



The World Bank

Food Systems Resilience Program for Eastern and Southern Africa (P178566)



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TECHNICAL ANNEXES

FOR A

FOOD SYSTEMS RESILIENCE PROGRAM FOR EASTERN AND SOUTHERN AFRICA

AS PHASE 1 UNDER THE MULTI-PHASE PROGRAMMATIC APPROACH

WITH AN OVERALL FINANCING ENVELOPE OF US\$2.3 BILLION EQUIVALENT

MAY 24, 2022

Agriculture and Food Global Practice
Water Global Practice
Eastern and Southern Africa Region



ANNEX II-1: Economic and Financial Analysis for Phase 1

1. **This annex presents the economic and financial analysis (EFA) for the first phase of the Food Systems Resilience Project for Eastern and Southern Africa, covering Ethiopia and Madagascar.** The EFA applies a pragmatic approach to the Cost-Benefit Analysis (CBA) to a range of key agricultural activities for each beneficiary country, using key statistics and past project experiences. While the Ethiopia version of the analysis is more advanced, there is the risk of double counting of beneficiaries, and the Madagascar version defines project boundaries using resource constraints to deliver internal coherence and proportionality.¹ With this said, approximately 1.81 million direct beneficiary households are expected to experience substantial net incremental benefits. The project is expected to generate substantial on-site and off-site benefits, from four types of investment in: (a) building of resilient productive capacity, (b) sustainable development of natural resources in agricultural landscapes, (c) enhanced market access, and (d) food systems resilient focused public policies and regional coordination.
2. **The annex is structured around three key questions.** The first asks, “what is the project’s development impact?” This is an underlying question to cost-benefit analysis, which considers the expected stream of project benefits and costs, and establishes an explicit causal framework linking project activities to targeted outcomes. The second asks, “is public sector provision or financing the appropriate vehicle?” It probes the rationale for public financing and/or implementation and explicitly considers alternative modes of financing. The third asks, “what is the World Bank’s value added?” It examines the World Bank’s contribution to the project outcomes and seeks to determine the benefit of World Bank’s involvement, or whether the proposed project maximizes the development impact.
3. **The analysis draws a link between the project’s investments in multiple benefit streams that assumes direct interactions between improved natural resources management and more resilient livelihood activities, reduced food insecurity, and poverty reduction.** The project’s expected results are driven by investments in upstream and downstream areas around watersheds and specific value-chains, resulting in increased agricultural productivity and sales, as well as incomes for agricultural producers and processors, to improved market access and institutional development of public offices and capacity building of key participants in the generation and dissemination of technology, to improved food access and lower food prices on local and regional markets - within a food systems nutrition sensitive approach. The present analysis focuses primarily on net incremental gains in productivity and income for project beneficiaries involved in key crops, livestock activities and forest products, while quantifying some of the environmental benefits, and assuming related improvements in agrobiodiversity, climate-smart agriculture and integrated land management practices and technologies, research and development and improved public policies. Therefore, the results are to be considered conservative, given the project’s full potential.
4. **To estimate the benefits of the project’s investments, the CBA seeks to determine whether the dollar benefits of the project are likely to outweigh dollar costs, by comparing the ‘without-project’ and ‘with-project’ scenarios as two hypothetical scenarios to generate the net incremental benefit.** The project-level aggregation is based on reasonable adoption rates and value for money principles for

¹ The net incremental benefit per hectare by crop, the number and type of targeted beneficiaries and hectares of land harvested were used to define the potential command area of the project, while the budget by component remains to be defined for Madagascar. Please refer to the Ethiopia EFA for more detailed analysis.



achieving developmental impact. In addition, the analysis incorporates the estimated benefits resulting from the greenhouse gases (GHG) accounting, using the Ex-Ante Carbon-balance Tool (EX-ACT) methodology. The EFA also benefits from previous *ex-ante* project analyses² in regional agricultural investment, documented literature reviews that take up the issue of regional spillover effects and good practice AKIS³ notes on economic analyses.

5. **Some (quantified and unquantified) general assumptions are based on local, regional and global conditions.** Local assumptions include that operation and maintenance costs are 6 percent the discount period is 20 years, agricultural activities increase productivity by 15-30 percent and grant subsidies are limited to 50 percent of cost of financed activities. Regional assumptions are that: (a) better management of ecosystem services results in the reduction of soil loss; (b) soil nutrient replacement improves resilience of agricultural production that is affected by a warming climate and potential water deficit; (c) repairs associated with natural disasters (e.g. floods and landslides) are reduced due to increased flood protection; (d) improved access roads reduce travel times and allow for better market access and market prices; and (e) increased capacities and reduced repair and maintenance costs in multiple sectors supported by the project increases the overall resilience of public authorities and private households to adapt to forces of change. Global assumptions include carbon sequestration per hectare using market and shadow prices of carbon are based on World Bank Guidance Notes on Shadow Price of Carbon, 2017. Low, high and average social values of carbon start at US\$ 42, US\$ 84 and US\$ 63 respectively, in 2022 and increase up to US\$ 64, US\$ 128 and US\$ 96 in 2041.

6. **Project development impact.** The modelling considers capturing the collective 'technology capital' generated by human, physical, and institutional research and extension stock and its impact on driving agricultural productivity, at the most basic and fundamental – crop, farm, and livestock – level. The modelling aggregates the number of anticipated farmers and hectares harvested at the project-level. The modelling factors in qualitative and quantitative improvements in (a) input supply, postharvest handling services and agribusiness services, (b) accelerated adoption of improved agricultural technologies, (c) increased agricultural productivity, sales and income by producers and processors (d) enhanced food and nutrition security (e) increased job creation and youth employment (f) benefits from green, grey and marketing infrastructure (g) enhanced climate resilience across agricultural landscapes using ILM practices and technologies, (h) broad use of climate-smart agricultural practices, and (i) enhanced economic integration of local and regional agricultural markets. These benefit streams suggest the project can produce a positive level of return, due to historic underinvestment in the sector at large. The estimated returns when calculating the economic internal rate of return (EIRR) for FSRP investments is **25.8 percent**, while the net present value is estimated at **US\$1,131.85 million**. In terms of GHG accounting, the results are very positive, with the total reduction in CO₂e emissions estimated at 21.1 million tonnes over 20-years.

7. **Spillover effects.** At the regional level, the potential to capture spillovers of technology from outside the region is historically less in Sub-Saharan Africa than in other regions. One reason is that crops grown in Sub-Saharan Africa are more diverse and include many so-called 'orphan crops' for which little global public or private research and development (R&D) is done. The project is however well positioned to generate positive spillover effects through its regional dimension by supporting the dissemination of

² West Africa Agricultural Productivity Program, East African Agricultural Productivity Programme and Eastern and Central Africa Agricultural Transformation Program.

³ Agricultural Knowledge and Information Systems (AKIS).



technology while recognising the 'agroecological distance' between Africa and other regions and the fragmentation of agricultural research centres within Sub-Saharan Africa. Although benefits are likely to lag in this respect, the project can still generate positive results in this area. Capturing such benefits over time in evaluations is inherently difficult and may go underreported. Nevertheless, the services by the project will likely be significant in this respect and are worth recognising here. At the local level, the anticipated on-site benefits are likely to continue beyond the immediate beneficiary target areas of the basins into off-site areas. It is realistic to expect additional spillover effects due to investments in better green infrastructure, environmental control and ecosystem services and better access to food and improved diets. Some of the off-site benefits are captured in the analysis, such as improved carbon sequestration, but not all off-site benefits are included. It is anticipated that after the project is implemented, lessons learned will be transferable, and replicable as a model for other vulnerable communities in Phase 2.

8. **Project summary table.** The project-level results are tested with various discount rates to account for short-term volatility and risk by using a discount rate of 12 percent and the long-term nature of infrastructure investments by using a 3 percent discount rate, while the standard 6 percent discount rate is considered the norm. In all instances, the project returns are estimated to be positive.

Performance indicators - over 20 years

	0.06	0.12	0.03
EIRR	25.8%	25.8%	25.8%
NPV (US\$ MN)	1,311.85	554.79	2,001.63
NPVb (US\$ MN)	1,967.37	1,071.52	2,754.10
NPVc (US\$ MN)	655.52	516.73	752.47
Switching values - benefit	-0.67	-0.52	-0.73
Switching values - cost	2.00	1.07	2.66
BCR	3.00	2.07	3.66

		2022	2023	2024	2025	2026	2027	2028	2041
PROJECT-LEVEL ANALYSIS		Yr-1	Yr-2	Yr-3	Yr-4	Yr-5	Yr-6	Yr-7	Yr-20
Net Incremental benefits	US\$ MN	-98.83	-160.20	-131.25	-63.89	18.26	145.70	209.40	187.95
Total benefits	US\$ MN	-40.35	-4.24	11.65	56.27	123.66	207.09	263.51	194.76
Total costs	US\$ MN	58.48	155.96	142.89	120.17	105.40	61.39	54.11	6.82
NPV by year	US\$ MN	-93.24	-235.81	-346.01	-396.62	-382.97	-280.26	-140.99	1,311.85

9. **Sensitivity Analysis.** The EFA uses the incremental net benefit from each country based on past project experiences, and aggregates this to the project-level. Sensitivity analysis of the results checks for robustness across key variables over the 20-year discount period. Sudden changes in pricing and delays in implementation are key. The below heat map table highlights the scenarios with distinctly high and low returns.



Table 1: Sensitivity analysis results table.

Scenarios	IRR			NPV		
	0.06	0.12	0.03	0.06	0.12	0.03
base scenario	19%	19%	19%	991.54	324.36	1,614.78
costs +10%	17%	17%	17%	892.53	248.81	1,498.92
costs +20%	15%	15%	15%	793.53	173.27	1,383.06
costs +30%	14%	14%	14%	694.53	97.72	1,267.20
benefits +10%	21%	21%	21%	1,189.69	432.34	1,892.12
benefits +20%	23%	23%	23%	1,387.85	540.32	2,169.46
benefits +30%	25%	25%	25%	1,586.01	648.31	2,446.79
benefits -10%	17%	17%	17%	793.38	216.38	1,337.44
benefits -20%	15%	15%	15%	595.22	108.39	1,060.10
benefits -30%	12%	12%	12%	397.06	0.41	782.76
benefits delayed 1 year	16%	16%	16%	821.75	190.53	1,428.71
benefits delayed 2 years	13%	13%	13%	656.98	69.60	1,239.65

10. **Public provisioning of finances.** The threat of ever-increasing events in natural disasters, conflict, disease and climate change is a fate shared by many countries across Sub-Saharan Africa. This threat can diminish the food resilience of economies that are already challenged by structural transformation of an economy dominated by agriculture and low productivity growth. To kick-start a process of improved predictability, resilience and transformation, a combination of strategic investments, conducive policies and effective institutions requires a public coordinating body to guide the process, to build institutional capacities and to trigger and crowd-in private sector involvement. Support for natural disasters and crisis response, financed by the project, is usually a function of the State, even in developed market economies. Public sector funding is justified on this basis but also since investments will involve the rehabilitation and improvement of State-managed landscapes, green infrastructure and assets, and in the provision of public goods that are important for local communities at the provincial and national levels. These upstream investments are mirrored by downstream investments to help build climate-resilient grey infrastructure systems from natural disasters and public institutional strengthening to better deal with the unpredictability.

11. **Supporting local communities to respond to ever-increasing threats, risks and costs in the aftermath of crises is a public good.** Yet, even without these challenges, moving from low input, low output practices and into high risk, low output perceptions of risk require external assistance to shoulder some of the burden of experimentation during the adoption of new technologies, innovations and management practices among smallholder farmers, producer organizations, and MSMEs. Project grant funding will for these reasons work to trigger private-sector investors to co-invest and share the burden of risk and allow the project to focus on investments in environmental services, carbon sequestration and the dissemination of new practices and techniques, which are clear public goods that the project is well placed to support.

12. **World Bank value addition.** The World Bank's position as a global convener is well recognized and even more so in Sub-Saharan Africa. The project focuses on the softer issue of collaboration and coordination among participating countries, an area that the World Bank is well positioned to fund and assist the requests by the countries through its global network and accumulated knowledge and experience in this area.



ANNEX II-2: Greenhouse Gas Accounting for Phase 1

- 1. Introduction.** In its 2012 Environment Strategy, the World Bank adopted a corporate mandate to conduct greenhouse gas (GHG) emissions accounting for investment lending. The quantification of GHG emission is an important step in managing and ultimately reducing emissions, and is common practice for many international financial institutions.
- 2. Methodology.** The World Bank had adopted the EX-ACT developed by the FAO in 2010,⁴ to assess a project's net carbon-balance. This is the net balance of tons of CO₂ equivalent (tCO₂e) GHGs that were emitted, or carbon sequestered as a result of project implementation compared to a 'without project' scenario compared to the 'initial' scenario. EX-ACT thus estimated the carbon stock changes as well as GHG emissions per unit of land, expressed in tCO₂e per hectare, per year.
- 3. Data Inputs in EX-ACT.** Ethiopia is considered to have a predominantly warm temperate climate and High Activity Clay soil, while in Madagascar the climate is considered predominantly tropical mountain and moist with low activity clay soils. The project duration is 7 years, and the capitalization period is assumed to be 13 years. Dynamics of evolution are assumed to be linear. Default 'Tier 1' coefficients are used.
- 4. Summary Results.** The project proposes several activities that can be captured with the GHG accounting tool EX-ACT. Under component 1, the project aims to invest in climate-smart agricultural practices, as well as Farmer-Field Schools, restoration of productive assets and innovation and services for agri-business development, after climatic and weather event shocks. Changes in the current, without-project and with-project scenario are presented with the above investments incorporated, using aggregate figures for land use, as per the EFA.

Table 1: Preliminary EX-ACT Results - All GHG in tCO₂e

Component		WITHOUT	WITH	BALANCE
Land use changes				
	Deforestation			
	Afforestation			
	Other land-use	-186,733	-173,276	13,457
Crop land	Annual	8,130,606	3,351,401	-4,779,205
	Perennial	-167,644	-772,062	-604,418
	Flooded Rice	-64,520	147,115	211,635
Grasslands & L.stock	G.lands & L.stock	32,521,953	27,316,806	-5,205,147
	Forest mngt.		-12,838,210	-12,838,210
	Inland wetlands	672	672	0
	Coastal wetlands		0	0
	Inputs and invest.	1,570,569	3,767,246	2,196,677
Total emissions, tCO ₂ -e		41,804,903	20,799,692	-21,005,211
Per hectare		82	41	-41
Per hectare per year		4	2	-2
Ethiopia, ha		40,005		
Madagascar, ha		472,244		
Total, ha		512,249	per year	-1,050,261

- 5.** First results show that the project sequesters a net amount of **-21,005,211 tCO₂e** over 20 years, **-1,050,261 tCO₂e** annually, due to increases in fertilizer usage and increased cropping intensity that are

⁴ <http://www.fao.org/in-action/epic/ex-act-tool/en/>



offset by climate smart agricultural practices, ILM and reforestation/afforestation activities.

Table 2 Summary table: Ethiopia EX-ACT Results

GROSS FLUXES				SHARE PER GHG OF THE BALANCE					AVERAGE ANNUAL EMISSIONS		
In tCO ₂ -e over the whole period analysis				In tCO ₂ -e over the whole period analysis					In tCO ₂ -e/yr		
PROJECT COMPONENTS	WITHOUT	WITH	BALANCE	CO ₂ BIOMASS	CO ₂ SOIL	N ₂ O	CH ₄	ALL NON-AFOLU EMISSIONS*	WITHOUT	WITH	BALANCE
Land use changes											
Deforestation	0	0	0	0	0	0	0		0	0	0
Afforestation	0	0	0	0	0	0	0		0	0	0
Other land-use	0	13,457	13,457	29,139	-15,682	0	0		0	673	673
Annual	3,090,163	-12,791	-3,102,953	0	-2,865,003	-152,170	-85,781		154,508	-640	-155,148
Cropland											
Perennial	0	-506,745	-506,745	-286,952	-219,793	0	0		0	-25,337	-25,337
Flooded rice	0	0	0	0	0	0	0		0	0	0
Grasslands & Livestock											
Grasslands	0	0	0	0	0	0	0		0	0	0
Livestock	32,521,953	32,640,806	118,853			75,584	43,269		1,626,098	1,632,040	5,943
Forest mgmt.	0	0	0	0	0	0	0		0	0	0
Inland wetlands	672	672	0	0	0	0	0		34	34	0
Coastal wetlands	0	0	0	0	0	0	0	0	0	0	0
Inputs & Invest.	1,570,569	3,723,718	2,153,149		0	887,880		1,265,269	78,528	186,186	107,657
Total emissions, tCO₂-e	37,183,356	35,859,117	-1,324,239	-257,813	-3,100,478	811,295	-42,512	1,265,269	1,859,168	1,792,956	-66,212
Total emissions, tCO₂-e/ha	1,062.2	1,024.4	-37.8	-7.4	-88.6	23.2	-1.2	36.1			
Total emissions, tCO₂-e/ha/yr	53.1	51.2	-1.9	-0.4	-4.4	1.2	-0.1	1.8			

+ = Source / - = Sink

Results presented here include GHG fluxes on mineral and organic soils
See further down for detailed results on organic soils

* Includes fisheries, aquaculture and inputs & investments that are not included in the AFOLU definition.

Uncertainty level	tCO ₂ -e/yr	Percent
Without	1,859,168	35%
With	1,792,956	33%
Balance	-66,212	40%

Table 3 Summary table: Madagascar EX-ACT Results

GROSS FLUXES				SHARE PER GHG OF THE BALANCE					AVERAGE ANNUAL EMISSIONS		
In tCO ₂ -e over the whole period analysis				In tCO ₂ -e over the whole period analysis					In tCO ₂ -e/yr		
PROJECT COMPONENTS	WITHOUT	WITH	BALANCE	CO ₂ BIOMASS	CO ₂ SOIL	N ₂ O	CH ₄	ALL NON-AFOLU EMISSIONS*	WITHOUT	WITH	BALANCE
Land use changes											
Deforestation	0	0	0	0	0	0	0		0	0	0
Afforestation	0	0	0	0	0	0	0		0	0	0
Other land-use	0	0	0	0	0	0	0		0	0	0
Annual	1,228,110	856,056	-372,054	0	-310,036	-16,859	-45,158		61,405	42,803	-18,603
Cropland											
Perennial	-167,644	-265,317	-97,673	0	-97,673	0	0		-8,382	-13,266	-4,884
Flooded rice	-64,520	147,115	211,635	0	0	-28,806	240,441		-3,226	7,356	10,582
Grasslands & Livestock											
Grasslands	0	-5,324,000	-5,324,000	0	-5,324,000	0	0		0	-266,200	-266,200
Livestock	0	0	0			0	0		0	0	0
Forest mgmt.	0	-12,838,210	-12,838,210	-12,838,210	0	0	0		0	-641,911	-641,911
Inland wetlands	0	0	0	0	0	0	0		0	0	0
Coastal wetlands	0	0	0	0	0	0	0	0	0	0	0
Inputs & Invest.	0	43,528	43,528		0	11,671		31,857	0	2,176	2,176
Total emissions, tCO₂-e	995,946	-17,380,828	-18,376,774	-12,838,210	-5,731,710	-33,995	195,283	31,857	49,797	-869,041	-918,839
Total emissions, tCO₂-e/ha	2.4	-41.5	-43.9	-30.7	-13.7	-0.1	0.5	0.1			
Total emissions, tCO₂-e/ha/yr	0.1	-2.1	-2.2	-1.5	-0.7	0.0	0.0	0.0			

+ = Source / - = Sink

Results presented here include GHG fluxes on mineral and organic soils
See further down for detailed results on organic soils

* Includes fisheries, aquaculture and inputs & investments that are not included in the AFOLU definition.

Uncertainty level	tCO ₂ -e/yr	Percent
Without	49,797	44%
With	-869,041	40%
Balance	-918,839	40%



ANNEX II-3: Gender Gap Analysis and Gender Action Plan

Overview and Analysis

Regional Gender Gaps

1. **Women represent upward of 40 percent of the agricultural labor force globally and grow much of the food for their families and communities.** In East and Southern Africa (ESA), this number is at times much higher; more than 75 percent of employed women in Burundi, Mozambique, and Uganda are employed in agriculture.⁵ In ESA, men's migration from rural areas to cities has also led to increased women's responsibilities on the farm and driven the 'feminization' of agriculture in many countries. While women provide the backbone of agricultural labor in the region, they remain under-represented and under-served by productive inputs. They are still frequently seen merely as laborers, with little decision-making power, rather than as independent farmers in need of support. Thus, the gender agricultural productivity gap persists. The 'Leveling the Field' study found that the gender productivity gap ranged from 13 percent in Uganda to 25 percent in Malawi, even when women had access to land and inputs, in part because women lack secure land tenure and have less access to education, information, and markets than men.

2. **While there have been improvements to many areas of gender inequality, such as education, health, and political participation, there are still important gender gaps, including in economic potential from agriculture and food security.** A report by UN Women and the United Nations Population Fund highlights several vulnerabilities exacerbated by the pandemic; in Malawi, 82 percent of rural women and 79 percent of urban women indicated a decrease in availability of food due to increases in the price of commodities. In Rwanda, women were more likely than men to indicate that the food that their households produced did not meet their food needs. In Uganda, lack of access to food due to COVID-19 was relatively even between genders.

Gender Gaps in Ethiopia

3. **Agriculture, the base for food security and main source of livelihood for rural communities in Ethiopia, accounts for more than 80 percent of the labor force, of which 50 percent are women.** Estimates suggest that women contribute to approximately 70 percent of food production in Ethiopia, mainly as smallholder farmers and either as spouses or FHHs. While women in married households contribute equally to agricultural activities, they rarely participate in decision-making processes and do not get to share equally the benefits (including income) of their labor with their male counterparts. Women farmers are also often excluded from equal access to inputs, technology, extension advice, and credit that are not tailored to their needs.

4. **Rural women and girls in Ethiopia are not a homogeneous group.** There are notable differences between females living in a male or female-headed household, females engaged in agriculture or pastoralism, and the youth. In all value chains, there is a general male dominance over decision-making and control of economic resources. Women and girls working in crop value chains report difficult access to productive inputs and technologies while the regular day-to-day work that they do in livestock value chains is often not remunerated. Cultural norms are strong in the livestock sector where married women,

⁵ UN Women



in particular, have almost no say in purchasing or selling livestock and use of the earned money as beef, camels, mules, and donkeys are considered male property. Also, married women have less access to opportunities to improve their knowledge and skills partly due to the wrong assumption that they will be passed to them within the household. Women cooperatives are few due to their limited access to market information and market infrastructures not taking into account women-specific needs. Even though Ethiopia has put remarkable efforts into promoting financial inclusion, it is not as successful as other East African countries. The gender disparity in financial inclusion is attributed to a variety of causes, including sociocultural, institutional, legal, and regulatory barriers, according to the literature (Adegbite and Machethe 2020).

5. **Ethiopians, especially women, prefer informal saving clubs rather than formal financial institutions.** In this regard, Lakew and Azadi (2020) argued that this preference, combined with unemployment and low income, is the barrier to the financial inclusion strategy in Ethiopia. Young rural women in Ethiopia possess less productive assets than males (Doss et al. 2019), putting them at a disadvantage when attempting to use their assets as leverage for financial services, protect themselves from income shocks, and increase their income through the use of productive assets (IFAD 2019). Also, regardless of their financial needs, most females depend on male decisions about getting access to and using financial resources. Financial inclusion, according to Abebe et al. (2017), necessitates paying close attention to institutional concerns such as gender-responsive finance technologies, efficiency, affordability, accessibility, and sustainability. Women in Ethiopia, on the other hand, lack collateral, formal identification, and mobility owing to social norms (World Bank 2017b). Inappropriate product offerings and a lack of gender-specific regulations are both significant barriers to women's financial inclusion in Ethiopia. Other barriers to Ethiopian women benefiting from financial services include legal and regulatory issues. Women, for example, are constrained by account opening requirements, obstacles to accessing formal identification, and a lack of gender-inclusive credit reporting (Alliance for Financial Inclusion ; 2017, World Bank 2017b). Furthermore, there are major gender differences, at least within urban areas. Older teenage boys were slightly more likely than girls of the same age to influence financial capital (39 percent versus 21 percent) (Jones et al. 2019).

6. **The gender gap in agricultural productivity in Ethiopia is 36 percent.** Although laws are in place to ensure equal access to land, the average size of land women own is only 60 percent of the average land size owned by men. Also, most FHHs are often forced to share or lease out their plots because they do not have adequate family labor, access to animal or mechanical traction or the financial resources to hire the labor needed (World Bank 2019b⁶). Having smaller land plots, hinders their productive capacities and availability of collateral for accessing financial services.

7. **Women also often carry the full-unpaid burden of household management and child-caring.** The burden of unpaid work of women and girls does not allow them to engage in remunerated activities, increase their self-esteem, allow attendance at education and health care services, and -participate in decision-making processes.

⁶ World Bank 2019b. What are the economic costs of gender gaps in Ethiopia?



Gender Gaps in Madagascar

8. In Madagascar, 64 percent of the population is employed in agriculture and women represent 60 percent of this workforce. Despite their large presence, the productivity of rural women is relatively low compared to men due to various factors: (a) unequal access to production plots, (b) weak targeting of women for advice and extension activities, (c) low yield for equal access to parcels and inputs, (d) extremely high workload inside and outside the household and subsequent reduced time for management of parcels as a reflection of family obligations, and (e) reduced employment of women in cash crop production (Ravelosoa et al. 2015).

9. Women are disadvantaged in access and capacity to use productive resources, such as land, finance, assets, and income. In Madagascar the land belongs to men with only 15.3 percent of agriculture landholders being women (FAO 2021). Despite the 2005 land reform, traditional marriage codes often supersede it, resulting in women frequently losing their assets when they separate or become widowed. Female heads of households are more likely than married women to obtain land deeds and women typically certify land that they have inherited individually. In contrast, among couples, there is a tendency to register jointly held land only in the name of the husband. As women tend to have less land and more workload and familiar responsibilities, they are on average more vulnerable to any unforeseen shock. As a result, food insecurity and malnutrition disproportionately affect women and children, making them a high-risk population, and increase the risk of infection with other diseases globally (FAO et al, 2020).

10. **While women are more likely to be excluded from financial services altogether, they rely more on informal financial services compared to men.** In 2018, only 16 percent of women had a bank account at a financial institution (World Bank 2018). Credit requirements and financial guarantees are the main challenges for many women, particularly in rural areas (Mahmud and Rabary 2019). While Madagascar performs well in terms of establishing equality between men and women in signing a contract, registering a business, and opening a bank account, it does not have legislation in place prohibiting discrimination in access to credit based on gender (Women Business and the Law database⁷). A 2016 Finscope Survey⁸ has confirmed that women represent the majority of the adult population in Madagascar and face substantial difficulties in accessing financial services, with 41 percent of women excluded from financial services (FinScope Madagascar 2016). The Government of Madagascar launched its current financial inclusion strategy (2018–2022) with the vision to improve access to formal financial services from 29 percent in 2016 to 45 percent in 2022. To achieve these results, the financial inclusion strategy focuses on developing savings and insurance as well as financial education and consumer protection. Although gender is not specifically mentioned in the revised Insurance Law, it is expected that women will benefit from increased access to financial services once it takes effect. When it comes to financial education, the new text foresees that different entities will be responsible for implementing financial education programs. These programs will be targeted at women's groups, among others, and ensure that they are empowered to identify their own insurance needs and understand how insurance products work.⁹

⁷ <https://wbl.worldbank.org/en/wbl-data>

⁸ FinScope Consumer Survey Highlights (2016)- available at:

https://finmark.org.za/system/documents/files/000/000/262/original/finscope-madagascar-pocket-guide_en.pdf?1602600987

⁹ Bridging the Gender Gap: The role of the Insurance Supervisor. Report of the A2ii- IAIS Consultation Call (2019).



Gender Issues in the Food Security and the Agricultural Sector

11. **The COVID-19 pandemic has had an outsized effect on rural women and food security, and it is far from over.** In some cases, some of the deeper ramifications will last longer, and through generations, especially those that affected human capital such as health, education, and mobility. Addressing structural inequities, data gaps, digital gaps, information access gaps, regulatory, and institutional hurdles will be critical to ensuring women continue to access food systems and markets.

12. **Lessons from past and ongoing agriculture and food security project demonstrate some essential pathways to support women's empowerment from food systems through their better ability to produce, sell, make decisions, and be empowered from their participation.** While some interventions address immediate food security needs, a significant portion work to ensure women are able to participate to a fuller extent in the food and agriculture economy. Interventions aimed at women's empowerment are a key part of the solution to food resilience, not only to combat gender inequality but more in general to respond and overcome crises. Projects with a strong gender focus have shown outstanding response in the aftermath of the pandemic outbreak due to the roles women play in community resilience, and as backbones of the rural economy. Scaling up investments in women in agriculture and recognizing the role played by women in the food crisis situation work for the food system and for women empowerment as well. Therefore, the MPA aspires to go beyond tackling the symptoms of unequal participation in the food system, to address systemic root issues such as representation, decisions, and participation over food system resources, gender-blind national food policies, and inefficient means to providing women farmers with productive inputs.

13. **At the global level, the gender gap in the prevalence of moderate or severe food insecurity has grown even larger in the year of the COVID-19 pandemic.** The prevalence of moderate or severe food insecurity was 10 percent higher among women than men in 2020—compared to 6 percent in 2019 (SOFI 2021). Severe food insecurity in the East Africa region has been deteriorating over the years, driven primarily by the impacts of conflict, multi-season drought, floods, climate (swarms of desert locusts in the worst desert locust infestation in decades), and economic shocks on household food and income sources (FEWSnet 2022). Only in the Eastern Africa region, the prevalence of undernourishment in 2020 (28 percent) was back to the levels of 2010 while in the Southern Africa region it was higher (10 percent) than 10 years back (6 percent) (SOFI 2021). Women and children continue to be the most affected with nearly 5.5 million children in the region who are threatened by acute malnutrition and an estimated 1.4 million by severe acute malnutrition (UNNews 2022).

14. **Before the onset of the COVID-19 triggered pandemic, the WFP estimated that a record 45 million people—mostly women and children—were gravely food insecure, just within 16 countries of SADC.** This is the result of low rainfall and droughts, flooding in some areas, and economic problems. Southern Africa in particular has only had one normal agricultural growing season since 2015 because of temperature increases and dependence on subsistence farmers who are vulnerable to unreliable and ever-decreasing rainfall. In Madagascar, over 1.1 million people are coping with severe hunger, while the country has been hit by Storm Dumako, Cyclone Batsirai and Tropical Storm Ana only in the first few months of 2022 (UNICEF 2022).

15. **As highlighted by the *State of Food Security and Nutrition (SOFI)* report, women are proved to be more vulnerable to food insecurity, as they are more inclined to adopt extreme responses than men to food shortages, such as reducing calorie intake.** Moreover, *women's livelihoods depend mainly on*



informal activities linked to the sale of perishable products that if not sold on the market during times of crises within a short period, imply major losses. With reduced sales, less access to storage options, and consequently more post-harvest losses on perishables, women face major loss of income. This undermines women's ability to finance the next planting season and so their food security.

16. **Indexes measuring the gender social and economic empowerment dimensions of development**, such as the Africa Gender Index, indicate that the gaps between women and men in AFE are largest (closest to 0) in Comoros, Sudan, Eritrea, Ethiopia, and Mauritius and smallest (closest to 1) in Rwanda, Seychelles, Lesotho, Namibia, and South Africa (Human Development Report, 2020). It is worth noting that the impact of COVID-19 has exacerbated pre-existing inequalities and vulnerabilities of women and girls also within their households that will have to be properly tackled. Women and men across the ESA region think that GBV is a big problem in their country and that its frequency has increased during COVID-19¹⁰

17. **Gender inequalities related to rural access to financial services pre-existed the pandemic and are rooted in sociocultural, economic, legal, and educational constraints.** Rural women represent a majority of the financially underserved accounting for 56 percent of unbanked adults, about 1 billion people. They live mostly in rural areas and often in poverty (Fiorillo and Kellison 2019). Meeting the needs of rural women is a largely untapped opportunity for funders and financial service providers. Women power rural economies, but few solutions respond specifically to their needs and ambitions. Service providers that discard outdated business models and mass market approaches to innovate and learn from emerging innovations are poised to capture the enormous unmet market opportunities to serve rural women (Financial Solutions for Women in Rural Livelihoods, CGAP, World Bank).

18. **In the context of the COVID-19 pandemic, a diminished ability for women to access credit, worsened by decreased women's access to risky financing from banks, results in dramatic economic downturns.** According to FInscope, the biggest gender gap lies in the form of financial inclusion attained. Men in East Africa are much more likely to own a formal bank account, while women are much more likely to use informal means to access finance. Financial and non-financial service providers have opportunities to add value to rural women's lives and livelihoods, particularly by improving their access and returns to labor and markets and the project will enable tested and innovative pathways to financially service rural women better. Taking a customer-centric approach allows service providers to tailor services to the unique needs of various profiles of rural women and the contexts in which they live and work. In addition, recognizing that rural women are at the front lines of climate change, embedding climate-smart approaches in these financial and non-financial services is both essential and a key market opportunity.

19. **Women have less access to technologies, information, resources, and finance for their agriculture activities across the globe.** The gender productivity gap in agriculture – inequalities in access to and control of productive and financial resources—inhibits agricultural productivity, reduces food security, and costs millions to countries. For instance, UN Women estimates that the gender productivity gap in agriculture is US\$100 million in Malawi, US\$105 million in Tanzania, and US\$57 million in Uganda. Making those technologies, resources, and information (especially the critical climate-smart ones) available, either through improved pathways and ability to access or by tailoring those technologies and resources to those needs is essential for getting the potential of the sector.

¹⁰ [The Impact of COVID-19 on women and men. Nairobi: UN Women and UNFPA, East and Southern Africa Regional Offices, 2021.](#)



20. **Most women in ESA gain their livelihoods from subsistence agriculture, sometimes combined with informal sector micro- and small-scale businesses.** In most countries, women are more likely than men to be employed in the informal sector. With 57.2 percent, and 54 percent respectively, Ethiopia and Madagascar are among the countries where more than half of the non-agricultural labor force are women. Informality makes them disproportionately vulnerable to shocks that might disrupt their livelihoods. The impact of the COVID-19 pandemic triggered consequences (such as containment measures including lockdowns, curfews, and quarantine measures) as well as climate-related extreme events has been disproportionately unequal between men and women in the ESA region. The increased unpaid care work burden of women during the pandemic reduced their ability to participate in productive activities, study, and rest. In addition to affecting their capacity to generate income, it also negatively affected their mental and physical health. In addition, the disruption of domestic and international distribution channels of inputs and outputs as well as consumer hoarding has led to an increase in the price of agricultural and other commodities, reducing the purchasing power of households. It is estimated that the deteriorating food security situation will particularly affect female-headed households, who in most countries belong to the poorest socioeconomic segment of the society.

Program Actions and Activities

Program Focus on Three Main Gender Gaps

Barriers to Credit and Finance

21. **To support the access of women in agricultural value chains to affordable and appropriate financial services, the Program aims to support financial institutions with a package of options and solutions to meet rural women's more specific constrained demands.** Simply making credit and grants available to women does not always serve to overcome gender gaps which can stem from many layers of normative and asset-based impediments. The MPA is set up to provide, in a future partnership with CGAP's Women and Rural Livelihoods Incubator, tools using relevant and recent research that meet women's needs and localized particularities for accessing finance.

22. **The MPA aims to avail a wide array of options and financial service providers that have been identified as successful and innovative in reaching and employing women.** Digital options can be drivers of better services and better reach for them, and these will be included as part of the packages designed to reach women and groups of women in the Program. The opportunity to leverage digital financial services is particularly relevant to women, who often lack access to formal financial services provided through banks and MFIs. New technologies such as mobile payments and alternative credit scoring can overcome some traditional barriers to women's access to finance, while the entry of new players like e-commerce and last-mile distribution companies boasting large agent networks can facilitate the reach of financial services and inputs into underserved rural communities.

23. **The Program aims to identify, design, pilot, and scale innovative financial solutions that promote women's equitable participation in food systems.** Financial institutions, e-money providers, fintechs, and other emerging players such as e-commerce companies and last-mile distributors will be supported with the intent to expand women's access to (a) financing for inputs (for example, labor, seeds, fertilizer, pesticides, and tools), (b) insurance to mitigate the risks of weather and pests, and (c) payments products that improve access to input and output markets.

24. **Financial services design and support may also be used in other aspects of delivery for women farmers in the project areas.** It may be useful, for example, to leverage government transfers in times of



crisis to reach women and vulnerable households in rural and agricultural livelihoods, to include innovations and products to reach them better. This may also position stakeholders for longer-term interventions to build resilience. Designs will include rapidly assessing needs, constraints, and opportunities in local ecosystems; designing and delivering interventions related to food aid and input credit; supporting action research as well as baseline and ongoing data collection with rural households involved in the FRSP, which can be disaggregated by gender and life stage; and designing evidence-based tailored financial and nonfinancial services that help improve long-term resilience and livelihood opportunities among rural households, addressing the root causes of the gender gap in agricultural productivity. This support and design will come from partnerships between various World Bank partners, national programs regional programs and potentially more donors. CGAP increasing the number of provider collaborations, to convene a more robust provider cohort; test solutions across multiple use cases, value chains, and customer profiles; and generate a broader evidence base. This Gender Transformative Business Accelerator for Rural Women's Livelihoods will have a targeted research agenda and consist of a competitively selected cohort of financial, agricultural, and rural service providers keen to experiment, share learnings, and scale climate-responsive GTBM that add value to rural women's lives and livelihoods. The data collected in each national program will be consistent to facilitate aggregation and therefore regional and global analysis.

Access to Productive Resources and Farmer Organizations

25. **Studies point to the importance of membership in farmers' and producers' organizations as a means for women to gain access to markets and better leverage tools and resources.** As a 2021 study¹¹ points out, membership also contributes to women's empowerment. The study concluded that, "When a household joins any PO, regardless of whether the man or the woman in the household is the registered member, women achieve a higher control over production decisions, buying and selling of land and cows, use of loans and receiving dairy income. Distinguishing by gender of membership, there is stronger women empowerment when the woman in the household is a member" (Mwambi, Bijman, and Galie 2021, 1).

26. **In Sub-Saharan Africa and East Africa specifically, membership in these organizations, as well as the capacity to organize, has gone beyond the power to access inputs and markets and has shifted decision-making in the household and about market choices as well.** The Program will consider various ways of increasing women's membership in strengthening the capacity of producer and farmer organizations. Experiences from AGP II in Ethiopia show that women producer organizations (a) are often strong and stay together, (b) can potentially evolve into cooperatives, and (c) act as incubators for micro-business development for youth. In these respects, POs are important actors in the enterprise development landscape. An inventory of the status of existing groups of female producers might be undertaken and these groups selected for continued strengthening. This will include training around technical and business skills development and group dynamics, and promotion of links with input suppliers, off-takers, and regulatory or certifying bodies depending on the activities chosen. Seed funding may be provided to support the groups establishing their enterprises.

27. **Attracting women to extension services remains a bottleneck in widening women participation in rendering extension services more responsive to women' and girls' needs.** A minimum participation of women should be guaranteed with gender-related focus in the training curriculum of extension services as well as specifically designed incentives (to be identified, among other ways, through focus group

¹¹ <https://doi.org/10.1016/j.wsif.2021.102492>.



discussions and key informant interviews when drafting the gender strategy). Specific needs of women-only POs and women members of POs will be considered in training activities and the construction and functioning of rural and commercial markets through (a) flexible hours for attendants (allow women to leave early at the time they choose) and (b) child care facilities within the markets. In addition, the Program will consider establishing binding requirements for the inclusion of a gender perspective in the development of manuals, infrastructure, and market information services.

28. **Water use, decisions over landscapes and infrastructure, and irrigation decisions are also key to ensuring that women participate equally in the food system.** The Program will ensure (particularly under Pillar 3) that different uses, access points, and needs from communal resources and infrastructure are onboarded. This will include the rigorous inclusion of women in groups and associations as well as planning systems that consider different uses. For example, irrigation systems are redesigned and developed in such a way that non-irrigation uses—both productive and domestic—can be accommodated.

29. **Gender-smart indicators measure whether climate-smart technologies and interventions are contributing to women's empowerment.** Gender-smart indicators measure gender results in five main areas to measure the degree of gender empowerment, based on the Gender Empowerment Index: (a) access and control of CSA technologies, farm inputs, and personal assets; (b) increased production; (c) access to climate information services; (d) access to credit; and (e) decreases in workload, and how these affect women's participation in decisions at household and community levels. Setting into food policy that climate-smart technologies must work for women and can be reached by them will likely increase their usage and impact. Gender-smart indicators and technologies will be a core factor under Pillar 2 of MPA projects, in which advisory services and the increased access to tools and technologies will be adapted to women's demands and needs. Their impact on women, under Pillar 2, will be measured through regional research work under Pillar 5. A not insignificant side effect will be to create a more systemic demand for gender-sensitive agricultural research and technology at national and policy levels too.

Representation at Local and National Levels

30. **Including concerns of women farmers is important to ensuring better inclusion in food system goals, but for achieving all the potential, women must also be included in the decision-making processes and, in institutions, their roles must be acknowledged, and gender differentials must be captured by national and local data.** Recent CG and World Bank work highlights that recent analysis of NDCs submitted before October 2021 found that only 43 countries (22 percent) addressed gender in relation to agricultural adaptation or mitigation actions. A total of 48 NDCs were submitted by African countries, and only 23 included a reference to gender in relation to agriculture. The Program will tackle the visibility and representation of rural women by including gender in national documents, policy documents, research tracks, and strategies. It will set up an institutional framework to enable better and more sustainable investment in women farmers. The MPA will also encourage abandoning gender-blind policy approaches and systematically collect gender-disaggregated data.

31. **There is evidence that women's participation in WUAs results in better enforcement of rules, collection of fees, conflict management and resolution, more orderly and disciplined meetings, and sustainable irrigation systems.** Since women comprise a significant share of the agricultural workforce, they play a critical role in how water is used, saved, and managed in agricultural fields. Engaging women and men equally in irrigation development is critical to water resources management goals and other development objectives. This inclusion will be strongly enabled through Pillar 3 and measured in terms of



increases in participation in decision-making groups such as WUAs and other infrastructure community groups.

Table 1. Examples of Gender-Smart Actions

Pillar 2: (Re-)Building Resilient Agricultural Production Capacity	Pillar 3: Supporting the Sustainable Development of Natural Resources for Resilient Agricultural Landscapes	Pillar 4: Getting to Market	Pillar 5: Promoting a Greater Focus on Food Systems Resilience in National and Regional Policymaking
<ul style="list-style-type: none"> • Target number of gender-smart technologies developed • Extension and advisory service program (mobile, family friendly, delivered by women, on topics related to women's production) 	<ul style="list-style-type: none"> • Set a quota for women's participation in all producer and WUA groups supported by the Program • Include gender as part of training on discussion facilitation and leadership • Alternative livelihoods adapted to women's burdens and capacities 	<ul style="list-style-type: none"> • Tailored financial services given to women in the context of agricultural credit • Specific conditions set out to ensure women can access a type of credit 	<ul style="list-style-type: none"> • Support to set up a mechanism at the regional level to include gender in NAIP's • Set up strategy to include gender in investment plans
<ul style="list-style-type: none"> • Women reached with specific tools and information services through tailored campaigns 		<ul style="list-style-type: none"> • Women's groups supported with capacity building • Women's groups created with a program to ensure they reach markets 	<ul style="list-style-type: none"> • Measurement of gender-smart Indicators • Training

Program Activities and Monitoring

32. Country-level projects will also include certain prerequisite activities to set up the institutional capacity to implement the gap-closing activities. For example, they will

- Assess whether proposed project activities could heighten the risk of GBV and develop strategies for addressing the issue;
- Include concrete gender actions in the PIM to thoroughly integrate gender into the guidance for implementation of all pillars and integrate gender indicators in the results chain in the M&E manual;
- Develop the content for the project gender training for project staff and implementers at various levels and include robust project gender staffing (gender experts at the national, regional and implementers staff);
- Conduct qualitative evaluations of gender to inform on the quality of implementation of gender activities and impact; and
- Assign a gender budget to each Program pillar, tied to the specific activities identified for that pillar, which should show in the annual plans.



Regional Aspects and Activities

33. **Certain core elements of preparing country-level projects to tackle gap-closing activities will need to be supported by the MPA's regional-level activities.** Regional partners' value addition and leverage will be critical to enabling country-level projects to effectively target gender gaps. The involvement of regional partners in closing gender gaps will be of particular importance in the following areas:

- Setting up development and research support for NAIPs and national investments to include a gender lens, ensuring gender-related learning, and developing a regional gender strategy.
- Putting in place a gender-smart monitoring and measuring mechanism relating to regional agricultural research. The independent verification of the gender-smart mechanism, using CGIAR tools, will be a core part of regional-level gender activities taken on by CCARDESA. It will include the systematic collection of evidence from the MPA to generate knowledge and support policy advocacy.
- Producing and generating gender-sensitive tools. A quota and budget will be specifically set aside to ensure a steady focus on research, production, and dissemination of tools and technologies that are designed to have an impact on women farmers (irrigation-plus approaches, improved cooking stoves, household food transformation technologies, and so on) and strengthen links between gender-and nutrition-sensitive activities and technologies.
- Promoting regional policies that favor the inclusion of women and girls in agriculture and their improved productivity and decreased workload, notably by promoting study visits within the region to learn from remarkable experiences of gender inclusion in the rural world and in agriculture, organizing high-level regional events to sensitize stakeholders about the role of women, girls, and youth in agriculture, and establishing a regional platform for engaging with government in a continued dialogue on reforms that will improve the conditions of women and girls in the agricultural sector.

34. **As part of their role in capturing and tracking success in meeting gender targets, the regional institutions should assign a specific body to** (a) develop a Program (or project) gender strategy, complete with overall objectives, activities and targets for each component of projects; (b) establish a gender technical working group as part of the project technical committee; (c) develop an approach for communications on the gender strategy (familiarization workshops for staff, trainings, and more); and (d) collect case stories about successful women under the project (with pictures or videos), disseminate them, and incorporate them into project trainings as examples of best practice.

Measurement and Results Chain

35. **Capturing women's participation at every level of the Program will be critical to the measuring success.** All people-level indicators will be gender disaggregated. PrDO-level indicators will capture women beneficiaries as well as beneficiaries of climate-smart technologies that are gender smart. Furthermore, it will be important to capture female beneficiaries of all support programs and as participants in food systems processes.



36. More specifically, as it relates to the results chain on gender gaps, the Program will track:

- (Gender tag) Women farmers using modified access to inputs/services for agricultural production (number)
- (Gender tag) Technologies developed and transferred to extension services that are gender-smart (number)
- (Gender disaggregation) Female-led SMEs supported by the Program and running their business sustainably (number)
- (Gender disaggregation) WUAs set up with at least 40 percent women members (percentage)

Table 2. Project Gender Tag Results Chain

Gender Gap	Action	Indicator
Lesser access to productive resources and services, including water, land and finance, extension services and technologies	Development and provision of gender-designed services such as financial services and methods, modified access venues for productive inputs to agriculture, and support to organization and information access	Number of women using modified access to inputs/service for agricultural production (Number)
Lesser ability to withstand shocks to FSN	Specific needs of women-only POs and women members of POs will be considered in training activities and the construction and functioning of rural and commercial markets through (a) flexible hours for attendants (allow women to leave early at the time they choose) and (b) childcare facilities within the markets. In addition, the Program will consider establishing binding requirements for the inclusion of a gender perspective in the development of manuals, infrastructure, and market information services.	Technologies developed and transferred to extension that are gender-smart (number) Farmers adopting resilient enhancing technologies and practices (Number)
Limited visibility in country strategies, data, and regional commitments	Gender-smart indicators and technologies will be a core factor under Pillar 2 of MPA projects, in which advisory services and the increased access to tools and technologies will be adapted to women's demands and needs. Their impact on women under Pillar 2 will be measured through regional research work under Pillar 5. Development and research support for NAIPs and national investments to include a gender lens, ensuring gender-related learning, and developing a regional gender strategy.	Technical areas for which a regional knowledge sharing mechanism is put in place (Number) Countries with current NAIPs/NAFSIPs in place (Number)
Representation, participation, and agency over communal and natural resources	Different uses, access points and needs from communal resources and infrastructure are onboarded. This will include the rigorous inclusion of women in groups and associations, as well as planning systems that consider different uses	Female Farmers accessing food system and hydromet information to manage shocks that affect food supply (Number)