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Report No: PAD3775

INTERNATIONAL BANK FOR RECONSTRUCTION AND DEVELOPMENT

PROJECT APPRAISAL DOCUMENT

ON A

PROPOSED LOAN

IN THE AMOUNT OF US\$25 MILLION

TO

BELIZE

FOR A

CLIMATE RESILIENT AND SUSTAINABLE AGRICULTURE PROJECT

FEBRUARY 17, 2022

Agriculture and Food Global Practice
Latin America and Caribbean Region

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CURRENCY EQUIVALENTS

(Exchange Rate Effective January 31, 2022)

Currency Unit = Belize dollar (BZ\$)

BZ\$ 2.00 = US\$1

US\$ 1.43 = SDR1

FISCAL YEAR

April 1 – March 31

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ABBREVIATIONS AND ACRONYMS

AWPB	Annual Work Program and Budget
BAHA	Belize Agricultural Health Authority
BAIMS	Belize Agriculture Information Management System
BCUL	Belize Credit Union League
BMDC	Belize Marketing and Development Corporation
BSIF	Belize Social Investment Fund
BZ\$	Belizean dollar
CARICOM	Caribbean Community
CERC	Contingent Emergency Response Component
CIAT	International Center for Tropical Agriculture (<i>Centro Internacional de Agricultura Tropical</i>)
COVID-19	Coronavirus
CPF	Country Partnership Framework
CRESAP	Climate Resilient and Sustainable Agriculture Project
CRI	Corporate Result Indicator
CRIP	Climate Resilient Infrastructure Project
CSA	Climate-smart agriculture
DA	Designated Account
DAC	District Agricultural Coordinator
°C	Degree Celsius
DFC	Development Finance Corporation
DFIL	Disbursement and Financial Information Letter
EFA	Economic and Financial Analysis
EIRR	Economic Internal Rate of Return
ENPV	Economic Net Present Value
ESCP	Environmental and Social Commitment Plan
ESF	Environmental and Social Framework
ESMF	Environmental and Social Management Framework
ESRC	Environmental and Social Risk Classification
ESS	Environmental and Social Standards
EX-ACT	Ex-Ante Carbon-Balance Tool
FAO	Food and Agriculture Organization of the United Nations
FIs	Financial Intermediaries
FM	Financial Management
FY	Fiscal Year
GBV	Gender Based Violence
GDP	Gross Domestic Product
GHG	Greenhouse Gas
GRID	Green, Inclusive, and Resilient Development
GRM	Grievance Redress Mechanism
HCP	High Carbon Price
HSCV	High Sugar Content Varieties
IBM	Iterative Beneficiary Monitoring
IBRD	International Bank for Reconstruction and Development
IDA	International Development Association
IDB	Inter-American Development Bank

IFAD	International Fund for Agriculture Development
IFR	Interim Financial Report
IPF	Investment Project Financing
LCP	Low Carbon Price
LMP	Labor Management Procedure
M&E	Monitoring and evaluation
MAFSE	Ministry of Agriculture, Food Security, and Enterprise
MED	Ministry of Finance, Economic Development and Investment
MFD	Maximizing Finance for Development
MGAC	Matching Grant Approval Committee
MGOM	Matching Grant Operations Manual
MoU	Memorandum of Understanding
NDC	Nationally Determined Contribution
NMS	National Meteorological Service
NPV	Net Present Value
NRP	Nominal Rate of Protection
O&M	Operations and Maintenance
OP	Operational Procedure/Policy
PCB	Pest Control Board
PCM	Private Capital Mobilization
PDO	Project Development Objective
PFI	Participating Financial Institution/Intermediary
PIU	Project Implementation Unit
POM	Project Operations Manual
PPSD	Project Procurement Strategy for Development
PSC	Project Steering Committee
RPF	Resettlement Policy Framework
SA	Social Assessment
SEP	Stakeholder Engagement Plan
SOP	Series of Projects
SPS	Sanitary and Phytosanitary Standards
TA	Technical Assistance
tCO ₂ e	Tons of carbon dioxide equivalent
US\$	United States dollar
WBG	World Bank Group

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DATASHEET

BASIC INFORMATION

Country(ies)	Project Name	
Belize	Climate Resilient and Sustainable Agriculture Project	
Project ID	Financing Instrument	Environmental and Social Risk Classification
P172592	Investment Project Financing	Moderate

Financing & Implementation Modalities

<input type="checkbox"/> Multiphase Programmatic Approach (MPA)	<input checked="" type="checkbox"/> Contingent Emergency Response Component (CERC)
<input type="checkbox"/> Series of Projects (SOP)	<input type="checkbox"/> Fragile State(s)
<input type="checkbox"/> Performance-Based Conditions (PBCs)	<input checked="" type="checkbox"/> Small State(s)
<input type="checkbox"/> Financial Intermediaries (FI)	<input type="checkbox"/> Fragile within a non-fragile Country
<input type="checkbox"/> Project-Based Guarantee	<input type="checkbox"/> Conflict
<input type="checkbox"/> Deferred Drawdown	<input type="checkbox"/> Responding to Natural or Man-made Disaster
<input type="checkbox"/> Alternate Procurement Arrangements (APA)	<input type="checkbox"/> Hands-on Enhanced Implementation Support (HEIS)

Expected Approval Date	Expected Closing Date
14-Mar-2022	31-Mar-2027

Bank/IFC Collaboration

No

Proposed Development Objective(s)

The Project Development Objectives are to: (i) increase agricultural productivity and the adoption of climate-smart agricultural approaches among project beneficiaries; and (ii) respond effectively to an Eligible Crisis or Emergency event.

**Components**

Component Name	Cost (US\$, millions)
Institutional Strengthening	2.94
Investments in Climate-Smart Agriculture	19.00
Project Management, and Monitoring and Evaluation	3.00
Contingent Emergency Response Component (CERC)	0.00
Front End Fee	0.06

Organizations

Borrower:	BELIZE
Implementing Agency:	Ministry of Agriculture, Food Security, and Enterprise (MAFSE) Ministry of Economic Development

PROJECT FINANCING DATA (US\$, Millions)**SUMMARY**

Total Project Cost	45.70
Total Financing	45.70
of which IBRD/IDA	25.00
Financing Gap	0.00

DETAILS**World Bank Group Financing**

International Bank for Reconstruction and Development (IBRD)	25.00
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Non-World Bank Group Financing

Counterpart Funding	2.50
Local Beneficiaries	2.50
Commercial Financing	18.20
Unguaranteed Commercial Financing	18.20

**Expected Disbursements (in US\$, Millions)**

WB Fiscal Year	2022	2023	2024	2025	2026	2027
Annual	0.50	2.50	3.50	4.50	6.00	8.00
Cumulative	0.50	3.00	6.50	11.00	17.00	25.00

INSTITUTIONAL DATA**Practice Area (Lead)**

Agriculture and Food

Contributing Practice Areas

Gender, Urban, Resilience and Land, Water

Climate Change and Disaster Screening

This operation has been screened for short and long-term climate change and disaster risks

SYSTEMATIC OPERATIONS RISK-RATING TOOL (SORT)**Risk Category****Rating**

1. Political and Governance	● Moderate
2. Macroeconomic	● Substantial
3. Sector Strategies and Policies	● Moderate
4. Technical Design of Project or Program	● Moderate
5. Institutional Capacity for Implementation and Sustainability	● Moderate
6. Fiduciary	● Moderate
7. Environment and Social	● Moderate
8. Stakeholders	● Moderate
9. Other	● Substantial
10. Overall	● Moderate



COMPLIANCE

Policy

Does the project depart from the CPF in content or in other significant respects?

☐ Yes ☒ No

Does the project require any waivers of Bank policies?

☐ Yes ☒ No

Environmental and Social Standards Relevance Given its Context at the Time of Appraisal

E & S Standards	Relevance
Assessment and Management of Environmental and Social Risks and Impacts	Relevant
Stakeholder Engagement and Information Disclosure	Relevant
Labor and Working Conditions	Relevant
Resource Efficiency and Pollution Prevention and Management	Relevant
Community Health and Safety	Relevant
Land Acquisition, Restrictions on Land Use and Involuntary Resettlement	Relevant
Biodiversity Conservation and Sustainable Management of Living Natural Resources	Relevant
Indigenous Peoples/Sub-Saharan African Historically Underserved Traditional Local Communities	Relevant
Cultural Heritage	Relevant
Financial Intermediaries	Relevant

NOTE: For further information regarding the World Bank's due diligence assessment of the Project's potential environmental and social risks and impacts, please refer to the Project's Appraisal Environmental and Social Review Summary (ESRS).

Legal Covenants

Sections and Description

1. Article III, Clause 3.01. The Borrower, through MAFSE, shall carry out the Project with the assistance of BSIF, in



accordance with the provisions of Article V of the General Conditions, Schedule 2 to the Loan Agreement and the Subsidiary Agreement with BSIF.

Sections and Description

2. Loan Agreement, Schedule 2, Section I. A. 4. The Borrower, through MAFSE, shall establish, and maintain throughout Project implementation, an approval committee ("Matching Grant Approval Committee"), with a composition, functions and responsibilities satisfactory to the Bank, as set forth in the Matching Grant Operations Manual (MGOM).

Sections and Description

3. Loan Agreement, Schedule 2, Section I. E. 1. To facilitate the carrying out of Subcomponent 2.2. of the Project, the Borrower, through the MAFSE, shall cause BSIF to make part of the proceeds of the Loan available to PFIs under agreements between BSIF and each PFI ("PFI Agreements"), under terms and conditions approved by the Bank.

Sections and Description

4. Loan Agreement, Schedule 2, Section I. F. 1. The Borrower, through MAFSE, shall cause BSIF to cause PFIs to enter into agreements ("Participation Agreements") with Beneficiaries under which a PFI shall provide a Beneficiary with a Matching Grant to finance a CSA Investment, in a manner acceptable to the Bank and on the basis of a model satisfactory to the Bank, as set out in the MGOM.

Sections and Description

5. Loan Agreement, Schedule 2, Section I. A. 2 (ii). No later than sixty (60) days after the Effective Date, the Borrower, through MAFSE, shall appoint a Project Coordinator and a Deputy Project Coordinator to head the PIU, under terms of reference and with qualifications and experience satisfactory to the Bank, as set forth in the POM.

Sections and Description

6. Loan Agreement, Schedule 2, Section I. B. 1. Not later than sixty (60) days after the Effective Date the Borrower, through the MAFSE and with the assistance of BSIF, shall prepare and adopt a Project Operations Manual ("Project Operations Manual" or "POM"), in form and substance satisfactory to the Bank.

Conditions

Type Effectiveness	Financing source IBRD/IDA	Description 1. Loan Agreement; Article V; Clause 5.01. The Subsidiary Agreement between the Borrower, through MAFSE, and BSIF has been executed and delivered in form and substance satisfactory to the Bank.
Type Disbursement	Financing source IBRD/IDA	Description 2. Loan Agreement; Schedule 2, Section III, Clause B.1 (b) (i). No withdrawals shall be made for payments under Category 2 of the loan, unless the Matching Grant Operations Manual has been adopted by the Borrower, through MAFSE, in form and substance satisfactory to the Bank.



Type Disbursement	Financing source IBRD/IDA	Description 3. Loan Agreement; Schedule 2, Section III, Clause B.1 (b) (ii). No withdrawals shall be made for payments under Category 2 of the loan, unless the Matching Grant Approval Committee (MGAC) has been established by the Borrower.
Type Disbursement	Financing source IBRD/IDA	Description 4. Loan Agreement; Schedule 2, Section III, Clause B.1 (b) (iii). No withdrawals shall be made for payments under Category 2 of the loan, unless at least one (1) PFI Agreement has been signed.
Type Disbursement	Financing source IBRD/IDA	Description 5. Loan Agreement; Schedule 2, Section III, Clause B.1 (c). No withdrawal shall be made for Emergency Expenditures under Category (3), unless and until the following conditions have been met: (i) the Borrower has determined that an Eligible Crisis or Emergency has occurred; (ii) the Bank has agreed with such determination; and (iii) the Borrower has adopted the CERC Manual and Emergency Action Plan, in form and substance acceptable to the Bank.



I. STRATEGIC CONTEXT

A. Country Context

1. **Belize is a lower-middle-income country in Central America with close socio-economic and political ties to the wider Caribbean region.**¹ As of 2021, Belize had a population of 430,190, with 55 percent living in rural areas, and a gross domestic product (GDP) of US\$1.7 billion in 2020.² As a member of the Caribbean Community (CARICOM) economic union, Belize enjoys access to the markets of all other members and benefits from trade agreements established through CARICOM. The national territory is 8,867 square miles, of which 95 percent is on the mainland and the other 5 percent comprises more than 1,060 small islands.³

2. **The Belizean economy relies heavily on the country's natural resources, which deliver ecosystem products and services valued at 15–22 percent of GDP.** It features the largest coral reef in the Americas, an extensive mangrove system, and pristine forests that cover 60 percent of the national territory.^{4,5} At the same time, Belize is highly exposed to climate change impacts, such as increasing temperatures, changing precipitation patterns, and more frequent and more severe extreme weather events, which regularly disrupt agricultural production. Among small states in the 182 countries in the Climate Risk Index⁶, Belize is the third most vulnerable to natural disasters and the fifth most vulnerable to climate change.⁷ Between 2000 and 2016, nine major storms caused major damage from flooding, including Hurricane Earl in 2016, which resulted in damages assessed at 11 percent of GDP (US\$184 million).⁸

3. **More than one-half of Belize's population was living in poverty even before the COVID-19 pandemic.** According to the latest poverty data, 52 percent of the population lived below the national poverty line in 2018, up from 41 percent in 2009.⁹ During the 2009 to 2018 period, there was a sharp increase in urban poverty (from 28 to 43 percent), together with an increase in poverty in rural areas (from 55 to 59 percent), driven in part by repeated natural disasters. The increase in rural poverty was more significant in the Toledo District (from 60 to 82 percent in the same period), where the economy depends heavily on agriculture. Belizeans of Mayan descent were also much more likely to be poor in 2018 (at 77 percent) than Creoles, Garifuna, Mestizo or other ethnic groups (between 47–52 percent).¹⁰ Income inequality rose sharply during the 2009–2018 period, with the Gini coefficient increasing from 0.38 to 0.49. Since the COVID-19 pandemic resulted in an estimated 14 percent decline

¹ Belize was classified as an upper-middle income country as of July 2020, based on a 2019 Atlas GNI per capita of US\$4,450. However, a sharp economic decline in 2020 reduced the GNI per capita to US\$3,970 for 2020, resulting in Belize moving from the upper-middle income to the lower-middle income category as of July 1, 2021. See: <https://blogs.worldbank.org/opendata/new-world-bank-country-classifications-income-level-2021-2022>.

² International Monetary Fund: "Belize - Staff Report for the 2021 Article IV Consultation". IMF Country Report No. 21/103.

³ World Bank Group (2016), "Belize Systematic Country Diagnostic." Washington, DC. <https://openknowledge.worldbank.org/handle/10986/23953>.

⁴ World Resources Institute estimate cited in the World Bank Country Partnership Framework for Belize for FY18–22.

⁵ World Bank data available at <https://data.worldbank.org/indicator/AG.LND.FRST.ZS?locations=BZ>

⁶ Small States' Resilience to Natural Disasters and Climate Change – Role for the IMF. IMF, November 2016

⁷ International Monetary Fund (2018), "Belize Climate Change Policy Assessment." IMF Country Report No. 18/329. Washington, DC. <https://www.imf.org/en/Publications/CR/Issues/2018/11/16/Belize-Climate-Change-Policy-Assessment-46372>.

⁸ World Bank Group (2018), "Advancing Disaster Risk Finance in Belize." See: <https://openknowledge.worldbank.org/handle/10986/33088>

⁹ Statistical Institute of Belize: "Poverty Study 2018-19", released on June 30, 2021, available at: <http://sib.org.bz/wp-content/uploads/PovertyStudy2018.pdf>

¹⁰ Most Belizeans are of multiracial descent: about 34 percent of the population is of mixed Indigenous (mostly Mayan) and European descent (Mestizo), 35 percent are Creoles, about 11 percent are Mayan, and about 6 percent are Afro-Amerindian (Garifuna). The remaining population of Belize (about 14 percent) includes persons of European, East Indian, Chinese, Middle Eastern and North American descent.



in GDP in 2020 (in good measure due to impacts on tourism, which provides 40 percent of GDP), it is likely that poverty rates will have increased further since 2018.¹¹

4. **Belize Investment Climate.** Belize's economic and fiscal outlook remains troubled, particularly with the global health and accompanying economic crisis. Due to a need to diversify and expand its economy, the government actively seeks Foreign Direct Investment (FDI); however, the high cost of doing business, high public debt, bureaucratic delays and often insufficient infrastructure constitute serious investment challenges.¹² Belize's proximity to the economically developed nations of North America has translated into a dependence on tourism and agriculture as the primary economic sectors for foreign exchange income. Belize's small, undiversified¹³ and export-dependent economy is especially vulnerable to exogenous shocks, as well as being exposed to environmental disasters and to preferential market access policies. Generally, Belize has no restrictions on foreign ownership or control of companies, but the country ranks poorly in terms of competitiveness.¹⁴

5. **Foreign Trade Constraints.**¹⁵ Belize is one of the smallest economies in LAC and is not as competitive as its Central American neighbors. High cost of inputs (e.g., machinery and equipment, utilities, fuel, and telecommunication services) drive up the cost of goods, which has downstream impacts on pricing of domestic goods and contributes to a relatively high cost of doing business. Among the most frequently cited challenges for enhancing market access and foreign trade, the key ones are:

- (a) **The financial system continues to be categorized as stable but fragile.** Relatively high borrowing rates and lack of flexible financing mechanisms to ease access to financial services by all sectors cause credit to remain heavily constrained.
- (b) **Lengthy bureaucratic delays serve as disincentives to investments.** Time-consuming delays and bureaucracy are perceived as an endemic problem by businesses, which are also critical of the many challenges they face in bidding, procurement, and dispute settlement processes, particularly when dealing with state owned enterprises (SOEs).
- (c) **The courts are independent and impartial, but legal proceedings are often delayed for years due to significant case backlogs.** While local courts are empowered to recognize and enforce foreign arbitration awards against the government, judgments are generally challenged up to the Caribbean Court of Justice, the country's final appellate court, causing additional delays.
- (d) **Infrastructure development has not picked up the expected pace.** The Government of Belize continues to expend significant resources in rebuilding the economy through support to improving key infrastructure for tourism and agriculture sectors. However, the fiscal situation and limited resources have constrained this process; thus, many public works and economic recovery projects have been slower than expected.
- (e) **Strategic agribusiness investments are needed to improve efficiency and competitiveness** and to build a more resilient sector, such as expanding irrigation, storing agriculture and agro-processed commodities, food packaging and preservation, as well as other value-adding investments to promote food security and quality.
- (f) **Disease prevention and quality certification are top concerns for Belize.**¹⁶ Some farming industries continue to battle with diseases (e.g., citrus greening disease and a bacterial disease that has stalled shrimp production). In addition, the lack of compliance with some of the U.S. Food and Drug Administration (FDA)

¹¹ See the Statistical Institute of Belize's GDP projection for 2019 at: <http://sib.org.bz/statistics/gross-domestic-product/> and "Pandemic fallout to drive deep recession in Belize." Oxford Analytica Daily Briefings, July 1, 2020.

¹² US Department of State. <https://www.trade.gov/country-commercial-guides/belize-market-challenges>.

¹³ Agriculture, the second most important economic sector, is based on a small group of exports, including sugar, banana, and citrus juice.

¹⁴ See: <https://www.weforum.org>.

¹⁵ International Trade Administration; Sept. 23, 2021. <https://www.trade.gov/country-commercial-guides/belize-market-challenges>

¹⁶ Inter-American Development Bank (IADB)- Integration and Trade in Belize. TECHNICAL NOTE No. IDB-TN-606; December 2013.



food safety regulations and the detection of diseases (e.g., Salmonella) have been some of the main reasons why certain food products have been having problems in reaching the U.S. market.

- (g) **Institutional Capacity needs to be strengthened further.**¹⁶ It looks imperative for Belize to maintain a strong focus on institutional strengthening, with gradual capacity building programs, to be able to develop an enhanced institutional structure that supports the stronger role of trade in the economy, and to manage the increasingly complex intra-regional and global trade agendas and to facilitate trade.

6. **Trade facilitation performance.** This performance has improved between 2017 and 2019 in the areas of: simplification and harmonization of documents, automation of border processes, streamlining of procedures, and domestic border agency co-operation. For the group of upper middle-income countries to which Belize belonged prior to the pandemic, the assessment of the impact of trade facilitation measures has shown that there are key reforms with significant potential impacts on bilateral trade flows and reducing trading costs. Taking into account the potential effects of these policy areas in foreign trade, the country would benefit from continued improvements in the areas of information availability, governance and involvement of the trade community, appeal procedures, formalities and automation of formalities, and a simplification of procedures.

B. Sectoral and Institutional Context

7. **The country's agricultural sector accounts for more than 10 percent of GDP and 15 percent of employment.** Around 28,000 individuals (18 percent of the working population) are directly engaged in primary sector employment, which accounts for one-quarter to one-third of all jobs in four of Belize's six Districts.¹⁷ Moreover, agriculture is the country's main source of merchandise export revenue, with food and live animals accounting for 93 percent of merchandise exports in 2019.¹⁸ Sugar, bananas, and orange concentrate were the primary merchandise exports, accounting for 65 percent of all exports by value in 2019. The agricultural sector is also critical for the country's nutrition security in a context in which 14 percent of Belizean children under 5 years of age are affected by stunting.¹⁹

8. **Agriculture is characterized by four main subsectors.** The first subsector is the subsistence-oriented, smallholder subsector producing a wide range of food crops, especially vegetables, mainly for on-farm consumption and limited off-farm sales. Subsistence-oriented smallholders are among the poorest farmers, and Belize has sought support from the International Fund for Agricultural Development (IFAD) to strengthen this sector. The second subsector is the group of smallholder farms that are transitioning to commercial activities. These farms sell a greater share of their production to local markets and have the potential to broaden the range of Belize's exported commodities, as evidenced by rising exports of non-traditional crops such as red kidney beans.²⁰ The third subsector includes the well-organized, export-oriented commercial farms that specialize mainly in sugarcane, bananas, and citrus. The fourth subsector includes the vertically integrated, large-scale commercial producers (dominated by the Mennonite community) that produce cereals and livestock products for local and export markets.²¹

¹⁷ Statistical Institute of Belize, Belize Labor Force Survey (April 2018).

¹⁸ The Statistical Institute of Belize's GDP, trade and employment data are available at: <http://sib.org.bz/statistics/>

¹⁹ World Bank data available at <https://data.worldbank.org/country/belize>.

²⁰ Foster, William, Alberto Valdés, Pedro Martel, and Carmine Paolo De Salvo (2017), "Analysis of Agricultural Policies in Belize." Inter-American Development Bank, Washington, DC. <https://publications.iadb.org/publications/english/document/Analysis-of-Agricultural-Policies-in-Belize.pdf>.

²¹ Ministry of Agriculture (2015), "National Agriculture and Food Policy of Belize, 2015 to 2030." Belmopan, available at: <https://www.agriculture.gov.bz/wp-content/uploads/2017/05/National-Agriculture-and-Food-Policy-of-Belize-2015-2030.pdf>.



9. **In spite of its importance to the economy, the agricultural sector faces numerous constraints.** With its uneven topography and susceptibility to erosion,²² 62 percent of the land in Belize is considered only marginally suitable for agriculture.²³ Data from the Belizean Ministry of Agriculture, Food Security, and Enterprise (MAFSE) indicate that of the 10,000 registered farmers in the country, 25 percent were working on farms with less than 5 acres (2 ha) and 57 percent on farms with less than 20 acres (8.1 ha). Only one-third of farmers had formal title to the land they cultivated; another 30 percent used land leased by the government, 7 percent rented land, and the remaining 30 percent farmed land accessed through informal or communal arrangements.²⁴ These conditions are part of the reasons for a limited financial sector support for smaller agricultural farms, as lenders tend to focus on medium- and large-sized enterprises with sufficient collateral and proven loan records. Most smaller farm enterprises lack access to formal sources of credit to be able to invest in improving climate resilience at the farm level, while products such as agricultural insurance, micro-credit, and micro-insurance are essentially unavailable in financial markets.²⁵ A further constraint is that Belize has no public irrigation and drainage infrastructure. Although some private irrigation systems (primarily surface water irrigation systems) are used for banana and citrus production, MAFSE estimates that only 10 percent of agricultural land in production is irrigated, leaving most lands vulnerable to increasingly erratic rainfall.²⁶ Consequently, Belize relies heavily on food imports, which were equivalent to 68 percent of the value of food exports in 2020.²⁷

10. **Belizean agriculture is highly vulnerable to the impacts of climate change.**²⁸ Climate change is having, and is projected to continue to have, a major impact on crop yields and agricultural incomes. Modeling projections indicate that temperatures could rise by as much as 2.1°C by the 2050s, while average rainfall could decrease by 7-10 percent, which would severely reduce crop yields. For example, changing weather patterns could result in annual yield losses equivalent to US\$6.7–7.8 million just for rice, maize, and beans. Drought devastated the agricultural sector in 2019, when total rainfall was only 1,325 mm versus the 1960–2018 average of 2,087 mm, resulting in agricultural losses of US\$38.5 million for Belizean farmers, according to estimates by MAFSE.²⁹ At the same time, agriculture is the sector (ahead of tourism and housing) that is most disrupted by hurricanes and tropical storms, with hurricanes and storms causing wind- and flood-related damage exceeding US\$232 million in the two decades before 2018, notably in the rice, sugarcane, citrus, and papaya industries.³⁰ Promoting green and resilient development via climate-smart agriculture³¹ is therefore a critical priority for Belize's agricultural sector.

²² Soil erosion is impacted negatively and directly by climate changes, especially changes in rainfall amounts and intensity.

²³ CIAT and World Bank (2018), "Climate-Smart Agriculture in Belize."

²⁴ The Farm Registry data are based on the last agriculture census conducted by the Government of Belize and finalized in 2002. While another census was conducted in 2010 no summary results are available with MAFSE. The Ministry is currently collecting farmer data using the Belize Agriculture Information Management System (BAIMS) however they have not concluded the exercise. The BAIMS data will be validated and updated with the Project's support.

²⁵ World Bank Group (2016), "Belize Systematic Country Diagnostic."

²⁶ FAO (2015), "Country Profile – Belize." FAO AQUASTAT Reports. Rome. <http://www.fao.org/3/ca0417en/CA0417EN.pdf>.

²⁷ High food imports were highlighted as a major concern in Belize's National Agricultural and Food Policy for 2015-30. See:

<https://www.agriculture.gov.bz/wp-content/uploads/2017/05/National-Agriculture-and-Food-Policy-of-Belize-2015-2030.pdf>

²⁸ The vulnerability of Belizean agriculture to climate change is high despite the fact that sector contributes only a small portion of national greenhouse gas emissions. A 2019 analysis of climate-smart agriculture in Belize found that, as of 2014, about 3 percent of the country's total greenhouse gas (GHG) emissions came from agriculture (56.2 percent from livestock production and 43.8 percent from crop production, including from deforestation, which is common in Belize). Source: Ministry of Agriculture (2019), "Belize Drought Loss Assessment Report." Belmopan.

²⁹ Ministry of Agriculture (2019), "Belize Drought Loss Assessment Report." Belmopan.

³⁰ Foster et al. (2017), "Analysis of Agricultural Policies in Belize."

³¹ Climate-smart agriculture (CSA) normally includes technologies, infrastructure practices and approaches (e.g., temperature appropriate storage infrastructure, crop rotation, zero tillage, adapted varieties of crops, protected agriculture, efficient irrigation, etc.) that support a combination of measures to promote agriculture and food systems sustainability via: 1) greater productivity; 2) lower emissions; and 3) increased resilience. See Annex 2 for details on CSA approaches.



11. **Gender gaps in the agricultural sector pose particular challenges for Belize's women farmers.** While 30 percent of farmers are women, only 3 percent of women farmers head their own farming units, and the participation of women in the skilled agricultural labor force is lower (at 9 percent) than in the overall labor force (38 percent).³² Most women farmers work alongside their husbands on small-scale farms and live in households with incomes below the poverty line. Women farmers have greater household responsibilities, less educational opportunities, limited participation in producer organizations, and their mobility is relatively restricted. This limits their access to productive resources, especially technical education and advisory services, agricultural inputs and land, but also technology to intensify production, labor, credit, and markets. Under these circumstances, the productivity of female producers is lower than that of their male counterparts, and their production is more vulnerable to adverse climate events like hurricanes, floods, and droughts.

12. **The COVID-19 pandemic has accentuated the challenges facing Belizean agriculture.** It has disrupted domestic and international supply chains, reduced purchasing power and weakened the demand for food products (including from Belize's tourism sector), leading to shortages of farm inputs, labor and financing that are affecting planting cycles and agricultural markets. This highlights the importance of implementing immediate measures to restore agricultural production, as well as longer-term measures that strengthen food security and enhance climate resilience.

13. **To address the multiple challenges facing Belizean agriculture, the capacity of many public institutions that are active in the sector needs to be strengthened.** As the lead institution in the sector, MAFSE plays a critical role in improving agricultural productivity, efficiency, and climate change resilience, but it faces important financing and technical constraints. Among others, its information management system, agrometeorological monitoring capacity, and research and extension services require significant strengthening to be able to support farmers in a shift toward climate resilient agriculture. Similarly, the Belize Agricultural Health Authority (BAHA) and Pest Control Board (PCB), which are in charge of overseeing safe and sanitary production of food and livestock, face important technical and equipment constraints that are hampering their efforts to ensure adequate surveillance of zoonotic diseases, appropriate use of pesticides, and maintenance of food safety and quality. The National Meteorological Service (NMS), which manages the National Meteorological Network, likewise requires technical and financial support to provide timely, reliable agrometeorological data for farmers, and, together with MAFSE, to assess the hazard exposure of various crops to inform farmers' investment decisions. The Agriculture Department of the University of Belize plays an important research and analysis role for MAFSE that also warrants strengthening. Finally, Belize's Development Finance Corporation (DFC) and, looking beyond the public sector, Belize's Credit Union League and its commercial banks, are important potential partners for financing investments in climate-smart agriculture, but require further knowledge-sharing and advisory support to enhance their potential role in this area (see Box A3.1 in Annex 3 for an overview of Belize's financial sector). Thus, addressing capacity constraints is a key priority to promote more climate-resilient agriculture in Belize.

C. Relevance to Higher Level Objectives

14. **The higher-level objectives of the Climate Resilient and Sustainable Agriculture Project (CRESAP)—increasing production, incomes and climate change resilience in the Belizean agri-food system—are closely aligned with Belize's National Agriculture and Food Policy for 2015–30,³³ as well as with Plan Belize, the Government's plan for 2020–25³⁴ and with Horizon 2030, the country's National Development Framework.³⁵ By supporting innovative, climate-smart agricultural technologies, better rural infrastructure, improved linkages to**

³² Statistical Institute of Belize, Belize Labour Force Survey, April 2020.

³³ <https://www.agriculture.gov.bz/wp-content/uploads/2017/05/National-Agriculture-and-Food-Policy-of-Belize-2015-2030.pdf>

³⁴ <https://planbelize.bz>.

³⁵ <https://med.gov.bz/horizon-2030-the-national-development-framework-for-belize/>



financing and to markets, and environmentally sound production practices, CRESAP will support the implementation of four of the five strategic pillars of Belize's National Agriculture and Food Policy, namely: Sustainable Production, Productivity, and Competitiveness (Pillar 1); Market Development, Access, and Penetration (Pillar 2); National Food and Nutrition Security and Rural Livelihoods (Pillar 3), and Sustainable Agriculture and Risk Management (Pillar 4).

15. **CRESAP aligns closely with Belize's national policy on climate change and will support achievement of its Nationally Determined Contribution (NDC).** Belize submitted its NDC to the United Nations Framework Convention on Climate Change³⁶ in 2016 and updated it in August 2021,³⁷ confirming its commitment to strategically transition to low carbon development while strengthening resilience to the effects of climate change. Belize has mainstreamed climate change into its national development planning framework, including its long-term development plan (Horizon 2030). Since deforestation and land use change have been identified as key drivers of higher emissions, the sustainable agricultural intensification and climate-smart agricultural practices and technologies supported by CRESAP will be important for meeting Belize's NDC targets.

16. **The objectives of CRESAP closely reflect objectives set out in the World Bank Group's (WBG) Belize Country Partnership Framework (CPF) FY2018–22 (Report No. 106630), discussed by the Board on May 30, 2017,³⁸ as well as the WBG twin goals of reducing poverty and increasing shared prosperity.** CRESAP will contribute directly to the CPF's key focus area of "Fostering climate resilience and environmental sustainability," by promoting the adoption of climate-smart agriculture (CSA) technologies and practices as well as financing more resilient rural infrastructure, which will increase agricultural productivity in an environmentally sustainable manner, while making farmers less vulnerable to climate change and weather variability.

17. **The Project is aligned with the Government's longer term COVID-19 recovery agenda and the WBG's focus on Green, Inclusive, and Resilient Development (GRID) to support a post-pandemic equitable and low carbon growth path for clients.**³⁹ The Government of Belize has developed an Emergency Action Plan to respond to COVID-19 that seeks to mitigate the impact on farmers of shrinking agricultural markets and assist farmers suffering from the effects of the pandemic as well as the drought conditions. To this end, it accessed funding through the Contingent Emergency Response Component (CERC) component of the Bank-financed Climate Resilient Infrastructure Project (CRIP, P127338). By August 30, 2021, 8,456 heads of farming households (including 2,481 female farmers) had received cash transfers under the CRIP-CERC activities and also benefitted from 12,722 input vouchers for key subsectors (vegetable, poultry, dairy, livestock, shrimp, sugarcane, grains, and pulses). The GRID approach promotes economic growth through a recovery path that is more sustainable, more inclusive and more resilient to future shocks to avoid long-term loss for short-term gain. The Project will contribute to greater inclusion, poverty reduction and shared prosperity by targeting support to small farmers transitioning to commercial production, by promoting financial inclusion, and by ensuring greater access to resources for women farmers. Moreover, by financing capacity building and investments that promote CSA, CRESAP will support green agricultural development that will be more resilient to future shocks.

³⁶ Government of Belize (2016), Belize First NDC. Available at <https://www4.unfccc.int/sites/ndcstaging/Pages/Party.aspx?party=BLZ>.

³⁷ <https://www4.unfccc.int/sites/ndcstaging/PublishedDocuments/Belize%20First/Belize%20Updated%20NDC.pdf>

³⁸ Report No. 106630.

³⁹ World Bank Group (2021), "Green, Resilient, and Inclusive Development"; <https://openknowledge.worldbank.org/bitstream/handle/10986/36322/Green-Resilient-and-Inclusive-Development.pdf?sequence=1&isAllowed>



II. PROJECT DESCRIPTION

A. Project Development Objective (PDO)

PDO Statement

18. The Project Development Objectives are to (i) increase agricultural productivity and the adoption of climate-smart agricultural approaches among project beneficiaries; and (ii) respond effectively to an Eligible Crisis or Emergency event.

PDO Level Indicators

19. The results of the Project will be measured via the following PDO indicators:

- (i) Increase in the yield of crop and livestock products (maize, onions, sweet peppers, beef cattle) produced by targeted beneficiaries (percentage increase), disaggregated by gender;
- (ii) Farmers who have adopted an agricultural technology (number), disaggregated by gender (CRI); and
- (iii) Land area under sustainable land management practices (hectares) (CRI).⁴⁰

B. Project Design and Components

20. The Project will have a total estimated cost of US\$45.7 million, including US\$25 million in IBRD Investment Project Financing (IPF). The Project, to be implemented over a 5-year period, will provide support to agricultural producers, with a particular emphasis on individual smallholder farmers who are transitioning to more commercial production, while also supporting more established commercial farmers and farmer associations that wish to adopt climate-smart practices to improve the sustainability of their enterprises. In addition, the Project will strengthen the capacity of selected agricultural institutions to assist farmers in adopting CSA approaches.

21. The Project builds on experiences from successful climate-smart agriculture projects implemented across the Latin America and the Caribbean Region and beyond. Based on these experiences, CRESAP will focus on institutional strengthening and on investments in subprojects that promote climate-smart technologies and practices.⁴¹ The Project will support: (i) capacity building for key public agricultural institutions, so that these are equipped to support a transition to more resilient, productive, and green agricultural development; and (ii) financing for the adoption of improved practices and know-how by agricultural producers, as well as for collective/shared technologies and assets. The adoption of improved practices will be supported via: (a) matching grants and private capital mobilization (PCM) for farmers and farm groups that adopt climate-smart agriculture (CSA) technologies or practices, and (b) investments in strategic collective agricultural infrastructure assets that contribute to increased agricultural production and sustainability and augment economic resilience.

Component 1: Institutional Strengthening (Total Cost, financed by IBRD: US\$2.9375 million)

22. This component focuses on strengthening the capacity of key public institutions (government agencies and academic organizations) to support a more productive and sustainable agricultural sector. The component will finance goods, small works, equipment, studies, training, consulting, and advisory services to:

⁴⁰ Productivity indicators will measure increases in beneficiaries' crop yields over the life of the Project for four key agricultural products: maize, onions, sweet peppers, and beef cattle. The land area under sustainable land management would include not only on-farm lands benefitting from matching grants but also off-farm lands benefitting from investments in collective assets (e.g., drainage and irrigation).

⁴¹ The relevant best-fit climate-smart approaches for Belize include several on-farm and off-farm measures, such as efficient water management through irrigation and drainage solutions for rice or bananas (among others) or use of crop rotation for beans, corn, *inter alia*, coupled with an enabling institutional framework and measures to promote their adoption (see Annex 2 for a menu of climate-smart approaches applicable to selected key value chains).



- **Strengthen MAFSE's and NMS' agricultural and agro-meteorological management systems to be able to deliver relevant and timely advisory services.** CRESAP will support upgrading the Belize Agricultural Information Management System (BAIMS), to improve the management of geo-referenced data and increase the ability to manage agro-climatic risks and build resistance to climate change. CRESAP will finance investments to: (i) improve the collection of relevant sectoral data to enhance the BAIMS system (on- and off-farm); (ii) strengthen MAFSE and the National Meteorological Service (NMS) remote sensing capacity to be able to monitor agricultural activities, generate aggregate information, and assess production losses; (iii) upgrade MAFSE's geo-location capacity, and promote access to regular weather and agrometeorological information to inform more targeted adaptation actions; (iv) support the NMS to improve its services through upgraded equipment at weather stations in agricultural production areas.⁴² MAFSE and NMS will receive technical support to conduct diagnostics to estimate the hazard exposure of key agricultural activities and assess the vulnerability of target crops, so as to inform *ex-ante* risk management decisions and increase the resilience of the sector; and (v) enhance NMS capacity to be able to improve the agro-meteorological services offered. These activities will result in upgraded data processing capacities and reinforced Agro-Climatic Software tools, as well as a strengthened national weather station network in agricultural production areas and the technical capacity of NMS staff. Furthermore, CRESAP will develop a communication system to transmit regular NMS agro-meteorological information and products to end-users. At the same time, the Project will strengthen the capacity of MAFSE's extension service to provide high-quality guidance about CSA to farmers. Gender-sensitization training will be provided to staff of the public agricultural institutions as well as the Belize Marketing and Development Corporation (BMDC) to carry out their functions in CRESAP in ways that support achievement of project objectives with regard to gender.
- **Strengthen the capacity of the Pest Control Board (PCB) to promote sustainable, integrated pest management practices in agriculture.** The Project will equip PCB to ensure compliance with climate-smart, integrated pest management practices that are proven to be good practices—including to address the climate-induced spread of pests and diseases—and to train extension officers and farmers in these areas.
- **Strengthen the ability of the Belize Agricultural Health Authority (BAHA) to monitor and enforce sanitary and phytosanitary standards (SPS) and regulations.** The Project will strengthen BAHA's capacity to ensure compliance with SPS requirements and improve its surveillance capabilities (especially of zoonotic diseases), via equipment, training, and studies, to ensure food safety and quality, as well as its capacity to inspect animals and certify that they are free of disease. This is important as climate changes (including alternating droughts and deluges) are expected to induce the spread of diseases, requiring an enhanced inspection process as part of the adaptation to these changes. At the same time, improved regulation of the use of fertilizers for food safety and quality is expected to lead to climate change mitigation benefits.
- **Strengthen the integration of CSA approaches in training programs offered by the Agriculture Department of the University of Belize.** The Agriculture Department trains agronomists, engages in agri-food research in its labs, runs demonstration areas on its central farm and provides training directly to farmers and students. The Project will support the department to upgrade its research and training capacity in climate-smart agriculture.

⁴² The alternative of entirely satellite-based systems has been explored, and NMS does receive some satellite data; however, in light of the high continuing costs and concerns about the reliability of granular information from such systems, NMS prefers to maintain a less costly network of weather stations on the ground.



Component 2: Investments in Climate-Smart Agriculture (Total Cost: US\$39.7 million, of which IBRD: US\$19 million; commercial finance from Participating Financial Institutions (PFIs): US\$18.2 million, and beneficiary farmers: US\$2.5 million)

23. **This component will finance three subcomponents:** The three subcomponents are interrelated and complementary leading to the objective of strengthening the capacity of farmers and participating financial intermediaries engaging in climate-smart agricultural investments under the Project, as to be able to take advantage of the provision of financing to farmers (matching grants and loans from PFIs) to adopt CSA technologies and practices, and increasing their productivity, levels of income and resiliency to climate change and weather events.

24. **Subcomponent 2.1: Strengthening the capacity of PFIs, individual farmers and farmer organizations participating in the CRESAP matching grants program in support of CSA investments (IBRD US\$1 million).** This subcomponent will finance training courses and advisory services for PFIs, such as Belize's Development Finance Corporation (DFC), the Belize Credit Union League and its member credit unions, commercial banks, and beneficiary farmers and farmer groups applying for grants under Subcomponent 2.2. In particular, Subcomponent 2.1 will: (i) build capacity among PFIs to develop and implement environmental and social management systems (ESMSs) that are consistent with the Bank's Environmental and Social requirements, evaluate climate change considerations in underwriting loans, and provide gender-sensitization training, including on addressing and mitigating risks related to gender-based violence (GBV); (ii) support training courses on climate-smart agriculture approaches for PFIs; (iii) promote the matching grants program among targeted beneficiaries; (iv) strengthen the organizational and business capacities of farmer groups and organizations applying for matching grants under CRESAP; (v) provide specific TA to individual farmers via MAFSE's extension agents and/or service providers for the preparation of business plans and subproject proposals for financing via the matching grants subcomponent to promote the adoption of CSA approaches. The preparation of these business plans would constitute an important aspect of the capacity building for farmers and would address not only the adoption of CSA approaches in production, but also marketing strategies to strengthen commercial linkages for beneficiary farmers and ensuring improved market access; and (vi) tailor technical assistance and financial and business training to women's needs, including holding training events at convenient locations and times for women farmers.

25. **Subcomponent 2.2: Promotion of CSA technologies and practices via matching grants and leveraging of private capital (Total cost: US\$ 36.7 million; of which IBRD: US\$16 million, PFIs: US\$18.2 million and beneficiary farmers: US\$2.5 million).** This subcomponent will promote the adoption of tested and properly selected CSA technologies, approaches and practices. Agricultural technologies and practices are considered "climate smart" if they enhance food security while addressing at least one of three additional objectives: (1) sustainably increasing agricultural productivity and farmers' incomes, (2) adapting and building resilience to climate change, and (3) reducing and/or removing greenhouse gas (GHG) emissions. Many CSA practices have potential to deliver "triple wins" by sustainably increasing productivity, enhancing resilience, and/or reducing GHG emissions. Examples that have been proven effective in Belize include crop rotation, intercropping, use of improved drought- and heat-tolerant varieties, integrated pest management, water harvesting, investment in drainage and irrigation infrastructure, integrated soil and land management, and agroforestry, among others.⁴³ In the livestock sub-sector, CSA technologies and practices include the use of quality breeds, pasture improvement, use of forage banks, and adoption of conservation techniques for forage, silage, and hay. Many farmers in Belize are already practicing CSA to some degree, but more widespread adoption of CSA technologies has been hindered by a lack of information and technical knowledge, as well as by a lack of resources to pay for initial investment costs, as the

⁴³ Analytical work undertaken to inform the design of CRESAP evaluated 24 representative CSA packages deemed of potential interest to project beneficiaries. See Annex 2 for details.



economic benefits typically take several years to be realized. The Project will provide matching grants to partially finance CSA investment subprojects (the subprojects) promoting the uptake of CSA technologies and practices, which will be complemented by private loans from Participating Financial Intermediaries (PFIs) covering the financial assistance needed for the implementation of the CSA investment subprojects. Respective responsibilities will be set forth in the PFI Agreements to be signed between BSIF and PFIs. The matching grants will be provided via two windows, targeting different groups of farmers, with 30 percent of grants targeted to women farmers:

26. **Window 1: Smallholder farmers (IBRD: US\$10 million; PFIs: US\$6.6 million).** The first window will provide matching grants to about 3,300 individual smallholder farmers who are transitioning to commercial production to enable them to adopt climate-smart approaches. These grants will cover up to 60 percent of the investment cost of each subproject financed, with a maximum limit of US\$6,000 (corresponding to an investment of US\$10,000). Based on estimated investment, operating, and TA costs for smallholder farmers' subprojects, the overall expected average investment would be around US\$5,000 per subproject with an average matching grant of around US\$3,000. The matching grants will leverage financing from PFIs, and may also leverage contributions from smallholder farmers, although the latter will not be mandatory (see Annex 3).

27. **Window 2: Medium and Large Farmers and Farmers Organizations (IBRD: US\$6 million; PFIs: US\$11.6 million and beneficiary farmers: US\$2.5 million).** The second window will provide matching grants to medium and large commercial farmers and to groups of farmers (for a total of about 400 subprojects), with a view to supporting larger investments needed to adopt CSA approaches. These grants will cover up to 30 percent of the investment cost of each subproject, financed with a maximum limit of US\$30,000 (corresponding to an investment of US\$100,000). Based on estimated investment, operating, and TA costs for these types of subprojects, the overall expected average investment would be around US\$67,000 per subproject with an average matching grant of around US\$20,000. These matching grants made through the second window will leverage a larger financing share from PFIs and farmers, so the grant element will be reduced compared to Window 1, and beneficiary contributions will be required (see Annex 3 for a description of the matching grants mechanism).

28. **Subcomponent 2.3: Provision of selected strategic collective assets to strengthen resilience (IBRD: US\$2 million).** This subcomponent will finance technical studies, equipment and works to construct strategically selected infrastructure, collectively used, that will contribute to enhancing the climate-smart impacts of on-farm CSA investments. Examples include but are not limited to shared drainage infrastructure for low-lying, flood-prone areas (such as those commonly found in northern Belize); and small-scale, collective water-harvesting or land-use assets (where communities are interested in sharing a collective pond, pasture, or similar asset). This collectively used infrastructure will be identified based on existing MAFSE plans and on proposals drawn from consultations with farmers, including women farmers. Investments will be prioritized based on criteria and on a transparent selection process established in the Project Operations Manual (POM), that will include the estimated Economic Internal Rates of Return and the number of farmers, including women farmers, who will benefit from the increased climate resilience generated by the investments.

Component 3: Project Management, Monitoring and Evaluation (Total Cost, financed by IBRD: US\$3 million)

29. **This component will finance incremental and operating costs, goods and equipment for the Project Implementation Unit (PIU).** It will provide resources to enable the PIU to effectively carry out administrative, fiduciary management, planning, monitoring and evaluation (M&E), and reporting functions; to provide training as needed to PIU staff; and to ensure compliance with all applicable environmental and social standards. This component will also finance external audits, as well as a baseline assessment, the mid-term evaluation, and the end-of-Project assessment to document the Project's results and evaluate its outcomes and impacts. Additionally, the Project will help carry out strategic studies to be able to identify current constraints and limitations being faced by agri-business seeking enhanced market access, as well as opportunities to strengthen competitiveness



and improve exports. These will help to identify possible policy reforms and improvement in legal and regulatory frameworks, as well as to design mechanisms to support enhancing market access by private agri-business.

Component 4: Contingent Emergency Response Component (CERC) (US\$0 million)

30. **The CERC is a contingent financing mechanism which will permit Belize rapid access to World Bank support in the event of an eligible crisis or emergency.** The mechanism for triggering the CERC will be established in the CERC Operations Manual, detailing the applicable fiduciary, environmental and social, monitoring, reporting, and other implementation arrangements required for implementing the activities to be financed. In case of an event triggering the CERC, funds will be reallocated to this component to finance emergency purchases and activities, including goods, works, and technical assistance to respond to the emergency. The implementation agency for the CERC will be determined in the CERC Manual.

Key Considerations in the Project Design

31. **Climate change: A climate change and disaster risk screening has been completed, which concludes that the overall climate change and disaster risk to achieving project outcomes is Substantial.** The Project will contribute significantly to building climate resilience, and climate risk mitigation measures are embedded throughout the Project in the form of support for CSA technologies and practices (efficient irrigated agriculture, improved drainage, soil and water conservation, the adoption of drought-resilient crops, and so on). The Project will address climate vulnerabilities through project activities that address climate risks, build the capacity of institutions and communities to respond to climate change, and enhance the resilience of beneficiaries through access to technical and financial resources, while also reducing greenhouse gas emissions from the agriculture sector. Project activities will also contribute to climate change mitigation through the promotion of low-carbon agricultural practices (including agroforestry systems), improved livestock management (more production with a lower emissions ratio by production unit), and enhanced water harvesting. Indeed, GHG accounting analysis points to important potential mitigation gains from the Project (see paragraph 50 below).⁴⁴

32. **Private capital mobilization (PCM) is a core element of the Project, in line with the Bank's goals of Maximizing Finance for Development (MFD).** The Project will crowd in private sector financing for the adoption of CSA technologies and practices via the Climate-Smart Matching Grants Program under Subcomponent 2.2. It is estimated that the IBRD loan of US\$25 million will leverage an additional US\$18.2 million in financing from PFIs and US\$2.5 million from project beneficiaries, for a total of US\$20.7 million. This will be achieved by providing capacity building to PFIs and beneficiary farmers and by ensuring that matching grant proposals are technically and commercially sound per the requirements of the PFIs. The strengthening of public agricultural services (including e-extension services) and improved use of agro-meteorological information to inform investment decisions will also reduce risks and improve conditions for private capital mobilization.

33. **The Project will address some of the gender gaps that exacerbate the challenges that women farmers are already facing.** Women farmers bear greater household responsibilities, have less educational opportunities, and face greater restrictions in mobility in rural areas. These challenges will be taken into consideration in delivering training and technical assistance (including by women trainers) that will be tailored to women farmers' needs and constraints (see the Gender Action Plan in Annex 6).⁴⁵ In addition, the Project will address and reduce gaps in access to productive resources, including financial resources and technology to increase productivity and resilience, by targeting at least 30 percent of matching grants to women farmers; supporting women farmers with tailored capacity building for the design and implementation of the matching grant business proposals, and by

⁴⁴ See the Climate Risk and Adaptation Profile for Belize at: <https://climateknowledgeportal.worldbank.org/country/belize>.

⁴⁵ Beegle, Kathleen, and Eliana Rubiano-Matulevich (2020), "Adapting Skills Training to Address Constraints to Women's Participation." Jobs Note No. 7. World Bank, Washington, DC. <https://openknowledge.worldbank.org/handle/10986/33694>.



ensuring that the selected technologies are affordable and consider the time constraints that women face due to their other responsibilities. In addition, given women's vulnerability to GBV, CRESAP investments will examine whether investments could heighten the risks of Sexual Harassment and Sexual Exploitation and Abuse (SEA) and develop strategies to reduce these risks. The Project will also finance gender-sensitization training for public and private sector participants in CRESAP, include a Grievance Redress Mechanism (GRM) with a special channel for GBV, and require gender issues to be included in progress reports. In order to monitor progress in closing gender gaps, the results framework will include gender-disaggregated indicators for increased productivity and the adoption of improved technologies, as well as for the number of women participants trained, and for timely responses to grievances, including in relation to GBV.

34. **Citizen engagement has been a core aspect of project design and preparation and will remain essential throughout implementation to ensure that stakeholder feedback is integrated into project activities.** During preparation, consultations were held with potential beneficiaries, affected groups, and other interested parties, and their feedback influenced the project design, the Stakeholder Engagement Plan (SEP), and the GRM. The PIU will produce periodic reports on citizen engagement activities in collaboration with beneficiary communities. The reports will include feedback from beneficiaries on project implementation, beneficiary participation in the project, the grievances registered, if any, and whether/how they were addressed. An improved communication strategy will provide timely information and feedback that can be used to improve project performance. The citizen engagement process will continue to employ a variety of tools (focus groups, interviews, client surveys); digital communication channels (WhatsApp, Facebook, Messenger, Teams, Zoom, Webex, Google Meet, phone calls, text messages, etc.); and personal interactions (with strict regard for COVID-19 physical distancing rules) to reach various audiences and ensure opportunities for two-way dialogue and closing the feedback loop.

C. Project Beneficiaries

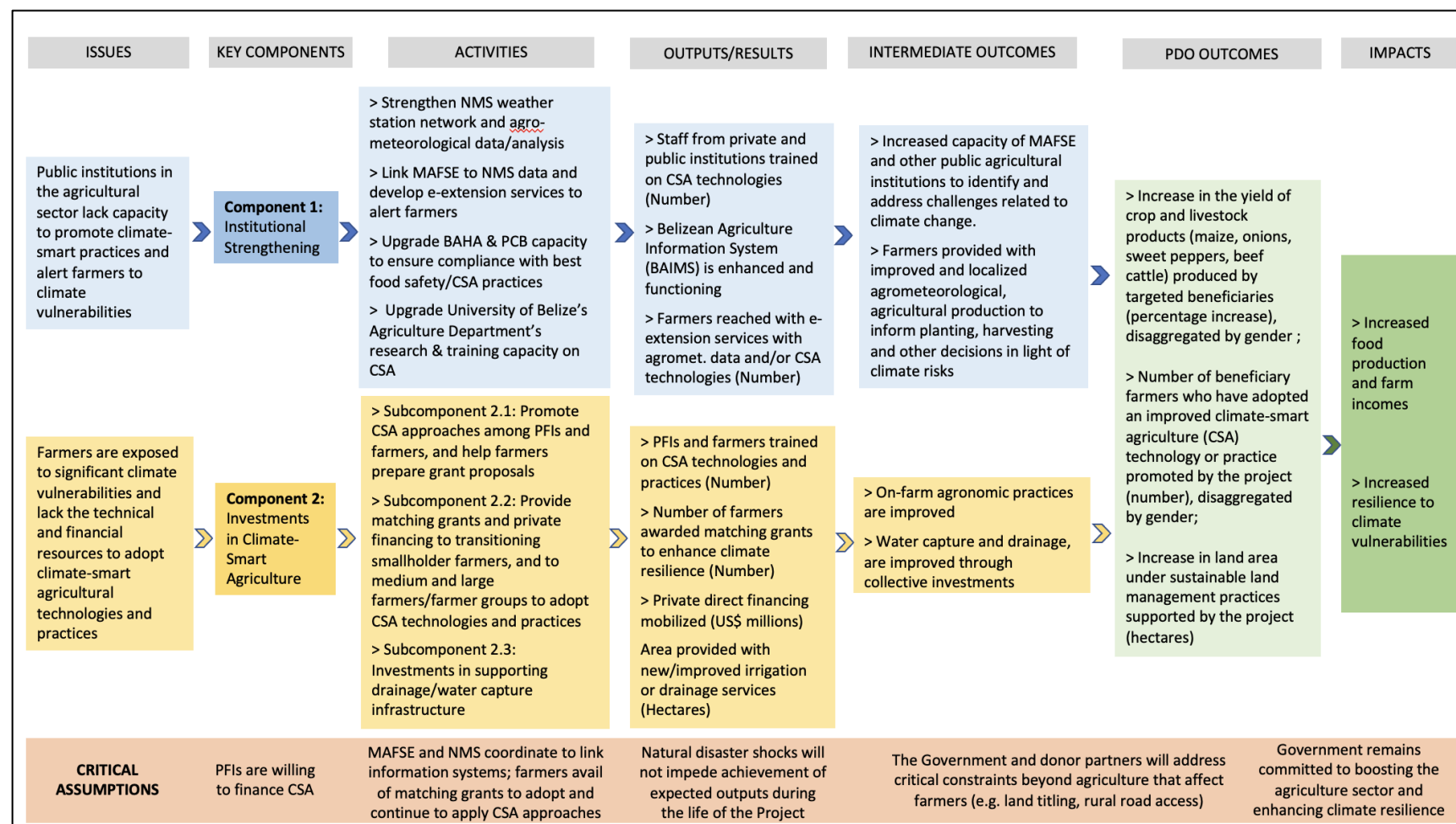
35. **The Project aims to benefit an estimated 7,300 beneficiaries directly.** The e-extension developed under Component 1 will reach around 7,000 farmers (i.e., around 70 percent of farmers registered in BAIMS) with agro-meteorological and other extension information. Matching grants provided under Subcomponent 2.2 are expected to benefit 3,700 farmers (3,300 small-scale farmers and 400 medium- or large-scale farmers and farmers in farmer groups), while infrastructure investments made under Subcomponent 2.3 are projected to benefit an additional 660 farmers. This would result in a total of 4,360 farm households (or 17,876 individuals, based on 4.1 family members per household) that are expected to benefit from investments made under the Project. The beneficiaries from the infrastructure investments and matching grants will be concentrated in the four northern Districts of Belize (Cayo, Orange Walk, Corozal, and Belize), because these Districts receive significantly less rainfall than the two southern Districts and have been subjected to severe drought conditions as a result of climate change. The beneficiaries under the matching grants (Subcomponent 2.2) will also benefit from technical support for preparing their matching grant proposals under Subcomponent 2.1, while the beneficiaries of both the matching grants and the infrastructure subcomponents (Subcomponents 2.2 and 2.3, respectively) will be among the beneficiaries of the e-extension services delivered under Component 1. In addition, a minimum of 220 individuals in public institutions under Component 1 and 80 individuals in PFIs under Subcomponent 2.1 will benefit from the capacity building and technical assistance, for a total of at least 300 beneficiaries, of whom an estimated 30 percent would be women. Therefore, the total number of direct beneficiaries that CRESAP is expected to reach are 7,300 heads of household, of whom 7,000 will be farmers. When all members of the beneficiary households are considered, a total of 29,000 individuals (6.9 percent of the country's population) will benefit from the Project, of whom about 28,700 will be members of farm households. As noted, CRESAP will aim for women farmers to be at least 30 percent of beneficiaries.



D. Results Chain

36. The Theory of Change for the Project is summarized in Figure 1.

Figure 1: Theory of Change





E. Project Costs and Financing

Table 1: Summary of Project Cost and Financing

Project Component	Project Costs (US\$ million)	IBRD Financing - Loan (US\$ million)	Counterpart Funding (US\$ million)
Component 1: Institutional Strengthening	2.9375	2.9375	0.0
Strengthening the Capacity of Relevant Government and Academic Institutions	2.9375	2.9375	0.0
Component 2: Investments in Climate-Smart Agriculture	39.7	19.0	20.7
Subcomponent 2.1: Strengthening the capacity of PFIs, individual farmers and farmer organizations participating in the CRESAP matching grants program	1.0	1.0	0.0
Subcomponent 2.2: Promotion of on-farm CSA technologies and practices via matching grants and leveraging of private capital	36.7	16.0	20.7
Subcomponent 2.3: Provision of selected strategic collective assets to strengthen resilience	2.0	2.0	0.0
Component 3: Project Management, Monitoring and Evaluation	3.0	3.0	0.0
Component 4: Contingent Emergency Response Component (CERC)	0.0	0.0	0.0
Front-End Fee:	0.0625	0.0625	0.0
TOTAL (US\$ million)	45.7	25.0	20.7

F. Rationale for Bank Involvement and Role of Partners

37. **The World Bank is well placed to support the Belizean agricultural sector in addressing the major development challenges associated with climate change.** Weather variability and climate change are already affecting Belize's agricultural sector: changes in rainfall distribution and the decline in cumulative rainfall, including the 2019 drought conditions, have reduced yields in rainfed agriculture and made them more volatile. As climate change continues, these conditions are likely to worsen, with negative effects both on food for local consumption and on Belize's main export crops. These challenges have been augmented by the supply chain disruptions occasioned by the COVID-19 pandemic. With its experience and its technical and financial resources, the World Bank can play an important role in building institutional capacity among Belize's agricultural institutions to facilitate a transition to more CSA approaches, restoring agricultural production with climate-smart technologies, and helping to build medium- to longer-term resilience to climate change in Belizean agriculture.

38. **CRESAP will complement support being provided by major donor partners for Belizean agriculture, namely IFAD and the Inter-American Development Bank (IDB).** IFAD is financing a Resilient Rural Belize Project that is focused on the poorest farmers, especially in southern Belize, i.e., those below the poverty line and those who are slightly above the poverty line (<25 percent) but vulnerable to poverty through climate shocks. In light of IFAD's support for subsistence smallholder farmers, MAFSE has requested the Bank to focus its support under CRESAP on non-subsistence smallholder farmers who are able to transition to commercial production. Moreover, CRESAP will complement the IFAD operation by focusing on the four northern Districts of Belize (Cayo, Orange Walk, Corozal, and Belize), which receive significantly less rainfall than the southern Districts and which have been subjected to severe droughts as a result of climate change. The IDB-funded Eco-Micro Project is developing financial products for CSA technologies with three of the nine credit unions in the country and strengthening the capacity of credit unions and the Belize Credit Union League. Thus, CRESAP will collaborate closely with the Eco-Micro Project by sharing training materials and expertise in developing bankable, climate-smart proposals, and by



opening opportunities for more credit unions to benefit from training and become PFIs serving CRESAP beneficiaries. The IFAD, IDB, and World Bank teams are exchanging detailed information on their respective operations and have agreed to work together in a coherent, synergistic manner.

G. Lessons Learned and Reflected in the Project Design

39. **An important lesson from earlier World Bank responses to disease outbreaks and natural disasters is that the most effective responses combine both short-term and medium/long-term measures.** In particular, the combination of short-term recovery responses with measures to strengthen resilience in the medium-/long-term have been shown to promote more sustainable development. Thus, CRESAP will provide technical and financial support to increase agricultural productivity while ensuring greater resilience via the adoption of CSA approaches.

40. **CRESAP's design, and especially of the CSA packages, draws on recent analytical work by the International Center for Tropical Agriculture (CIAT) and the World Bank to identify best-fit CSA practices and technologies for Belizean producers.** This analytical work highlights that a combination of public sector engagement (including via research, extension, and capacity building) and support for private investment is often needed to support the uptake of CSA and identifies optimal CSA practices and technologies for Belizean farmers (see Annex 2). It finds that matching grants can play a critical role in promoting transitions to CSA technologies and in mobilizing private finance. This can also be seen from the highly relevant and positive experience of the IDA-financed series of COMRURAL operations in Honduras.⁴⁶ Thus, the climate-smart matching grants program is a key component of the Project. Similarly, strengthening information systems can empower policymakers to make evidence-based decisions on climate change adaptation for the agricultural sector.

41. **The Project will incorporate lessons from recent projects in the agricultural sector in Belize, including the Belize Rural Finance Programme, co-financed by IFAD and the Central American Bank for Economic Integration.** Based on the challenges encountered in the Belize Rural Finance Programme, CRESAP will draw on capacity in the Belize Social Investment Fund (BSIF), which has gained experience in implementing Bank-financed projects, for the implementation of CRESAP.

42. **Lessons from various projects around the globe have influenced the design of the matching grant program that will be implemented via CRESAP.** These include: separate windows for farmers in different categories (based on farm area and income); higher proportions of grant funds for smallholder farmers than larger commercial farmers; two-stage evaluation of proposals to assess their technical soundness and their financial viability; evaluation of proposals using a transparent procedure implemented by a committee comprising a range of key skills and interests; the possibility of distributing a portion of the matching grant only after the beneficiary has established a repayment track record, to incentivize loan repayments to PFIs; providing TA for beneficiaries before and during implementation of the grants, and addressing PFIs' lack of knowledge of agriculture.⁴⁷

III. IMPLEMENTATION ARRANGEMENTS

A. Institutional and Implementation Arrangements

43. **MAFSE will maintain overall responsibility for the implementation of CRESAP, but will be assisted by the Belize Social Investment Fund (BSIF).** Based on recent and ongoing experiences in Belize with similar projects, MAFSE has opted for the continuation of the current implementation arrangements with BSIF under ongoing

⁴⁶ COMRURAL (P101209, US\$23 million, approved in 2008); COMRURAL Additional Financing (AF - P158086, US\$48 million, approved in 2017); COMRURAL II (P168385, US\$75 million, approved in 2019) and COMRURAL III (P174328, US\$100 million, approved in 2021).

⁴⁷ See: <https://openknowledge.worldbank.org/bitstream/handle/10986/33829/How-Can-Matching-Grants-in-Agriculture-Facilitate-Access-to-Finance-Lessons-Learned-from-World-Bank-Group-s-Experience.pdf?sequence=1&isAllowed=y>



operations, in light of its significant experience implementing Bank-financed projects. Under this approach, MAFSE will sign a Subsidiary Agreement with BSIF (as a Condition of Effectiveness), by which BSIF will establish and maintain a PIU for the Project to coordinate and manage all Project activities, manage the Designated Account to cover all eligible expenditures, generate technical and financial reports and submit such reports and withdrawal requests to the Bank. BSIF will assign technical and fiduciary staff (involved in procurement, FM, accounting, reporting, environmental and social risk management, and M&E) with clear responsibilities for these areas during CRESAP's entire implementation period. This BSIF PIU will be directly responsible for implementing all components of the Project. In the case of Subcomponent 2.2, the PIU will select and enter into agreements (the PFI Agreements) with highly qualified Participating Financial Institutions (PFIs) with experience and current penetration in the rural sector to provide resources to project beneficiaries for financing CSA investment subprojects. A Matching Grant Approval Committee (MGAC) will approve these CSA investment subprojects and BSIF will transfer the approved grant amounts to the PFIs. These PFIs will provide complementary financing by providing loans to these beneficiaries (under their normal lending procedures and terms) and will disburse the grant and the loan amounts to the beneficiaries. PFIs will sign a Participation Agreement with each beneficiary of the CSA investment subprojects (or their representatives in case of groups or associations of beneficiaries) before disbursing the grants and loans.⁴⁸ The PIU will be responsible for the coordination and monitoring of all project activities to ensure comprehensive and seamless monitoring, evaluation, and reporting arrangements for CRESAP (see Annex 1). Project funds will be executed by the BSIF PIU once the Subsidiary Agreement has been signed with MAFSE and the PIU has been established with appropriate staff, satisfactory to the Bank.

44. For the operation of the PIU, BSIF will competitively select a Project Coordinator to head the PIU with solid knowledge on agricultural development and significant experience in internationally funded projects (preferably Bank-funded projects). MAFSE will also appoint a Deputy Project Coordinator who must be also fully knowledgeable on Belize's agricultural sector and with experience in implementation of Bank-funded projects, ensuring MAFSE's full engagement and participation in daily decision-making process and progress monitoring. Both appointments will have to be under Terms of Reference, and with qualifications and experience, satisfactory to the Bank and both appointments shall take place not later than sixty (60) days after the date of Effectiveness (Dated Covenant). BSIF will also recruit other technical specialists to be able to perform all activities under the Subsidiary Agreement effectively and efficiently, and in accordance with the POM and the Loan Agreement.

45. **Operations Manuals.** A comprehensive Project Operations Manual (POM), in form and substance satisfactory to the Bank, shall be prepared and adopted by MAFSE with the assistance of BSIF, not later than sixty (60) days after the Effective Date (Dated Covenant). Additionally, a Matching Grant Operations Manual (MGOM) that is satisfactory to the Bank, shall be prepared by MAFSE with assistance from BSIF and shall be incorporated as part of the POM (as a Condition of Disbursement for Category 2).

46. **A Climate-Smart Matching Grant Approval Committee (MGAC) will be established to review and approve the matching grants under Subcomponent 2.2, with support from PFIs.** The establishment of this Committee is a Disbursement Condition for loan proceeds under Category 2 of the loan. The MGAC will comprise *ex officio* technical experts, notably from MAFSE, BSIF, and other relevant public institutions, and representatives from PFIs, who will participate in decisions related to proposals submitted for their institution's financing, and it will be supported technically by the PIU. PFIs will contribute analyses of the financial and environmental and social soundness of proposals, while the technical soundness will be assessed by the technical experts on the Committee.

⁴⁸ If a Beneficiary applies successfully for a grant from MGAC but does not want a loan from a PFI because they want to self-finance the investment (with grant support), the PFI selected by BSIF to undertake the review of the financial viability of the Beneficiary's proposal will sign a Participation Agreement with the Beneficiary of the CSA investment subproject (or their representatives in case of groups or associations of beneficiaries) and BSIF will subsequently transfer the grant approved by the MGAC to the Beneficiary's account opened by the PFI for the purpose of receiving the grant for the CSA investment subproject.



Matching grants will be approved for proposals that receive financial, technical, and environmental and social approvals. The implementation arrangements for Subcomponent 2.2, including evaluation criteria and flow of funds will be specified in the POM and in the Matching Grant Operations Manual (MGOM) (see further details in Annexes 2 and 3).

47. **Overall guidance for the Project will be provided by a Project Steering Committee (PSC).** The PSC will be chaired by the Chief Executive Officer of MAFSE and will comprise representatives of the public sector entities involved in implementing the Project (MAFSE, BSIF, NMS, BAHA, PCB, BMDC, and the Agriculture Department of the University of Belize), as well as of the Ministries of Finance, Economic Development and Investment and of Sustainable Development, Climate Change and Disaster Risk Management.

48. **CRESAP will apply a 'do-no-harm' approach to implementation in the context of the COVID-19 pandemic.** In line with the practice adopted in the CERC triggered under the CRIP Project (IDA 8416), all activities supported under the Project will be subject to strict health measures to prevent the spread of COVID-19, following procedures detailed in CRESAP's POM. Key measures include the significant expansion of e-extension services, applying safety measures at all project events/activities, including ensuring the use of masks, temperature measurements and maintenance of physical distancing, and hygiene measures for vehicles and meeting locations (see Annex 1 for details on Bank supervision arrangements under COVID-19).

B. Results Monitoring and Evaluation Arrangements

49. **The PIU will be responsible for overall project monitoring and reporting.** The PIU will develop the project M&E Manual, which will be included in the POM and will specify, *inter alia*, roles and responsibilities for M&E; Results Framework indicators and methodologies to calculate them;⁴⁹ and formats for project reports. The PIU will gather baseline data, generate overall progress reports every six months, prepare a progress report for the Mid-Term Review, and coordinate a final evaluation at the end of the Project.⁵⁰ The PIU will also manage CRESAP's grievance reporting mechanism. CRESAP's M&E system will enable progress to be assessed against stated objectives as well as the Project's cost-effectiveness. The web-based M&E platform will permit CRESAP to systematically record, aggregate, generate, analyze, and report quantitative and qualitative data from various implementation levels (regions and Districts, e.g., District Agricultural Coordinators) in real time. Some of the monitoring data will be collected using KoBo Toolbox (with questionnaires and content developed by the PIU with regard to outcome and results indicators) and integrated with the M&E platform (see details on M&E in Annex 1). Additional qualitative evaluations could be conducted with regard to gender impacts, extension services and the adoption of CSA technologies and practices, based on guidance from the PSC. The Project will also use the Iterative Beneficiary Monitoring (IBM) approach, which is a feedback mechanism that collects qualitative information about deliverables on regular basis through existing survey mechanisms directly from beneficiaries and produces frequent brief reports that can be useful for identifying emerging issues on the ground.

C. Sustainability

50. **The Project will contribute to creating a more productive and resilient agricultural system via capacity building and investments that can sustain rural transformation towards CSA beyond project implementation.** The economic, social, environmental, and institutional sustainability of the Project is built into CRESAP's design:

- (i) **Economic and social sustainability.** Enhanced agricultural productivity and resilience to natural disasters as a result of the adoption of CSA technologies and practices will make beneficiaries' agricultural activities more profitable. The application of measures identified in the Environmental and Social Management

⁴⁹ Including the methodology for calculating each indicator.

⁵⁰ The final evaluation process will analyze the Project's relevance, efficacy, efficiency, and sustainability.



Framework (ESMF) and targeting of women farmers will strengthen social sustainability. Moreover, the long-term sustainability of the activities of beneficiary farmers will be reinforced through capacity building and technical assistance, while support for enhanced financing of CSA by PFIs will lay the foundation for financially sustainable CSA investments beyond the timeframe of the Project.

- (ii) **Environmental and eco-system sustainability.** Environmental and eco-system sustainability will be ensured by specific measures identified in the ESMF. Subproject investments under Subcomponent 2.2 will promote CSA technologies and practices that will reduce the environmental footprint of agriculture, reduce Greenhouse Gas (GHG) emissions, and promote the climate resilience of key agricultural products. Component 1 will enhance the capacity of key public agricultural institutions to support and promote climate adaptation and mitigation, both among project beneficiaries and at a systemic level. The on-farm adoption of CSA technologies and practices, supported by selected, collective strategic rural infrastructure investments, will promote ecosystem preservation, contribute to climate change mitigation, and reduce the vulnerability of beneficiary households (especially the poorest) to climate change and natural disasters.
- (iii) **Institutional sustainability.** The enhanced capacities of the key public agricultural institutions, together with strengthened agricultural information and extension systems, and with increased knowledge and financing of agriculture by PFIs, will lay the foundation for sustained capacity to support the expanded adoption of CSA approaches even after the Project ends.

IV. PROJECT APPRAISAL SUMMARY

A. Technical, Economic and Financial Analysis

Technical analysis

51. **The Project has been designed to ensure efficient, sustainable, and equitable agricultural recovery by improving productivity as well as economic and climate resilience.** To address the lack of institutional capacity to improve efficiency and climate resilience in the agricultural sector, MAFSE and related government bodies will be trained and equipped to respond more effectively to these imperatives. Sectoral information systems will be improved and developed to support their coordinated efforts. The Project will also work with PFIs to enhance their knowledge and financing of CSA technologies and approaches. Farmers will be supported to better respond to climate change impacts in agriculture.

52. **Component 2 will encourage the private sector to assume a more prominent role in promoting CSA technologies and practices.** Technical solutions will be provided to: (i) increase the climate resilience of Belizean agriculture; (ii) widen access to water for agriculture through enhanced water management approaches that optimize water-use efficiency; (iii) create conditions for crop diversification, including the introduction of higher-value crops and/or increased land-use intensity (through double cropping, intercropping, the use of high-yielding varieties, and other practices), thereby also improving nutrition levels; and (iv) reduce inefficient use of purchased agricultural inputs. Technical solutions will include gender-sensitive CSA technologies, in particular technologies for women that are affordable, accessible, and adapted to their needs, including the need to reduce labor.

Economic and financial analysis

53. **The economic analysis uses a cash flow model over a 20-year period that includes all investment and operational costs of the CRESAP CSA investment subprojects, as well as the incremental net revenues derived from the financial models.** CIAT has developed 24 CSA packages that are a realistic, representative mix of CSA investment subprojects that could be financed under CRESAP. The economic and financial analysis (EFA) focused on eight packages that small and medium farmers in the project areas are considered most likely to adopt (see



Annex 4 for details). The analysis assumes that any increase in incomes resulting from the Project will depend largely on farmers' adoption of the CSA packages promoted by CRESAP, along with infrastructure developed through the Project to improve production (especially water for agriculture) and market access. Finally, as Belize currently imports horticultural products during the winter, it is reasonable to assume that increased horticultural production facilitated through project interventions will reduce imports, resulting in foreign exchange savings. The economic analysis considers all project costs that will contribute to the success of project activities. The analysis assumes a failure rate of 30 percent for investment subprojects to adopt CSA packages, based on results from similar projects in the region.

54. **The EFA indicates that the project is justified on economic grounds, with an economic internal rate of return (EIRR) for the base case scenario of 16.3 percent and a net present value (NPV) of US\$5.9 million, at a discount rate of 12 percent.** Moreover, sensitivity analysis suggests that the Project would remain economically viable even with a reduction in benefits of up to 24 percent or increase in costs of up to 31 percent.

Table 2: Results of the economic analysis and sensitivity analysis for the base case scenario, CRESAP

Base case scenario	Project Benefits					Project Costs		Delay in benefits	
	-30%	-20%	-10%	+10%	+20%	+10%	+20%	1 year	2 year
16.3%	10.6%	12.6%	14.5%	17.9%	19.5%	14.7%	13.3%	13.7%	11.7%
						Total costs		Total benefits	
Switching values						31%		-24%	

55. **In accordance with the World Bank Environmental Strategy and Climate Action Plan, the carbon balance of the Project was evaluated and integrated into the economic analysis.** Over the 20-year-period of the analysis, CRESAP will lead to a net reduction in emissions of 1,076,668 tons of carbon dioxide equivalent (tCO₂e). This net reduction in emissions arising has been valued at low and high carbon shadow prices and included in the economic analysis⁵¹ to complement the base case scenario. Under the low carbon price (LCP) scenario, the economic internal rate of return (EIRR LCP) increases to 26.2 percent, while the economic net present value (ENPV LCP) rises to US\$22.7 million. The switching value for costs is 116 percent and the switching value for benefits is -54 percent. Under the high carbon price (HCP) scenario, the economic rate of return (EIRR HCP) increases to 34.3 percent, the economic net present value (ENPV HCP) rises to US\$39.5 million, the switching value for costs is 201 percent, and the switching value for benefits is -67 percent. Table 3 summarizes the economic indicators for these scenarios.

56. Table 3: Summary of economic indicators: Baseline, LCP, and HCP scenarios, CRESAP

Indicator	Baseline	LCP	HCP
EIRR (%)	16.3%	26.2%	34.3%
ENPV (USD)	5,916,007	22,723,315	39,515,543
Switching value for costs (%)	31%	116%	201%
Switching value for benefits (%)	-24%	-54%	-67%

57. **In the medium to long term, the Project is expected to have a substantial positive fiscal impact,** mainly due to: (i) increased output, income, and employment, resulting in increased tax revenues; and (ii) multiplier effects due to increased economic activity in the targeted area—and emulation of project beneficiaries by non-project beneficiaries using their own funds—resulting in increased demand for goods and services, which is expected to generate additional income and employment effects. Furthermore, because Belize is currently a net

⁵¹ As per World Bank (2017), "Guidance note on the shadow price of carbon in the economic analysis." Washington, DC. September.



importer of vegetables and staple foods during the winter, substantial foreign exchange earnings/savings can be expected as increased production of locally grown vegetable and staple crops substitutes for imports.

B. Fiduciary

Financial Management (FM)

58. **BSIF will be responsible for managing the FM and disbursement arrangements for CRESAP under the overall guidance of the Ministry.** BSIF has experience with implementing Bank-financed projects, including the recently closed Climate Resilient Infrastructure Project (IDA 8416), with satisfactory performance in FM. An FM assessment of BSIF carried out during project preparation identified two main FM risks related to CRESAP: (i) responsibility for implementing CRESAP will be ensured by BSIF (which is already in charge of several projects and will also be responsible for the fiduciary functions of CRESAP) with support from MAFSE (which will be responsible for the technical aspects of the Project) as specified in the Subsidiary Agreement to be signed between MAFSE and BSIF; and (ii) the Climate-Smart Matching Grant Program implies risks related to assessing the capacities of the PFIs, defining the beneficiary eligibility criteria, and managing the grant application process (including appraisal and approval of applications), flow of funds, financial reporting, and auditing arrangements, all under the guidance of the Ministry.

59. **Several measures have been agreed upon to mitigate the identified FM risks.** MAFSE will sign a Subsidiary Agreement with BSIF to clarify their roles and responsibilities with respect to CRESAP. BSIF will strengthen its FM capacity by hiring an accountant who will be fully dedicated to CRESAP. It will also update its accounting system to properly record and report CRESAP transactions and prepare a POM covering all CRESAP activities. MAFSE and PFI staff will be trained on Bank fiduciary requirements. CRESAP will also develop a detailed Matching Grants Operations Manual to define the grant program's design, internal control arrangements, flow of funds, financial reporting requirements, and auditing arrangements. The adoption of the Matching Grants Operations Manual will be a Condition for Disbursement under Subcomponent 2.2. In addition, legally enforceable agreements shall be signed between BSIF and the PFIs ("PFI Agreements"), prior to the PFIs' participation in the Project, clarifying their respective roles and responsibilities for implementing Subcomponents 2.1 and 2.2.

60. **Administration, accounting, and financial reporting procedures for CRESAP will be set up in compliance with Bank requirements.** BSIF uses the cash basis accounting method for preparing financial statements and will use QuickBooks computerized accounting software to record and report financial transactions related to project activities. Disbursement will be based on unaudited interim financial reports (IFRs), which BSIF will submit to the WBG within 45 days following each calendar semester. The IFR format and content will be specified in the Disbursement and Financial Information Letter (DFIL) and generally will include a short narrative of major project achievements for the period, the sources and uses of project funds, bank reconciliation statements, procurement tables, and a separate section on Matching Grants. BSIF will consolidate financial statements received from PFIs and include a consolidated report with each IFR. BSIF will also prepare and submit to the Bank annual audited financial statements, including the sources and uses of project funds, a detailed analysis of project expenditures, a schedule of withdrawal applications presented during the year, a reconciliation of the Designated Account (DA), and notes to the financial information. The external audit terms of reference will be expanded to include a separate section of the audit of the operations, resources and expenditures related to the activities financed with each Matching Grant and verify compliance with the Project's Matching Grant Manual. The audited financial statement will be submitted to the Bank within six months after the end of the fiscal year.

61. **Disbursement Arrangements and Flow of Funds for CRESAP will be streamlined to facilitate execution, avoid unnecessary incremental operational arrangements, and rely as much as possible on the existing FM system.** Disbursement of project funds will be processed in accordance with Bank procedures as stipulated in the



DFIL and in the Disbursement Guidelines for Investment Project Financing, dated February 2017. The following disbursement methods will be available: advance, reimbursement, direct payment, and special commitment as defined in the DFIL. Advances will be processed to a segregated DA denominated in US dollars, held at the Central Bank of Belize. Funds will be transferred periodically from the DA to a project account denominated in local currency and managed by BSIF. The Project will report on the use of the advances through IFRs, showing the actual expenditures incurred by category of expenditure and project component and subcomponent. Flow of funds arrangements for the matching grants are described under the implementation arrangements for the matching grants (Annex 3).

C. Procurement

62. **Procurement for the Project will be carried out using the World Bank Procurement Regulations for IPF Borrowers, dated November 2020.** World Bank-accredited procurement staff conducted an assessment of procurement risk and management capacity at BSIF and MAFSE, in line with the Procurement Risk Assessment and Management System. Measures to mitigate risks associated with procurement include: (i) designating BSIF as the Project Implementing Agency, given its significant experience with other Bank-financed projects; (ii) creating an action plan to strengthen its procurement capacity; and (iii) training BSIF staff, and relevant MAFSE staff as needed, on Bank procurement methods and requirements. A Procurement Plan for the first 18 months of project implementation was prepared using the World Bank Systematic Tracking of Exchange in Procurement (STEP) system, after preparation of the Project Procurement Strategy for Development (PPSD). Annex 1 provides additional information on procurement arrangements.

D. Legal Operational Policies

	Triggered?
Projects on International Waterways OP 7.50	Yes
Projects in Disputed Areas OP 7.60	Yes

63. **Project on International Waterways (OP 7.50): Project activities under Component 2 will be carried out in four northern Districts (Belize, Cayo, Corozal, and Orange Walk) and rely on water from two international watersheds, namely the Rio Hondo and Belize River, which are considered international waters as defined in paragraph 1 of OP 7.50.** The Project will not invest in new irrigation schemes fed by river water or alluvial aquifers. Rather, project activities will include small-scale investments in CSA technologies and in small-scale, collective rural infrastructure to increase water-use efficiency. Investments in additional irrigated areas will be limited to water from small-scale water-harvesting investments, and none of the project investments will interfere with or affect runoff from surface water sources such as streams or rivers, nor are they expected to adversely affect water quality. Thus, an exception to the riparian notification requirement based on Paragraph 7 (a) was approved by the Regional Vice President for Latin America and the Caribbean on September 15, 2021.

64. **Projects in Disputed Areas (Policy OP): This policy applies to the Project because of the longstanding territorial dispute between Belize and Guatemala.** Some parts of the four Districts mentioned above fall within the general area under dispute. In line with OP 7.60, the Bank has ensured compliance with the requirements of the policy and notified the Project to Guatemala. Given that the Bank considers that the execution of the Project is not prejudicial to the interests of Guatemala and that the Bank does not intend to pass any judgment with regard to the legal status, nor any other status in reference to the territories concerned and does not intend to



prejudice or influence the final decision of the International Court of Justice regarding the claims of Guatemala and Belize, Guatemala has no objection to the Project.

E. Environmental and Social

65. **The Environmental and Social Risk Classification (ESRC) under the Bank's Environmental and Social Framework (ESF) is Moderate.** The Project is expected to yield overall positive environmental and social benefits by increasing agricultural productivity and supplying agricultural commodities more reliably in an environmentally and socially sustainable manner. At the same time, project activities will potentially be accompanied by moderate environmental and social risks, depending on the location, type, sensitivity, and scale of project interventions, the nature and magnitude of the potential risks and impacts, and Borrower capacity and ownership. The Bank documents its due diligence assessment of the Project's potential environmental and social risks in the Environmental and Social Review Summary. All ten Environmental and Social Standards (ESSs) of the ESF are relevant for the Project. The requirements set out in the ESF also apply to the technical assistance activities to be financed under CRESAP.

66. **The environmental risk classification is Moderate.** The key environmental risks that were identified include: (i) release and management of solid and hazardous waste associated with infrastructure works; (ii) pollution of creeks, rivers, wetlands, and groundwater from pesticides and fertilizers; (iii) nuisance related to noise and air emissions from project interventions, including current agricultural practices, such as slash and burn in sugarcane production; (iv) occupational health and safety of workers and supervisors of on-farm works and infrastructure works; and (v) community health and safety from on-farm works, machinery, and infrastructure.

67. **The social risk classification is Moderate.** The key social risks include: (i) works may result in limited land acquisition and economic displacement, including loss of assets or access to assets from works; (ii) community-level water harvesting structures may require voluntary land donations from farmers; (iii) there are risks in working in remote rural areas, including in indigenous communities; and (iv) child labor is a risk as some traditional Mennonite farmers engage family labor from the ages of 14-16.

68. **As the Belize Social Investment Fund (BSIF) has experience working with World Bank projects and the old safeguards, BSIF will be responsible for environmental and social risk management during CRESAP's entire implementation.** To manage this, BSIF will hire one social and one environmental specialist and work in close coordination with the MAFSE Environmental and Social Coordinator. MAFSE has prepared the required environmental and social instruments under the ESF with the help of a consultant. These instruments describe procedures, assessments, mitigation measures, and monitoring actions to ensure that the potential environmental and social risks and impacts are adequately addressed in a manner acceptable to the Bank. MAFSE's and BSIF's capacity to manage environmental and social risk will be strengthened via: (1) training, (2) hiring staff within the PIU with expertise in environmental and social risk assessment and management, and (3) seeking technical support from the Ministry of Sustainable Development, Climate Change and Disaster Risk Management, which has experience in managing Bank projects that apply the old safeguard policies.

69. **MAFSE, through the BSIF PIU, will manage all project components and will oversee the PFIs that will channel matching grant resources to recipients under Subcomponent 2.2.** As financial institutions in Belize have limited experience and capacity in managing environmental and social risks, the capacity of PFIs will be strengthened by providing support to develop and implement Environmental and Social Management Systems (ESMS), providing targeted and in-depth training under Subcomponent 2.1, facilitating exchanges with PFIs that have experiences in implementing ESMSs, and by tapping into the knowledge and networks of other projects geared toward greening the private sector. The environmental and social instruments that MAFSE has



prepared describe procedures, assessments, mitigation measures and monitoring actions to ensure that the potential environmental and social risks and impacts are adequately addressed in a manner acceptable to the Bank.

70. **MAFSE has developed an Environmental and Social Management Framework (ESMF).** The ESMF describes the environmental and social procedures for subprojects to follow once the specific locations and the nature of activities are known. In addition to covering Subcomponent 2.3 on collective investments, the ESMF also covers Component 4 on the CERC. A draft Stakeholder Engagement Plan (SEP) has been prepared and includes a grievance mechanism (GM) with a special channel for GBV-related complaints. The Borrower conducted stakeholder consultations. In addition to the ESMF and SEP, MAFSE has prepared, consulted upon the following documents: (i) Resettlement Policy Framework (RPF), where complaints will be addressed through the project-level GRM described in the SEP; (ii) Labor Management Procedure (LMP), with its GRM; and (iii) Indigenous People Planning Framework where complaints will be addressed through the project-level GRM described in the SEP. The E&S instruments were disclosed in-country and on the Bank's website before project appraisal on November 22, 2021. The E&S instruments will be finalized and redisclosed no later than 30 days after the Effective date of the Project. Further to that, MAFSE will complete a Social Assessment and an ESMS guideline 90 days after Project Effectiveness. The PFIs will prepare/update and adopt an ESMS acceptable to the World Bank prior to disbursing the first funds to beneficiaries under the PFI subprojects. The Environmental and Social Commitment Plan (ESCP) was agreed upon and negotiated with the Government of Belize. It sets out risk mitigation measures, actions, and responsible parties required for the Project to achieve compliance with relevant ESSs over a specified timeframe. The World Bank will review the ESRC on a regular basis throughout the project life cycle to ensure that it continues to accurately reflect the level of risk the Project presents.

71. **CRESAP will incorporate specific gender actions to ensure that women farmers benefit fully from the Project's technical assistance and green investments.** CRESAP's implementation strategy will include identification of gender gaps to be addressed; integration of gender equity at all levels of implementation; gender-sensitization training for staff in participating institutions; inclusion of specific activities for women to obtain project services and resources, and the identification and dissemination of accessible and affordable technologies that meet women's requirements, including the need to reduce agricultural labor, with a view to addressing identified gender gaps. Thirty percent of the beneficiaries of matching grants and collective goods will be women farmers. To measure progress against the Project's Development Objectives and in addressing gender gaps, notably in terms of women's access to agricultural services and resources, the Results Framework will measure the increase in yields on women beneficiaries' farms and the number of beneficiary women farmers who have adopted an improved climate-smart agricultural technology or practice promoted by the Project (see Annex 6 for details on the Gender Action Plan).

V. GRIEVANCE REDRESS SERVICES

72. **Communities and individuals who believe that they are adversely affected by a World Bank-supported project may submit complaints to existing project-level grievance redress mechanisms or the Bank's Grievance Redress Service (GRS).** The GRS ensures that complaints received are promptly reviewed in order to address project-related concerns. Project-affected communities and individuals may submit their complaint to the World Bank's independent Inspection Panel, which determines whether harm occurred, or could occur, as a result of World Bank non-compliance with its policies and procedures. Complaints may be submitted at any time after concerns have been brought directly to the World Bank's attention, and Bank Management has been given an opportunity to respond. For information on how to submit complaints to the World Bank's corporate Grievance Redress Service (GRS), please visit <http://www.worldbank.org/en/projects-operations/products-and->



services/grievance-redress-service. For information on how to submit complaints to the World Bank Inspection Panel, please visit www.inspectionpanel.org.

VI. KEY RISKS

73. **The overall risk for the Project is *Moderate*.** Most risks to the Project are considered Moderate, with the exception of Macroeconomic risks and “Other” risks (related to COVID-19 and climate vulnerability) that are considered Substantial, even after mitigation measures are considered. Consequently, the overall level of risk is Moderate. These risks, along with measures to address them, are discussed below.

74. **Macroeconomic risk to the Project is *Substantial*.** COVID-19 and the resulting economic crisis led to a contraction in real GDP of 14 percent in 2020. Although the recovery initiated in 2021 is expected to result in GDP growth of 9 percent, to a great extent it will depend on the recovery of tourism, upon which approximately 40 percent of the Belize economy relies. At 98 percent of GDP, public debt was high prior to the crisis, but soared to 132 percent of GDP in 2021, before a debt restructuring concluded in November 2021 reduced it by 12 percentage points.⁵² Macroeconomic vulnerabilities challenge the Government's capacity to finance resilient agricultural development and affect the enabling environment for project-supported investments. The Project will mitigate these risks by financing 100 percent of investments together with PFIs and project beneficiaries (requiring no Government financing) and by careful assessments and sensitivity analyses for project-supported investments.

75. **Other Risk related to the COVID-19 pandemic is *Substantial*.** COVID-imposed restrictions on physical movements of people and goods are among the main reasons for the recent decline observed in the agriculture sector. The impact of COVID-imposed restrictions will be partly mitigated in the Project via the use of local agro-suppliers to provide farmers with agricultural inputs. CRESAP activities will include hygiene and sanitary protocols in line with national regulations, international good practice and procedures for virtual and remote consultation.⁵³ In addition, Belize has sought financial assistance from the Bank for a proposed operation, which is under preparation, that will be dedicated to helping Belize respond to the COVID-19 pandemic.⁵⁴

76. **Other Risk related to climate vulnerabilities is *Substantial*.** Belize is one of the most vulnerable small countries in the world to natural disasters and climate change, and climate-related hazards have highly destructive impacts on crops, livestock, landscapes, livelihoods, and lives in the country. Major storms and hurricanes cause extensive flooding damage, while the northern Districts targeted under CRESAP are also the most vulnerable Districts in Belize to drought conditions. Alternating drought and flood conditions could present major risks to increasing agricultural productivity under the Project. Climate vulnerabilities will be mitigated by supporting the adoption of CSA and resilience-enhancing landscape management practices and by strengthening institutional capacity to respond to climatic impacts. Moreover, the Project provides for a CERC in the event of an eligible emergency. Nevertheless, risks from climate vulnerabilities will remain substantial.

⁵² See <https://www.imf.org/en/Publications/CR/Issues/2021/06/07/Belize-2021-Article-IV-Consultation-Press-Release-Staff-Report-and-Statement-by-the-50198> and the Economist Intelligence Unit: Country Report - Belize, generated on November 3, 2021. As part of the debt restructuring deal, Belize agreed to double the percentage of its ocean attributed to Biodiversity Protection Zones, up from 15.9 percent to 30 percent, and to allocate significant resources for promoting the growth of the country's blue economy.

⁵³ World Bank (March 2020), *Technical Note: Public Consultations and Stakeholder Engagement in WB-supported operations when there are constraints on conducting public meetings March 20, 2020*. See: https://biwta.portal.gov.bd/sites/default/files/files/biwta.portal.gov.bd/page/f3ca1ff6_95b0_4606_849f_2c0844e455bc/2020-10-01-11-04-717aa8e02835a7e778b2fff46f531a8c.pdf

⁵⁴ The proposed operation is the Belize COVID-19 Emergency Response Project (P177987).



VII. RESULTS FRAMEWORK AND MONITORING

Results Framework

COUNTRY: Belize

Climate Resilient and Sustainable Agriculture Project

Project Development Objectives(s)

The Project Development Objectives are to: (i) increase agricultural productivity and the adoption of climate-smart agricultural approaches among project beneficiaries; and (ii) respond effectively to an Eligible Crisis or Emergency event.

Project Development Objective Indicators

Indicator Name	PBC	Baseline	Intermediate Targets				End Target
			1	2	3	4	
Increase the yield of crops and livestock products							
Increase yield of maize produced by targeted beneficiaries (Percentage)		0.00	2.00	4.00	6.00	8.00	10.00
by female beneficiaries (Percentage)		0.00	2.00	4.00	6.00	8.00	10.00
Increase yield of onions produced by targeted beneficiaries (Percentage)		0.00	2.00	5.00	10.00	15.00	20.00
by female beneficiaries (Percentage)		0.00	2.00	5.00	10.00	15.00	20.00
Increase yield of sweet peppers produced by targeted beneficiaries (Percentage)		0.00	2.00	5.00	10.00	15.00	20.00



Indicator Name	PBC	Baseline	Intermediate Targets				End Target
			1	2	3	4	
by female beneficiaries (Percentage)		0.00	2.00	5.00	10.00	15.00	20.00
Increase yield of beef cattle produced by targeted beneficiaries (Percentage)		0.00	2.00	4.00	6.00	8.00	10.00
by female beneficiaries (Percentage)		0.00	2.00	4.00	6.00	8.00	10.00
Increase number of beneficiary farmers who have adopted an improved CSA technology or practice							
Farmers adopting improved agricultural technology (CRI, Number)		0.00	0.00	500.00	1,800.00	3,000.00	3,700.00
Farmers adopting improved agricultural technology - Female (CRI, Number)		0.00	0.00	150.00	540.00	900.00	1,110.00
Increase land area under sustainable land management practices supported by the project							
Land area under sustainable landscape management practices (CRI, Hectare(Ha))		0.00	0.00	3,000.00	6,500.00	18,000.00	22,000.00

Intermediate Results Indicators by Components

Indicator Name	PBC	Baseline	Intermediate Targets				End Target
			1	2	3	4	
Institutional Strengthening							
Staff from private and public		0.00	50.00	100.00	150.00	200.00	300.00



Indicator Name	PBC	Baseline	Intermediate Targets				End Target
			1	2	3	4	
institutions trained on CSA technologies (Number)							
Female staff trained from private and public institutions trained on CSA technologies (Number)		0.00	10.00	30.00	40.00	60.00	90.00
Staff of private and public institutions that receive gender-sensitization training (Number)		0.00	50.00	100.00	150.00	200.00	300.00
Farmers reached with e-extension services(including agro-met services) (Number)		0.00	250.00	750.00	3,000.00	5,000.00	7,000.00
Female farmers reached with e-extension services(including agro-met services) (Number)		0.00	75.00	225.00	900.00	1,500.00	2,100.00
Number of agrometeorological products developed and disseminated through digital technologies (Number)		1.00	1.00	2.00			3.00
Belizean Agriculture Information System (BAIMS) is strengthened and functioning (Yes/No)		No	No	Yes			Yes
Public and private institutions providing technical assistance and services to farmers on CSA technologies and practices (Number)		0.00	2.00	9.00	14.00	15.00	15.00
Investments in Climate-Smart Agriculture							
Number of farmers benefitting		0.00	0.00	500.00	1,000.00	3,000.00	3,700.00



Indicator Name	PBC	Baseline	Intermediate Targets				End Target
			1	2	3	4	
from matching grants (Number)							
Female farmers benefitting from matching grants (Number)		0.00	0.00	150.00	300.00	1,000.00	1,100.00
Area provided with new/improved irrigation or drainage services (CRI, Hectare(Ha))		0.00	0.00	870.00	4,350.00	8,700.00	8,700.00
Private capital mobilized (Amount(USD))		0.00	0.00	3,000,000.00	7,000,000.00	12,000,000.00	18,200,000.00
Volume of funds disbursed as part of matching grants (Amount(USD))		0.00	0.00	2,000,000.00	4,000,000.00	13,000,000.00	16,000,000.00
Project Management and M&E							
All grievances reported via the project-level GRM are responded to or escalated for resolution within 90 days throughout project implementation (Percentage)		0.00	0.00	100.00	100.00	100.00	100.00
All grievances reported via the special channel for GBV- related complaints in the GRM are responded to or escalated for resolution within 30 days throughout project implementation (Percentage)		0.00	0.00	100.00	100.00	100.00	100.00
Management, monitoring and evaluation system implemented and functioning		0.00	30.00	60.00	100.00	100.00	100.00



Indicator Name	PBC	Baseline	Intermediate Targets				End Target
			1	2	3	4	
(Percentage)							
Beneficiaries satisfied with technical and financial assistance received under the project (Percentage)		0.00	80.00	80.00	80.00	80.00	80.00
Contingent Emergency Response Component							
Emergency Operations Guidelines Prepared (Yes/No)		No					Yes

Monitoring & Evaluation Plan: PDO Indicators					
Indicator Name	Definition/Description	Frequency	Datasource	Methodology for Data Collection	Responsibility for Data Collection
Increase yield of maize produced by targeted beneficiaries	This indicator measures the percentage increase in the yield of maize per hectare produced by the targeted project beneficiaries who receive training, support services and financing under the project (matching grant).	Annually	PIU progress report	Yearly crop surveys administrated with representative sample of targeted project beneficiaries and control group	PIU-M&E Unit, external survey firm
by female beneficiaries	For female beneficiaries (the same definition as the above indicator)	Annually	PIU progress report	Yearly crop surveys administrated with representative sample of targeted project	PIU-M&E unit



				beneficiaries and control group	
Increase yield of onions produced by targeted beneficiaries	This indicator measures the percentage increase in the yield of onions per hectare produced by the targeted project beneficiaries who receive training, support services and financing under the project (matching grant).	Annual	PIU progress report	Yearly crop surveys administrated with representative sample of targeted project beneficiaries and control group	PIU-M&E unit
by female beneficiaries	For female beneficiaries (the same definition as the above indicator)	Annual		Yearly crop surveys administrated with representative sample of targeted project beneficiaries and control group	PIU-M&E unit
Increase yield of sweet peppers produced by targeted beneficiaries	This indicator measures the percentage increase in the yield of sweet peppers per hectare produced by the targeted project beneficiaries who receive training, support services and financing under the project (matching grant).	Annual	PIU progress report	Yearly crop surveys administrated with representative sample of targeted project beneficiaries and control group	PIU-M&E unit
by female beneficiaries	For female beneficiaries (the same definition as the above indicator)	Annual	PIU progress report	Yearly crop surveys administrated with representative sample of targeted project	PIU-M&E unit



				beneficiaries and control group	
Increase yield of beef cattle produced by targeted beneficiaries	This indicator measures the percentage increase in the yield of beef cattle per hectare produced by the targeted project beneficiaries who receive training, support services and financing under the project (matching grant).	Annual	PIU progress report	Yearly crop surveys administrated with representative sample of targeted project beneficiaries and control group	PIU-M&E unit
by female beneficiaries	For female beneficiaries (the same definition as the above indicator)	Annual	PIU progress report	Yearly crop surveys administrated with representative sample of targeted project beneficiaries and control group	PIU-M&E unit
Farmers adopting improved agricultural technology	<p>This indicator measures the number of farmers (of agricultural products) who have adopted an improved agricultural technology promoted by operations supported by the World Bank.</p> <p>NB: "Agriculture" or "Agricultural" includes: crops, livestock, capture fisheries, aquaculture,</p>	Annual	Survey Report	<p>i) Survey</p> <p>This target is based on assumption of 80% adoption and use by farmers who are provided access through grants</p>	PIU-M&E Unit, external survey firm



	<p>agroforestry, timber and non-timber forest products.</p> <p>Adoption refers to a change of practice or change in use of a technology that was introduced or promoted by the project.</p> <p>Technology includes a change in practices compared to currently used practices or technologies (seed preparation, planting time, feeding schedule, feeding ingredients, postharvest storage/processing, etc.). If the project introduces or promotes a technology package in which the benefit depends on the application of the entire package (e.g., a combination of inputs such as a new variety and advice on agronomic practices such as soil preparation, changes in seeding time, fertilizer schedule, plant protection, etc.), this counts as one technology.</p> <p>Farmers are people engaged in farming of</p>				
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	agricultural products or members of an agriculture related business (disaggregated by men and women) targeted by the project.				
Farmers adopting improved agricultural technology - Female					
Land area under sustainable landscape management practices	The indicator measures, in hectares, the land area for which new and/or improved sustainable landscape management practices have been introduced. Land is the terrestrial biologically productive system comprising soil, vegetation, and the associated ecological and hydrological processes; Adoption refers to change of practice or change in the use of a technology promoted or introduced by the project; Sustainable landscape management (SLM) practices refers to a combination of at least two technologies and approaches to increase land quality and restore degraded lands for example,	Annual	Land area managed with sustainable practices - larger farmers + Land area managed with sustainable practices - small and medium farmers) in the frame of the project implementation	i) Evaluation report on the application of sustainable management practices, ii) List of sustainable management practices	PIU-M&E unit



	agronomic, vegetative, structural, and management measures that, applied as a combination, increase the connectivity between protected areas, forest land, rangeland, and agriculture land.				
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Monitoring & Evaluation Plan: Intermediate Results Indicators

Indicator Name	Definition/Description	Frequency	Datasource	Methodology for Data Collection	Responsibility for Data Collection
Staff from private and public institutions trained on CSA technologies	Staff trained from various institutions benefitting under component 1 and staff from private financial institutions	Semi-Annual	Training reports	PIU Progress Report	PIU
Female staff trained from private and public institutions trained on CSA technologies	Number of Female staff trained	Semi-annual	PIU Training reports	Progress Reports	PIU
Staff of private and public institutions that receive gender-sensitization training	the number of staff in these institutions trained on CSA issues (it could be part of the CSA training).	Semi-Annual	PIU Reports	Progress Reports	PIU
Farmers reached with e-extension services(including agro-met services)	Farmers who benefitted from extension or agro-met technology services developed/supported under the Project				



Female farmers reached with e-extension services(including agro-met services)	Female farmer				
Number of agrometeorological products developed and disseminated through digital technologies	Number of agrometeorological products developed and disseminated through digital technologies through project support Baseline-compound index calculated with DROMON	Annual in year 2 and year 3	technical reports commissioned by the NMS of Belize	PIU Progress Report	PIU
Belizean Agriculture Information System (BAIMS) is strengthened and functioning	BAIMS can potentially be considered as a monitoring and registration tool for producers who may benefit from government's support type of programmes. However, BAIMS' current records shows some inconsistencies. For instance, (i) there are errors in geographical coordinates of some registered farms, (ii) different farms shared the same geographical coordinates but have different surface area, ID Farm or ID Farmer, and (iii) several farms recorded do not have a surface area identified	Annual	Technical reports commissioned by the NMS of Belize and bulletins published by the NMS. And technical reports published in the BAIMS/Ministry of Agriculture web page.	PIU progress report and BAIMS web page reports	PIU



Public and private institutions providing technical assistance and services to farmers on CSA technologies and practices	Number of public and private institutions (national, regional and/or local institutions) directly providing technical services and participating financial institutions providing financial products for loans for CSA Products	Annual	Institutional agreements (letter of agreements, etc.)	From records of Institutional agreements (letter of agreements, etc.)	PIU-M&E unit
Number of farmers benefitting from matching grants	Number of farmers benefitting who have recieved a matching grant under the Project	Annual	Internal database	Progress reports	PIU
Female farmers benefitting from matching grants					
Area provided with new/improved irrigation or drainage services	This indicator measures the total area of land provided with irrigation and drainage services under the project, including in (i) the area provided with new irrigation and drainage services, and (ii) the area provided with improved irrigation and drainage services, expressed in hectare (ha).	Annual	Surveys and data collected form PFI	Surveys/Records from PFI	PIU-M&E unit
Private capital mobilized	Private capital mobilized as part of the matching grant (from the participating financial institutions)	Annual	From PFI	Records from PFI	PIU-M&E
Volume of funds disbursed as part of matching grants	Volume disbursed as part of matching grants	Annual	From PFI records	PFI Records	PIU-M&E unit



All grievances reported via the project-level GRM are responded to or escalated for resolution within 90 days throughout project implementation					
All grievances reported via the special channel for GBV-related complaints in the GRM are responded to or escalated for resolution within 30 days throughout project implementation	GRM specific to GBV based issues-targeted for faster resolution	Semi-annual	PIU reports	Collection from PIU reports	PIU
Management, monitoring and evaluation system implemented and functioning	Development and use of different components of M&E system	Bi-annual	PIU reports	PIU progress report	PIU-M&E unit
Beneficiaries satisfied with technical and financial assistance received under the project	Measurement if beneficiaries are satisfied with all aspects of Project implementation	Annual	Surveys	beneficiary surveys via SMS to farmers or perhaps surveys just of matching grants recipients.	
Emergency Operations Guidelines Prepared	Emergency Operation Guidelines prepared	Annual	PIU Progress reports	PIU Progress reports	PIU



ANNEX 1: Implementation Arrangements and Support Plan

A. Project Institutional and Implementation Arrangements

1. **The Ministry of Agriculture, Food Security, and Enterprise (MAFSE) will have overall responsibility for the implementation of CRESAP, with the assistance of BSIF.** The duration of project implementation will be five years, with a Project Closing Date of March 31, 2027.

B. Project Oversight

2. **A Project Steering Committee (PSC) will be established to provide overall guidance for the Project.** The PSC will be chaired by the Chief Executive Officer of MAFSE and will comprise the BSIF PIU Coordinator and the Deputy Coordinator, as well as representatives of the public sector entities involved in the Project (NMS, BAHA, PCB, and the University of Belize), and the Ministries of Finance, Economic Development and Investment and of Sustainable Development, Climate Change and Disaster Risk Management. The final composition of the PSC will be determined in the POM. The PSC will meet semi-annually to approve the Annual Work Program and Budget (AWPB) and project progress reports, ensure that project objectives are being met and ensure coherence between CRESAP and other projects in the sector funded by development partners. The Project Coordinator will ensure the Secretariat for the PSC.

C. Project Implementation

3. **Based on ongoing experiences in Belize, MAFSE has opted to continue with the current approach for project implementation under ongoing operations.** MAFSE will retain overall supervision and technical responsibility for project implementation, while it will delegate to BSIF the operational responsibilities for project implementation. MAFSE will sign a Subsidiary Agreement with BSIF (as a Condition for Effectiveness) to establish and maintain a PIU for the implementation of the Project, which will be in charge of the implementation of project activities. The BSIF PIU's responsibilities will include procurement and financial management, monitoring and evaluation (M&E), management of environmental and social risks and instruments (including gender), communications and citizen engagement, management of the Designated Account (DA), preparation of technical and financial reports, submission of withdrawal applications to the Bank, and management of the Grievance Recourse Services (GRS). BSIF will report on all project activities to MAFSE, the PSC and the Bank. These institutional and implementation arrangements are illustrated in Figure A1.1 below, while the roles of key Ministries and other institutions involved in implementing CRESAP are presented next in Table A1.1.

4. For the operation of the PIU, BSIF will competitively select a Project Coordinator to head the PIU with solid knowledge on agricultural development and significant experience in internationally funded projects (preferably Bank-funded projects). MAFSE will appoint a Deputy Project Coordinator who must be also fully knowledgeable on Belize's agricultural sector and with experience in implementation of Bank-funded projects, ensuring MAFSE's full engagement and participation in daily decision-making process and progress monitoring. Both appointments will have to be acceptable to the Bank (mainly in terms of qualifications, experience, and Terms of Reference) and shall be completed not later than sixty (60) days after Effectiveness of the Loan Agreement. In addition, BSIF will assign qualified staff to ensure adequate implementation of all aspects of the Project during the entire implementation period of CRESAP and prepare a detailed plan for training PIU staff in key areas of responsibility (e.g., fiduciary aspects, management of environmental and social risks).



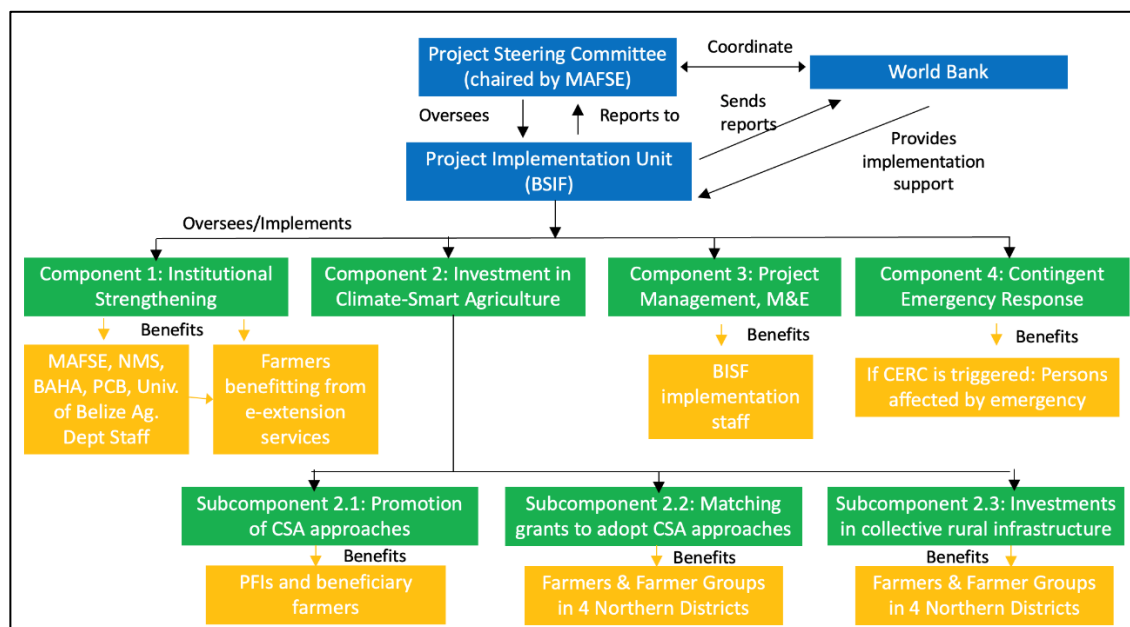
Table A1.1: Roles of Ministries and other institutions involved in implementing CRESAP

Ministry/Agency	Role in project implementation
Component 1: Institutional Strengthening	
Ministry of Agriculture, Food Security and Enterprise (MAFSE); NMS; BAHA; PCB and the Agriculture Department of the University of Belize	Various MAFSE directorates will contribute to implementing activities under Component 1, including the Extension Department, Policy Department, Water Management and Climate Resiliency Department, Cooperative Department, and the Central Farm Department. Also, NMS will provide agro-meteorological data; BAHA & PCB will support on food security and pest management, and the University of Belize will support agricultural training, research and extension.
Component 2: Investments in Climate-Smart Agriculture	
MAFSE/BSIF & service providers	MAFSE/BSIF will draw on technical advisory consulting services as needed to provide capacity building to PFIs and to farmers who apply for CSA matching grants. MAFSE extension agents will assist service providers as needed, and technical advisors will help applicants prepare proposals and advise them during grant implementation.
MAFSE/BSIF together with PFIs	BSIF will sign a PFI Agreement with each participating PFI and BSIF will work with PFIs to implement Subcomponent 2.2. A Matching Grants Approval Committee (MGAC) will be established, staffed with <i>ex officio</i> technical experts and an environmental and social coordinator from MAFSE and other relevant public agencies, to review the technical soundness of proposals from applicants, whereas PFIs will review their economic and financial viability. PFIs will also evaluate the E&S aspects of subprojects using the ESMS, ⁵⁵ after which the E&S focal point in the BSIF PIU will review and recommend a decision. PFIs shall enter into agreements with Beneficiaries ("Participation Agreements") under which the PFIs shall provide beneficiaries with matching grants approved by the MGAC, as well as with loans that the PFIs may provide to beneficiaries under their own terms and conditions, to finance CSA investment subprojects. Once a subproject proposal is approved, the PFI will open an account for the beneficiary farmer in the PFI, after which the matching grant will be transferred to this account by BSIF, and the PFI will transfer its loan financing to the beneficiary. The PFI will be responsible for overseeing the implementation of the proposal and the recovery of the PFI's financing. A portion of the matching grant may be transferred after the beneficiary has repaid the PFI loan to encourage timely repayment by the beneficiary.
MAFSE/BSIF	BSIF, along with MAFSE, will be in charge of selecting, evaluating and procuring the investments under Subcomponent 2.3 and as needed with support from the Ministry of Infrastructure Development.
Component 3: Project Management, Monitoring, and Evaluation	
MAFSE/BSIF	MAFSE will have overall responsibility for the project. However, BSIF will be in charge of project implementation through its PIU, including all fiduciary, environmental and social aspects, and M&E.
Component 4: Contingency Emergency Response Component	
MAFSE	MAFSE and BSIF will be in charge of Component 4, unless the type of emergency leads to a different implementation agency being specified in the CERC Manual.
Cross-cutting roles and coordination	
MAFSE/Other Ministries	MAFSE will have overall responsibility for implementing CRESAP, via the BSIF PIU, while the Ministry of Finance, Economic Development and Investment; the Ministry of Sustainable Development, Climate Change and Disaster Risk Management will serve on the PSC. The final composition of the PSC will be fully determined in the POM.

⁵⁵ Some FIs have an ESMS in place; however not all. Therefore, those without one must be quickly trained if they are to be included in this project.



Figure A1.1: Institutional and implementation arrangements for CRESAP



D. Implementation Arrangements for the Climate-Smart Matching Grants Program

5. **MAFSE will have overall responsibility for the implementation of CRESAP, assisted by the Belize Social Investment Fund (BSIF).** MAFSE will sign a Subsidiary Agreement with BSIF to establish/maintain a PIU for the Project and assign technical and fiduciary staff (involved in procurement, FM, accounting, reporting, and M&E) and environmental and social risk management staff responsibility for these areas during CRESAP's entire implementation period. This BSIF PIU will be directly responsible for implementing Components 1, 2, 3 and 4. In the case of Subcomponent 2.2, the PIU will select and enter into agreements (the PFI Agreements) with qualified Participating Financial Institutions (PFIs) with experience and penetration in the rural sector to provide resources to project beneficiaries for financing CSA investment subprojects. The Matching Grant Approval Committee will approve these CSA investment subprojects and BSIF will transfer the grant amounts to the beneficiary's account created for this purpose in the PFI. These PFIs will provide complementary financing by providing loans to these beneficiaries (under its normal lending procedures and terms) and will disburse the grant and the loan amount to the beneficiaries. The PFIs will sign a Participating Agreement with each beneficiary of the CSA investment subprojects (or their representatives in case of groups or associations of beneficiaries).

6. **The BSIF PIU will be responsible for the overall coordination and monitoring of the Climate-Smart Matching Grant Program.**⁵⁶ The roles of the BSIF PIU for this Project will be detailed in the POM and will include: (i) serving as the focal point for the PFIs to request information and assistance; (ii) monitoring compliance by PFIs with terms and conditions of the PFI Agreements signed with them and with the POM and the MGOM; (iii) reviewing matching grant applications for compliance with application guidelines upon receipt (as per the MGOM); (iv) supporting the Climate-Smart Matching Grants Approval Committee and preparing the document packages before and after meetings; (v) ensuring compliance with audit requirements, in coordination with the Ministry of Finance and PFIs; (vi) carrying out on-site monitoring visits to beneficiaries and conducting beneficiary file reviews to ensure full necessary documentation is retained in PFI files (loan appraisal, procurement documents, environmental and social action plans, any permits, and so on); (vii) preparing progress reports, FM

⁵⁶ The Project will also strengthen MAFSE in various key areas to build capacities for the implementation of future projects.



reports, and environmental and social reports at the agreed times; (viii) participating in the financial and operational assessment of PFIs prior to their participation in the Project and monitoring (as necessary) of PFIs' financial and operational status and their handling of the matching grants; (ix) managing the implementation of technical assistance to beneficiaries and PFIs, and ensuring feedback to the Bank and the technical assistance providers; (x) reviewing the results of the environmental and social screening of the farmer proposals conducted by the PFIs; (xi) receiving and distributing proposals that do not specify a preferred PFI to all the participating PFIs for their review; (xii) contracting a PFI to review any proposal that requests no PFI financing (i.e. that proposes self-financing of the non-matching grant portion of the investment) to ensure the financial and environmental and social soundness of the proposal and to administer the corresponding matching grant, if approved; as well as (xiii) carrying out a number of other responsibilities, as agreed with the Bank, which will be detailed in the POM and the MGOM (which will be forming part of the POM).

7. **A Matching Grant Approval Committee (MGAC) will be established at the outset of the Project.** It will consist of *ex officio* technical specialists representing MAFSE and other relevant public agencies as needed, the environmental and social focal point, as well as representatives of the PFIs. The MGAC will have overall responsibility for reviewing the proposals for technical soundness and for approving the matching grant requests. The work of the MGAC will be supported by BSIF and participating PFIs. The MGAC will meet at regular intervals, together with the relevant PFIs, to evaluate proposals under each window of Subcomponent 2.2; assess the technical merits of the proposal against criteria specified in the POM; confirm the amount of financing that PFIs are ready to provide and determine the matching grant amount (see Annex 3). The detailed responsibilities and functions of the MGAC will be set forth in the MGOM. The establishment of the MGAC and the adoption of the MGOM are conditions for disbursements of loan proceeds under Category 2 for expenditures related to Subcomponent 2.2.

8. **The PFIs will play a critical role in implementing the Climate-Smart Matching Grant Program.** The specific responsibilities of the PFIs will be set forth in the PFI Agreements to be signed between BSIF and the selected PFIs prior to their participation in the Project. These PFIs will receive the initial proposals and review their financial viability, determine the amounts the PFIs are ready to finance for each proposal from their own funds, screen the proposed activities on environmental and social aspects and share their decisions with MGAC to support the approval of matching grants for the CSA investment subprojects they will finance. If a beneficiary wishes to self-finance (i.e., apply for a matching grant but not for a PFI loan), a PFI may be contracted by BSIF to carry out the due diligence on the proposal and administer/disburse the grant via the PFI in the same way that it would do for one of its loans. For approved proposals, the PFI will establish an account in their institution for the beneficiary and deposit the PFI's agreed financing amount in the account. After approval by the MGAC, the PFI will sign a Participation Agreement with the beneficiary and open an account for the beneficiary for the CSA investment subproject, and BSIF will transfer the agreed grant amount to the beneficiary's account in the PFI, at which point the resources will become available to the beneficiary (a portion of the grant element could be released after the beneficiary has established a repayment track record with the PFI). The PFI will be responsible for executing loan/grant disbursements, monitoring and collecting loans, and, if required in case of a default, the matching grants as well. PFIs will return any undisbursed grant amounts to BSIF in a timely manner for these amounts to be awarded to other proposals. Due diligence of the PFIs will be carried out by a consultant with international experience, and the PFIs will receive training by local and international experts under Subcomponent 2.1. Legally enforceable agreements would be signed between BSIF and the PFIs, prior to the PFIs' participation in the Project, clarifying their respective roles and responsibilities for the implementation of Subcomponents 2.1 and 2.2.

9. **The governance arrangements for the matching grant program will be carefully designed to promote appropriate incentives for all stakeholders.** They will be designed to ensure transparency, consistency and efficiency, avoid elite capture through grant allocation guidelines, ensure that 30 percent of beneficiaries are



women farmers and ensure that grants are broadly distributed across the four Districts targeted under the Project (i.e., Cayo, Orange Walk, Corozal, and Belize) and not unduly concentrated in a given area. Eligibility criteria will be detailed in a Matching Grants Operations Manual and will be decided in collaboration with MAFSE management and District Agricultural Coordinators.

E. Monitoring and Evaluation

10. **The BSIF PIU will have overall responsibility for M&E.** It will generate, aggregate, systematically record, and analyze information/data from various implementation levels (regions and Districts) as well as from qualitative and quantitative surveys (related to outcome indicators/results). The PIU will analyze relevant data to evaluate impacts and outcomes, track progress, and identify implementation bottlenecks to be resolved. The PIU will assess and document progress on achieving CRESAP's objectives, outcomes, and intermediate results (see the Results Framework and key performance indicators) in the annual work plans and in progress reports that will be produced every semester, for the Mid-Term Review, and for the end-of-project final evaluation, and that will be submitted to the PSC and the World Bank. BSIF will draw on these analyses and reports to identify implementation gaps and challenges so as to advise the PSC and undertake proactive corrective actions. Additional qualitative evaluations could be conducted with regard to gender impacts, extension services and the adoption of CSA technologies and practices, based on guidance from the PSC. BSIF will oversee the consulting firms/institutes/consultants hired to conduct the various evaluations. The PIU will, in addition, document lessons learned from project implementation for learning events with farmers (see below) and for future government programs, including the potential scale-up of project activities.

11. **The BSIF PIU will develop the project M&E Manual, which will be incorporated in the POM.** The M&E Manual will: (i) identify M&E roles and responsibilities under CRESAP; (ii) define Results Framework indicators; (iii) identify additional indicators to track progress (in the results chain); (iv) define parameters and tools for project monitoring; (v) define the purpose and type of evaluations and studies; (vi) monitor complaints via the GRM; (vii) collect best practices/case stories; and (viii) provide the formats for project reports. The PIU will avail of the KoBo Toolbox to develop and implement questionnaires.

12. **The PIU's M&E role will be supported by the District Agricultural Coordinators (DACs), who will report on the indicators in their respective areas of responsibility in the Results Framework and results chain, using KoBo Toolbox and progress reports.** In addition, the capacity-building experts providing training under Component 1 and under Subcomponent 2.1. will report on Indicators and data relating to government capacity strengthening and on capacity-building for PFIs and beneficiaries. The PFIs will report on indicators/data relating to the matching grants program under Subcomponent 2.2., while the MAFSE, Ministry of Infrastructure Development and Housing, and contractors, will report on indicators and data relating to infrastructure investments under Subcomponent 2.3. In the event that the CERC is triggered, the M&E arrangements for Component 4 will be specified in the CERC Manual. The Project will also use the Iterative Beneficiary Monitoring (IBM) approach, which is a feedback mechanism that collects qualitative information about deliverables on regular basis through existing survey mechanisms directly from beneficiaries and produces frequent brief reports that can be useful for identifying emerging issues on the ground. The BSIF PIU will be in charge of aggregating and analyzing all data for inclusion in the semi-annual progress reports.

13. **Monitoring of environmental and social aspects will be carried out throughout CRESAP's implementation to ensure that the prepared and disclosed instruments are followed.** Monitoring will include environmental and social performance reviews to assess compliance with instruments, determine lessons learned, and provide guidance for improving future performance. Project reporting formats will include environmental and social indicators, particularly for the GRM. The PIU's environmental and social experts will be responsible for the overall monitoring and reporting on environmental and social indicators.



14. **The PIU and the DACs will promote learning by organizing semi-annual District-level learning fora.** At these events, farmers from communities where the Project will be active will discuss the results achieved, best practices as well as problems encountered, following simple visual formats. The PIU also will organize an annual national learning forum for project and government staff (local and national) and implementers to learn from each other, share issues encountered, solutions implemented, and lessons learned (compiling success stories, case studies, and audio-visual materials).

F. Financial Management

15. **Belize's public financial management system has been strengthened over the past decade, although the gaps that are often found in small states are also present in Belize.** Budget preparation and controls over budget execution have improved, but challenges remain. The accuracy and timeliness of financial statements submitted to the Auditor General are poor. Financial oversight remains weak, with significant capacity gaps in internal and external audit functions. To mitigate the risks in the public financial management environment, the Project's FM arrangements will be ring-fenced as detailed below.

16. **BSIF will be responsible for managing the FM and disbursement arrangements for CRESAP.** BSIF has experience with implementing Bank-financed projects, including the recently closed Climate Resilient Infrastructure Project (IDA 8416), whose FM performance has been satisfactory. An FM assessment of BSIF was carried out during preparation of CRESAP to determine the adequacy of the FM arrangements for the Project. The main FM risks were found to be: (i) the sharing of responsibilities between BSIF and MAFSE (BSIF is already in charge of several projects, and will also be responsible for the fiduciary functions of CRESAP, whereas MAFSE will be responsible for the technical leadership of the Project); and (ii) BSIF's and MAFSE's capacity to implement the matching grants: implementation of the matching grants could be a challenge, due to the complexity associated with assessing the capacities of the PFIs, defining the beneficiary eligibility criteria, and managing the grant application process (including appraisal and approval of applications), the flow of funds, financial reporting, and auditing arrangements.

17. **The following mitigation measures have been agreed to mitigate the identified FM risks:** (i) signature of a Subsidiary Agreement to clarify MAFSE's and BSIF's roles and responsibilities with regard to CRESAP; (ii) strengthening BSIF's FM capacity by hiring an additional accountant fully dedicated to CRESAP; (iii) modifying BSIF's accounting system to properly record and report on CRESAP activities and transactions; (iv) preparing a full Project Operations Manual (POM) reflecting responsibilities for CRESAP activities; (v) training for MAFSE, BSIF and PFI staff on Bank fiduciary requirements, and (vi) developing a detailed Matching Grants Operations Manual (MGOM) to define the program design, internal control arrangements, flow of funds, financial reporting, and auditing arrangements, and (vii) legally enforceable agreements would be signed between BSIF and the PFIs (PFI Agreement), prior to the PFIs' participation in the Project, clarifying their respective roles and responsibilities for the implementation of Subcomponents 2.1 and 2.2.

Given the above risks and mitigating measures, the Project's residual FM risk is Moderate.

18. **The FM staffing arrangements at BSIF are adequate, as the staff are competent and the arrangements allow for proper segregation of duties, which aids in a proper review and approval process.** BSIF's FM team comprises a Finance Unit Coordinator and a Senior Accounts Officer. All CRESAP accounts and reports will be prepared by the Senior Accounts Officer, and reviews and approvals will be done by the Finance Unit Coordinator. A Caribbean-wide virtual World Bank FM and disbursement training was held in June 2020 and was attended by the BSIF FM team. In light of the increased workload of projects being implemented by BSIF, CRESAP will provide for an additional accountant to be hired and fully dedicated to the Project.



19. **BSIF applies a systematic budgeting process, with an investment plan (budget) prepared for the life of the project, broken down by component and activities.** BSIF will prepare an Annual Work Program and Budget (AWPB) which will specify in detail the project activities planned for the year. The AWPB will be submitted to the PSC for approval and then to the Bank for no objection. The annual budget will be uploaded in the project accounting system, QuickBooks, where its execution will be monitored. BSIF will conduct regular budget variance analysis (actual versus budgeted expenditures) and report the results in the semi-annual financial reports.
20. **Administration, accounting and financial reporting for CRESAP will be set up in accordance with Bank requirements, which include the preparation of financial statements in accordance with acceptable accounting standards.** Unaudited IFRs will be due within 45 days following each calendar semester and will provide the required monitoring information to be used for disbursements. The format and required content of IFRs are established in the Disbursement and Financial Information Letter (DFIL) for CRESAP. The IFRs will include a short narrative outlining major project achievements for the period; sources and uses of funds; bank reconciliation statements and required procurement tables and a separate section on Matching Grants. BSIF will consolidate financial statements received from PFIs and include a consolidated report with each IFR. BSIF will also be responsible for preparing and submitting annual audited financial statements to the Bank, which will include the Project's sources and uses of funds; a detailed analysis of project expenditures; a schedule of withdrawal applications presented during the year; a reconciliation of the Designated Account (DA), and notes to the financial information. The audited financial statement will be due to the Bank within six months of the end of the Government of Belize's fiscal year, which runs from April to March. BSIF uses the cash basis of accounting for preparing financial statements.
21. **Disbursements of project funds will be processed in accordance with Bank procedures as stipulated in the DFIL and the Disbursement Guidelines for Investment Project Financing, dated February 2017.** The following disbursement methods will be available, as defined in the DFIL: advances, reimbursements, and direct payments. IBRD loan proceeds will flow into a Designated Account (DA) for the Project, denominated in US dollars, and located in the Central Bank of Belize. All withdrawal applications will need to be signed off by the Government's authorized representatives via the World Bank Client Connection. The ceiling for the DA will be variable, based on a cash forecast as per the IFRs, and will be specified in the DFIL.
22. **Further advances will be made from the DA to an operating account to be opened at commercial bank acceptable to the World Bank.** The operating account will be maintained in Belize dollars and managed by BSIF. Transfers from the DA to the operating account will be reviewed and approved by the Ministry of Economic Development (MED). The payments to be made from the operating account will be verified and approved by the BSIF Accountant and the BSIF Executive Director. Uses of the advance to the operating account will be reported and reconciled with the DA on a monthly basis, and the outstanding balance will be reported as a separate line item on the DA reconciliation statement that is submitted together with the withdrawal applications from the DA. Flow of funds arrangements for the matching grants are described under the implementation arrangements for the matching grants (Annex 3). The IBRD loan proceeds will be disbursed against eligible expenditures (inclusive of taxes) as shown in Table A1.2.
23. **Internal controls: BSIF has a good internal control environment that incorporates competent FM staff, segregation of duties, and the maintenance of appropriate records, which ensures that proper documentation exists for each project expenditure.** BSIF has an Operations Manual in place to guide day-to-day operations of the Finance Unit. Proper authorization for payment requests, segregation of duties, and other relevant internal control mechanisms are clearly defined in the BSIF Operations Manual. To further enhance the internal controls, BSIF will update the manual to reflect the activities of the Project. In addition, regular oversight by MED, periodic Bank supervision, and annual external audits will serve as the mechanisms to ensure that FM controls are functioning appropriately.



Table A1.2: Withdrawal of the loan proceeds for financing CRESAP expenditures

Category of expenditure	Amount of the IDA Credit (US\$ thousand)	Percentage of expenditures to be financed by the credit (inclusive of taxes)
(1) Goods, works, non-consulting services, consulting services, and operating costs and training for the project (except matching grants for Component 2 of the project under Category 2 below)	8,937.5	100%
(2) Matching Grants for CSA investments under Sub-component 2.2 of the Project: Window 1: Smallholder farmers Window 2: Medium and Large Farmers and Farmers Organizations	10,000 6,000	100 percent of the Matching Grant amounts as set forth in the Participation Agreements signed with Beneficiaries.
(3) Eligible emergency expenditures for Component 4 of the project	0	
Front-end-Fee	62.5	
Total amount	25,000	

24. **External audit: BSIF's consolidated financial statements will be subject to annual external audits by an independent audit firm acceptable to the World Bank Group.** Details of the Project will be included and disclosed in the annual consolidated financial statements. The external audit terms of reference will be expanded to include a separate section of the audit of the operations, resources and expenditures related to the activities financed with each Matching Grant and verify compliance with the Project's Matching Grant Manual. The annual audit report will be due to the Bank within six months after the end of each fiscal year. The World Bank will make the report available to the public in accordance with the World Bank Group Policy on Access to Information.

G. Procurement

25. **Procurement for the Project will be done using the World Bank Procurement Regulations for IPF Borrowers, dated November 2020.** Eligible expenditures are described and identified by project component and subcomponent in Table A1.3.

26. **The procurement arrangements and procedures for the CERC under Component 4 will be elaborated in further detail in the CERC Manual in the POM.** If urgent assistance is needed as a result of a natural disaster or other eligible emergency, the simplified procurement procedures outlined in the World Bank guidance note, "Situations of Urgent Need of Assistance or Capacity Constraints, Simplified Procurement Procedures," may be used.

Procurement Assessment

27. **Procurement risk rating: the overall project risk for procurement is Moderate.** World Bank-accredited procurement staff conducted an assessment of procurement risk and management capacity of BSIF as the initial implementing agency for the Project in July 2020, in line with the Procurement Risk Assessment and Management System. CRESAP's Moderate risk rating is based on the assessment of the capacity of BSIF and MAFSE, after mitigation measures for procurement risk under CRESAP are implemented, as agreed: "Procurement to be conducted by BSIF and MAFSE shall be carried out in compliance as agreed in the POM, PAD, and Loan Agreement."

28. **Procurement Plan: The Procurement Plan for the first 18 months of project implementation was prepared** using the World Bank Systematic Tracking of Exchanges in Procurement (STEP) system together with the Project Procurement Strategy for Development (PPSD).



Table A1.3: Eligible Expenditures for CRESAP

Project Component/Subcomponent	Eligible Expenditures
Component 1: Institutional Strengthening (US\$3 million)	
Strengthening the Capacity of Relevant Government and Academic Institutions	<ul style="list-style-type: none"> Individual Consultants and Consultancy of firms (for delivering training) Goods (equipment such as computers, meteorological equipment) Training (renting of rooms, transportation of participants, catering, local travel and per diem, daycare allowance, etc.)
Component 2: Investments in Climate-Smart Agriculture (US\$19 million)	
Subcomponent 2.1: Strengthening the capacity of PFI, individual farmers and farmer organizations participating in the CRESAP matching grants program (US\$1 million)	<ul style="list-style-type: none"> Individual Consultants and Consultancy of firms (for delivering training) Training (renting of rooms, transportation of participants, catering, local travel and per diem, daycare allowance, etc.) Goods (equipment such as computers)
Subcomponent 2.2: Promotion of on-farm CSA technologies and practices via matching grants and leveraging of private capital (US\$16 million)	<ul style="list-style-type: none"> Climate-Smart Matching Grant Program (there is no Procurable)
Subcomponent 2.3: Provision of selected strategic collective assets to strengthen resilience (US\$2 million)	<ul style="list-style-type: none"> Individual Consultants and Consultancy of firms (studies and technical assistance) Goods Works (for complementary infrastructure)
Component 3: Project Management, Monitoring and Evaluation (US\$3 million)	
Project Management, Monitoring and Evaluation	<ul style="list-style-type: none"> Individual Consultancies Non-Consultant Services Goods Operating costs
Component 4: Contingency Emergency Response Component (CERC) (US\$0 million)	
CERC	<ul style="list-style-type: none"> Simplified procurement procedures outlined in the World Bank guidance note, "Situations of Urgent Need of Assistance or Capacity Constraints, Simplified Procurement Procedures," may be used. Component 4 procurement arrangements and procedures will be detailed in the CERC Manual in the POM.

H. Implementation Support Plan: Substantive Support with Digital Technology in the COVID-19 Era

29. **CRESAP will apply a 'do-no-harm' approach to implementation in the context of the COVID-19 pandemic.** In line with the practice adopted in the CERC triggered under the CRIP Project (IDA 8416), all activities supported under the Project will be subject to strict health measures to prevent the spread of COVID-19, following procedures detailed in CRESAP's POM. Key measures include the significant expansion of e-extension services, applying safety measures at all project events/activities, including ensuring the use of masks, temperature measurements and maintenance of physical distancing, and hygiene measures for vehicles and meeting locations.

30. **CRESAP addresses multiple aspects of agricultural production and of the wider ecological system, which means that multiple specialists are needed to support implementation.** The COVID-19 travel restrictions require the Bank to develop a different type of support mission that goes beyond simply replacing the intensive two-week physical visit with a digital interface. For example, the ability to meet easily online, with no travel-related costs, can enable a series of productive engagements over a longer timeline. The Project will prioritize early and substantial investment to ensure high-quality Client bandwidth and connectivity to allow face-to-face online conversations. This investment will greatly increase the value of interactions, personalize engagements, and lead to considerably more meaningful and substantive information transfers. The Project will maximize the use of online brainstorming tools (such as shared digital whiteboards) and shared document workspaces, giving immediate priority to training counterpart staff in digital communication and online workshop tools to enable



effective digital supervision. These digital investments cost a fraction of conventional mission travel and accommodation and make the difference between a stilted, impersonal, often disjointed engagement and a more seamless, productive exchange.

31. **With these tools in place, implementation support will occur in three phases.** In the first phase, specialists and PIU sub-teams will each be assigned a lead person and will link up in a series of *pre-mission small-group sessions* to engage in discussions with three to five people on status and progress. These groups will identify data availability, data requirements, and suitable reporting formats and work collaboratively to get these populated. This engagement will make it possible to define problems and issues prior to the digital mission (the second phase) and easily include specialists wherever they are located globally, calling for a few hours of input each week over a few weeks. The groups will build rapport, establish working relationships, and ensure that counterpart staff have the necessary information, usefully structured and presented, prior to the digital mission. The *digital implementation support missions* will resemble a conventional mission, with a sequence of intensive meetings lasting approximately 3 hours each. The mission sessions will work through the summary data prepared by the small groups, identify problems, and discuss and agree upon solutions. Gaps in information that hinder decision-making will be identified and referred to post-mission working groups. In the third phase, the same small groups that worked together during the pre-mission sessions will participate in *post-mission small-group sessions* to address pending supervision issues and gaps. Through small group and frequent one-on-one online discussions (using WhatsApp, Skype, Teams, Zoom, or similar platforms), they will ensure active support to the PIU team. Ongoing *ad-hoc* support can also be provided, reflecting a mentoring style of implementation support with greater continuity. The mission will also have access to the KoBo Toolbox data to allow real-time implementation support and supervision of progress.

32. **Implementation support for CRESAP will require the following skills and resources over the five-year life of the Project** (see Table A1.4):

Table A1.4 - Implementation Support Resource Estimates

Time (after Board Approval)	Activity	Skills and Resources Needed
Year 1	<ul style="list-style-type: none"> - Baseline M&E studies - Refine and finalize detailed plan for project activities - Recruit PIU staff to initiate project activities - Negotiate and sign agreements with related agencies and independent institutions in the agricultural sector (NMS, PCB, BAHA, University of Belize), and with PFIs - Constitute the Matching Grants Review Committee - Prepare ToRs for TA and bidding documents (for works, agrometeorological and equipment of key agencies, computerized systems, etc.) - Identify additional gaps in TA and needs for additional institutional strengthening efforts - Initiate promotion and dissemination campaign for the matching grants program after Effectiveness - Establishment of GRM 	<ul style="list-style-type: none"> - Project management - Climate-smart agriculture - Infrastructure for agriculture - Financial sector - Environmental and social risk management - Fiduciary management - Monitoring and evaluation
Years 2-4	<ul style="list-style-type: none"> - Full project implementation - Capacity building for public and private actors, including gender-sensitivity training - Implementation of e-extension using agro-meteorological data and extension of CSA practices 	<ul style="list-style-type: none"> - Project management - Climate-smart agriculture - Infrastructure for agriculture - Financial sector - Environmental and social risk



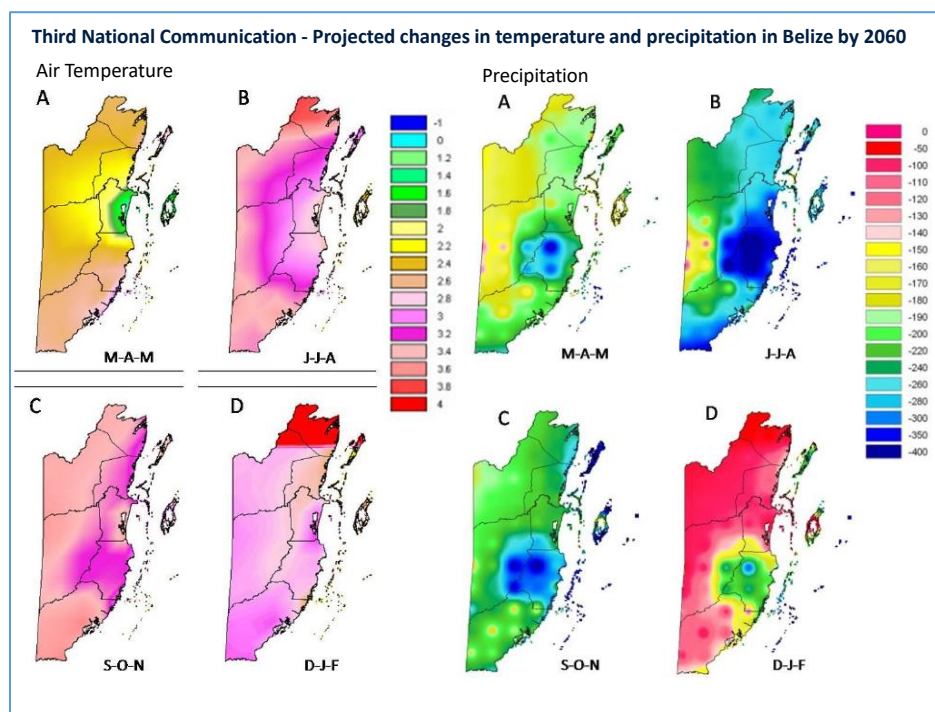
	<ul style="list-style-type: none">- Calls for matching grants proposals; TA for preparation of proposals; reception, assessment and approval of proposals; and disbursement of matching grants and PFI loans- Implementation of subprojects with supporting TA- Implementation of complementary infrastructure investments- Social and environmental monitoring and management- Fiduciary (FM reviews and procurement reviews of bidding documents /processes and contracts)- Full implementation of M&E system, surveys and GRM mechanism	<p>management</p> <ul style="list-style-type: none">- Fiduciary management- Monitoring and evaluation
Year 5	<ul style="list-style-type: none">- Completion of all subprojects, investments and capacity-building- Full implementation of M&E system, surveys and GRM mechanism- Final Evaluation and Reporting	<ul style="list-style-type: none">- Project management- Technical quality oversight- Environmental and social risk management- Fiduciary management- Monitoring and evaluation



ANNEX 2: Projected Climate Change Effects and Climate-Smart Practices for Belizean Agriculture

1. **Climate change effects—especially rising temperatures, reduced rainfall, and more frequent and more severe extreme weather events—will be dramatic in Belize.** According to the Third National Communication of Belize to the United Nations Framework Convention on Climate Change,⁵⁷ Belize will experience an increase in average temperatures exceeding 2.0–2.4 °C by 2060–70. The projected changes in mean seasonal air temperature will be associated with significant changes in precipitation patterns. As shown in Figure A2.1, by 2060–70 almost all areas of Belize will receive less rainfall in every season, although droughts are likely to alternate with damaging bouts of excessive rainfall and floods.

Figure A2.1: Changes in mean seasonal air temperature (°C) and rainfall (mm) by season in Belize between 1961–90 and 2060–70



Source: Government of Belize (2016), “Belize’s Third National Communication to the United Nations Framework Convention on Climate Change.”

2. **The projected effects of climate change will significantly impact agricultural productivity in Belize.** Simulations for the main crops cultivated in northern Belize under the climate scenario projected for 2060⁵⁸ were compared with historical data from 1981–2019 using the Aquacrop model developed by FAO. Results indicate that, *ceteris paribus*, sugarcane yields (currently averaging between 36.1–43.4 tons/hectare) will decrease by 17 percent by 2060 if no adjustments are made (Table A2.1). Maize production using existing technologies will not be viable in 2060 without irrigation. Similarly, for cabbage and onions, yields are projected to decline (by 47.5

⁵⁷ Government of Belize (2016). “Belize’s Third National Communication to the United Nations Framework Convention on Climate Change.” National Climate Change Office, Ministry of Agriculture, Fisheries, Forestry, the Environment and Sustainable Development, Belmopan. <https://unfccc.int/sites/default/files/resource/blznc3.pdf>.

⁵⁸ Based on the Third National Communication projected changes in temperature and precipitation by 2060.



percent and 43.5 percent, respectively). As these scenarios emphasize, the effects of climate change will have a major impact on the sustainability of agricultural production.

Table A2.1: Estimated climate change effects on two key crops in Belize (sugarcane and maize)

	Scenario	Climate (1981 - 2019)				CC 2060			
		Average yield (ton/ha)	Dry Yield (ton/ha)	Water productivity (**)	Biomass (t/ha) (potential vs estimated)	Average yield (ton/ha)	Dry Yield (ton/ha)	Water productivity (**)	Biomass (t/ha) (potential vs estimated)
Sugar Cane	Irrigated (*)	70.1	25.9	2.11	72.1	69.3	25.6	2.20	72.1
	Rainfed	43.4	16.1	1.83		36.1	13.3	1.73	
Maize	Irrigated (*)	3.4	3.4	0.78	17.0	3.3	3.3	0.79	16.99
	Rainfed	3.3	3.3	0.78		0.0	0.0	0.0	

(*) with water stress management
(**) kg of yield per m3 water evapotranspired
Note: CC = climate change.

3. **Using a prioritization framework, best-fit climate-smart agricultural practices and technologies for Belize's agricultural sector were identified via a multi-phase participatory exercise.** Based on detailed technical and economic analysis, a team from CIAT and the World Bank assessed the climate smartness of different technologies and practices and identified a set of “best-fit” technologies and practices for major crop/livestock production systems in different regions of Belize.⁵⁹ The Project will promote adoption of the best-fit CSA technologies and practices, making an inventory of such CSA approaches available for consideration by beneficiary farmers and providing resources through the Climate-Smart Agriculture Matching Grants Program that will allow them to adopt those approaches. Adoption of the CSA approaches by Project beneficiaries is expected to generate higher and more stable incomes for the beneficiaries and their families, as well as improvements in the adaptive capacity and resilience of the sector overall. In addition, to the extent that adoption of CSA practices will lead to reduced GHG emissions, the Project will also contribute to climate change mitigation (see Annex 5).

Figure A2.2: Examples of Best-Fit Climate Smart Agricultural Technologies and Practices for Belize, and their Potential Contribution to Climate Adaptation (A) and Mitigation (M)

Banana	Timely bagging (using biodegradable bags) Water-efficient mgmt (drainage-canals/irrigation-drip) Biofertilization (ground cover with N-fixing legumes)	M	Coconut	Integrated pest management (biological control) Use of high-quality certified planting material Intercropping (e.g. soursop, lime, pineapple)	M
Bean	Crop rotation (e.g. corn, soybean) Planting high-yielding varieties Adjusted planting date to match rainfall pattern	A&M	Corn	Plant density management Crop rotation with beans Water-efficient irrigation (e.g. sprinkler)	A&M
Cattle	Crop rotation (e.g. corn, soybean) Use of improved pastures (e.g. Mombasa) Use of improved breeds (e.g. Brangus)	A&M	Rice	Planting high-yielding varieties Water harvesting (e.g. ponds) Water-efficient mgmt (alternate wetting & drying)	A&M
Cacao	Grafting techniques Management of cacao trees (pruning) Agroforestry (e.g. mahogany, salmwood, plantain)	A&M	Sugarcane	Planting of high-sugar-content varieties Water-efficient mgmt (e.g. vinasse for irrigation) Soil and land management (minimum tillage)	A&M
Citrus	Intercropping (e.g. coconut, pineapple, soursop) Improved drainage (e.g. raised beds) Use of certified planting material	A&M	Vegetables	Use of disease-tolerant varieties Cover structures (e.g. bubble house) Drip Irrigation (fertigation)	A

⁵⁹ CIAT and World Bank (2018), "Climate-Smart Agriculture in Belize." CSA Country Profiles for Latin America and the Caribbean Series.



ANNEX 3: Detailed Project Description

1. **Project Development Objectives (PDO) and Cost.** The Project Development Objectives (PDOs) are to (i) increase agricultural productivity and the adoption of climate-smart agricultural approaches among project beneficiaries; and (ii) respond effectively to an Eligible Crisis or Emergency event. The total project cost will be US\$45.7 million, consisting of (i) a US\$25 million loan from IBRD; (ii) co-financing for matching grants from eligible PFIs, estimated at US\$18.2 million; and (iii) US\$2.5 million contribution from beneficiary farmers.

Component 1: Institutional Strengthening (Total Cost, financed by IBRD: US\$2.9375 million)

2. **This component will focus on strengthening the capacity of relevant Governmental and academic institutions.** It will enhance capacity of key MAFSE departments and other key institutions—specifically, BAHA, PCB, NMS, and the Agriculture Department of the University of Belize—by capacity building and training of farmers and students to increase understanding and enhance responses to the impacts of climate change on agriculture in Belize. Specific departments to be supported in MAFSE include: (i) the Extension Department, for the provision of technical and climate advisory services to the farmers; (ii) the Policy Department, for the improvement of the Belize Agriculture Information Management System (BAIMS); (iii) the Water Management and Climate Resiliency Department, in order to better plan, manage, monitor and inform decisions related to water and soil information systems; (iv) the Cooperative Department, for better organization of farmers; and (v) the Central Farm Agricultural Station. These actors play a pivotal role in agricultural research and extension for farmers, with an emphasis on climate change and on CSA technologies and practices. Moreover, support will be provided to MAFSE to identify gender gaps and other inequalities in access to resources and build capacity on ways to directly address the needs of marginalized producers and provide gender-sensitization training for staff in BSIF and in all of the public sector agricultural agencies engaged in the Project (MAFSE, NMS, BAHA, PCB and the Agricultural Department of the University of Belize.)

3. **A primary aim of this component is to strengthen MAFSE information systems and develop MAFSE's e-extension capacity.** This effort will focus on developing accessible content (videos and brochures) on key issues faced by Belizean farmers and on ensuring that the information generated from weather monitoring tools (discussed in paragraph 7 below) is communicated to farmers in ways that apply directly to their production decisions—for example, through recommendations on optimal planting dates for various crops based on weather forecasts. To this end, the Component will also finance efforts by MAFSE's Policy Department to validate and enhance agricultural records and other data in BAIMS, including to: (a) identify and map crop and livestock farms; (b) manage administrative data on agricultural farms and update it to farm polygons; and (c) manage and carry out agricultural surveys in almost real time. The upgraded information in BAIMS will facilitate improved outreach by extension services, including via e-extension, to farmers.

4. **Component 1 will finance capacity-building activities, training, studies, and provide technical assistance to the Agricultural Department of the University of Belize.** This will include support for purchasing licenses for selected software (crop modeling, crop irrigation, others) and for training and/or other capacity building activities for supporting improved delivery of technical and agribusiness training by the University's Agriculture Department, including at its Central Farm Station.

5. **BAHA and PCB, the regulatory agencies for plant and animal health in Belize, will be supported through training and equipment purchases.** This support, which is especially critical considering the COVID-19 crisis, will include improved surveillance (especially of zoonotic diseases) to ensure food safety and quality, improve the capacity to inspect animals and certify that they are free of disease, and ensure compliance with best, climate-smart integrated pest management practices. The range of activities pursued by BAHA and PCB will be informed by global best practices on food safety and climate-smart pest control measures.



6. **Component 1 will also strengthen the capacity of NMS and MAFSE to help farmers manage extreme climate events, by strengthening agro-meteorological data collection, processing and sharing, and by analyzing hazard risks for selected agricultural activities under extreme climate events (specifically, excessive rainfall and drought).** NMS and MAFSE will be supported to explore different climate risk management strategies and the feasibility of associated financial instruments to improve the management of risks due to extreme weather and climate events. Critical capacity strengthening will include activities to:

- a) Maintain and upgrade the National Meteorological Observations Network through the rehabilitation of weather stations in agricultural production areas.⁶⁰ To this end, the Project will provide technical assistance, training, equipment (including agrometeorological equipment), and field vehicles to allow NMS staff to improve climate data management and weather monitoring.
- b) Strengthen the agro-meteorological systems of NMS to improve its services by enhancing NMS' climate information, agrometeorological products, services, and advisory capacity to monitor weather variability and agrometeorological conditions. More specifically, CRESAP will finance the continued development of the NMS climate data management system (SURFACE CDMS) to carry out quality control of agro-climate data; produce forecasts, reports (agro-weather bulletins), and agrometeorological indices; and analyze and visualize climate data. These activities will also include the purchase of computer servers and network devices to better host applications for stakeholder access.
- c) Enhance the NMS ability to better identify climate-induced hazards and estimate the hazard exposure of agricultural activities implemented by targeted beneficiaries, assess the vulnerability of target crops and estimate the value at risk with different exceedance probabilities. It will also help MAFSE to develop an e-extension system for sharing agroclimatic data and information with end-users (farmers, financial institutions, public servants), from which experts can directly interact with external or internal users in real (or almost real) time. The climate information services generated through these initiatives will help to increase productivity and resilience for participating farmers by advising on crop vulnerabilities, informing decisions that improve water-use patterns in irrigated areas, and advising on the optimal timing of planting/harvesting based on weather forecasts.
- d) Build Capacity among NMS staff by facilitating the training of mid-level technicians from instrumentation, climatology, agro-meteorology and weather and climate forecasting.
- e) Design and establish a system to ensure linkages by BAIMS into NMS agrometeorological data systems, and put in place a communication system, drawing on contact information in the BAIMS, to provide agro-weather advisories and e-extension to farmers. This will include improved and localized agro-meteorological and agricultural production information, as well as BAHA and PCB guidance, and other e-extension information to increase agricultural productivity and better manage climate-related risks. The e-extension will be provided using tools such as WhatsApp and Short Messaging Service (SMS). CRESAP will provide training to staff and finance technical support for the development and use of these platforms.

Component 2: Investments in Climate-Smart Agriculture (Total Cost: US\$39.7 million, of which IBRD: US\$19 million; commercial finance from Participating Financial Institutions (PFIs): US\$18.2 million, and beneficiary farmers: US\$2.5 million).

7. This component will consist of three interrelated and complementary subcomponents providing technical and financial assistance to carry out strategic investments of private and public nature to increase productivity and climate resilience. The first subcomponent will provide technical assistance and training on CSA approaches to participating financial intermediaries and to potential beneficiaries willing to engage in climate-smart

⁶⁰ Currently, conventional weather stations are no longer supported internationally, and most of the automated stations do not have high-precision sensors to properly validate data recorded by conventional, manually operated stations.



agricultural investments under the Project. The second subcomponent will promote CSA technologies and practices at the farm level via a matching grants program that would also leverage private contribution from PFIs. The third subcomponent will finance selected investments in public/private goods for collective benefit, such as rural infrastructure for drainage, water capture, collection and distribution.

Box A3.1: The Climate-Smart Agriculture Matching Grants Program

Under Subcomponent 2.2 of CRESAP, uptake of CSA technologies will be promoted through the provision of matching grants. Matching grants have proven to be an effective mechanism for directing resources to well-defined groups of carefully targeted beneficiaries in a way that responds to user demand, elicits a strong commitment on the part of grant recipients by requiring them to invest their own resources, and leverages significant contributions from the private sector. An additional benefit is that, when matching grants are provided along with technical assistance and capacity building, financial institutions are often more inclined to provide loans to co-finance the activities being supported, increasing the penetration of commercial banks into the agricultural sector and establishing relationships that usually continue beyond the life of the project.

The CRESAP Climate-Smart Agriculture Matching Grants Program will be implemented using a demand-driven approach. Key features of the Matching Grants Program include the following:

1. Eligibility criteria (detailed in a Matching Grant Operations Manual, or MGOM) will be decided in collaboration with MAFSE management and District Agricultural Coordinators so that matching grants can be directed to production systems and groups within the population deemed most vulnerable to the impacts of climate change, based on observed climate risks, and that are best positioned to take advantage of CSA technologies and practices.
2. A strong public awareness effort (as part of a communication plan) will be organized by the PIU to inform potential beneficiaries—including via targeted outreach to women farmers—about technical and financial support available for CSA technologies and practices.
3. Technical assistance will be provided to interested farmers to help them prepare subproject proposals and to integrate into their subprojects specific mechanisms to improve market access.
4. The PIU will log all proposals and then send them to the Matching Grant Approval Committee for screening in order to confirm their compliance with eligibility requirements and application guidelines as well as the final decision.
5. Proposals will be evaluated by PFIs in one of three ways to determine their financial soundness:
 - If the applicant has an established banking relationship with a PFI, the proposal will be evaluated by the PFI to determine its financial soundness.
 - If the applicant does not have an existing banking relationship with a PFI, the application will be distributed to all participating PFIs for their evaluation/expression of interest.
 - If the applicant wishes to self-finance the non-matching grant portion of an investment, the PIU will contract a PFI to do the due diligence evaluation of the financial soundness of the proposal and to disburse the grant.

A Climate-Smart Agriculture Matching Grants Approval Committee (MGAC), comprising *ex officio* public agricultural technical experts specified in the Project Operations Manual (POM) and representatives from the participating PFIs. The MGAC will evaluate proposals using criteria specified in the POM and in the MGOM, confirm with the PFIs the amount of financing that PFIs are ready to provide, and determine the matching grant amount. The respective responsibilities will set forth in the PFI Agreement to be signed by the BSIF PIU and the PFIs.



For approved proposals, the PFI will sign a Participation Agreement with the beneficiary and establish an account in their institution for the beneficiary,⁶¹ and after the PFI and the beneficiary have deposited their respective agreed financing amounts in the account; the PIU will transfer the agreed grant to the beneficiary's account in the PFI, at which point the resources become available to the beneficiary.

The eligibility criteria, application requirements, and governance arrangements will be carefully designed to promote appropriate incentives for all stakeholders, transparency, consistency and efficiency, and to ensure that 30 percent of beneficiaries are women farmers and that grants are broadly distributed across the four northern Districts targeted under CRESAP (i.e., not unduly concentrated in a given area).

Subcomponent 2.1: Strengthening the capacity of PFIs and beneficiaries (IBRD loan US\$1 million)

8. **This subcomponent will provide technical assistance and training to participating eligible financial institutions (PFIs),** such as: (i) the Belize Development Finance Corporation (DFC) and other PFIs, including commercial banks and credit unions, to enhance their knowledge of the new CSA technologies and practices, as well as their capacity to select and appraise eligible climate-smart subproject proposals in a transparent, timely, and systematic manner; and (ii) the Belize Credit Union League, which is an advocacy and training body for credit unions, to enhance their knowledge of new technologies promoted by the project and their capacity to lend advisory support to the credit unions, complementing the capacity-building activities under the IDB-financed Eco-Micro Project.⁶² In addition, gender-sensitivity training will be provided to the PFIs to raise awareness of the particular constraints faced by women and ways to address them.

Box A3.2 - Key Financial Sector Institutions in the Belizean Financial Sector

All financial sector institutions operating in Belize are licensed under the Domestic Banks and Financial Institutions Act (DBFIA), the International Banking Act (IBA), the Credit Unions Act (CUA), the Moneylenders Act (MA) and the National Payment System Act (NPSA). They are supervised and regulated by the Financial Sector Supervision Department of the Central Bank of Belize. Belize's financial sector comprises: (i) the Belize Development Finance Corporation (DFC), which is a publicly owned development bank that accesses financing from larger regional and international lending institutions to provide loans for a range of agricultural, manufacturing and services (including tourism) sectors. Around 30 percent of its loan disbursements in recent years have been for agricultural sector activities; (ii) four commercial banks (Atlantic, Belize Bank, Caribbean International Bank and Scotia Bank), which provide standard deposit-taking and loan services, including, to a lesser degree, lending to the agricultural sector; and (iii) thirteen credit unions, most of which are associated with the Belize Credit Union League (BCUL), where some of these credit unions are service-related (e.g., for the police and civil service), but several are important financial services providers for smaller farmers.

The total size of the regulated financial sector (excluding DFC) was BZ\$5.5 billion as of July 2021, of which around 80 percent of assets were in commercial banks and 20 percent in credit unions. Net domestic credit stagnated with the onset of the COVID-19 pandemic, although there are signs that growth is beginning to accelerate. In addition, aggregate excess cash reserves have risen to BZ\$384 million, or 172 percent above the primary reserve requirement, pointing to opportunities for engaging private capital in future lending for CSA technology adoption. Conversations by the Bank team with these institutions suggest that several of them would be interested in participating in CRESAP.

⁶¹ This applies to beneficiaries that are not doing self-financing.

⁶² The specific financial instruments will be designed in collaboration with the IDB-financed Eco-Micro Project, which is designing green investment finance instruments.



9. **This subcomponent will also provide training to individual farmers and farmers' organizations**, including to: (i) strengthen the organizational, operational, and business capacities *inter alia* of organized groups, producer organizations, and other types of groups of producers supported by CRESAP; (ii) provide international and national technical assistance and extension and climate advisory services to farmers to raise awareness of new, climate-smart technologies and practices with proven benefits to increase productivity, enhance resilience, and reduce GHG emissions, and (iii) provide TA to interested farmers for the preparation of matching grant proposals under Subcomponent 2.2, including ways to secure market access for their products, and to farmers awarded matching grants for the implementation of their proposals. The CRESAP Project will ensure that women farmers benefit from technical, financial, and business training opportunities and will facilitate such training in ways that take into consideration their household responsibilities. For example, training sessions will occur at locations and times that are convenient for women farmers, and the Project will finance (to the extent necessary) the temporary use of daycare facilities as an incentive for women farmers' participation.

Subcomponent 2.2: Promotion of CSA technologies and practices via matching grants and leveraging of private capital (Total cost: US\$ 36.7 million; of which IBRD: US\$16 million, PFIs: US\$18.2 million and beneficiary farmers: US\$2.5 million).

10. **This Subcomponent will foster the uptake of tested and carefully selected CSA technologies and practices that increase resilience to climate shocks and weather events, improve productivity, and lower production costs so as to increase profitability.** More specifically, Subcomponent 2.2 activities aim to: (i) increase climate resilience of Belizean agricultural producers; (ii) enhance access to water in agriculture with the objective of optimizing productivity, enhancing water resource management and efficiency in the use of water for agriculture; (iii) create conditions for crop diversification, including the introduction of higher-value crops and/or increased land-use intensity (through double cropping, intercropping, the use of high-yielding varieties, varieties better adapted to resist climate change, and other practices to increase resiliency to climate change); and (iv) reduce inefficient use of purchased agricultural inputs as well as food losses and waste. This subcomponent will also include activities to reduce GHG emissions (for example, through energy and water efficiency measures and adoption of alternative sources of energy), thereby contributing to the productivity and mitigation pillars of the CSA approach.

11. **Most investments under this subcomponent will be small-scale investments in technologies** linked to water in agriculture (such as individual water harvesting, modern on-farm irrigation, and drainage technologies), as well as uptake of CSA technologies and practices (such as improved seeds of drought-resistant varieties or changing to more resilient and adaptive practices in the production system, such as agroforestry and improved soil management). The list of the most appropriate CSA technologies and proven practices for increasing resilience and reducing GHG emissions in relation to Belizean production systems will be based on previous Bank studies (for example, the 2018 CSA country profile) and on validated technologies promoted by national and international research institutions (University of Belize, CIAT and the Consultative Group for International Agricultural Research). The selection of technologies will also be guided by activities from the approved list in Annex A.C.1 of the *2020 Joint Report on Multilateral Development Banks' Climate Finance*⁶³ and the World Bank guidance for meeting climate change requirements in agriculture.⁶⁴ Uptake of these technologies and practices will increase the resilience of producers and of other actors further down the value chain when droughts and floods occur, as well as their ability to recover from climate shocks. This subcomponent will support gender-sensitive CSA technologies that take into consideration the particular challenges that women farmers face and that are affordable, accessible and labor-saving (see Annex 6).

⁶³ ERBD et al. (2021), *2020 Joint Report on Multilateral Development Banks' Climate Finance*.

⁶⁴ World Bank (2018), "Climate Change Requirements: Guidance Note for Meeting Corporate Requirements in Climate Smart Agriculture."



12. **Subcomponent 2.2. will provide matching grants to farmers and their organizations to invest in demand-driven CSA investment subprojects involving key strategic innovations and improvements for the adoption of CSA.** The matching grants will be responding to effective demands as identified by beneficiaries and made accessible to farmers through a range of PFIs, including credit unions, commercial banks, and the DFC. Matching grant recipients will supplement the grant funds with credit provided by PFIs and from their own resources. The matching grant program will have two initial stages before grants are awarded to ensure wide dissemination of information on the grant program and to enable applicants to develop promising CSA subprojects proposals for financing by PFIs. The first stage will raise awareness among targeted beneficiaries, including women farmers, about CRESAP support for CSA technologies and practices and will provide information on the terms and conditions of the matching grants. The second stage will focus on supporting farmers with technical assistance for preparing matching grant proposals and applications for complementary credit.
13. **The Climate-Smart Matching Grant Program will have two windows for two different sets of farmers (see Table A3.1 below).**
14. **Window 1: Smallholder farmers (IBRD: US\$10 million; PFIs: US\$6.6 million).** The first window will provide matching grants to about 3,300 individual smallholder farmers who are transitioning to commercial production to enable them to adopt climate-smart approaches. These grants would be equivalent to up to 60 percent of investment amounts and up to a maximum of US\$6,000 per subproject, corresponding to a total investment of US\$10,000 (if the investment is higher the difference has to be covered by the beneficiaries). On average, these grants are estimated to amount US\$3,000 per subproject, based on average estimated investments, operating and TA costs for smallholder farms of about US\$5,000 per subproject. The matching grants will leverage financing from PFIs, and may leverage non-mandatory contributions from smallholder farmers.
15. **Window 2: Medium and Large Farmers and Farmers Organizations (IBRD: US\$6 million; PFIs: US\$11.6 million and beneficiary farmers: US\$2.5 million).** The second window will provide matching grants to medium and large commercial farmers and to groups of farmers (for a total of about 400 subprojects), with a view to supporting larger investments needed to adopt CSA approaches. The grants under this window, would be equivalent to up to 30 percent of investment amounts, not exceeding US\$30,000 per subproject (maximum corresponding to a total investment of US\$100,000). Based on estimated investments, the average investment cost would be around US\$67,000 and the average amount of matching grants will be around US\$20,000 per subproject. These matching grants will leverage a larger financing share from PFIs and beneficiaries, and beneficiary contributions will be required, thus keeping the amount of matching grants under Window 2 within reasonable limits (see Table A3.1).
16. Farm sizes are generally classified based on land size: those operating on 0.5–20 acres are considered small-scale farmers, whereas those operating on more than 20 acres are considered medium and large farmers. Under Subcomponent 2.2, the working definition will be: (a) smallholder farmers eligible for Window 1 grants will be defined as those with "a total land area under cultivation (including crops, vegetables, fruits, livestock or aquaculture) between 0.5 acres and 20 acres"; and (b) medium and large farmers eligible for Window 2 will be defined as those with "a total land area under cultivation (including all uses) above 20 acres". All prospective beneficiaries shall be registered in the Belize Agriculture Information Management System (BAIMS).
17. **A Matching Grant Operations Manual (or MGOM, to be part of the POM) will specify the full eligibility criteria for potential beneficiaries,** as well as the types of subproject investments to be supported, terms and conditions, procedures for loan appraisal, application for the grant funds, the grant approval process, maximum amounts by type of beneficiaries and the process for accepting PFIs into the Project. The eligibility criteria will focus on enhancing climate resilience at the farm and community levels and will ensure that at least 30 percent of grants will be targeted to women farmers.



Table A3.1: Grant Windows under the Climate-Smart Matching Grant Program

Windows	Window 1: Small Holders	Window 2: Medium and Large Farmers and Farmers Organizations	Total
Farm size	0.5 to 20 acres	20.1 to 200 acres	-
Farmer population	4,950 (including at least 55% of farmers producing only sugarcane)	3,870	8,820
Indicative total amount allocated to each window	US\$10,000,000	US\$6,000,000	US\$16,000,000
CSA matching grant as share of subproject investment	60%	30%	-
Eligible CSA costs	<ul style="list-style-type: none"> ✓ Investment costs ✓ Technical assistance (when needed) ✓ Recurrent production costs ✓ Operations and maintenance 		-
Maximum cost of investment considered for matching grants per subproject	US\$10,000	US\$100,000	-
Ceiling of the CSA matching grants provided per subproject	Not exceeding US\$6,000	Not exceeding US\$30,000	-
Estimated Average Investment per subproject	US\$5,000	US\$67,000	
Estimated Average CSA matching grant per subproject	US\$3,000	US\$20,000	-
Estimated number of beneficiaries per window	3,300	400*	3,700
Estimated private capital leveraged per window	US\$6,600,000	US\$14,100,000 (of which: PFIs: US\$11,600,000 and farmers: US\$2,500,000)	US\$20,700,000

18. **To ensure that all investments in CSA technologies are complemented by critical TA and extension services, the Project will provide an integrated technical support package to each farmer benefitting from grant support.** The advice will include guidance directly related to the CSA technology (for instance, the most appropriate deployment of irrigation equipment procured with project support) and broader technical advice, such as how to make other operations on the farm climate-resilient (e.g., appropriate pruning of tree crops). Technical support will be available, but optional, for medium-/large-scale farmers and farmer groups under Window 2 but will be mandatory for the individual smallholder farmers under Window 1.

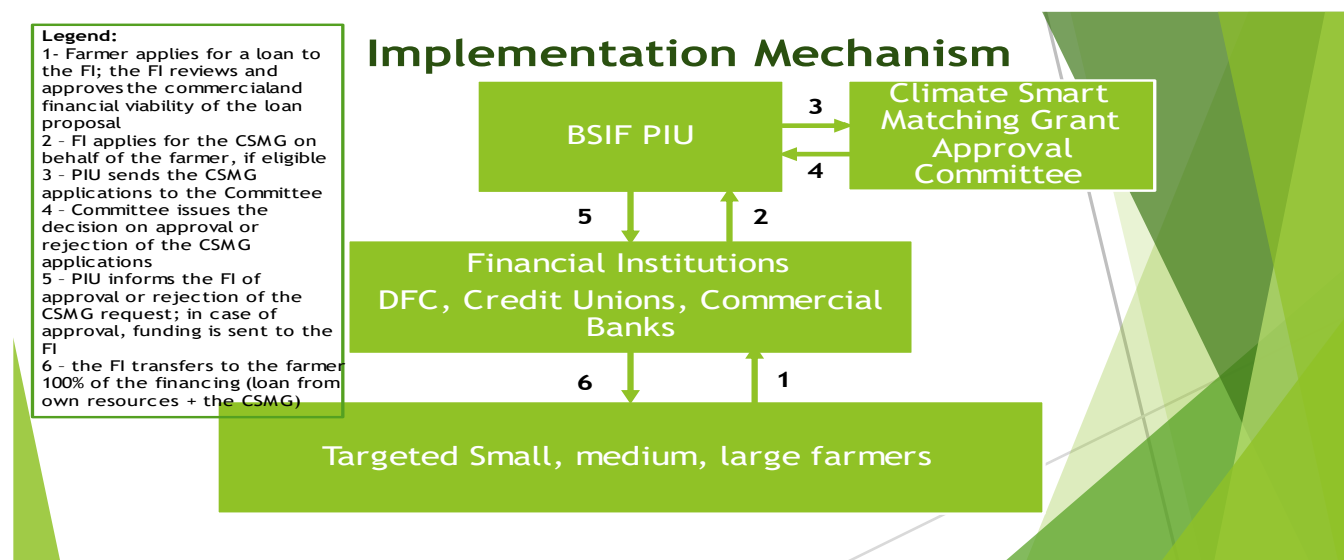
19. **Eligible farmers and their organizations will submit proposals to their selected PFI, which will review their financial soundness.** The PFI will also screen the farmers' proposals on environmental and social aspects through the ESMS developed. Each proposal will specify the PFI of the farmers' preference (to accommodate



existing banking relationships, see the discussion below on the eligibility of financial institutions to participate in CRESAP). If loan financing is requested but no PFI is specified, the proposal can be submitted to BSIF, which will share it with all eligible PFIs. If an applicant wishes to apply for a matching grant without loan financing (self-financing the difference), the proposal would be submitted to BSIF, which would contract a PFI to undertake the required due diligence, sign the Participation Agreement with the beneficiaries and administer the grant funds, as if it were providing loan financing for the proposal. In exceptional cases, BSIF could decide to hire a PFI to undertake the assessment of the proposals but opt to sign the agreement with beneficiaries directly and manage the disbursement of the grant funding approved.

20. **Since PFIs will co-finance an estimated 40–70 percent of subproject costs from their own resources, they will review and approve the commercial and financial viability of the loan requests based on their banking considerations.** If the PFI endorses the loan request, BSIF will pre-screen them for compliance with application guidelines before distributing the applications to the full Matching Grants Approval Committee, including the relevant PFI, which will review the technical merits of the proposal and, if found to be satisfactory, the grant amount will be determined and approved by the MGAC. If the proposal is not considered satisfactory by the PFI or the MGAC, it could be sent back to the applicant for revision or denied for failing to meet eligibility criteria. For approved proposals, the PFI will sign a Participation Agreement with the beneficiaries specifying the respective responsibilities. Based on this Participation Agreement, the PFI will establish an account in their institution for the beneficiary and deposit the PFI's agreed financing amount as well as the Beneficiary's counterpart contribution, if any, in the account. Then BSIF will transfer the agreed matching grant amount to the beneficiary's account in the PFI, at which point the resources will become available to the beneficiary for the investment. A portion of the grant element, agreed by the MGAC, could be released after the beneficiary has established a repayment track record with the PFI. The PFI will be responsible for executing loan/grant disbursements, monitoring and collecting loans, and, if required in case of a loan default, the matching grants will be transformed into a loan under the same conditions and terms as the PFI loan. Any matching grants recovered as a result of their conversion into loans, and any undisbursed matching grants, will be returned by the PFI to BSIF. Figure A3.1 below summarizes this process.

Figure A3.1: Implementation mechanism for the Climate-Smart Matching Grant Program



Note: Proposals that do not require PFI financing would be submitted directly to the PIU by farmers; the PIU would contract a PFI to undertake a due diligence review of the financial soundness of the proposal and to manage disbursement of the grant.



21. **Other terms and conditions of the matching grants are as follows:**

- (i) MAFSE will sign a legally enforceable PFI Subsidiary Agreement with each PFI.
- (ii) The grants will target four Districts of northern Belize (Cayo, Orange Walk, Corozal, and Belize).
- (iii) Eligible subsectors: climate-smart production of sugarcane, rice, maize, soybeans, vegetables, livestock, fruit, and shrimp in the target Districts, as well as bananas and citrus nationally.
- (iv) Selected post-harvest processing investments that contribute to climate change mitigation via crop loss and waste reduction will also be eligible for matching grants.
- (v) A missed payment to the PFI could result in conversion of the disbursed portion of the grant into a repayable loan (any portion of the grant not disbursed to the beneficiary, or that is collected from the beneficiary, will be returned to BSIF for distribution to other proposals).
- (vi) No more than 20 percent of all project resources for the Climate-Smart Matching Grant Program will be invested in one subsector, for risk management and results.
- (vii) At least 30 percent of grants will be awarded to women farmers.

22. **Financial institutions interested in participating in the Climate-Smart Matching Grant Program will undergo an initial assessment process during which their operational and financial situation will be assessed. The initial assessment will be guided by the following criteria:** (i) compliance with the respective laws and prudential regulations of the Central Bank of Belize; (ii) an unqualified audit report by an audit company acceptable to the Bank; (iii) positive net income; (iv) acceptable loan portfolio quality, or an action plan with specific measures to achieve good loan portfolio quality (with non-performing loans that do not exceed 5 percent of the gross portfolio); (v) adherence to good corporate governance and managerial standards; (vi) ability and commitment to serving the project clients in the target area; (vii) willingness to co-finance matching grants with the institution's own resources; (viii) willingness to participate in CRESAP's capacity building and other activities; and (ix) expected continuous adherence to the eligibility criteria. The PFIs will have to adhere to an ESMS. The detailed criteria, terms, and conditions for accepting financial institutions as participants in the Project will be set forth in the MGOM within the POM.

Subcomponent 2.3: Provision of Selective Strategic Collective Assets to Strengthen Resilience (IBRD loan US\$2 million).

23. **Subcomponent 2.3 will finance studies, technical assistance, goods and works for strategically selected infrastructure for collective use, which would contribute to eliminate constraints and/or increase the impacts of on-farm CSA investments under Subcomponent 2.2.** A multi-dimensional analysis undertaken for CRESAP with support from FAO has identified priority areas for key rural investments in irrigation and drainage infrastructure, based on biophysical, climatic, productive, and social parameters. These areas include suitable sites where ponds can be built to collect rainwater for irrigating farmers' land during summer or drought periods.⁶⁵ Investments under Subcomponent 2.3 could also include investments in drainage infrastructure for low-lying, flood-prone areas in much of northern Belize, or pilot initiatives for small-scale, collective water-harvesting or land-use assets (where communities are interested in sharing a collective pond, pasture, or similar asset). The characteristics of the infrastructure to be implemented under Subcomponent 2.3 have been defined in light of projected changes in temperature and precipitation by 2060, based on the Third National Communication. It is important to highlight that women farmers will be involved in the determination and use of infrastructure supported under this Subcomponent, and will receive training to manage the infrastructure, including leadership training to participate in O&M committees (see Annex 6).

⁶⁵ Potential water diversion and harvesting sites were identified using the AGRI World Sources tool (<https://agri-worldsources.com/>) developed by CIAT and FAO.



24. **CRESAP will incorporate specific gender actions to ensure that women farmers benefit fully from the Project's technical assistance and green investments.** CRESAP's implementation strategy includes identification of gender gaps; integration of gender equity at all levels of implementation; gender-sensitization training for staff in participating institutions; inclusion of specific activities for women to obtain project services and resources, and the identification and dissemination of accessible and affordable technologies that meet women's requirements, including the need to reduce agricultural labor. Thirty percent of the beneficiaries of matching grants and collective goods will be women farmers. The Results Framework will measure the increase in yields on women beneficiaries' farms and the number of beneficiary women farmers who have adopted an improved climate-smart agricultural technology or practice promoted by the Project (see Annex 6 for details on the Gender Action Plan).

Component 3: Project Management and Monitoring, and Evaluation (Total Cost, financed by IBRD: US\$3 million)

25. **This component will finance incremental and operating costs, goods and equipment for BSIF's implementation of CRESAP.** It will provide resources to enable BSIF to effectively carry out administrative, fiduciary management, planning, monitoring and evaluation (M&E), and reporting functions; to provide training as needed to the BSIF PIU staff; and to ensure compliance with all applicable environment and social standards. This component will also finance external audits, as well as a baseline assessment, mid-term evaluation and end-line assessment to document the Project's results and evaluate its outcomes and impacts. In addition, the Project will help carry out strategic studies to be able to identify current constraints and limitations being faced by agri-business seeking enhanced market access, as well as opportunities to strengthen competitiveness and improve exports. These will help to identify possible policy reforms and improvement in legal and regulatory frameworks, as well as to design mechanisms to support enhancing market access by private agri-business.

Component 4: Contingent Emergency Response Component (CERC) (US\$0 million)

26. **The CERC is a contingent financing mechanism for Belize to have immediate access to Bank financing in the event of an eligible crisis or emergency event.** The mechanism for triggering the CERC will be established in the CERC Operations Manual, detailing the applicable fiduciary, environmental and social, monitoring, reporting, and other implementation arrangements required for implementing the activities to be financed. In case of an event triggering the CERC, funds will be reallocated to this component to finance emergency purchases and activities, including goods, works and technical assistance to respond to the emergency. The CERC will be activated and managed in accordance with applicable Bank policies and would be triggered only when the Government of Belize has officially declared an emergency and has provided a statement of the facts justifying the request to activate emergency funding. The implementation agency for the CERC will be determined in the CERC Manual.



ANNEX 4: Economic and Financial Analysis

1. **Benefits expected from the Project include increased production, improved productivity, increased marketed production (value of sales), and various climate co-benefits.** The additional production and its value were estimated using representative budgets for CSA packages. The GHC accounting was done using the Ex-Ante Carbon-balance Tool (EX-ACT). The Project is anticipated to increase incomes for beneficiary farmers through: (i) increased crop yields and productivity due to enhanced agricultural practices based on CSA packages, water availability, and increased land-use intensity (more cropping cycles per year); (ii) increased shares of marketed produce; (iii) fewer losses during production and processing owing to investments in innovative climate-smart technology; (iv) improved quality and more consistent availability of products, which will attract higher prices as a result of demand from processors for more reliable inputs/outputs; (v) increased employment, either for hired or family labor; and (vi) increased tax revenues owing to increased volumes of taxable production. The increase in incomes will depend largely on the extent to which farmers adopt CSA packages, which CRESAP will promote directly, as well as the development of selected collective infrastructure investments that will help to improve production (including water availability for agriculture). Together, these investments will create a more favorable economic environment and encourage farmers to produce more competitive products. Finally, as Belize currently imports horticultural products during the winter, it is reasonable to expect that increased production of these products will reduce imports and foreign exchange expenditures.

2. **Increased output, income, and employment in the targeted zones will result in increased demand for goods and services, which will generate additional income and employment beyond the agricultural sector.** As the Project will support high-potential areas in the production of major food and commercial crops, the increased output from the targeted areas will increase national production, and thereby contribute to growth in overall GDP and national food security. Furthermore, it is expected that consumers will benefit from reduced consumer prices and improved availability of better quality, locally produced food commodities. Given the unmet growing domestic demand for food commodities targeted by CRESAP, it can be assumed that the Project will more than offset any potential negative effects of reduced producer and retail prices.

3. **The Project is also expected to indirectly benefit input retailers as well as traders and processors involved in the selected value chains, as the investment subprojects are expected to make input use more efficient and profitable for farmers and to increase their output.** The additional production will create a critical mass of marketable surplus to attract larger-scale buyers seeking higher-quality produce, which will trigger a virtuous cycle of profitable production, improved productivity, and increased purchases of inputs.

4. **The Project will also generate important institutional and social benefits, as well as climate co-benefits.** Major institutional benefits expected from the Project would be: (i) agriculture and communities linked to markets and functioning more effectively; (ii) local communities managing the infrastructure provided; and (iii) public institutions supported under Component 1 having stronger capacity to respond to climate change. The social benefits and climate co-benefits expected from CRESAP will come from its focus on reducing rural poverty, creating jobs, and enhancing climate resilience. The Project will provide additional sources of income for poor rural households, serve to diversify rural incomes and improve environmental sustainability, thereby helping to reduce exposure and vulnerability to climate change.

I. FINANCIAL ANALYSIS

Introduction

5. **The main objective of the financial analysis is to examine the potential for increased profitability of key crops as a result of project interventions.** The analysis assesses whether: (i) productive activities supported by CRESAP will offer sufficient financial incentives to attract targeted farmers to participate; and (ii) cash incomes



generated by these activities will be adequate for farmers to repay the funds borrowed for their investments. The analysis uses eight representative financial budgets prepared for crops and livestock produced with the CSA packages considered most relevant in the target areas. Table A4.1 shows the CSA packages used in combination with particular crops and livestock. The data for the financial analysis are based on three studies prepared by the World Bank and CIAT,⁶⁶ MAFSE data, the Belize 2019 agriculture census, and field visits.

6. **The analysis compares the situation without the project to the likely situation with the project.** Without the Project, farmers are expected to retain the current low-input, low-output production systems, even as output declines with increasing land degradation and limited resilience to extreme climate events (droughts and floods in particular). The most important cultivated crops in the target areas for CRESAP are sugarcane, maize (corn), rice, tree crops (citrus and coconuts), beans, and vegetable crops (cabbages, sweet peppers, and tomatoes). Livestock are also important. Irrigation is not very common in Belize, except for banana and rice production.

Table A4.1: Representative crops and CSA practices used for the financial analysis⁶⁷

Crop	CSA practice	Practice
Sugarcane	Water-efficient management (vinasse for irrigation) & soil and land management (minimum tillage) & planting of high sugar content varieties	Sc WEM & SLM & HSCV
Cattle	Use of improved pastures (Mombasa) & use of improved breeds (Brangus)	Ca UIP & UIB
Beans	Adjust planting date	Be APD
Corn	Water efficient irrigation	Cor WEM
Rice	Water harvesting	Ri WH
Coconut	Intercropping with lime	Co INTC
Vegetables	Tomato - Cover structures (bubble house)	Tom CS
Vegetables	Onion - Disease tolerant varieties & drip irrigation (fertigation)	On UDTV & DI

Note: Column 3 lists the abbreviations for the combinations of crops and CSA technologies.

Assumptions and Results

7. **Of the 24 representative CSA packages identified by CIAT, this analysis focuses on the 8 packages (Table A4.1) regarded as the most likely to be adopted by small to medium farmers in the project areas.** Four of those eight packages are also considered likely investments for large-scale farmers: (i) sugarcane varieties with high sugar content (HSCV), grown with more efficient management of water (irrigation) and soil (minimum tillage); (ii) rice produced with water-harvesting technology; (iii) beans planted on dates adjusted to the rainfall pattern; and (iv) corn produced with water-efficient irrigation. Note that these combinations are far from an exhaustive list of the potential CSA investments that farmers may choose to pursue through the grant program.

⁶⁶ CIAT and World Bank (2018), "Climate-Smart Agriculture in Belize" (CSA Country Profile); CIAT and World Bank (2018), "Climate-Smart Agriculture in Belize: Identifying Investment Priorities"; and World Bank (2018), "Financing Strategies for Climate Smart Agriculture in Belize." Washington, DC. <https://documents1.worldbank.org/curated/zh/822531541671797430/pdf/Financing-of-CSAs-in-Belize-26-Oct-2018-FINAL.pdf>.

⁶⁷ Source: CIAT and World Bank (2018), "Climate-Smart Agriculture in Belize: Identifying Investment Priorities." International Center for Tropical Agriculture (CIAT) and World Bank, Washington, DC. <http://documents.worldbank.org/curated/en/119891541671081913/pdf/131879-REVISED-PUBLIC-Belize-CSA-Prioritization-Framework-FINAL.pdf>.



Table A4.2: Investment costs (US\$/acre) for representative CSA packages

CSA Package	Investment costs Acre
	USD
Vegetables Tomatoes Covered structures	119,737
Sugar water efficient irrigation+HSCV+Soil and land manag.	3,259
Onions Drip irrigation + tolerant varieties	2,848
Coconut intercropping (lime or pineapples)	1,933
Cattle improved pasture+improved breeds	1,853
Rice Water harvesting	911
Corn water efficient irrigation (e.g. sprinkler)	399
Bean adjusted planting date to match rainfall pattern	303

Source: CIAT and World Bank (2018), "Climate-Smart Agriculture in Belize: Identifying Investment Priorities."

8. **Financial prices for crop production are determined by the market, with market prices used in the analysis (expressed in constant 2019 US dollars) based on data from field visits, discussions with officers in the concerned Districts, and official statistics.** The agricultural sector is subsidized in Belize, but a review of agricultural sector support and taxation in Belize indicates that subsectors targeted by CRESAP do not benefit from major distortionary support, so no major direct input or output subsidies affect the representative cases analyzed here. The analysis does not take tariffs into account, partly due to the volatile nature of tariffs on some agricultural products. In general, the supply of labor is not a major constraint on the development of farm and non-farm activities in the project area, as there is sufficient local unskilled labor. The available family labor can largely meet on-farm and off-farm requirements, as well as the projected increase in demand. The cost of daily farm labor is BZ\$25, which is based on the minimum salary scale and the ongoing influence of supply and demand. Table A4.2 above presents the investment costs for each CSA package. These costs provide the basis for calculating the potential area on which CSA technologies and practices could be adopted through CRESAP interventions.

9. **Table A4.3 summarizes the financial results for the representative CSA packages.** The estimated parameters include incremental annual revenues, net benefits/income, NPV of benefit flows (at a 12 percent annual discount rate), and the IRR. Note that IRRs are calculated without taking the grant financing into account. The results show that all packages are viable, with positive NPVs and IRRs of 17–52 percent, in line with the expectations and calculations in the CIAT–World Bank (2018) analysis. Thus, even without the grant subsidies, these packages show good financial viability, and the costs of investing in them could be repaid in one to four years.

Table A4.3: Summary of financial results for representative CSA packages

	Representative CSA packages small and medium farmers	NPV USD	IRR	Increase in revenue USD per acre
1	Vegetables Tomatoes Covered structures	20,091	17%	7,873
2	Sugar water efficient irrigation+HSCV+Soil and land manag.	6,351	N/A	408
3	Onions Drip irrigation + tolerant varieties	38,741	N/A	3,152
4	Coconut intercropping (lime or pineapples)	14,697	41%	2,876
5	Cattle improved pasture+improved breeds	7,292	52%	1,018
6	Rice Water harvesting	4,250	N/A	72
7	Bean adjusted planting date to match rainfall pattern	1,665	N/A	84
8	Corn water efficient irrigation (e.g. sprinkler)	872	N/A	102

Note: IRRs are calculated without the grant component. When cash flow is only positive, "N/A" (not available) appears in the table.

10. **Table A4.4 below presents the assumed year-to-year increases in area under the CSA packages on small and medium farms.** By the final year of CRESAP implementation, the projected area under CSA packages is estimated to exceed 14,000 acres. Taking into account failure rates as well as adoption, however, the final figure could be around 10,000 acres (or a little over 4,000 hectares).



Table A4.4: Assumed increase in area (acres) under CSA packages adopted by small and medium farmers

	Phasing acres	Y1	Y2	Y3	Y4	Y5
1	Vegetables Tomatoes Covered structures	-	1	5	6	-
2	Sugar water efficient irrigation+HSCV+Soil and land manag.	-	72	286	358	-
3	Onions Drip irrigation + tolerant varieties	-	20	82	102	-
4	Coconut intercropping (lime or pineapples)	-	51	206	257	-
5	Cattle improved pasture+improved breeds	-	79	315	394	-
6	Rice Water harvesting	-	160	640	800	-
7	Bean adjusted planting date to match rainfall pattern	-	481	1,925	2,406	-
8	Corn water efficient irrigation (e.g. sprinkler)	-	365	1,462	1,827	-

11. **Table A4.5 below displays only the financial returns for the subset of four CSA packages considered likely candidates for adoption by large farmers, given their current cropping patterns.** In addition, Table A4.6 shows the assumed year-to-year increases in area under those packages on large farms. By the final year of CRESAP implementation, the projected area under CSA packages on large farms is estimated to exceed 43,000 acres. However, taking into account adoption and failure rates, this figure could be set at around 30,000 acres. In sum, the total potential area under CSA packages could reach 57,000 acres (around 23,000 ha) and an estimated 3,700 farmers (small to large).

Table A4.5: Financial results for representative CSA packages that large farmers are likely to adopt

	Representative CSA packages for large farmers	NPV USD	Increase in revenue USD per acre
1	Sugar water efficient irrigation+HSCV+Soil and land manag.	6,351	408
2	Rice Water harvesting	4,250	72
3	Bean adjusted planting date to match rainfall pattern	1,665	84
4	Corn water efficient irrigation (e.g. sprinkler)	872	102

Table A4.6: Assumed increase in area (acres) under CSA packages adopted by large farmers

	Phasing acres	Y1	Y2	Y3	Y4	Y5
1	Sugar water efficient irrigation+HSCV+Soil and land manag.	-	163	652	815	-
2	Rice Water harvesting	-	576	2,305	2,881	-
3	Bean adjusted planting date to match rainfall pattern	-	2,079	8,317	10,396	-
4	Corn water efficient irrigation (e.g. sprinkler)	-	1,579	6,316	7,895	-

II. ECONOMIC ANALYSIS

Assumptions and Results

12. **The economic analysis uses a cash-flow model over a 20-year period that includes all investment and operational costs of the CRESAP CSA packages, as well as the incremental net revenues derived from the financial models.** The analysis assumes that producers will not change their cropping patterns during project implementation. It also assumes a preliminary failure rate of 30 percent for investment subprojects to adopt CSA packages, based on the results of similar projects in the region.

13. **The economic cost of CRESAP was calculated using preliminary estimates of investment and maintenance costs.** Total project investments have been estimated at US\$45.7 million over five years of implementation. The investment costs are estimated at US\$3 million for Component 1, US\$39.7 million for Component 2, and US\$3 million for Component 3. The yearly economic costs that are likely to persist after the



Project ends are estimated at 20 percent of the total costs in the final year of CRESAP (US\$1 million per year over the 20-year period of the analysis). The economic analysis takes into account all costs related to Components 1–3, as they are all related to implementation and will contribute to the success of the Project. Financial costs were converted into economic costs using a conversion factor that varied by the activities involved. The exchange rate is set at BZ\$2/US\$1 for the analysis. The opportunity cost of labor (economic price) is US\$10 per day, which is the bottom price for unskilled labor in rural Belize. The opportunity cost of capital was set at 12 percent. The import-shared-weighted border-measure Nominal Rate of Protection (NRP) is 14 percent.⁶⁸ An economic conversion factor of 0.85 has been taken into account for benefits generated by the Project.

14. **The economic analysis is based on direct costs and benefits.** In other words, the analysis does not encompass the potential social, institutional, and indirect benefits generated by CRESAP, which include, for example, job creation, enhanced competition in input markets, enhanced national food security, import substitution, foreign currency earnings, and the development of farmer organizations. The overall economic cash flow and corresponding EIRR for the Project were calculated by aggregating the net incremental benefits that are obtained by the beneficiaries as a result of additional production (yield) and of productivity increases.

15. **Given the above assumptions and using a 12 percent discount rate, the EIRR for the base case scenario is 16.6 percent and the NPV is US\$5.9 million, at a discount rate of 12 percent.** These results indicate that the Project is justified on economic grounds. These results will be further validated at project appraisal. Sensitivity analysis (Table A4.7) confirms that the EIRR and NPV are robust to changes in costs and benefits. The switching values are high, meaning that even a high increase in costs or steep reduction in benefits will not affect the economic viability of the Project. However, a delay in benefits of two years would bring the EIRR close to 12 percent (the minimum acceptable level), implying that careful follow-up will be needed during project implementation to avoid such delays.

Table A4.7: Results of the economic analysis and sensitivity analysis for the base case scenario, CRESAP

Base case scenario	Project Benefits					Project Costs		Delay in benefits	
	-30%	-20%	-10%	+10%	+20%	+10%	+20%	1 year	2 year
16.3%	10.6%	12.6%	14.5%	17.9%	19.5%	14.7%	13.3%	13.7%	11.7%
						Total costs		Total benefits	
Switching values						31%		-24%	

16. **In accordance with the World Bank Environmental Strategy and Climate Action Plan, the carbon balance (net reduction in GHG emissions) of the Project was evaluated.** Over a 20-year-period, the Project will lead to a net reduction in emissions of 1,076,668 tCO₂e. This net reduction in CO₂e emissions is valued at carbon shadow prices and included in the economic analysis.⁶⁹ The analysis includes both a low carbon price (LCP) and high carbon price (HCP) scenario to complement the base case scenario. Under the LCP scenario, the economic internal rate of return (EIRR LCP) increases to 26.2 percent, while the economic net present value (ENPV LCP) rises to US\$22.7 million. The switching value for costs is 116 percent and the switching value for benefits is -54 percent. Under the HCP scenario, the economic rate of return (EIRR HCP) increases to 34.3 percent, the economic net present value (ENPV HCP) rises to US\$39.5 million, the switching value for costs is 201 percent, and the switching value for benefits is -67 percent. Table A4.8 summarizes the economic indicators for these scenarios.

⁶⁸ Foster et al. (2017), "Analysis of Agricultural Policies in Belize."

⁶⁹ As per World Bank (2017), "Guidance note on the shadow price of carbon in the economic analysis." Washington, DC. September 2017.

**Table A4.8: Summary of economic indicators: Baseline, LCP, and HCP scenarios, CRESAP**

Indicator	Baseline	LCP	HCP
EIRR (%)	16.3%	26.2%	34.3%
ENPV (USD)	5,916,007	22,723,315	39,515,543
Switching value for costs (%)	31%	116%	201%
Switching value for benefits (%)	-24%	-54%	-67%

17. **Based on the assumptions and results described above, the Project is justified on economic grounds.** The Project is also expected to have a substantial positive fiscal impact in the medium to long term, mainly due to: (i) increased output, income, and employment, resulting in increased tax revenues; and (ii) multiplier effects due to increased economic activity in the target area—and emulation of project beneficiaries by non-project beneficiaries using their own funds—resulting in increased demand for goods and services, which will generate additional income and employment effects. Furthermore, because Belize is currently a net importer of vegetables and staple foods during the winter, substantial foreign exchange earnings/savings can be expected as increased production of locally grown vegetable and staple crops substitutes for imports. Given that all potential economic benefits have not been included in the analysis, and that the likely multiplier effects have not been quantified, it is safe to assume that the estimated economic benefits are on the low side of the potential economic returns that can be expected under the Project.



ANNEX 5: Greenhouse Gas Analysis

Background and Methodology

1. In its *Environment Strategy 2012–2022*,⁷⁰ the World Bank Group adopted a corporate mandate to conduct GHG emissions accounting for investment lending. Quantifying GHG emissions is an important step in managing and ultimately reducing GHG emissions and is now a common practice for many international financial institutions. The World Bank uses EX-ACT, a tool developed by FAO, to assess the impact of agricultural and rural development investment lending on GHG emissions and carbon sequestration. EX-ACT allows the ex-ante assessment of a project's net carbon balance, defined as the net balance of CO₂ equivalent GHG that would be emitted or sequestered as a result of implementing the Project (the “with-project scenario”), compared to a scenario in which the Project is not implemented (“without-project scenario”). EX-ACT estimates the carbon stock changes (emissions or sinks), expressed in equivalent tons of CO₂ per hectare and year. CRESAP will be implemented over five years and will promote the adoption of CSA technologies and practices that will sustainably enhance resilience to climate change and climate variability. EX-ACT is used to assess the GHG impacts associated with the activities contemplated under the Project.

Application of EX-ACT

2. **Project boundaries: CRESAP will offer demand-led support to strengthen CSA technologies and practices implemented by small, medium, and large-scale farmers in Belize.** Based on an analysis by CIAT and the World Bank,⁷¹ the project preparation team has identified CSA production packages for crops and livestock with the highest financial, environmental (including climate change mitigation and adaptation), and economic impacts. Table A5.1 summarizes the characteristics of the packages and the areas on which they are projected to be adopted by different types of farmers (small, medium, and large). As described in Annex 4, these CSA packages provided the basis for the on-farm investment models developed to estimate the expected incremental net benefits (financial and economic) under Component 2 of the Project, which are linked to the public services improved through Component 1. The GHG accounting is based on these same packages, and the results are factored into the economic and financial analysis described in Annex 4. The technical capacities and enabling environment to attain the projected climate co-benefits are also considered in the institutional strengthening and technical assistance activities under Components 1 and 2.

Table A5.1: CSA packages (on-farm investment models) used for GHG accounting

CSA on-farm investment models: Improved technologies and practices for climate change mitigation and adaptation		All farmers (ha)	Small and medium farmers (ha)	Large farmers (ha)
1	Vegetables, Tomatoes: Covered structures	7	7	-
2	Sugarcane: Water-efficient irrigation, varieties with high sugar content, and soil and land management	1,030	409	621
3	Onions: Drip irrigation and tolerant varieties	117	117	-
4	Coconut: Intercropping (limes or pineapples)	294	294	-
5	Cattle: Improved pasture and improved breeds	450	450	-
6	Rice: Water harvesting	3,110	915	2,195
7	Beans: Adjusted planting date to match rainfall pattern	10,671	2,750	7,921
8	Corn: Water-efficient irrigation (e.g., sprinkler)	8,104	2,089	6,015
Total		23,782	7,030	16,752

⁷⁰ World Bank Group (2012), “Toward a Green, Clean, and Resilient World for All: A World Bank Group Environment Strategy 2012–2022.” Washington, DC. <https://openknowledge.worldbank.org/handle/10986/23746>.

⁷¹ CIAT and World Bank (2018), “Climate-Smart Agriculture in Belize.”



3. The GHG accounting considers the following interventions with implications for GHG fluxes:

- *The transition from business as usual to climate-resilient and sustainable models.* The approximate area and dynamics (initial, without project, and with project) of different land uses are detailed in the following sections.
- *The likely trends in input use (fertilizers, pesticides), energy consumption, and construction of new infrastructure based on changes in production intensity and efficiency gains, as a result of CSA technologies and practices.*

4. Data sources: the main sources of data for the GHG accounting are the previously cited 2018 CIAT and World Bank CSA analysis, as well as agronomic references on input use (for business-as-usual production) from MAFSE and local institutions. These data make it possible to undertake a detailed GHG analysis of the investment models supported by the Project.

5. The following basic assumptions were used in the GHG analysis. Belize has a humid subtropical climate. No soil type is dominant, so low-activity clay soil was selected as the dominant soil type for this assessment. The Project will be implemented over 5 years, and the capitalization phase will be 15 years, so the period of analysis is a total of 20 years. Dynamics of evolution are assumed to be linear for most of the variables. Default “Tier 1” coefficients for the EX-ACT estimation were used. The trajectories for the “without project situation” and “with project situation” are based on averages for the technical parameters.

6. Annual and perennial crop production: the technical guidelines for annual and perennial crops incorporate improved agricultural technologies and practices that contribute to GHG mitigation, while supporting better climate resilience. For annual crops, the improved technologies and packages considered in the basic EX-ACT accounting framework include improved agronomic practices, nutrient management, no-till and residue retention, manure application, and water management (Table A5.2). It is estimated that the improved technologies and practices for annual crops will be adopted on more than 22,000 hectares.

Table A5.2: Agronomic management options for annual crops

Model	Management option				
	Improved agronomic practices	Nutrient management	No-till and residue retention	Water management	Manure application
Climate resilient (CSA)	Yes	Yes	Yes	Yes	Yes
Business as usual	No	Yes	No	No	No

7. For improved perennial crop systems (agroforestry, orchards, tree crops, live fences, and other interventions), the fundamental element in the EX-ACT GHG calculations is the type of residue/biomass management. The Project will support improved practices and technologies for climate resilience in perennial crop systems on an estimated 1,406 ha, mainly fruit tree plantations (coconut–lime systems will account for 250 ha) and will introduce live fences in annual crop systems. These calculations assume a reasonable proportion of land-use change from degraded land to perennials (live fences).

8. Livestock: The Project will support sustainable livestock systems, combining agriculture and silvo-pastoral systems for beef cattle production. CRESAP is expected to introduce improved breeding and feeding (Table A5.3) and will promote other management practices contributing to climate change mitigation and adaptation (improved manure management, assisted natural regeneration, and increased tree coverage on farms). The Project will cover an estimated 191 ha of grassland and will support the adoption of sustainable livestock models on 382 ha (which includes a change in land use, as land degraded by poor livestock production practices is reforested).



Table A5.3: Livestock and manure management

Livestock category	Number of animals (mean per year)			Technical mitigation option (%)								
	Start	With-out project	With project	Feeding practices [†]			Specific agents [‡]			Breeding [§]		
				Start	With-out	With	Start	With-out	With	Start	With-out	With
Dairy				0	0	0	0	0	0	0	0	0
Cattle	944	944	1,889	0	0	100	0	0	100	0	0	100
Sheep				0	0	0	0	0	0	0	0	0
Swine (market)				[†] Feeding practices: e.g., more concentrates, adding certain oils or oilseeds to the diet, improving pasture quality. [‡] Specific agents: specific agents and dietary additives to reduce CH ₄ emissions (Ionophores, vaccines, bovine somatotropin, others). [§] Breeding: increasing productivity through breeding and better management practices (reduction in the number of replacement heifers).								
Poultry												

9. **Land-use change: the evolution of land use by land-use type is summarized below in Table A5.4.** It is important to note that the area of each land-use type in Table A5.4 does not exactly correspond to the area used to estimate the various CSA models. Annual crop models (vegetables, sugarcane, onions, rice, beans, and corn) include the implementation of live fences to promote a more resilient and sustainable system; live fences are included in the “perennials” land-use category. Sustainable livestock models (particularly those located in the boundaries of forest areas) will support implementation of assisted natural regeneration, forest plantation, and other restorative practices that enhance the resilience and sustainability of the livestock production system while preserving the ecosystem; forest tree cover from natural regeneration or forest plantation is included in the “Forest/Plantation” land-use category.

Table A5.4: Evolution of land use/category (ha)

Land use		Initial state	Without project	With project
Forest/Plantation		0	0	90
Agriculture	Annual	21,887	21,887	22,022
	Perennial	294	294	1,446
Grassland		225	225	225
Other lands	Degraded	1,377	1,377	0
Total area (ha)		23,782	23,782	23,782

10. **Inputs: the main inputs considered in the GHG analysis are agricultural inputs (seed, fertilizer, others) as well as energy (electricity and gas consumption) and infrastructure (irrigation systems, agricultural infrastructure, and public infrastructure).** Technical guidelines available for agricultural inputs in crop production include the use of improved seed, fertilizer, and pest control management. The amounts (tons per year) of fertilizer (other N-fertilizers, phosphorus, and potassium), herbicide, insecticide, and fungicide were calculated based on data from the CIAT–World Bank CSA analysis, agronomic references from technical reports, and guidelines from MAFSE and local institutions. Data on input use per hectare are available for a number of annual and perennial crops. Average amounts of inputs (in tons per year) for annual and perennial crops (under baseline, without project, and with project CSA conditions) were multiplied by the projected area for every model. The Project will provide technical support for more efficient input use and alternative methods (such as compost) to reduce the need for agrochemicals.



11. **Estimates of energy consumption for CSA investment models consider the production intensity and energy efficiency supported by improved technologies and practices.** The analysis considers improvements in the use of renewable energy technologies and other investments (in infrastructure, machinery, and equipment) that are expected to enable more efficient use of resources (soil, water, inputs, and others) and reduce losses within the production system.

12. **The Project will also build or improve various kinds of productive infrastructure, including metal structures, water ponds, irrigation systems, and drainage infrastructure.** Investments in building post-harvest facilities envisioned under the Project are not included in the GHG analysis, as the technical specifications for these facilities will be completed later during appraisal/implementation. Ideally, however, any GHG emissions resulting from the construction of public infrastructure will be compensated by reforestation and other land restoration activities on site and/or in highly vulnerable areas.

Results

13. **Net carbon balance: the main results of the GHG analysis are summarized in Table A5.5.** In addition to the achievement of the PDO, implementation of CRESAP will provide intermediate GHG emission reductions as a result of the interventions. Based on the parameters and assumptions described above, CRESAP will lead to a reduction of 53,833 tCO₂e in GHG emissions annually—or 2.3 tCO₂e/hectare/year—compared to the business-as-usual baseline scenario. After 20 years, GHG mitigation benefits amount to a reduction of 1,076,668 tCO₂e.

Table A5.5: Main results of the GHG analysis

Project Name	Belize: Climate Resilient Ag	Climate	Tropical (Moist)	Duration of the Project (Years)		20
Continent	Central America	Dominant Regional Soil Type	LAC Soils	Total area (ha)		23782,07103
Components of the project	Gross fluxes			Share per GHG of the Balance		
	Without	With	Balance	All GHG in tCO ₂ e	N ₂ O	CH ₄
Land use changes						
Deforestation	0	0	0	0	0	0
Afforestation	0	-32,747	-32,747	-23,660	-9,087	0
Other LUC	0	52,570	52,570	-1,977	54,270	279
Agriculture						
Annual	0	-1,048,142	-1,048,142	0	-1,075,209	27,067
Perennial	-65,050	-82,741	-17,691	-3,580	-14,111	0
Rice	0	0	0	0	0	0
Grassland & Livestocks						
Grassland	8,816	-1,356	-10,172	0	-10,172	0
Livestocks	51,374	92,624	41,250	0	7,263	33,986
Degradation & Management						
Forest degradation	0	0	0	0	0	0
Peat extraction	0	0	0	0	0	0
Drainage organic soil	0	0	0	0	0	0
Rewetting organic soil	0	0	0	0	0	0
Fire organic soil	0	0	0	0	0	0
Coastal wetlands						
Inputs & Investments	1,568,351	1,506,615	-61,736	0	-54,971	-6,745
Fishery & Aquaculture	0	0	0	0	0	0
Total						
	1,563,491	486,823	-1,076,668	-29,218	-1,054,310	-54,971
Per hectare						
	65.7	20.5	-45.3	-3.5	-44.3	-2.3

14. **Carbon sources and sinks: the main GHG emissions come from livestock, inputs and infrastructure.** The sequestration benefits come principally from afforestation/restoration of degraded areas, followed by the transition from degraded land that has been set aside to planting with perennials (live fences, orchards, gardens, tree crops, and others) and the improved management of agroforestry, livestock, and crop systems.

15. **Sensitivity analysis: the uncertainty of these results, as calculated by EX-ACT, is 48.6 percent.** The analysis was run using mostly tier 1 coefficients, which may over- or under-estimate some values. This is a relevant source of uncertainty in the estimation of GHG emission/sequestration scenarios for CRESAP.



ANNEX 6: Gender Gaps and Action Plan

1. **Gender gaps: a range of gender gaps in the agricultural sector result in particular challenges for Belize's women farmers.** While 30 percent of farmers are women, only 3 of women farmers head their own farming units, and their participation in the skilled agricultural labor force is lower (at 9 percent) than in the overall labor force (38 percent).⁷² Most women farmers work alongside their husbands on small-scale farmers and live in households with incomes below the poverty line. Women farmer's greater household responsibilities, lesser educational opportunities, limited participation in producer organizations and restrictions in mobility in rural areas also limit their access to productive resources, especially technical education and advisory services, agricultural inputs and land, but also technology to intensify production, labor, credit, and markets. Under these circumstances the productivity of female producers is lower than that of their male counterparts, and their production is more vulnerable to adverse climate events like hurricanes, floods, and droughts.
2. **Actions to address gender gaps: several gender gaps will be addressed under the Project.** Technical support for women farmers will take into consideration the above-mentioned challenges. Training and technical assistance (including by women trainers) will be tailored to women farmers' needs and constraints.⁷³ In addition, the Project will address and reduce gaps in access to productive resources, including financial resources and technology to increase productivity and resilience, by targeting at least 30 percent of matching grants to women farmers; supporting women farmers with tailored capacity building for the design and implementation of the matching grant proposals, and by ensuring that the selected technologies are affordable and consider the time constraints that women face due to their other responsibilities. In light of women's particular vulnerability to gender-based violence (GBV), CRESAP investments will examine whether they could heighten the risks of GBV and develop strategies to reduce the risks, finance gender-sensitization training for public and private sector participants in the Project, include a special channel in the GRM for GBV, and require gender issues to be included in progress reports.
3. **Monitoring of progress in closing gender gaps will be measured in the results framework.** In order to monitor progress in closing gender gaps, the results framework will include gender-disaggregated outcome indicators for increases in productivity and the adoption of improved technologies by women farmers. It will also include gender-disaggregated intermediate indicators, including on the number of women participants trained and on timely responses to grievances, including in relation to GBV.
4. **Table A6.1 below presents the linkages from gender gaps to actions to address the gaps to monitoring of progress on closing gaps, and their relationship to the Bank's Gender Strategy.** In addition, Table A6.2 below presents the Gender Action Plan for CRESAP, detailing specific gender actions associated with each component of the Project.

⁷² Statistical Institute of Belize, Belize Labour Force Survey, April 2020.

⁷³ Beegle, Kathleen, and Eliana Rubiano-Matulevich (2020), "Adapting Skills Training to Address Constraints to Women's Participation." Jobs Note No. 7. World Bank, Washington, DC. <https://openknowledge.worldbank.org/handle/10986/33694>.



Table A6.1: Linkages from Gender Gaps to Actions to Monitoring and Strategic Priorities⁷⁴

Gender Gap	CRESAP Actions	Monitoring Indicators	Bank Gender Strategy Pillar
Women farmers have less access to TA due to greater household responsibilities, less educational opportunities and greater restrictions in mobility	Training and TA (including by women trainers) will be tailored to women farmers' needs and constraints, including with regard to timing and location, and tailored capacity building will be provided for the design and implementation of matching grant proposals	<ul style="list-style-type: none"> • Female farmers trained on CSA technologies (Number) • Also: Female staff from private and public institutions trained on CSA technologies (Number); • Female farmers trained on CSA technologies who received funding (matching grants/credit) to enhance climate resilience (Number) 	<ul style="list-style-type: none"> • Close gender gaps in human endowments • Women's voice and agency
Women farmers have less productive resources, including financial resources and technology, to increase productivity and resilience	At least 30% of matching grants will be targeted to women farmers, including technologies that are affordable and consider time constraints that women face due to other responsibilities	<ul style="list-style-type: none"> • Increase in crop yields per hectare (composite index) on women beneficiaries' farms • Increase in value of sales by women beneficiary farmers (Percentage increase) • Farmers adopting improved agricultural technology - Female (CRI, Number) • Female farmers trained on CSA technologies who received funding (matching grants/credit) to enhance climate resilience (Number) 	<ul style="list-style-type: none"> • Close gender gaps in human endowments • Ownership and control of assets • More and better jobs
Female project participants are especially vulnerable to GBV	CRESAP will examine if investments could heighten the risks of GBV and develop strategies to reduce the risks; finance gender-sensitization training for public and private sector project participants; include a GRM for GBV, and require gender issues to be included in progress reports	<ul style="list-style-type: none"> • Staff in public and private institutions trained on gender-sensitization (Number) • GBV-related grievances reported via the GRM are responded to or escalated for resolution within 30 days throughout project implementation (Percentage) • Also: investment proposals address GBV risks, and there is reporting on gender issues in semi-annual progress reports 	<ul style="list-style-type: none"> • Women's voice and agency

Table A6.2: Gender Actions by Component, CRESAP

Component	Actions
Component 1: Institutional Strengthening	<ul style="list-style-type: none"> • Train staff in gender gap analysis and the integration of gender equity strategies in farmer training curricula. • On the basis of the division of labor by gender in farming, develop technical extension services that address women farmers' specific needs (develop training content that that addresses women's needs and specificities, train extension staff on women's needs in agriculture, use training methods to facilitate women's capacity to participate, etc.). Consider drafting gender-specific guidelines for women, taking into account their needs for specific technologies/practices. • Promote women's membership and active participation in cooperatives.

⁷⁴ See the World Bank Group Gender Strategy (FY16-23): *Gender Equality, Poverty Reduction and Inclusive Growth*, available at: <https://openknowledge.worldbank.org/handle/10986/23425>



	<ul style="list-style-type: none"> • Ensure 30 percent of beneficiaries of TA are women. • Tailor training sessions to women's time constraints by locating sessions at convenient places with flexible hours. Designing training to facilitate women's participation is essential, given that women have household obligations in addition to their farming contributions. Accessible training will help to mobilize married women. If necessary, women's participation in training may be facilitated by financing temporary use of daycare centers as an incentive.
Component 2: Investments in Climate-Smart Agriculture	<ul style="list-style-type: none"> • Tailor training in leadership, finance, and business management skills to accommodate women's time constraints. Training sessions should be located in convenient places with flexible hours. • Provide training to women farmers for the preparation of matching grant proposals. • Promote gender-sensitive technologies. Such technologies will reduce women's labor and will be affordable, accessible, and based on their needs. Ensure that technology used by men does not increase women's labor burden in farming activities. • Disseminate low-cost, labor-saving technologies that meet women's needs and contribute to productivity/production and increased capacity to earn a livelihood. O&M training will be provided for technology maintenance, when needed (particularly with mechanization). • Establish an annual award recognizing the best-performing extension delivery staff (from each District) who are empowering women by promoting their access to CSA technologies. Such awards could offer recipients professional development or career opportunities. The results will be monitored and evaluated by the project gender expert. • Increase outreach of extension services to women farmers by employing and/or training women as extension agents for the Project. • Involve women beneficiaries in the design and use of project infrastructure. • Train women in the management of project infrastructures and provide leadership skills to participate in O&M committees for infrastructure. • Establish and enforce a policy of gender equity in salaries for construction work on irrigation schemes/other infrastructure. • Promote women's participation—all females: married females (all wives) and female household heads (FHHs)—in O&M infrastructure management committees (encourage married women, and women who are farming communal land, to participate). Undertake active recruitment efforts to attract more women members. • Ensure that at least 30 percent of matching grants accrue to women farmers.
Component 3: Project Management and Monitoring and Evaluation	<ul style="list-style-type: none"> • Conduct a gender gap analysis/assessment to further inform gender activities within each project component, to be included in the POM. • Assess whether project activities could heighten the risk of GBV and develop strategies for addressing the issue. • Include concrete gender actions in the POM to thoroughly integrate gender balance into the guidance for implementation of components. • Tailor the gender training program for project staff and project implementors to specific project activities at all levels of implementation (cf. POM). This program must be practical and adapted to the specificities of the field. • Assign a well-trained gender expert to monitor and help the team in the development of field strategies. • Strengthen analysis of all gender-disaggregated data collected by the Project, looking specifically at: the extent of gender gaps between men in male-headed households (MHHs), married women in MHHs, and FHHs in project activities; the trend in the gender gaps over time; and key factors that explain changes in the gaps. Present such analysis in periodic reports (not an annex), including the semi-annual progress reports. • Conduct qualitative evaluations of progress in gender balance, to demonstrate the effectiveness and impact of gender activities within the Project. • Integrate gender indicators in the results chain in the M&E Manual. • Assign a gender budget to each program component, tied to the specific activities identified for that component; it should be visible in the annual plans. • Collect case stories about successful women participants (with still and/or video images) and disseminate them in the project areas/integrate them in project training as best practices. • Promptly address GBV-related grievances raised through the GRM.

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MEXICO

GUATEMALA

BELIZE

HONDURAS

Major Watersheds:

- 1 Rio Hondo
- 2 New River
- 3 Belize River
- 4 Sibun River
- 5 Manatee River
- 6 Mullins River
- 7 North Stann Creek
- 8 Sittee River
- 9 South Stann Creek
- 10 Monkey River
- 11 Deep River
- 12 Golden Stream
- 13 Rio Grande
- 14 Moho River
- 15 Temash River
- 16 Sarstoon River

MAJOR ROADS

SELECTED CITIES

DISTRICT CAPITALS

NATIONAL CAPITAL

INTERNATIONAL BOUNDARIES

Geographical Features:

- Bahia Chetumal
- Caribbean Sea
- Lake Peten Itza
- San Pedro
- Caye Chappel
- Bahia de Amatique
- Motagua R.
- San Juan R.
- Machaquilá R.
- Cancuén R.
- Chiyu R.
- Sarstoon R.
- Golden Stream
- Monkey River
- Placencia
- Maya Beach
- Sittee River
- Dangriga
- Hattieville
- Orange Walk Town
- Progresso
- Corozal
- Corozalito
- Guinea Grass
- Crooked Tree
- Fireburn
- San Ignacio
- Belmopan
- Tambran
- Big Falls
- Punta Gorda