AFRICAN DEVELOPMENT BANK GROUP

GREEN CLIMATE FUND

BUILDING CLIMATE RESILIENCE FOR FOOD AND LIVELIHOODS IN THE HORN OF AFRICA (BREFOL)

Djibouti, Ethiopia, Kenya, Somalia, and South Sudan

Annex 3. Economic and Financial Analysis

BUILDING CLIMATE RESILIENCE FOR FOOD AND LIVELIHOODS IN HORN OF AFRICA (BREFOL) BASELINE

ECONOMIC AND FINANCIAL ANALYSIS

I. Introduction

The proposed Program, Building Climate Resilience for Food and Livelihoods in Horn of Africa (BREFOL), funded by GCF-AfDB with an estimated budget of USD 335.30 million, aims to integrate climate change and variability considerations into the development strategies of Djibouti, Ethiopia, Kenya, Somalia, and South Sudan, within the Horn of Africa (HoA) region. The region is one of the most vulnerable regions to the impacts of climate change and is prone to highly variable rainfall patterns, with differing intensity and distribution. The frequency of extreme weather events has increased considerably owing to climate change and variability. Some of the most pronounced weather events are characterized by increased rains and floods during El Nino years, and droughts during La Nina years, culminating in production losses/failure, emergence of crop and livestock diseases, and livestock deaths. The effects are humanitarian emergencies, food insecurity and damages to infrastructure and the environment.

Unfortunately, poor rural communities and households who are the most vulnerable, do not have the necessary resources to absorb or mitigate such risks. Besides, the highly fragile nature of the region creates an unhealthy investment environment necessary for the growth of the private sector, which is often the next biggest spender in the continent after most governments. There are many private entrepreneurs that have vested interests in lucrative renewable energy, energy saving, waste recycling and other businesses for profit and not necessarily as climate change adaptation and mitigation or NDC interventions. Also, beyond these green/circular ventures, the private sector offers different kinds of private financing such as debt, equity, guarantees, insurance products etc., which holds great potential for bridging the adaptation gap financing in Africa. Unfortunately, they often lack the incentives and other enabling instruments to bring about a self-sustaining green/circular economy, sustainable wealth creation and jobs in the region. This is particularly true of fragile states, which attract even fewer private firms, given high-risk profile associated with them.

Concessional green financing from the GCF together with the AfDB ***Strategic Private Sector Investment for Fragile States Project*** can help cascade an effective win-win private-private and private-public partnerships for strong green economic growth in the region. Additionally, the requested GCF funds will help in leveraging additional green-blended.

In this Annex, the results of the financial and economic analysis related to the Programme are presented. The aim is to show the financial and economic viability of the proposed interventions, and the effectiveness of GCF investments into the Programme. The financial analysis, including crop and household (HH) financial models, is reported in the next section, followed by economic analysis. The description of the expected Programme benefits is described next. The net benefits derived from the activity level models in the form of incremental benefits with respect to the baseline are aggregated in both financial and economic analyses considering the scale of the project and its targets (total area of cultivable land in Hectares) to assess the overall benefits generated from the proposed programme interventions. Derived benefits are compared with the project costs (estimated from the project budget) to assess overall investment effectiveness indicators (Key Performance Indicators for Different Discount Rates -DRs). Crop financial and economic models, as well as a summary of the economic analysis can be found in the attached Excel worksheets (Annex 3B).

II. Financial Analysis (FA)

The FA aims to achieve three things. 1) Firstly, to assess the financial soundness of the development interventions promoted under BREFOL. 2) Secondly, to examine the impact of BREFOL activities on the incomes of smallholder farmers, pastoralists, agribusiness MSMEs, Producers Organisations (POs), local PFIs, and Farmers Based Associations (FBAs). 3) Thirdly, to provide a strong analytical framework for the economic assessment of the Programme in the region. Such an analysis is important for an overall assessment of the Programme in terms of the society rather than on individual basis (FA).

Data Sources: Data for the FA were extensively drawn from two major sources. 1) The first was from primary sources mainly through field surveys, stakeholders' consultation, focus group discussions, carried out during the feasibility studies exercise. Primary data were mostly collected for crop yields, cropping patterns, daily wage rate for low returns economic activities, farm gate prices, costs of inputs such as seeds, seedlings, fertilizer and pesticide, farm application practices and management. 2) Secondary data were obtained from Agricultural Ministries, Statistical Bureaus, previous published works, past and ongoing projects/programs in the region. It was used to cross check those obtained from the field.

The FA models, assumptions used, and specifications: Crop activity model (per hectare of crop land), and four farm-household models that simulates the implementation of traditional farming practices and climate resilient practices for a variety of agricultural production systems in the region (horticulture – cabbage, lettuce, tomatoes, beans and maize), staple crops (TAAT COMPAC maize), and agroforestry (mango), were used. Note that intercropping is a widely used farming technique in the region for resilience building and improved livelihood options. The models allow us to identify the total variable costs, the total fixed costs, and the total project revenues, which are essential for computing the gross margin budgets for each agricultural production systems used in the analysis.

Inputs in the Computation:

- Labor: Most farms in the programme countries use family labour for manual work. Labour is paid daily and, in most instances, subject to negotiation between the labourer and the employer. Most mechanized service delivery activities are paid per hectare and varies from country to country, but ranges from $50 to $100. Hired labour is often used during critical times such as ploughing, sowing and weeding. In the analysis, hired labour is substitute for family labour for ease of computation. Since the goal of the analysis is to consider all the input costs, labour is valued in the same way, no matter if the labourer is a family member or an external labour. In other words, the analysis looks at labour costs within overall production costs. Most smallholders, however, do not rely on hired labour and use only family labour, without accounting for their labour costs. Therefore, in each crop model, both the gross and net margins are computed (where the net margin is obtained by subtracting the labour costs from the gross margin), to also consider family labour costs. Last, the labour-related indicator *returns to family labour* (ratio between gross margin and total family labour used in farming activities) is established. The returns to family labour indicate how much is earned for each day of work attributed to the crop enterprise, irrespective of who provided the labour.

- Prices: The markets for agricultural inputs and products in the region, are determined by the law of supply and demand. The prices used for the financial analysis were collected from various value chain actors during field visits (farmers, pastoralists, Agro-dealer, PO, MSMEs, ACSs), including agricultural ministries, national bureau of price statistics, and other online statistical databases.

- The Opportunity Cost of Capital: The average of the deposit interest rate (DIR) and the lending interest rate was used in the analysis as the opportunity cost of capital. This was computed for each participating country and the average of the five countries (9.6%) was used in the FA as shown in the table below.

Discount Rate (DR)

	Indicator	Deposit interest rate	Lending interest rate	Average	*DR Financial Analysis*	*DR Economic Analysis*	
Djibouti	*Rate (%)*	1.7%	11.2%	6.4%	***6.4%***	***12%***	*AfDB, 2023*
Ethiopia	*Rate (%)*	7.7%	8.0%	7.9%	***7.9%***	***10%***	*AfDB, 2023*
Kenya	*Rate (%)*	7.2%	10.5%	8.8%	***8.8%***	***12%***	*AfDB, 2023*
Somalia	*Rate (%)*	25.0%	13.1%	19.1%	***19.1%***	***10%***	*AfDB, 2023*
South Sudan	*Rate (%)*	0.1%	12.0%	6.0%	***6.0%***	***12%***	*AfDB, 2023*
Average for the Program					***9.6%***	***11%***	

- Loan repayment: The total loan repayment schedule for each country with a credit line facility (i.e., at individual and aggregate levels), was simulated and factored into the FA, as shown in the table below. The amortization

period assumed was 6 years corresponding to the disbursement period, and interest rate was assumed to be the lending interest rate for each country as shown in the table above.

Sample GCF loan repayment schedule for Ethiopia

No grace period assumed.	
Interest rate (fixed annual)	8%
Amortization Period in Years	6.00
Payments per year	12.00
Borrowed Principal	**$64,746,000.00**
Monthly Payment	$1,135,207.20
Number on monthly payments	$72.00
First Payment Date	15/01/2024
Annual payment (GCF loan facility)	**$13,622,486.36**

It is assumed that 10% of the necessary total loan funding= down payment paid by investor (s) from own resources. 80%= total borrowed money for operations, as described below.

Total necessary amount for operations:	$71,940,000.00	**Line of credit (LoC) Facility to Ethiopia**
Loan Down Payment:	$7,194,000.00	
Total borrowed:	**$64,746,000.00**	

Payment #	Payment Due	Principal	Interest	Balance	Due Date
1.00	$1,135,207.20	$703,567.20	$431,640.00	$64,042,432.80	15.02.2023
2.00	$1,135,207.20	$708,257.64	$426,949.55	$63,334,175.16	15.03.2023
3.00	$1,135,207.20	$712,979.36	$422,227.83	$62,621,195.80	15.04.2023
4.00	$1,135,207.20	$717,732.56	$417,474.64	$61,903,463.24	15.05.2023
5.00	$1,135,207.20	$722,517.44	$412,689.75	$61,180,945.80	15.06.2023
6.00	$1,135,207.20	$727,334.22	$407,872.97	$60,453,611.57	15.07.2023
7.00	$1,135,207.20	$732,183.12	$403,024.08	$59,721,428.45	15.08.2023
8.00	$1,135,207.20	$737,064.34	$398,142.86	$58,984,364.11	15.09.2023
9.00	$1,135,207.20	$741,978.10	$393,229.09	$58,242,386.01	15.10.2023
10.00	$1,135,207.20	$746,924.62	$388,282.57	$57,495,461.39	15.11.2023
11.00	$1,135,207.20	$751,904.12	$383,303.08	$56,743,557.27	15.12.2023
12.00	$1,135,207.20	$756,916.81	$378,290.38	$55,986,640.45	15.01.2024
13.00	$1,135,207.20	$761,962.93	$373,244.27	$55,224,677.52	15.02.2024
14.00	$1,135,207.20	$767,042.68	$368,164.52	$54,457,634.84	15.03.2024
15.00	$1,135,207.20	$772,156.30	$363,050.90	$53,685,478.55	15.04.2024
16.00	$1,135,207.20	$777,304.01	$357,903.19	$52,908,174.54	15.05.2024
17.00	$1,135,207.20	$782,486.03	$352,721.16	$52,125,688.51	15.06.2024
18.00	$1,135,207.20	$787,702.61	$347,504.59	$51,337,985.90	15.07.2024
19.00	$1,135,207.20	$792,953.96	$342,253.24	$50,545,031.94	15.08.2024
20.00	$1,135,207.20	$798,240.32	$336,966.88	$49,746,791.63	15.09.2024

- Financial Results

Four scenarios are generally considered for each FA as shown in the attached Excel worksheets (Annex 3B). That is, **1)** '**model assumptions'**, which provides the general assumptions and parameters used for each FA; 2) **'without project' (WOP) scenario**, which is the baseline of the analysis); and **'with project' (WP) scenario**, that is, the proposed activities and intervention of the program. Note that the WOP is the Business-as-Usual (BAU) scenario, where yields are below the potential, and the returns to family labour are expected to be lower, though not in all cases. Irrigation is an old farming technique and some traditional famers especially those involved in intercropping in the region used this technique. In most of the analysis, we have factored in irrigation as a '**Drought Factor',** for both scenarios given the aridity of the region. If this assumption is relaxed in the WOP scenario, it is likely that yields would be below the potential, and the returns to family labour would be lower for the WOP scenario. Besides this, the use of the two scenarios avails us with the opportunity to obtain the net advantages of the **4) 'incremental situation'** of the program at the individual and aggregate levels as shown in the tables below.

1) FA model assumptions

Financial Analysis						
Assumptions and parameters		**Unit**	**Unit Price ($)**	**Qtty WOP**	**Qtty WP**	**Incremental**
Parameters						
	Household Size (HHSize)	Number		5.97	5.97	0.0
Area under Cultivation/Ha		Ha		**1.00**	**1.00**	0.0
	Beans, dry	Ha		0.20	0.20	0.0
	Cabbages	Ha		0.20	0.20	0.0
	Maize (Corn)	Ha		0.20	0.20	0.0
	Tomatoes	Ha		0.20	0.20	0.0
	Lettuce	Ha		0.20	0.20	0.0
Yields* (exluding PHL)/0.20Ha						0.0
	Beans, dry	kg/Ha	$0.44	637.0	652.9	15.9
	Cabbages	kg/Ha	$0.37	1,588.0	1,627.7	39.7
	Maize (Corn)	kg/Ha	$0.68	4,000.8	4,100.8	100.0
	Tomatoes	kg/Ha	$0.14	1,259.1	1,290.6	31.5
	Lettuce	kg/Ha	$0.62	424.8	435.4	10.6
Drought Factor						0.0
	Solar irrigation systems	Fixed Price	$1,000.00	$1,000.0	$1,000.0	0.0
Input Requirements/0.20Ha						
	Land rental	$/Ha	$56.2	$56.2	0.0	-56.2
	Beans seeds	kg/Ha	$1.0	6.0	6.0	0.0
	Cabbage seeds	kg/Ha	$3.5	10.0	10.0	0.0
	Maize seeds	kg/Ha	$0.7	5.0	5.0	0.0
	Tomatoes seeds	kg/Ha	$1.0	5.0	5.0	0.0
	Lettuce seeds	kg/Ha	$2.5	10.0	10.0	0.0
	Fertilizer (50 - Kg DAP Bag)	kg/Ha	$0.7	300.0	450.0	150.0
	Fertilizer (50 - Kg CAN Bag)	kg/Ha	$0.7	300.0	450.0	150.0
	UREA	kg/Ha	$0.6	300.0	450.0	150.0
	Compost Manure	kg/Ha	$0.1	100.0	900.0	800.0
	Insecticides and weedicides	Litres	$11.5	3.0	6.0	3.0
	Crop suplement	Litres		0.0	0.0	0.0
	Pump	Pc	$5.0	0.0	1.0	1.0
	Labour	$/Mandays(MDs)	$2.7			
	Interest period	% per month	11.2%	4.0	4.0	0.0
Labour Inputs/Ha						
	Land preparation	MDs	$2.7	30.0	30.0	0.0
	Nursey Establishment	MDs	$2.7	30.0	30.0	0.0
	Transplanting	MDs	$2.7	10.0	10.0	0.0
	Fertilizer application	MDs	$2.7	25.0	30.0	5.0
	Pesticides application	MDs	$2.7	25.0	30.0	5.0
	Manure application	MDs	$2.7	5.0	20.0	15.0
	Weeding	MDs	$2.7	12.0	12.0	0.0
	Harvesting	MDs	$2.7	30.0	30.0	0.0
	Transportation	MDs	$2.7	15.0	30.0	5.0
	Post-harvest Losses PHL	Percent (%)		20.0%	15.0%	-5.0%
	O&M for DIDS	Percent (%)		5.0%	5.0%	0.0%
	Irrigation Labour	MDs	$2.7	75.0	125.0	50.0
Cost Summary ($)						
	Cost of Input	$/Ha		**$1,847.4**	**$2,141.7**	**$294.2**
	Labour Input Cost	$/Ha		**$693.9**	**$874.3**	**$180.4**
	Post-harvest Losses PHL	$/ha		**$805.6**	**$604.2**	**-$201.4**
	O&M for DIDS (5% Cost of DIDS	$/Ha		**$50.0**	**$50.0**	**$0.0**
	Interest Rate (11.2% of Input Cost)			**$827.6**	**$959.5**	**$131.8**

2) Without project scenario (WOP)

"WITHOUT PROJECT (WOP)" SCENARIO (Under RCP 4.5)

1.1. Cashflow Statement-Individual Point of View, REAL Values

	Qtty WOP	Unit Price ($	Units	2024	2025	2026	2027	2028	2029	2030	2031	2032
INFLOWS												
Beans, dry	637.00	0.44	USD	0.00	280.28	280.28	280.28	280.28	280.28	280.28	280.28	280.28
Cabbages	1,588.00	0.37	USD	0.00	587.56	587.56	587.56	587.56	587.56	587.56	587.56	587.56
Maize (Corn)	4,000.80	0.68	USD	0.00	2,720.54	2,720.54	2,720.54	2,720.54	2,720.54	2,720.54	2,720.54	2,720.54
Tomatoes	1,259.13	0.14	USD	0.00	176.28	176.28	176.28	176.28	176.28	176.28	176.28	176.28
Lettuce	424.75	0.62	USD	0.00	263.35	263.35	263.35	263.35	263.35	263.35	263.35	263.35
TOTAL INFLOWS (USD REAL)			**USD**	**0.00**	**4,028.01**	**4,028.01**	**4,028.01**	**4,028.01**	**4,028.01**	**4,028.01**	**4,028.01**	**4,028.01**
OUTFLOWS												
Cost of Input		1,847.43	USD	1,847.43	1,847.43	1,847.43	1,847.43	1,847.43	1,847.43	1,847.43	1,847.43	1,847.43
Labour Input Cost		693.90	USD	693.90	693.90	693.90	693.90	693.90	693.90	693.90	693.90	693.90
Post-harvest Losses PHL (20% of Yield)		805.60	USD	0.00	805.60	805.60	805.60	805.60	805.60	805.60	805.60	805.60
O&M for DIDS (5% Cost of DIDS)		50.00	USD	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00
Interest Rate (11.2% of Input Cost)		827.65	USD	827.65	827.65	827.65	827.65	827.65	827.65	827.65	0.00	0.00
TOTAL OUTFLOWS (USD REAL)			**USD**	**#####**	**4,224.58**	**4,224.58**	**4,224.58**	**4,224.58**	**4,224.58**	**4,224.58**	**3,396.93**	**3,396.93**
NET CASH FLOW (USD REAL)			**USD**	**#####**	**-196.57**	**-196.57**	**-196.57**	**-196.57**	**-196.57**	**-196.57**	**631.08**	**631.08**

Financial Viability Metrics (Individual)		
Discount Rate	**6%**	
Values in USD		
FNPV	**297**	*USD*
FIRR	**7%**	%
MIRR	**7%**	%

3) With project scenario (WP)

"WITH PROJECT (WP)" SCENARIO

1.1. Cashflow Statement-Individual Point of View, REAL Values

	Qtty WP	Unit Price ($	Units	2024	2025	2026	2027	2028	2029	2030	2031	2032
INFLOWS*												
Beans, dry	652.93	0.44	USD	0.00	287.29	287.29	287.29	287.29	287.29	287.29	287.29	287.29
Cabbages	1,627.70	0.37	USD	0.00	602.25	602.25	602.25	602.25	602.25	602.25	602.25	602.25
Maize (Corn)	4,100.82	0.68	USD	0.00	2,788.56	2,788.56	2,788.56	2,788.56	2,788.56	2,788.56	2,788.56	2,788.56
Tomatoes	1,290.60	0.14	USD	0.00	180.68	180.68	180.68	180.68	180.68	180.68	180.68	180.68
Lettuce	435.37	0.62	USD	0.00	269.93	269.93	269.93	269.93	269.93	269.93	269.93	269.93
TOTAL INFLOWS (USD REAL)			**USD**	**0.00**	**4,128.71**	**4,128.71**	**4,128.71**	**4,128.71**	**4,128.71**	**4,128.71**	**4,128.71**	**4,128.71**
OUTFLOWS												
Cost of Input		2,141.65	USD	2,141.65	2,141.65	2,141.65	2,141.65	2,141.65	2,141.65	2,141.65	2,141.65	2,141.65
Labour Input Cost		874.30	USD	874.30	874.30	874.30	874.30	874.30	874.30	874.30	874.30	874.30
Post-harvest Losses (15% of Yield)		604.20	USD	0.00	604.20	604.20	604.20	604.20	604.20	604.20	604.20	604.20
O&M for DIDS (5% Cost of DIDS)		50.00	USD	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00
Annual payment (GCF loan facility)		157.00	USD	157.00	157.00	157.00	157.00	157.00	157.00	157.00	0.00	0.00
TOTAL OUTFLOWS (USD REAL)			**USD**	**3,222.95**	**3,827.15**	**3,827.15**	**3,827.15**	**3,827.15**	**3,827.15**	**3,827.15**	**3,670.15**	**3,670.15**
NET CASH FLOW (USD REAL)			**USD**	**-3,222.95**	**301.56**	**301.56**	**301.56**	**301.56**	**301.56**	**301.56**	**458.56**	**458.56**

*Under TAAT COMPAC technology, yield is predicted to increase by at lea https://taat-africa.org/.

Loan repay -157.70

Financial Viability Metrics (Individual)		
Discount Rate	**6%**	
Values in USD		
FNPV	**1,548**	*USD*
FIRR	**11%**	%
MIRR	**8%**	%

4) Incremental scenario (WP – WOP) – Individual

INCREMENTAL FINANCIAL (WP-WOP)

1.3. Cashflow Statement-Individual Point of View, REAL Values

	Qtty WP	Unit Price ($	Units	2024	2025	2026	2027	2028	2029	2030	2031	2032
INFLOWS												
Beans, dry	15.93	0.44	USD	0.00	7.01	7.01	7.01	7.01	7.01	7.01	7.01	7.01
Cabbages	39.70	0.37	USD	0.00	14.69	14.69	14.69	14.69	14.69	14.69	14.69	14.69
Maize (Corn)	100.02	0.68	USD	0.00	68.01	68.01	68.01	68.01	68.01	68.01	68.01	68.01
Tomatoes	31.48	0.14	USD	0.00	4.41	4.41	4.41	4.41	4.41	4.41	4.41	4.41
Lettuce	10.62	0.62	USD	0.00	6.58	6.58	6.58	6.58	6.58	6.58	6.58	6.58
TOTAL INFLOWS (USD REAL)			**USD**	**0.00**	**100.70**	**100.70**	**100.70**	**100.70**	**100.70**	**100.70**	**100.70**	**100.70**
OUTFLOWS												
Cost of Input		294.22	USD	294.22	294.22	294.22	294.22	294.22	294.22	294.22	294.22	294.22
Labour Input Cost		180.40	USD	180.40	180.40	180.40	180.40	180.40	180.40	180.40	180.40	180.40
Post-harvest Losses PHL (20% of Yield)		-201.40	USD	0.00	-201.40	-201.40	-201.40	-201.40	-201.40	-201.40	-201.40	-201.40
O&M for DIDS (5% Cost of DIDS)		0.00	USD	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Interest Rate (11.2% of Input Cost)		-670.65	USD	-670.65	-670.65	-670.65	-670.65	-670.65	-670.65	-670.65	0.00	0.00
TOTAL OUTFLOWS (USD REAL)			**USD**	**-196.03**	**-397.43**	**-397.43**	**-397.43**	**-397.43**	**-397.43**	**-397.43**	**273.22**	**273.22**
NET CASH FLOW (USD REAL) WP-WOP			**USD**	**-196.03**	**-296.73**	**-296.73**	**-296.73**	**-296.73**	**-296.73**	**-296.73**	**373.92**	**373.92**

Financial Viability Metrics (Individual)		
Discount Rate	**6%**	
Values in USD		
FNPV	**1,074**	*USD*
FIRR	**12%**	%
MIRR	**9%**	%

5) Incremental scenario (WP – WOP) – Aggregate

INCREMENTAL FINANCIAL														
1.4. Cashflow Statement-AGGREGATE, REAL Values (0000$)														
	Qtty WP	**Unit Price ($**	**Units**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**	**2034**
INFLOWS			10,000.00											
Beans, dry			10,000.00	0.00	11.49	11.49	11.49	11.49	11.49	11.49	11.49	11.49	11.49	11.49
Cabbages			10,000.00	0.00	24.09	24.09	24.09	24.09	24.09	24.09	24.09	24.09	24.09	24.09
Maize (Corn)			10,000.00	0.00	111.54	111.54	111.54	111.54	111.54	111.54	111.54	111.54	111.54	111.54
Tomatoes			10,000.00	0.00	7.23	7.23	7.23	7.23	7.23	7.23	7.23	7.23	7.23	7.23
Lettuce			10,000.00	0.00	10.80	10.80	10.80	10.80	10.80	10.80	10.80	10.80	10.80	10.80
TOTAL INFLOWS (USD REAL)			**USD**	**0.00**	**165.15**	**165.15**	**165.15**	**165.15**	**165.15**	**165.15**	**165.15**	**165.15**	**165.15**	**165.15**
OUTFLOWS														
Cost of Input			10,000.00	482.52	482.52	482.52	482.52	482.52	482.52	482.52	482.52	482.52	482.52	482.52
Labour Input Cost			10,000.00	295.86	295.86	295.86	295.86	295.86	295.86	295.86	295.86	295.86	295.86	295.86
Post-harvest Losses PHL (20% of Yield)			10,000.00	0.00	-330.30	-330.30	-330.30	-330.30	-330.30	-330.30	-330.30	-330.30	-330.30	-330.30
O&M for DIDS (5% Cost of DIDS)			10,000.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Interest Rate (11.2% of Input Cost)			10,000.00	-1,099.86	-1,099.86	-1,099.86	-1,099.86	-1,099.86	-1,099.86	-1,099.86	0.00	0.00	0.00	0.00
TOTAL OUTFLOWS (USD REAL)			**USD**	**-321.49**	**-651.78**	**-651.78**	**-651.78**	**-651.78**	**-651.78**	**-651.78**	**448.08**	**448.08**	**448.08**	**448.08**
NET CASH FLOW (USD REAL)			**USD**	**-321.49**	**-486.64**	**-486.64**	**-486.64**	**-486.64**	**-486.64**	**-486.64**	**613.23**	**613.23**	**613.23**	**613.23**

Financial Viability Metrics (AGGREGATE)		
Discount Rate	**6%**	
Values in USD		
FNPV	**1,761**	*000 USD*
FIRR	**12%**	%
MIRR	**9%**	%

As observed from the sample modelling results shown above, and in the attached Excel worksheets (Annex 3B), most of the crop models are profitable from an individual point of view (farmers' perspective). This shows the effectiveness of the investments aimed at supporting innovation adoption in the region such as Carbon Farming, CRA and Agroforestry management. The cash flows show that farmers will have the capacity to cover the necessary operating costs. Furthermore, with the possibly of introducing the **Technologies for African Agricultural Transformation (TAAT) Program[1] (TAAT COMPAC Technologies)** into the Programme, potential yields of the selected crops will double: implying more cash inflows to farmers. Notably under TAAT, the average productivity increases recorded among farmers who have been recipients of proven agricultural technologies for different commodities are: 33% for Small Livestock, 38% for both Cassava and Maize, 40% for Orange and Flesh Sweet Potato, 42% for Rice, 44% for Aquaculture (Tilapia), 64% for Sorghum, 71% for Forage, 80% for Millet, 100% for Wheat, and 113% for High Iron Bean, with an average of 62.5% across commodities.

The FA results further confirm that the proposed production packages are financially attractive for the participants and that the potential gains for beneficiary farmers to participate in the activities rolled out under BREFOL are financially attractive. The cash flows outlay show also that smallholder farmers will have the capacity to cover the necessary operating costs, especially with increasing yields associated with the introduction of TAAT COMPAC seeds. Farmers may equally decide to intercrop some of the horticultural crops (cabbage, lettuce, and tomatoes), with staples or agroforestry to generate more revenue inflows. However, since our analysis is conducted in a conservative way, such option is not considered here.

At the aggregate level, the FA calculates an aggregate financial internal rate of return (FIRR) of 59.8% for the baseline scenario, and average financial net present values (FNPVs) of 477.48 million at a discount rate of 9.6%, $732.13 million at 6% discount rate, $586.76 million at 7.9% discount rate, and $186.11 million at discount rate of 19.1%. Further sensitivity analysis was conducted on the FIRR for various scenarios under the RCP 8.5, such as: 10% and 20% cost over-run, benefits increment, benefits decrease, and 1 and 2 years of benefits delays. In all cases the FIRR as shown in the table below were higher than the discount rates and, in most cases, they were much

[1] TAAT is an AfDB flagship program, which offers a wide range of technology brokerage services to assist African countries. The services include the latest climate-smart technologies, their accompanying management practices, and post-harvest and value-addition interventions. Different strategies are offered for different commodities but are usually combined to strengthen national food systems. The overall goal of TAAT is to radically transform African agriculture into a competitive sector by deploying high-impact, proven agricultural technologies to raise agricultural productivity in Africa; mitigate risks and promote diversification and processing in 18 agricultural value chains within eight priority intervention areas, namely: self-sufficiency in rice production; cassava intensification; food and nutrition security in the Sahel; transforming African Savannahs into breadbaskets; revitalizing tree plantations; expanding horticulture; increasing Africa's wheat production and achieving self-sufficiency in inland fish production. These' work alongside six enabler domains that address transversal issues such as soil fertility management, water management, and capacity development, policy support, attracting African youth in agribusiness, and fall armyworm response.

higher. The FNPVS were also always positive. This demonstrates that the Program is not only very robust from the smallholder beneficiary's standpoint, but also it would remain viable under a wide range of alternatives.

Summary table of the key performance indicators of the FA under different discount rates

	Key Performance Indicators for Different Discount Rates (DR)								
Financial Discount Rate (FDR)	**9.6%**	**6.0%**	**7.9%**	**19.07%**		**9.6%**	**6.0%**	**7.9%**	**19.1%**
	FNPV				**FIRR**	**MIRR**			
Base Scenario	$477.48	$732.13	$586.76	$186.11	59.8%	21.7%	19.5%	20.6%	28.1%
costs +10%	$1,667.55	$465.48	$574.28	$176.20	54.0%	20.8%	18.7%	19.7%	27.2%
costs +20%	$1,652.45	$706.09	$561.79	$166.30	49.2%	20.1%	17.9%	19.0%	26.4%
benefits +10%	$1,866.01	$818.36	$657.92	$214.62	66.3%	22.4%	20.2%	21.3%	28.8%
benefits +20%	$2,049.38	$904.59	$729.08	$243.14	72.8%	22.9%	20.6%	21.8%	29.4%
benefits -10%	$1,499.28	$645.90	$515.60	$157.59	53.4%	20.8%	18.6%	19.7%	27.1%
benefits -20%	$1,315.92	$559.67	$444.44	$129.08	47.1%	19.7%	17.5%	18.6%	26.0%
benefits postipated 1 Year	$1,600.37	$665.13	$523.43	$139.57	41.3%	18.7%	16.6%	17.6%	24.9%
benefits postipated 2 Year	$1,638.12	$695.47	$551.94	$159.64	47.4%	13.9%	17.2%	18.3%	25.7%
* See Dashboard for NPV Value									
** FDR = Financial Discount Rate									

III. Economic Analysis (EA)

The EA does several things. First, it assesses the economic viability and overall cost effectiveness of the Programme. This is usually from the stand point of the society rather than at the individual and household levels as obtained with the FA. This is usually done through a comparison of the aggregated economic benefits with the Programme economic costs and the assessment of the *economic internal rate of return* (EIRR). Second, it shows how sensitive the proposed investments can be to small changes in model parameters used such as prices, incomes, interest rates, discount rate etc., due to risk and unforeseen factors. Refer to the attached Excel worksheets for details on sensitivity to model parameters.

The economic models and its assumptions: The building block for the economic analysis starts at the household level. It is based on the estimation of the benefits gained from the increased economic performance of the smallholder farmers and other target beneficiaries (incremental benefits from 'with' and 'without' project scenarios). It is premised on the assumption that the net incremental benefits as computed in the financial analysis (the difference between the **net cash flows** (USD real) in the WOP and WP project scenarios), can be aggregated over the total number of beneficiaries or the area under cultivation (total land hectares) to mirror the overall economic gains expected of a Programme. Since projects and programmes are typically designed to catalyse development benefits over a specific period of time, the EA takes this into account. In the case of BREFOL, the expected development time frame for the Programme is 25 years with a flow of funds for 6 years. Thus, the EA reported here is carried out for a programme period of 25 years, including a funding period of 6 years. Specifically, the farm household models discussed in the FA above are used to link the crop activity models with the total area of cultivable land under the programme (set as target, as reported in Annex 23 to the FP), to estimate the overall flow of benefits, and compute the Programme EIRR as shown in the table below.

BREFOL total cultivable land area, disaggregated per country

	Carbon Farming (Holticulture)		TAAT COMPAC Techno		Agroforestry	
Country	**Land Ha/Country***	**Percent**	**Land/Ha**	**Percent**	**Land/Ha**	**Percent**
Djibouti	16,400.0	4.0%	16,400.0	5.5%	8,000.0	7.3%
Ethiopia	110,000.0	26.8%	70,000.0	23.3%	29,000.0	26.4%
Kenya	100,000.0	24.4%	80,000.0	26.7%	26,000.0	23.6%
Somalia	69,400.0	16.9%	50,000.0	16.7%	22,000.0	20.0%
South Sudan	114,200.0	27.9%	83,600.0	27.9%	25,000.0	22.7%
Total	**410,000.0**	**100.0%**	**300,000.0**	**100.0%**	**110,000.0**	**100.0%**
* Based on country's cultivable land area						

Benefit summary

Benefit Summary												
Incremental Financial (WP-WOP)												
Holticulture (CRA)	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**	**2034**	**2035**
Benefits (Individual)	0.00	970.58	970.58	970.58	970.58	970.58	970.58	970.58	970.58	970.58	970.58	970.58
Benefits (Aggregate) -000$	0.00	7,944.37	8,074.24	8,078.34	8,080.80	8,084.08	8,086.54	8,089.82	8,093.10	8,096.38	8,100.48	8,103.76
Incremental Economic												
Benefits (Individual)	0.00	1,310.04	1,320.04	1,332.54	1,340.04	1,350.04	1,357.54	1,367.54	1,377.54	1,387.54	1,400.04	1,410.04
Benefits (Aggregate) -000$	0.00	11,859.62	11,941.62	12,044.12	12,105.62	12,187.62	12,249.12	12,331.12	12,413.12	12,495.12	12,597.62	12,679.62
TAAT COMPAC Maize (CRA)												
Incremental Financial (WP-WOP)												
Benefits (Individual)	0.00	2,035.68	2,035.68	2,035.68	2,035.68	2,035.68	2,035.68	2,035.68	2,035.68	2,035.68	2,035.68	2,035.68
Benefits (Aggregate) -000$	0.00	11,477.62	11,477.62	11,477.62	11,477.62	11,477.62	11,477.62	11,477.62	11,477.62	11,477.62	11,477.62	11,477.62
Incremental Economic												
Benefits (Individual)	0.00	2,307.75	2,317.75	2,330.25	2,337.75	2,347.75	2,266.75	2,363.25	2,373.25	2,383.25	2,395.25	2,405.75
Benefits (Aggregate) -000$	0.00	12,979.75	13,039.75	13,114.75	13,159.75	13,219.75	12,645.25	13,310.75	13,370.75	13,430.75	13,502.25	13,565.75
Agroforestry												
Benefits (Individual)	0.00	0.00	0.00	3,909.74	3,909.74	3,909.74	3,909.74	3,909.74	3,909.74	3,909.74	3,909.74	3,909.74
Benefits (Aggregate) -000$	0.00	0.00	0.00	6,192.57	6,192.57	6,192.57	6,192.57	6,192.57	6,192.57	6,192.57	6,192.57	6,192.57
Incremental Economic												
Benefits (Individual)	0.00	0.00	0.00	4,040.08	4,047.58	4,057.58	4,065.08	4,075.08	4,085.08	4,095.08	4,107.58	4,117.58
Benefits (Aggregate) -000$	0.00	0.00	0.00	5,199.57	5,209.77	5,223.37	5,233.57	5,247.17	5,260.77	5,274.37	5,291.37	5,304.97

Since economic benefits are estimated using economic prices rather than the financial prices, it is highly important to normalize the economic prices using a Standard Conversion Factor (SCF). The procedure for the standardization process is shown in the table below and detailed in the attached Excel worksheets (Annex 3B).

Million (USD)

		Djibouti	***Ethiopia***	***Kenya***	***Somalia***	***South Sudan***	***Ave.***	***Data Source***	
1)	*Total Imports*	4,321.6	4,163.1	1,569.13	3,518.82	*21.5*		*WITS-Country Profile*	
2)	*Total Exports*	4,594.6	873.5	*619.4*	123.8	9.5		*WITS-Country Profile*	
3)	Import Taxes	812.5	674.4	106.7	246.3	2.2		WTO, 2023	
4)	Export Taxes	0	141.51	0	0	0		World Bank, 2023	
5)	Import Duties &Taxes (%)	18.8%	16.2%	6.8%	7.0%	10.2%		World Bank, 2023	
6)	VAT	10.0%	15.0%	16.0%	10.0%	15.0%		World Bank, 2023	
	SCF	1.09	1.11	1.05	1.07	1.07			
	SER	194.18	61.83	159.62	610.88	643.37			
	OER	178.0	55.9	152.2	572.2	600.8			
	SCF*	**0.98**	**0.94**	**0.88**	**0.96**	**0.91**	**0.93**	IGAD*	0.93

**SCF with VAT also applied to all tradable goods

** We take the average for all 5 countries as SCF For IGAD

Shadow Exchange rate (SER) and Standard Conversion Factor (SCF) calculation

SER = OER * SERF. SER=(M+X)/[(M+Tm)+(X-Tx)]*OER

SCF = SER/OER

Furthermore, for some key traded goods, specific import/export parity prices at farm gate have been standardized using conversion factors for each category of costs, and eliminating taxes, transfers and subsidies as shown in the table below. Specifically, import parity prices are computed for fertilizers (DAP, CAN, Urea, Phosphate and Potassium Chloride), and pesticides that are among key imported items using the conversion factors shown below. Export parity price is computed for most of the exportable commodity among those targeted by the Programme and the present analysis.

Conversion factors for import/export parity prices

Conversion Factor for imported chemicals Djibouti	0.77
Conversion Factor for agric export/products Djibouti	0.84
Conversion Factor for imported chemicals Ethiopia	0.81
Conversion Factor for agric export/products Ethiopia	0.85
Conversion Factor for imported chemicals Kenya	0.79
Conversion Factor for agric export/products Kenya	0.88
Conversion Factor for imported chemicals Somalia	0.62
Conversion Factor for agric export/products Somalia	0.74
Conversion Factor for imported chemicals South Sudan	0.71
Conversion Factor for agric export/products Sudan	0.75

In order to account for the implicit cost of the investments, the EA links social discount rates to the long-term growth prospects of the target countries. The average for all the five participating countries was adopted for the EA at 11%. Though a sensitivity analysis was carried out for different social discount rates. This typically falls with each country's deposit lending rate and the real interest rate as shown in the table below. The rate is also reasonable given the economic growth profiles of the targeted countries (see table below). The shadow wage rate was obtained by dividing the economic wage rate for unskilled labour by the market wage rate to get a conversion factor as presented in the table below.

Discount Rate (DR)

	Indicator	Deposit interest rate	Lending interest rate	Average	*DR Financial Analysis*	*DR Economic Analysis*	
Djibouti	*Rate (%)*	1.7%	11.2%	6.4%	***6.4%***	***12%***	*AfDB, 2023*
Ethiopia	*Rate (%)*	7.7%	8.0%	7.9%	***7.9%***	***10%***	*AfDB, 2023*
Kenya	*Rate (%)*	7.2%	10.5%	8.8%	***8.8%***	***12%***	*AfDB, 2023*
Somalia	*Rate (%)*	25.0%	13.1%	19.1%	***19.1%***	***10%***	*AfDB, 2023*
South Sudan	*Rate (%)*	0.1%	12.0%	6.0%	***6.0%***	***12%***	*AfDB, 2023*
Average for the Program					***9.6%***	***11%***	

GDP Annual Growth Rate (AGR %)

GDP Growth Rate	2018	2019	2020	2021	2022	Average
Djibouti	4.8	5.5	1.3	4.5	3.2	3.86
Ethiopia	7.7	9	6.1	6.3	6.4	7.10
Kenya	5.7	5.1	-0.3	7.6	4.8	4.58
Somalia	3.0	3.6	-2.6	3.3	2.4	1.94
South Sudan	-2.1	0.9	-6.5	5.3	0.5	-0.38

Wage Shadow Rate (WSR)	Market Wage Rate (USD)	Economic Wage Rate (U	CF = EWR/MWR
Djibouti	196.67	84.29	0.43
Ethiopia	225.34	93.89	0.42
Kenya	99.34	64.68	0.65
Somalia	79.69	53.20	0.67
South Sudan	84.88	61.92	0.73

Also, the carbon sequestration potentials of the 810,000 ha, of cultivable land area under BREFOL were normalized to the economic prices using the World Bank shadow prices for carbon as shown in the table below. Detailed computation for each country is presented under the model assumption Excel worksheets (Annex 3B). In addition to the carbon sequestration potentials normalized to economic prices using the shadow prices for carbon, there are many other

important mitigation co-benefits that can't be valued at the conversional markets. For example, according to FAO[2] and USAID[3], climate-resilient agricultural practices (CRA) can reduce the intensity of climate impacts on agriculture productivity and generate additional benefits by increasing resilience to floods and droughts. Certain CRA practices such as, use of drought resistance and improved yield seeds, sustainable agro-forestry practices, and livestock management, have been shown to improve soil quality and potentially double the yield per hectare. On the other hand, agro-forestry practices will provide an alternative and more sustainable source and many other benefits for smallholders as it offers compelling synergies between adaptation and mitigation. According to Mbow et al. (2014)[4], agroforestry is a source of income from carbon and wood fuels, it improves soil fertility and creates micro-climates and it provides ecosystem services and reduces the intensity of human impacts on natural forests. In general, agroforestry improves the economic and resource sustainability of agriculture while sequestering greenhouse gases. It provides a particular set of innovative practices that are designed to enhance productivity in a way that often contributes to climate change mitigation through enhanced carbon sequestration, and that can also strengthen the system's ability to cope with adverse impacts of changing climate conditions (Torquebiau, 2013).[5]

Shadow Prices of carbon (in USD/tonne of carbon, in 2022 $USD CPI adjusted).

Shadow Prices of Carbon (in USD/tonne of carbon, in 2022 $USD CPI adjusted). Source: World Bank											
Year	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**
Low	51.0	52.0	53.0	54.0	56.0	57.0	58.0	59.0	60.0	61.0	63.0
High	102.0	103.0	105.0	108.0	111.0	113.0	116.0	118.0	121.0	124.0	126.0
Average	76.5	77.5	79.0	81.0	83.5	85.0	87.0	88.5	90.5	92.5	94.5
Aggregate (0000$)	125.5	127.1	129.6	132.8	136.9	139.4	142.7	145.1	148.4	151.7	155.0
	2034	**2035**	**2036**	**2037**	**2038**	**2039**	**2040**	**2041**	**2042**	**2043**	**2044**
Low	65.0	66.0	67.0	69.0	71.0	72.0	74.0	76.0	77.0	79.0	79.0
High	129.0	132.0	135.0	138.0	142.0	144.0	148.0	151.0	155.0	158.0	158.0
Average	97.0	99.0	101.0	103.5	106.5	108.0	111.0	113.5	116.0	118.5	118.5
Aggregate (0000$)	159.1	162.4	165.6	169.7	174.7	177.1	182.0	186.1	190.2	194.3	194.3

Source: World Bank

Beneficiaries: The programme is expected is expected to directly benefit **3.7 million** (GCF plus baseline investments) smallholder farmers and pastoralists who must be organized into Farm-based Associated (FBAs), Women in Agribusiness Enterprises (WABEs), Youths in Agribusiness Enterprises (YABEs), Agricultural Cooperative Societies (ACSs), Producers Organisation, Agro-Dealers, and Agribusiness MSMEs. It will also indirectly benefit over 14.92 **million** people (GCF plus baseline investments), of which 50% will be women and 50% youths. Other beneficiaries include: 12,000 women-led MSMEs/FBAs, youth-led MSMEs/FBAs ACSs, and other Agribusiness MSMEs, and at least **5 Local Private Financial Institutions (LPFIs).** Furthermore, about **7 Technologies for African Agricultural Transformation (TAAT) COMPACT** technologies and innovative solutions will be transferred to support climate resilient, low emission development during the implementation of the programme. The breakdown of the beneficiaries is summarized in the table below, disaggregated by country. More details are provided in Annex 17 (country breakdown) and Annex 22 (computations).

[2]FAO. (2012). Identifying opportunities for climate-smart agriculture investments in Africa. Rome: Food and Agriculture Organization of the United Nations - Economics & Policy Innovations for Climate-Smart Agriculture.

[3] USAID (2017). Cost and Benefit Analysis for Climate-Smart Agricultural (CSA) Practices in the Coastal Savannah Agro-Ecological Zone (Aez) of Ghana. USAID Working Paper, September 2017. f

[4]Mbow, C., Smith, P., Skole, D., Duguma, L., Bustamante, M. (2014). Achieving mitigation and adaptation to climate change through sustainable agroforestry practices in Africa. Current Opinion in Environmental Sustainability, 6, 8-14.

[5]Torquebiau, E. (2013). Agroforestry and climate change. FAO webinar. http://www.fao.org/climatechange/36110-0dff1bd456fb39dbcf4d3b211af5684e2.pdf

Programme Direct Beneficiaries

Country	Expected total number of direct beneficiaries
Djibouti	447,628.81
Ethiopia	875,390.25
Kenya	963,934.91
Somalia	465,288.68
South Sudan	765,261.30
IGAD	183,957.04
Total	**3,701,461.00**

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Economic Programme Costs. The programme financial costs, invested over 6 years, are derived from the budget reported in the project proposal (Annex 4). Since separate EFA have been carried out for the baseline investment, the economic costs used in the EA is limited to GCF investment only. The financial costs have been converted into economic cost using the SCF shown above, for each of the participating country, and then aggregated. The conversion produces a financial cost of about $141.61 million as shown below. In order to avoid double counting, costs already included in the estimation of the net incremental benefits of the crop models have been excluded as they are incorporated in the aggregation of the farm household and per hectare activity models.

Aggregate costs summary

Program Costs Summary (000,000$)								
Aggregate Costs Summary								
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	**Total**
Financial Costs	$45.30	$37.75	$30.20	$15.10	$15.10	$7.55	$0.00	**$151.01**
Economic Costs	$42.49	$35.41	$28.33	$14.16	$14.16	$7.08	$0.00	**$141.64**

Programme performance indicators (EIRR and NPV). Three performance indicators were computed for the EA. That is, the *Economic Net Present Value* (ENPV), *Economic Internal rate of Return (EIRR), and the Modified Internal Rate of Return (MIRR)* as presented in the table below. On this basis, the EA calculates an aggregate economic internal rate of return of 28.0% for the Programme baseline scenario, aggregate economic net present values (ENPVs) of $112.74 million at a discount rate of 11.0%, $133.92 million at 10.0% discount rate, $100.48 at 7.9% discount rate, and $238.11 million at discount rate of 6.0.

Sensitivity Analysis: To test for the EA model stability, we carried out additional robustness check on key variables of the model. That is, 10 and 20% cost over-run, benefits increment, benefits decrease, and 1 and 2 years of benefits delays. Results are further shown in the table below. In all cases the EIRR and the MIRR were higher than the discount rates used and, in most cases; they were much higher. The ENPV were also always positive. This demonstrates that the Program is not only very robust but also it would remain viable under a wide range of alternatives.

Summary table of the key EA performance indicators for different discount rates

	Key Performance Indicators for Different Discount Rates (DR)								
Economic Discount Rate (EDR)									
	11.0%	**10.0%**	**12.0%**	**6.0%**		**11.0%**	**10.0%**	**12.0%**	**6.0%**
	ENPV (000$)				**EIRR (%)**	**MIRR (%)**			
Base Scenario	$112.74	$133.92	$100.48	$238.11	28.0%	16.9%	16.1%	17.3%	13.9%
costs +10%	$101.86	$122.75	$89.79	$225.91	24.9%	16.0%	15.3%	16.5%	13.0%
costs +20%	$90.98	$111.59	$79.09	$213.70	22.3%	15.3%	14.6%	15.7%	12.3%
benefits +10%	$134.89	$158.47	$121.23	$274.14	31.5%	17.8%	17.1%	18.3%	14.8%
benefits +20%	$157.05	$183.03	$141.97	$310.16	35.1%	18.6%	17.9%	19.1%	15.6%
benefits -10%	$90.59	$109.36	$79.74	$202.09	24.6%	15.9%	15.2%	16.4%	13.0%
benefits -20%	$68.43	$84.80	$59.00	$166.07	21.2%	14.9%	14.2%	15.4%	12.0%
benefits postipated 1 Year	$88.37	$108.87	$76.55	$210.54	21.8%	15.1%	14.4%	15.6%	12.1%
benefits postipated 2 Year	$112.31	$133.76	$99.89	$238.99	26.9%	16.1%	15.4%	16.6%	13.1%
* See Dashboard for NPV Value									

IV. Conclusion

In conclusion, the financial and economic analysis conducted for the BREFOL Programme aimed to demonstrate the financial and economic viability of the proposed interventions and evaluate the effectiveness of Green Climate Fund (GCF) investments. The analysis encompassed both financial and economic aspects, utilizing crop and household financial models followed by an economic assessment. The financial analysis (FA) served a triple purpose: firstly, to evaluate the financial soundness of the development interventions; secondly, to gauge the impact of BREFOL activities on the incomes of various beneficiary groups; and thirdly, to provide an analytical framework for the economic assessment of BREFOL at the societal level. Data were meticulously sourced from both primary and secondary sources, including field surveys, stakeholder consultations, focus group discussions, and information from relevant agricultural bodies. Two scenarios, 'without project' (WOP) and 'with project' (WP), were considered in the financial analysis. The results indicated that almost all crop models were profitable from a farmer's perspective, demonstrating the effectiveness of investments in supporting innovation adoption. The introduction of the Technologies for African Agricultural Transformation (TAAT) Program into the Programme was shown to potentially double yields for selected crops, further enhancing farmers' financial outcomes. The financial analysis concluded that potential net incomes of smallholder farmers and other beneficiary groups would significantly increase due to BREFOL activities, affirming the financial attractiveness of the proposed production packages. The economic analysis (EA) aimed to assess the economic viability and overall cost-effectiveness of the Programme from a societal standpoint. Key performance indicators, including the *Economic Net Present Value (ENPV),* the *Economic Internal Rate of Return (EIRR)*, and *the Modified Internal Rate of Return (MIRR)* were computed. The EIRR of 28.0% and the MIRRs of 16.9%, 16.1%, 17.3%, and 13.9% under different discount rates (base case scenarios), exceeded the opportunity cost of capital, confirming the economic justification of the Programme in the Horn of Africa region. To test model stability, robustness checks were performed on key variables, demonstrating the economic robustness of the proposed program under various simulated changes. In summary, the results of both financial and economic analyses underscore the favourable prospects of BREFOL, not only in terms of individual and household benefits but also from a broader societal and economic perspective in the Horn of Africa region.