(32,000)	(12,000)	-	-
	Building the capacity of farmers on “on-farm” value addition	(5,000)	(15,000)	(10,000)	-	-	-
	Support farmers acquire better on-farm handling and storage facilities	(460,000)	(937,500)	-	-	-	-

	Item	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6-20
	Supporting farmer cooperatives get better markets for the farmer produce.	(20,000)	(20,000)	(20,000)	-	-	-
Output 1.2	Support famers acquire on-farm rain water harvesting facilities	(700,000)	(700,000)	(851,000)	-	-	-
	Capacity building of local artisans on the management and repair of farm level water harvesting facilities	(25,000)	(40,000)	(40,000)	-	-	-
Output 2.1	Generation of evidence at local level on the benefits of SLM	(12,000)	(22,000)	-	-	-	-
	Local benefits of SLM documented and shared widely	(10,000)	(10,000)	(10,000)	-	-	-
Output 3.1	Review of policies and regulations governing soil and water conservation	(3,500)	(4,000)	-	-	-	-
	Drafting of draft policy and by-laws for soil and water conservation	(5,000)	(10,000)	-	-	-	-
Output 2.2	Training of district level agricultural extension officers	(10,000)	(10,000)	(10,000)	-	-	-
Output 2.1	Training of lead farmers on soil and water conservation	(5,000)	(5,000)	(5,000)	-	-	-
	Training of farmers through farmer field schools	(10,000)	(30,000)	(30,000)	(20,000)	-	-
PMC	Project coordination , M&E and reporting	(100,000)	(100,000)	(100,000)	(100,000)	(80,000)	-

6.2 Detailed Analysis



Burundi SAP
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