



1. Project Data

Project ID P151963	Project Name Sustainable Family Farming Modernization	
Country Ecuador	Practice Area(Lead) Agriculture and Food	
L/C/TF Number(s) COFN-C1410,IBRD-85150	Closing Date (Original) 30-Jun-2021	Total Project Cost (USD) 34,906,196.18
Bank Approval Date 15-Jul-2015	Closing Date (Actual) 31-Dec-2023	
	IBRD/IDA (USD)	Grants (USD)
Original Commitment	80,000,000.00	0.00
Revised Commitment	37,854,311.77	0.00
Actual	34,906,196.18	0.00

Prepared by Hassan Maher Amin Waly	Reviewed by Avjeet Singh	ICR Review Coordinator Avjeet Singh	Group IEGSD (Unit 4)
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2. Project Objectives and Components

a. Objectives

The Project Development Objective (PDO) of the Sustainable Family Farming Modernization Project as articulated in the Loan Agreement (LA, page) was identical to the one stated in the Project Appraisal Document (PAD, paragraph 8) and aimed to:

"Enhance incomes of small and medium sized farm households* by supporting more productive and climate-smart use for land and water."



*Small and Medium farmers are established by the Ministry of Agriculture, Livestock, Aquaculture and Fisheries (MAGAP) according agro-climatological regions:

- Sierra: 0-5 ha (small farmers) – 5 to 20 ha (medium farmers)
- Costa: 0-20 ha (small farmers) - 20 to 40 ha (medium farmers)

Parsing the PDO. The PDO will be parsed based on one Objective:

To enhance incomes of small and medium sized farm households.

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

Yes

Did the Board approve the revised objectives/key associated outcome targets?

Yes

Date of Board Approval

14-Dec-2018

c. Will a split evaluation be undertaken?

Yes

d. Components

The PDO was supported by the following three components:

1. Investments for climate-smart sub-projects (appraisal cost: US\$106.80 million, actual cost: US\$34.20 million). This component supported the following activities: (a) Productive investments: financing of sub-projects to be implemented by the Project Implementation Unit (PIU) and aligned with the Project objective and provincial priorities, including (i) individual and/or collective small water storages (ponds); (ii) on-farm investments for modernization⁸ of irrigation techniques (drip, sprinkler, modern gravity techniques), and (iii) complementary works to improve off-farm irrigation and drainage networks; (b) Improvements in agricultural practices, water and soil management: financing small investments linked to the sub-projects under (a) and supporting climate smart agriculture activities, and building capacity of beneficiaries to adopt new farming techniques aiming at (i) increasing productivity and yields, (ii) improving the resilience of their crops to the impact of climate change, and (iii) creating more sustainable plant, soil and water management.

2. Capacity building for institutional stakeholders and beneficiaries' organizations (appraisal cost: US\$6.30 million, actual cost: US\$4.50 million). This component supported the provision of technical assistance and training needed in the short term (up to 12 months) to help optimize the productive, environmentally sustainable, and commercial use of the off- and on-farm irrigation systems and water ponds built or improved under component 1. Additional support would be provided to strengthen organizational and business capacities of producer groups, communities and small producer organizations (including Water User Organizations/Irrigation Associations (IAs) and Farmer Organizations (FOs)) as well as broad activities fostering smallholders' linkages to markets in the medium-term. Provision of agricultural inputs (financed through other Government programs).



3. Project Management (appraisal cost: US\$15.50 million, actual cost: US\$10.00 million). This component financed : (i) the Project Implementation Unit (PIU) to function under the Under-Secretariat of Irrigation and Drainage in the Ministry of Agriculture and Livestock (MAG) in Quito; (ii) eligible costs and staffing related to the project in seven decentralized offices of MAG; and, (iii) activities related to Monitoring and Evaluation (M&E), impact evaluations, progress reports, and audits.

Revised Components. The components were revised as follows:

Component 1: The number of sub-projects was reduced twice: (a) from 88 to 63 reflecting the partial loan cancellation of US\$15.00 million (14-Dec-2018 Restructuring); (b) from 63 to 49 reflecting the partial loan cancellation of US\$27.15 million (22-Dec-2022 Restructuring).

Component 2: The 14-Dec-2018 Restructuring included: adding a new subcomponent (2.2) under Component 2 to finance “Agri-environmental Innovations” which financed agricultural inputs, tools, and minor equipment.

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

Project Cost. The total cost of the project at appraisal was estimated to be US\$128.60 million. The actual cost according to the ICR (Data Sheet, page ii) was US\$68.31 million or 53% of the appraisal amount. The difference was due to two partial loan cancellation and a reduction in beneficiaries counterpart funding as explained below. In a further communication on June 17, 2024, the project team explained that the total project cost at appraisal was US\$128.60 million as noted in the ICR Annex 3, whereas the Data Sheet reported the total cost as US\$124.2 million. The difference of US\$4.4 million can be explained as follows: (i) Co-financing from MAG was US\$20.00 million, not US\$16.20 million as in the Data Sheet; and (ii) Local Beneficiaries contribution is US\$8.6 million, not US\$8.0 million as in the Data Sheet.

Financing. The project used an Investment Project Financing (IPF) as its financing instrument with an IBRD Loan of US\$80 million. The Spanish Agency for International Development Cooperation (AECID) provided a US\$20.00 million co-financing credit. Total financing was US\$100.00 million. The actual amounts disbursed were US\$34.91 million (43% of the estimated loan amount) and US\$9.20 million (46% of the estimated co-financed loan amount) for the IBRD and AECID Loans, respectively. Total disbursed loan amount (for IBRD and AECID) was US\$44.11 million or 44% of the original estimated loan amount. The December 2018 Restructuring included a US\$15.00 million partial loan cancellation, reducing the IBRD loan amount to US\$65.00 million. Also, the December 2022 Restructuring included a US\$27.15 million partial loan cancellation, reducing the loan amount to US\$37.85 million (or 47% of the original loan amount). At closing, an amount of US\$2.95 million remained undisbursed and US\$5.30 million was undocumented (ICR, paragraph 18).

Borrower Contribution. The Borrower's Ministry of Agriculture and Livestock (MAG) was expected to provide US\$20.00 million as counterpart funding. Also, in-kind contributions from Beneficiaries were estimated at US\$8.6 million. Total counterpart funding was US\$28.60 million. The actual amounts of the contributions of MAG and Beneficiaries were US\$6.40 million and US\$3.90 million, respectively (ICR, annex 3, page 41).

Dates. The project was approved on July 15, 2015, and became effective five months later on December 16, 2015. The Mid-Term Review (MTR) was conducted on October 1, 2018, about two years and nine months after effectiveness. The PAD did not specify a date for the MTR, but this Review finds that it was timely conducted respective to the original closing date on June 30, 2021. The project closed on December



31, 2023 which was 30 months beyond the original closing date. The project closing date was extended three times as noted below, according to the ICR (paragraph 19) "the extensions were needed to accommodate the completion of activities under execution."

The project was restructured five times, all Level 2 Restructuring as follows:

1. On December 14, 2018, when the amount disbursed was US\$8.86 million, in order to: revise the Results Framework (RF), change in components and their cost, partial cancellation of US\$15.00 million of the IBRD Loan, reallocate funds between disbursement categories, and change in institutional arrangements.
2. On March 16 2020, when the amount disbursed was US\$13.12 million, in order to: change disbursement arrangements.
3. On March 1, 2021, when the amount disbursed was US\$19.86 million, in order to: extend the Loan closing date by six months from June 30, 2021 to December, 31, 2021.
4. On November 25, 2021, when the amount disbursed was US\$24.32 million, in order to: extend the Loan closing date by twelve months from December, 31, 2021 to December 31, 2022.
5. On December 22, 2022, when the amount disbursed was US\$30.43 million, in order to: extend the Loan closing date by twelve months from December 31, 2022 to December 31, 2023, revise the RF, change components and their cost, partial cancellation of US\$27.15 million of the IBRD Loan, and reallocate funds between disbursement categories.

A split rating will be applied to assess the overall outcome of the project because the PDO outcome indicator was revised downwards twice, first in 2018 and second in 2022.

3. Relevance of Objectives

Rationale

Context at Appraisal. The agricultural sector accounted for 9.4% of the GDP in 2013. Ecuador had 1.1 million agricultural households (small and medium producers with land size between 1 hectare and 20 hectares), those together owned about 1.6 million ha (25% of total agricultural area). This segment of farmers was crucial for many value chains such as rice (49% of national production), potatoes (64%), maize (76%) and onions (80%). However, the development of this segment was limited by small farm size, lack of access to markets and inefficient water management in agriculture. Out of 338,000 ha irrigated by small and medium producers, 315,000 ha (93%) were still under traditional irrigation methods with very low application efficiency and limited water storage capacity. Also, access to modern techniques of irrigation of small and medium producers was notably below the national average. The project aimed to support the agricultural sector to enhance incomes of small and medium sized farm households by financing more productive and climate-smart use of land and water.

Previous Bank Experience. The World Bank has a wide global experience in supporting agriculture/irrigation projects. This project benefited from the experience and lessons of the Chimborazo Development Investment Project (P094784, US\$15 million, closed in June 2014). This operation was the



first subnational loan financed by the World Bank in Ecuador. The experience of the Chimborazo project emphasized the need to: (i) combine physical investments with capacity building activities; (ii) frontload technical assistance and train institutional stakeholders; and (iii) build beneficiary ownership by following a demand-driven and participatory approach with the Irrigation Association (IAs) participating in subproject design, financing, execution and supervision while taking on full responsibility for Operation and Maintenance (O&M). This project also adopted the sub-project cycle developed under the Chimborazo project, including effective participation of beneficiaries from the design phase to the construction. Overall, the Bank with its global experience combined with the lessons learnt under the Chimborazo project was in a good position to guide the implementation of this project.

Consistency with the Bank Strategies. At project appraisal, the PDO was in line with World Bank Group's (WBG) Interim Strategy Note for Ecuador (ISN, 2013). The ISN identified agriculture and rural development as key priorities for the Government and the Bank to contribute to the country's goal for inclusive and sustainable growth. Specifically, the project would contribute to the ISN's main strategic areas: (i) Pillar I- Sustainable and Inclusive Growth and; (ii) Pillar II - Access to Social Protection and Quality Services for All, which focused on investment project financing.

At completion, the PDO continued to be in line with the WBG's Country Partnership Framework for Ecuador (CPF, FY2019 – FY2023). Specifically, the project contributed to the CPF's Objective 7: To Improve Resilience to Disaster Risks and Climate Change, since the project supported the shift to climate-smart use of land and water among small and medium-sized agricultural households, and contributed to reductions in greenhouse gas emissions. The project also supported accessing productive opportunities in targeted regions of the country and to reducing rural poverty, especially among indigenous communities and women. Finally, the project was expected to contribute to the WBG goals of reducing extreme poverty and increasing shared prosperity by increasing agricultural revenues and resilience of Ecuador's family farming sector, through promoting diversification and increase of agricultural production, and improving access to markets for smallholders and their organizations

Consistency with the Government Strategies/Priorities. At project appraisal, the PDO was in line with Government of Ecuador's National Good Living Plan (2013-2017). The plan featured twelve key objectives, five of which outlined the importance of enhancing the productive water access in a sustainable manner as key intermediate priorities to ensure quality of life and social cohesion for its farmers and rural communities. Further, the PDO was in line with the Ministry of Agriculture, Livestock, Aquaculture and Fisheries' institutional objectives which included: improving the lives of farmers and rural communities; and promoting the modernization of agriculture.

At project completion, the PDO continued to be in line with Government of Ecuador's National Good Living Plan (2013-2017) which included five objectives: production diversification and economic security; universal access to superior assets; social equity; social diversification; and sustainability. The PDO was also in line with National Development Plan (2017-2021) which included improvement of environmental sustainability and increasing resilience to disaster risks as key objectives. Finally, the PDO continued to be in line with the Government of Ecuador's National Climate Change Strategy (2012-2025) which established mitigation and adaptation parameters for sector plans and promotes improved use of water resources.

Summary of Relevance of Objectives. The PDO statement was clear, focused, but pitched at an ambitious level given the extended coverage of the project. At completion, the PDO continued to be in line



with the Bank Strategy and the Government Priorities as discussed above. Therefore, Relevance of Objectives is rated High.

Rating

High

4. Achievement of Objectives (Efficacy)

OBJECTIVE 1

Objective

To enhance incomes of small and medium sized farm households.

Rationale

Theory of Change (ToC). To achieve the stated objective, the project supported the following activities:

1. Finance investments for climate-smart sub-projects: this included productive investments in individual and/or collective water storage (ponds); and improvements in agricultural practices and water and soil management. This was expected to improve irrigation water availability, reduce water losses, improve maintenance of irrigation systems, introduce more efficient irrigation methods, and improve crop management.
2. Providing capacity building activities for institutional and beneficiaries' organizations including short term technical assistance and training; and strengthening organizational and business capacities of producer groups, communities and small producer organizations; and fostering smallholder linkages to markets in the mid-term. This was expected to optimize the operation, administration, and productive use of the off- and on-farm irrigation systems and water ponds that improved or built under by the project. Also, fostering linkages to markets would improve marketing of products and potentially provide farmers with better opportunities to market their produce.

The expected outputs of the above-stated activities included: the area provided with irrigation and drainage services (new and improved); trained water users and technical staff (operational water user associations created or strengthened); number of clients who adopted an improved agricultural technology; percentage of cultivated area divided in total arable land; sub-projects with post-project community engagement or O&M arrangements; number of client days of training provided; and Beneficiaries' organizations receiving support from another MAGADP or the Autonomous Decentralized Provincial Governments (GADP) project or program.

The expected outcomes resulting of the above-mentioned activities and outputs were: annual net income on benefitted area increased; and water users provided with new or improved irrigation and drainage



services. The anticipated outcome was enhanced income of small and medium sized farm households supported by a more productive and climate-smart use of land and water.

The achievement of the PDO was underpinned by the following critical assumptions: 1. The demand for sub-projects materializes among beneficiaries; 2. Synchronized implementation of sub-project activities; 3. Effective and coordinated implementation of the project and other MAG's programs supporting agricultural development is achieved.

Overall, the activities stated in the ToC were directly connected to the outputs and outcomes in a plausible causal chain.

Outputs/Intermediate Results

- 6,328 ha were provided with irrigation and drainage services which was below the original target of 12,400 ha (target not achieved).
- 136.80 ha were provided with new irrigation and drainage services which was below the original target of 3,720 ha (target not achieved).
- 6,191 ha were provided with improved irrigation and drainage services which was below the original target of 8,680 ha (target substantially achieved). Improvements of existing systems included: Individual and collective small water storage (ponds); on-farm investments for modernization of irrigation techniques (drip, sprinklers, or modern gravity techniques); complementary works aiming at improving off-farm irrigation and drainage networks.
- 4,840 clients adopted an improved agricultural technology promoted by the project exceeding the original target of 4,245. Examples of such technologies included: improved soil management; improved crop or livestock management; improved application and handling of crop protection agents and/or fertilizers, and agrochemicals, and/or use of different types; and improved post-harvest practices (target exceeded).
- 1,955 female clients adopted an improved agricultural technology promoted by the project exceeding the original target of 850 (target exceeded).
- By project completion land use intensity increased by 21.6% exceeding the original target of 15%. Baseline was zero. This indicator was defined as the increase in the land used for agricultural production within a given year in the area benefiting from sub-project irrigation investments. Its measurement accounted for multiple cropping of a given piece of land within the same year (target exceeded). According to the ICR (paragraph 30) "cultivation of short-cycle crops such as vegetables increased from only one harvest to 2 or 3 harvests/year, further helped by technical assistance promoting crop rotation to reduce pest and disease pressure; one extra harvest (dry season) for rice, potato, and maize; intercropping of tree crops (coffee, cacao) with watermelon, maize, and pineapple."
- 89.80% of the sub-projects had post-project community engagement or O&M arrangements which almost fully achieved the original target of 90%.
- 44 sub-projects were expected to have a mechanism for post-completion operation which was below the original target of 59 (target not achieved).
- 49 water user associations were created and/or strengthened which was below the original target of 88 (target not achieved).
- 49 beneficiaries' organizations received support from another MAG's or GAD's Project or Program which was below the original target of 59 (target not achieved).



- 43,172 client days of training were provided which was below the original target of 63,000 (target not achieved).
- 17,860 client days of training were provided for females exceeding the original target of 12,600 (target exceeded).
- 1,540 training days were provided to MAG's or GAD's staff which was below the original target of 1,920 (target not achieved).

Outcomes

- By project completion 6,014 water users including 2,309 females were provided with new/improved irrigation and drainage services which was below the original target of 14,150 (PDO outcome indicator #1). Also, the average annual net income per ha on area benefited by the project reached US\$409.69 compared to a baseline of US\$277.10, while this represented an increase of 47% from baseline, it substantially achieved 92.2% of the original target increase set at 60% from baseline (US\$443) (PDO outcome indicator #2). The indicator value reflected the net income by hectare, defined as the sum of all net revenues divided by the total area monitored.
- While the full sub-project cycle was completed for 26 sub-projects (i.e., construction of improved irrigation infrastructure, execution of technical assistance, and delivery of agri-innovation package), the cycle was not completed for 22 sub-projects (2,338 beneficiaries). For those not completed, agricultural inputs were not delivered due to procurement issues. Also, the project closed with some pending minor works remaining in six sub-projects (ICR, paragraph 32).

Notable project achievements (as reported by the ICR -paragraph 30) not directly captured by the Results Framework included:

- Climate-smart agriculture and increased food availability. Before the investments in irrigation modernization agricultural activities were limited to the rainy season, modern irrigation systems allowed dry season production, thus accessing better prices. Continuous and timely availability of water in the quantities required increased the productivity of long cycle crops (e.g., cacao, banana, oranges) while allowing additional cycles of short duration crops (e.g., vegetables such as green onions, peppers, tomato etc.). Improved irrigation also contributed to an increases in crop and livestock productivity as a result of improved irrigation. For example: milk yields increased from 6 to 10-15 liters/day/cow since modernized irrigation; cacao yields increased from 30 to 40 quintals/hectare and benefited from training, fruit pruning and fertilizers; rice yields increased from 37 to 50 bags per hectare helped by land leveling and drainage improvements.
- Farmer well-being. The project activities contributed to an improvement in daily life of farmers: evidence easier and faster maintenance of the new irrigation systems compared to the maintenance of the old systems, which was more labor intensive and often required frequent repairs, reconstruction of earth canals and water intakes. Also, operating the modernized system also no longer requires long early morning walks which makes a major difference to the safety and workload of female beneficiaries.
- Social fabric and community strengthening. The project contributed to increased crop diversification (e.g., Lupin beans and nutritive forage crops such as lucerne) and the use of improved varieties of potatoes and maize have become increasingly common. In highland communities, some farmers have on their own initiative invested in adjusting their modernized irrigation systems (e.g., transition from sprinkler to drip) and greenhouse construction (e.g., to produce roses for export); these investments indicated substantial knowledge regarding irrigation system management requirements and



awareness of improved market access. IAs were strengthened and all of them reported having a tariff system in place.

Summary of Efficacy Assessment. To enhance incomes of small and medium sized farm households, the project strengthened and scaled up the sustainable modernization and intensification of agriculture with a focus on small and medium-sized farms. It leveraged improvements in agricultural practices and water and soil management by modernizing traditional irrigation systems. The project achieved 42.5% of the target for the first PDO outcome indicator, and about 92.2% of its target for PDO outcome indicator 2 as noted above. Also, the project did not achieve its targets for six intermediate results indicators. Finally there were shortcomings in the completion of sub-projects where the full cycle was not completed for 22 sub-projects.

Therefore, the efficacy with which this objective was achieved is rated Modest.

Rating

Modest

OBJECTIVE 1 REVISION 1

Revised Objective

To enhance incomes of small and medium sized farm households.

Revised Rationale

Theory of Change (ToC). The PDO not revised and the same ToC under objective 1 still applies. The target for PDO outcome indicator 1 was revised down from 14,150 to 9,000 families benefiting from the project. Among the Intermediate Result Indicators, several targets were adjusted including the target for area provided with irrigation services was reduced from 12,400 ha to 10,500 ha. Similarly, the target for number of sub-projects and Water Users Associations benefitted by the project has been adjusted downward from 88 to 63. Also, two new indicators were included to reflect the addition of the new subcomponent "Productive and Environmental Innovations": (i) Number of organizations implementing process of value addition, and (ii) Percentage of beneficiaries who attended at least 70% of the training on business management for association.

Outputs/Intermediate Results

- 6,238 ha were provided with irrigation and drainage services which was below the revised target of 10,500 ha (target not achieved).
- 136.80 ha were provided with new irrigation and drainage services which was below the revised target of 200 ha (target not achieved).
- 6,191 ha were provided with improved irrigation and drainage services which was below the revised target of 10,500 ha (target not achieved). Improvements of existing systems included: Individual and collective small water storage (ponds); on-farm investments for modernization of irrigation techniques (drip, sprinklers, or modern gravity techniques); complementary works aiming at improving off-farm irrigation and drainage networks.
- 4,840 client adopted an improved agricultural technology promoted by the project exceeding the revised target of 2,700. Examples of such technologies included: improved soil management;



improved crop or livestock management; improved application and handling of crop protection agents and/or fertilizers, and agrochemicals, and/or use of different types; and improved post-harvest practices (target exceeded).

- 1,955 female clients adopted an improved agricultural technology promoted by the project exceeding the revised target of 540 (target exceeded).
- By project completion land use intensity increased by 21.6% exceeding the original target of 15%. Baseline was zero. This indicator was defined as the increase in the land used for agricultural production within a given year in the area benefiting from sub-project irrigation investments. Its measurement accounted for multiple cropping of a given piece of land within the same year (target exceeded). According to the ICR (paragraph 30) "Cultivation of short-cycle crops such as vegetables increased from only one harvest to 2 or 3 harvests/year, further helped by technical assistance promoting crop rotation to reduce pest and disease pressure; one extra harvest (dry season) for rice, potato, and maize; intercropping of tree crops (coffee, cacao) with watermelon, maize, and pineapple."
- 89.80% of the sub-projects had post-project community engagement or O&M arrangements which almost fully achieved the original target of 90%.
- 44 sub-projects were expected to have a mechanism for post-completion operation which was below the revised target of 57 (target not achieved).
- 49 water user associations were created and/or strengthened which was below the revised target of 63 (target not achieved).
- 49 beneficiaries' organizations received support from another MAG's or GAD's Project or Program which substantially achieved the revised target of 50 (target substantially achieved).
- 43,172 client days of training were provided which substantially achieved the revised target of 45,000 (target substantially achieved).
- 17,860 client days of training were provided for females exceeding the revised target of 9,000 (target exceeded).
- 42 organizations were implementing process of value addition exceeding the original target of 20, baseline was none (target exceeded).
- 92.64% of beneficiaries attended at least 70% of the training on business management for organizations exceeding the original target of 80% (target exceeded).
- 1,540 training days were provided to MAG's or GAD's staff which was below the original target of 1,920 (target not achieved).

Outcomes

- By project completion 6,014 water users including 2,309 females were provided with new/improved irrigation and drainage services which was below the revised target of 9,000, but exceeded the revised target of 1,800 for females (PDO outcome indicators #1). Also, the average annual net income per ha on area benefited by the project reached US\$409.69 which exceeded the baseline of US\$277.10, and substantially achieved original target of US\$443 per ha (PDO outcome indicator #2). The indicator value reflected the net income by hectare, defined as the sum of all net revenues divided by the total area monitored.
- While the full sub-project cycle was completed for 26 sub-projects (i.e., construction of improved irrigation infrastructure, execution of technical assistance, and delivery of agri-innovation package), the cycle was not completed for 22 sub-projects (2,338 beneficiaries). For those not



completed, agricultural inputs were not delivered due to procurement issues. Also, the project closed with some pending minor works remaining in six sub-projects (ICR, paragraph 32).

Notable project achievements (as reported by the ICR -paragraph 30) not directly captured by the Results Framework included:

- **Climate-smart agriculture and increased food availability.** Before the investments in irrigation modernization agricultural activities were limited to the rainy season, modern irrigation systems allowed dry season production, thus accessing better prices. Continuous and timely availability of water in the quantities required increased the productivity of long cycle crops (e.g., cacao, banana, oranges) while allowing additional cycles of short duration crops (e.g., vegetables such as green onions, peppers, tomato etc.). Improved irrigation also contributed to an increases in crop and livestock productivity as a result of improved irrigation. For example: milk yields increased from 6 to 10-15 liters/day/cow since modernized irrigation; cacao yields increased from 30 to 40 quintals/hectare and benefited from training, fruit pruning and fertilizers; rice yields increased from 37 to 50 bags per hectare helped by land leveling and drainage improvements.
- **Farmer well-being.** The project activities contributed to an improvement in daily life of farmers: evidence easier and faster maintenance of the new irrigation systems compared to the maintenance of the old systems, which was more labor intensive and often required frequent repairs, reconstruction of earth canals and water intakes. Also, operating the modernized system also no longer requires long early morning walks which makes a major difference to the safety and workload of female beneficiaries.
- **Social fabric and community strengthening.** The project contributed to increased crop diversification (e.g., Lupin beans and nutritive forage crops such as lucerne) and the use of improved varieties of potatoes and maize have become increasingly common. In highland communities, some farmers have on their own initiative invested in adjusting their modernized irrigation systems (e.g., transition from sprinkler to drip) and greenhouse construction (e.g., to produce roses for export); these investments indicated substantial knowledge regarding irrigation system management requirements and awareness of improved market access. IAs were strengthened and all of them reported having a tariff system in place.

Summary of Efficacy Assessment. To enhance incomes of small and medium sized farm households, the project strengthened and scaled up the sustainable modernization and intensification of agriculture with a focus on small and medium-sized farms. It leveraged improvements in agricultural practices and water and soil management by modernizing traditional irrigation systems. The project achieved 66.8% of the target for the first PDO outcome indicator, and about 92.2% of its target for PDO outcome indicator 2 as noted above. The project also substantially achieved its targets for six intermediate results indicators and exceeded it for several others. Finally, there were shortcomings in the completion of the full cycle for 22 sub-projects.

Therefore, the efficacy with which this objective was achieved is rated Substantial with moderate shortcomings.

Revised Rating
Substantial



OBJECTIVE 1 REVISION 2

Revised Objective

To enhance incomes of small and medium sized farm households.

Revised Rationale

Theory of Change (ToC). The PDO was not revised and the same ToC under objective 1 still applies. The target for PDO outcome indicator 1 was revised down from 9,000 to 6,014 families including 1,203 females benefiting from the project. Among the Intermediate Result Indicators, several targets were adjusted including the target for area provided with irrigation services was reduced from 10,500 ha to 6,328.61 ha. Similarly, the target for number of sub-projects and Water Users Associations benefitted by the project was adjusted downward from 63 to 49.

Outputs/Intermediate Results

- 6,238 ha were provided with irrigation and drainage services which almost achieved revised target of 6,329 ha (target achieved).
- 136.80 ha were provided with new irrigation and drainage services fully achieved the revised target of 136.8 ha (target fully achieved).
- 6,191 ha were provided with improved irrigation and drainage services which fully achieved the revised target of 6,191.8 ha (target fully achieved). Improvements of existing systems included: Individual and collective small water storage (ponds); on-farm investments for modernization of irrigation techniques (drip, sprinklers, or modern gravity techniques); complementary works aiming at improving off-farm irrigation and drainage networks.
- 4,840 client adopted an improved agricultural technology promoted by the project exceeding the revised target of 2,700. Examples of such technologies included: improved soil management; improved crop or livestock management; improved application and handling of crop protection agents and/or fertilizers, and agrochemicals, and/or use of different types; and improved post-harvest practices (target exceeded).
- 1,955 female clients adopted an improved agricultural technology promoted by the project exceeding the revised target of 540 (target exceeded).
- By project completion land use intensity increased by 21.6% exceeding the original target of 15%. However, no baseline was provided. This indicator was defined as the increase in the land used for agricultural production within a given year in the area benefiting from sub-project irrigation investments. Its measurement accounted for multiple cropping of a given piece of land within the same year (target exceeded). According to the ICR (paragraph 30) "Cultivation of short-cycle crops such as vegetables increased from only one harvest to 2 or 3 harvests/year, further helped by technical assistance promoting crop rotation to reduce pest and disease pressure; one extra harvest (dry season) for rice, potato, and maize; intercropping of tree crops (coffee, cacao) with watermelon, maize, and pineapple."
- 89.80% of the sub-projects had post-project community engagement or O&M arrangements which almost fully achieved the original target of 90%.
- 44 sub-projects were expected to have a mechanism for post-completion operation which substantially achieved the revised target of 45 (target substantially achieved).
- 49 water user associations were created and/or strengthened which fully achieved the revised target of 49 (target fully achieved).



- 49 beneficiaries' organizations received support from another MAG's or GAD's Project or Program which substantially achieved the revised target of 50 (target substantially achieved).
- 43,172 client days of training were provided which substantially achieved the revised target of 45,000 (target substantially achieved).
- 17,860 client days of training were provided for females exceeding the revised target of 9,000 (target exceeded).
- 42 organizations were implementing process of value addition exceeding the original target of 20, baseline was none (target exceeded).
- 92.64% of beneficiaries attended at least 70% of the training on business management for organizations exceeding the original target of 80% (target exceeded).
- 1,540 training days were provided to MAG's or GAD's staff which was below the original target of 1,920 (target not achieved).

Outcomes

- By project completion 6,014 water users including 2,309 females were provided with new/improved irrigation and drainage services which fully achieved the revised target of 6,014 and exceeded the revised target of 1,203 females (PDO outcome indicators #1). Also, the average annual net income per ha on area benefited by the project reached US\$409.69 compared to a baseline of US\$277.10 and substantially achieving the revised target of US\$443.36 (PDO outcome indicator #2). The indicator value reflected the net income by hectare, defined as the sum of all net revenues divided by the total area monitored.
- While the full sub-project cycle was completed for 26 sub-projects (i.e., construction of improved irrigation infrastructure, execution of technical assistance, and delivery of agri-innovation package), the cycle was not completed for 22 sub-projects (2,338 beneficiaries). For those not completed, agricultural inputs were not delivered due to procurement issues. Also, the project closed with some pending minor works remaining in six sub-projects (ICR, paragraph 32).

Notable project achievements (as reported by the ICR -paragraph 30) not directly captured by the Results Framework included:

- Climate-smart agriculture and increased food availability. Before the investments in irrigation modernization agricultural activities were limited to the rainy season, modern irrigation systems allowed dry season production, thus accessing better prices. Continuous and timely availability of water in the quantities required increased the productivity of long cycle crops (e.g., cacao, banana, oranges) while allowing additional cycles of short duration crops (e.g., vegetables such as green onions, peppers, tomato etc.). Improved irrigation also contributed to an increases in crop and livestock productivity as a result of improved irrigation. For example: milk yields increased from 6 to 10-15 liters/day/cow since modernized irrigation; cacao yields increased from 30 to 40 quintals/hectare and benefited from training, fruit pruning and fertilizers; rice yields increased from 37 to 50 bags per hectare helped by land leveling and drainage improvements.
- Farmer well-being. The project activities contributed to an improvement in daily life of farmers: evidence easier and faster maintenance of the new irrigation systems compared to the maintenance of the old systems, which was more labor intensive and often required frequent repairs, reconstruction of earth canals and water intakes. Also, operating the modernized system also no longer requires long



early morning walks which makes a major difference to the safety and workload of female beneficiaries.

- Social fabric and community strengthening. The project contributed to increased crop diversification (e.g., Lupin beans and nutritive forage crops such as lucerne) and the use of improved varieties of potatoes and maize have become increasingly common. In highland communities, some farmers have on their own initiative invested in adjusting their modernized irrigation systems (e.g., transition from sprinkler to drip) and greenhouse construction (e.g., to produce roses for export); these investments indicated substantial knowledge regarding irrigation system management requirements and awareness of improved market access. IAs were strengthened and all of them reported having a tariff system in place.

Summary of Efficacy Assessment. To enhance incomes of small and medium sized farm households, the project strengthened and scaled up the sustainable modernization and intensification of agriculture with a focus on small and medium-sized farms. It leveraged improvements in agricultural practices and water and soil management by modernizing traditional irrigation systems. The project fully achieved its revised target for PDO outcome indicator #1, and substantially achieved its revised target for PDO outcome indicator #2 with an achievement rate of 92.4%. Also, the project achieved most of its targets the intermediate results indicators. However, there were shortcomings in the completion of the full cycle for 22 sub-projects.

Therefore, the efficacy with which this objective was achieved is rated Substantial with moderate shortcomings.

Revised Rating
Substantial

OVERALL EFFICACY

Rationale

Overall efficacy against the original targets is rated Modest. The project achieved 42.5% of its target for the first PDO outcome indicator, and about 92.4% of its target for PDO outcome indicator 2. Also, the project did not achieve its targets for six intermediate results indicators. Finally there were shortcomings in the completion of sub-projects where the full cycle was not completed for 22 sub-projects.

Overall Efficacy Rating
Modest

Primary Reason
Low achievement

OVERALL EFFICACY REVISION 1

Overall Efficacy Revision 1 Rationale

Overall efficacy against revised targets 1 is rated Substantial with moderate shortcomings. The project achieved 66.8% of its target for the first PDO outcome indicator, and about 92.4% of its target for PDO outcome indicator 2. The project also substantially achieved its targets for six intermediate results indicators



and exceeded it for several others. Finally, there were shortcomings in the completion of the full cycle for 22 sub-projects.

Overall Efficacy Revision 1 Rating

Substantial

OVERALL EFFICACY REVISION 2

Overall Efficacy Revision 2 Rationale

Overall efficacy against revised targets 2 is rated Substantial with moderate shortcomings. The project fully achieved its revised target for PDO outcome indicator #1, and substantially achieved its revised target for PDO outcome indicator #2 with an achievement rate of 92.4%. Also, the project achieved most of its targets for the intermediate results indicators. However, there were shortcomings in the completion of the full cycle for 22 sub-projects.

Overall Efficacy Revision 2 Rating

Substantial

5. Efficiency

Economic and Financial Analysis (EFA)

ex-ante

- The EFA at appraisal estimated the overall Economic Internal Rate of Return (EIRR) of the whole project at 31% with an Economic Net Present Value (ENPV) for a total investment of US\$ 129.1 million, and the Financial Internal Rate of Return (FIRR) at 19% with a Financial Net Present Value (FNPV) for a total investment of US\$ 129.1 million. These estimates were based on an evaluation period of 10 years and an annual real discount rate or Opportunity Cost of Capital (OCC) of 12%.
- The project benefits were expected to result from an increase of beneficiaries' annual agricultural production value and of agricultural revenues generated by investments on irrigation infrastructure rehabilitation, on-farm irrigation technology improvement; water storage subprojects and the related activities of training and technical assistance.
- The Economic Internal Rate of Return (EIRR) of the nine most promising sub-projects ranged: from 21 to 56% with an average of 41% when the economic life of irrigation investments was assumed to be 5 years; and from 26 to 58% with an average of 44%, when such an economic life was 10 years. The FIRR of the nine most promising sub-projects ranged: from 10 to 38% with an average of 26%, when the economic life of irrigation investments was assumed to be 5 years; and from 16 to 40% with an average of 31%, when such an economic life was 10 years.



- The PAD EFA drew on the conclusions of the Bank-funded Chimborazo Productive Development Investment Project (PIDD) as well as on a feasibility study of the national irrigation program for small and medium-scale family farming conducted by the sub-Secretariat for Irrigation of the Ministry of Agriculture.

ex-post

- The EFA at completion showed that with an investment horizon of 20 years, the economic and financial analyses of sub-projects suggested an economic internal rate of return (EIRR) of 12.35% and a financial internal rate of return (FIRR) of 14.23%. These results reflected a modest outlook on financial and economic profitability than estimated at project appraisal - when an economic IRR of 31% and a financial IRR of 22% under equivalent assumptions regarding time horizon and discount rates were estimated.
- The EFA at completion was undertaken using data collected through the project’s monitoring and evaluation (M&E) system for 10 out of the 49 sub-projects financed by the project.
- Participants in these 10 sub-projects reported a per-hectare net income that increased from US\$515 to US\$1,673 from the baseline. This represented a 3.2-fold increase in income by year 5 of implementation, comparable to the 2.8-fold increase that was estimated in the analysis done at appraisal. However, the ICR (paragraph 35) noted that many sub-projects had high per-hectare and per-beneficiary costs, as well as high variance between them.
- Implementation Efficiency. The project closed 30 months after its original closing date with a total implementation duration of eight years. The project was negatively affected by low budget allocations by MAG which reflected limitations on the authorization to spend due to the lack of liquidity that the Government consistently experienced (ICR, paragraph 36). These budget restrictions resulted in significant implementation delays. The project also had two cancellations of loan proceeds, first in 2018, and later in 2022. In total, 53% of the original loan was cancelled (from US\$80.00 million to US\$37.85 million), and the total number of sub-projects financed by the project was reduced from 88 at appraisal to 49. Finally, the project implementation was also negatively impacted by the outbreak of COVID-19 and the associated restrictions as well as with the frequent high rates of ministerial turnover in MAG.

Summary of Efficiency Assessment. At 12.35%, the *ex-post* EIRR was significantly lower at completion compared to 31% at appraisal. The project also experienced significant implementation delays, cancellation of 53% of the original Loan and a reduction in the sub-projects financed from the originally 88 sub-projects envisioned at appraisal to only 49 at completion. Therefore, Efficiency is rated Modest.

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	✓	31.00	100.00 <input type="checkbox"/> Not Applicable
ICR Estimate	✓	12.35	100.00 <input type="checkbox"/> Not Applicable

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

6. Outcome

Against Original Targets

Relevance of Objectives was rated High. Overall Efficacy was rated Modest. The project achieved 42.5% of its target for PDO outcome indicator #1, and about 85.5% of its target for PDO outcome indicator 2. Also, the project did not achieve its targets for six intermediate results indicators. Finally there were shortcomings in the completion of sub-projects where the full cycle was not completed for 22 sub-projects. Efficiency was rated Modest due to significantly lower EIRR at completion and significant implementation delays.

Based on the assigned ratings for the three Outcome criteria, Outcome is rated Moderately Unsatisfactory.

Against Revised targets (2018 Restructuring).

Relevance of Objectives was rated High. Overall Efficacy was rated Substantial with moderate shortcomings. The project achieved 66.8% of its revised target for PDO outcome indicator #1, and about 85.5% of its original target for PDO outcome indicator 2. The project also substantially achieved its targets for six intermediate results indicators and exceeded it for several others. Finally there were shortcomings in the completion of sub-projects where the full cycle was not completed for 22 sub-projects. Efficiency was rated Modest due to significantly lower EIRR at completion and significant implementation delays.

Based on the assigned ratings for the three Outcome criteria, Outcome is rated Moderately Satisfactory due to moderate shortcomings pertaining to the operation's Efficacy and significant shortcomings pertaining to the operation's Efficiency.

Against Revised targets (2022 Restructuring).

Relevance of Objectives was rated High. Overall Efficacy was rated Substantial with moderate shortcomings. The project fully achieved its revised target for PDO outcome indicator #1, and substantially achieved its revised target for PDO outcome indicator #2 with an achievement rate of 92.4%. Also, the project achieved most of its targets for the intermediate results indicators. However, there were shortcomings in the completion of the full cycle for 22 sub-projects. Efficiency was rated Modest due to significantly lower EIRR at completion and significant implementation delays.

Based on the assigned ratings for the three Outcome criteria, Outcome is rated Moderately Satisfactory due to moderate shortcomings pertaining to the operation's Efficacy and significant shortcomings pertaining to the operation's Efficiency.

Split Rating



	Against Original Targets	Against Revised targets 1	Against Revised targets 2
Relevance of Objectives	High		
Efficacy	Modest	Substantial	Substantial
Efficiency	Modest	Modest	Modest
Outcome rating	Moderately unsatisfactory	Moderately Satisfactory	Moderately Satisfactory
Numerical Value of Outcome ratings	3	4	4
Disbursement	US\$8.8 million	US\$30.43	US\$34.91
Share of Disbursement	25% (0.25)	61.9% (0.61)	13.1% (0.13)
Weighted Value of Outcome	$3 \times 0.25 = 0.75$	$4 \times 0.61 = 2.44$	$4 \times 0.13 = 0.52$
	$0.75+2.44+0.52=3.71$ rounds to 4	$0.75+2.44+0.52=3.71$ rounds to 4	$0.75+2.44+0.52=3.71$ rounds to 4
Final Outcome Rating	Moderately Satisfactory		

Based on the split rating calculation, the final weighted Outcome rating of the project is Moderately Satisfactory.

a. Outcome Rating
Moderately Satisfactory

7. Risk to Development Outcome

The following risks could potentially impact the Development Outcome:

1. Technical risk. The beneficiaries demonstrated that they highly value the modernized irrigation systems. Also, field visits to project area showed that some beneficiaries contributed additional investments to better synchronize the systems with their agricultural production mix and schedule. This aimed to maximize the advantages of a more efficient water supply brought about by the modernized systems.

2. Institutional risk. The Farmer Organizations (FOs) in Ecuador have a long experience in the management of irrigation systems and are deeply embedded in the beneficiaries' culture (especially in the highland areas where the presence of indigenous peoples is significant). This strength allows the FOs to pursue solutions to address challenges in the systems' operation and maintenance needs, taking into account alternatives for institutional or technical support. The FOs are also familiar with the beneficiaries'



cultural issues particularly with respect to the payment of tariffs and in-kind contributions (mainly labor) to maintain the systems.

The following risk is emphasized by IEG:

3. Political risk. Ecuador has been experiencing political instability and heightened insecurity. This situation could undermine the gains achieved under the project. Also, further deterioration in security could result in the suspension of future operations in the country by the WBG and other International Development Partners.

8. Assessment of Bank Performance

a. Quality-at-Entry

- **Strategic relevance and approach.** The project was strategically relevant and in line with the Government priorities. The PDO was also in line with the Bank strategies (see Section 3 for details). Increasing irrigation efficiency was vital to maximize the use of available water resources and increase agricultural production in Ecuador. The proposed project was expected to coordinate with three large MAG programs. These included: (i) the Strategy Hombro a Hombro (Shoulder to Shoulder), which invested US\$30 million per year in agricultural extension services; (ii) the Buen Vivir Rural Program (Rural Living Well Program), supporting 41,000 small family farmers; and the Technological Innovation Program investing US\$417 million in support to family farming.
- **Technical, financial and economic aspects.** While the project design featured a clear and focused PDO, the PDO statement did not reflect several important areas under the project (see section 3). The project featured an ambitious design that targeted a vast project area spanning 17 provinces under a difficult operational environment and capacity limitations. The project design financed the modernization of on-farm irrigation systems, and technical assistance focused mainly on the operation of these irrigation systems and overall productivity enhancement. This was to be complemented with government programs government programs to support agricultural productivity and environmental safeguards. However, the government was not able to deliver the activities planned, which negatively impacted the implementation of the project activities and investments. Also, the sub-projects implementation approach was cumbersome, with 18 steps and engaged too many stakeholders at each level (i.e. central, provincial and local levels), resulting in an excessive number of revisions and approvals (ICR, paragraph 49). Also, there was insufficient coordination between sub-project activities and the agricultural production cycle, resulting in conflicts between the activities and the beneficiaries' agricultural calendars (ICR, paragraph 49). The economic and financial analysis in the PAD could have benefited from more details. Overall, design was complex and its implementation proved more challenging than anticipated.
- **Poverty, gender, and social development aspects.** The project directly benefited medium and small farmers who were amongst the poorest and most vulnerable populations in Ecuador. The project's investments in modern irrigation systems, including on-farm investments, brought direct benefits to beneficiary families' living conditions while increasing crop and livestock yields and household incomes. While the project the financed the preparation of a Gender Strategy, its implementation suffered from frequent personnel changes and lack of specialists at the PIU (ICR,



paragraph 38). Women benefited from the modernized irrigation systems financed by the project, since the modernized systems required less time and labor to operate, hence freeing up women's time for other household tasks.

- **Environmental and Fiduciary aspects.** While environmental aspects of the project were adequate, the high turnover in the PIU negatively affected the project's environmental and social safeguards management capacity and consequently undermining compliance. Financial management and procurement proved challenging. The transfer of procurement and financial management responsibilities to the deconcentrated offices as initially planned did not materialize.
- **Implementation arrangements.** Implementation arrangements were complex involving multiple institutions against the background of limited institutional capacity. Implementation responsibility was shared between the national and the 17 provincial governments and involved a PIU, two central coordination committees, provincial technical roundtables and separate committees for each sub-project. The functioning of the different committees was poor, and coordination with GADs and their technical teams remained challenging.
- **Risk assessment.** The project's overall risk rating at appraisal was Substantial. Identified risks related to: (i) the decentralized nature of the project; (ii) significant participation of GADs; (iii) lack of experience in MAG with World Bank's fiduciary procedures, particularly in view of the foreseen decentralization of selected procurement and financial management (FM) activities; and (iv) insecure land tenure ownership. While Land tenure risk was identified as a major risk during preparation, the ICR (paragraph 50) noted that it was not mentioned in the implementation records of the project. The risk related to the complex institutional environment materialized and contributed to implementation delays and inefficiencies indicating that mitigation measures did not work as expected. Also, the risk related to fiscal situation of the Government was not identified at appraisal. This risk materialized and the project experienced serious liquidity challenges throughout all Government institutions, which proved to be a major implementation constraint.
- **M&E arrangements.** There were significant shortcomings in the M&E system and its implementation (see Section 9 a & b for details).

Summary of QAE Assessment. The project was strategically relevant. Design was complex with an extended project area. The sub-projects implementation approach was cumbersome and resulted in delays. Environmental aspects were adequate, but fiduciary experienced challenges. The complex implementation arrangements were not adequate in an environment of weak institutional capacity. The risk related to the tight fiscal situation of the government was not identified at appraisal, and the risk related to the failure of the government to implement complimentary activities was also overlooked. M&E arrangements had significant shortcomings in the design of the M&E system and its implementation. Overall, Quality at Entry is rated Moderately Satisfactory due to moderate shortcomings pertaining to technical aspects, implementation arrangements, risk identification, M&E arrangements.

Quality-at-Entry Rating
Moderately Satisfactory

b. Quality of supervision

- This project had an ambitious design that covered a vast geographic area in an environment with limited implementation capacity. The Bank carried out a total of 18 supervision missions



(Implementation Support Missions, ISMs, two of which were virtual missions) and included the participation of the co-financier (AECID). The project was led by three Task Team Leaders from preparation through closing. The Bank provided responsive supervision, collaborated with the client and co-financier and proactivity followed up the severe budget constraints that affected the project during most of the implementation period.

- The Bank supervision supported the government team to develop the required technical specifications to implement the sub-projects and carry out procurement of consultancies and works. However, the Bank supervision team could not prevent implementation speed from slowing down, as a consequence of the country's continuous severe fiscal constraints combined with continuous changes in the PIU team and MAG management.
- The PIU benefited from the Bank's continuous engagement to provide technical advice to the PIU-given its limited technical capacity. The Bank also collaborated with the client and co-financier and proactivity followed the severe budget constraints that affected the project during most of the implementation.
- The Bank supervision proactively restructured the project to adapt to new conditions on the ground, and to readjust activities with the partial cancellation of loan proceeds. The Bank team also guided the PIU regarding completion of all required fiduciary elements through the end of the grace period. The Bank worked to ensure the completion of pending activities at the closing date, including minor works in six sub-projects, resolving a number of outstanding complaints, and addressing the requirements of the Safeguards Action Plan.
- However, the Bank supervision "was less successful in ensuring the social safeguards policies were complied with (ICR. paragraph 67)". Specifically to ensure that social safeguards information was regularly reported in the project records, and that the social safeguards instruments were consistently prepared, consulted and disclosed.

Summary of Quality of Supervision Assessment. The Bank supervision faced several challenges most notable were the severe fiscal constraints combined with continuous changes in the PIU team and MAG management, and limited implementation capacity. To the extent possible, the Bank provided support to the client to overcome implementation challenges including restructuring the project five times. However, Bank supervision could have closely followed safeguards performance to ensure reporting and compliance. Overall, the Quality of Bank Supervision is rated Moderately Satisfactory due to moderate shortcomings related to safeguards performance.

Based on the assigned ratings to QAE and Bank Supervision, the Overall Bank Performance rating is Moderately Satisfactory due to moderate shortcomings pertaining to QAE and Quality of Bank Supervision.

Quality of Supervision Rating

Moderately Satisfactory

Overall Bank Performance Rating

Moderately Satisfactory

9. M&E Design, Implementation, & Utilization



a. M&E Design

- The PAD did not include a Theory of Change (ToC) since it was not yet required by the Bank at the time of appraisal. Nonetheless, the ICR included a ToC that reflected the relationship between the project activities, outputs, intermediate outcomes and PDO outcomes in a plausible causal chain. This Review reconstructed a ToC narrative for the PDO based on the detailed project description in the PAD (Annex 2) in combination with the ToC reported in the ICR.
- The PDO was composed of one objective (see Section 2), which was assessed based on the following two PDO outcome indicators: 1. The increase of Annual Net Income on benefited area and; 2. The number of water users provided with new or improved irrigation and drainage services (Core indicator), disaggregated by men and women. The two outcome indicators were relevant, measurable, included a baseline for the second indicator and both were connected to the PDO. Also, the expected income increment was mainly derived from irrigation improvements that would improve agricultural yields. The RF lacked any indicator that assessed the impact of the project on crop yields in the project areas.
- The Results Framework (RF) included 13 intermediate results indicators (IRIs) to track the progress of the different project activities. The IRIs were measurable, reflected reasonable targets, and were connected to the project activities. However, strengthening the institutional capacity of the MAGAP/GADP was not adequately captured. Also, the expected income increment was mainly derived from irrigation improvements that would improve agricultural yields. The RF lacked any indicator that assessed the impact of the project on crop yields in the project areas.
- Overall, M&E design reflected an adequate RF that included relevant indicators to measure the project achievements and assess its outcome.

b. M&E Implementation

- The PIU hired an M&E specialist in the first implementation year. Also, two specialists from the Food and Agriculture Organization of the United Nations Cooperative Program (FAO-CP) joined the World Bank team to assist the project in defining methodologies for M&E and impact evaluation, and in the design of a baseline survey. A participatory Beneficiary Monitoring System was also designed.
- M&E implementation activities started in the second year of the project, and a methodology and data collection tools were developed to conduct the baseline survey and tested in three sub-projects.
- However, by the third year M&E implementation faced challenges that negatively impacted the progress of the M&E activities. Most notable was the cancellation of the contract of the consultant overseeing the development of the M&E software due to objections from the Ministry of Telecommunications. Also, the M&E software required improvements, the baseline information needed consolidation, and the definition of reporting procedures for results indicators needed clarifications. Further, M&E implementation was negatively impacted by the lack of stability in personnel at the PIU, which disrupted the development of the M&E process and undermined its overall quality (ICR, paragraph 54).
- M&E data was collected in four waves of survey data prior to project closing. This included a baseline wave, and a maximum of three follow-up waves, spaced approximately 12-18 months apart. However, complete survey waves were only collected for the eleven sub-projects representing one group out of four sub-project groups that completed their cycle by 2020. The



sub-project cycles for the other groups 2, 3 and 4 were completed during 2022 – 2023, which prevented the implementation of a full set of data collection (ICR, paragraph 55).

- Overall, M&E implementation was challenging and the M&E system only generated the full set of data for one out of four groups of sub-projects.

c. M&E Utilization

- The mid-term impact evaluation informed the Restructuring carried out in December 2018. The final evaluation report of December 2023 informed the Efficacy Section of the ICR (ICR, paragraph 56).
- Weaknesses in the data collected by the project's M&E system limited suitability for economic and financial analysis. Specifically, every survey wave exhibited a high degree of variation in the percentages of surface area covered and sub-project beneficiaries captured. This complicated the process of extrapolation required to estimate full benefits at the sub-project level. In addition, per hectare data regarding yields, costs and incomes exhibited high degrees of variance, which raised concerns on its robustness.
- A more comprehensive review of the data transcription and entry process for each survey wave was not possible given the time constraints and limitations in human resource capacity at the PIU.

Summary of M&E Quality Assessment. While the M&E design reflected an adequate RF, the M&E arrangements were not optimal. M&E implementation was challenging and there were concerns on the robustness of the generated data. Utilization was limited given that the complete set of data was only available for one group of sub-projects out of four.

Therefore, the M&E Quality is rated Modest.

M&E Quality Rating

Modest

10. Other Issues

a. Safeguards

- **Environmental Category and Safeguards.** This project was classified as a “Category B” under OP/BP 4.01 with a partial assessment as the environmental impacts were likely to be positive. The project involved investments in productive activities and construction or rehabilitation of small irrigation infrastructure which would have limited environmental impacts mostly during construction. Four environmental and two social safeguard policies were triggered: Environmental Assessment (OP/BP 4.01), Natural Habitats (OP/BP 4.04), Pest Management (OP/BP 4.09), Physical Cultural Resources (OP/BP 4.11, Involuntary Resettlement (OP/BP 4.12) and Indigenous Peoples (OP/BP 4.10). In compliance with the Bank's safeguard policies, the borrower prepared an Environmental and Social Management Framework (ESMF), an Indigenous Peoples Planning Framework (IPPF) and a Resettlement Policy Framework (RPF).



- **Compliance with Environmental and Social Safeguards.** According to the ICR (paragraph 58) the overall safeguard compliance rating was "Moderately Unsatisfactory (MU) at Project closing, reflecting an Unsatisfactory (U) social safeguards rating." By project completion, 45 sub-projects out of 49 had up-to-date environmental permits (Environmental Certificates) while the remaining permits for 4 sub-projects were being processed for recategorization (ICR, paragraph 59). However, compliance with Indigenous Peoples (OP/BP 4.10) was uneven. The project records did not supply sufficient and consistent information explaining why compliance was not always met. The ICR (paragraph 59) reported that while Indigenous Peoples Plans (IPPs) were prepared for 10 sub-projects, there was no information regarding consultations, disclosure or implementation. Further, these IPPs could not be found in the project records, nor anywhere else in MAG. Also, ICR reported that no information was found in the project records regarding occurrence of impacts covered under Involuntary Resettlement Policy (OP/BP 4.12) nor regarding the preparation of the required instruments in case such impacts have occurred (paragraph 59). The project's Grievance Redress Mechanism (GRM) received a total of 83 complaints, of which 73 were satisfactorily addressed, and 10 were being processed. However, the ICR noted that at closing the exact number of complaints received was uncertain, due to a lack of documentary evidence.

The poor compliance with the Bank safeguards was attributed to six main reasons as reported by the ICR (paragraph 61):

1. The high turnover in the PIU negatively affected the Project's environmental and social safeguards management capacity.
2. Environmental and social safeguards (E&S) activities could not always be properly resumed once the new consultants were engaged, mainly because newly engaged staff needed time to familiarize themselves with the project and changing realities on the ground.
3. Resource limitations and administrative restrictions preventing staff travels to the field also generated additional difficulties to ensure the implementation of the measures established within the E&S project instruments.
4. Lack of involvement of the project's E&S safeguards specialists early in each subproject cycle contributed to insufficient assurance of E&S safeguards compliance at the sub-projects level.
5. The quality of reporting on the implementation of E&S mitigation measures, and documentary evidence of E&S management were also deficient.
6. The project implementation faced significant challenges due to the absence of a comprehensive tracking system for safeguards compliance.

b. Fiduciary Compliance

- Overall, fiduciary performance was weak. This was attributed to five main reasons: "(i) continuous liquidity challenges and budgetary problems in the government causing delays in the implementation of the project's procurement plan; (ii) prolonged and tedious administrative and approval procedures; (iii) inconsistent compliance with World Bank fiduciary (FM and procurement)



guidelines and procedures; (iv) complexities associated with the management of multiple financing sources, compounded by the need to measure, monitor, and record in-kind contributions in each sub-project requiring a strong financial management system to ensure proper financial reporting; and (v) frequent changes in the fiduciary staff in the PIU (ICR, paragraph 62)."

- **Financial Management (FM).** While the project generated the required financial information, FM suffered from persistent shortcomings that became increasingly apparent during the final couple of implementation years. These included: (i) delays in producing timely and reliable financial information; (ii) frequent changes in FM personnel disrupted FM activities; and (iii) delays in submitting audit reports for the years 2021 and 2022. The ICR (paragraph 65) noted that "as of the closing date, the project still had pending financial tasks to carry out for an orderly closing – including completion of payments of eligible expenditures, documentation of these expenditures to the Bank." The ICR paragraph 18) reported that US\$5.30 million of Loan proceeds were undocumented. At completion, FM performance was rated Moderately Satisfactory.
- **Procurement.** The project faced significant procurement challenges due to: "(i) high rotation of procurement and other project staff; (ii) insufficient coordination between the technical and procurement teams in the PIU which complicated the regular updating of the Project's procurement strategy and review of market conditions; (iii) significant delays in procurement-related decision making in the government; and (iii) cumbersome and elaborate government procedures related to the various steps in the procurement process (ICR, paragraph 63)." The procurement team initiated approximately 70 new procurement processes in the final year for most of the remaining activities financed by the project. At completion, procurement performance was rated Moderately Satisfactory.

c. Unintended impacts (Positive or Negative)

None.

d. Other

None.

11. Ratings

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



12. Lessons

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

1. To ensure smooth implementation of project activities, appropriate institutional arrangements are required to be in place. Implementation of the project was significantly affected by two institutional factors: a cumbersome institutional decision-making process; and the fact that the project was designed as part of a broader Government program, which would finance certain activities needed for the project to achieve its objective. While a number of legal provisions were introduced early on in the project to facilitate implementation, the PIU was not provided with sufficient decision-making power. Also, the complementary activities of other programs (especially delivery of agri-environmental innovations) ended up being taken on by the project itself (through a restructuring). Further, the assignment of the project implementation to a sub-secretary under MAG resulted in weak institutional leverage and ownership. Future projects should be enabled with sufficient decision-making autonomy; be strategically placed at a level that guarantees full institutional ownership; and encompass all the elements needed to ensure that the agreed objective can be achieved without depending on other programs or other initiatives beyond the project's control.

2. Projects involving multiple activities need a smart procurement approach to ensure smooth flow of procurement activities. The sub-project cycle involving three main groups of activities (i.e., works, capacity building, input delivery) triggered a cumbersome procurement approach in which multiple activities were split in large numbers of small consultant and work contracts, resulting in low participation of bidders, high volume of low-cost activities, large geographic dispersion, and frequent contract extensions. To reduce transaction costs and foster economies of scale future projects could adopt packaging contracts in larger lots to improve procurement efficiency.

3. The project design need to reflect relevant M&E arrangements combined with adequate capacity in the PIU to ensure proper and verifiable project impact evaluation. The validation of the project's M&E system data experienced shortcomings that include data collection and transmission errors, and incorrect interpretation and calculation of results indicators. Future operations need to include in the PIU an M&E specialist with sufficient statistical knowledge and programming capabilities to enable the replicability of survey results.

The following lesson is emphasized by IEG based on input from the project team:

4. To ensure timely implementation of projects in countries with limited implementation capacity, the Bank needs to ensure timely flow of funds, stability of the PMU, coordinating with other development partners (like FAO), and better synchronization of activities. Given Ecuador's extremely slow, bureaucratic and cumbersome internal approval processes (including procurement and financial processes), channeling the Bank loan funds through a second-tier bank (e.g. CONAFIPS, a government-owned but enjoys a great deal of independence) should be considered. This likely would have avoided a substantial portion of the delays suffered by the project. Also, the Bank from the very beginning onwards should agree with the Borrower on a stable PIU which would not be affected by any change in government, ministers, vice-ministers, and Secretaries of Irrigation. Further, the Bank should explore the possibility of engaging an



implementation support agency (such as FAO e.g.) to support the PIU. Finally, more attention should be given to the synchronization of the three main elements of the project, i.e. building of irrigation infrastructure, training & capacity building of prospective users (farmers), and supply of complementary inputs.

13. Assessment Recommended?

No

14. Comments on Quality of ICR

- **Results Orientation.** The ICR included an adequate discussion on the achievement of the PDO.
- **Quality of Analysis.** The ICR included an adequate assessment of outcomes even though there were some challenges in providing clear links between the activities and evidence.
- **Internal Consistency.** Various parts of the ICR were internally consistent and logically linked and integrated.
- **Lessons.** Lessons reflected the project experience and were based on evidence and analysis.
- **Consistency with guidelines.** The ICR used the standard structure defined in the Guidelines and used available evidence to justify the assigned ratings.
- **Conciseness.** Overall, the ICR provided a clear and concise coverage of project activities to the extent possible, and candidly reported on most shortcomings. However, M&E shortcomings needed more details.

Summary of the Quality of ICR Assessment. The ICR included an adequate assessment of outcomes. The lessons drawn by the ICR were relevant. Most sections were concise and reflected relevant evidence. Overall, the Quality of the ICR is rated Substantial with minor shortcomings.

a. **Quality of ICR Rating** Substantial

