Report Number: ICRR0022069

## 1. Project Data

| Project ID | Project Name |
|---|---|
| P095091 | Mali-Agricultural Productivity GEF (SIP) |
| **Country** | **Practice Area(Lead)** |
| Mali | Agriculture and Food |

| L/C/TF Number(s) | Closing Date (Original) | Total Project Cost (USD) |
|---|---|---|
| IDA-47510,TF-97175 | 30-Sep-2016 | 71,644,772.40 |
| **Bank Approval Date** | **Closing Date (Actual)** | |
| 03-Jun-2010 | 31-Jul-2019 | |

| | IBRD/IDA (USD) | Grants (USD) |
|---|---|---|
| Original Commitment | 70,000,000.00 | 17,910,666.88 |
| Revised Commitment | 72,055,346.99 | 925,229.87 |
| Actual | 67,267,145.28 | 2,105,802.20 |

| Prepared by | Reviewed by | ICR Review Coordinator | Group |
|---|---|---|---|
| Hassan Wally | John R. Eriksson | Christopher David Nelson | IEGSD (Unit 4) |

| Project ID | Project Name |
|---|---|
| P099709 | Mali-Agricultural Productivity GEF (SIP) ( P099709 ) |

| L/C/TF Number(s) | Closing Date (Original) | Total Project Cost (USD) |
|---|---|---|
| TF-97183 | | 4377627.12 |
| **Bank Approval Date** | **Closing Date (Actual)** | |
| 03-Jun-2010 | | |

| | IBRD/IDA (USD) | Grants (USD) |
|---|---|---|
| Original Commitment | 0.00 | 6,200,000.00 |
| Revised Commitment | 0.00 | 4,377,627.12 |
| Actual | 0.00 | 4,377,627.12 |

## 2. Project Objectives and Components

### a. Objectives

This project was a fully blended IDA/GEF operation.

The Project Development Objective (PDO) as articulated in the Project Appraisal Document (PAD, para 14) was to:

***"increase the productivity of smallholder agricultural and agribusiness producers in the targeted production systems <u>and project areas.</u>"***

The Project Development Objective (PDO) as articulated in the Financing Agreement (FA, p. 8) was to:

***"increase the productivity of smallholder agricultural and agribusinesses producers in the Targeted Production Systems <u>in Selected Areas of the Recipient's territory."</u>***

The PDO statement in the PAD and the FA were similar except for the underlined sections.

The PDO as articulated in the Global Environment Facility Grant Agreement (p. 5) was to:

***"increase the productivity of smallholder agricultural and agribusinesses producers in the Targeted Production Systems in Selected Areas of the Recipient's territory.***

The Global Environment Objective (GEO) as articulated in the PAD (para 15) was to:

***"increase the use of sustainable land and water management (SLWM) practices in the targeted production systems and project areas."***

While the Global Environment Objective is not referenced in any of the legal agreements, it is cited in the PAD (ICR, p. 3, footnote#1).

This Review will evaluate the project according to the PDO as stated in the Financing Agreement.

### b. Were the project objectives/key associated outcome targets revised during implementation?

Yes

**Did the Board approve the revised objectives/key associated outcome targets?**
No

**c. Will a split evaluation be undertaken?**
No

**d. Components**
The PDO was supported by the following three components:

**1. Technology transfer and service provision to agricultural producers (appraisal cost: US$59.10 million, actual cost: US$30.51 million).** This component aimed to foster the modernization of smallholder farming systems and supply chains through dissemination of improved technologies and practices, and through the professionalization of agricultural support services. This component included the following sub-components:

**1.1. Farming systems and supply chains modernization.** The aim of this sub-component was to promote and disseminate productive technologies and techniques in order to increase smallholders' farm productivity and enhance competitiveness of supply chains.

**1.2. Capacity building for producer organizations (POs) and service providers.** The project would support capacity building of the Permanent Assembly of Mali Agricultural Chambers (APCAM), the Regional Chambers of Agriculture (CRAs) and POs. It would support the hiring or training of PO staff for selected internal functions so that they can deliver services to their members.

**1.3. Facilitating rural credit development.** The project would facilitate rural credit development, following recommendations from the Bank's 2006 Rural Finance Study, by providing financial management and accounting assistance to investors in the agribusiness sector.

**1.4. Technology generation and research-producers linkages.** The project would facilitate technology generation by supporting the National Agricultural Research Committee and will strengthen linkages between research, extension and producers by supporting the Regional Committees for Research and Extension.

**2. Irrigation Infrastructure (appraisal cost: US$67.00 million, actual cost: US$34.11 million).** This component would finance infrastructure to improve water management. Irrigation design would pay particular attention to the protection of soil and water resources. All irrigation development investments funded by the project would include a package of advisory support services financed under component 1. This component included two sub-components:

**2.1. Small scale irrigation.** The project would support feasibility and environment studies for small-scale irrigation investments. It would contribute to the development of 1,500 hectares (ha) of new small-scale gravity-fed village irrigation schemes and 3,100 ha of small-scale low-land development through sustainable rainwater management practices.

**2.2. Large scale irrigation.** The project would contribute to the expansion and modernization of the Office du Niger (ON) area through expansion of the land under irrigation and improved management of the scheme along the lines of the ON area development master plan. The project would develop 2,200 ha of irrigable land at Sabalibougou for which a detailed design study is available. The project would also support 500 ha of new irrigation scheme at M'Béwani, as well as the extension of the drainage system (53 km).

**3. Comprehensive Programmatic Approach, Sector Monitoring and Project Coordination (appraisal cost: US$25.00 million, actual cost: US$19.02 million).** This component supports the evolution toward a programmatic approach in the agricultural sector through facilitating institutionalized policy dialogue between the Government of Mali and donor partners, establishing the framework for shared financing, enhancing the design of key public programs, and improving the evidentiary base for monitoring sector performance. This component included four sub-components.

**3.1. Policy dialogue and coordination.** The project would support policy dialogue between Ministries, Producer Organizations (POs), private sector representatives and donors to strengthen the coordination of the sector and forge a more
consistent programmatic approach of investments and interventions.

**3.2. Sector Monitoring and Evaluation.** The project would seek to: (i) restore the regular production of reliable statistics on the sector; (ii) provide reliable data and up-to-date information to policy decision makers; (iii) facilitate sector-wide consultation based on reliable information and analyses; and, (iv) monitor sector evolution and progress.

**3.3. Delivery of core public services.** The project would facilitate the emergence of a pluralistic network of service providers through the creation of the National Agricultural Advisory Service Council. This sub-component
would help line Ministries deliver core public services that are critical to agricultural productivity increases and to the competitiveness of value chains.

**3.4. Project coordination and monitoring and evaluation.** This sub-component would finance project implementation, coordination of stakeholders, monitoring and evaluation.

## e. Comments on Project Cost, Financing, Borrower Contribution, and Dates

**Project Cost.** Total project cost was expected to be US$160 million equivalent. The actual cost reported by the ICR (p. ii) was US$88.22 million or 55% of the expected amount at appraisal. The difference was due the failure of the borrower to provide the agreed share of counter-part funding, and the disbursement of 10.5% and 46% of the original amounts pledged by the European Union Food Crisis Rapid Response Facility Trust Fund and the International Fund for Agriculture Development (IFAD), respectively (see below for more details).

**Financing.** The project was financed through a six-year Specific Investment Loan (SIL) of US$70 million from the International Development Association (IDA), a Grant of US$6.2 million from the Global Environment Fund (GEF) and a Grant of US$19.5 million equivalent from the European Union Food Crisis Rapid Response Facility Trust Fund. The International Fund for Agricultural Development (IFAD) co-financed the project with a credit of US$32 million. The actual amounts disbursed according to the ICR (p. ii) were US$65.16 million for the IDA credit (94%), US$2.10 million for the European Union Food Crisis Rapid

Response Facility Trust Fund (10.5%), US$4.45 million for the GEF fund (72%), and US$14.70 million for IFAD (46%). The total amount disbursed from all the afore mentioned sources was US$86.41 million.

**Borrower Contribution.** The Government's contribution to the project was estimated at US$23.7 million through tax exemption. Beneficiaries' contribution was estimated at US$6.7 million. The actual amounts according to the ICR (p. ii) were US$1.8 million for beneficiaries and the Government did not provide any counterpart funding due to resource constraints (ICR, para 16).

**Dates.** The project was approved on June 3, 2010, and became effective on June 19, 2010. The Midterm Review (MTR) was carried out on January 21, 2015 compared to a suggested date in the PAD on September 15, 2011. The suggested date in the PAD would have been too early into implementation to conduct the MTR. The project closed on July 31, 2019 compared to an original closing date of September 30, 2016. The 34 months extension was needed to accommodate extensive procurement delays that negatively impacted implementation (ICR, para 57).v

The project was restructured four times, all of which were Level II restructuring.

The first was on December 15, 2011, when the amount disbursed was US$6.06 million, in order to extend the EU TF closing date from December 31, 2011 to April 30, 2012 , and reallocate funds from the IDA credit to finance all the project activities that could not be implemented prior to April 30, 2012 from the proceeds of the EU Grant.

The second was on June 14, 2013, when the amount disbursed was US$20.78 million, in order to modify the results framework (modifications to indicators and targets), changes to: components, project costs and disbursement arrangements, reallocation of proceeds, and changes to financing plan.

The third was on January 27, 2016, when the amount disbursed was US$52.75 million, in order to extend the closing date (of the IDA Credit and the 2 Grants) from September 30, 2016 to July 31, 2018.

The fourth was on June 14, 2018, when the amount disbursed was US$60.50 million, in order to extend the closing date from July 31, 2018 to July 31, 2019, change the implementation schedule, change disbursement estimates, and modify the results framework (modifications to indicators and targets).

## 3. Relevance of Objectives

### Rationale

**Context at Appraisal.** In 2008, Mali continues to be one of the poorest countries in Sub-Saharan Africa with a US$480 GDP per capita and a 47.6% national poverty rate according to 2006 estimates. Poverty is more prevalent in the rural areas (57.6%) and most rural people continue to derive their livelihoods from agriculture. Food insecurity and malnutrition are high and were aggravated by the fuel and food crisis of 2007/08. In 2009, food prices remain above the 2008 level and above the 5-year average. Natural resources degradation, population growth and climate change continue to pose serious challenges to medium and long-term food security in the country. Furthermore, increasing agricultural productivity is

hindered by three main challenges: lack of productive infrastructure, low usage of modern agricultural inputs, and lack of coordination in the agricultural sector.

At appraisal, objectives were in line with the Government's Growth and Poverty Reduction Strategy Framework (GPRSF) for 2007-2011, which prioritized food security and raising the incomes of rural producers through increasing, securing and diversifying food production. Objectives were also in line with the Bank's Country Assistance Strategy for Mali (CAS; 2007-11) which placed agriculture as one of the three key sectors to drive economic growth. Objectives were also in line with pillar 1 of the Comprehensive Africa Agriculture Development Program (CAADP) which called for establishing a comprehensive programmatic approach to sustainable land and water management (SLWM). Objectives were also in line with the four pillars of the Bank Climate Change strategy in Sub Saharan Africa.

At completion, objectives continue to be in line with the Bank's Country Partnership Framework for Mali (CPF FY16-19) which among others aimed to improve productivity in Mali's agriculture sector, specifically under Objective 2.1 (Improve Productive Capacity and Market Integration of Farmers and Pastoralists) and Objective 2.2 (Agriculture value diversification) of Area of Focus 2 (Create Economic Opportunities). The ICR did not report on the relevance of objectives with regards to the Government's priorities at completion.

The Project Development Objective PDO was: "to increase the productivity of smallholder agricultural and agribusinesses producers in the Targeted Production Systems in Selected Areas of the Recipient's territory." According to the ICR para 28: "the project's focus was increasing productivity of smallholders and primarily address low irrigation levels, low input use, the poor adoption of technology and have a better coordination of the sector." Therefore, the relevance of including "agribusiness producers"as stated in the PDO is questionable given the focus of the project. The PDO also lacked connection to higher level objectives, namely, ensuring food security and increasing the income of rural producers.

The Relevance of the GEO was not discussed, neither in the PAD nor the ICR. That said, this Review finds that the GEO statement lacks any connection to environmental objectives.

Based on the above-mentioned information, Relevance of Objectives is rated Substantial rather than High due to lack of information on the Government priorities at completion, inconsistency between the PDO and the project activities with regards to "agribusiness producers", and lack of connection to higher level objectives.

### Rating

Substantial

## 4. Achievement of Objectives (Efficacy)

## OBJECTIVE 1

### Objective

PDO: to increase the productivity of smallholder agricultural and agribusiness producers in the targeted production systems in selected areas of the recipient's territory.

### Rationale

**Theory of Change.** To achieve the stated objective, as articulated in the PDO, "to increase the productivity of smallholder agricultural and agribusiness producers" the project aimed to increase adoption of technologies; and improve access to water resources for agricultural production. These two approaches were to be supported by a programmatic approach to invest in the sector, as well as better monitoring and coordination. The disseminated technologies and sustainable land and water management practices (SLWM), as articulated in the GEO, would target smallholders in various value chains. According to the ICR (para 9) this was expected to result in better links between agricultural research and farmers, facilitated by stronger producer organizations and better access to agricultural financing. Improved water access for agricultural production would focus on the rice value chain, and to a lesser extent horticulture, through the development of irrigation infrastructure on both large and small scale schemes. The adoption of technologies and improving access to water were expected to result in increasing productivity in the project areas. As a long-term outcome, the project was expected to improve food security in Mali.

Achieving the stated objectives was underpinned by three key assumptions identified by the ICR (para 9). First, political, social and economic stability in the country are critical factors to ensure smooth implementation and sustainability of outcomes. Second, achieving food security is dependent on the successful management of the occurrence and impact of extreme weather events or natural catastrophes. Third, technology adoption and matching grants both require an effective delivery mechanism in order to achieve the project's objectives. Specifically, for technology adoption, the availability of capable public and private service providers is critical for the dissemination of new technologies.

While the stated activities were linked to the PDO and the included assumptions were logical, it was not clear how better links between agriculture research and farmers would be achieved. Also, claiming that investing in the sector would improve agricultural financing was not backed by specific project activities geared to improve financing.

**Outputs**

The information below is form the ICR (Annex 1) unless referenced otherwise.

**Technology Transfer and Service Provision to Agricultural Producers**

- Number of producers that have adopted new cowpea varieties: no information was provided on the number, but the ICR reported that 70% of producers adopted new cowpea varieties compared to a target of 50% and baseline of 1% (target exceeded).
- 3,705 producers adopted the system for rice intensification (SRI) representing 26% of producers compared to a target of 30% and a baseline of 1% (target not achieved).

- Number of dairy producers that adopted improved husbandry practices: no information was provided by the ICR on the number, but the ICR reported that 26% of dairy producers adopted improved husbandry practices compared to a target of 30% and a baseline of 1% (target not achieved).
- 1,250 producers that adopted SLWM practices for rice (ICR, p.13 table 7), cowpea and maize, and 3,789 adopted SLWM practices for agroforestry (ICR, p. 13, table 7), these represented 62% of producers compared to a target of 60% and a baseline of 5% (target exceeded).
- 13 strategic and applied research programs under the Agricultural Research Agency and the Institute of Rural Economic Research were directly supported by the project in the following themes: forage crops, animal feeds, artificial insemination and SLWM (ICR, para 40).
- 661 sub-projects were financed for various types of projects; predominantly cowpeas (26%), horticulture (17%), rice (12%) and livestock fattening (10%) (ICR, para 39).

**Irrigation Infrastructure**

- 6,209 hectares of irrigated areas were developed compared to an original target of 7,295 hectares and a revised target of 6,400 hectares (revised target largely achieved).
- 4,180 producers benefited from developed irrigated area compared to an original target of 7,740 and a revised target of 5,400 (target not achieved). The ICR noted that "there original target as stated in the PAD indicated 7,740 farm units, with 10 individuals expected to benefit per farm unit, and thus a target of 77,400 individuals. It is not clear how it was changed to 7,740 individuals in the results framework."
- An 11 km drain was constructed although 33 km at Karankola and 20 km at Tango were initially expected. The drain was completed just before the project closed (target not achieved).

**Comprehensive programmatic approach, sector monitoring and project coordination**

- Number of policies/strategies developed: The project monitored the adoption by the Government of agricultural policies, namely: Agricultural Development Policy and the Land Tenure Policy (ICR, p. 8, table 4). However, no further information was provided on the impact of these policies.
- 1,750 reliable statistical data and sectoral analyses were produced compared to a target of 1,800 and a baseline of 610 (target substantially achieved).
- Number of stakeholders whose capacity has been built: no data provided on this indicator.

**Outcome**

The project aimed to increase productivity of smallholders agricultural producers. To achieve this objective, the project featured two approaches, first, the project supported technology transfer and improved service provision to smallholders, and second, the project supported improved access to irrigation water through improvements to the irrigation infrastructure in the project areas. The project initially focused on 15 value chains which were later (during the 2016 Restructuring) reduced to 3 chains (rice, cowpea and milk). Direct project beneficiaries for the three value chains reached 247,720 compared to a target of 300,000.

**Impact of the project on dairy production.** The project supported dairy production by input distribution of animal feeds, forage seeds, artificial insemination and training. According to the ICR (para 35) milk production per cow per day reached 5.83 liters per day per cow compared to an original target of 6 liters per day per cow and a formally revised target of 2.71 liters per day per cow. However, improved husbandry

practices showed a low adoption rate where only 22% of dairy producers adopted improved husbandry practices compared to a target of 50%. Furthermore, the ICR (para 35) reported that data was not regularly collected by the project. Therefore, it is doubtful whether the increase in milk production is directly attributable to the project activities.

**Impact of the project on cowpea yields.** The project supported improvements in cowpea yield through input distribution, and linkages to research. High yielding and drought tolerant cowpea seeds were distributed to smallholders, in some cases they served a dual purpose of cowpea production for human consumption and forage for animals. By project completion cowpea yield reached 700 kg per hectare (target achieved).

**Impact of the project on rice yields.** The project supported improvements in rice yield through extension and input distribution, in combination implementation support with producer organization strengthening and sub-project financing. The project also promoted the System for Rice Intensification (SRI). Adoption of SRI reached 26% among rice producers compared to a target of 30%. Irrigation improvements supported by the project also had a significant impact on rice yields which increased from 3-4 tons per hectare to 6-7 tons per hectare (ICR, para 38).

The project achieved seven out of ten intermediate outcome indicators, and six PDO outcome indicators were fully achieved and three substantially achieved. However, the achievements under three PDO indicators (share of producers that have adopted new cowpea varieties in the target production basins, total irrigated area developed in hectares, and the number of producers benefiting from newly or improved irrigated land) as well as two intermediate outcome indicators (producer organizations' sub-projects that have achieved their objectives, and percentage of dairy producers who adopted improved husbandry practices) were not directly attributable to the project (ICR, para 37).

Based on the above-mentioned assessment, the efficacy of achieving the PDO is rated Modest due to concerns about the robustness of the data provided in the ICR, and questionable attribution of the reported improvements to the project activities.

### Rating
Modest

## OBJECTIVE 2
### Objective
GEO: to increase the use of sustainable land and water management (SLWM) practices in the targeted production systems and project areas.

### Rationale
**Theory of Change.** To achieve the stated GEO "increase the use of sustainable land and water management (SLWM) practices in the targeted production systems and project areas", the project would promote the adoption of SLWM practices such as moisture conservation, live fences, and water saving technologies among the smallholders in project areas. This Review assumes that the implementation of these activities was expected to improve the sustainability of production in the project areas.

**Outcome**

The project supported the adoption of SLWM activities through training, farmer field schools, and communal activities. Among the SLWM activities supported were: moisture conservation, live fences, and water saving technologies. By project completion, producers that had adopted SLWM practices reached 60 producers (target achieved), and 30 areas were under SLWM techniques in project production basins compared to a target of 25. However, the ICR (para 37) reported that M&E field missions showed the number of producers that adopted the SLWM practices, but they do not indicate the proportion of producers or areas (nor the total number of producers in the areas visited) that adopted. Therefore, it was not possible to attribute this achievement directly to the project. Furthermore, it is not clear from the GEO statement what environmental objective the project was trying to achieve through increasing the use of sustainable land and water management practices.

**Rating**
Not Rated/Not Applicable

## OVERALL EFFICACY

**Rationale**
The project achieved seven out of ten intermediate outcome indicators, and Six PDO outcome indicators were fully achieved and Three substantially achieved. However, the achievements under three PDO indicators (share of producers that have adopted new cowpea varieties in the target production basins, total irrigated area developed in hectares, and the number of producers benefiting from newly or improved irrigated land) as well as two intermediate outcome indicators (producer organizations' sub-projects that have achieved their objectives, and percentage of dairy producers who adopted improved husbandry practices) were not directly attributable to the project (ICR, para 37).

Overall efficacy is rated Modest due to concerns about the robustness of the data provided in the ICR, and questionable attribution of the reported improvements to the project activities.

| Overall Efficacy Rating | Primary Reason |
|---|---|
| Modest | Insufficient evidence |

## 5. Efficiency

**Economic and Financial Efficiency**

***ex ante***

At appraisal the economic and financial analysis (EFA) in the PAD estimated that the project investments would generate an internal economic rate of return of 34% with a Net Present Value (NPV) of US$184 million over six years. The capital opportunity cost was 12%. These results were based on a project budget of US$76.2 million (IDA+GEF). No sensitivity analysis was conducted to test the impact of different scenarios, particularly these linked with the risk matrix at appraisal, on the estimated IERR.

The EFA used different production practices in the project's regions and the differences between smallholders and medium holders as representative for the target population. The analysis focused on four value chains (rice, cowpea, milk production and poultry) as indicative models for the project investments. The analysis used the production costs and margins of the selected crop and livestock activities without modeling incremental benefits rather than the standard methodology of comparing with-project situation (WP) with the without-project situation (WOP). Also, the EFA used a systemic aggregation of benefits, instead of aggregating the targeted number of beneficiaries assuming that the entire agricultural population in the project regions would benefit from the technology transfer and adoption. The ICR (para 42) correctly questioned the methodological choices used in the ex ante EFA, and pointed out that the ex ante EFA methodology resulted in very large economic results with an over-estimated efficiency.

***ex post***

The ICR efficiency analysis estimated an economic internal rate of return (EIRR) of 11.7% compared to 34% at appraisal and an NPV of US$13.9 million compared to US$184.2 million at appraisal. The ICR EFA did not follow the same methodology as that used at appraisal. The ex post EFA used a cost-benefit approach to estimate the net additional benefits attributable to the project's main outcomes, and a cost analysis to assess the efficient use of resources. Representative sub-projects (cowpea, rice, horticulture, livestock fattening, bio-digester) were analyzed by modelling to demonstrate the impact of technology transfer and service provision to agricultural producers. The EFA also analyzed the financial returns to the large-scale irrigation schemes financed by the project, demonstrating their economic justification.

The ICR analysis of the efficiency of the use of the project resources is problematic.. The EU Trust Fund disbursed only 10.8% of the trust due to procurement delays and a 6-month Bank suspension following the coup d'état in March 2012 (ICR, para 25) .The ICR (para 46) reported that the project experienced significant overspending for some activities, for example, activities relating to capacity building for POs and service providers over spent by 221% compared to the envisaged budget. Also, under the third component (comprehensive programmatic approach, sector monitoring and project coordination), the project over-spent significantly by 141% when compared with the restructuring allocation. On the other hand, while significant resources from the first and third components were reallocated to the large-scale irrigation activities under the second component, only 80% of the re-allocated resources were spent. Also, the public service delivery related expenditure utilized 83% of the allocated resources. Finally, the ICR (para 46) reported that "very little has been spent for technology generation and research/production linkages and not all resources were used for sub-component 1.1 (farming systems and supply chains modernization)."

The ex post analysis could have benefited from the inclusion of a cost efficiency analysis comparing the cost of irrigation infrastructure in Mali to similar countries. Also, the EFA could have included a sensitivity analysis to show the variation in EIRR against different scenarios that might face the project investments.

**Administrative and Institutional Efficiency**

The project closing date was extended twice for a total of 34 months. The project experienced significant procurement delays combined with an escalation in labor and materials costs. This negatively impacted the implementation of the irrigation schemes. Implementation delays meant that the expected benefit streams from the project investments would not materialize in the envisaged time-frame. Therefore, it is plausible to assume that such delays would negatively impact the project's economic rate of return. The project also experienced a slow disbursement rate, and according to the ICR (para 47) by project completion the project achieved an overall 78% disbursement rate including all financing sources: IDA (96%), EU TF (11%), IDA GEF TF (64%), and the UNDP GEF TF (72%). There were also implementation delays that stemmed from firing incompetent project implementation staff and delays in the recruitment of replacements (ICR, para 58).

Efficiency is rated Modest. This rating is based on a low ex post EIRR of 11% compared to a discount rate of 12% (owing to the difference between the methodologies employed for estimating the ex ante EIRR and the ex post, a comparison between the two estimates is not valid) combined with significant implementation delays, and concerns about the efficiency of resource use.

### Efficiency Rating

Modest

a. If available, enter the Economic Rate of Return (ERR) and/or Financial Rate of Return (FRR) at appraisal and the re-estimated value at evaluation:

| | Rate Available? | Point value (%) | *Coverage/Scope (%) |
|---|---|---|---|
| Appraisal | ✓ | 34.00 | 100.00<br>☐ Not Applicable |
| ICR Estimate | ✓ | 11.70 | 100.00<br>☐ Not Applicable |

* Refers to percent of total project cost for which ERR/FRR was calculated.

## 6. Outcome

Relevance of Objectives was rated Substantial. Efficacy was rated Modest. While the project-supported activities that seemed to improve cowpea and rice yields as well as dairy productivity, there are concerns about the robustness of the data provided in the ICR, and attribution of the reported improvements to the project activities is questionable. Efficiency was rated Modest due to a low ex post EIRR (11% compared to a discount rate of 12%) combined with significant implementation delays, and concerns on the efficiency of resource use.

Based on a Substantial rating for Relevance of Objectives, and Modest rating for both Efficacy and Efficiency, Outcome is rated Moderately Unsatisfactory.

### a. Outcome Rating

Moderately Unsatisfactory

## 7. Risk to Development Outcome

The ICR (para 82) identified four areas that pose potential risk to the development outcome:

First, the risk related to SLWM practices promoted by the project is not likely to be sustained. The ICR reported that the cost associated with some SLWM practices, such as building dams to reduce the speed of surface water, might discourage beneficiaries' participation.

Second, weather fluctuation poses a risk to sustained agriculture production, specifically, the cowpea and forage production. Mali is prone to drought and floods. The agricultural season 2018/19 was negatively impacted due to drought. These weather-related events could negatively impact yields with serious consequences to food security in the country.

Third, the lack of adequate maintenance plans for the irrigation infrastructure supported by the project pose a technical risk. Maintenance of the developed irrigation perimeters depends on the availability of government funding. If government priorities change, allocation to irrigation maintenance might be reduced. This would negatively impact maintenance implementation. The establishment of a rolling fund for water fees might provide a sustainable solution that would enable funding maintenance requirements.

Fourth, the is a risk that the input subsidy program supported by the government would stop. If this happens, the achieved yield gains under the project would be expected to decline, in the absence of subsidization, as poor farmers would not have the economic means to purchase inputs, including fertilizers and high-quality seed, for their production.

The fifth risk is emphasized by IEG:

Political stability and security concerns. Mali continues to be prone to political instability. There are also security concerns in some regions. A deterioration in one or both aspects could undermine the gains achieved under the project, and threaten the fragile food security situation in the country.

## 8. Assessment of Bank Performance

### a. Quality-at-Entry

This project was in response to the Government's request to move to a sector wide approach in agriculture. The project builds on the Bank-financed National Rural Infrastructure Project (closed on December 31, 2007) for large-scale and small-scale irrigation development, and on the Bank-financed Agriculture Services and Producer Organizations Program (closed on December 31, 2009) for technology generation and transfer, promotion of private delivery for advisory services to farming communities, and empowerment of producer organizations (POs).

Notable lessons reflected in the project design included: maximizing the efficient use of resources through the parallel combination of soft and hard investments, close supervision and adequate level of post-construction support-especially on the marketing side to ensure ownership and long-term sustainability of small scale irrigation, and responding to capacity needs of various stakeholders in addition to beneficiaries, where capacity-building would be provided to agricultural researchers and extension agents, and service providers for quality control and phyto- and zoo-sanitary surveillance.

The project design was complex including several value chains and irrigation basins. Design was also ambitious as it aimed to address three main challenges in one project: (i) the lack of productive infrastructure especially for irrigation and post-harvest management and processing; (ii) low productivity due to low input use, unsustainable land and water management practices, and poor access to advisory services and financing; and, (iii) the lack of coordination in the sector, and (iv) a lack of strategic vision by the Government of Mali (GoM) for long-term investments in the sector (ICR, para 6). The Results Framework did not reflect the key assumptions underpinning the project's theory of changes (ICR, para 9). Design overestimated the capacity of the implementing agencies to be able to develop irrigation for 7,000 hectares in 18 months after project approval. Also, the expectation for the provision of advisory services through partnerships with the private sector was unrealistic-given that private sector organizations were not included in the implementation arrangements.

Eleven risks were identified at appraisal, four were rated High, five were rated substantial and two were rated moderate. The ICR (para 75) reported that the suggested mitigation measures were not enough to manage the risks. For example, the project relied on capacity assumptions for the various implementing agencies that proved to be overestimated, and capacity building efforts to manage the risk were not enough.

Finally, M&E design was complex with too many indicators and "no resource allocation was made to finance M&E activities (ICR, para 75)."

Based on the above mentioned assessment, Quality-at-Entry is rated Moderately Unsatisfactory due to a complex design that over estimated the implementation capacity, failure to include adequate risk mitigation measures and complex M&E design.

### Quality-at-Entry Rating

Moderately Unsatisfactory

## b. Quality of supervision

The project implementation was challenging at the earlier stages of the project due to political instability and security concerns. The Bank carried out a total of 17 supervision missions throughout the life of the

project. According to the ICR (para 76), the Bank provided "adequate supervision support." The ICR (para 76) reported that the MTR and the 2016 project restructuring contributed to "a turnaround in the project's performance" particularly on irrigation development activities. The Bank and the project team worked together to restructure the project and revise indicators to make them more measurable.

During the first part of the implementation period, the project suffered from low quality reporting, which undermined addressing implementation bottlenecks. Further, the implementation agency did not always follow the recommendations of the Bank Task Team. The performance ratings assigned to the project in the first half of the implementation period did not reflect accurately the problems that the project faced. These included: "issues with financial management, procurement, recruitment, and implementation progress (ICR, para 78)." Also, see Section 10b below.

The Task team could have provided more attention to addressing M&E problems. While the project was restructured specifically to address issues related to the Results Framework, these changes were not adequately followed up with the project. The team also should have given more attention to the candor of assessing the project ratings at the first half of the implementation period. Finally, the Task Team leader was changed three times compared to changing the project coordinator seven times, these excessive changes of the latter were disruptive and affected the project implementation (ICR, para 80).

Based on the above-mentioned assessment, the Quality of Supervision is rated Moderately Unsatisfactory due to significant shortcomings including M&E weaknesses.

Overall Bank performance is rated Moderately Unsatisfactory. This rating reflects significant shortcomings at Quality at Entry including design weaknesses and failure to included adequate risk mitigation measures. Also, Quality of Supervision suffered from significant shortcomings including limited attention to M&E weaknesses.

### Quality of Supervision Rating
Moderately Unsatisfactory

### Overall Bank Performance Rating
Moderately Unsatisfactory

## 9. M&E Design, Implementation, & Utilization

### a. M&E Design
The PAD included a Results Chain, but not an explicit Theory of Change as it was not a requirement at the time of appraisal. Nonetheless, the ICR (pages 2 and 3) included a Theory of Change that reflected the

connections between the project inputs, outputs, intermediate outcomes, outcomes and longer-term objectives. The ICR also stated the longer-term assumptions that underpin the Theory of Change.

The overall responsibility of M&E activities would be under the Statistics and Planning Unit (CPS),-which oversees the rural development sector under the Ministry of Agriculture. CPS was expected to oversee data collection, compilation and communication to the central level through two national M&E staff and to collaborate at regional level with one staff in the Agricultural Regional Division and one staff in each Regional Agricultural Chamber. Both these national partners were expected to collect data on certain indicators, the Mali Rural Economics Research Institute would collect yield measurements, the Agricultural Market Observatory would collect data on urban markets, and all environment and SLWM related M&E activities and indicators would be collected by the Ministry of Environment and Sanitation. However, according to the ICR (para 61), M&E activities lacked the necessary financial resources to support regional M&E activities, which were the primary entry point for data collection.

The PDO would be assessed through four project outcome indicators: increase in rice production in project targeted areas, increase of rice yield on small scale irrigation perimeters, increase of cowpea yield in project production basins, and increase of milk production per milking cow in the targeted areas. These indicators were linked to the PDO and measurable. However, the RF lacked outcome indicators for the agri-business segment of the project beneficiaries (ICR, para 59). The GEO would be assessed through two GEO outcome indicators: increase in areas under sustainable land and water management (SLWM) practices in project areas, and increase in producers' organizations adopting SLWM practices. While these indicators were linked to the GEO, they were intermediate outcome indicators rather than outcome indicators.

The Results Framework (RF) included 16 intermediate outcome indicators to assess the different activities supported by the project. Most of these indicators were linked to the project activities and had clear measurable targets with baseline data. The ICR (para 60) reported that the monitoring and evaluation manual included 60 indicators in total, which made tracking this large number of indicators relatively difficult for the project's M&E system. This relatively large number of indicators was needed to "meet the specificity of the other donor partners of the
project, especially IFAD and GEF, ICR para 60)."

M&E design was overly complex with over 60 indicators in the monitoring manual. Design also lacked the adequate financial incentives that would ensure the efficient functioning of a system that relied on multiple national agencies and institutions to collect M&E data.

### b. M&E Implementation

M&E implementation was negatively impacted by the delayed start-up, and set-up complications associated with using national procedures. Also, the deteriorated security situation in some regions of of the country hindered M&E activities. The M&E system was only set-up in 2013, three years after the effectiveness in 2010, which left data gaps in the earlier period of implementation (ICR, para 63). After the 2013 restructuring, the number of indicators was reduced and the roles and responsibilities of the different actors involved collection on project activities was clarified. While these two actions improved data collection, not all PDO and intermediate indicator data was regularly collected. Missing data was completed through various surveys and monitoring field missions. There was no consolidated database or system to track the changes in indicators. The M&E system also lacked Information and

Communication Technology (ICT) methods to complement the system, such as a mapping using GPS coordinates of the sub-projects.

The ICR (para 64) reported that the M&E system was not capable of providing a full picture of the project activities except towards the end of the implementation period. Data on crop yields seem to be based on sound methodology and independent analysis. Despite efforts to avoid beneficiary double counting, the ICR (para 64) reported that this could not be accurately ruled out particularly for component 2. That said, M&E implementation improved starting in 2016 as the agencies involved in data collection started to receive financial resources to fund M&E activities. A final impact evaluation was carried out which according to ICR (par 65) was "well done" and "timely."

Overall, M&E implementation was challenging given the complex design, deteriorated security situation, and lack of resource allocation to fund M&E activities for the majority of the implementation period.

### c. M&E Utilization

According to the ICR (para 67) M&E utilization was modest. This was due to a number of reasons, first the project lacked a management information system "capable of providing real time information beyond some of the core indicators." Second, M&E implementation difficulties resulted in a situation where the project management relied on ad-hoc decisions rather than strategic decisions based on sound project M&E data. Third, M&E information flow was hindered by the initial implementation arrangements and according to the ICR (para 67) efforts to rectify this problem resulted in limited success. That said, the ICR (para 67) commended the final impact evaluation study and some knowledge management products, which could potentially inform future operations in the sector.

Overall, M&E is rated Modest due to a complicated design, problematic implementation arrangements and lack of dedicated M&E funding, all of which resulted in limited M&E utilization.

### M&E Quality Rating

Modest

## 10. Other Issues

### a. Safeguards

The project was classified as an environmental category A operation because of key investments in large scale irrigation. These irrigation investments might have adverse but limited environmental impacts mainly on water resources and might require the resettlement of local villages. Seven safeguard policies were triggered: Environmental Assessment (OP/BP 4.01), Natural Habitats (OP/BP 4.04), Pest Management (OP 4.09), Physical Cultural Resources (OP/BP 4.11), Involuntary Resettlement (OP/BP 4.12), Safety of Dams (OP/BP 4.37), and Projects on International Waterways (OP/BP 7.50). An environmental and social management framework (ESMF) and a pest management plan (PMP) were prepared. An environmental assessment (EA) for the Sabalibougou irrigation scheme was updated and a resettlement action plan (RAP)

was prepared. As per OP/BP 4.11 on Physical Cultural Resources, an archaeological survey was conducted on the proposed irrigation sites to determine the project's potential impact on those resources and propose mitigation measures. As per OP/BP 7.50 regarding "Projects on International Waterways", on October 9, 2009, the Recipient notified on a no-objection basis the riparian countries through the Niger River Basin Authority in Niamey of the type and size of the irrigation investments planned at ON under this project.

**Safeguard compliance.** According to the ICR (para 69) an Environmental and Social Specialist was not hired during the project implementation, and safeguards issues were addressed through consultants hired by the Office du Niger. A resettlement action plan was prepared to displace four hamlets. However, some infrastructure that was built according to the plan did not comply with national standards and displaced households received 3 hectares rather than 5 as the plan stated (ICR, para 71). Also, the Grievance mechanism did not follow the Bank standards and no report of its implementation was available. According to the ICR (para 70) the Bank "recommended the Client to handle with all social and environmental incompliance on the project." However, it remains unclear whether the Client took the necessary actions recommended by the Bank or not.

### b. Fiduciary Compliance

**Financial Management.** The project experienced a 10-month implementation delay because the borrower had to agree on using the "Bank's financial management system as the national systems were not considered to be sufficiently robust (ICR, para 25)." According to the ICR (para 72), financial reports, statements and audit reports were timely, and audit reports did not highlight "important shortcomings." The total disbursement rate of the IDA managed financing (IDA, EU and GEF) reached only 78% at the closing date (ICR, para 72).

**Procurement.** Procurement was negatively impacted by a number of factors reported in the ICR (para 71): first, the project experienced delays in contract signatures; second, there were delays in the execution of works; third, some contracts were not approved in the procurement plan, while other contracts were not submitted to General Directorate of Public Markets review as required; fourth, procurement notices and contract awards were not published; fifth, the deadline for bid submission was not sufficient; sixth, technical expert(s) were absent in the contracts evaluation committee; seventh, there was poor record keeping and documents were not uploaded in the Systematic Tracking of Exchanges in Procurement; and last, receipts and payments were not archived. Procurement delays partially contributed to the cancellation of the EU trust fund-when only 10% of the trust fund was disbursed (ICR, para 25). Also, procurement delays and escalation of labor and material costs negatively impacted the implementation of irrigation schemes (ICR, para 25). The Unit for Planning and Statistics procurement staff were hired after a two- year delay. Furthermore, procurement delays contributed to the late construction of the Karankorola drain-which was only completed as the project was closing. Therefore, the immediate impact of this infrastructure investment could not be assessed during the life of the project-despite a nine years implementation period. Overall, procurement was weak and contributed to implementation delays and to the cancellation of EU funding.

### c. Unintended impacts (Positive or Negative)

None

### d. Other

None

## 11. Ratings

| Ratings | ICR | IEG | Reason for Disagreements/Comment |
|---|---|---|---|
| Outcome | Moderately Unsatisfactory | Moderately Unsatisfactory | |
| Bank Performance | Moderately Unsatisfactory | Moderately Unsatisfactory | |
| Quality of M&E | Modest | Modest | |
| Quality of ICR | --- | Substantial | |

## 12. Lessons

The ICR included eight lessons. The following three are emphasized with some adaptation of language:

- **To ensure capturing early stage data, it is important to have the M&E system fully designed and ready to implement once the project becomes effective.** The project experience showed that relegating the system's design to the project's implementation phase fails to capture early stage data, the system often becomes under-resourced, and eventually becomes unhelpful as a management tool. For example, ensuring baseline information/studies are undertaken before project implementation begins.
- **Projects implemented in challenging conditions like Mali need to be more focused to ensure smooth implementation and achievement of outcomes.** This includes better targeting at design stage, and strategic choice of value chains to accelerate the pace of implementation. The complexity of demand-driven approaches need to be tempered by limiting the menu of options (type of support, commodities included, etc.), and by avoiding a geographical scattering of interventions.
- **Successful Risk Management requires integrating systemic risks (social, political and economic) in the design choices combined with the development of adequate adaptation/mitigation measures.** The project's risk analysis at design failed short of identifying any macro risks, yet the emerging crisis in 2012 posed multiple challenges to implementation. Innovations – in terms of activities and implementation arrangements – have to be gradually introduced in riskier contexts and some contingency plans should be

developed for the main risks in order to avoid as much as possible disruptions to implementation and ad-hoc decision-making.

## 13. Assessment Recommended?

No

## 14. Comments on Quality of ICR

Quality of Evidence. The ICR acknowledged that M&E design was complex and implementation was weak. The ICR (para 49) also acknowledged that robustness of the evidence provided by various outcome indicators weakened the attribution of their achievements to the project.

Quality of Analysis. The ICR provided clear linking between evidence and findings to the extent possible - given the M&E weaknesses. However, two outcome indicators and three intermediate outcome indicators suffered from attribution problems.

Lessons were generally based on evidence and analysis. They were based on the project experience although they could have befitted from better formulation, see Section 12.

Results Orientation. The ICR included a good discussion on outcomes despite concerns on the accuracy of the M&E data. However, the discussion was overly positive giving the reader a false impression that outcomes are positive. This suddenly ended when the ICR concluded that the achieved results could not be fully attributed to the project activities.

Internal Consistency. Various parts of the ICR were internally consistent and logically linked and integrated.

Consistency with guidelines. The assigned ratings in the ICR were justified and backed by sound arguments. However, the outcome discussion could have benefited from more details on the reasons that contributed to the assigned rating.

Conciseness. The ICR provided thorough coverage of the implementation experience and candidly reported on shortcomings. There was enough clarity in the report’s messaging. However, attribution was problematic due to a complex M&E design combined with poor M&E implementation. The ICR did not report on the relevance of objectives with regards to the Government's priorities at completion.The ICR could have provided more explicit statements on compliance with Bank's safeguard policies.

Overall, the ICR Quality is rated Substantial, despite minor shortcomings.

**a. Quality of ICR Rating**
Substantial