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Report No: ICR00294

IMPLEMENTATION COMPLETION AND RESULTS REPORT
IDA CREDIT 61880-ML AND IDA GRANT D2740-ML

ON A

PROPOSED CREDIT
IN THE AMOUNT OF
EURO 25.1 MILLION (US$ 30 MILLION EQUIVALENT)

AND A PROPOSED GRANT
IN THE AMOUNT OF
SDR 21.1 MILLION (US$ 30 MILLION EQUIVALENT)

TO THE
REPUBLIC OF MALI

FOR A
LIVESTOCK SECTOR DEVELOPMENT SUPPORT PROJECT

December 23, 2024

Agriculture and Food Global Practice
Western And Central Africa

CURRENCY EQUIVALENTS

(Exchange Rate Effective {June 28, 2024})

Currency Unit =	FCFA (XOF)
FCFA 657.89 =	1 EURO
1 EURO=	US$1.07
FCFA 613.49=	US$1
US$ 1.31=	SDR 1

FISCAL YEAR
January 1 – December 31

Regional Vice President:	Ousmane Diagana
Country Director:	Clara Ana Coutinho De Sousa
Regional Director:	Chakib Jenane
Practice Manager:	El Hadj Adama Toure
Task Team Leader:	Soulemane Fofana
ICR Main Contributors:	Fred Kizito, Eustacius N. Betubiza

ABBREVIATIONS AND ACRONYMS

BP	Bank Procedures
CBPP	Contagious Bovine Pleuropneumonia
CERC	Contingent Emergency Response Component
COVID-19	Coronavirus Disease 2019
CPF	Country Partnership Framework
EFA	Economic and Financial Analysis
EIRR	Economic Interna Return Rate
FAO	Food and Agriculture Organization
FCFA	Franc de la Communauté Financière Africaine
FCV	Fragility, Conflict, and Violence
GDP	Gross Domestic Product
ICR	Implementation Completion and Results Report
IDA	International Development Association
IFC	International Finance Corporation
ISR	Implementation and Results Report
M&E	Monitoring and Evaluation
NPV	Net Present Value
OP	Operational Policy
PADEL-M	*Projet de développement de l'Elevage au Mali*
PDO	Project Development Objective
PIU	Project Implementation Unit
PPR	Pestes de Petits Ruminants
SCD	Systematic Country Diagnostic
SDR	Special Drawing Rights
SME	Small and Medium Enterprise

TABLE OF CONTENTS

DATA SHEET i
I. PROJECT CONTEXT AND DEVELOPMENT OBJECTIVES 1
A. CONTEXT AT APPRAISAL 1
B. SIGNIFICANT CHANGES DURING IMPLEMENTATION (IF APPLICABLE) 4
II. OUTCOME 4
A. RELEVANCE OF PDO 4
B. ACHIEVEMENT OF PDOs (EFFICACY) 4
C. EFFICIENCY 9
D. JUSTIFICATION OF OVERALL OUTCOME RATING 10
E. OTHER OUTCOMES AND IMPACTS (IF ANY) 10
III. KEY FACTORS THAT AFFECTED IMPLEMENTATION AND OUTCOME 11
A. KEY FACTORS DURING PREPARATION 11
B. KEY FACTORS DURING IMPLEMENTATION 11
IV. BANK PERFORMANCE, COMPLIANCE ISSUES, AND RISK TO DEVELOPMENT OUTCOME 12
A. QUALITY OF MONITORING AND EVALUATION (M&E) 12
B. ENVIRONMENTAL, SOCIAL, AND FIDUCIARY COMPLIANCE 13
C. BANK PERFORMANCE 14
D. RISK TO DEVELOPMENT OUTCOME 14
V. LESSONS AND RECOMMENDATIONS 15
ANNEX 1. RESULTS FRAMEWORK AND KEY OUTPUTS 16
ANNEX 2. BANK LENDING AND IMPLEMENTATION SUPPORT/SUPERVISION 22
ANNEX 3. PROJECT COST BY COMPONENT 24
ANNEX 4. EFFICIENCY ANALYSIS 25
ANNEX 5. BORROWER, CO-FINANCIER AND OTHER PARTNER/STAKEHOLDER COMMENTS 27
ANNEX 6. SUPPORTING DOCUMENTS (IF ANY) 29
ANNEX 7. Regulatory texts developed by PADEL-M 30
ANNEX 8. PADEL-M Footprint in Mali (PADEL-M sites are the pink circles) 31

DATA SHEET

BASIC DATA

Product Information

Operation ID	Operation Name
P160641	Mali Livestock Sector Development Support Project (PADEL-M)
Product	Operation Short Name
Investment Project Financing (IPF)	PADEL-Mali
Operation Status	Approval Fiscal Year
Closed	2018
Original EA Category	
Partial Assessment (B) (Approval package - 28 Feb 2018)	

CLIENTS

Borrower/Recipient	Implementing Agency
Ministry of Economy and Finance	Ministry of Rural Development

DEVELOPMENT OBJECTIVE

Original Development Objective (Approved as part of Approval Package on 28-Feb-2018)

The Project Development Objective (PDO) is to “enhance productivity and commercialization of non-pastoral animal production in selected value chains, and strengthen the country’s capacity to respond to an eligible crisis or emergency.”

FINANCING

Financing Source	Original Amount (US$)	Revised Amount (US$)	Actual Disbursed (US$)

World Bank Financing	60,000,000.00	60,000,000.00	56,320,294.45
IDA-D2740	30,000,000.00	30,000,000.00	29,133,325.33
IDA-61880	30,000,000.00	30,000,000.00	27,186,969.12
Non-World Bank Financing	18,400,000.00	18,400,000.00	14,460,000.00
Local Beneficiaries	4,200,000.00	4,200,000.00	3,150,000.00
Borrower/Recipient	4,800,000.00	4,800,000.00	610,000.00
Borrowing Country's Fin. Intermediary/ies	9,400,000.00	9,400,000.00	10,700,000.00
Total	**78,400,000.00**	**78,400,000.00**	**70,780,294.45**

RESTRUCTURING AND/OR ADDITIONAL FINANCING

Date(s)	Type	Amount Disbursed (US$M)	Key Revisions

KEY DATES

Key Events	Planned Date	Actual Date
Concept Review	06-Feb-2017	06-Feb-2017
Decision Review	25-Oct-2017	25-Oct-2017
Authorize Negotiations		12-Jan-2018
Approval	28-Feb-2018	28-Feb-2018
Signing	04-Apr-2018	29-Mar-2018
Effectiveness	20-Sep-2018	23-Aug-2018
ICR/NCO	27-Dec-2024	--
Mid-Term Review No. 01	17-Jan-2022	24-Jan-2022
Operation Closing/Cancellation	28-Jun-2024	28-Jun-2024

RATINGS SUMMARY

Outcome	Bank Performance	M&E Quality
Satisfactory	Moderately Satisfactory	Substantial

ISR RATINGS

No.	Date ISR Archived	DO Rating	IP Rating	Actual Disbursements (US$M)
01	28-May-2018	Satisfactory	Satisfactory	0.00
02	28-Nov-2018	Satisfactory	Moderately Satisfactory	0.00
03	02-Jun-2019	Satisfactory	Moderately Satisfactory	4.80
04	16-Dec-2019	Satisfactory	Satisfactory	6.99
05	10-Jun-2020	Satisfactory	Moderately Satisfactory	9.14
06	16-Dec-2020	Satisfactory	Moderately Satisfactory	11.65
07	22-Jun-2021	Satisfactory	Satisfactory	15.44
08	23-Dec-2021	Moderately Satisfactory	Moderately Satisfactory	20.06
09	23-May-2022	Moderately Satisfactory	Moderately Satisfactory	23.12
10	21-Nov-2022	Moderately Satisfactory	Moderately Satisfactory	28.61
11	27-Jun-2023	Moderately Satisfactory	Moderately Satisfactory	37.84
12	07-Mar-2024	Satisfactory	Satisfactory	51.69

SECTORS AND THEMES

Sectors

Major Sector	Sector	%	Adaptation Co-benefits (%)	Mitigation Co-benefits (%)
FY17 - Agriculture, Fishing and Forestry	FY17 - Fisheries	16	34	0
	FY17 - Livestock	17	0	2
	FY17 - Public Administration - Agriculture, Fishing & Forestry	17	34	61
FY17 - Industry, Trade and Services	FY17 - Agricultural markets, commercialization and agri-business	50	47	8

Themes

Major Theme	Theme (Level 2)	Theme (Level 3)	%

FY17 - Environment and Natural Resource Management	FY17 - Climate change	FY17 - Adaptation	34
		FY17 - Mitigation	15
	FY17 - Renewable Natural Resources Asset Management	FY17 - Fisheries Policies and institutions	17
FY17 - Finance	FY17 - Finance for Development	FY17 - Agriculture Finance	44
FY17 - Private Sector Development	FY17 - Enterprise Development	FY17 - MSME Development	44
FY17 - Urban and Rural Development	FY17 - Disaster Risk Management	FY17 - Disaster Preparedness	3
	FY17 - Rural Development	FY17 - Rural Infrastructure and service delivery	64
		FY17 - Rural Markets	85

ADM STAFF		
Role	At Approval	At ICR
Practice Manager	Marianne Grosclaude	El Hadj Adama Touré
Regional Director	Simeone Kacou Ehui	Chakib Jenane
Global Director	Martien van Nieuwkoop	Shobha Shetty
Practice Group Vice President	Juergen Voegele	Juergen Voegele
Country Director	Soukeyna Kane	Clara Ana Coutinho De Sousa
Regional Vice President	Makhtar Diop	Ousmane Diagana
ADM Responsible Team Leader	Christian Berger	Soulemane Fofana
Co-Team Leader(s)	Mahamoud Magassouba	
ICR Main Contributors	Fred Kizito and Eustacius N. Betubiza	

I. PROJECT CONTEXT AND DEVELOPMENT OBJECTIVES

A. CONTEXT AT APPRAISAL

1. **With a per capita gross national income estimated at US$ 760 in 2015, and life expectancy at 58 years, Mali was rated as one of the poorest countries in the world at the time of project appraisal**. The country was also ranked 175 out of 188 countries on the 2015 UN Human Development Index. Although economic growth had rebounded in 2014 after years of sluggish growth exacerbated by political and security crises, the economy remained very fragile. Mali's long-term growth required sustained performance among the key drivers of the country's economy, particularly agriculture which accounted for 40 percent of gross domestic product (GDP). This included livestock which contributed about 19 percent to national GDP and was a major source of income to about 30 percent of the population.

2. **However, the livestock sector's productivity remained extremely low**. The main challenges to the sector's growth included the prevalence of animal diseases, low genetic potential of animal breeds, poor quality fodder, limited use of quality feed formulations, and lack of access to credit for livestock sector investments, among others. The impact of these constraints was being amplified by climate change, especially in the absence of an institutional framework and tools for preventing and managing crises in the livestock sector. To address these challenges, the Government's National Agriculture Development Policy of 2013 had prioritized improving animal productivity and food safety and strengthening government's capacity to respond to crises in the sector in order to take advantage of the growing demand for animal products, some of which were being imported. It is against this backdrop that the Government requested the World Bank Group to assist in the formulation and financing of the "*Mali Livestock Sector Development Support Project (PADEL-M, P160641)*" whose goal was to enhance productivity and commercialization of non-pastoral animal production in selected value chains and strengthen the country's crisis management capacity for the livestock sector.

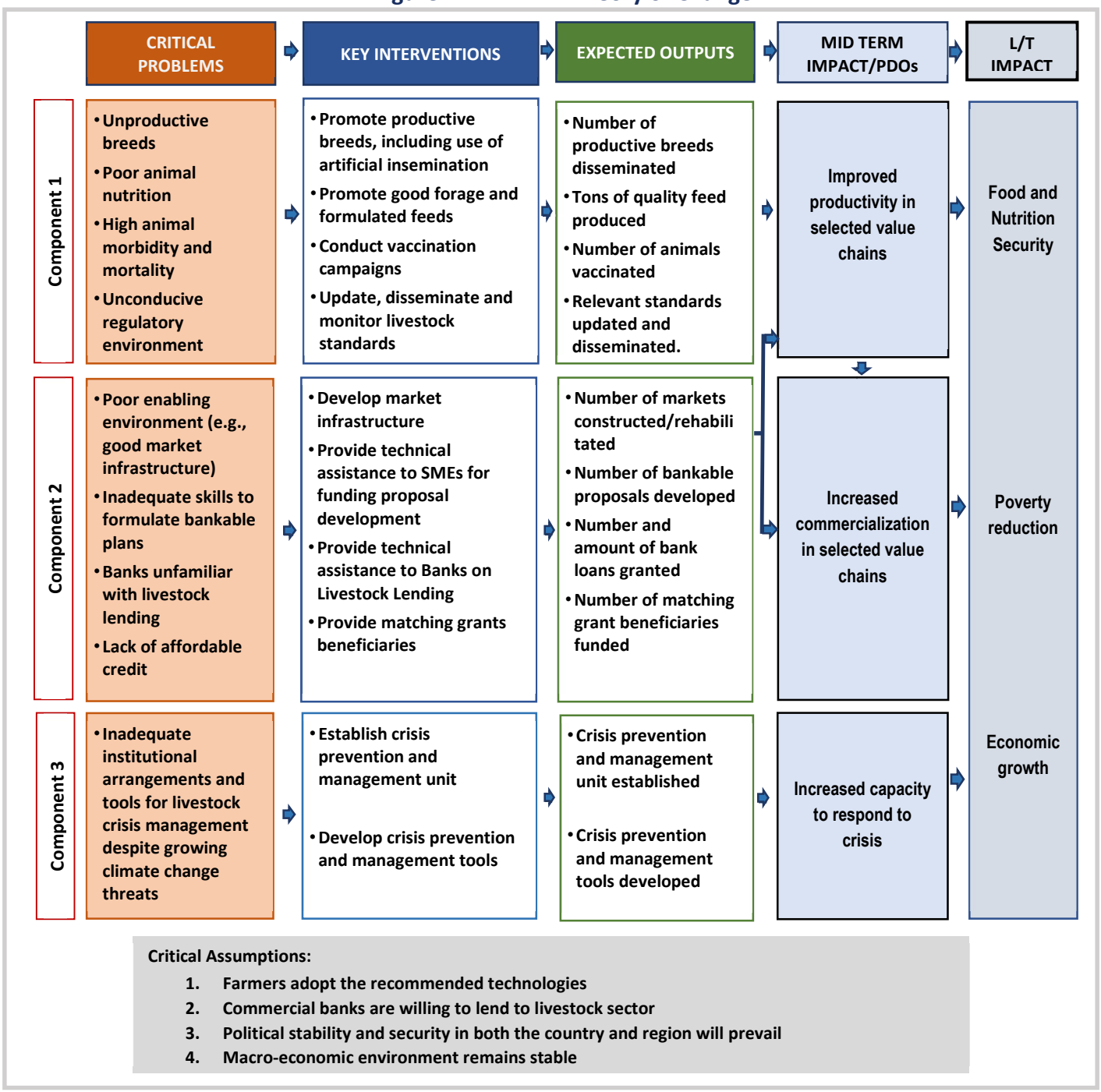
3. **The requested support was fully consistent with the World Bank's Country Partnership Framework (CPF) for 2016–2019 which emphasized the importance of agriculture for broad-based growth, among other themes**. Under Focus Area 2 regarding creating economic opportunities, the CPF's Objective 2.1 emphasized improving productive capacity and market integration of farmers and pastoralists, and Objective 2.2 emphasized agriculture value addition through the development of value chains. PADEL-M would complement the Regional Sahel Pastoralism Support Project (PRAPS-1, 2015–2021, P147674) which focused on nomadic farming. PADEL-M would focus on sedentary livestock farming. The project would work closely with the International Finance Corporation (IFC) in its efforts to promote investment opportunities in the livestock sector.[1] It would also coordinate very closely with other development partners active in the sector, including the African Development Bank, the International Fund for Agricultural Development, the Islamic Development Bank, and the United States Agency for International Development.

Theory of Change (Results Chain)

4. **Since a formal theory of change was not developed at appraisal, a reconstructed version based on information available in the project appraisal document is presented in Figure 1 below**. The theory of change recognizes the importance of livestock in poverty reduction and food security, as well as overall economic growth in Mali, and underscores the need for increasing productivity, improving commercialization, and enhancing crisis management in order to achieve these long-term goals. Key project interventions included animal disease control, promoting productive animal breeds, promoting quality fodder and quality formulated feeds, and facilitating access to credit for livestock sector investments, among others. These activities were selected in recognition of the interconnectedness of the causes underlying the sector's chronic poor performance, hence the holistic value chain approach, acting on each node of the principal value chains, within an eco-system that is conducive to agribusiness development. It also identifies potential threats that could hinder the attainment of these goals and the critical underlying assumptions.

[1] IFC already supported private companies in the dairy and red meat value chains near urban centers.

Figure 1: PADEL-M Theory of Change



Project Development Objectives (PDOs)

5. The PDO was to "enhance productivity and commercialization of non-pastoral animal production in selected value chains and strengthen the country's capacity to respond to an eligible crisis or emergency."

Key Expected Outcomes and Outcome Indicators

6. Progress toward the achievement of the PDO would be measured by the following results indicators:

a) Percentage increase of yields produced by targeted beneficiaries among selected value chains.[2]

b) Incremental sales in targeted value chains (aggregated over all the targeted value chains).[3]

c) Time to reach 50 percent of the targeted beneficiaries (based on the inclusive contingency intervention plan).

d) Farmers reached with agricultural assets or services—core indicator (number of females; number of youth).

e) Beneficiary satisfaction rate with services provided by the project for the livestock sector (percentage of which female and percentage of which youth).

Components

7. Component 1: **Strengthening of Livestock Services (Appraisal: US$ 23.8 million, of which US$ 20.5 million from IDA, US$ 2.1 million from the Government of Mali, and US$ 1.2 million from beneficiaries; Actual: US$ 21.02 million, of which US$ 19.9 million from IDA, US$ 0.12 million from the Government of Mali, and US$ 1.0 million from Beneficiaries)**. The component sought to enhance livestock producers' access to animal health services, animal genetic resources, and quality animal feed, all this in a conducive policy and regulatory environment. Activities included: (**i**) *Component 1.1* – promoting animal health and food safety through enhanced surveillance systems for priority animal diseases, conducting vaccination campaigns against contagious bovine pleuropneumonia (CBPP), Pestes de Petits Ruminants (PPR), and Newcastle disease; (**ii**) *Component 1.2* – enhancing livestock productivity by equipping artificial insemination centers, acquiring and distributing semen, promoting nutritious feeding and quality feed formulations with locally available materials, and disseminating good agricultural practices including through farmer field schools; (**iii**) *Subcomponent 1.3* – strengthening the policy and regulatory environment, including reviewing and updating livestock and fishery policies as appropriate, and studying the feasibility of a Livestock Identification and Traceability System.

8. Component 2: **Support to Private Investment (Appraisal: US$ 43.0 million, of which US$ 30.1 million from IDA, US$ 9.4 million from participating financial institutions (PFIs), US$ 3.0 million from Beneficiaries, and US$ 0.5 million from the Government of Mali; Actual: US$ 38.54 million, of which US$ 25.87 million from IDA, US$ 10.7 million from PFIs, US$ 2.15 million from Beneficiaries, and US$ 0.02 million from the Government of Mali)**. The component sought to promote private sector investment in the livestock sector by creating an enabling environment and facilitating access to finance. Activities included: (**i**) *Subcomponent 2.1* – creating an enabling environment including constructing/rehabilitating market infrastructure; (**ii**) *Subcomponent 2.2* – assisting investors in developing bankable business plans and training banks in developing financial products suitable to livestock investors; (**iii**) *Subcomponent 2.3* – providing matching grants through two windows: an SME window for investment plans above FCFA 15 million and to be cofinanced with a bank loan (these arrangements were named "productive partnerships"), and a window for smaller investments of less than FCFA 5 million which didn't mandate a bank cofinancing requirement (and with a higher expectation of female and youth beneficiaries).

9. Component 3: **Crisis Prevention and Management, and Project Coordination (Appraisal: US$ 11.6 million, of which US$ 9.4 million from IDA and US$ 2.2 million from the Government of Mali; Actual: US$ 11.01 million, of which US$ 10.54 million from IDA, and US$ 0.47 million from the Government of Mali)**. The component was aimed at developing mechanisms for preventing and responding to severe crises and emergencies in the livestock sector and strengthening project coordination capacities within the Ministry of Livestock and Fisheries. Activities included: (**i**) *Subcomponent 3.1* – operationalizing a new unit for crisis prevention and management, including, developing, and operationalizing crisis management tools; (**ii**) *Subcomponent 3.2* – coordinating overall project implementation, including procurement, financial

[2] This indicator would be measured for every targeted value chain, but only the weighted average across all targeted value chains would be reported as a Key Performance Indicator.

[3] As is the case for yields, only the weighted average across all targeted value chains would be reported as a Key Performance Indicator.

management, communication, environmental and social safeguards oversight, gender, and the project's monitoring and evaluation (M&E).

B. SIGNIFICANT CHANGES DURING IMPLEMENTATION (IF APPLICABLE)

Revised PDOs and Outcome Targets

10. The PDO remained unchanged throughout project implementation.

Revised PDO Indicators

11. The PDO indicators remained officially unchanged throughout project implementation.

Revised Components

12. There were no revisions to the components.

Other Changes

13. There were no other changes.

Rationale for Changes and Their Implication on the Original Theory of Change

14. There were no changes made.

II. OUTCOME

A. RELEVANCE OF PDO

Assessment of Relevance of PDOs and Rating

15. The PDOs' continued relevance is rated High. They remain consistent with the World Bank Group CPF FY16-FY19 and the Performance and Learning Review which extended the CPF to FY20.[4] Specifically, they are consistent with Area of Focus Number 2 that calls for improving productive capacity and market integration of farmers and pastoralists. While acknowledging that the livestock sector remains underdeveloped, with low productivity levels, the Mali Systematic Country Diagnostic (SCD) notes that the country has a strong comparative advantage in livestock, and in its *Pathway III: Private Sector Development for Job Creation*, the SCD calls for supporting livestock as one of the "emerging value chains". The PDOs are also aligned with Mali's 2022 Country Private Sector Diagnostic, particularly with its *Third Strategic Pillar: Agriculture and Agribusiness* (including Livestock) which highlights opportunities for value addition and job creation in the livestock value chain. Under its *Goal #4: Ramp up climate resilience*, the World Bank's Western & Central Africa Region Priorities 2021-2025 postulate options for fostering increased resilience to climate change, including strengthening the countries' ability to "transform systems in response to climate change, such as switching from crop to livestock production in response to reduced rainfall." This is particularly pertinent for Mali where climate change is a major threat. Finally, the PDOs are aligned with Mali's five-year Master Plan for the Development of Aquaculture (2016-2020), as well as Mali's National Agricultural Sector Investment Plan 2015/2025, which is an offshoot of the Comprehensive African Agricultural Development Program process.

B. ACHIEVEMENT OF PDOs (EFFICACY)

Assessment of Achievement of Each Objective/Outcome

16. This assessment is based on the extent to which the project's three objectives were achieved, namely: (**i**) Enhancing *productivity* of non-pastoral animal production in selected value chains; (**ii**) Enhancing *commercialization* of non-pastoral animal production in selected value chains; and (**iii**) Strengthening the country's *capacity to respond to severe crises* affecting the livestock sector. The targeted value chains were beef, milk, poultry meat, and aquaculture. These three

[4] The new country engagement instruments are still under development and have not yet been finalized at present.

objectives and their corresponding targets are summarized in Table 1. Besides PADEL-M's Monitoring and Evaluation (M&E) data and reports, evidence of the achievements of these objectives was drawn from several other sources including: (a) annual progress reports; (b) Aide Memoires; (c) Implementation Status and Results Reports; (d) the borrower's PADEL-M completion report (June 2024); (e) project impact assessment report; and (f) discussions with key project stakeholders. Data from the 1,216 microprojects and 164 productive partnerships had been collected on an ongoing basis during project implementation, but in order to validate it at project closing, a sample of 266 subprojects were randomly selected across the project-supported value chains and participating regions and visited for data corroboration by project-financed consultants. The data used in this assessment is deemed reliable. All the three objectives exceeded their targets. In addition, the two overarching indicators also exceeded their targets, namely: (i) the indicator for farmers reached with agricultural assets or services which was 346,465 farmers against a target of 340,000 at appraisal (i.e., 101.9 percent attainment rate); and (ii) the percentage of beneficiary farmers satisfied with services provided by the project, which was 94.5 percent, against a target of 65.0 percent.

Table 1: Actual Target Achievements Relative to Appraisal Targets

Indicator	Baseline	Appraisal Target	Realized Target	Percentage*
PDO Indicators by Objectives				
Enhance productivity of non-pastoral animal production in selected value chains				
Percentage increase in the yields obtained by the targeted beneficiaries in the selected value chains	0	25.00	29.00	116.00
Enhance commercialization of non-pastoral animal production in selected value chains				
Increase in sales in the targeted channels (cumulative for the targeted channels	0	35	81.45	242.71
Strengthen the country's capacity to respond to eligible crisis				
Time (weeks) to reach 50% of targeted recipients, as outlined in the inclusive emergency response plan (with the necessary services, funds)	52	10	8	125%*
Overarching PDO Indicators				
Farmers reached with agricultural assets or services (Number, Corporate)	0	340,000.00	346,465.00	101.90
➢ Female	0	102,000.00	108,785.00	106.65
➢ Youth	0	102,000.00	115,278.00	113.02
Beneficiary satisfaction rate with services provided by the project for the livestock sector (% of which female and % of which youth) (Percentage, Custom)	0	65	94.5	145.40
➢ Female	0	65	98.3	151.23
➢ Youth	0	65	95.2	146.46

Note: - For livestock Crises Management, desired change is a decline in response time. Therefore, the Target is divided by the Actual.*

PDO #1: Enhancing productivity of non-pastoral animal production in selected value chains

17. Productivity increased by a weighted average of 29.0 percent across the selected value chains, against a target of 25 percent. The was variation in productivity across the supported value-chains which depended upon the nature of the predominant intervention in each value-chain (e.g., genetic, management, etc.) since each intervention's contribution to productivity is different.[5] This increase in productivity was made possible by adopting a wide array of technologies that were promoted by the project. These technologies included: (**i**) introducing animal bloodlines with superior traits; (**ii**) promoting improved management regimes with good agricultural practices; and (**iii**) supporting animal health through vaccination campaigns.

i. **The project promoted animal breeds of superior quality across the selected value chains.** *A) Cattle (beef and milk).* Superior production traits were obtained through artificial insemination with Montbéliard and Holstein bloodlines.

[5] This was comprised of 17.5 percent productivity increase for beef, 43 percent productivity increase for milk, 11.3 percent productivity increase for poultry, and 56 percent productivity increase for fish.

The project financed the acquisition of 60,000 doses of semen and the production of 36,592 liters of liquid nitrogen for semen preservation for the 15 artificial insemination units that were set up in the regions which enabled successfully inseminating 42,616 cows between 2019 and 2023. This resulted in significant productivity gains in meat and milk. For example, a male cross at 1.5 to 2 years of age weighed an average of 300 to 350 kg with 50 to 55 percent carcass yields, whereas it takes the slow-growing indigenous breed 4 to 5 years to attain similar weight, and its carcass yield is only 45 to 48 percent. Similarly, a female cross yielded 8 to 15 liters of milk per day versus 3 to 4 liters for local dairy breeds. *B) Poultry*. The project supported the introduction of the Wassachié poultry breed, a product of Mali's zootechnical research. This highly productive chicken grows very rapidly to a maturity weight of 1,500 grams in 6 months versus traditional poultry breeds which attain only 900 grams during the same period when reared under similar conditions. *C) Fish*. Superior fish breeds were introduced across 7 regions of Mali. High-performance fish strains of Clarias catfish obtained a market weight of 2,000 grams in 6 months of rearing compared to about 500 - 800 grams using existing traditional breeds. Similarly, high performing Tilapia were able to reach up to 1,000 grams within 5 months of rearing compared to 500 grams within the same time period and similar conditions for unimproved fish breeds.

ii. **The project also promoted improved management regimes which included feeding and other good agricultural practices.** *A) Cattle*. A total of 120 tons of fodder seeds of Brachiaria, Panicum, fodder cowpea and fodder maize were acquired and distributed in the regions of Kayes, Koulikoro, Sikasso, Ségou, Mopti and Bamako, and 20 seed producers trained in fodder seed production techniques (these seed producers multiply and sell improved fodder seed to other farmers). In addition, 40 silos for fodder conservation as well as 60 shredders, 20 straw axes and 10 balers, all motorized, were acquired and made available to the participating producers as a demonstration. As a result, 9,597 hectares were sown with improved fodder by 3,026 producers who produced 52,716 tons of dry matter sufficient to feed 14,726 cattle of 250 kg each or 147,260 small ruminants. This data does not include the impact from the distribution of 34 tons of fodder seed acquired and distributed to producers just towards the end of the project which is estimated to produce 14,932 tons of dry matter sufficient to feed 4,172 cattle of 250 kg each or 41,723 small ruminants. Improved nutrition significantly enhanced livestock productivity. For example, fattening of local breeds using improved fodder took 70 days to add 52 kgs of beef in body weight compared to 100 to 120 days when using unimproved fodder. This allowed the farmers using improved fodder to carry out up to 4-5 cycles per year compared to 2-3 cycles per year without nutritious feeding. Additionally, the lactation period increased from 210 days to 270 days for those using nutritious feed. *B) Poultry*. For traditional farming systems, farmers were taught how to formulate poultry feed using locally available materials and how to improve poultry housing structures. Strong emphasis was placed on local sources of protein (such as insects) to accelerate growth and thus enhance productivity. The project supported 48 Farmer Field Schools on various themes pertaining to good agricultural practices for improving poultry productivity. *C) Fish*. The principal management interventions for improving productivity were the use of floating cages and better-quality feed. A floating cage improves fish productivity by providing a controlled environment which facilitates efficient feeding and easy monitoring, while enabling continuous water flow to remove waste and provide fresh oxygen to the fish within the cage. The project distributed 20 floating fish cages and 40 above-ground tanks as demonstrations. For the same genetic material, adoptees of good management practices (quality feed, high feed use efficiency such as using a floating cage, etc.,) obtained an estimated 50 percent higher productivity than non-adoptees of improved practices. In addition, a number of fry producers were trained in effective methods of fry production. These will continue supplying other producers with improved fry. Similarly, feed producers were also trained in composing nutritious floating feeds.

iii. **The project's support for animal health was predominantly through vaccination.** *A) Cattle and Small Ruminants.* At appraisal, the project had committed to procuring 3.0 million doses for Contagious Bovine Pleuropneumonia (CBPP), and 3.0 million doses for Pestes de Petits Ruminants (PPR). But as the actual price per dose turned out lower than the appraised amount, the project increased the number of doses and was able to vaccinate 7.6 million cattle and 9.5

million small ruminants. Although the project did not do an impact assessment of vaccination on morbidity and mortality, studies conducted in similar environments in the region indicate that vaccination normally reduces the mortality rate of vaccinated animals by about 6 percent for CBPP and 5 percent for PPR[6]. Productivity arises from higher weight gain by healthy animals, and from stemming animal loss. The project trained and deployed 200 community vaccinators. *B) Poultry*. The number of poultry vaccinated against Newcastle disease with project support was 7.6 million against a target of 5.0 million. The project trained and equipped 700 local poultry vaccinators (50 percent of whom were women). According to the World Organization for Animal Health, a Newcastle disease outbreak leads to a partial or complete drop in egg production, and the eggs may be abnormal in color, shape, or surface, and have watery albumen. Mortality is variable but can be as high as 100 percent.[7] *C) Fish*. Fish health was monitored by trained community champions who were able to conduct controlled exposure to iodized salt to forestall mortality after stress episodes (such as transportation) by accelerating restoration of their normal physiological and immunological status.

18. **The project supported developing/updating a number of policies and standards**. The National Policy for the Development of Livestock in Mali was updated, and animal genetic resources characterized. Five Malian standards relating to fish farming were developed as well as five implementing texts of Law No. 08-026 of 23 July 2008 relating to the sanitary and hygienic protection of poultry farms and the control of poultry products. In order to ensure their contribution to productivity, the developed standards were integrated in training programs and feed formulation protocols.

PDO #2: Enhancing commercialization of non-pastoral animal production in selected value chains

19. **There were notable incremental sales in the targeted value chains (beef, poultry, milk and fish) which attained a level of 81.45 percent against a target of 35 percent (weighted average for the targeted value chains)**. Although there was incremental output due to increased productivity arising from PDO #1, incremental sales under the project were predominantly driven by subprojects financed through matching grants. The beneficiary SMEs under the matching grants also experienced productivity gains just as other project beneficiaries did. However, most of their growth in turnover was driven by horizontal expansion. For example, one subproject beneficiary engaged in cattle fattening moved from 30 to 450 heads of cattle per fattening cycle and was running multiple cycles annually. And there were several such cases of rapid growth in turnover. These levels of turnover were much higher than projected at appraisal, hence the significantly higher incremental sales at ICR stage.

20. **The project financed a number of matching grants for investment subprojects by small- and medium-sized SMEs (Table 2)**. The project financed 1,216 microprojects against the project target of 600. Women constituted 62.4 percent of the microprojects. Cattle fattening was the most predominant activity followed by poultry. The average size of a microproject grant was US$ 2,500. The project paid 85 percent of the investment cost, and the beneficiary 15 percent. Regarding the large investments (productive partnerships), the project financed 164 subprojects, against 160 planned by the project. Women constituted 26.2 percent of the large subprojects. The average size of a grant for a productive partnership subproject was US$ 71,000, and the average size of an accompanying loan from a PFI was US$ 65,000. The beneficiaries' own contribution to these large investments averaged US$ 13,000.

Table 2: Number of Microprojects and Productive Partnerships in each Supported Value Chain

Value Chain	Microprojects		Productive Partnerships	
	Number	Percentage	Number	Percentage
Cattle	548	45.1%	53	2.3%
Poultry - Broilers	326	26.8%	12	28.7%
Milk	135	11.1%	40	24.4%

[6] Entrepôt de données des ressources animales et halieutiques, Burkina Faso
[7] https://www.woah.org/en/disease/newcastle-disease/

Fish	142	11.7%	19	11.6%
Poultry - Layers	29	2.4%	35	1.2%
Other	36	3.0%	5	1.8%
Total	**1,216**	**100.0%**	**164**	**100%**

21. **As indicated earlier, sales by subproject beneficiaries under matching grants increased by 81.45 percent (Table 3)**. Egg sales were the most dominant, followed by beef cattle.

Table 3: Incremental Sales by Subproject Beneficiaries (USD Millions)

Value-Chain	Without Project (A)	With Project (B)	Change in Sales (C)	Percentage Change (C/A) * 100
Eggs	8.5	18.3	9.80	115.29%
Beef Cattle	7.9	13.5	5.60	70.88%
Broilers	6.5	8.6	2.10	32.31%
Fish	1.4	3.5	2.10	150.00%
Milk	0.8	1.4	0.60	75.00%
Total	**25.0**	**45.3**	**20.36**	**81.45%**

22. **In order to facilitate marketing of the project-induced surplus, the project undertook several activities aimed at**: (**i**) enhancing linkages between producers and buyers through market rehabilitations (case of cattle and fish) and extending the coverage of the current electronic market to fish and poultry; (**ii**) setting up rapid preservation facilities to avoid spoilage of the increased output (case of milk aggregation centers); and (**iii**) facilitating transformation (case of fish smoking and milk processing). Not all project output necessarily passed through these mechanisms as there were other existing or newly developed business relationships and marketing channels outside these arrangements. The goal of these project interventions was to fill gaps that might arise in order to ensure smooth marketing.

i. **Facilitating Buyer-Seller Linkages through Physical and Electronic Markets**. *A) Physical Markets*. (**i**) Regarding cattle, the project financed the rehabilitation of two markets in Konobougou and Kouremalé, and the reconstruction of 3 livestock markets in Konna, Korientzé and Bougouni. Beyond serving as aggregation hubs for facilitating buyer-seller interactions, these market facilities offer other services such as vaccination to contain the spread of diseases, water for animals, security prior to onward destinations (temporary stays at the market can last days before the animals' onward journey), and loading rumps for easy handling. (**ii**) Regarding fish, the project financed the modernization of the Niono fresh fish market. It was renovated and equipped with a shed and cold room for overnight fish storage. *B) Electronic Markets*. A market information system for cattle (SIM-Bétail) already existed, facilitating access to cattle market information by traders and other stakeholders. This project supported software configuration to broaden SIM-Bétail's coverage to poultry and fish. It also financed smart phones with an app for gathering market information.

ii. **Facilitating Rapid Cooling and Preservation**. A total of four strategic milk collection centers were constructed in Koulikoro, Ouélessébougou, Siby and Kassela. These milk collection centers are organized as cooperatives, each with a capacity of 10,000 liters and are equipped with the infrastructure to allow for milk pasteurization and use renewable energy sources (solar panels) for cooling to reduce milk spoilage (prior to the solar energy connection, producers at Kassela, for instance, lost 36,000 liters of milk equivalent to US$ 29,130 when their connection to the national power grid experienced a blackout, which is common).

iii. **Facilitating transformation (case of fish smoking and milk processing)**. *A) Fish*. Women groups facilitated to conserve Tilapia and Clarias fish species using clay Chorkor ovens which saved them both labor and wood (uses 20 kg of wood per 100 kg of fresh fish compared to traditional methods that use 80 kg of wood for the same weight of fish). *B) Milk*.

Under the subprojects (66 micro projects and 3 productive partnerships), some 5,300 liters of milk per day are currently processed into milk products, including yoghurt.

PDO #3: Strengthening the country's capacity to respond to eligible crises

23. The planned unit for championing prevention and response efforts in cases of crises in the livestock and fisheries subsectors was duly established, and the tools developed. The Crisis Management Unit examines animal movement patterns, rainfall levels and pasture conditions in order to determine localities that are likely to have livestock feed crises. This information is then integrated into the national consultation of the *Cadre Harmonisé* (the harmonized food security assessment framework). During the course of this project's implementation, 6,700 people were identified and supported with livestock feed, forage and vaccination with a response time of about 8 weeks. This is significantly less than the target of 10 weeks set at appraisal (resulting in a 125% achievement). At the time of writing this ICR, this crisis management unit was in the process of working towards evaluating the level of damage by the recent floods in Mali and had elaborated an action plan to address the problem.

Justification of Overall Efficacy Rating

24. All productivity, commercialization, and crisis preparedness and response targets were fully achieved. However, the feasibility study of a Livestock Identification and Traceability System with potential benefits for breed performance monitoring and for commercialization which had been envisaged at appraisal was not done. Therefore, overall efficacy is rated *Substantial.*

C. EFFICIENCY

Assessment of Efficiency and Rating

25. A cost-benefit analysis was used to assess whether the project's resources were efficiently used. Economic benefits considered in the analysis were derived from incremental revenue under the with-project versus the without-project scenarios for the value chains supported by the project, namely beef, milk, poultry, and fish. Benefit streams were transformed into economic values by applying conversion factors for each category. Economic costs and benefits were projected over a 20-year period (2018-2038).

26. At appraisal, the net present value (NPV) of the project's incremental revenues had been estimated at US$ 31.4 million, using a discount rate of 6 percent, and the economic internal rate of return (EIRR) had been estimated at 16.0 percent (Table 4). At ICR, the project's incremental benefits without environmental benefits have an updated NPV of US$ 62.8 million, and an EIRR of 25.2 percent.

27. An assessment was also carried out incorporating environmental benefits. These benefits, which were assessed using the livestock module in the EX-ANTE FAO tool, derive from: (i) the project's promotion of Chorkor ovens for fish smoking and drying instead of traditional methods which was estimated to save 311 hectares of forest land per year; (ii) use of high-output prolific fodder crops instead of exclusive reliance on landscape-denuding pasture-based feeding practices; (iii) adoption of breeds with high feed conversion ratios; and (iv) feeding practices that minimize feed waste, among others. There is a modest net reduction of about 5,217 tons CO2 eq. annually. When environmental benefits are considered, the EIRR is re-estimated at 26.79 percent at the low estimate range of carbon with a NPV of US$ 66.39 million and 27.90 percent at high estimate range of carbon with a NPV of US$ 69.80 million.

Table 4. EIRR and NPV at ICR Stage, With and Without Environmental Benefits

	Appraisal	ICR		
	Without Env. Benefits	Without Env. Benefits	Env. @ low carbon Price	Env. @ High Carbon Price
EIRR (Percent)	16.00	25.2	26.79	27.90
NPV (US$, Million)	31.40	62.8	66.39	69.80

Aspects of design and implementation

28. Some design and implementation experiences enhanced project efficiency. For instance, the project leveraged existing resources under PRAPS-M, including sharing several staff positions with PRAPS-M, utilizing its background studies and assessments, synchronizing the vaccination campaigns to synergize vaccination experience and share resources where possible. However, there are other experiences that undermined efficiency including: (i) high Bank TTL turnover which led to some delays in project implementation; (ii) social/political developments that disrupted project implementation, resulting in the World Bank's suspension of disbursements (OP 7.30), as well as several other adverse developments including COVID-19, the Russia's invasion of Ukraine, and an economic embargo by ECOWAS, etc.

29. The project's rate of return is what would be expected in the operation's sector. However, there were shortcomings, including in Bank supervision that disrupted project implementation. Therefore, Efficiency is rated as *Substantial*.

D. JUSTIFICATION OF OVERALL OUTCOME RATING

30. Relevance remains high, and both Efficacy and Efficiency are rated Substantial. Therefore, Overall Outcome is rated as *Satisfactory.*

E. OTHER OUTCOMES AND IMPACTS (IF ANY)

Gender

31. **A number of activities were undertaken which had a positive impact on gender**. *First*, matching grants for microprojects were structured such that women and youth would contribute 10 percent compared to 20 percent for men. This incentive appears to have worked since 62.5 percent of the microproject grant recipients were women. *Second*, 15 innovation platforms were formed for women on fish production, fish smocking, and sheep fattening. There were 4,433 female beneficiaries who received training and equipment. *Third*, five young women received master's degrees in veterinary medicine from EISMV in Dakar, Senegal. In terms of GBV/SEA/SHS, codes of conduct, action plans, training, and awareness-raising were continuously conducted within the various project activities across the selected value chains in all regions to prevent and mitigate GBV/SB/SH[8]. There were no known unintended negative impacts.

Institutional strengthening

32. PADEL-M strengthened a number of institutions including: (**a**) the Ministry of Livestock and Fisheries through training of its extension agents and equipping them (e.g., including with smart phones) for effective execution of field missions; (**b**) Institut d'Economie Rurale which received laboratory equipment to improve livestock research; (**c**) four agricultural interprofessional organizations (livestock/meat, milk, poultry and fish) which were established and endowed with office and logistical equipment to enhance stakeholder dialogue; and (**d**) the National Center for Animal Artificial Insemination which received support for equipment and facilities to expand its activities from 5 to 15 artificial insemination centers and bring artificial insemination services closer to farmers.

Mobilizing private sector financing

33. The project was designed to attract private capital from commercial banks as co-financing under the Matching Grant scheme. The project attracted US$ 10.7 million from participating financial institutions against the project target of US$ 9.4 million (i.e., 113.83 percent attainment rate). PFI funding accounted for 38.1 percent of the total investment costs under the subprojects (Table 5)

Table 5: Funding Mechanisms among Subprojects by Value Chains (US$ Millions)

Value-Chain	Matching Grant	Beneficiaries	PFIs	Total
Beef	8.78	1.15	6.85	16.79
Milk	2.26	0.35	1.71	4.32

[8] PADEL-M: Mid-Term Review Aide Memoire for December 7 to 22, 2023

Poultry	2.79	0.83	1.71	5.34
Aquaculture	0.85	0.35	0.43	1.63
Total	**14.69**	**2.69**	**10.70**	**28.08**
Percentage	*52.31*	*9.58*	*38.11*	*100.00*

Poverty Reduction and Shared Prosperity

34. PADEL-M contributed to poverty alleviation through several key mechanisms: (**i**) by vaccinating 7.6 million cattle against CBPP, 9.5 million small ruminants against PPR, and 7.6 million poultry, which are mostly owned by poor smallholder farmers, the estimated loss prevented is valued at around US$ 206 million;[9] (**ii**) the project served as a bridge for access to credit for poor small-scale producers through microprojects – some microprojects created one extra job as business support (a total of 1,000 jobs), and also allowed the youth and women to engage in diversified activities such as beef transformation (cured, dried and salted beef which fetched a higher market price); (**iii**) each of the 164 productive partnerships created an average of 8 permanent jobs leading to 1,312 jobs; (**iv**) the 29 percent increase in productivity serves as a source of revenue through marketable surplus thus endowing the farmers with some disposable income; (**v**) farmer field schools attracted at least 3,000 people who were trained in fish and milk transformation who then trained others to scale up PADEL-M's footprint towards reaching the most needy in rural communities; and (**vi**) cross-partner collaborations were noted for farmers who were doing dairy – the small producers carrying out milk transformation would link up with small farmers whereby these intra-community transactions created an ecosystem that often reduced transport and middle-men costs.

III. KEY FACTORS THAT AFFECTED IMPLEMENTATION AND OUTCOME

A. KEY FACTORS DURING PREPARATION

35. Considerable effort was undertaken during preparation to ensure implementation readiness. The project capitalized on the wave of success of proven technologies from the World Bank-financed West Africa Agricultural Productivity Program (WAAPP, P122565) which closed on 31-Dec-2019, as well as lessons learned from other Bank-funded projects like PRAPS-M. Both projects shared the PIU (same coordinator and implementation manuals). The government was interested in the project because it was aligned with their policies and thus greatly facilitated its preparation.

B. KEY FACTORS DURING IMPLEMENTATION

B.1. Factors subject to the control of government and/or implementing entities

36. As mentioned earlier, the project benefited from the presence of PRAPS-Mali (P147674) to ensure good coordination and engagement coupled with leadership that helped it to start in a timely manner. The Government was very helpful in supporting missions and following up on agreed recommendations. The project coordination team was very resourceful. For example, during unexpected disruptions such as disbursement suspensions, the team would focus on activities that do not require immediate funding such as preparation of manuals, reviewing business plans for sub-projects, etc., When some parameters were difficult to measure, such as the daily weight gain of large ruminants, they adopted alternative measures (such as time to gain "market weight" as determined by buyers). However, there was occasional slowness in the

[9] For example, assuming a reduction from 5 percent to 2 percent in mortality which is induced by diseases that can be prevented by the three vaccines, the savings in wealth valued at mature animal size is roughly US$ 206 million (number of immunized animals x net reduction in mortality x prevailing price of 400,000 FCFA for cattle, FCFA 125,000 for small ruminants, and FCFA 2,000 for chicken).

provision of the technical specifications of the equipment or works by the technical departments concerned[10]. Also, Government was unable to pay the full amount of its contribution to the project (paid US$ 0.6 million against the US$ 4.8 million estimated at appraisal, i.e., 13 percent). The main reasons were Mali's economic hardship precipitated by COVID-19, social political developments, an ECOWAS embargo, insecurity in parts of the country, and the impact from the Russia's invasion of Ukraine.

B.2 Factors subject to World Bank control

37. The Bank was active in conducting implementation support missions (2 missions per year). However, there were numerous changes in team leadership (5 Task Team Leaders) which caused implementation delays. In addition, the Bank suspended disbursements on 3 occasions due to the political situation at the time resulting in a combined duration of about 7 months which delayed implementation of some activities. However, this did not necessitate an extension of the project's closing date – task team leadership was more stable in the last 1.5 years and project implementation support was ramped up to make up for lost time.

B.3 Factors outside the control of Government and/or implementing entity

38. These factors include: (a) the COVID-19 pandemic which disrupted project progress since teams could not effectively conduct field monitoring; (b) the Russia's invasion of Ukraine which impacted the price of feed (grain became expensive); (c) an ECOWAS embargo in response to political developments in the country which affected timely arrivals of some imported equipment; and (d) the passing away of the Project Coordinator 3 years after the project had started which disrupted project implementation.

IV. BANK PERFORMANCE, COMPLIANCE ISSUES, AND RISK TO DEVELOPMENT OUTCOME

A. QUALITY OF MONITORING AND EVALUATION (M&E)

M&E Design

39. PADEL-M identified adequate indicators in the results framework to monitor progress toward achievement of the PDO using effective M&E arrangements. The M&E design was adequate with provisions for collection of key datasets, including a baseline survey, continuous data collection to inform decision making during the implementation phase, beneficiary satisfaction surveys, and end of project impact assessment to assess outcome and draw lessons. However, some indicators were difficult to measure (such as the need to weigh heavy animals to monitor their weight gain).[11]

M&E Implementation

40. The project's staffing included qualified M&E specialists at the national as well as regional levels who were responsible for the entire M&E portfolio. Data collection was carried out using both Kobo Toolbox and TOM2 Monitoring software. The strengthening of the Geo-Enabling initiative for Monitoring and Supervision (GEMS) Platform in Mali enhanced data entry with improved visual perspectives on project beneficiary reach at the national level (Annex 8). The team was very resourceful in implementing the M&E system. As noted earlier, upon realization of the difficulty in measuring cattle weight gain during fattening activities, the team started monitoring "time for attaining market weight" which was a good and easier-to-measure proxy for productivity. It should be noted that although the project had mutualized the position of the M&E specialist with the PRAPS-M, this was overwhelming as workload grew, it recruited its own M&E specialist.

[10] Mid-Term Review Aide Memoire for December 7 to 22, 2023

[11] Regarding animal vaccination, PADEL-M had contributed to the national vaccination program alongside Government and its other development partners. The indicator for measuring disease prevalence was, by design, not meant to be monitored by the PADEL-M on its own, but by the Government as part of its routine surveillance and monitoring activities. Hence national data is used in assessing disease prevalence.

M&E Utilization

41. M&E was utilized in multiple ways. *First*, it facilitated dynamic feedback loops between beneficiaries and the project implementation team for recalibrating project interventions. For instance, M&E was used extensively in monitoring female technology adoption, whereby feedback on field performance was integrated in farmer field schools' curriculum to maximize relevance. *Second*, it was used during the project's mid-term review in gauging progress and planning for accelerating implementation. *Third*, it was used to assess the project's impact. Some of this information has been useful in writing this ICR.

Justification of Overall Rating of Quality of M&E

42. The M&E system was sufficient to assess the achievement of the PDO. Where there were deficiencies, the project implementation team was resourceful in collecting other data that served the same goal. M&E was also used as a key tool to inform decision-making by the project management team. Therefore, the overall rating for quality M&E is *Substantial*.

B. ENVIRONMENTAL, SOCIAL, AND FIDUCIARY COMPLIANCE

B.1 Environmental Compliance

43. The project was classified as Category B (it did not support activities likely to have harmful, significant, irreversible or widespread impacts on the environment) and was implemented according to World Bank safeguard policies. It triggered four World Bank operational policies namely: Environmental Assessment (OP/BP 4.01), Natural Habitats (OP/BP 4.04), Pest Control (OP/BP 4.09) and Forests (OP/BP 4.36). The following environmental safeguards instruments were duly prepared and disclosed nationwide and by the World Bank: Environmental and Social Management Framework (ESMF), Pest Management Plan, and an Environmental and Social Monitoring Manual. The Environmental and Social Impact Assessments (ESIAs) of the business plans were completed and the mitigation measures developed. The project did not record any significant incidents throughout its implementation including during the construction of infrastructures, and implementation of subprojects. Safeguard measures were integrated in the development of the Guide for Good Practices in the Management of Biomedical Waste. At closing, the project's environmental performance was rated Satisfactory.

B.2 Social Compliance

44. **Social compliance requirements were adhered to.** PADEL-M triggered the Involuntary Resettlement Policy Framework (OP/BP 4.12) as a social safeguards instrument, which was prepared by the Borrower, amply consulted upon, and publicly disclosed both in-country (on October 24, 2017) and on the World Bank external website (on October 24, 2017) after approval. The Involuntary Resettlement Policy Framework provisions were implemented to address resettlement issues during project implementation. A Grievance Redress Mechanism was set up and was fully functional. It received 20 complaints, which were all resolved satisfactorily and closed. They mostly related to complaints by people who felt that they had been excluded when their business plans were not selected for the microprojects which had raised high interest in the regions. There were no complaints reported relating to Gender-Based Violence or Sexual Harassment. During implementation, safeguards reports were regularly shared with the Bank and a final report on the project's environmental and social performance was made available at project closure. At closing, the project's social safeguards performance was rated Satisfactory.

B.3 Fiduciary Compliances

Financial Management

45. Project accounts were up to date, bank reconciliation statements regularly drawn up, and the quality of reporting was, overall, deemed satisfactory. The current undisbursed balance is only US$ 726. Project audit reports were provided within the timeframe of the Financing Agreement and were unqualified. However, the Government only paid US$ 0.6 million out of the planned US$ 4.8 million counterpart funding. This was due to fiscal difficulties exacerbated by COVID-19 economic disruptions, social-political as well as adverse security developments. At project completion, financial management was rated satisfactory.

Procurement

46. All documents were processed in STEP as required. It should be noted that implementation of PADEL-M's activities was impacted by the political crisis in mid-2020 and 2021 that led to a temporary suspension of World Bank disbursements and restrictions which impacted the procurement process. At some point, some allegations were made about the integrity of some of the procurement activities, and some of these allegations were referred to the Integrity Vice Presidency of the World Bank and reviewed, although it appears that they were deemed not to warrant further action, as none was taken.

C. BANK PERFORMANCE

Quality at Entry

47. At appraisal, the project was consistent with the World Bank's CPF for Mali as well as the government's economic policies. The project built on lessons from the Bank-supported PRAPS-Mali, co-shared positions in the PIU, and shared implementation manuals which led to the project's timely effectiveness. It also had strong feasibility from the financial and economic analysis. It ensured a strong gender and youth focus including lower beneficiary contribution requirements for microprojects. Adequate social and environmental safeguards were put in place, and all requisite disclosures made. However, the project was overly ambitious, trying to cover everything in the livestock and fisheries sector. Although the project implementation unit did a herculean task of implementing it satisfactorily, it could have benefited from more selectivity to amplify impact. As noted earlier, there were some shortcomings in measurability of livestock weight for gauging productivity, although the project implementation team was resourceful in tracking suitable alternative data.

Quality at Supervision

48. The quality of supervision was Satisfactory. Supervision missions were conducted regularly. When capacity gaps on the part of the client were identified (for example, those in procurement), they were addressed through dedicated training by the World Bank. Aide memoires were detailed with clear actions for the following weeks and months. Also, during the COVID-19 pandemic, the World Bank continued providing implementation support, albeit remotely. However, between 2018 and 2021 (in four years), the World Bank changed TTLs four times which affected the quality and timeliness of implementation. The situation improved markedly in the latter months of project implementation when Bank support became more intense. This led to a rapid acceleration in disbursement and completion of project activities within the original timeframe, without necessitating a project extension.

Justification of Overall Rating of Bank Performance

49. Whereas Quality at Entry was generally Satisfactory despite some minor shortcomings in the measurability of some productivity indicators, Quality of Supervision was Moderately Satisfactory, especially due to many changes in team leadership. Therefore, Overall World Bank performance is rated *Moderately Satisfactory*.

D. RISK TO DEVELOPMENT OUTCOME

50. Risks to the project's development outcomes were assessed against factors influenceable by the project as well as exogenous factors. Influenceable factors considered include: (**i**) maintenance arrangements for public and collective infrastructure; (**ii**) continued availability of pasture seeds, fish fry, and artificial insemination services; and (**iii**) sustainability prospects for the subprojects financed under the matching grants. Exogenous factors include market risk, security, and climate change.

51. The risk from influenceable factors is generally low. *A) Public and Collective Infrastructure*. Although the markets whose renovation was financed by the project already existed prior to the project and had management committees, the project actively involved these committees in planning and supervising the rehabilitation progress in order to reinforce their sense of ownership. Exact arrangements vary from market to market, but each market has fee collection mechanisms for financing operation and maintenance costs. Similarly, the milk collection centers have management committees that collect user fees for operation and maintenance. *B) Pasture Seeds, Fish Fry, Artificial Insemination Services*. Regarding

pasture seeds and fish fry, the project trained and equipped seed/fry producers to expand and improve the quality of their services in order to meet farmers' demand in their communities. Regarding artificial insemination, private importers and inseminators already existed, and there is a strong willingness to pay by farmers. The project's main value-added was to stimulate demand for artificial insemination by demonstrating its benefits more broadly. Hence, the use of this technology will continue to grow. *(C) Sustainability Prospects for the Subprojects*. Subproject beneficiaries were already experienced in their sectors (beef fattening, milk production, poultry rearing, etc.). The project provided technical assistance to reinforce their skills. In addition, the technologies in question were simple.

52. The risk from exogenous factors varies from low to high. Regarding market risk, demand for food is strong and growing, thus market risk is generally low. However, the milk value-chain was reported to suffer from cheaper imports of powdered and condensed milk with potential for jeopardizing its long-term growth and enhancing its long-term market risk. Mali is a fragile country, with security issues in some parts of the country. This intermittently threatens the flow of animals thus disrupting fattening operations, a risk that is high in some regions. Regarding Climate Change Risk, Mali continues to experience erratic rainfall patterns which affect the livestock sector. The project promoted hardy forage varieties, and while this is a step in the right direction, this is clearly not enough and more needs to be done to make the livestock sector more resilient. Climate change risk remains high.

V. LESSONS AND RECOMMENDATIONS

53. **Promoting productive partnerships between livestock SMEs and financial institutions provides the needed liquidity for fostering transformational pathways that link pastoral herders to lucrative markets**. Project-supported activities, such as technical assistance to livestock SMEs to formulate bankable investment proposals and to banks to provide suitably adapted financial products to livestock SMEs led to a significant increase in the SMEs' turnover. These SMEs were able to purchase large numbers of animals from pastoral systems, fatten them, and sell them in lucrative markets in Mali and in the subregion. This approach can be adopted for similar countries in the Sahel that have similar production systems.

54. **Several factors are critical for successful project outcomes in a fragile environment**. In fragile environments, the security situation can change at any time, making it difficult to implement projects in some regions as and when the security situation deteriorates. From this project's experience, there were three factors that facilitated operating in an evolving security situation. *First*, key actors in the project areas should be involved in project design and implementation monitoring, to develop a strong sense of ownership down in the community. *Second*, day-to-day implementation should be led by entities located in the local community (technical services, producers' organizations). *Third*, to the extent possible, contracts should be awarded from a pool of qualified local bidders previously vetted as they have greater chances of successfully operating in the area even when security conditions are not ideal.

55. **Leveraging synergies with existing operations can help maximize operational efficiency**. The project initially shared staff with PRAPS and built on its operational manuals. This facilitated expediting the declaration of the project's effectiveness as well as the initiation of several project activities. The project also harmonized some of its field operations with PRAPS-M, such as animal vaccination, for efficient coverage and optimization of project resources. Where this form of leverage and collaboration is possible it is critical to monitor very closely the evolving workload and the staff's ability to cope, so that corrective action is taken, including hiring separate staff for critical functions.

56. **Effective communication, transparency, continuous sensitization, and outreach campaigns are critical to the success of matching grant schemes.** Some community members who were not selected for matching grants expressed some dissatisfaction with the project, alleging exclusion. To avoid this, one needs clear criteria, robust communication tools, inclusive and transparent sensitization strategies, and outreach campaigns on how the criteria are administered, in order for people to understand that they are not being excluded unfairly.

ANNEX 1. RESULTS FRAMEWORK AND KEY OUTPUTS

A. RESULTS FRAMEWORK

PDO Indicators by Outcomes

Enhance productivity of non pastoral animal production in selected value chains								
Indicator Name	Baseline		Closing Period (Original)		Closing Period (Current)		Actual Achieved at Completion	
	Result	Month/Year	Result	Month/Year	Result	Month/Year	Result	Month/Year
Percentage increase of yields produced by targeted beneficiaries among selected value chains (Percentage)	0.00	Jul/2017	25.00	Jun/2024	25.00	Jun/2024	29.00	Jun/2024
	Comments on achieving targets		This indicator measures the percentage increase in yields produced by targeted beneficiaries among selected VCs. Targeted beneficiaries were those who received kits and relevant training under Component 1 and all the beneficiaries of funded PPs and MPs under Component 2. Selected VCs were: cattle/meat, milk, aviculture (eggs and broilers), and aquaculture.					
Farmers reached with agricultural assets or services (Number)	0.00	Jul/2017	340,000.00	Jun/2024	340,000.00	May/2024	346,465.00	Jun/2024
	Comments on achieving targets		This indicator measures the number of livestock households and small livestock operators and enterprises in targeted areas who were provided with agricultural assets or services by the project. The baseline value for this indicator is zero. This is an outcome indicator. To-date the Project has reached 346,465 farmers against a final target of 340,000 by then end of activities. The total number of males reached in the Project were 122,402. This number does not include the number of males counted as youth.					
Farmers reached with agricultural assets or services - Female (Number)	0.00	Jul/2017	102,000.00	Jun/2024	102,000.00	Jun/2024	108,785.00	Jun/2024
Farmers reached with agricultural assets or services - Youth (Number)	0.00	Jul/2017	102,000.00	Jun/2024	102,000.00	Jun/2024	115,278.00	Jun/2024
Enhance commercialization of non pastoral animal production in selected value chains								
Indicator Name	Baseline		Closing Period (Original)		Closing Period (Current)		Actual Achieved at Completion	
	Result	Month/Year	Result	Month/Year	Result	Month/Year	Result	Month/Year

Beneficiary satisfaction rate with services provided by the project for the livestock sector (% of which female and % of which youth) (Percentage)	0.00	Aug/2017	65.00	Jun/2024	65.00	Jun/2024	94.50	Jun/2024
	Comments on achieving targets		This indicator measures the percentage of beneficiaries who expressed satisfaction with the services provided in the project areas based on formal surveys. Two beneficiary satisfaction surveys were conducted during the project. The sample size was representative of the total number of beneficiaries. This is a core indicator. It was measured at mid-term and at the end of the project.					
Beneficiary satisfaction rate with services provided by the project for the livestock sector - Female (Percentage)	0.00	Aug/2017	65.00	Jun/2024	65.00	Jun/2024	98.30	Jun/2024
Beneficiary satisfaction rate with services provided by the project for the livestock sector - Youth (Percentage)	0.00	Aug/2017	65.00	Jun/2024	65.00	Jun/2024	95.20	Jun/2024
Incremental sales in targeted value chains (aggregated over all the targeted value chains) (Percentage)	0.00	Aug/2017	35.00	Jun/2024	35.00	Jun/2024	81.45	Jun/2024
	Comments on achieving targets		This indicator measures the average increase in the value of sales in targeted VCs: cattle/meat, milk, aviculture (eggs and broilers), and aquaculture. To measure this indicator, targeted beneficiaries were those who received kits and relevant training under Component 1 and all the beneficiaries of funded PPs and MPs under Component 2.					

Stengthen the country's capacity to respond to eligible crisis								
Indicator Name	Baseline		Closing Period (Original)		Closing Period (Current)		Actual Achieved at Completion	
	Result	Month/Year	Result	Month/Year	Result	Month/Year	Result	Month/Year
Time to reach 50% of the targeted beneficiaries as foreseen in the inclusive contingency intervention plan (Weeks)	52.00	Aug/2017	10.00	Jun/2024	10	Jun/2024	8	Jun/2024
	Comments on achieving targets		This indicator relates to efficiency (time to respond) and effectiveness (share of targeted beneficiaries reached) in response to a crisis or emergency. This was in response to livestock feed crises as a result of multiple droughts.					

Intermediate Indicators by Components

Component 1: Strengthening of livestock services								
Indicator Name	Baseline		Closing Period (Original)		Closing Period (Current)		Actual Achieved at Completion	
	Result	Month/Year	Result	Month/Year	Result	Month/Year	Result	Month/Year
Farmers adopting improved agricultural technology (Number)	0.00	Jul/2017	45,000.00	Jun/2024	45,000.00	Jun/2024	48,026	Jun/2024

Farmers adopting improved agricultural technology - Female (Number)	0.00		13,500.00		13,500.00		16,150	
Farmers adopting improved agricultural technology - male (Number)	0.00		31,500.00		31,500.00		31,876	
Farmers adopting improved agricultural technology - Youth (male and female: 15-40 years old) (Number)	0.00	Jul/2017	13,500.00	Jun/2024	13,500.00	Jun/2024	14,600	Jun/2024
Number of poultry vaccinated against Newcastle Disease (Number (Thousand))	11,000.00	Aug/2017	16,000.00	Jun/2024	16,000.00	Jun/2024	18,600.00	Jun/2024
Number of sectoral policies developed as a result of the project (Number)	0.00	Aug/2017	5.00	Jun/2024	5.00	Jun/2024	12.00	Jun/2024
	Comments on achieving targets		Policies developed were specific to the Livestock Sector or directly apply to the Livestock Sector.					
Prevalence of two priority diseases (herd prevalence of contagious bovine pleuropneumonia [CBPP] and post-vaccinal seroprevalence of small ruminant plague [PPR]) -- PPR (Percentage)	37.00	Aug/2017	70.00	Jun/2024	70.00	Jun/2024	54	Jun/2024
Prevalence of two priority diseases (herd prevalence of contagious bovine pleuropneumonia [CBPP] and post-vaccinal seroprevalence of small ruminant plague [PPR]) -- CBPP (Percentage)	37.00	Aug/2017	20.00	Jun/2024	20.00	Jun/2024	5.32	Jun/2024

Component 2: Support to private investment

Indicator Name	Baseline		Closing Period (Original)		Closing Period (Current)		Actual Achieved at Completion	
	Result	Month/Year	Result	Month/Year	Result	Month/Year	Result	Month/Year
Number of micro-projects funded (of which % female and % youth) (Number)	0.00	Aug/2017	600.00	Jun/2024	600.00	Jun/2024	1,216.00	Jun/2024

Number of micro-projects funded (of which % female and % youth) - Female (Number)	0.00	Aug/2017	300.00	Jun/2024	300.00	Jun/2024	1,078.00	Jun/2024
Number of micro-projects funded (of which % female and % youth) - Youth (Number)	0.00	Aug/2017	300.00	Jun/2024	300.00	Jun/2024	759.00	Jun/2024
Number of Productive Partnerships funded (of which % female and % youth) (Number)	0.00	Aug/2017	160.00	Jun/2024	160.00	Jun/2024	164.00	Jun/2024
Number of Productive Partnerships funded (of which % female and % youth) - Female (Number)	0.00	Aug/2017	24.00	Jun/2024	24.00	Jun/2024	32.00	Jun/2024
Number of Productive Partnerships funded (of which % female and % youth) - Youth (Number)	0.00	Aug/2017	24.00	Jun/2024	24.00	Jun/2024	28.00	Jun/2024
Volume of loans granted by Partner Financial Institutions (Amount(USD))	0.00	Aug/2017	6,620,000.00	Jun/2024	6,620,000.00	Jun/2024	10,700,000.00	Jun/2024
Percentage of financed business plans that have met their loan repayment schedule (Percentage)	0.00	Aug/2017	85.00	Jun/2024	85.00	Jun/2024	96.00	Jun/2024

Component 3: Crisis prevention & management, and Project coordination

Indicator Name	Baseline		Closing Period (Original)		Closing Period (Current)		Actual Achieved at Completion	
	Result	Month/Year	Result	Month/Year	Result	Month/Year	Result	Month/Year
Time between request from government to making funds available to respond to an eligible crisis (Weeks)	52.00	Aug/2017	12.00	Jun/2024	12	Jun/2024	2.00	Jun/2024
	Comments on achieving targets		This indicator is common to PRAPS-ML's results framework, with the same baseline and targets					

B. KEY OUTPUTS BY COMPONENT

Objective/Outcome 1: Enhancing Productivity of Non-Pastoral Animal Production in Selected Value Chains	
Outcome Indicators	1. 29% percent increase of yields produced by targeted beneficiaries among selected value chains (against a target of 25%) 2. 346,465 farmers reached with agricultural assets or services (against a target of 340,000) (of which 108,785 are Female, 122,402 are Male, and 115,278 are Youth) 3. 94.5% beneficiary satisfaction rate with services provided by the project for the livestock sector (98.3% of which are female and 95.2% of which are youth)
Intermediate Results Indicators	1. 48,026 farmers adopting improved agricultural technology (against a target of 45,000) 2. 18,600,000 poultry vaccinated against Newcastle Disease (against a target of 16,000,000)[12] 3. 12 regulatory texts developed (against a target of 5)[13] 4. 5.32% herd prevalence of contagious bovine pleuropneumonia (CBPP) (against target of 20%) – this is not a project-specific target but a Government Vaccination Campaign target in which other development partners were participating 5. 54% post-vaccinal seroprevalence of small ruminant plague (PPR) (against target of 70%) -- this is not a project-specific target but a Government Vaccination Campaign target in which other development partners were participating
Key Outputs by Component (linked to the achievement of the Objective/Outcome 1)	1. 42,616 cows successfully became pregnant with artificial insemination 2. 15 Artificial Insemination Dissemination Units deployed from an initial 5 units. 3. 52,716 tons of dry matter produced sufficient to feed 14,726 cattle of 250 kg each. 4. 7,600,000 heads of cattle vaccinated against CBPP 5. 9,500,000 heads of small ruminants vaccinated against PPR 6. 8,665 producers including 4,433 women, 4,232 men and 3,932 young people trained on improved agricultural practices in the selected value chains

[12] This was meant to be an increment to the baseline of 11,000 million by the project hence the project vaccinated an additional 7,600,000 thus exceeding the original target of 16,000,000

[13] Regulatory Standards included: (i) five Malian standards relating to fish farming; (ii) five implementing texts of Law No. 08-026 of 23 July 2008, and Decree No. 09-232/P-RM of 15 May 2009 on the sanitary and hygienic protection of poultry farms and the control of poultry products; (iii) ten (10) decrees implementing Law No. 14-062 determining the principles and conditions of fisheries and aquaculture management in Mali.

Objective/Outcome 2: Enhancing Commercialization of Non-Pastoral Animal Production in Selected Value Chains	
Outcome Indicators	1. 81.45% Incremental sales in targeted value chains (aggregated over all the targeted value chains) (against a target of 35%).
Intermediate Results Indicators	1. 1,216 micro-projects funded (against a target of 600) (89% are female owned and 62% are youth) 2. 164 Productive Partnerships funded (against a target of 160) (32% are female owned and 28% are youth). 3. 10.70 Million USD as volume of loans granted by financial institution partners (against a target of 6.62 Million USD)* 4. 96 % of funded PP met the repayment schedule (against a target of 85%)
Key Outputs by Component (linked to the achievement of the Objective/Outcome 2)	1. Four (04) agricultural interprofessional organizations (livestock/meat, milk, poultry and fish) established 2. 15 innovation platforms for women who are trained on fish production, fish smocking, and sheep fattening. 3. Two (02) livestock markets rehabilitated in Konobougou and Kouremalé, and three (03) livestock markets reconstructed in Konna, Korientzé and Bougouni. 4. Modernization of One (01) fish market in Niono which was renovated and equipped with a shed and cold room for overnight fish storage. 5. At least 2,312 jobs created from both microprojects and productive partnerships; allowing youth and women to engage in diversified activities.
Objective/Outcome 3: Strengthening the country's capacity to respond to severe crises affecting the livestock sector and Project Coordination	
Outcome Indicators	1. 8 weeks as time to reach, with services and / or funds, 50% of the targeted beneficiaries as foreseen in the inclusive crisis intervention plan in the livestock sector.
Intermediate Results Indicators	1. 2 weeks between request from government to making funds available to respond to an eligible crisis 2. 6,782 farmers supported with livestock feed in emergencies
Key Outputs by Component (linked to the achievement of the Objective/Outcome 2)	1. One (01) Crisis Management Unit formed (embedded in the Ministry of Livestock and Fisheries) for championing prevention and response efforts in cases of crises and vulnerabilities in the livestock and fisheries subsectors. 2. One (01) Emergency Operations Manual was developed. 3. One (01) *Cadre Harmonisé* developed and operationalized as a crisis management tool to identify feed crisis pockets.

* Note: in the Data Sheet, the PFI contribution had been projected at US$ 9.4 million

ANNEX 2. BANK LENDING AND IMPLEMENTATION SUPPORT/SUPERVISION

A. TASK TEAM MEMBERS

Name	Role
Soulemane Fofana	Team Leader
Ndri Marina Assoumou	Financial Management Specialist
Tahirou Kalam	Financial Management Specialist
Boubacar Diallo	Procurement Specialist
Rahmoune Essalhi	Procurement Specialist
Mamadou Sangare	Procurement Specialist
Mohamed Youba Sokona	Environmental Specialist
Sinse Bagayoko	Environmental Specialist
Tolidji Blaise Donou	Environmental Specialist
Mahamadou Ahmadou Maiga	Social Specialist
Sachiko Morita	Counsel
Mehdi Benyagoub	Peer Reviewer
Angele Compaore Ouattara	Procurement Team
Aissata Diop Diallo	Procurement Team
Moussa Sidibe	Procurement Team
Nikolai Alexei Sviedrys Wittich	Procurement Team
Mahamadou Sissoko	Procurement Team
Alice Diarra Sangare	Procurement Team
Benjamin Billard	Team Member
Salam Hailou	Team Member
Faly Diallo	Team Member
Christine Heumesser	Team Member
Rhoda Rubaiza	Team Member
Diletta Doretti	Team Member
Mahamoud Magassouba	Team Member
Christian Berger	Team Member
Andre Taptue	Team Member

Habibatou Gologo	Team Member
Himanshu Sharma	Team Member
Lilian Puech	Team Member
Amadou Ba	Team Member
Malick Fall	Team Member
Jane Hopkins	Team Member

B. STAFF TIME & COST

Stage of Project Cycle	Staff Time & Cost	
	No. of Staff Weeks	US$ (including travel and consultant costs)
Preparation		
FY17	15.579	132,077.94
FY18	28.248	203,848.83
FY19	16.549	110,013.98
Total	60.38	445,940.75
Supervision/ICR		
FY18	2.000	11,397.60
FY19	9.216	33,099.90
FY20	33.651	163,720.83
FY21	35.279	90,461.29
FY22	34.895	81,165.27
FY23	30.708	78,580.24
FY24	45.920	224,434.66
FY25	10.874	52,731.82
Total	202.54	735,591.61

ANNEX 3. PROJECT COST BY COMPONENT

Components	Amount at Approval (US$M)	Actual at Project Closing (US$M)	Percentage of Approval (US$M)
Component 1: Strengthening of livestock services	20.5	19.91	97.12
Component 2: Support to private investment	30.1	25.87	85.28
Component 3: Crisis prevention & management, and Project coordination	9.4	10.54	112.12
Total	**60.0**	**56.32**	**93.53**

Note: At project closing there was only US$ 726 undisbursed balance. The difference between the disbursed amount and the project cost at appraisal is due to foreign exchange fluctuations.

ANNEX 4. EFFICIENCY ANALYSIS

Assessment of Efficiency and Rating

Rating: Substantial

Economic and financial analysis

Introduction

1. This is an ex-post Economic and Financial Analysis of the "Livestock Sector Development Support Project in Mali" (PADEL-M) at completion in June 2024. The PDO for PADEL was to "enhance productivity and commercialization of non-pastoral animal production in selected value chains and strengthen the country's capacity to respond to an eligible crisis or emergency.
2. At appraisal, the project total costs were estimated at USD 78.4 million, including contributions from IDA (76.53%) and the counterpart contributions from the beneficiaries (5.36%), partner financial institutions (11.99%) and the government (6.12%).
3. The Economic Financial analysis uses a cost-benefit analysis to estimate the net additional benefits attributable to the project's main outcomes and to assess whether the project resources were used efficiently up to the time of completion in June 2024.

Efficiency Analysis

Methodology and Assumptions

4. The EFA includes a cost-benefit analysis to assess the ex-post economic viability of PADEL-M from the overall national economy standpoint. The analysis was conducted over a 20-year period in constant 2018 as base year prices.
5. Benefit streams were transformed into economic values by applying conversion factors for each category. Economic benefits considered in the analysis were quantified as those derived from economic benefit streams of the funded sub-projects across the value chains.
6. The vaccination campaigns confer co-benefits from avoided mortality and associated medical costs as a result of the prevented diseases and thus higher productivity of livestock and net sales and this was modeled using a vaccination model. The artificial insemination was substantial for PADEL and directly translates to increased productivity in milk production and was modeled using the herd growth model will be done.
7. The overall benefits of the project have been estimated using the economic results of the financial models from the livestock value chains, against the economic project costs over a 20-year period (2018-2038). Overall, the economic results are positive, indicating the project's economic soundness based on the information provided. Hence the project's updated Economic Internal Rate of Return (EIRR) is 25.72 percent, with a Net Present Value (NPV) of US$ 62.87 million (Table 1) and is profitable. This assessment also considered the environmental benefits of the project using the livestock module in the EX-ANTE FAO tool.
8. Value addition: The value addition to fish through smoking and drying in the PADEL-M introduced Chockor ovens instead of traditional methods was estimated to save 311 ha of forest land per year, and sequestration of about 5,217 tons CO2 eq. annually, for an aggregate of up to 26,086 tons equivalent over the course of the project's implementation period. There was value addition from the use of improved feed formulations, and the livestock

vaccination campaigns. When environmental benefits are considered, the EIRR is 26.79 percent at the low estimate range of carbon with a NPV of US$ 66.39 million and 27.90 percent at high estimate range with a NPV of US$ 69.80 million (Table 1).

Table 1. EIRR and NPV at ICR Stage, With and Without Environmental Benefits

	Appraisal (Discount Rate of 6 percent)	ICR (Discount Rate of 6 percent)		
	Without ENV. Benefits	Without ENV. Benefits	With ENV. Benefits @low carbon estimate range	With ENV. Benefits @high carbon estimate range
EIRR (percent)	16	25.72	26.79	27.90
NPV (US$, Million)	31.4	62.87	66.39	69.80

Sensitivity Analysis

9. To verify the results' robustness, we perform a sensitivity analysis on key variables, including the replacement costs. It highlights that the project remains financially viable even if the project benefits decrease by 10 to 20 percent after year 5 or the operating costs increase by 10 to 20 percent after year 5. It also highlights a case where benefits would be affected if there was a lag of 1 or 2 years. Even under this very conservative scenario, the sensitivity analysis shows good resilience to increases in costs and reduction in benefits (Table 3). The EIRR of 21.1 percent is equal to the value of the social discount rate—if benefits were reduced by 20 percent or were to lag by five years.

Table 3. Summary of sensitivity analysis (scenario with all project costs)

	Base Case	Increase in Operational Costs after Year 5			Increase in Benefits after Year 5		Reduction of Benefits after Year 5	
		+10%	+20%	+50%	+10%	+20%	-10%	-20%
EIRR	25.7%	25.7%	25.6%	25.5%	27.8%	29.9%	23.5%	21.1%
NPV (FCFA Million)	52,559	52,378	52,194	51,682	60,248	67,937	44,870	37,181
NPV (US $ Million)	84.9	84.6	84.3	83.5	97.4	109.8	72.5	60.1

ANNEX 5. BORROWER, CO-FINANCIER AND OTHER PARTNER/STAKEHOLDER COMMENTS

5.1 Government Completion Report

Technical Summary

PADEL-M was approved by the World Bank's Board of Directors on February 28, 2018; The Financing Agreement (FA) covering a Grant (No. D2740-ML) and a Credit (No. 6188-ML) was signed on March 29, 2018. The implementation was effective on August 23, 2018. It was financed with an IDA amount of US$ 60 million USD. The project closed on June 28, 2024.

The PDO is to "enhance productivity and commercialization of non-pastoral animal production in selected value chains and strengthen the country's capacity to respond to an eligible crisis or emergency."

The Government of Mali analysis of the overall results focused on the three main components of PADEL: (i) Strengthening of Livestock Services; (ii) Support to Private Investment; (iii) Crisis Prevention and Management, and Project Coordination.

The evaluation of PADEL's performance was based on the following:

- **Project relevance (pertinent):** The project achieved development objectives in line with the needs and expectations of the population, which can be summed up as the challenges of (a) food security through increased production and productivity; (b) improved income through the marketing of products, with an impact on the living conditions of the population; and (c) capacity building to strengthen human capital and the sustainability of achievements.
- **Project coherence:** The project was consistent with a number of international, regional, subregional, and national development plans; commitments; agreements; and mechanisms (Sustainable Development Goals 2016–2030; and Comprehensive Africa Agriculture Development Program 2015–2025.
- **Project effectiveness:** Overall, the RF shows that the PDO indicators were achieved, and results rating is Satisfactory. The completion rates for the activities and sub-activities of Components 1, 2, and 3 are 100 percent, 140 percent, and 100 percent respectively. There is a caveat for Component 3 because no crisis was experienced but livestock feed distributions were made to support livestock farmers in a timely manner during periods of drought and severe scarcity. Thus, the results showed completion rate of 113 percent of activities.
- **Project efficiency:** Overall, the project efficiency rating is satisfactory despite its being implemented in a disrupted context of COVID 2019, and political events in Mali/terrorism in the Sahel. It reflects the optimum use of financial resources, which enabled achievement of most planned activities, leading to the conclusion that the project is efficient in its use of financial resources.
- **Effects/Impacts:** The project delivered positive impacts, given the (a) investments made in rural areas, which produced noticeable impacts on young people and women resulting in significant gains, the creation of jobs on milk, cattle, poultry and aquaculture farms. Indeed, on the financial level, there was an obvious increase in income for producers who were supported in PP and MP; (b) investments in institutional aspects such as training and capacity building that developed the capacities of the beneficiaries to implement and monitor activities, both producers and public support institutions; (c) PADEL directly contributed to environmental integrity and preservation by constantly ensuring compliance with environmental standards that avoided pollution and

contributed towards GHG mitigation. Additionally, PADEL-M provided social cohesion at the level of private beneficiaries and communities by contributing to the strengthening of organizations and their capacities to manage activities, facilitated the integration of young people and women, by revitalizing social life and links between actors within organizations and between organizations. The Field School approach was a method of extension in rural areas which facilitated the sharing of knowledge and experiences among peers and developed social harmony through solidarity between learners.

- **Project sustainability:** The project was implemented with a view to ensuring the sustainability of investments and the gains through the various approaches developed during implementation: (a) strong ownership of the project by various beneficiaries, (b) technical and institutional capacity building for direct beneficiaries and other stakeholders, (c) strong relationships and commitments through the promotion of win-win partnerships agreements between the various players in the supply chains towards PP development, particularly in the sub-sectors of dairy production and livestock fattening, Improvement of animal health, skills development and capacity building of the Ministry of Livestock and Fisheries for the successful implementation of activities.
- **The Full version of the Government Completion Report can be accessed below:**
    - Rapport d'achèvement PADEL

ANNEX 6. SUPPORTING DOCUMENTS (IF ANY)

Please click on the links to access documents:

1. Rapport de l'étude d'impact du PADEL-M
2. Le rapport d'évaluation de l'Insémination artificielle animale au Mali en mettant en contribution l'apport du PADEL-M.
3. Le rapport d'audit environnemental et social du PADEL-M Le rapport d'évaluation de la satisfaction des bénéficiaires du PADEL-M
4. Le rapport d'évaluation du genre du PADEL-M
5. Le rapport d'étude sur le taux d'adoption des technologies et des bonnes pratiques diffusés par le PADEL-M
6. Project Appraisal Document
7. Project Financing Agreement
8. Aide-Memoirs of the Implementation Support Missions
9. Project ISRs (Implementation Status and Results Reports)

ANNEX 7. Regulatory texts developed by PADEL-M

Texts prepared by PADEL-M:

1. **Decree laying down the terms and conditions for the application of Law No. 08-026 of 23 July 2008 on the health and hygiene protection of poultry farms and the control of poultry products in terms of sanitary and hygienic requirements, authorization to operate and control of poultry farming and hatchery activities**
    a. Decree laying down the procedures for veterinary health approval of industrial poultry slaughterhouses, cold stores and poultry meat cutting and processing establishments
    b. Order laying down the procedures for the approval of hatcheries and breeding farms
    c. Order fixing the minimum distances to be respected between poultry holdings
2. **Decree laying down the terms of application of Law No. 028 of 14 June 2011 instituting the control of foodstuffs of animal origin and animal feed with regard to poultry products**
    a. Preliminary draft decree laying down common and specific biological safety measures for the premises, equipment and operation of intensive poultry production farms and hatcheries
3. **Drafting of ten (10) implementing decrees of Law No. 14-062 determining the principles and conditions of fisheries and aquaculture management in Mali**
    (i) Decree defining the terms and conditions for the exercise of professional fishing.
    (ii) Decree defining the conditions for the installation and use of fishing booms.
    (iii) Interministerial Order determining the minimum catch size of the main fish species and the list of threatened fish species.
    (iv) Order fixing the rate of charge on the packaging of smoked and dried fish.
    (v) Interministerial order defining emergency measures in the event of escape of specimens of exotic or genetically modified species into the natural environment.
    (vi) Interministerial order specifying the alert and response system in the event of an animal health crisis.
    (vii) Order specifying and determining the rules applicable to the collection of eggs and seeds in the wild for aquaculture purposes.
    (viii) Interministerial Order defining the standards relating to the hygiene and quality of aquaculture products.
    (ix) Decree laying down the model contract and specifications for the aquaculture concession in the domain of the State.
    (x) Interministerial Order fixing the rate of discounts to agents on the receipts from fees and transactions.
4. **Brucellosis control strategy in peri-urban dairy cattle farms in Mali 2022-2026**
5. **Strategy for the control of tuberculosis in peri-urban dairy cattle farms in Mali 2022-2026**
6. **Newcastle disease control strategies in Mali.**
7. **Strategies for controlling avian salmonellosis in Mali.**
8. **Fish Farm Standards – Characteristics**
9. **Fish Feed Standards – Composition**
10. **Standards for Fish Farm Fry – Production Techniques and Characteristics of African Catfish - Clarias gariepinus and Tilapia – Oreochromis niloticus Fry**
11. **Fishing Net Standards – Specifications**
12. **Standards for Smoked Fish and Smoked-Dried Fish: Processing Techniques**

ANNEX 8. PADEL-M Footprint in Mali (PADEL-M sites are the pink circles)

