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IMPLEMENTATION COMPLETION AND RESULTS REPORT

IDA-H5210, IDA-H9740, TF-17447

IN THE IN THE AMOUNT OF
US\$113.05 MILLION EQUIVALENT

TO THE

Burkina Faso

Agricultural Productivity and Food Security Project

June 29, 2020

Agriculture And Food Global Practice
Africa Region

CURRENCY EQUIVALENTS

(Exchange Rate Effective {May 21, 2020})

Currency Unit

XOF 600 = US\$1

US\$ 0.7288 = SDR 1

FISCAL YEAR

July 1 - June 30

Regional Vice President: Hafez M. H. Ghanem

Country Director: Soukeyna Kane

Regional Director: Simeon Kacou Ehui

Practice Manager: Chakib Jenane

Task Team Leader(s): Elisee Ouedraogo

ICR Main Contributor: Ernest Ruzindaza

ABBREVIATIONS AND ACRONYMS

AF	Additional Financing
AI	Artificial insemination
CAADP	Comprehensive Africa Agriculture Development Programme
CAS	Country Assistance Strategy
CPF	Country Partnership Framework
DGPV	<i>Direction Générale des Productions Végétales</i> (General Directorate of Plant Production)
EFA	Economic and Financial Analysis
EIRR	Economic Internal Rate Return
EX-ACT	Ex-Ante Carbon-balance Tool
FM	Financial management
FAO	Food and Agriculture Organization of the United Nations
GAFFSP	Global Agriculture and Food Security Program
GDP	Gross Domestic Product
GHG	Greenhouse gas
ha	Hectares
ICR	Implementation Completion and Results
ICT	Information and communication technology
IDA	International Development Association
IF	Initial financing
IFAD	International Fund for Agricultural Development (IFAD)
IRR	Internal rate of return
ISR	Implementation Status Report
M&E	Monitoring and evaluation
MEAHA	<i>Ministère de l'Eau, des Aménagements Hydrauliques et de l'Assainissement</i> (Ministry of Water, Irrigation and Sanitation)
MIS	Market Information System
MT	Metric tons
NAIP	National Agriculture and Food Security Investment Plan
NPV	Net present value
PAPSA	<i>Projet d'Appui à la Production et à la Sécurité Alimentaire</i> (Agricultural Productivity and Food Security Project)
PDO	Project Development Objective
PIU	Project Implementation Unit
PNDES	<i>Programme National de Développement Economique et Social</i> (National Economic and Social Development Program)
PNSR	<i>Plan National du Secteur Rural</i> (National Program for the Rural Sector)
RCA	Regional Agricultural Chambers
SCADD	<i>Stratégie de Croissance Accélérée et de Développement Durable</i> (Strategy for Accelerated Growth and Sustainable Development)
SDR	<i>Stratégie de Développement Rural</i> (Rural Development Strategy)
SDR	Special Drawing Rights
UTL	<i>Unité de transformation du lait</i> (milk processing unit)
VAT	Value-added tax
WFP	World Food Programme
WOP	Without project
WP	With project

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DATA SHEET

BASIC INFORMATION

Product Information

Project ID	Project Name
P114236	Agricultural Productivity and Food Security Project
Country	Financing Instrument
Burkina Faso	Investment Project Financing
Original EA Category	Revised EA Category
Partial Assessment (B)	Partial Assessment (B)

Organizations

Borrower	Implementing Agency
Burkina Faso	Ministry of Agriculture and Irrigation

Project Development Objective (PDO)

Original PDO

The project development objective is to improve the capacity of poor producers to increase food production and to ensure improved availability of food products in rural markets.



FINANCING

	Original Amount (US\$)	Revised Amount (US\$)	Actual Disbursed (US\$)
World Bank Financing			
IDA-H5210	40,000,000	39,861,300	38,974,588
IDA-H9740	35,950,000	35,950,000	32,272,967
TF-17447	37,100,000	37,100,000	36,990,375
Total	113,050,000	112,911,300	108,237,930
Non-World Bank Financing			
Borrower/Recipient	14,000,000	0	0
Total	14,000,000	0	0
Total Project Cost	127,050,000	112,911,300	108,237,930

KEY DATES

Approval	Effectiveness	MTR Review	Original Closing	Actual Closing
10-Dec-2009	28-Jul-2010	08-Jul-2013	30-Jun-2016	29-Nov-2019

RESTRUCTURING AND/OR ADDITIONAL FINANCING

Date(s)	Amount Disbursed (US\$M)	Key Revisions
21-Jun-2018	61.88	Change in Results Framework Change in Loan Closing Date(s) Reallocation between Disbursement Categories

KEY RATINGS

Outcome	Bank Performance	M&E Quality
Satisfactory	Satisfactory	Substantial

**RATINGS OF PROJECT PERFORMANCE IN ISRs**

No.	Date ISR Archived	DO Rating	IP Rating	Actual Disbursements (US\$M)
01	25-Jun-2010	Satisfactory	Satisfactory	0
02	23-Mar-2011	Satisfactory	Satisfactory	1.96
03	12-Dec-2011	Satisfactory	Satisfactory	4.88
04	04-Jul-2012	Moderately Satisfactory	Moderately Satisfactory	21.24
05	22-Apr-2013	Moderately Satisfactory	Satisfactory	21.24
06	01-Dec-2013	Moderately Satisfactory	Moderately Satisfactory	28.48
07	02-Jul-2014	Satisfactory	Satisfactory	34.85
08	12-Jan-2015	Satisfactory	Satisfactory	39.10
09	06-Jun-2015	Satisfactory	Satisfactory	42.17
10	18-Dec-2015	Satisfactory	Satisfactory	44.15
11	22-Jun-2016	Satisfactory	Moderately Satisfactory	50.37
12	29-Dec-2016	Satisfactory	Moderately Satisfactory	54.28
13	25-Jun-2017	Satisfactory	Moderately Satisfactory	54.28
14	28-Nov-2017	Satisfactory	Satisfactory	57.73
15	29-Jun-2018	Satisfactory	Satisfactory	61.88
16	27-Nov-2018	Satisfactory	Moderately Satisfactory	61.88
17	22-May-2019	Satisfactory	Moderately Satisfactory	63.85
18	05-Dec-2019	Satisfactory	Satisfactory	71.05

**SECTORS AND THEMES****Sectors**

Major Sector/Sector (%)

Agriculture, Fishing and Forestry 100

Fisheries 10

Crops 80

Livestock 10

Themes

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

Private Sector Development 100

Jobs 100

Human Development and Gender 100

Nutrition and Food Security 100

Food Security 100

ADM STAFF

Role	At Approval	At ICR
Regional Vice President:	Obiageli Katryn Ezekwesili	Hafez M. H. Ghanem
Country Director:	Ishac Diwan	Soukeyna Kane
Director:	Simeon Kacou Ehui	Simeon Kacou Ehui
Practice Manager:	Karen Mcconnell Brooks	Chakib Jenane
Task Team Leader(s):	Abdoulaye Toure	Elisee Ouedraogo
ICR Contributing Author:		Ernest Ruzindaza



I. PROJECT CONTEXT AND DEVELOPMENT OBJECTIVES

A. CONTEXT AT APPRAISAL

Context

- 1. Appraisal of the Agricultural Productivity and Food Security Project (*Projet d'Amélioration de la Productivité Agricole et de la Sécurité Alimentaire, PAPSA*) coincided with an economic slowdown in Burkina Faso, unleashed by the world food and energy price crises in 2007–08.** The persistence of those crises, coupled with Burkina's financial crisis, caused a 3 percent increase in poverty in 2008. The share of the population living in poverty rose to levels last seen in 2003–04, and Burkina ranked second to last in the 2008 United Nations Human Development Index.¹ Burkina's rise in poverty was occurring in a context of rapid population growth (estimated at 3 percent per year).
- 2. The chronic food insecurity of Burkina Faso's fast-growing population could be reduced by taking full advantage of the country's agro-pastoral potential.** According to the national household survey of 2007, more than 38 percent of households had difficulty satisfying their food needs. Burkina Faso has always relied on extensive agriculture to meet its food needs, but in the past two decades, the population has grown at nearly 3 percent per year while crop productivity has stagnated. Stagnant crop productivity has been a barrier to improvements in food security. Livestock production, largely practiced under extensive pastoral and agro-pastoral conditions, displays equally low productivity. Food security varies greatly between years, as large annual fluctuations in rainfall lead to erratic cereal production. These challenges persist even though the country's substantial agro-pastoral endowments could be tapped to achieve faster and more sustainable rural sector growth and food security. Of the 9 million hectares (ha) of farmland in Burkina Faso, less than half (46 percent) was under cultivation in 2008. The country's agroecological endowment also includes a large number of pastoral areas, village pasture zones, transhumance corridors, agroecological areas suited to diversified development of the livestock sector, and important potential for biodiversity production and conservation.
- 3. Agriculture sector strategies were defined by the National Program for the Rural Sector (*Programme National du Secteur Rural, PNSR*), under the overall objective of ensuring food and nutrition security, sustained economic growth, and poverty reduction.** The PNSR was the framework for operationalizing the 2011–15 National Strategy for Accelerated Growth and Sustainable Development (*Stratégie de Croissance Accélérée et de Développement Durable, SCADD*)², as well as the reference framework for all strategies, policies, and plans related to agriculture, animal resources, water, fisheries, and the environment. The main objective of the PNSR was to contribute in a sustainable manner to food and nutrition security, strong economic growth, and poverty reduction. To remedy food insecurity caused by low productivity—which is the result of worsening climatic conditions, insecure land tenure, and challenges in accessing agricultural inputs and equipment—the PNSR planned to ensure better coverage of food needs, reduce the share of the population that consumes less than the minimum caloric intake, and reduce the prevalence of underweight among rural children ages 0–5 years. The PNSR promoted agricultural intensification through irrigation, input use, and market linkages for agro-silvo-pastoral production.

¹ Project Appraisal Document, 2008.

² The SCADD is the strategic framework for all economic and social development policies of the Government of Burkina Faso.



4. **The Government of Burkina Faso recognized that the country's agricultural systems were not providing food security outcomes to match the needs of its growing population.** The government regarded agriculture as a high-priority sector—it contributed 30 percent of gross domestic product (GDP) and employed around 80 percent of the workforce—and the national Rural Development Strategy (*Stratégie de Développement Rural, SDR*) of 2003 highlighted the need to strengthen food security. National demographic dynamics, coupled with the world food crisis, called for improvements in productivity-led agricultural growth to improve food security and reduce rural poverty. Three of the seven strategic pillars of the SDR prioritized agriculture and food security: (i) increasing, diversifying, and intensifying crop, livestock, and forestry and fishery production; (ii) reinforcing the links between production and markets; and (iii) increasing and diversifying income sources. The SDR priorities were reinforced by the SCADD, which aimed to boost economic growth toward a target of 10 percent annual GDP growth and to reduce poverty to less than 35 percent by 2015, thereby achieving the first Millennium Development Goal.
5. **In alignment with the SDR and SCADD, the World Bank developed a Country Assistance Strategy (CAS) FY 10-12 that strongly emphasized the role of agriculture as source of shared growth, increased employment, and reduced income risks in rural areas.** The government was pursuing several short-term measures to address the immediate impacts of the food crisis, including fiscal measures (such as the reduction of import duties on widely consumed foods such as milk and rice), the distribution of subsidized seed and fertilizer to boost food production, and the use of social safety nets in the education and health sectors.³ Support from the World Bank through PAPSA was intended to deal with the immediate effects of the food crisis by helping poor producers to increase food production and market their produce, and by laying the groundwork for stronger national food security systems in the longer term.

Theory of Change (Results Chain)

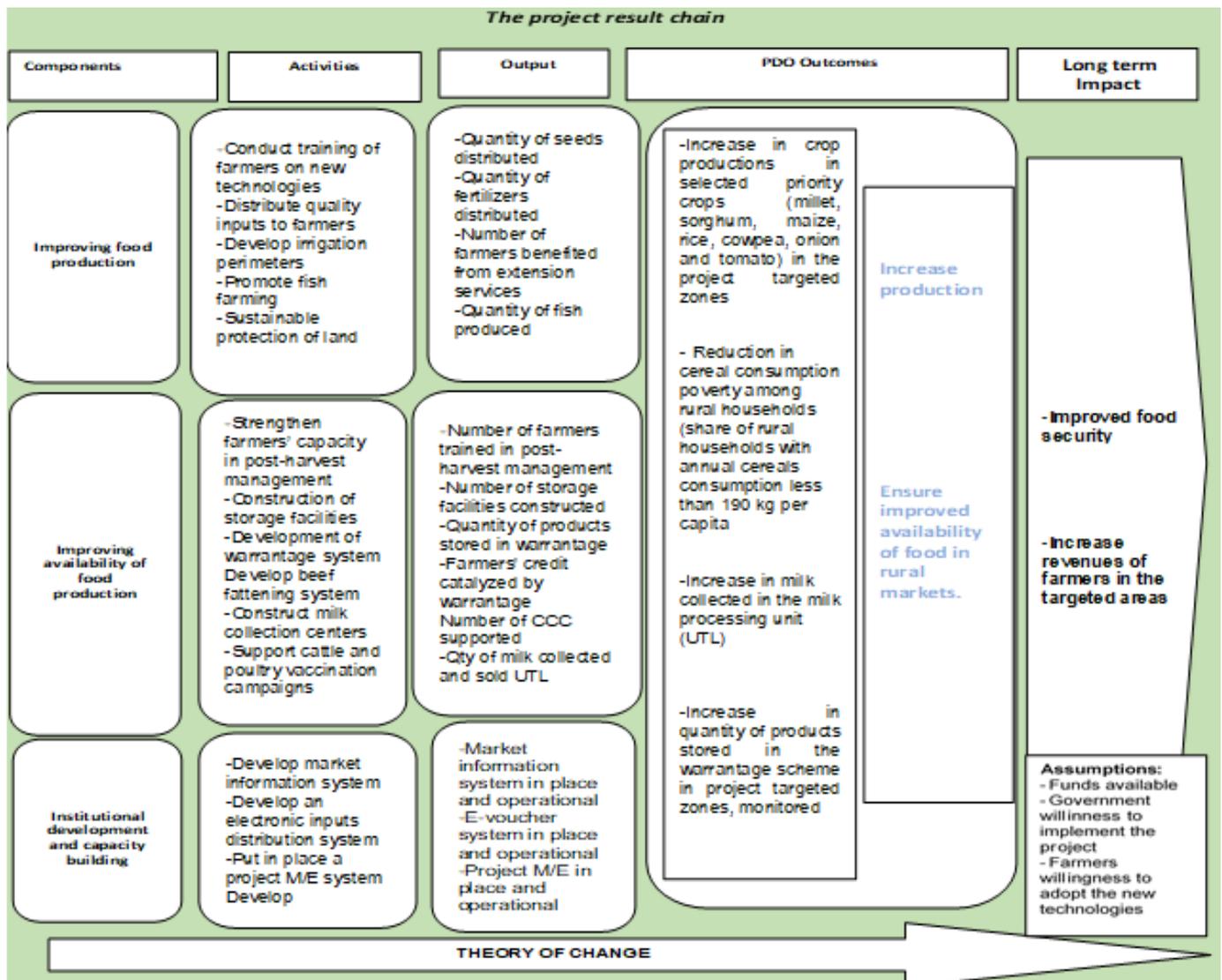
6. **A theory of change was not developed for PAPSA at appraisal, but one is proposed for the purpose of this Implementation Completion and Results (ICR) Report.** The logic underlying PAPSA intervention is that poor farmers engaged in agro-silvo-pastoral production have limited access to technological innovations and appropriate training to increase production and cope with the diverse availability of food in rural markets during the year. The public and private sector had little capacity to provide quality agricultural services adapted to the technical and training needs of small producers—making it hard to reverse the status quo of low productivity, low availability of agricultural products in the markets, and the resulting food insecurity. To address the overarching challenges related to food insecurity, PAPSA sought to achieve two critical near-term outcomes: (i) increased food production and (ii) improved availability of food in rural markets. To achieve the two outcomes, the project provided packages of agricultural technology to enhance crop and livestock production and productivity, and it supported efforts to make food more consistently available and accessible in local rural markets throughout the year. PAPSA intervened in selected value chains through technology transfer and capacity building for small producers and their organizations. In addition, PAPSA strengthened the operational capacity of private and public extension services with a view to delivering better services to small producers. By doing so, PAPSA intended to contribute to the longer-term outcomes of greater food security and reduced poverty among the targeted beneficiaries.
7. Figure 1 illustrates the results chain and theory of change in relation to project outputs and indicators. It indicates how specific project activities and outputs would contribute to achieving increased production and availability of food in the rural markets while supporting the longer-term outcomes of food security and poverty reduction. The technological packages for crops included inputs such as seed and fertilizer; livestock production technologies

³ Project Appraisal Document, 2010.



included breed improvement, vaccines, and animal feed; and support for fish farming focused on supplying fingerlings and feed. In conjunction with this support, the provision of extension services and capacity building for producers and producer organizations were central to achieving the objective of increased production. The project enhanced availability of food in rural markets by investing in facilities (storage structures, milk collection centers,) to reduce post-harvest losses, strengthening village cereal marketing cooperatives, and consolidating market information system. The project gave particular attention to activities that could improve producers' incomes and access to food, including sheep and cattle fattening, fish farming, food processing, promotion of non-timber forest products, and horticultural (vegetable) production, and it linked producers to microfinance through a warrantage system.⁴

Figure 1: Theory of Change for the Agricultural Productivity and Food Security Project



⁴ Warrantage is an inventory credit system in which microfinance institutions grant credit using stored grain as the collateral.



Project Development Objectives (PDOs)

8. **The PDO as stated in the project financing agreement was “to improve the capacity of poor producers to increase food production and to ensure improved availability of food products in rural markets”.** During its life span, PAPSA was to directly benefit some 800,000 rural people. Beneficiaries were selected from among the poorest producers, those whose livelihoods depended on subsistence agriculture—the production of cereal crops, cowpeas, roots, tubers, as well as milk and short-cycle livestock.

Key Expected Outcomes and Outcome Indicators

9. **The project had two expected outcomes, measured by four main indicators.** The expected outcomes were: (i) increased production and (ii) improved availability of food in rural markets. Four main indicators were proposed to measure the PDO: (i) increase in the production of selected priority crops (millet, sorghum, maize, rice, cowpeas, onions, and tomatoes) in the project’s target zones; (ii) increase in milk collected in the milk processing units (unités de transformation du lait, UTLs); and (iii) increase in quantity of products stored in the warrantage scheme in project targeted zones, monitored; and (iv) reduction in cereal consumption poverty among rural households (share of rural households with annual cereals consumption less than 190 kg per capita).

Components

10. **The project was designed with the three following components:**

11. **Component 1: Improving food production** (appraisal: US\$26.7 million; actual: US\$72.8 million). Component 1 financed (i) matching grants and (ii) community works that supported the adoption of high-performing technology packages for improved productivity by poor households. For crop production, these packages included improved seed, fertilizer, manure, irrigation infrastructure, sustainable soil management technologies, and improved post-harvest technologies. Support for animal production emphasized the production of milk and short-cycle livestock; the technology packages included artificial insemination (AI) for genetic improvement (local and exotic breeds), access to veterinary services (vaccines), and animal feeds. Fish farming was supported by providing fingerlings and feed to farmers and through the development of fish pens and ponds.

12. **Component 2: Improving the availability of food products** (appraisal: US\$5.4 million; actual: US\$20 million). Component 2 helped to strengthen stakeholders’ capacity to manage the variability of food supplies at the local and national level. The project invested in post-harvest management by: (i) disseminating improved technologies to reduce post-harvest losses, including improved grain storage facilities and triple-bagging; (ii) supporting multifunctional platforms to facilitate the adoption of food processing equipment; and (iii) reinforcing improved, small-scale food processing units managed principally by women’s groups in rural areas. Component 2 also funded the development of warrantage in areas of surplus food production and supported community storage by strengthening the capacity of village cereal marketing cooperatives (former cereal banks) and reinforcing market information systems.

13. **Component 3: Institutional development and capacity building** (appraisal: US\$7.1 million; actual: US\$18 million). Component 3 reinforced the capacities of institutions directly involved in implementing PAPSA—four ministries (Agriculture and Irrigation; Animal Resources and Fisheries; Environment, Green Economy and Climate Change; Water Management and Sanitation) and the National and Regional Chambers of Agriculture, which were involved in



supporting M&E, mobilizing producer organizations, and training their members. Through this component the project planned to build the capacity for extension, strengthen agricultural input supply and the capacity for producer organizations. This project component also supported the monitoring and evaluation (M&E) activities of the Project Implementation Unit (PIU) by the focal points located in the implementing agencies.

B. SIGNIFICANT CHANGES DURING IMPLEMENTATION

Revised PDOs and Outcome Targets

14. The project PDO remained unchanged during the life of the project.

Revised PDO Indicators

15. A new PDO indicator was introduced in 2014 to measure the “increase in fish production in the targeted zones,” with a target of 540 metric tons (MT) at the end of the project. At the same time, the indicator on “reduction in cereal consumption poverty among rural households (share of rural households with annual cereals consumption less than 190 kg per capita)” was dropped as proposed by the mid-term review and appraisal for the Additional Financing (AF). The AF paper mentions that at the decision meeting it was agreed that this indicator would be affected by many factors outside the project’s control.

16. **The PDO targets were revised upward, with one exception.** The increased quantity of produce projected to be stored under the warrantage initiative (25,000 MT) was judged to be overly ambitious and reduced to 10, 000 MT in 2014; with the 2018 restructuring, this target was then increased to 14,000 MT. The number of beneficiaries was expanded to 750,000 in 2014 and 800,000 in 2018. The targeted increases in food crop production (rice, millet, sorghum, maize, cowpeas) and horticultural crops (onions and tomatoes) increased from 35 percent to 52 percent. The milk collection target for UTLs in project areas increased in 2015 from 1.5 million liters to 3.5 million liters, and further increased to 5 million liters with the 2018 restructuring.

Revised Components

17. The number and names of components remained unchanged throughout the project, but all three components expanded the scope of some activities (adding interventions or increasing the number of targets) and reduced the scope of others (transferring some activities to other projects or suspending an activity as warranted).

18. **Component 1** added fish farming as a new income-generating activity and proposed to rehabilitate the fish farming station in Bazèga (Center-South Region), promoted 26 weighing centers to improve fish marketing, and developed fish farming around reservoirs. This component placed greater emphasis on irrigation and lowland development for rice production and horticulture. Cowpeas, onions, and tomatoes were added to the group of selected crops. A voucher-for-work system was initially proposed to improve the delivery of matching grants to poor producers by helping them to participate in the scheme and acquire quality inputs, but the activity was dropped in 2014. The AF paper reveals that the voucher for work activity faced procurement challenges and was replaced by the government input subsidy system which was already in place since 2008.

19. **Component 2** activities changed in several ways. Support for improved small-scale food processing units focused on units that were located around reservoirs and principally managed by women’s groups. To further support women’s



groups, cowpeas became eligible for inclusion in the warrantage initiative. Support for market information systems focused on the development and implementation of a system to monitor market food prices and availability for informed action by farmers, traders, and policy makers.

20. **Component 3** increased the targets for all activities and sharpened the focus on information and communication technology (ICT) by testing e-vouchers to distribute inputs. The digitalization of input distribution was meant to build efficiency and empower the private sector to expand its role in input distribution to improve service delivery to farmers. Activities to strengthen the seed system became the responsibility of the West Africa Agricultural Productivity Project (WAAPP, P 147874). Support to build input supply shops was removed, as the project was proposing private distribution through the e-voucher system.

Other Changes

21. **The project benefited from additional funding in the course of implementation.** In 2013, the Government of Burkina Faso secured US\$37.10 million from the Global Agriculture and Food Security Program (GAFSP). The funding was intended to help fill the financing gap in the country's agricultural investment program, developed to improve national food and nutrition security in the spirit of the Maputo Declaration.⁵ In the project implementation arrangements, it was agreed that the GAFSP funds would constitute an AF for PAPSA. In 2014, PAPSA secured another US\$35.95 million in AF from the International Development Association (IDA). As a result, the IDA commitment rose from US\$40.00 million to US\$75.95 million, and with the GAFSP funding, total project funding increased to US\$113.05 (excluding government counterpart funds and contribution of beneficiaries). The geographical scope of the project remained national, while GAFSP funds were targeted to cover the Center-East, Center-South, and Sahel Regions.

22. **The project was restructured in 2014 and in 2018.** The first restructuring was done in conjunction with the processing of the AF from GAFSP and IDA that aimed to scale up project activities. The restructuring revised targets upward to reflect this scaling up, updated disbursement profiles to reflect reallocations among disbursement categories, and extended the closing date for the project from June 30, 2016 to June 30, 2018. A second restructuring in 2018 extended the closing date from June 30, 2018 to November 29, 2019 and revised some end of the project targets as earlier discussed.

23. **Implementation arrangements underwent two key changes.** First, the Ministry of Water, Hydraulic Development, and Sanitation (MEAHA) was added among the PAPSA implementing ministries to reflect the project's emphasis on water management, bringing ministries implementing project activities to four. Second, the World Food Programme (WFP) was removed as a service provider for the voucher-for-work activity, which was cancelled in 2014 for lack of a contracting framework between the project, WFP, and the technical operator proposed to manage the activity on behalf of the project. Irrigation works and storage operations were entrusted to AGETEER, SONATER,⁶ or other private companies through delegated execution agreements.

⁵ To be eligible for GAFSP funds, countries were requested to comply with the requirements of the Comprehensive Africa Agriculture Development Programme (CAADP), including the development of a National Agriculture and Food Security Investment Plan (NAIP). CAADP was launched following the 2003 Maputo Declaration to support agricultural investment and entered its second phase following the 2014 African Union Heads of State Malabo Declaration on Accelerated Agricultural Growth and Transformation for Shared Prosperity and Improved Livelihoods. Countries operationalize the Malabo framework for Africa's agricultural transformation through their NAIPs; the NAIP for Burkina Faso is the second PNSR (PNSR II). As noted, the GAFSP grant filled the financing gap highlighted in the NAIP.

⁶ AGETEER (Agence d'Exécution des Travaux Eau et Equipement Rural); SONATER (Société Nationale de l'Aménagement des Terres et de l'Equipement Rural).



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

24. **With food security remaining a high priority for the country, additional financial resources were sought to expand the project impact.** The government wanted to scale up the impacts and development effectiveness induced by project interventions and successes by focusing more on building farmers' resilience to climate shocks, increasing agricultural productivity, improving irrigation infrastructure, reducing post-harvest losses, and promoting agricultural commercialization. The long-term outcomes for the project were articulated more fully around contributing to poverty reduction and improving food security, which were the priorities of the PNDES and PNSR. The additional IDA and GAFSP funding secured for the project reflected the government's desire to scale up the impacts of PAPSA and increase its development effectiveness through the above-mentioned activities.

II. OUTCOME

A. RELEVANCE OF PDOs

Assessment of Relevance of PDOs and Rating (High)

25. **At closing, PAPSA original objectives remained consistently aligned with the government's overall strategic objectives for economic and social development as expressed in the PNDES⁷ (2016-2020).** The second pillar of the PNDES, human capital development, prioritizes the development of a productive and resilient agro-silvo-pastoral and fisheries sector that is more market-oriented and reflects the principles of sustainable development. In its strategic objective 3.1 "sustainable development of productive and resilient agro-silvo-pastoral, wildlife, and fish farming sectors, with a greater market orientation," the strategy prioritizes key actions such as: (i) irrigation; (ii) facilitating access to inputs, equipment, and agricultural finance; (iii) promoting agricultural and agro-food entrepreneurship; (iv) improving the resilience of the sector to hazards; (v) strengthening market linkages; and (vi) mitigation of and adaptation to environmental impacts. The areas prioritized by PNDES demonstrate how consistent PAPSA outcomes and interventions have been with this five-year government plan.

26. **PAPSA has also remained consistent with PNSR II (2016-2020) which operationalizes the PNDES throughout the agricultural sector.** Interventions supported under PAPSA spanned all six axes of PNSR II: (i) food and nutritional security, especially to improve resilience in vulnerable populations; (ii) access to markets, achieved through competitive agro-silvo-pastoral, fisheries, and wildlife sectors; (iii) environmental governance, achieved through sustainable natural resource development and management; (iv) water, sanitation, and the living environment; (v) land tenure security and the strengthening of human capital in the rural sector; and (vi) capacity building and coordination. By implementing activities leading to increased production and improved availability of food products in rural markets, PAPSA remained aligned and consistent with the PNSRII.

27. **For the World Bank in Burkina Faso, the objectives and interventions of PAPSA remained highly relevant at closing.** The Burkina Faso Country Partnership Framework (CPF) 2018–23⁸ is designed to promote inclusive growth and shared prosperity throughout the country through three high-priority intervention areas: (i) accelerate sustainable private sector led-growth for job creation; (ii) invest in human capital and social protection systems; and (iii) strengthen governance and support citizen engagement. Objective 1.1 of the CPF for the first intervention area is to "improve

⁷ PNDES: Plan National de Développement Economique et Social.

⁸ The CPF is based on lessons learned in implementing the previous Country Partnership Strategy.



agriculture productivity and agribusiness value chains in targeted areas.” Paragraph 56 of the CPF recognizes the importance of agriculture for the country, given that agriculture employs 80 percent of the labor force, and highlights sector’s huge untapped potential in terms of arable land and irrigation potential. Objective 1.1 of the CPF is fully consistent with the PDO and activities implemented under PAPSA to enhance agricultural productivity, develop agribusiness value chains, improve the resilience of agriculture, diversify markets, and build capacity among small-scale producers.

B. ACHIEVEMENT OF PDOs (Substantial)

Assessment of Achievement of Each Objective/Outcome

28. **The project fully achieved its development objectives** of (i) increased production and (ii) improved availability of food in rural markets, **and all five PDO indicators exceeded their targets** (see **Error! Reference source not found.**).

Table 1: Main results of PAPSA for PDO-level indicators

PDO indicator	Unit of measure	Baseline	Target	End-of-project value	End-of-project achievement to target (% or p.p.)
1. Increase in production of selected priority crops (millet, sorghum, maize, rice, cowpeas, onions, and tomatoes) in the project target zones†	Ton	4,764,941	5,786,921	5,852,606	101.1%
2. Increase in fish production in the project area	Ton	–	540	560	103.7%
3. Increase in milk collected in milk processing units	Liter	1,803,000	5,000,000	7,006,012	140.1%
4. Increase in the quantity of produce stored under the warrantage scheme in project target zones, monitored	Ton	1,878	14,000	18,808	134.3%
5. Direct beneficiaries	Number	300,000	800,000	853,207	106.6%

† Data for individual crops were aggregated to determine production at the national level; the data reflect contributions from many sources.

Increase food production

29. **Yields and production of selected crops in the PAPSA target zones—both in the lowlands and in areas under sustainable land management—increased significantly.** The project strengthened farmers’ capacity and supported technologies that contributed to increased production for selected crops in the targeted areas. For instance, the project impact assessment report and the project final report show that PAPSA developed 10,978 ha of lowlands using a highly intensive community labor approach. The development of lowlands, coupled with the use of fertilizer and seed of improved varieties provided through the project, increased yields and production of priority crops (Figure 2). Paddy production in developed lowlands was 29,027.2 MT in 2018, equivalent to 8 percent of national paddy production,⁹ with the peak project contribution (equivalent to 10 percent of national production) occurring in 2016.

30. To improve soil health and fertility, the project supported erosion control activities on 16,341.20 ha in total—10,389.15 ha at the Initial Financing (IF) phase and 5,952.05 ha at the AF phase—benefiting about 27,500 farmers growing sorghum (28.3 percent), maize (23.6 percent), millet (19.9 percent), cowpeas (17.9 percent), and other crops (10.3 percent) such as

⁹ Data from the *Enquête Permanente Agricole*, issued by the Direction Générale des Prévisions et des Statistiques Agricoles and Direction des Statistiques Agricoles.



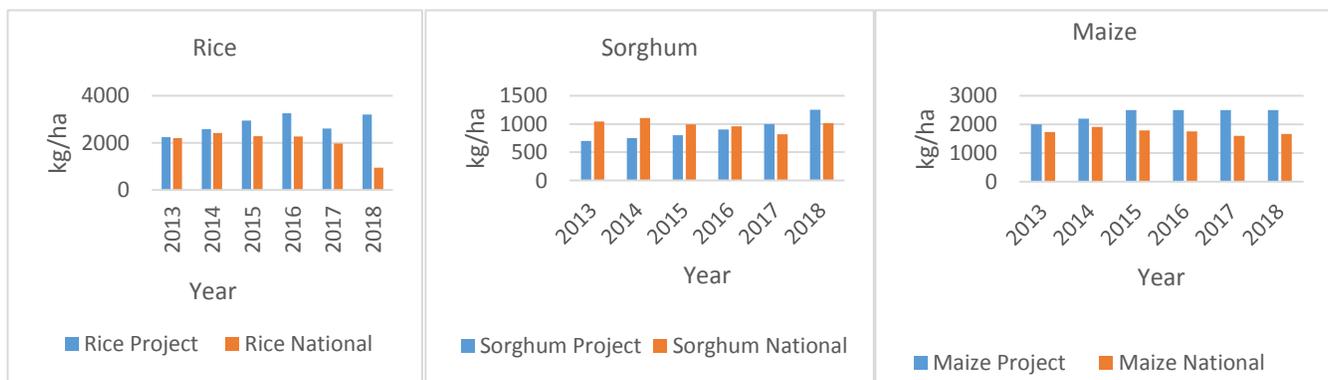
peanuts, sesame, cotton, and rainfed rice. Equipment, construction materials, and training were financed by PAPSA, while the beneficiaries provided the required labor.

31. The project supported farmers to construct 15,626 compost pits (6,106 units during the AF) with the capacity of 3.5 MT per unit to produce high-quality organic fertilizer to restore or improve soil fertility without depending entirely on the purchase of chemical fertilizers. The project provided construction equipment and technical support, and famers provided the labor to develop the units. Indeed, many studies confirm the role of composting in improving soil health and land productivity. Over the course of the project, 112,142 farmers (51 percent women) benefited from lowland rehabilitation and erosion control activities.

32. Thanks to the technological packages and capacity strengthening for farmers, PAPSA beneficiaries significantly increased their yields and production and contributed to achieving the national production target for selected crops. The data was collected periodically by the project M&E and the report on food security was published annually by the MAAH. Compared to the baseline and project targets, the big increase in yields for PAPSA supported area was registered by cowpea, maize and rice at 71 percent, 48,5 percent and 45,6 percent respectively against the 20 percent target yield increase set at end of the project.

33. Indeed, in 2019, national statistics show that the national production was evaluated at 5 852 606 MT, while the target set by PAPSA was 5,786,921MT representing an increase of 1,1 percent. The contribution to this national target was made possible by the increase in yields induced by PAPSA-promoted technologies in the project areas. The figure compares yields in PAPSA supported areas for selected crops with the average yields for those crops at national level (Figure 3).

Figure 3: National average yields of rice, sorghum, and maize compared to yields in areas supported under PAPSA



Source: Author, based on data from PAPSA (project area yields) and FAO (national average yields).

34. **Efforts to expand irrigation, especially to produce horticultural crops, have met with less success.** The project developed 253 ha of irrigated area and 572 ha of low-cost small irrigation infrastructure under a special technique (PAFR)¹⁰ that allows farmers to control water retention at the plot level. The area envisioned in the Project Appraisal Document was 2,000 ha. The average cost of developing 1 ha—estimated at US\$10,000 in 2013—proved to exceed US\$16,000 in 2018, depending on the complexity of the landscape. Irrigation costs had increased substantially since 2013 for several reasons. First, there was an unprecedented rise in prices of iron and steel. Second, firms bidding for irrigation works were required to include security costs in their offers, which also drove up the cost. In addition, technical studies of irrigation feasibility

¹⁰ PAFR stands for Programme d’Appui à la Filière Riz (rice value chain support program); the special technique has been developed under the PAFR program and named as PAFR technique.



demonstrated that soil erosion had reduced the amount of water that could be stored by dams at the proposed irrigation sites, and that it would be insufficient to irrigate the large areas targeted by the project. The search for more suitable sites delayed the irrigation works, which were completed in the last year of the project. The late construction of irrigation infrastructure and its limited use meant that the project could not report on the production of horticultural commodities in the new irrigation schemes. The project has arranged for the ministry team and deconcentrated entities to continue supporting farmers in the irrigation schemes.

35. The project also produced solid improvements in fish production and advanced the development of fish farming services. As a result of project investments in capacity building and input provision (fingerlings and feed) for fish farmers, fish production was 560 MT when the project came to an end, compared to the target of 540 MT. The project completed construction of 13 weighing centers and 3 fish input shops to support fish farming in the project area, and in its last two years it introduced a matching grant scheme (*production à coût partagés*) for entrepreneurs to develop fish ponds, in which 2 female and 8 male entrepreneurs participated. Fish production would have been even higher if the rehabilitation of the fingerling production center at Bazèga (Center-South Region) and the construction of the new one at Yakouta (Sahel Region), were negatively affected and delayed due to the country insecurity context (recurrent terrorist attacks), especially in the Sahel region.

Increase availability of food in the rural markets

36. Under PAPSA, support for the development of warrantage substantially expanded producers' storage options, the availability of food in the markets, and access to finance. Across the project period, 1,879 farmers received training on how warrantage systems operate, and 574 warrantage arrangements were supported. The project built 67 storage facilities for producers to aggregate their harvested produce so that they could adhere to the warrantage arrangements. Producers were able to store 18,808 MT of their production, surpassing the end-of-project target by 39 percent. Thanks to this support,¹¹ producers accessed FCFA 1.4 billion in credit from microfinance institutions based on their guaranteed grain stocks. The PAPSA impact assessment shows that warrantage supported by PAPSA provided additional income of FCFA 24 per kilogram (kg) for millet, FCFA 31/kg for sorghum, FCFA 28/kg for maize, FCFA 68/kg for rice, and FCFA 139/kg for cowpeas, compared with the income of farmers who did not receive project support. Data from the project impact assessment survey show that the credit obtained by farmers was invested in income-generating activities but also served to pay for schooling, healthcare, and other needs.

37. The activities to generate additional income for livestock producers included support for milk collection, animal fattening, and poultry production. The project built 30 centers that collected 7,006,000 liters of milk, compared to the target of 5,000,000 liters, enabled milk producers to earn an additional FCFA 24,019, and improved the quality of marketed milk. Over the project period, some 3,396 cows were artificially inseminated compared to the target of 9,000 representing 33 percent. The low result on this target is explained by the nomadic nature of livestock in the targeted area. A total of 1,704 beneficiaries supported by PAPSA initiated fattening business, producing 69,248 head of cattle and sheep in the three regions targeted by GAFSP funding. Additionally, PAPSA enabled a significant increase in vaccinations of poultry against Newcastle disease in project areas, which rose from 26 percent coverage in 2014 to 52.9 percent in 2018.¹² The project contribution represents 66 percent of this achievement at national level.

¹¹ PAPSA signed an agreement with financing institutions to facilitate producers' participation in warrantage loans at a special interest rate of 1 percent per month.

¹² PAPSA acquired 251,639 flasks of 100 doses of Newcastle disease vaccine (ITA-New) and 6,700,000 multipurpose poultry deworming tablets.



38. **PAPSA also supported innovation platforms that helped to increase the availability of produce in the markets and improved coordination of the participants in the platform.** Support was provided to develop five innovation platforms for rice, niébé, and potatoes, in which 10,154 farmers participated (51 percent women). Two collaboration protocols totaling over FCFA 384 million between the project and each of the innovation platform management committees were signed. The funds partially financed activities included in the platform action plans, which consisted of production, post-harvest, and processing activities. Beneficiaries contributed 25 percent of the cost of those activities, while the project covered 75 percent in the form of a matching grant. The final report for the project reveals that during 2018 and 2019, the five platforms generated revenue of FCFA 1,600,879,722 from agricultural products sold in rural markets (Table 2). Project support to shea processing was not as successful as anticipated, however, because poor equipment prevented the processed product from meeting quality standards.

President of the Songtaaba Commercial Cereal Cooperative, Yargo de Béré:
 “Today, we are able to replicate the training received. The cooperative has indeed acquired knowledge and is putting it into practice. At the end of the project, the cooperative can continue its training activities.”

M. Kossam Deoral, President of Milk Collection Center of Kankounandéni:
 "We can continue our activities alone because we are making efforts to properly apply the knowledge acquired in the dairy sector with the support received from PAPSA".

Table 2: Innovation platform results

Innovation platforms	Year	Qty processed (MT)	Qty sold (MT)	Income (FCFA)
Niébé Sanmatenga	2018	2.6	1,600	105,362,500
	2019	3.8	825	63,840,000
Niébé Kadiogo	2018	2.2	98	19,620,000
	2019	2,196.0	111	37,000,000
Rice Sanguié	2019	1,660.0	5,060	607,200
Potato Nahouri	2018	50.0	6,247,5	624,750,000
	2019	70.0	7,497	749,700,000

Source: Author

39. **With PAPSA support for the market information system (MIS), the market platform, with 67,553 players, received bids on 1,060,382 MT of cereals and non-timber forest products and sale offers on 1,111,977 MT, and ultimately the platform concluded transactions for 476,862 MT of cereals and forest products.** The MIS is operated by the Regional Agricultural Chambers (RCAs) and Ministry of Agriculture. It provides regular market price information and also serves as a virtual marketplace linking farmer producers to food buyers. The project MIS was restructured in 2019 to become more digital and include more commodities in the marketplace platform.

40. **PAPSA contributed to more sustainable sources of income and wildlife resource management for people living near protected areas.** The development of non-timber forest products such as shea butter, baobab juice, honey and implementation of sustainable development plans for Wildlife Protection Areas (*Aires Protégées Faunique*) generated nearly FCFA 503.5 million for populations living near those areas, compared to the target of FCFA 500 million expected at the end of the project. The use of civil drones to monitor wildlife in protected forests to safeguard income from tourism for the population around protected areas was another important innovation introduced under the project.

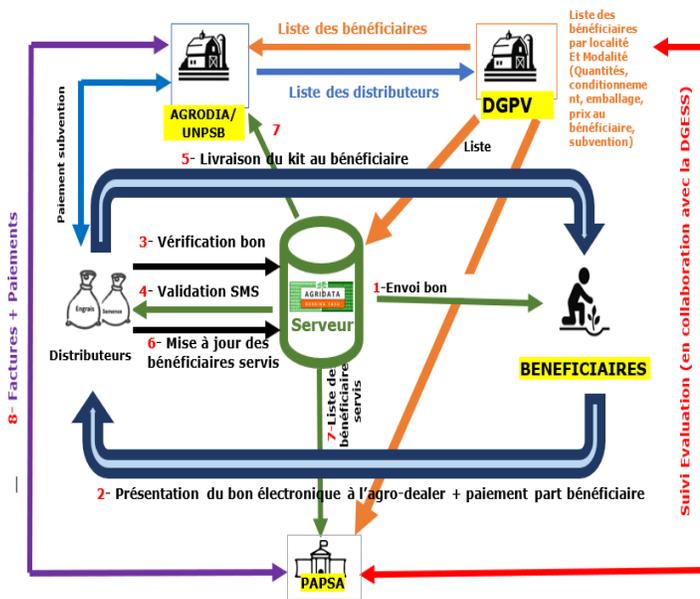
41. **The institutional capacity of the public and private service providers to farmers was strengthened.** The RCAs have received support from PAPSA, including training and equipment, which has allowed them to deliver extension services in



closer proximity to beneficiary farmers. PAPSA trained 9,140 public and private service providers against a target of 8,500. Alongside the government extension services, RCAs have been instrumental in delivering trainings to farmers on different technologies and with their countrywide network, their members were able to collect information on weekly prices for the MIS.

42. The project piloted the first electronic distribution system for inputs in Burkina Faso and unveiled the potential of ICT in agriculture.

Figure 2: E-voucher distribution piloted by PAPSA



For the first time, seed and fertilizer were distributed through an e-voucher system, which reached 69,095 farmers for the 2019 growing season. The system was implemented by many players with different responsibilities: AGRODIA, an apex organization of fertilizer agro-dealers, imported and distributed subsidized inputs; ECODATA, an IT company, developed an IT platform with data on all farmers, from which groups of eligible farmers were selected based on criteria set by MAAH; seed multiplication associations distributed subsidized seed; MAAH was responsible for quality control of inputs; and PAPSA provided funding and ensured M&E of the process, alongside MAAH through the General Directorate of Plant Production (DGPV). The e-voucher distribution system was piloted during two seasons and covered 6 of 13 regions of the country. Figure 2 depicts the players in the e-voucher system and their interactions.

43. The e-voucher system piloted under PAPSA proved to resolve several challenges with the government’s previous input distribution system, especially challenges related to the efficiency of public funds, and catalyzed private sector in fertilizer industry in Burkina Faso. The previous system was put into place in 2008 during the food crisis period and reformed in 2013 but it remained inefficient. With the piloted e-voucher, the private sector was more involved, the project trained 778 agro-dealers on input distribution and production technologies for targeted crops. Through piloted distribution system, 69,000 farmers received seeds and fertilizer and an electronic platform of 450,000 farmers was constituted in 6 regions following eligibility criteria for subsidies distribution, thus improving the targeting and traceability. AGRODIA conducted an evaluation of the system; its report shows that the distribution of e-vouchers was very successful and highly appreciated by all players, including beneficiaries and agro-dealers. According to the report NPK was distributed at 98.8 percent, urea at 98.2 percent whereas seeds were distributed at 86%. Following the successful pilot of the new system, the Ministry of Agriculture has developed an e-voucher input distribution strategy and plans to scale up the new system countrywide in the 2020 main growing season.

Justification of Overall Efficacy Rating (Substantial)

44. Targets for PDO indicators were achieved and, in some instances, significantly surpassed by the time PAPSA came to an end, despite acknowledged shortcomings in infrastructure development, particularly for irrigation. Yields and production of priority crops in the project target zones have increased significantly. Solid improvements in fish production and the generation of additional income for livestock producers (through animal fattening, milk collection centers, and poultry production) expanded the capacity of beneficiaries to access food. Support to develop warrantage substantially



expanded producers' storage options and access to finance, and the supported cereal marketing cooperatives and MIS increased food availability in rural markets. Nevertheless, the project experienced shortcomings in achieving the targets for irrigation and horticultural commodities, as a number of construction works were completed only in the last year of the project, leaving little time to strengthen water user associations and irrigation management committees.

C. EFFICIENCY

Assessment of Efficiency and Rating (Substantial)

45. **The two Economic and Financial Analyses (EFAs) conducted during the life of the project concluded that it was economically and financially viable.** The EFA of the IF phase focused on the financial analysis of investment models supporting agriculture (cereals and cowpeas) and livestock (poultry and milk production) under Component 1. No specific models were defined for activities under Component 2; instead, their benefits were included in the analysis of Component 1 activities by estimating reductions in post-harvest losses and increased prices at the producer level. The economic internal rate of return (EIRR), taking only Component 1 costs into account, was estimated at 46.6 percent, and the net present value (NPV) was US\$111 million at a social discount rate of 12 percent. The EFA at the Additional Financing (AF) phase analyzed 13 investments, including irrigation, the extension of the IF interventions to develop lowlands and restore degraded land through erosion control, livestock interventions (poultry farming, fish production, sheep and cattle fattening, pig breeding), honey production and processing, and storage of cereal crops. The benefits of the AF were estimated using data on the achievements of the project to date. The NPV was US\$44.1 million at a social discount rate of 10 percent, and the EIRR was estimated at 16.8 percent. The potential social and institutional development benefits under the Component 3 were not taken into account because they were difficult to quantify. Note that none of the EFAs included an assessment of environmental benefits.

46. **A basic analysis of expenditure efficiency for PAPSA compared planned disbursements for each component to actual disbursements at the time of restructuring and project completion.** Although the project reallocated significant shares of resources from Components 1 and 2 to Component 3 at the time of restructuring, mainly to support capacity building for extension and advisory services, this activity was significantly overspent (174 percent). Activities for "strengthening agricultural input supply delivery systems" had the lowest level of expenditure (12 percent) compared to the allocated amount. At completion, expenditures related to public service delivery only slightly exceeded (105 percent) the budget allocated at restructuring. It is worth noting that no large gap was found between expenditures at restructuring and completion.

47. **Implementation efficiency shows that delays in disbursement under PAPSA were significant.** The project planned to reach 100 percent disbursement by the end of 2018, but by the end of that year disbursement stood at 74 percent, because some activities had not been completed (notably irrigation investments, as discussed). The project benefited from an extension of the closing date from June 2018 to November 2019, by which time it had disbursed 99.6 percent of IDA and 96.8 percent of GAFSP funds.

48. **Greenhouse gas (GHG) accounting provides insight into the project's environmental impact and makes it possible to include environmental benefits in the assessment of the project's overall economic benefits.** The Ex-Ante Carbon-balance Tool (EX-ACT) developed by the Food and Agriculture Organization (FAO) was used to calculate the economic value of the GHGs mitigated as a result of PAPSA interventions. Based on the EX-ACT analysis, total reductions in carbon emissions and increases in carbon sequestration arising through PAPSA are estimated at 618,614 tons of CO₂ equivalent (tCO₂eq) over 25 years, corresponding to 24,745 tCO₂eq annually.



49. **The project's environmental impact contributed significantly to its economic benefits.** The monetary value of the GHG balance was estimated and added to the calculation of economic benefits. As recommended by the World Bank "Shadow Price of Carbon in Economic Analysis: Guidance Note" (September 2017), the economic analysis used a low and high shadow price of carbon. The annual average of the low and high shadow price was then used to calculate the project's overall economic benefits. In addition, the ex-post EFA considered a 6 percent discount rate as required by the World Bank (the other two EFAs excluded environmental benefits and considered default discount rates of 12 percent and 10 percent). When the environmental benefits are taken into account with the average carbon shadow price, the project EIRR is 26.4 percent and the NPV is US\$88.58 million. In contrast, if these environmental benefits are excluded, the project EIRR is 19.8 percent and the NPV is US\$69.9 million (closer to the EIRR estimated at the AF appraisal, which was 16.8 percent). Taking to account only the benefits of Component 1, as computed at appraisal, the EIRR is 38.8 percent, which is also closer to the appraisal EIRR (46.6 percent). By adopting a weighting approach of each EIRR based on financing volume, the aggregate EIRR would be 26.50 percent close to 27.35 percent at Appraisal. By adopting a weighting approach of each EIRR based on financing volume, the aggregate EIRR would be 26.50 percent close to 27.35 percent at Appraisal.

50. In light of these various assessments (including delays in implementation), the overall efficiency of this project is rated as **Substantial**.

D. JUSTIFICATION OF OVERALL OUTCOME RATING

51. **The overall outcome rating is Satisfactory**, based on the above assessments of:

- Relevance: **High**
- Efficacy: **Substantial**
- Efficiency: **Substantial**

E. OTHER OUTCOMES AND IMPACTS

Gender

52. **Project** activities reached large numbers of women and enabled them to increase their incomes from agriculture. Altogether, the project reached more than 260,000 women, who represented 31 percent of the direct beneficiaries (it also reached 120,000 young people, who represented 14 percent of beneficiaries).¹³ More specifically, 52 percent of the beneficiaries of interventions to develop lowland agriculture were women, as were 41 percent of the beneficiaries of warrantage activities. The shares of female beneficiaries were 65 percent for pig farming interventions, 39 percent for local poultry production, and 61 percent for sheep fattening.

Institutional Strengthening

53. **The project was implemented by four ministries and deconcentrated local entities.** The National and Regional Chambers of Agriculture, as service providers, implemented activities related to producer capacity building and the MIS. These arrangements provided an avenue for strengthening the capacity of the participating public institutions and streamlining coordination of their actions to support farmers in the PAPSA target area. The project has provided a

¹³ PAPSA, rapport consolidé 2010-2019 (November 2019).



template for technical ministries and deconcentrated institutions to follow in planning, delivering, and monitoring activities related to food security.

Mobilizing Private Sector Financing

54. **The project mobilized financing from the private sector through several approaches.** The project piloted the first electronic distribution of inputs through an e-voucher system, opening opportunities for the private sector to play its role in importing and distributing inputs. The digital technology facilitated the participation of private firms and lifted the burden on the government to invest public funds in the provision of agricultural services, freeing the government to focus on regulatory and quality assurances interventions. The warrantage system, by providing loan guarantees to microfinance institutions based on stored commodities, enabled those institutions to mobilize FCFA 1.4 billion in loans to participating producers. The matching grant approach encouraged investments in small and medium enterprises in the project area. These combined approaches constituted a good strategy for mobilizing finance for development (MFD).

Poverty Reduction and Shared Prosperity

55. **The project targeted poor farmers and contributed directly to the World Bank's twin goals of ending extreme poverty and boosting shared prosperity.** The impact assessment of PAPSA concluded that the project had positive impacts on beneficiary incomes and food security, compared to a scenario in which the population did not benefit from project activities.

Other Unintended Outcomes and Impacts

III. KEY FACTORS THAT AFFECTED IMPLEMENTATION AND OUTCOME

A. KEY FACTORS DURING PREPARATION

56. **Clear alignment with government priorities:** The project was fully aligned with PNSR I and II, and ministries working in the silvo-agro-pastoral sector were directly responsible for its implementation, which enhanced their capacity to plan and provide technical services.

57. **Partnership and coordination with partners in food security:** The implementation modality for the project required and encouraged the development of partnerships with a wide range of stakeholders concerned with food security in Burkina Faso to provide a harmonized solution to the food crisis. The project proposed to develop synergies and working relationships with technical and donor organizations such as WFP and FAO. The Bank agreed with other donors, particularly the International Fund for Agricultural Development (IFAD), the Danish Aid Agency (DANIDA), and the German Technical Cooperation Agency (GTZ, now GIZ), to conduct joint supervision missions and coordinate actions on food security.

58. **Lessons learned and synergies with World Bank projects:** Preparation of PAPSA incorporated lessons from previous World Bank operations of a similar nature. The project also proposed to develop collaborative frameworks with ongoing World Bank projects and programs to ensure synergies with one another, develop and share the lessons emerging from their operations, and scale up best practices.



59. **Safeguards:** As a Category B project, PAPSA was considered likely to have minimal, site-specific environmental and social impacts that would be manageable at accepted levels. Three World Bank safeguard policies applied to the project: Environmental Assessment (OP/BP 4.0 1), Involuntary Resettlement (OP/BP 4.12), and Pest Management (OP 4.09). During appraisal, the development of an Environmental and Social Management Framework and a Resettlement Policy Framework was required to assess the potential environmental and social impacts of the subprojects envisioned under PAPSA and determine which measures should be put into place to mitigate the related risks. All project safeguard instruments were prepared in full compliance with World Bank and national safeguard policies, following broad consultation involving all relevant stakeholders, public and private.

B. KEY FACTORS DURING IMPLEMENTATION

60. **Social and political unrest and increasing insecurity inevitably affected implementation.** Military unrest in 2011 disturbed political governance and led to major reforms in the organization of ministries and the army. Riots and mass demonstrations were triggered once again throughout the country in 2014, when the president proposed amending the constitution to extend his term in office. In 2015, a military coup threatened to topple the transitional government and generated large protests and strikes, closing private and public offices, but the situation reverted to normal following the general elections in November 2015. For PAPSA, this instability, including changes in leadership at line ministries under the transitional government and the newly elected government in 2015, affected procurement and delayed implementation. Security in Burkina Faso has continued to deteriorate, especially in the northern, Sahel, and eastern regions, and the country now has an internally displaced population surpassing 750,000.¹⁴ Implementation of PAPSA was especially affected in northern and Sahel areas, where project staff had to limit field visits and rely on local government and other partners, including the National and Regional Chambers of Agriculture, to support producers and collect data for M&E. Project investments were sometimes targeted by terrorist attacks in these regions.¹⁵ Irrespective of this situation, the government continued to provide counterpart funding for PAPSA as planned. In February 2020, the World Bank officially classified Burkina Faso as a country affected by the development challenge of FCV (Fragility, Conflict, and Violence).

61. **The food crisis during the 2011–12 agricultural campaign and the outbreak of H1N1 influenza in 2015 also took a toll on project activities.** The project supported plans to respond to both crises. At the request of the government, PAPSA redirected eligible activities to food-deficit areas to help mitigate the food crisis and mobilized resources to support the veterinary response to the H1N1 outbreak.

62. **During the project period, PAPSA coordination unit provided timely capacity in the preparation of two major operations,** including the Sahel Irrigation Initiative Project (US\$31million), and the Agricultural Resilience and Competitiveness Project (*Projet de Résilience et Compétitivité Agricole, PReCA*) (US\$200 million).

63. **Additional resources from IDA and GAFSP funds.** The AF from IDA and GAFSP increased project targets without changing the PDO, as discussed in Section B.

¹⁴ Report of the Conseil National de Secours d'Urgence et de Réhabilitation (CONASUR), Ministère de l'Action Sociale et de la Solidarité Nationale.

¹⁵ Report of the Regional Directorate for Sahel Region: 13 water pumps, 26 ha of maturing horticultural produce (tomatoes, onions, cabbages, potatoes, okra) estimated at 613 MT produced with the newly developed irrigation infrastructure have been destroyed by terrorists in Yagha Province, Sahel region.



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

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

M&E Design

64. **During appraisal, PAPSA developed the requisite results framework, implementation guidance, and M&E arrangements.** The results framework encompassed the project interventions, which in turn were reflected in the annual work plans and budgets. The Project Implementation Manual clarified the roles and responsibilities of the technical institutions involved in the project and the M&E arrangements, among other implementation arrangements. Monitoring and evaluation activities were linked to the implementing agencies: the ministries, deconcentrated local authorities, and the National and Regional Chambers of Agriculture were responsible for collecting M&E information and supplying it to the PIU for compilation. At the time, however, the project did not assess capacity within the agencies responsible for implementing M&E to identify any capacity building needs.

M&E Implementation

65. **From the start, PAPSA experienced issues in implementing its M&E framework owing to limited capacity in the entities responsible for that activity.** Throughout the first four years of the project, the deconcentrated institutions encountered problems in reporting on project activities; the main issues were insufficient capacity to collect and report project data and inadequate monitoring of investments in the field by the deconcentrated technical services.¹⁶ A clear need emerged to find another, more productive mechanism for working with all actors involved in implementing the project, including M&E.

66. **In light of these recommendations and the challenges on the ground, and with additional implementation support, the project moved ahead with M&E.** It continued to collect information at the national level for the indicator on production and yields of the priority crops. The last implementation support mission refocused data collection and reporting on estimating yields in target areas such as the lowlands and lands rehabilitated for agriculture through sustainable management. An impact evaluation of project activities was conducted, as well as two intermediate results studies in 2010–14 and 2015–16. From 2017, PAPSA improved its M&E system with the acquisition of software for M&E (DELTA) and data analysis and processing (SPHINX iQ2). The M&E team benefited from training in the use of software and methods for evaluating the impacts of projects.

M&E Utilization

67. **Throughout implementation, and especially in its last two years, the project routinely produced and used information from the M&E system for operational decisions.** The GIS localization of project investments made it possible to monitor progress in implementation more closely. The General Directorate of Sectoral Studies and Statistics (*Direction Générale des Etudes et des Statistiques Sectorielles, DGESS*) at each ministry involved in implementation

¹⁶ The mid-term review report for PAPSA revealed insufficiencies in M&E and proposed solutions to overcome them.



periodically conducted field visits to project activities and provided technical advice for project M&E. The participating ministries also used the M&E information to inform their decisions.

Justification of Overall Rating of Quality of M&E

68. **Monitoring and evaluation for PAPSA faced a difficult beginning, but performance improved following a change in strategy.** As noted, PAPSA encountered significant shortcomings in data collection and reporting by implementing agencies, especially local entities, owing to weak capacity. A change in M&E strategy in the last four years of the project strengthened the capacity of focal points from implementing institutions and introduced software and equipment, all of which greatly improved M&E. Weighing the initial shortcomings against efforts made by the project to turn this situation around, the quality of M&E for the project is rated **Substantial**.

B. ENVIRONMENTAL, SOCIAL, AND FIDUCIARY COMPLIANCE

69. **Environmental performance: The execution of environmental safeguards under PAPSA has been assessed as Satisfactory.** To strengthen technical and institutional capacity in environmental safeguards, two training sessions were conducted for 78 agents from decentralized technical services. For beneficiary groups, additional training, awareness-raising, and communication operations at various stages of implementation covered the environmental and social challenges of subprojects, methods for taking environmental risks into account, and measures to mitigate those risks. Through the regional directorates of environment (*Directions Régionales de l'Environnement et de l'Economie Verte et du Changement Climatique*), the project successfully implemented compensatory measures (particularly compensatory reforestation) and conducted environmental monitoring of activities in the field, based on established protocols and the systematic application of environmental and social screening for activities supported by the project. One shortcoming encountered by PAPSA in safeguard management was the absence of an environmental safeguard specialist within the project at the beginning of the implementation of the parent project, which delayed the nationally coordinated implementation of safeguard measures.

70. **Social compliance:** The project was implemented with attention to requirements for social protection, including the development, approval, and public release of a Resettlement Policy Framework (first undertaken in 2009 for the IF and updated in 2014 for the AF). Before the AF, the World Bank conducted a social audit in 2014 and confirmed the compliance of the project with the safeguard policies. The report indicated that project activities were implemented to World Bank standards for environmental and social safeguards. Establishment of a project grievance mechanism was delayed by the late recruitment of the environmental safeguard specialist (a formal mechanism was established in 2019),¹⁷ but no complaints were pending at closing. More than 300 simplified environmental and social safeguard studies were conducted under PAPSA, underlining the project's achievements as a champion of this due diligence requirement. At closing, 7,034 producers, including 4,256 women, had already benefited from access to restored agricultural land in the lowlands. As some works on irrigation infrastructure were delayed, it was decided that the process of land distribution to the remaining 643 beneficiary producers who were supposed to use that land would be conducted by the regional directorates of the Ministry of Agriculture.¹⁸

¹⁷ The project did not have a social safeguard specialist.

¹⁸ The last supervision mission of the project recommended to: (i) fully clarify the circumstances of the remaining project-affected persons and their rights (specifically, the area to be allocated to each affected person) and (ii) develop an action plan to improve and allocate land to the remaining affected population and specify which government entities would be responsible for doing so after the



71. **Financial management.** During preparation, the financial management (FM) risk was rated moderate, and the project developed an FM plan to ensure that the PIU would have the capacity to implement the project. During implementation, the overall FM performance of the project was rated **Moderately Satisfactory**, and the FM risk was assessed to be **Substantial**.

72. The main FM constraint encountered during implementation was the resignation of the Project Financial Management Specialist during the last year. Rather than recruiting a replacement for a project that was closing in a few months, the PIU opted to maintain the services of the former Project Financial Management Specialist as a consultant on a part-time basis. The PIU started experiencing delays in FM processes, including the transmission of interim unaudited financial reports, and documentation of the PIU's designated account did not occur on a regular basis. Nevertheless, with close follow-up by the Bank team, the PIU was able to catch up, and ultimately the project had a disbursement rate of 99.8 percent.

73. Financial audit reports were received mostly on time, and no ineligible expenditures were recorded during implementation.

74. The lesson from this experience is to maintain adequate staffing arrangements to ensure satisfactory completion of projects. Indeed, a second consultant should have been recruited to support project FM when the specialist resigned in the last year of the project.

75. **Procurement:** Procurement was foreseen to be a major challenge during implementation, given the project's national coverage, the number of implementing agencies involved (four-line ministries and the National Chamber of Agriculture), and the nature of investments, including infrastructure investments. Therefore, it was agreed to include an indicator to monitor the management of contracts, with a target of 80 percent of contracts that were successfully managed, which the project achieved. The low capacity of local entrepreneurs and complexity of the national procurement system are acknowledged constraints for donor operations in Burkina Faso and often delay the implementation and termination of contracts. The PIU was adequately staffed throughout implementation with a Senior Procurement Specialist, and procurement for PAPSA proceeded in line with agreed World Bank procedures. Post procurement review was conducted regularly, and recommendations were implemented. On average procurement was rated **Moderately Satisfactory** due to delays arising from the lengthy authorization processes within the national system and delays in terminating several contracts.

C. BANK PERFORMANCE

Quality at Entry (Moderately Satisfactory)

76. **The quality at entry is rated Moderately Satisfactory.** As indicated, the project design responded to the reality of the moment in 2008 by meeting short-term needs presented by the food security crisis and offering support to develop more sustainable food security systems over the longer term. Embedding the project in the government

project ended.



implementing institutions was a key step to streamline coordination and ownership of project activities and ensure that the project was an integral part of priority government programs. While the M&E design was adequate as part of overall design and had been carefully assessed at the time, it did not anticipate the complexity of the M&E system and the capacity building needed to make it work. Implementation and measurement of the data was delayed because of the extend of recruitment and training needed at the national PCU and all implementing agencies (four line ministries and the National Chamber of Agriculture) had M&E specialists as well as the 13 Regional Chambers of Agriculture to exercise third-party control of M&E quality. Other shortcomings encountered at entry were that i) the target number of beneficiaries was clarified during the project restructuring, ii) the pre-selection of the WFP as service provider for voucher did not materialize due to failed procurement of technical operator company and led delayed implementation.

Quality of Supervision (Satisfactory)

The quality of supervision is rated Satisfactory. The World Bank undertook regular support missions at least twice per year. These missions mobilized the expertise required to support implementation of PAPSA across all three components as well as compliance with safeguards. The mid-term review in 2013 provided valuable information for restructuring the project in 2014. The FM system was adequate throughout implementation and the quality of financial reporting improved considerably. The implementing ministries designated permanent focal points for the project who facilitated and tracked the implementation of its activities and reported on the results achieved by their respective institutions. Periodic Implementation Status Reports (ISRs) and aide-memoires provided an accurate picture of progress and highlighted issues that required special attention, which were closely monitored. The Task team was active and successful in holding the government accountable to address the M&E challenges. The Task team was also able to work with the government to untangle procurement issues that had delayed some contracts which were finally implemented in full. The good quality of the dialogue with the client has been recognized and was instrumental in safeguarding additional funds from IDA and GAFSP, which almost doubled the initial financing. Under guidance from the World Bank, the project team has taken steps to cope with insecurity by georeferencing sites, using civil drones, and training staff to use GEMS (Geo-enabling Initiative for Monitoring and Supervision) tools for remote monitoring. Due to insecurity and early procurement delays, unforeseen contingencies delayed the timely completion of irrigation activities and restricted the time available to strengthen water users' associations and irrigation committees, and to scale up the e-voucher system. These issues, which are recognized both by the government and the World Bank, will be addressed through government programs under new operations such as the Agriculture Resilience and Competitiveness project (P167945) or the Sahel Irrigation Initiative Support Project (P154482) which both have large irrigation components.

Justification of Overall Rating of Bank Performance

77. The World Bank performance is rated **Moderately Satisfactory** given the challenges which affected a big part of the implementation despite the proactivity during implementation.

D. RISK TO DEVELOPMENT OUTCOME

78. The risk that the development outcomes will not be maintained after closing is low, as arrangements for implementing PAPSA activities were embedded within the participating ministries from the start. The project achieved



good results in developing lowlands and recovering land for agricultural production. The project implemented the warrantage system on a wide scale and secured effective working arrangements between producers and microfinance institutions. The nascent dairy industry was equipped with 30 milk collection centers. The project supported and strengthened the National Chamber of Agriculture, which in turn provided capacity building and market information to its members. This strong foundation enables the Chamber to continue to pursue these activities and advocate on behalf of small-scale producers.

79. Nevertheless, close monitoring is required to ensure that the relevant ministries support irrigation infrastructure that became available in the last year of the project. In the same vein, the Ministry of Agriculture and Irrigation must widely implement the electronic input distribution system successfully piloted by PAPSA and continue capacity-building programs for farmers participating in the irrigation schemes. Particular support will be required by the water user associations and irrigation management committees, which the project did not have sufficient time to accompany. The significant potential for growth in rice productivity unveiled by PAPSA must be sustained and supported under other government and private sector initiatives to take advantage of the opportunities offered by the value chain in Burkina Faso. The project laid a solid foundation to meet the national imperative for sustained food security, and the experience and lessons derived from implementing PAPSA will inform the government during the third phase of PNSR, which is under preparation¹⁹.

V. LESSONS AND RECOMMENDATIONS

80. Scaling-up warrantage could enhance access to finance for farmers and improve food availability for rural markets. The project supported warrantage arrangements to stabilize the availability of food in local markets while providing an opportunity for farmers to access microfinance loans guaranteed by cereal stocks. During the project period, farmers mobilized loans totaling FCFA 1.4 billion, which offered them the means to pay their children's school fees and make further investments in their agricultural enterprises. In a Sahelian country like Burkina Faso with only one rainy season, food storage at all levels remains an important tool for managing climate shocks and building community resilience against climate change. Warrantage has been demonstrated to catalyze the commercialization of agriculture and create strong incentives to increase productivity while supporting farmers to access finance. However, scaling-up this initiative requires policies and laws to govern the warrantage or warehouse receipt system, quality infrastructure to reduce postharvest losses, and capacity building for farmers in post-harvest management and reduction of aflatoxin, among other efforts.

81. Thorough planning is important to successfully implement an e-voucher distribution system. PAPSA introduced the first e-voucher input distribution system in Burkina Faso, which unveiled the potential for digitalization of agriculture, improved the targeting of vouchers, and allowed the private sector to participate in input distribution. These actions have created a strong foundation for the Burkina fertilizer and seed industries to grow. The lessons learned during implementation of this system include: (i) smooth and timely planning of the e-voucher operation must begin at least in year n-1; (ii) a reliable beneficiary database is essential; (iii) strengthen or recycle distributors for better control of the platform; (iv) strengthen awareness campaigns for producers on the various aspects of the operation;

¹⁹ The Government of Burkina Faso has started planning its five-year country and sector strategy. Stakeholders are discussing the PNSR III roadmap.



(v) communicate which farmers are eligible for inputs by type of agricultural input (seed and fertilizer); and (vi) post lists of those farmers in each municipality and village at least one month before the start of distribution.

82. Strengthen government capacity for better service delivery instead of bypassing government actors. The institutional arrangements developed for PAPSA offered an opportunity for government technical services at the central and deconcentrated level to strengthen their ability to deliver on their mandates. The project has provided a template for empowering government technical services by providing support through a PIU rather than displacing or bypassing government services. It is important to note that these arrangements highlight the importance of adhering to performance-based management for the institutions and government staff involved, strengthening the capacity for implementers, and motivating and incentivizing them to succeed in service delivery. This approach complements and is an important component of the development of a multi-disciplinary, multi-player, pluralistic extension system.

83. Multi-stakeholder innovation platforms improve the prioritization of investments and enhance coordination of the value chain. The project supported innovation platforms as a means of increasing agricultural processing and improving coordination of value chain players. The platforms helped to improve planning and streamlined interventions across the value chains. The model proved useful but needs to be accompanied by capacity building through coaching and skills development. The processors also need to produce products that meet standards for competing in national and international markets.



ANNEX 1. RESULTS FRAMEWORK AND KEY OUTPUTS

A. RESULTS INDICATORS

A.1 PDO Indicators

Objective/Outcome: The project development objective is to improve the capacity of poor producers to increase food prod

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
Direct Project Beneficiaries	Number	0.00	800000.00		853207.00
		03-Nov-2010	29-Nov-2019		19-Nov-2019
Female beneficiaries	Number	0.00	40.00		31.27
		03-Nov-2010	29-Nov-2019		19-Nov-2019

Comments (achievements against targets):

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
Food crop production in	Metric ton	3590000.00	5742229.00		5852606.00



targeted zones		10-Dec-2009	19-Nov-2019		19-Nov-2019
Maize	Metric ton	878538.00	1475432.00		1700127.00
		31-Dec-2010	29-Nov-2019		19-Nov-2019
Rice	Metric ton	163600.00	347088.00		350392.00
		31-Dec-2010	29-Nov-2019		19-Nov-2019
Sorghum	Metric ton	1609113.00	2172302.00		1929834.00
		31-Dec-2010	29-Nov-2019		19-Nov-2019
Millet	Metric ton	1079910.00	2172302.00		1189079.00
		31-Dec-2010	29-Nov-2019		19-Nov-2019
Cowpea	Metric ton	626113.00	649563.00		683174.00
		31-Dec-2010	29-Nov-2019		19-Nov-2019
Comments (achievements against targets):					

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
Milk production in project	Number	1300000.00	5000000.00		7006012.00



targeted zones		10-Dec-2009	29-Nov-2019		19-Nov-2019
Comments (achievements against targets):					

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
Products stored in the warrantage scheme in project targeted zones	Metric ton	200.00 10-Dec-2009	14000.00 29-Nov-2019		18808.00 19-Nov-2019
Comments (achievements against targets):					

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
Increase in fish production in the targeted zones	Metric ton	0.00 31-Dec-2014	540.00 29-Nov-2019		560.00 19-Nov-2019
Comments (achievements against targets):					

A.2 Intermediate Results Indicators

Component: Improving food production



Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
Change in yield of targeted commodities (maize, rice, cowpea, onion and tomato) in the project area.	Percentage	0.00	20.00		33.11
		31-Dec-2013	30-Nov-2014		30-Nov-2014
Maize (baseline in kg/ha)	Percentage	1683.00	20.00		48.54
		31-Dec-2013	29-Nov-2019		19-Nov-2019
Rice (baseline in kg/ha)	Percentage	2186.00	20.00		45.60
		31-Dec-2013	29-Nov-2019		19-Nov-2019
Cowpea (baseline in kg/ha)	Percentage	700.00	20.00		71.42
		31-Dec-2013	29-Nov-2019		19-Nov-2019
Onion (baseline in kg/ha)	Percentage	21000.00	20.00		0.00
		31-Dec-2013	29-Nov-2019		19-Nov-2019
Tomato (baseline in kg/ha)	Percentage	25000.00	20.00		0.00
		31-Dec-2013	29-Nov-2019		19-Nov-2019
Comments (achievements against targets):					



Thanks to increased technology packages promoted, the project has been able to meet the target yield target set at the end of the project. The technologies involved improved access to seed and fertilizer, land management through SLM, and land recuperation. This was coupled by the capacity building to smallholders through extension services. The targets set for horticultural crops have not been reported on as the project finalized the irrigation infrastructure activities in the last year of the project.

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
Areas under sustainable land management practices	Hectare(Ha)	0.00	12952.00		21492.00
		10-Dec-2009	29-Nov-2019		19-Nov-2019

Comments (achievements against targets):

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
Area of developed lands in targeted zones	Hectare(Ha)	21423.00	26423.00		26391.00
		31-Dec-2014	29-Nov-2019		19-Nov-2019

Comments (achievements against targets):

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
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Revenues generated by communities adjacent to the 7 targeted protected areas (in CFA million)	Number	100.00	500.00		503.40
		10-Dec-2009	29-Nov-2019		19-Nov-2019
Comments (achievements against targets):					

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
Local poultry vaccination coverage	Percentage	15.00	50.00		52.79
		10-Dec-2009	29-Nov-2019		19-Nov-2019
Comments (achievements against targets):					

Component: Improving the availability of food products

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
Milk collection centers rehabilitated or created that are functional	Number	0.00	30.00		30.00
		10-Dec-2009	19-Nov-2019		19-Nov-2019
Comments (achievements against targets):					



Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
Credit provided by the financial institutions through the warrantage system	Number	5000000.00 10-Dec-2009	950000000.00 19-Nov-2019		1129584000.00 19-Nov-2019
Comments (achievements against targets):					

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
Cereal bank restructured into marketing cooperatives and functional	Number	0.00 10-Dec-2009	298.00 19-Nov-2019		298.00 19-Nov-2019
Comments (achievements against targets):					

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
Warrantage schemes set up and functional	Number	5.00 10-Dec-2009	574.00 29-Nov-2019		574.00 19-Nov-2019
Comments (achievements against targets):					



Component: Institutional development and capacity building

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
M&E system provides regular data and information on project results and impact to stakeholders	Yes/No	N 10-Dec-2009	Y 19-Nov-2019		Y 19-Nov-2019

Comments (achievements against targets):

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
Satisfactorily executed contracts	Percentage	0.00 10-Dec-2009	90.00 29-Nov-2019		80.00 31-Dec-2018

Comments (achievements against targets):

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
Public and private service	Number	0.00	9140.00		9140.00



providers trained		10-Dec-2009	19-Nov-2019		19-Nov-2019
Comments (achievements against targets):					

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
Targeted producers and community organizations who organize annually their general assembly during which they report on activities	Percentage	0.00 10-Dec-2009	100.00 19-Nov-2018		100.00 19-Nov-2018
Comments (achievements against targets):					



B. KEY OUTPUTS BY COMPONENT

Objective/Outcome 1: Increase production	
Outcome Indicators	<ol style="list-style-type: none"> 1. Increase production and 2. Ensure improved availability of food in rural markets
Intermediate Results Indicators	<ol style="list-style-type: none"> 1. Increase in production of selected priority crops (millet, sorghum, maize, rice, cowpeas, onions, and tomatoes) <ul style="list-style-type: none"> Maize: 1,700,127 MT Rice: 350,392MT Sorghum: 1,929,834 MT Millet: 1,189,079 MT Cowpeas: 683,174 MT Onions: Not available Tomatoes: Not available 2. Increase the quantity of fish: 560 MT
Key Outputs by Component (linked to the achievement of the Objective/Outcome 1)	<ol style="list-style-type: none"> 1. Quantity of inputs distributed: <ul style="list-style-type: none"> NPK: 21,716 MT Urea: 15,517 MT 2. Area of lowland rehabilitated: 10,978 ha 3. Area under sustainable land management (erosion control): 16,341.16 ha 4. Area under irrigation: 253 ha 5. Lowland developed PAFR type: 572 ha 6. Number of fishponds in place: 250 7. Number of fishponds supported through matching grants: 10



Objective/Outcome 2: Ensure improved availability of food in rural markets	
Outcome Indicators	<ol style="list-style-type: none">1. Increase the quantity of products stored through the warrantage system: 18,808 MT2. Increase the quantity of milk collected: 7,006,012 liters3. Increase the quantity of products marketed through SIMA (2015–19): 476,862 MT
Intermediate Results Indicators	<ol style="list-style-type: none">1. Number of farmers trained and participating in warrantage system2. Quantity of milk collection centers constructed3. Market information system operational
Key Outputs by Component (linked to the achievement of the Objective/Outcome 2)	<ol style="list-style-type: none">1. Number of warrantage storage facilities constructed: 672. Number of warrantage associations created: 5743. Number of cereal cooperatives supported: 2984. Number of milk collection centers constructed: 305. Number of honey collection centers constructed: 6

**ANNEX 2. BANK LENDING AND IMPLEMENTATION SUPPORT/SUPERVISION****A. TASK TEAM MEMBERS**

Name	Role
Preparation	
Supervision/ICR	
Elisee Ouedraogo	Task Team Leader(s)
Bouraima Diaite, Alpha Mamoudou Bah, Mohamed El Hamedh Hendah	Procurement Specialist(s)
Ngor Sene	Financial Management Specialist
Sandrine Egoue Ngasseu	Financial Management Specialist
Abdoulaye Toure	Team Member
Yacouba Konate	Team Member
Yemdaogo Emmanuel Nikiema	Team Member
Abdoul Wahabi Seini	Social Specialist
Nicolas Ahouissoussi	Team Member
Lionel F. Yaro	Team Member
Suzane Kabore Rayaisse	Procurement Team
Cheick Traore	Procurement Team
Roch Levesque	Counsel
Gwladys Nadine Isabelle Kinda	Procurement Team
Kofi Nouve	Team Member
Mamata Tiendrebeogo	Procurement Team
Begnadehi Claude Bationo	Team Member
Abdoulaye Gadiere	Team Member
Leandre Yameogo	Environmental Specialist
Gertrude Marie Mathilda Coulibaly Zombre	Social Specialist



B. STAFF TIME AND COST

Stage of Project Cycle	Staff Time and Cost	
	No. of staff weeks	US\$ (including travel and consultant costs)
Preparation		
FY09	53.609	286,534.78
FY10	32.826	178,544.25
Total	86.44	465,079.03
Supervision/ICR		
FY10	5.150	32,205.83
FY11	38.555	130,378.65
FY12	38.433	112,647.55
FY13	34.540	118,842.70
FY14	36.809	122,718.57
FY15	22.949	63,497.95
FY16	24.667	55,312.36
FY17	7.362	14,936.26
FY18	12.510	44,976.59
FY19	15.425	43,332.76
FY20	25.250	108,929.48
Total	261.65	847,778.70



ANNEX 3. PROJECT COST BY COMPONENT

Components	Amount at Approval (US\$M)	Actual at Project Closing (US\$M)	Percentage of Approval (US\$M)
Improving food production	72.40	68.70	95
Improving the availability of food products	20	17.20	86
Institutional development and capacity building	20.40	25.70	126
Total	112.80	111.60	98.94



ANNEX 4. EFFICIENCY ANALYSIS

Preamble

1. This ex-post EFA of the Agricultural Productivity and Food Security Project (PAPSA) in Burkina Faso makes use of two approaches. It uses a cost-benefit approach to estimate the net additional benefits attributable to the project's main outcomes, including the environmental co-benefits, estimated with the EX-ACT methodology for GHG accounting. It also uses a cost analysis approach to assess whether project resources have been used efficiently.
2. This annex has five sections. The first section discusses the results of the EFAs prepared at project appraisal and for the AF. The second section presents the financial analysis of a broad range of investments financed by PAPSA to improve food production (Component 1) and the availability of food products (Component 2). The third section discusses project investments that could not be evaluated. The fourth section compares the efficiency of actual project costs with estimates made at appraisal. The final section describes the economic analysis, summarizes the overall results of the EFA, and discusses the project's efficiency rating.
3. The number of people benefiting directly from PAPSA is 853,207 (31 percent female and 14 percent young people). The total disbursement rate for the project was 98.9 percent (99.6 percent for IDA and 96.8 percent for GAFSP funding), corresponding to a total of FCFA 66,819,186,485 for the entire project. The PDO is "Improving the capacity of poor producers to increase food production and ensuring improved availability of food products in rural markets." This ICR efficiency analysis presents an EIRR of 19.8 percent, excluding environmental co-benefits (increasing to 26.4 percent if co-benefits are computed), compared to the EIRR of 16.8 percent estimated in the EFA at the AF phase.²⁰ Using the same methodology as the EFA at the appraisal, the project EIRR for Component 1 only is 38.8 percent, which is closer to the appraisal EIRR of 46.6 percent. Based on the results of the analysis, overall project efficiency is rated as **Substantial**.

Note on Data Collection

4. The main sources of information for this EFA are the data from the project M&E system and studies conducted and prepared by the PIU, such as previous EFAs, the impact evaluation report, and project annual reports. However, the M&E system had limitations that impacted the full accuracy of the analysis described here, which therefore had to rely on some major assumptions. In addition, this EFA has benefited from information collected during field visits of a sample of microprojects in January 2020. For the investments that could not be analyzed, the EFA used secondary data from projects implemented in Burkina Faso by other international financing institutions, such as IFAD, to estimate the expected return of the activities.

I. Efficiency Analyses Throughout the Project Cycle

5. During the project cycle, two EFAs were prepared (not including environmental benefits). At the IF phase, the EFA focused mainly on the financial analysis of investment models supporting agricultural

²⁰ No environmental co-benefits were considered at the appraisal and AF stages.



production (cereals and cowpeas) and livestock production (poultry and milk) under Component 1. No specific models were defined for Component 2 activities. Their benefits were included in the analysis of Component 1 activities by estimating reductions in post-harvest losses and increases of prices at the producer level. The EIRR, taking into account only Component 1 costs, has been estimated at 46.6 percent and NPV at US\$111 million at a social discount rate of 12 percent.

6. At the AF phase, the EFA focused on 13 investments, including the irrigation scheme, extension of the IF interventions on lowland development and land rehabilitation through erosion control, livestock interventions (poultry farming, fish production, sheep and cattle fattening, pig breeding), honey production and processing, and cereal storage. The benefits of the AF were calculated using data on the achievements of the project to date. The EFA presented an NPV of US\$44.1 million using a social discount rate of 10 percent, while the EIRR was estimated at 16.8 percent. The potential social and institutional development benefits (under Component 3) of the project were not taken into account, because they could not be quantified with precision.

II. Financial Analysis

7. The financial analysis of investments under Components 1 and 2 described here had three steps: (i) development of farm/enterprise models for a 10-year period, including the benefits and costs (investment, variable, and recurrent/general costs) for without project (WOP) and with project (WP) scenarios (based on crop budgets); (ii) a comparison of the flows of benefits and costs and calculation of the differences between results obtained in the WOP and WP scenario to determine the incremental net benefits/cash flow of the proposed interventions; and (iii) calculation of the project financial profitability indicators of each model: NPV, financial IRR, and benefit-cost (B/C) ratio. For the NPV, the discount rate used is 8 percent, which correspond to the estimate of the average interest rate charged by commercial banks.

8. For the crop models such as those for rice, millet, and maize, the yield variability induced by climate change was included in the analysis using the IFAD Climate Adaption in Rural Development (CARD)²¹ tool.

Improve Food Production

9. Component 1 addressed the first part of the PDO through the development and transfer of technology in three production sectors: crop agriculture, livestock/fisheries, and the environment. The project financed several subprojects from the three sectors (Table A4.1).

Crop agriculture

10. The project supported food production by developing lowlands for rice production and rehabilitating land (erosion-controlled sites) for producing maize, millet, sorghum, and cowpeas. The project also promoted production of roots and tubers. During implementation, PAPSA subsidized the provision of seed of improved and more resilient varieties (1,649.7 MT) and agro-chemicals (17,439.79 MT of NPK fertilizer, 12,541 MT of urea, and 1,150 liters of insecticide). In addition, the project invested

²¹ See <https://www.ifad.org/en/web/knowledge/publication/asset/41085709>.



in compost pits to produce organic fertilizer, provided farming equipment, and promoted good farming practices through extension services. The financial analysis focuses on the lowland rice sites; erosion-controlled sites for millet, sorghum, maize, and cowpea production; and compost pit models. The results of the financial analysis are summarized in Table A4.2.

Table A4.1: Subprojects and activities under Component 1 of PAPSA

Sectors	Investments	Area/quantities	Number of beneficiaries
Crop agriculture	Basic lowland development† for rice	10,974 ha	84,642
	Erosion-controlled sites mainly for sorghum, millet, maize, and cowpea production	16,341.2 ha	27,500
	Economic lowland	572.13 ha	
	Irrigation scheme	253 ha	
	Compost pits	15,626 units	13,815
	Integrated agricultural model	8 units	48
Livestock and fisheries	Poultry	3,460 units	3,460
	Pig breeding	1,760 units	1,760
	Sheep fattening	1,437 units	1,437
	Cattle fattening	268 units	268
	Fish pen farming	250 pens	702
	Pond fish farming	10	10
	Cattle insemination for milk production	3,396 dairy cattle inseminated	966
Environment	Non-timber forestry products		3,549

Source: PAPSA reports.

Table A4.2: Financial models for investments in agricultural production

Model	Financial IRR	NPV (8% discount rate) in FCFA 000s	NPV (8% discount rate) in US\$	B/C
Lowland rice	94%	664	1,247	1.3
Maize	68%	513	964	1.5
Sorghum	40%	375	705	1.4
Cowpeas	63%	581	1,092	1.7
Millet	45%	318	598	1.4
Horticulture	111%	25,228	47,421	3.6
Solar irrigation	34%	23,564	44,294	2.0
Compost pit		392	737	2.3

Source: Author's calculations.



11. **Basic lowlands.**²² In lowland areas, PAPSA supported the development and rehabilitation of 10,974 ha, including the installation of basic infrastructure (6,623 ha during the IF period and 4,354.98 ha during the AF period). For the civil works (costed at about 155,000 FCFA/ha), the project hired a private operator, and beneficiaries provided the labor. Some sites faced constraints such as delays in operations and low participation of beneficiaries due to the hardship of the work and lack of payment. The project financed improved seed, chemical and organic fertilizer, farming equipment, and training services. The lowlands were mainly dedicated to rainfed rice cultivation and the investment benefited 84,642 individuals (8 beneficiaries/ha); 51 percent of participating farmers were female. Before the project, rice yields were low (1 t/ha) and the production was used only for family consumption. The lowland development and rehabilitation supported under PAPSA contributes to household food security and self-sufficiency in rice, in addition to increasing rice yields (3.2 t/ha), household income (through sales of rice), and access to land for women. The financial model has positive returns, with an IRR of 94 percent, a B/C ratio of 1.3, and NPV of 664,000 FCFA/ha.

12. **Erosion-controlled sites.** The project supported the development of erosion control on 16,341.20 ha (10,389.15 ha at the IF phase and 5,952.05 ha at the AF phase), benefiting about 27,500 farmers growing sorghum (28.3 percent), maize (23.6 percent), millet (19.9 percent), cowpeas (17.9 percent), and other crops (10.3 percent) such as peanuts, sesame, cotton, and rainfed rice. Equipment, construction materials, and training were financed by PAPSA, while the beneficiaries provided the required labor. Erosion control mechanisms to protect farmland and enhance the infiltration of rainwater cost 183,717 FCFA/ha on average. Before the project initiated this activity, these lands had degraded soils. Yields were very low and in some cases the land had been abandoned. With project support, farmers experienced significant increases in yield and income, depending on the crops cultivated. The financial analysis focuses on sorghum, maize, millet, and cowpea production, allocated in proportion to the area planted to each of these crops on these lands. For the four types of crops, the WP situation highlights significant improvements. Yields increased from 1,200 to 2,500 kg/ha for maize, from 500 to 900 kg/ha for millet, from 500 to 1,250 kg/ha for sorghum, and from 600 to 1,200 kg/ha for cowpeas, according to M&E data. Among the crops cultivated on erosion-controlled sites, the financial analysis shows a high IRR for maize (68 percent) and cowpeas (63 percent), with respective NPVs of FCFA 513,000 and FCFA 581,000 and respective B/C of 1.5 and 1.7. The financial results for sorghum and millet are not particularly high, but these crops nevertheless represent profitable investments; the IRRs for sorghum and millet are 40 percent and 45 percent, respectively, with NPVs of FCFA 375,000 and FCFA 318,000, and a B/C of 1.4 for both models. These crops are the main staples, cultivated primarily for home consumption.

13. **Irrigation perimeters.** For the production of horticultural crops (onions and tomatoes), PAPSA developed 253 ha of irrigation perimeters. Although delays in implementation prevented those investments from being used during the life of the project, the infrastructure has been built and will eventually be used. The financial analysis estimated the expected returns to this investment based on information from a similar investment project in Burkina Faso. Two horticultural crop cycles (for onions and tomatoes) and one rainfed crop cycle (for rice) were considered in the analysis. This model shows the highest returns, with an IRR of 111 percent, NPV of FCFA 25,228,000, and B/C ratio of 3.6.

²² In addition to basic lowlands, the project developed 572.13 ha of economic lowlands. The investment has not been exploited during the project life cycle. No specific model has been constructed for the infrastructure, but it has been estimated that the economic lowland is 40 percent more profitable than the basic lowland.



14. **Solar irrigation system.** PAPSA supported 8 private enterprises to pilot a solar irrigation system for horticultural and rainfed crop production. The financial model estimates the expected returns from this system on a farm of 3 ha. The investment is profitable, with an IRR of 34 percent, NPV of FCFA 23,564,000, and B/C of 2.0.

15. **Compost pits.** The project constructed 15,626 compost pits (6,106 units during the AF) to produce high-quality organic fertilizer to restore or improve soil fertility without depending entirely on the purchase of chemical fertilizers. The project provided construction equipment and technical support, and farmers provided the labor to develop the units. A single compost pit cost around FCFA 15,000 and produced 3.5 MT of compost every year on average. Even if the compost is used only on the farm where it is produced, compost pits are a successful investment, with an NPV of FCFA 392,000 and B/C of 2.3.

Livestock and fisheries

16. The livestock and fisheries models assumed full production in year 1 for animal fattening and full production in year 2 for breeding activities, because the beneficiaries were familiar with these activities. The interventions focused on animal production (pigs, poultry, sheep, cattle, and fish), milk production (supported by genetic improvement through AI), and improved access to veterinary services and products (including vaccines and animal feed). Moreover, PAPSA financed subprojects to improve animal housing. The financial analysis includes models for poultry, sheep, and cattle fattening, pig production, and fish farming. Table A4.3 summarizes the results.

Table A4.3: Financial models for livestock production investments

Model	Financial IRR	NPV (8% discount rate) in FCFA 000s	NPV (8% discount rate) in US\$	B/C
Poultry	51%	196	369	1.1
Pigs	41%	1,185	2,228	1.2
Sheep		1,795	3,375	1.2
Beef cattle	112%	2,431	4,570	1.1
Fish pen	50%	2,177	4,4092	1.8
Fishpond	56%	16,418	30,860	2.7

Source: Author's calculations.

17. **Poultry.** The project financed 3,460 poultry farming units (400 at the IF phase) at a cost of FCFA 400,000 per unit during the IF and FCFA 100,000 per unit during the AF. The WP model consists of 125 chickens, with 20 bags (50 kg) of manure sold per year by each poultry production unit. The activity is profitable, with an IRR of 51 percent, NPV of FCFA 196,000, and B/C of 1.1.

18. **Sheep fattening.** During the AF, PAPSA financed 1,437 sheep fattening units with working capital of FCFA 400,000 per unit. Compared to 12 sheep sold per unit per year in the WOP scenario, under the WP scenario the number of sheep sold increases to 27, with an additional 20 cartloads of manure sold. This model produces an NPV of FCFA 1,795,000 and a B/C of 1.2.

19. **Cattle fattening.** During the AF phase, the project supported 268 cattle fattening subprojects, providing a subsidy of FCFA 1,000,000. The number of cattle increased from 5 to 16 head and sales of



manure went from 0 to 77 cartloads. This activity is profitable with an IRR of 112 percent, NPV of FCFA 2,431,000, and B/C of 1.1.

20. **Pig breeding.** PAPSA financed around 1,760 pig breeding units (160 at the IF phase). The amount of the subsidy was FCFA 500,000 per unit at the IF phase and FCFA 400,000 at the AF phase. The analysis considers an average increase in production per unit per year that increases the number of pigs sold from 5 to 50 and the amount of manure sold from 0 to 5 cartloads. The activity is profitable with an IRR of 41 percent, NPV of FCFA 1,185,000, and B/C of 1.2.

21. **Fish farming.** The project provided support for two types of fish farming systems: pen farming in a natural water source and farming in artificial ponds. Both individual farmers and farming collectives benefitted from the pen farming system. The pen farming model has an IRR of 50 percent, NPV of FCFA 2,177,000, and B/C of 1.8. Pen farming required a significant subsidy but was not sufficiently productive. To achieve the fish production target, the project provided financing totaling FCFA 20.8 million for 10 private entrepreneurs to initiate pond farming. These investments proved very profitable, with an IRR of 56 percent, NPV of FCFA 16,418,000, and B/C of 2.72.

Environment

22. **Activities around protected areas.** The project financed various labor-intensive activities around protected areas²³ which generated income for local inhabitants.²⁴

23. **Beekeeping.** The project also promoted non-timber forestry products by demonstrating the value of products such as honey as a source of income. It provided improved beehives and equipment to 57 beekeepers. In a model with 8 beehives in the WP scenario versus 3 in the WOP scenario, beekeeping is a profitable activity, with an IRR of 25 percent, NPV of FCFA 374,000, and B/C ratio of 1.1 (Table A4.4).

Table 4: Financial model for a non-timber forest product investment (beekeeping)

Model	Financial IRR	NPV (8% discount rate) in FCFA 000s	NPV (8% discount rate) in US\$	B/C
Beekeeping	25%	374	703	1.1

Source: Author’s calculations.

Improve the Availability of Food Products

24. Under Component 2, which aimed to improve the availability of food products in local markets, PAPSA developed a post-harvest management system, with investments in storage, processing facilities, and market development, summarized in Table A4.5.

²³ Including the recovery of degraded land (1,652 ha), reforestation (702 ha), wildlife surveys, ecological monitoring, anti-poaching efforts, remediation of saline areas, improvement of impassable trails, rehabilitation of 2,000 km of forest trails and the Nazinga central trail, construction or rehabilitation of reservoirs, early brush fire control, construction of bungalows, creation of a wild animal farm, and fodder production. Revenues from those activities are estimated at FCFA 346,008,966 for tourism, FCFA 593,998,866 for safaris, and FCFA 11,423,300 for venison

²⁴ Documented in project activity reports, 2010–19.



Table A4.5: Investment subprojects under Component 2 of PAPSA

Sectors	Investment	Units	Number of beneficiaries
Crop agriculture	Organizing producers to participate in warrantage system	67 storage units constructed	574 farmer organizations established
	Cereal marketing centers	298 units	298 farmer organizations established (10,484 members)
	Cassava processing unit	20 units	413 members
	Multifunctional food-processing platform	49 units	2,356
	Onion storage facilities	10 units	
	Innovation platform	07 units	10,194
Livestock and fisheries	Milk collection centers	30 units	486
	Aquaculture investments	13 units	
Environment	Honey collection centers	6 units	1,714
	Non-timber forest product processing centers (shea butter, other products)	400 units of equipment	3,549

Source: PAPSA reports.

Crop agriculture

25. To reduce post-harvest losses, PAPSA invested in double- and triple-bagging (200,000 bags distributed) and storage (for onions). The project also financed processing equipment and facilities (multifunctional platforms and cassava processing units), promoted warrantage in surplus production areas and cereal marketing units in food-deficit areas, and supported a market information platform to facilitate increased sales of produce. Results of the financial analysis are presented in Table A4.6.

Table A4.6: Financial models for investments in agricultural processing and reduction of post-harvest losses

Model	Financial IRR	NPV (8% discount rate) in FCFA 000s	NPV (8% discount rate) in US\$	B/C
Organizing producers to participate in warrantage system	48%	16,814	31,605	1.2
Cassava processing unit	18%	657	1,235	1.1
Multifunctional food-processing platform	18%	394	741	1.1
Onion storage	37%	9,951	18,704	1.5
Triple bagging		5	9	4.9

Source: Author's calculations.

26. **Warrantage.**²⁵ The project organized 574 farmer organizations for warehousing activities through an agreement with a microfinance institution.²⁶ In total, 67 warehouses were constructed, 18,000 MT of

²⁵ The WOP scenario was not included in the group investment because it is assumed that farmer organizations did not participate in warrantage activities prior to the project.

²⁶ Caisse Populaire de l'Épargne et du Crédit.



cereals were stored, and FCFA 1,400 million were lent to producers. Warehousing had three major benefits for farmers: improving the sale price, reducing post-harvest losses, and providing credit²⁷ to invest in income-generating activities or for social use. The financial analysis of warehousing shows it to be very profitable, with an IRR of 48 percent, NPV of FCFA 16,814,000, and B/C of 1.2.

27. **Multifunctional platforms.** The project financed 49 multifunctional food-processing platforms, together with capacity development for female farmer organizations. A subsidy of FCFA 500,000 was provided as working capital to famers. The activity presents an IRR of 18 percent, NPV of FCFA 394,000, and B/C of 1.06.

28. **Cassava processing units.** The project provided equipment and technical support to 20 female farmer organizations to engage in cassava processing. This activity had an IRR of 18 percent, NPV of FCFA 657,000, and B/C of 1.1.

29. **Triple-bagging.** Throughout its life, PAPSA provided 200,000 bags to farmers. The model assumes that half of the bags have been distributed, and the other half have been used for warehousing and cowpea production. Triple-bagging has an NPV of FCFA 5,000 and a B/C of 4.9.

30. **Onion storage.** To facilitate the storage and conservation of onions produced under irrigation, PAPSA constructed 10 storage units near the irrigation perimeters. Use of these storage facilities has an IRR of 37 percent, NPV of FCFA 9,951,000, and B/C of 1.5

Livestock

31. **Milk collection centers.** The project constructed and equipped 30 milk collection centers to improve the quality of the milk collected, reduce losses, and increase the quantity of milk sold. The project finalized a contract between the milk collection centers and a milk processor to facilitate commercialization and improve milk prices received by producers. As shown in Table A4.7, the collection centers were profitable, with an IRR of 79 percent, NPV of FCFA 28,253,000, and B/C of 1.1.

Table A4.7: Financial model for investment in milk collection centers

Model	Financial IRR	NPV (8% discount rate) in FCFA 000s	NPV (8% discount rate) in US\$	B/C
Milk collection centers	79%	28,253	53,107	1.1

Source: Author’s calculations.

²⁷ Twenty percent of the credit was estimated as the added value of the credit generated by the activities.



III. Limits of the Financial Analysis

32. The financial analysis could not calculate some of the project's benefits. For instance, in the environment sector, the benefits (ecosystem services) of activities developed around protected forest areas are challenging to compute with the limited data available. The project also supported the valorization of non-timber forestry products (shea butter, souballa, néré, baobab, neem), but insufficient data prevented the calculation of credible financial returns. For the livestock sector, interventions to improve milk production through AI (3,396 dairy cows inseminated) was not evaluated because of the lack of monitoring information related to this activity (possibly related to the transhumant nature of livestock production).

33. Finally, delays experienced by the project in some key activities precluded a direct assessment of any benefit streams arising from certain investments, such as the innovation platform, honey collection centers, and fingerling production.

IV. Efficiency of Project Expenditure

34. PAPSA was implemented from 2010 to 2019, with two financing phases. The target zone for the project was national (all 13 regions of Burkina Faso) for the IDA-funded activities and covered 3 regions (Centre-East, Centre-South, and Sahel) for GAFSP-funded activities. The initial project financing from 2010 to 2014 was an estimated US\$51.3 million from IDA (US\$40 million), the government (US\$4.7 million), and beneficiaries' contributions (US\$6.6 million). In 2015, PAPSAs received AF estimated at US\$79.392 million from IDA (US\$35.95 million), GAFSP (US\$37.1 million), beneficiaries (US\$4.1374 million), and the government (US\$2.204 million). The PDO originally established for PAPSAs ("Improving the capacity of the poor producers to increase food production and ensuring improved availability of food products in rural markets") was unchanged for the AF phase. At the same time, project investments were scaled up and new activities were developed, such as livestock fattening, fish farming, irrigation development, and others.

35. A basic expenditure analysis for PAPSAs compares planned disbursements to actual disbursements by component (Table A4.8), both at the time of restructuring and at completion. Although PAPSAs reallocated a significant share of resources from Components 1 and 2 to Component 3 at the time of restructuring, mainly to support capacity building²⁸ for extension and advisory services to farmers, this activity was significantly overspent (174 percent). Activities for "strengthening agricultural input supply delivery systems" had the lowest level of expenditure (12 percent) compared to the allocated amount. At completion, expenditures related to public service delivery only slightly exceeded (105 percent) the budget allocated at restructuring. It is worth noting that no large gap was found between expenditures at restructuring and completion at the component level.

36. The project experienced significant disbursement delays; it had planned to disburse 100 percent of funding in 2018, but at the end of 2018 disbursement stood at 74 percent because a number of activities were not completed (Figure A4.1). The project was therefore extended for the second time from June 2018 to November 2019 to finalize critical infrastructures. By closing, PAPSAs had disbursed 99.6 percent of IDA and 96.8 percent of GAFSP funds.

²⁸ The target number of trained partners was exceeded by 8 percent.



Table A4.8: Costs and expenditures, PAPSA, 2010–19

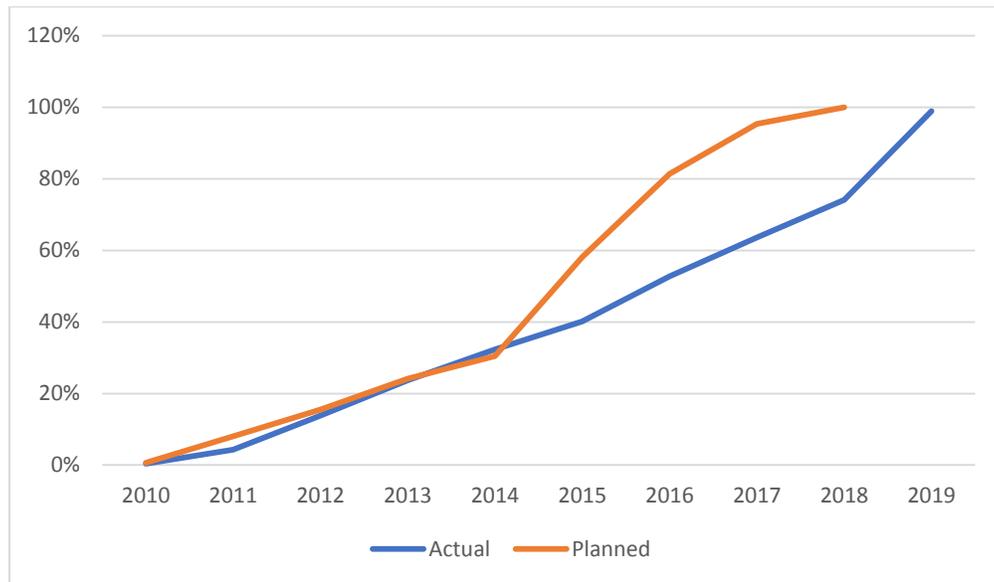
Project components and subcomponents (SCs)	IF: IDA only (US\$ million)	AF: IDA + GAFSP (US\$ million)	IF+AF (US\$ million)	Amount at restructuring (US\$ million)	Amount at completion (US\$ million)	Share of approved expenditure (%)	Share of restructuring (%)
Component 1: Improving food production	25.4	47.0	72.4	71.0	68.7	95%	97%
SC 1: Crop production	11.9	30.8	42.7	40.7	42.9	100%	106%
SC 2: Animal production (including fisheries)	6.8	11.2	18.0	19.3	17.6	98%	91%
SC 3: Forestry and protected areas	6.7	5.0	11.7	11.0	8.2	70%	75%
Component 2: Improving food availability	5.2	14.8	20	17.3	17.2	86%	99%
SC 1: Reducing post-harvest losses	2.2	6.6	8.8	7.6	5.6	64%	74%
SC 2: Supporting the marketing of food products	3.0	8.3	11.3	9.7	11.5	102%	119%
Component 3: Institutional development and capacity building	7.0	11.0	18.0	24.5	25.7	143%	105%
SC 1: Building capacities for extension and advisory services to farmers	1.8	1.6	3.4	4.5	7.8	228%	174%
SC 2: Strengthening agricultural input supply delivery systems	1.0	0.1	1.1	1.2	0.1	13%	12%
SC 3: Strengthening the capacity of producer organization	3.4	1.6	5.0	7.9	6.4	128%	82%
SC 4: Coordination, management, and M&E of project activities	0.8	7.6	8.4	11.0	11.3	134%	103%
Project preparation facility	0.8						
Unallocated	1.6						
Total	40.0	72.8	112.8	112.8	111.6	99%	99%

Note: IF is initial financing; AF is additional financing.

Source: Author's calculations.



Figure A4.1: Planned and actual cumulative disbursement rates per year (%), PAPSA, 2010–19



Source: Author's calculations.

37. The project identified several constraints that affected disbursement performance and implementation. First, PAPSA was required to operate under the rules of the national procurement system, which created large delays in the procurement of some activities. In addition, the collection of data for the M&E system was not successfully implemented at the IF by national agents (the technical services). Second, some of the firms selected for investment subprojects (such as the development of irrigation systems) underperformed, causing PAPSA to revoke some contracts and reinitiate procurement, which again delayed operations. As noted, the costs of some activities were underestimated at appraisal. For instance, irrigation system construction, estimated to cost at FCFA 3 million/ha at appraisal, actually cost around FCFA 7 million/ha on average. Finally, political turmoil and increased insecurity in Burkina Faso and high staff turnover limited project implementation and supervision in some areas.

V. Economic Analysis

Methodology and Assumptions of the Economic Analysis

38. The economic analysis evaluates returns to PAPSA at the national level, based on a cost-benefit analysis at shadow prices that better reflect the economic value to society of goods and services (often referred to as “economic opportunity costs” or “social opportunity costs”). For this analysis, the financial analysis models were converted to economic models using conversion factors for the project’s various inputs and outputs: 0.72 for vehicles and fuel, 0.82 for equipment, 0.83 for labor and agricultural inputs, 0.85 for goods and services with value-added tax (VAT), 1.0 for goods and services without VAT, and 1.07 for exportable goods. The discount rate used for the economic analysis is 6 percent, as recommended by the World Bank Guidance Note on the Social Discount Rate Calculation (2016). The economic analysis also includes the environmental co-benefits, which were calculated using the FAO EX-ACT tool.



39. The models estimate the average expenditures and benefits of each type of activity, including the required labor and the expected lifespan of equipment (4 years) and infrastructure (20 years). The incremental net incomes of the models have been aggregated at the project level, taking into account the adoption rate, to derive the additional benefit arising from the project. The net additional benefit of the project is computed by removing the project cost (real ex-post disbursements), adjusted to avoid double counting and to remove the cost of non-exploited investments. The economic analysis was conducted over 25 years to account for the benefits of the hard investments that were realized with delays.

Calculation of Environmental Benefits

40. The FAO EX-ACT tool²⁹ was used to assess the environmental benefits related to PAPSA activities that mitigated the effects of climate change. Project achievements were used to define the WP scenario, and the WOP scenario was assumed to remain identical to the baseline level. The GHG calculation was based on the agroecological zone where the project was implemented (a tropical dry climate with low activity for type of soils) and included the following elements:³⁰ (i) land-use change, with 1,687 ha of reforestation, 253 ha of irrigation, and 11 546 ha for lowland development; (ii) annual crop cultivation on 16,341 ha of erosion-controlled land, with a shift from traditional cultivation practices to improved agronomic practices; (iii) livestock production (cattle sheep, poultry, and pigs) with improved feed and vaccination; and (iv) investment inputs (additional fuel consumption, increased use of organic and chemical fertilizer).

41. Results of the EX-ACT analysis demonstrate that total carbon emissions and sequestration arising from the project will be 618,614 tCO₂eq over 25 years, corresponding to 24,745 tCO₂eq annually. The monetary value of the GHG balance has been estimated and added to the additional benefit of the project. As recommended by the “Shadow Price of Carbon in Economic Analysis: Guidance Note” (September 2017), the economic analysis uses a low and high shadow price of carbon. The annual average of the low and high shadow price has been used to compute the project overall benefit.

Results of Economic Analysis and Project Efficiency Rating

42. The economic analysis without environmental benefits produced an EIRR of 19.8 percent and NPV of US\$69.9 million for PAPSA. When the analysis includes the project’s environmental benefits, the EIRR increases to 25.5 percent, and the NPV rises to US\$88.54 million. Table A4.9 presents a sensitivity analysis indicating how the IRR and NPV are affected by scenarios in which the expected benefits of PAPSA activities decline by 10 percent and 20 percent, and yields obtained by producers also decline by 10 percent and 20 percent.

²⁹ Using default IPCC Tier 1 parameters.

³⁰ Information for the WP scenario (numbers of livestock, land area, and so on) was derived from project reports; the WOP scenario relies on some realistic assumptions based on knowledge of traditional activities.



Table A4.9: Sensitivity analysis, PAPSA

Sensitivity analysis	Δ%	Matrix of risk	NPV (6%) (FCFA million)	Economic IRR
Base scenario with environmental benefit at average carbon price			33,801	26.4%
Benefits	10%	Reduction of benefit, price fluctuation, and insecurity risk	28,326	23.8%
Benefits	20%		22,851	21.2%
Benefits	30%		17,376	18.5%
Yield	10%	Failure risk (under-performance, non-adopted inputs and material), climate risk	21,205	19.8%
Yield	20%		8,672	13.3%

Source: Author's calculations.

43. This ex-post EFA is more accurate than the EFAs performed for appraisal and for the AF. It includes the environmental benefits contributed by the project and uses the 6 percent discount rate required by the World Bank, whereas the previous EFAs did not include environment benefits and used default discount rates of 12 percent (appraisal) and 10 percent (AF). Using the same methodology of the appraisal EFA, the EIRR (38.8 percent) is closer to the EIRR at appraisal (46.6 percent). However, analysis of the project in its entirety shows that the EIRR of this ex-post EFA (19.8 percent) is significantly higher than the EIRR estimated for the AF (16.8 percent). Nevertheless, in consideration of the shortcomings identified in this ICR, including the delays in implementation, overall project efficiency is rated as **Substantial**.



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

Appréciations sur le projet par le Ministère de l'Agriculture et des Aménagements Agricoles, le Directeur Général des Productions Végétales (DGPV), Responsable du programme budgétaire de rattachement du PAPSA

1. Cohérence du Projet avec les priorités nationales en matière de sécurité alimentaire, en l'occurrence l'amélioration de la production vivrière et de la disponibilité des produits alimentaires ;
2. La forte implication des acteurs régionaux à travers le Comité Technique de Suivi est une approche qui permet l'appropriation des projets par les bénéficiaires et leur responsabilisation dans sa mise en œuvre. En effet pour une des fois un projet a associé à la fois l'administration générale, les collectivités territoriales, la société civile aux structures techniques, aux Chambres Régionales d'Agriculture et aux bénéficiaires directs pour apprécier périodiquement la qualité de sa mise en œuvre.
3. La culture de la reddition des comptes pour et par tous les acteurs à travers le CTS ;
4. La prise en compte systématique des questions environnementales (études, screening) a non seulement été une innovation voire une culture nouvelle dans un projet y compris celle de la notion de durabilité technique, économique et sociale.
5. La responsabilisation des structures déconcentrées du ministère, en l'occurrence les DRAAH, pour la planification et la conduite des activités a permis de créer des compétences dans les régions.
6. Une forte contribution à l'accroissement de la production nationale de riz à travers des bonnes pratiques d'adaptation aux changements climatiques.
7. L'amélioration de la résilience des producteurs à travers, l'aménagement des bas-fonds et des périmètres rizicoles, le warrantage, l'embouche...
8. L'appui institutionnel aux CRA a renforcé leurs capacités d'intervention sur le terrain
9. La conception et la mise en œuvre du mécanisme de distribution des intrants à l'aide de bons électronique (e-voucher) qui constitue à ce jour un bon héritage pour le ministère.

SUGGESTIONS

1. Prévoir une composante « appui au développement institutionnel (y compris l'autonomie financière des CRA) ;
2. Renforcer le déploiement du warrantage et l'amélioration des boutiques ;
3. Continuer la prise en compte de la sécurisation foncière des sites d'investissement (aménagements, construction de magasins...).

Appréciation de la chambre régionale de l'Agriculture

Le PAPSA était un projet de catégorie A dans l'ancienne réglementation des projets et programmes et de catégorie 1 dans la nouvelle, placé sous la tutelle technique du ministère en charge de l'agriculture. Il a été mis en œuvre à travers les 03 ministères en charge du développement rural. Au niveau de chaque ministère et à la CNA, un Point focal a été nommé pour assurer la mise en œuvre des activités.

L'exécution technique des activités relevait des structures administratives et techniques tant au niveau central que déconcentré ainsi que les CRA à travers des protocoles de collaboration. Ces structures étaient



chargées de planifier les activités et d'élaborer des rapports périodiques de mise en œuvre des activités.

Ce dispositif organisationnel mis en place a permis d'exécuter le projet conformément aux textes et lois en vigueur au Burkina Faso et d'assurer l'implication et la responsabilisation des différentes parties prenantes ainsi que le partage des informations et des données. Les principaux résultats atteints par le projet à date du 29 novembre 2019 sont :

De nombreux changements, gage de la durabilité ont été impulsés par le Projet notamment i) l'organisation/restructuration des OPA qui a permis une meilleure définition des tâches, rôles et responsabilités des membres et des organes dirigeants ; ii) une meilleure gestion avec la mise en place d'outils de gestion (cahiers de membres, cahiers de visite, règlement intérieur, carnets de reçu, compte caisse et compte bancaire, registre des opérations de commercialisation depuis l'ouverture, etc.) ; iii) une plus grande crédibilité auprès de l'administration et des autres structures, institutions ou organisations ; iv) l'enrichissement du paysage institutionnel avec la mise en place/création de nouvelles organisations et l'obtention de nouveaux agréments ; v) un meilleur accès aux crédits auprès des institutions financières (la négociation du taux de crédit avec le RCPB pour le warrantage); vi) une plus grande solidarité et cohésion au sein des groupements y compris l'adhésion de nouveaux membres; vii) une plus grande transparence dans la gestion et la prise de décision.

Au niveau des CRA, l'intervention du PAPSA a impacté positivement leur développement institutionnel et leurs capacités d'appui conseil : appui en logistique et matériel de fonctionnement, reconnaissance institutionnelle, tenue régulière des sessions statutaires, suivi et de supervision des travaux et activités des projets sur le terrain; opérationnalisation des CIR/SIMA, meilleure visibilité des missions des CRA, meilleure communication avec les agents étatiques; changements de mentalité des bénéficiaires par rapport à leurs responsabilités etc. Ainsi, le projet a impulsé une recherche d'autonomisation soutenue durable des CRA.



ANNEX 6. SUPPORTING DOCUMENTS

1. Project Appraisal Document
2. Project financing agreement
3. Project economic and financial analysis, 2019
4. FAO policy paper on food security in Burkina Faso, 2008
5. Project's ISRs
6. Project consolidated report
7. Project impact assessment
8. Country Agricultural Annual Statistic Reports
9. EFA excel sheets