IFAD
Investing in rural people

Belize

Resilient Rural Belize (Be-Resilient)

Detailed programme design report

Main report and appendices

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Currency equivalents

Currency Unit	=	
US$1.0	=	

Weights and measures

1 kilogram	=	1,000 g
1 000 kg	=	2,204 lb.
1 kilometre (km)	=	0.62 mile
1 metre	=	1.09 yards
1 square metre	=	10.76 square feet
1 acre	=	0.405 hectare
1 hectare	=	2.47 acres

Abbreviations and acronyms

AWPB	Annual Work Plan and Budget
BMDC	Belize Marketing and Development Corporation
BOS	Bureau of Standards
BP	Business Plan
BRFP	Belize Rural Finance Programme
BWS	Belize Water Services
BZ	Belize Dollar
CABEI	Central American Bank for Economic Integration
CARD	Community-Initiated Agricultural and Resource Management
CARICOM	Caribbean Community
CATIE	Centro Agronómico Tropical de Investigación y Enseñanza
CCA	Climate Change Adaptation
CCVI	Climate Change Vulnerability Index
CDB	Caribbean Development Bank
CI	Core Indicators
CN	Concept Note
CPA	Country Poverty Assessment
CPM	Country Programme Manager
CRI	Climate Risk Index
CRRIA	Climate Resistance Rural Infrastructure
CRVC	Climate Resilient Value Chain Development
CSN	Country Strategy Note
CU	Credit Union
5Cs	Caribbean Community Climate Change Centre
DE	Department of Extension
DC	Department of Cooperatives
DFC	Development Finance Corporation
EA	Extension Agents
EAP	Economically Active Population
EFA	Economic and Financial Analysis
EO	Extension Officers
EU	European Union
FAO	Food and Agriculture Organization
FM	Financial Management
FO	Finance Officer
FPM	Financial Procedures Manual
GAI	Global Adaptation Index
GCF	Green Climate Fund
GDP	Gross Domestic Product
GNI	Gross National Income
GoB	Government of Belize
GSDS	Growth and Sustainable Development Strategy
GST	General Sale Tax
HH	Households
ICP	IFAD Client Portal
IPP	Infrastructure and Production Plan
IDB	Inter-American Development Bank
IFAC	International Federation of Accountants
IFAD	International Fund for Agricultural Development
IP	Implementing Partner
IPM	Integrated Pest Management
IPSAS	International Public Sector Accounting Standards
IRR	Internal Rate of Return
IWRM	Integrated Water Resource Management
KM	Knowledge Management
KMP	Knowledge Management Plan

LAC	Latin America and Caribbean Division
LF	Log Frame
LFS	Labour Force Survey
LPA	Lead Programme Agency
LTB	Letter to the Borrower
MC	Management Committee
M&E	Monitoring and Evaluation
MED	Ministry of Economic Development
MGF	Matching Grant Fund
MICS	Multiple Indicator Cluster Survey
MIS	Management Information System
MoA	Ministry of Agriculture, Fisheries, Forestry, Environment and Sustainable Development
MoF	Ministry of Finance
MOM	Management, Operation and Maintenance
MOU	Memorandum of Understanding
MoW	Ministry of Works
MNR	Ministry of Natural Resources
MRD	Ministry of Rural Development
MTR	Mid-Term Review
NAFP	National Agricultural and Food Policy 2015-2030
NCCO	National Climate Change Office
NGO	Non-Governmental Organization
NPESAP	National Poverty Eradication Strategy Action Plan
NPV	Net Present Value
ODP	Organisational Development Plan
ORMS	Operational Results Measurement System
PBAS	Performance-Based Allocation System
PCB	Pesticide Control Board
PCR	Programme Completion Report
PES	Payments for Ecosystem Services
PFM	Public Financial Management
PFS	Programme Financial Statements
PIM	Programme Implementation Manual
PM	Programme Manager
PMU	Programme Management Unit
POC	Programme Oversight Committee
PO	Producers' Organisation
PP	Procurement Plan
PPPP	Public Private Producer Partnership
POC	Programme Steering Committee
R&D	Research and Development
RB-COSOP	Results-Based Country Strategic Opportunities Programme
RIMS	Results and Impact Management System
RPP	Resilient Production Plan
RRI	Rural Roads Improvement
RSP	Rural Sector Performance
SDGs	Sustainable Development Goals
SECAP	Social, Economic and Climate Assessment Paper
SIB	Statistical Institute of Belize
SIDS	Small Island Developing State
SME	Small and Medium-sized Micro Enterprises
SO	Strategic Objective
SOE	Statements of Expenditure
SSID	Small Scale Irrigation and Drainage
TCGA	Toledo Cacao Growers Association
TEC	Technical Evaluation Committee
TOR	Terms of Reference
TSDP	Toledo Small Farmer Development Project
UB	University of Belize

UMIC	Upper Middle Income Country
UNDESA	United Nations Department of Economic and Social Affairs
UNDP	United Nations Development Program
UNICEF	United Nations International Children's Emergency Fund
USAID	United States Agency for International Development
USD	United States Dollar
VCS	Value Chain Specialist
WB	World Bank
WUA	Water Users' Association
WUG	Water Users' Group

Map of the programme area

Belize

Resilient Rural Belize (Be-Resilient)

Design report

IFAD

The designations employed and the presentation of the material in this map do not imply the expression of any opinion whatsoever on the part of IFAD concerning the delimitation of the frontiers or boundaries, or the authorities thereof.

Map compiled by IFAD | 04-10-2017

Executive Summary[1]

Country context and background

Although part of the North American continent, Belize is designated as a Small Island Developing State (SIDS)[2] as it suffers from vulnerabilities and challenges typical of SIDSs. With a Gross National Income of US$4,490 *per capita* (2010), Belize is also considered an Upper Middle-Income Country (UMIC). Notable inequality marks the economy, however, with a small portion of the population active in the high-performance segments of the tourism, agricultural, and services sectors. Poverty in rural areas grips 55% of the population, a rate twice that of urban areas, with a further 14% considered vulnerable to poverty.

Agriculture is a notable, if uneven, contributor to the US$1.76 billion (2016) national economy, with its GDP contribution fluctuating between 10% and 15% over the last seven years, reaching a high of 15% in 2005. With plentiful land and water resources, Belize is a successful food exporter (primarily of raw sugar, bananas, and citrus products), and serves growing North America, the Caribbean and European markets. Despite abundant farming resources and growing national markets, Belize continues to import 50% of its food needs. Large plantation holdings dominate production. [3]Smallholding farmers are notably underproductive. Many have as much as 25 acres, yet use much less for productive purposes. Water is relatively abundant, and national demand for smallholders can produce is left to import markets.

Belize is among the most vulnerable countries to climate-change, with impacts being particularly acute in rural areas. Since 1930, a major hurricane or tropical storm has hit the coast of Belize once every 2½ years. The human and economic costs of the ever-increasing intensity of climate events are catastrophic. The 2017 Climate Risk Index (CRI) estimates average annual economic loss to climate-related events is US$57 million, or 2.87% of GDP.[4] Hurricane Dan in 2007, for example, caused US$90 million in damages to the economy (7% of GDP), of which, 64% was in agricultural sector.[5]

Recognizing the climate and productivity constraints of the smallholder sector development, as well as its potential for rural and national economic development, poverty alleviation, and food security the Government of Belize (GoB) requested IFAD support a rural development project to be co-financed by Green Climate Fund (GCF).[6] The proposed programme follows the successful IFAD financed Belize Rural Finance Programme (BRFP), and would be part of the national strategy for agricultural.[7] The proposed programme would also build upon, and complement the work of other donors and the private sector, including a recently finished FAO smallholder value-chain project, as well as the Caribbean Development Bank (CDB) and European Union (EU) large-scale farmer support programme in the sugar and banana sectors. Other donors with complementary activities and

[1] The Detailed Programme Design Document was prepared by the Appraisal Mission that visited Belize from 29th October to 3rd November 2017. Its members were: Ms. Luisa Migliaccio, Country Programme Manager, LAC/PMD; Mr. Steven Oliver, Technical Team Leader, Agricultural Economist; Mr. Enrique Hennings, Technical Lead Advisor, Value Chain Specialist, PTA; Mr. Agustín Pérez Andrich, Economist/Financial Analyst; Ms. Ingrid Schreuel**,** Gender Equality/Social Inclusion and M&E Specialist; Mr. Lorne Solis, Institutions, Financial Management and M&E Specialist; Mr. Oliver Page, Senior Environment and Climate Change Specialist, LAC/ECD; Mr. Eric Patrick, Climate Change Adaptation Specialist, ECD; and Ms. Tatiana Botelho, Environment Analyst.
[2] The Division for Sustainable Development, United Nations Department of Economic and Social Affairs (UN-DESA).
[3] In Belize, farmers with less than 25 acres are classified as small farmers;
[4] Germanwatch Nord-Süd Initiative.e.V is a German non-governmental organization that seeks to influence *inter alia* public policy on climate change.
[5] The CRI ranks countries vulnerability to extreme weather events as a function of total deaths per 100,000 inhabitants, absolute losses financial loss, losses as a percentage of GDP. Belize has the highest CRI among Central American countries.
[6] The GCF recently provided positive feedback on the Be Resilient concept note. There is also expressed interest by the CDB and other regional institutions specialized in climate-related development (e.g., UNDP, 5Cs).
[7] The BRFP was the third IFAD programme in Belize during the period 1985-2017.

possible programme participants include the Inter-American Development Bank (IDB), the United Nations Development Program (UNDP), and the Caribbean Community Climate Change Centre.

Problem Statement

Demand for agricultural produce is not a constraint to rural and smallholder development in Belize, nor are access to water and land. While not densely clustered, rural smallholders are numerous and have traditionally supplied many currently imported foods. Despite these advantages, production volume, quality, and diversity remain low primarily due to inefficient production methods/ technologies, poor market access, and relatively weak public infrastructure (e.g., roads, drainage, and irrigation).

These constraints are exacerbated by the country's great vulnerability to climate change, the most visible of which are those related to the intensity and increased intensity of tropical storms and hurricanes. Risks also result from shifting climate trends, resulting in irregular droughts, floods, and rainfall patterns. Smallholder farmers suffer periodic and often substantial losses to both types of impacts, which erodes their natural and financial assets, and a corresponding ability to invest in preventative resilience measures.

Despite these challenges, strengthening smallholder farmer productive capacity and climate resilience offers a unique development opportunity. With immediate national market share expansion potential through import substitution, the introduction of modern and climate smart good farming practice, along with market access support would have notable effects on the national economy, food security and poverty alleviation in rural areas. Coordinated and sustainable support to smallholders would also require strengthening the administrative, technical, marketing, and member service capacities of producer organizations (POs). It would also require capacity development in relevant GOB ministries/ departments for the provision of climate smart smallholder capacity development/ extension services, as well as formulation and enforcement of a supportive national regulatory/ legal environment.

Proposed Programme

The programme aims to minimize the impacts of climatic and economic events on smallholder farmers while supporting sustainable market access for their produce. The programme will help farmers employ climate resilient agricultural practices and technologies. It will integrate profitable smallholder participation into the development of select vegetable, fruit, and honey value chains.[8] The programme will support smallholder production capacity through investments in public and private climate resilient infrastructure, strengthening smallholder famer POs and related/ relevant GOB capacity development.

The programme will initially work in 23 communities clustered in *five priority areas* in five Districts (five communities in Orange Walk District, six in Belize District; five in Cayo District, two in Stann Creek District and five in Toledo District). The main criteria for identifying communities include: i) presence of both male and female smallholder farmers; ii) potential integration of smallholders in targeted value chains; iii) market-oriented smallholder farmers (e.g., not just subsistence farming); iv) farmer interest in programme; and, v) presence of formal or informal POs.

The target group would include: i) poor rural families (indigent and poor, with incomes below the poverty line); and ii) vulnerable rural families (whose income is ≤ 25% above the poverty line, vulnerable to poverty). Additionally, households will have ≤ 25 acres of land, and be engaged part-time or full-time in farming. Direct beneficiaries are 6,000 rural households, of which, 3,500 will be in the programme's five priority area communities, and 2,500 will be in non-priority areas (to be identified during implementation). A further 24,000 indirect household will benefit from the programme

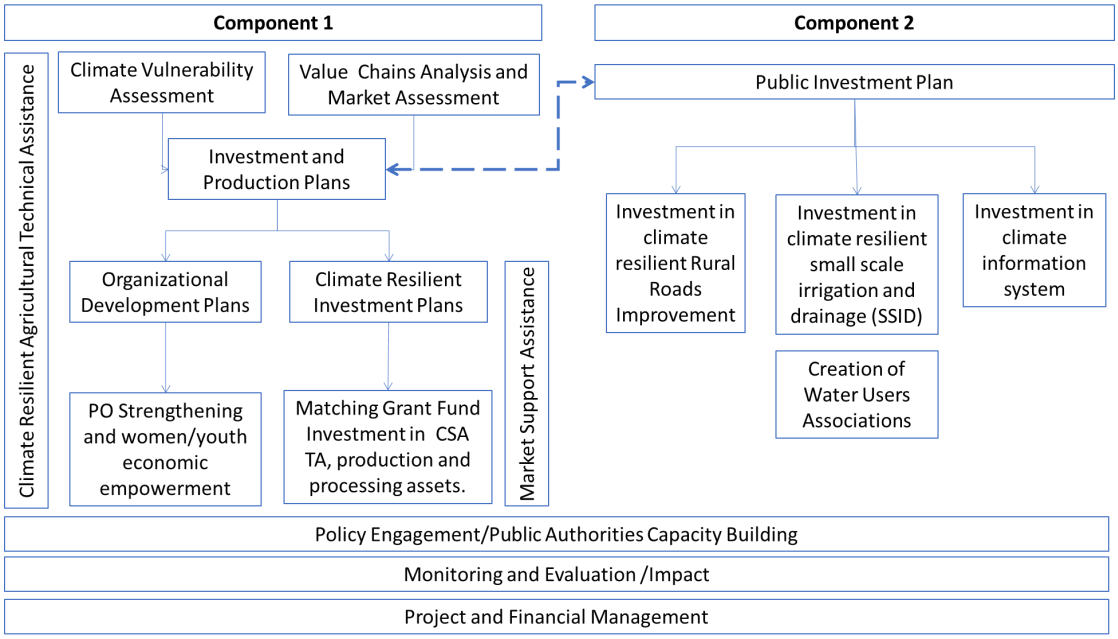
Consistent with the importance of women in the Belize rural economy, and in smallholder farming generally (over 30% of farming is carried out by women), 40% of programme beneficiaries will be women. For their similar importance, youth will comprise 20% of programme beneficiaries.[9]

[8] Livestock value chain(s) will be considered for inclusion during the startup phase of the programme.

Programme Components and Outcomes

The proposed Programme has two complementary and mutually-reinforcing components: Climate Resilient Value Chains Development and Climate Resilient Rural Infrastructural and Assets Development.

Figure 1 : Project Structure



Component 1: Climate Resilient Value Chains Development (CRVC)

This component will introduce/strengthen smallholder participation in select value chains through the promotion of climate resilient production methods, product diversification, and related innovations. Value chain development will be participatory, with the objectives of: i) supporting high quality smallholders' production for commercialization; and, ii) enhancing sustainable smallholder farmer access to markets. Additionally, this component will support self-consumption and healthy food choices through support for backyard gardens.

Activities will initially focus on the development of six vegetables (tomatoes, sweet peppers, hot peppers, cabbages, carrots, and onions), one fruit (pineapples), bee-keeping products (principally honey).[10] These products were selected from over twenty commodities identified by the GoB and community stakeholders through a participatory process. Three criteria were used to prioritize the commodities: i) significant market opportunity; ii) scope for sustainable and profitable smallholder farmers participation; and, iii) value chain development potential (e.g., productivity, quality, and market access). Communities selected five priority products, from which POs will select two each for programme support. Other value chains may be identified during implementation once the programme has experience developing the initial eight products.

The CRVC has three sub-components to support climate resilient smallholder integration into value chains: i) Infrastructure and Production Plans; ii) Strengthening of POs; and iii) Market-Oriented Value Chains Development.

Subcomponent 1.1: Infrastructure and Production Plans (IPP). This subcomponent will assess and facilitate stakeholder participatory of value chain development needs in each of the five priority area. It will result in an Infrastructure and Production Plan (IPP) for each area to guide resilient, smallholder focused value chain development. IPPs have two input studies, a *Climate Vulnerability Assessment* and a *Value Chains Analysis and Market Assessment*. These complementary

[10] Livestock will be considered for inclusion during the start up phase of the programme.

assessments provide the foundation for preparing the IPPs, and will inform related GoB smallholder policy/ regulatory and public infrastructure investment plans found in Component 2.

Climate Vulnerability Assessment (CVA) will analyze smallholder vulnerability to climate change in the five priority areas. It will define climate change risks, identifying the most vulnerable communities, sectors, value chains, and social groups, as well mitigation activities. Together with the programme's Climate Specialist, an international institution will conduct an evidence- based analysis of the relationships between climate variables and biophysical processes. This study will be complemented by a stakeholder self-assessment which will identify community level climatic threats .

The study and assessment will rank exposure to climate change between priority areas, value chains, producer groups, and social groups, identifying key constraints to resilience, levels of response capacity, and priority support areas. Analysis will assess factors influencing exposure and response across three core areas: i) exposure to climate-related natural disasters and rising sea-levels; ii) effects of population patterns, access to natural resources, agricultural dependency, and conflicts; and, iii) future vulnerability and adaptive capacity (e.g., infrastructure, social organization, and agro-ecological characteristics). Findings will be used to guide and prioritize priority area strategies for climate change adaptation/ resilience agro-ecosystems and public infrastructure.

Value Chains Analysis and Market Assessment (VCAMA) will define activities for the eight product value chains in each priority area. This includes definition of chain characteristics including: key actors (producers, transporters, packers, processors, traders, retailers, and consumers), market context/ potential, financial/ economic profile, product seasonality, and price trends etc. The objective of the analysis is to highlight strengths, weaknesses, opportunities, and threats to chain development, with a view to sustainably increasing profitable smallholder chain participation. The assessment will provide input to production intervention design, PO business plans, and public infrastructure planning. Data will also be used for end-market studies employing a USAID methodology designed for assessing demand and processing for high-end markets. [11]

Together, the CVA and VCAMA provide key input to priority area **Infrastructure and Production Plans** (IPP). The IPP is a "master plan" broadly defining smallholder value chain climate resilient production practices to be adopted (individually or in a collective, methods, and technologies), PO intervention imperatives, required infrastructure, and possible GOB regulatory/ policy needs.

Specifically, IPPs will identify: i) climate change adaptation (CCA) capacity-strengthening needs; ii) infrastructure essential for value chain market development and disaster risk management; and, iii) value chains market opportunities. PO Business Plans (BPs) will be aligned with priority area IPPs, which have the goal of supporting climate resilience at the farm and community levels.

Subcomponent 1.2: Strengthening of Producers' Organizations. Smallholders generally lack the resources and capacity to improve their production and to negotiate with market actors on an equitable basis. Despite this relative weakness, smallholder member-based POs offer a collective solution to overcoming these constraints. The programme will strengthen PO capacity to improve resilient smallholder production and participation/ markets access in select value chains. POs require support to improve/ coordinate membership services at scale, improve member market transactions representation/ negotiation skills, and enhance planning and project management capacities with a goal of achieving financial sustainability. In addition to organizational capacity building, the programme will focus on social inclusion (youth and women), confidence building, leadership training, and rural empowerment. As a part of this commitment, the programme will train local men and women in ten POs to become professional Local Managers. Local Managers will receive intensive six-month training, salary and mentorship support for two years, and their POs will receive some office support (e.g., computing and office equipment) after which POs will pay their salaries.

[11] The Value Chain End-market Research is a toolkit addressing the process and value of end-market research for value chain development. Developed by the United States Agency for International Development in 2008, it provides a portfolio of tools proven through practical application.

Activities under this sub-component will include *inter alia*: i) management and governance training; ii) development of internal administrative processes; iii) creation of Organizational Development Plans (ODPs); iv) national and international exchange visits; and, (v) youth (men and women) management/ leadership training. Gender member and leadership participation in POs will be increased (women are currently less than 30% of membership) through awareness-raising, and strengthening/ empowering the capacity of women to participate both as PO members and leaders.

Subcomponent 1.3: Market-Oriented Value Chains Development. Smallholder farmers and POs have little or no experience participating in commercial value chains on an equitable and sustainable basis. This subcomponent will address smallholder value chain participation constraints by improving market information to smallholders, enhancing linkages between farmers and buyers, improving marketing capacities, and providing targeted technical resilient production assistance/ extension services. Interventions will focus on local markets as well as on high-end domestic demand (e.g., hotels, supermarkets, restaurants etc.), strategically integrating smallholders/ POs into various parts of the value chain, including developing value-added functions (e.g., product aggregation collection, sorting, grading, storing, processing, transporting, marketing, etc.). Partnerships with key actors, such as industrial processors, hotels, and restaurants, will be explored to ensure smallholder can meet demand preferences.

Backyard gardens (BYGs) are also a part of this sub-component.[12] When principle of climate resilient agriculture is applied, BYGs have the potential to improve food security and income/ expense savings, increasing smallholder household climate resilience. The MGF (see below) will support groups of individuals from the same priority areas to invest in their individual BYGs. Collective application will foster cooperative activities and decrease MGF administrative burdens. The programme Climate Resilient technical staff, in coordination with the agricultural extension service of the MoA will provide support to BYG activities.

This subcomponent has three interlinked support activities.

Development of value chain Business Plans (BPs): This activity will provide TA to support for the development and implementation of PO BPs consistent with, and supportive of priority areas IPPs. Support will include a basic PO profiling and diagnostic, followed by an assessment of challenges (e.g., related to climate change, production, market development etc.). POs will develop a plan to address priority problems, detailing required technical assistance, budget, counterpart funding, time lines, beneficiaries' roles, expected results and benefits to the PO and smallholder members. Support will be provided to link POs with value chain market actors and technical assistance will be provided from the PMU and/ or specialized service provider for PO BP development.

Matching Grant Fund (MGF): Resilient production and value chain development investments defined in PO BPs will be financed by the MGF. This MGF will support investments with the goals of: i) increasing agricultural production climate resilience; ii) increasing production volume and quality; iii) climate-proofing value-chain infrastructure; and, iv) developing product value addition opportunities (e.g., via sorting, selection, packaging and labelling of products or the processing etc.).

Investment categories include: i) climate resilient technologies and practices (e.g., solar panels, solar pumps or equipment, soil analysis, water harvesting, agroforestry, tree nurseries); ii) climate resilient greenhouses and equipment; iii) climate proof storage, sorting and packaging facilities; iv) irrigation (e.g., wells and water systems connections); v) drainage; vi) beekeeping equipment; vii) climate proof agro-processing facilities and equipment; and viii) backyard gardens. The MGF will not finance purchase or lease of land, refinancing or payment of debts, or activities harmful to the environment.

The MGF will be a competitive fund, open to formal and informal POs. Programme target group members receiving support from other technical areas of the programme will be eligible for funding. The MGF will work with Credit Unions formerly supported by the BRFP to consider MGF funding as a

[12] Backyard gardens are between 1/8 and1/4 acres and located near the owners home.

risk reduction for loans to smallholder, groups of smallholders financing a PO project, and possibly to POs themselves. The MGF will promote/ support applications empowering women and youth.

Market Support Assistance: This activity will support climate resilient production, product marketing, and market linkages. It has four activities:

- *Climate Resilient Production Planning TA:* Significant crop and economic losses are *directly* related to unplanned, uninformed, and uncoordinated smallholder production decisions. A more coordinated and planned approach can avoid many of these losses. A Programme Value Chain Specialist will support the implementation PO coordinated demand-driven smallholder crop planning process in priority areas. This will help smallholders plan which crops to grow, when to grow, and how to respond to market needs. The Value Chain Specialist, together with Climate Resilience Extension Services, will provide TA for the introduction of climate resilient production technologies, focusing on volume and quality productivity, post-harvest loss reduction, storage, standards compliance, packaging, and other value-added opportunities.

- *Marketing TA:* Specialized marketing capacity development support will be provided to POs and smallholders, including: i) promoting farming as a business; ii) basic marketing skills and good marketing practices; iii) market analysis; [13] iv) production and processing implications for meeting target market opportunities; and, v) access to/ use of market information technologies (e.g., the MoA's agricultural market price information system and the BMDC's wholesale and retail market prices data).

- *Development of Partnerships and Market Linkages:* The development and implementation of post-harvest and agro-processing facilities will be supported through the MGF and will assist POs to take on new value-added functions (e.g., product collection, sorting, grading, storing, processing, transporting, and marketing). The programme will complement these investments by strengthening linkages between producers and buyers, and supporting PO partnerships with key market actors. Relationships will be initially build through PMU, BMDC, and MoA facilitated meetings between buyers and smallholders/POs with the objective of establishing direct contacts, information sharing, building PO/ smallholder confidence, and displaying PO smallholder products

- *Establishment of Intermediate Markets:* A large share of national market demand for many food products are met with legal and contraband imports, many of which can be substituted by local smallholder production. Responding to high-end market buyers interest in local supply, the programme will finance two pilot farmers' markets in Belize City, and one each in San Pedro and Caye Caulker for POs members to sell directly to wholesale and retail consumers. These activities will be informed by and implemented concurrently with Partnerships and Market Linkage activities.

Component 2: Climate Resilient Rural Infrastructure and Assets Development (CRRIA)

This component supports climate resilient productivity and improved market access through rehabilitation and provision of new road, drainage, and irrigation infrastructure in priority areas.

Infrastructure investment proposals will align with and support IPPs and PO BPs and demonstrate the potential to: i) reduce smallholder and infrastructure climate change vulnerability; and, ii) enhance smallholder economic opportunities/ incomes. The overarching goal is to support climate resilience infrastructure enhancing smallholder farming business/ rural enterprise opportunities, while serving the largest number possible of direct and indirect programme beneficiaries.

[13] The San Pedro and Placencia markets supply demand for 60 + vegetables and fruits (traditional, non-traditional, and organic fruits and vegetables).

The main types public/ common use infrastructure will be eligible under the CRRIA including: i) local or feeder roads and ancillary structures (e.g., culverts, bridges etc.); ii) small-scale irrigation; and, small scale drainage systems. The CRRIA component has three sub-components:

Subcomponent 2.1: Investment in Rural Roads Improvements (RRI). Investments will be directed at rural roads and ancillary structures most vulnerable to climate variability, and those that complement the Component 1 objectives (e.g., by assuring programme-supported value chains/commodity production year-round market access.) Improved roads will largely be the "last mileage" of local or uncategorised feeder roads, and are often poorly made and maintained, rendered inaccessible to vehicular traffic in the rainy season. Eligible investments will also include climate proofing of roads with ancillary structures (e.g., small bridges, culverts, drainage facilities and erosion protection works etc.). The PMU will procure consultancy services for road design and supervision, as well as construction.

Subcomponent 2.2: Investment in Small-scale Irrigation and Drainage (SSID)

This subcomponent will ensure better climate, environmental, social, and economic resilience as the reliability of water supply and agricultural land management improves and directly addresses the effects of continued, documented rainfall variability.[14] Small-scale irrigation and drainage systems funded will include *inter alia* intake structures, pumping stations, rain harvesting ponds, main and secondary distribution networks, drainage networks and flood protection structures. On-farm irrigation/ drainage systems for connecting to main or secondary networks (e.g., drip, sprinkler, gravity ditches or field open drains) will be provided by beneficiary finance through their own resources or MGF funding. Works for the small-scale irrigation and drainage schemes, design, the PMU will procure supervision consultancies. Ten Water User Associations (WUA) will be formed and provided technical assistance for institutional development and management of irrigation and drainage schemes. All SSID investments will be climate proofed to withstand expected future precipitation scenarios.

Subcomponent 2.3: Climate Information System

The subcomponent will focus on the creation of the Climate Information System (CIS) which has the purpose of providing farmers with timely and accurate climate information, allowing them to plan production activities and minimize climate related production losses. Its functions will include climate analysis and monitoring, assessment and attribution, prediction (monthly, seasonal, decadal) and projection (centennial scale). The CIS will authenticate and communicate climate information at across the country primarily via TV and radio, although cellular services may also be considered.

Cross-Cutting Activities

Cross cutting activities are those which support interventions found in Component 1 and 2, of which there are three.

Policy Engagement/Consultation: Several policy constrains to climate resilient value chain development were identified during programme design, the most notable relating to import tariffs and permits, product quotas, and out-dated agricultural and commercial laws and regulations. The programme will fund public consultations involving a broad set of stakeholders (e.g., programme beneficiaries, POs, the private and public sectors, etc.) on barriers to private sector value chain development. Discussions will likely lead commissioned research on targeted policy/regulatory issues/

[14] Belize is identified one of the most vulnerable countries to the adverse impacts of climate change. A 2009 UNDP Development Studies paper analyzed the costs of inaction on climate change for Belize, assessing the vulnerability of three economic sectors in Belize to the effects of climate change: agriculture and fisheries, energy and tourism. Climate change forecasts for Belize for the period 2001-2080 for two basic meteorological parameters, temperature and precipitation, show increases in average seasonal temperature until 2080 between 2ºC and 4 ºC depending on the season and area. The forecast predicts a decrease of average rainfall by 100 mm and changes in rainfall distribution. Although annual rainfall volumes are more than adequate for most crops, the increasing intensity of rainfall within the marked rainy and dry seasons mean that many parts of the country will increasingly suffer from a distribution of rainfall that provokes floods and droughts. More details on climate change projections are provided in the SECAP paper in Appendix 12.

themes, or the strengthening relationships/ coordination among public and private institutions (e.g., updating and management/ enforcement of agricultural import laws and regulations).[15]

Research and Development (R&D). The programme will complement MoA research activities by undertaking targeted research supporting sustainable smallholder climate change resilience production and market access (e.g., supporting research on extension-farmer linkages fostering access to locally-validated productivity and resilience enhancing agricultural technologies). Specific planned activities/ studies include:

- *Adaptation Strategies***:** Support for the University of Belize's Faculty of Agriculture to conduct applied research on adaptation strategies and climate resilient practices including on diversified production systems, agroforestry, protein banks, and windbreaks.
- *Index-based insurance:* The CDB and CCRIF recently launched the "Integrated Sovereign Risk Management in the Caribbean" Project. The project includes a Disaster Recovery Fund for Caribbean countries, but has not yet defined a mechanism for smallholder farmers to access the fund. The proposed study will assess mechanisms which provide Belizean smallholders to climate disaster insurance, allowing them to make production investments with greater financial security. Potential mechanisms include an index-based or conventional indemnity insurance schemes.
- *Ecosystem Services Payments: This study will assess the feasibility of using ecosystems payment* services to stimulate maintenance and restoration of local ecologies (e.g., native forests) which provide essential environmental services but do not currently generate revenue for smallholder farmers and other landowners.
- *Smallholder Cane Farmer Production Diversification:* Many small "out-growers" in the Corozal District provide Tower Hill refinery cane employing low-input, low-output, marginally profitable production systems (due to low yields, poor quality cane, and high cutting, and transport costs). The end of preferred access to EU sugar markets for Belize will further depress smallholder incomes. The programme will support participatory research to examine with smallholder farmers, their interest in and potential for diversification from cane. The study could also lead to the inclusion of communities in the Corozal District into the programme.

Public Authorities Capacity Building: The MoA will have a central role support programme implementation and related sustainable outcomes. Institutional strengthening of the MoA's capacity to provide technical services to smallholder farmers, both for programme implementation and in the future, is essential, particularly in the Departments of Extension (DE), the Department of Cooperatives (DC), and the Belize Marketing and Development Corporation BMDC.

The DE has a presence in each District and is responsible for executing MoA programs and operational activities at the local level. Intensive training/ capacity building of its personnel is planned for a range of strategic topics: climate change and resilient production practices and technologies; value chain development; marketing information communication/ management; rural organization management/ business development; social inclusion; development communications audio-visual training materials. The programme's Climate Resilient Agriculture Specialists will work with MoA extensions agents to develop and support service provision to target beneficiaries.

The DC has regulatory oversight of all non-financial co-operative enterprises including *inter alia* registration, management training, supervision and audit functions, and member enterprise development. The DC suffers from weak/ antiquated legislation and low staff capacity which limits its effectiveness. The programme will work to strengthen its capacities through training and capacity-building, resilient agriculture, social inclusion (gender and youth particularly) and value chain development.

[15] POs agreements with MoA related to food imports (e.g., borders closed when there is sufficient local production) will need to be replicated and fully complied with in a timely manner. To this end, the MoA will be sensitized to the damage caused by non-timely enforcement of protocols, and support will be provided for efficient implementation.

The PMU's Rural Organisation Development Specialist, along with two contract specialists, will work closely with the DE and DC to develop and execute a TA plan to strengthen MoA capacities, and to improve intra Ministerial/ departmental cooperation and collaboration. The plan will incorporate aspects of IFAD Learning Routes, and offer national and international study tours/exchange visits. As the MoA is one of a few GoB ministries with a Gender Focal Point, the programme will support activities designed/ led by the focal point team (e.g., research, workshops, etc).

Outcomes

The programme will reach a total of 6,000 households, or 30,000 persons. The number of people with strengthened resilience would be 24,000 (80% of all persons reached).

The outcome targeted under Component 1 is that target beneficiaries produce and market larger and more reliable supply of agricultural products via climate-resilient practices. Key results include:

- 60% of households will be incorporated into the programme, and 40% smallholders will be able to produce and market incremental volumes of agricultural products and to adopt climate-resilient practices;
- At least 30 formal and informal POs will be strengthened, benefitting at least 4,500 members, through improvement in their by-laws and in organizational and administrative skills. They will be able to increase their membership and generate revenues for their financial sustainability;
- Approximately 2,000 farmers will be trained in climate resilient agricultural technologies and practices for application to their production and marketing systems;
- Investments will be made in the rehabilitation/ construction of approximately 300 structures (covered structures, storage facilities, etc.) and other climate resilient technologies and infrastructure;
- Approximately 400 hectares of land will be brought under climate resilient management, benefiting from improved drainage and irrigation infrastructures, including about 240 ha under the newly developed public systems; and
- At least 700 smallholder farmers will build their entrepreneurial skills with training in business management and marketing.

More than 2,000 households, or approximately 9,300 poor and vulnerable rural men and women will benefit from Component 1 activities.

The Outcome targeted under Component 2 is that climate resilient public infrastructure and services, support production and access to markets for targeted beneficiaries. Key results include:

- Physical vulnerability will be reduced and resilience to natural hazards and the anticipated impacts of climate variability strengthened in an estimated 20 communities in five priority areas. Quality of life and efficiency of agricultural production will be improved in these communities;
- Approximately ten community -level Water Users' Associations/Informal Water Users' Groups will be established with the participation of men and women, and trained for irrigation and drainage systems management, operation, and maintenance;
- Approximately 400 rural households (2,000 people) will directly benefit from improved road infrastructure; and
- Approximately 350 rural households (1,750 people) will be provided with reliable irrigation water supply and adequate drainage networks.

The total number of households benefitting from the CRRIA component is projected to be 750 rural households (3,700 poor and vulnerable rural men and women).

Costs and financing

The programme will be implemented over a six-year period. Total programme cost, including physical and price contingencies, is estimated at US$20.0 million. IFAD will finance US$8.0 million in loans over two cycles, and the GCF will provide US$8.0 million. The GoB will fund US$3.2 million and beneficiaries US$0.8 million. The IFAD PBAS allocation for the IFAD10 cycle is USD 5.8 million, this leaves a financing gap of US$2.2 million which will be covered by IFAD11 Performance-Based

Allocation System (PBAS) resources, or if unavailable, by other sources (e.g., GCF has expressed interest in further funding and the CDB has expressed interest in co-financing). Component 1 has an estimated cost of US$7.9 million (41%), Component 2 US$8.2 (42%), Programme Management is US$3.27 million (17%, including US$0.34 million or 1.4% for Cross Cutting Activities).

Given the positive feedback from the GCF, no major misalignment of programme approval schedules between IFAD and GCF are anticipated. The IFAD financing is planned for submission to the April 2018 Executive Board, with GCF Governing Bodies consideration in July 2018. The resulting modest delay in GCF financing will not affect programme implementation which can begin with IFAD-financed activities. Retroactive financing and start-up costs will be accommodated in design, allowing for some activities to start with GOB advance financing.

Logical Framework

Results Hierarchy	Indicators				Means of Verification			Assumptions
	Name	Baseline	Mid-Term	End Target	Source	Frequency	Responsibility	
OUTREACH	People receiving services promoted or supported by the project (40% women and 20% youth).							
	a. Number of households reached.	0	2,000	6,000	M&E system and completion study	Annual reports, mid-term report, Closing report	Project Unit	
	b. Estimated number of household members (40% women and 20% youth).	0	10,000	30,000	M&E system and completion study	Annual reports, mid-term report, Closing report	Project Unit	
Goal: To improve the resilience of poor rural households.	1. Number of rural people with strengthened resilience (by sex and age) (≥20%). (RIMS Impact).[16]	0	3,000HH	6,000 HH (100% of HH;	M&E system and completion study	Annual reports, mid-term report, closing	Project Unit	No major external or internal shocks affecting Belize's economy

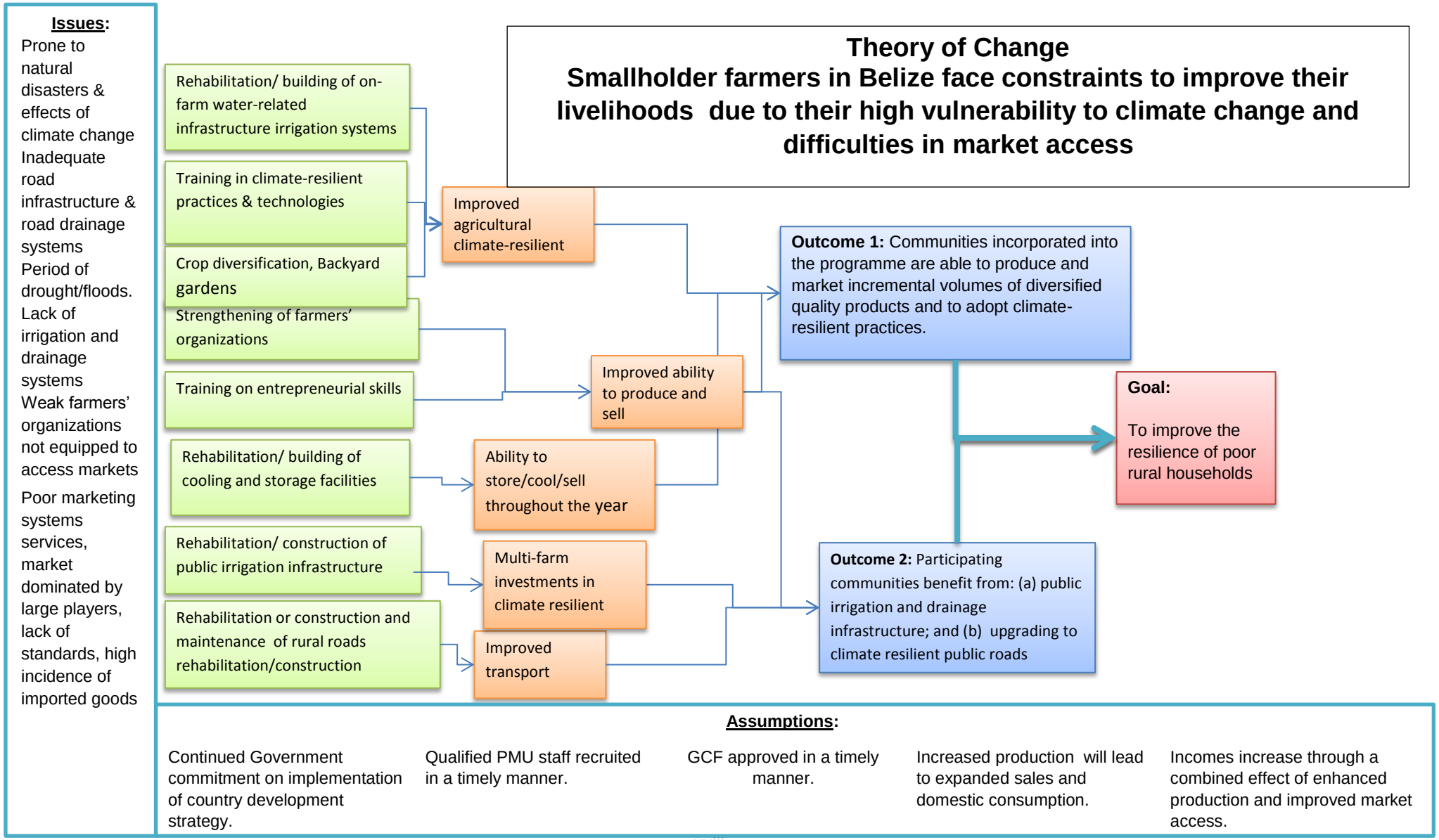
[16] Mandatory indicator for resilience for IFAD. Could be measured as "Reduction in time required to recover from a climate shock"; however, this will be defined with the PMU M&E Unit as early as possible during the programme life.

Results Hierarchy	Indicators				Means of Verification			Assumptions
	Name	Baseline	Mid-Term	End Target	Source	Frequency	Responsibility	
Development Objective: To build overall resilience to climate change by adopting new or improved climate resilient practices, increasing and diversifying agricultural production, and by facilitating their access to commercial market chains for the off-take of their surplus production.	2. Number of Households reporting adoption of environmentally sustainable and climate new/ improved practices.	0	2,500	5,500	M&E system and comple-tion study.	Annual reports, mid-term report, Closing.	Project Unit.	Continued Government commitment to country development strategy implementation -Increased production leads to expanded sales and domestic consumption. -Incomes increase through effect of enhanced production and improved market access.
Component 1. Climate Resilient Agricultural Production and Market Access								
Outcome 1.1 Smallholders produce and market larger and more reliable supply of agricultural products via climate-resilient practices.	3. Number of households reporting an increase in production due to adoption of environmentally sustainable and climate new/ improved inputs, technologies or practices.	0	800	1,600 HH (80% of HH receiving full extension/production/market services)	M&E system and comple-tion study.	Annual reports, mid-term report, Closing.	Project Unit	
	4. Number of households reporting at least 30% increase in sales value. (1.2.4)	0	800	1,600 (80% of HH receiving full extension/production/market services	M&E system and comp-letion study.	Annual reports, mid-term report, Closing.	Project Unit	
Output 1.1 Strengthening of	5. Number of rural formal POs/ members supported.	0[17]	10 (150: (40%	30 (450: (40% women	M&E system.	Annual reports, mid-	Project Unit.	

[17] Baseline for % women in POs in priority area is 15%.

Results Hierarchy	Indicators				Means of Verification			Assumptions
	Name	Baseline	Mid-Term	End Target	Source	Frequency	Responsibility	
Producer Organizations (cooperatives and farmers' associations and groups).	(2.1.3)		women and 20% youth).	and 20% youth)).		term report, Closing.		
Output 1.2 Training on climate-resilient agricultural practices.	6. Number of rural households engaged in climate vulnerability assessments and trained in climate resilience practices and strategies, basic agricultural production and market practices.	0	2,500 (40% women and 20% youth).	6,000 (40% women and 20% youth).	M&E system	Annual reports, mid-term report, Closing.	Project Unit	
Output 1.3 Investment in climate-resilient agricultural technologies inter alia greenhouses, rehab-ilitation/ building of water-related infra-structure (on-farm irrigation and drain-age); rehabilitation/ building of storage facilities, etc..	7. Number of facilities (covered structures, storage facilities) rehabilitated/ constructed. (2.1.6)	0	50	300	M&E system	Annual reports, mid-term report, Closing.	Project Unit	
	8. Number of hectares of land brought under climate-resilient management. (3.1.4)	0	40	400	M&E system	Annual reports, mid-term report, Closing.	Project Unit	
	9. Number of households with increased resilience through backyard gardens.	0	500	2000	M&E system	Annual reports, mid-term report, Closing.	Project Unit	
Output 1.4 Improving small farmers' entrepren-eurial capabilities to identify and exploit market opportunities.	10. Number of persons trained in business management and marketing. (2.1.2)	0	200 (40% women and 20% youth).	700 (40% women and 20% youth).	M&E system	Annual reports, mid-term report, Closing.	Project Unit	
Component 2. Climate Resilient Public Infrastructure and Assets								
Outcome 2.1 Climate resilient public infrastructure and	11. Number of households benefitting from improved public	0	1,000	6,000	M&E system and	Annual reports, mid-term report,	Project Unit	

Results Hierarchy	Indicators				Means of Verification			Assumptions
	Name	Baseline	Mid-Term	End Target	Source	Frequency	Responsibility	
services, support production and access to markets.	infrastructure and climate information system				comple-tion study.	Closing.		
Output 2.1 Multi-farm investments in public irrigation/ drainage infrastructure for climate resilience.								
	12. Number of people with access to agricultural water supply	0	700	1,750	M&E system	Annual reports, mid-term report, Closing.	Project Unit	
Output 2.2 Improvement of rural tracks and access routes.	13. Kilometres of roads constructed, rehabilitated or up-graded to all-weather status. (2.1.5)	0	30	80	M&E system	Annual reports, mid-term report, Closing.	Project Unit	
Policy (cross cutting)	14. Number of regulatory innovation and/or mechanism for climate responsive planning and development.	0	1	2	M&E system	Annual reports, mid-term report, Closing.	Project Unit	


Issues:
Prone to natural disasters & effects of climate change
Inadequate road infrastructure & road drainage systems
Period of drought/floods.
Lack of irrigation and drainage systems
Weak farmers' organizations not equipped to access markets
Poor marketing systems services, market dominated by large players, lack of standards, high incidence of imported goods
Theory of Change
Smallholder farmers in Belize face constraints to improve their livelihoods due to their high vulnerability to climate change and difficulties in market access
Rehabilitation/ building of on-farm water-related infrastructure irrigation systems
Training in climate-resilient practices & technologies
Crop diversification, Backyard gardens
Strengthening of farmers' organizations
Training on entrepreneurial skills
Rehabilitation/ building of cooling and storage facilities
Rehabilitation/ construction of public irrigation infrastructure
Rehabilitation or construction and maintenance of rural roads rehabilitation/construction
Improved agricultural climate-resilient
Improved ability to produce and sell
Ability to store/cool/sell throughout the year
Multi-farm investments in climate resilient
Improved transport
Outcome 1: Communities incorporated into the programme are able to produce and market incremental volumes of diversified quality products and to adopt climate-resilient practices.
Outcome 2: Participating communities benefit from: (a) public irrigation and drainage infrastructure; and (b) upgrading to climate resilient public roads
Goal:
To improve the resilience of poor rural households
Assumptions:
Continued Government commitment on implementation of country development strategy.
Qualified PMU staff recruited in a timely manner.
GCF approved in a timely manner.
Increased production will lead to expanded sales and domestic consumption.
Incomes increase through a combined effect of enhanced production and improved market access.

I. Strategic context and rationale

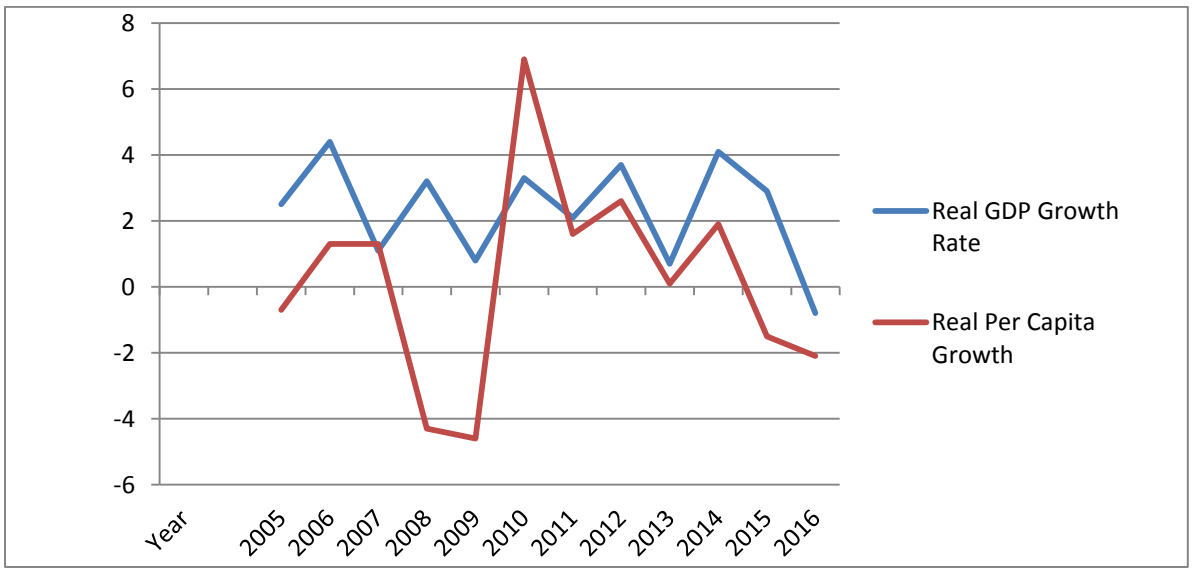
A. Country and rural development context

Economy

1. Belize is classified as a Small Island Developing State (SIDS) as it suffers the vulnerabilities characterizing a SIDS in addition to the many of the challenges facing developing countries in general. [18] The country is small with a total land area of only 8,867 square miles and a population of 385,766 inhabitants (2017), of whom 42.4% are urban dwellers. The country is sparsely populated, with a total population density of 16 people per km².[19]

2. With a Gross Domestic Product (GDP) of US$1.7 billion (2016)[20], Belize's *per capita* income is US$4,600, and is classified as an Upper Middle Income Country (UMIC). GDP and *per capita* income growth since 2005 has been notably cyclical. (See Figure 1), with both GDP and *per capita* GDP fluctuating considerably on an annual basis, registering an overall decline during the period. Since the economic and financial crisis of 2008, the economy has also seen high inflation rates, high levels of unemployment and under-employment, low investment, persistently negative balance of payments, high public debts, and high levels of poverty.

Figure 1: Rate of Growth of GDP and Per Capita Income, 2005-2016



3. In September 2017, the International Monetary Fund noted several economic challenges facing Belize: a weak macroeconomic outlook, high public debt (100% of GDP), and poor medium-term economic growth prospects projected (less than 2% annually). [21] The Fund noted that an improved economic outlook requires strategic prioritization of programmes under the Growth and Sustainable Development Strategy, in close cooperation with development partners.

4. As an open economy, Belize is highly vulnerable to external shocks and significantly affected by climate-related and natural disasters. It is estimated that almost 25% of the population was affected by the last three hurricanes, including significant negative impacts on agricultural production and infrastructure. Losses from hurricanes will continue to mount as evidence suggests they will

[18] Division for Sustainable Development of the United Nations Department of Economic and Social Affairs (UN-DESA).
[19] Belize's neighbors have much higher population densities: Guatemala (145 per km², 2014 data), Honduras (79 per km², 2017 projection), and Mexico (63 per km², 2017).
[20] Belize ranked 172nd out of 194 countries in The World Bank Development Indicators
[21] Staff Report: 2017 Article IV Consultation with Belize

continue to occur with increased frequency. The impact of Hurricane Earl in 2016, for example, cause a contraction of the GDP of almost 1.0%, with the primary sector shrinking almost 25% due to flooding and resulting disease affecting both livestock and humans. With the except of sugar cane, production of all major export-related crops declined after the hurricane (e.g., farmed shrimp, corn, rice, papaya).

5. Labour force participation has grown rapidly over the last several years due primarily to an expanding service sector, helping to decrease the unemployment rate to 9.5% in 2016 after several years of double digit levels. The most recent Labour Force Survey (LFS - 2017), shows 17% of employed persons worked in agricultural, 90% of them being men. The LFS found 68% of those unemployed were women, who as a group experienced net job loss in the rural areas compared to an increase for men.[22] The survey also found that the rate of underemployment increased in 2016, affecting women more disproportionately then men. Youth accounted for a *one-third* of the total underemployed population.[23]

Poverty

6. The most recent data on poverty in Belize shows between 2002-2009 an increase share of the total population lives below the poverty line (from 34% to 41%), and an increase in the number of households in poverty (24.5% to 31%). [24] Estimates for 2016, indicate that there are approximately 37,900 poor households in Belize. (See Appendix 2).[25]

7. In 2009, the rural poverty rate for households was twice as high as that in urban areas (42% to 21%). Both rural and urban poverty rates increased between 2002 and 2009, with increases being greater in rural areas (in both absolute and relative terms). The highest levels of rural poverty are found in the northern District of Corozal with its large number of smallholder farmers, and in the southern District of Toledo, with its large Mayan population.[26] Available data show that 46% of households in Toledo and Corozal are poor (Table 5). The greatest change to poverty rates between 2002 and 2009 was in Corozal where poverty doubled, and indigence tripled. Poverty in Toledo has fallen since 2002, although this District remains the poorest in the country with by far the highest level of indigence. Poverty and indigence at the household level have also increased substantially in Orange Walk and Cayo Districts since 2002; whereas increases in Belize District and Stann Creek District are less pronounced. Notably, the poorest people and communities in Belize are predominantly rural, with livelihoods largely dependent on climate-sensitive sectors such as small farm agriculture, fishing, and tourism. Many poor living in coastal areas are exposed to the risks of hurricanes and storm surges, while many others live near watersheds prone to flooding. These areas generally have lower levels of protective infrastructure and housing is of lower quality, increasing their vulnerability to hurricane and flood risks.

8. According to the World Bank (2017), increased poverty in Belize can be explained by several factors including the effects of the global financial crisis in 2008, recent natural disasters, and rising fuel prices. The Country Poverty assessment (CPA 2009), notes serious setbacks in 2006/ 2007 in the sugar cane, and banana markets, with the overall value of production decreasing 13%. This has had a notable impact on the national economy, but has been felt most in Corozal. The economy is marked by significant inequality with a large portion of the population unable to participate in the more dynamic/ high end segments of the tourism and service sectors.

[22] Women's participation in the labour market has always been less than that of men, and their unemployment rate has always been higher. Furthermore, women are at higher risk of being unemployed.
[23] Youth are particularly affected by a shortage and mismatch of skills which are major constraints to youth employment, productivity, and competitiveness. Other constraints include are the lack of parental guidance poor motivation and social skills, and peer pressure which encourages negative behaviour which makes being studious "uncool".
[24] Belize Country Poverty Assessment, 2009.
[25] Based on 2016 population projections, account for the rate of poverty for each District, applying the mean household size per District (data from the 2010 Census). See Appendix 2 for more details.
[26] Farmers with less than 25 acres are classified as small farmers;

Agriculture

9. Agriculture is the main source of rural livelihoods in Belize and is an important, if uneven contributor to the national economy. The sector contributed a high of 15% GDP in 2005 but less than 10% in 2016. During this period, performance fluctuated notably, with growth rates over 10% in 2010 and 2012, but low or stagnation in other years.

10. Traditional agricultural exports (e.g., raw sugar, citrus products, bananas, and marine products) are more than 70% of total exports. Belize is self-sufficient poultry meat, eggs, beef, pork, beans, rice and corn, and even exporting some of these products (e.g., to the Caribbean Community (CARICOM) and Central America). Despite this positive performance, Belize's food import bill has almost doubled over the last ten years. Three types of farming characterized the sector: well-organized commercial export commodities; well-integrated large- and medium-scale commercial value chains; and smallholder farming with mixed purpose farming (i.e., subsistence, local consumption, and some commercial sales).

11. Among the key concerns for Belize are how best to maximize use of rural means of production, and how to create a diversified, sustainable and food secure rural/ national economy. Smallholder farmer competitiveness in local and high-end markets is a major challenge due primarily to low productivity, lack of modern technology, and high input and labour costs. Small farmers also suffer from low cost imported food competition (legal and illegal) from neighbouring countries.

12. The new National Agriculture and Food Policy 2015 -2030 (NAFP) focuses on greater product diversification and achievement of food self-reliance. The policy emphasizes research on value addition and post-harvest handling, household and national food and nutrition security, increasing farm household income, promoting rural area development through inclusion of small farmers in agricultural development, and, increasing the resilience of rural livelihoods threatened by natural disasters and economic shocks.

13. The NAFP identifies several issues and challenges to be addressed: i) increasing the resilience of the economy and reducing the coming impacts EU preferential sugar and banana market treatment to end in 2018; ii) improving agricultural product competitiveness in external markets; iii) developing select product value chains (focusing on production technologies and market access particularly for small- and medium-scale producers); iv) enhancing development of agro-processing and other value-added activities; v) reducing expanding food imports; vi) ameliorating high levels of rural poverty; vii) alleviating moderate and, in some areas, high levels of food related insecurity and malnutrition; viii) changing food consumption and dietary patterns which contribute to increased levels of obesity/ non-communicable diseases; ix) increasing resilience to climate-related and natural disasters; x) reducing vulnerability of rural communities, particularly small farmers, women, and indigenous who dependent on agriculture; xi) improving rural infrastructure; and xii) improving use and management of natural resources.

14. There are numerous opportunities for addressing rural poverty, particularly within the small holder farming sector. Some include, increased product value-added activities, diversified production, diversified markets, and market segment access. Increasing production efficiency/ productivity in garden vegetables through the introduction of new technologies (e.g., irrigation, covered growing structures, etc.), would improve local produce competitiveness against imported foods. Main constraints for small holders to realize opportunities include lack of access to land (especially for food security and household income diversification), limited market access due to small production volumes, high transport costs, low quality products etc.), lack of appropriate and timely market information, and poor transport infrastructure. Rural areas also suffer from a lack of appropriate technological innovations, organised market intelligence systems, and participation in established product supply chains. Small holders seldom have the capacity to meet production quality requirements demanded in many value chains, limiting commercialization to less lucrative local markets.

15. The GOB has identified the need to support smallholder access to new markets, including strengthening MoA's protocols, communication with rural/ agricultural stakeholders, improving management of legal food imports (particularly closing borders to imports when sufficient local

production exists), increased control of illegal imports, and enforcement of applicable agricultural policies, laws, and regulations.

Rural context, natural resources, and climate

16. Agriculture, livestock, and fisheries (particularly shrimp) provide the most income, employment, and development opportunities in rural areas, followed by transport (including infrastructure), education, and health. The extent to which the development of these activities can be maximized is constrained, by varying degrees, by vulnerability to climate change and inadequate rural economic infrastructure.

17. **Environmental Vulnerability -** Belize is among the most climate event vulnerable countries in the world. Since 1930s, a hurricane or tropical storm has hit the country once every 2½ years. Moreover, the country is affected by significant climate change impacts on a *constant and increasing* basis (e.g., variations to rainfall patterns, floods, droughts etc.). The Climate Risk Index (CRI – 2017) estimates average annual economic losses because of climate change to be US$57 million or 3% of GDP. [27]

18. Hurricanes and tropical storms cause both human and material losses as well as serious damage to infrastructure, and corresponding negative impacts on agriculture and rural livelihoods. Over the last 15 years, natural disasters have severely affected the country: Hurricane Keith in 2002 inflicted economic losses of 30% of GDP; Hurricane Dan in 2007 caused US$90 million in damages (7% of GDP), 64% of which in the agricultural sector; and Hurricane Earl in 2016, resulted reduced the GDP by 1%.[28] Belize also experiences tropical storms and droughts on a regular basis, causing notable ongoing losses in various sectors of the economy, but particularly in agriculture.

19. Climate change threats, including rising sea-levels, hurricanes/ storm surges, are particularly acute along the lowlands and coastal belt of Belize, where soils are well suitable for cultivation, and where a substantial percentage of the population resides. Decreasing volumes and increased variability of rainfall, along with rising temperatures will make it difficult to plan agricultural production and are shortening seasons. Major crop yields are expected to decrease (e.g., sugar cane, rice, bananas, citrus, corn, and beans) and some crops are already seeing reduced resistance to pests and diseases, increased water stress, poor respiration rates stunting growth. (See SECAP, Appendix 14 for more details).

20. Adverse effects of climate related events will affect hit rural people disproportionally, particularly smallholder/ subsistence farming households who have few resources to “cushion” and recover from impacts. The effects on poor marginalized, indigent persons, and women-headed households will be even more dramatically affected.

21. **Infrastructure -** A major constraint to improved agricultural production and smallholder market access is generally poor rural roads, irrigation, and drainage infrastructure, most of which is not built to resist current and anticipated climate events. Inadequate infrastructure inhibits agricultural and enterprise development, and contributes to low agricultural and livestock productivity and production quality.

22. Analyses of rural infrastructure in Belize show a clear and urgent need for continued investments [29] . Poor road conditions are key barrier to market access, increased agricultural

[27] Germanwatch Nord-Süd Initiative.e.V is a non-governmental organization based in Bonn, Germany that seeks to influence public policy on climate change, amongst other areas of interest.

[28] Belize has the highest CRI among Central American countries. The Index shows countries that have been affected by extreme weather events, and takes into account the total deaths per 100,000 inhabitants, the absolute losses in millions of U.S. dollars and losses as a percentage of GDP. These indicators imply the development and vulnerability levels of the countries at risk.

[29] A National Adaptation Strategy to Address Climate Change in the Agriculture Sector (GoB/Caribbean Community Climate Change Centre/EU, 2015); Belize Technology Needs Assessment Adaptation (Identification and Prioritization of Adaptation Technologies for Belize, January 10, 2017); National Food and Agricultural Policy (2002 – 2020); National Environmental Policy and Strategy (2014 – 2024); An Irrigation Policy and Strategy for Belize (GoB/FAO, 2011); Agricultural Water Management Investment Plan (GoB/FAO, 2014).

productivity, and smallholder joint/cooperative initiatives. More all-weather rural roads (including climate resilient upgrades such as culverts, drainage, bridges etc.) are needed to ensure support year-around access to market towns, processing facilities, and production areas. Road design need to be upgraded to include *inter alia* improved materials, higher elevations, and better drainage in areas prone to flooding. While climate resilient roads typically last longer (with proper operation and maintenance) and suffer less damage due to climate events than conventional construction, they can cost up to 30% more to construct.

23. Rural infrastructure studies also show a need for significant investment in irrigation systems and drainage networks to cope with climate change events. Rainfed agriculture has been the norm in rural Belize and there is limited experience/ investment in smallholder irrigation. There is neither a public irrigation system nor substantive data available on private farm irrigation. Improved irrigation and drainage networks are essential for improved and sustained smallholder productivity gains and crop diversification.

24. Strategic investments in the above noted climate resilient rural infrastructure will not only enhance current production, but encourage more private sector investments in agriculture and other sectors (e.g., rural tourism), and contribute to the national economy generally and improved economic opportunities/ income for rural residents more specifically.

B. Rationale

25. The IFAD Country Strategy Note for Belize was approved in early 2017. Its strategic objectives are to: i) build, rehabilitate and maintain climate-resilient rural infrastructure; and, ii) foster small holder farmers' capacities to employ market-driven and climate change adaptive farming practices and technology. A programme to fight poverty in its various dimensions, with the cross-cutting key objective of increasing climate resilience, is justified by several considerations:

26. **Climate change** - Belize is highly vulnerable to the impacts of climate change. Highly dependent on natural resources, smallholder farmers are amongst the most vulnerable to climate change risks. The rural poor suffer devastating losses from extreme climate events, as they do from ongoing impacts of unpredictable seasonal climatic patterns. The poor have limited resources to recover and or prepare from/ for such events, and often see their incomes, and household/ natural assets eroded over time as a result. Support for improved smallholder welfare on a sustainable basis requires not only improved productivity, market access, and natural asset protection/restoration but resilience to climate shocks as well.

27. **Smallholders** - Smallholder farmers dominate Belize's agricultural sector and play a critical role in enhancing their community's and the nation's food security. Their income from agriculture is far below its potential due to inefficient production, low product quality, high production costs and limited access to markets. Smallholders are often unable to compete with agricultural imports and contraband products from neighbouring countries (principally Mexico). There is great potential for smallholders to sell greater volumes in local markets as there are opportunities to benefit from pre-harvest and post-harvest activities. More organized and coordinated production and marketing, would smooth output fluctuations and price depressing market "flooding" after production.

28. Responding to these challenges, the programme will increase resilient and sustainable smallholder production/ income through the support of select value chains, market access, and rural infrastructure. The proposed programme is consistent with IFAD's strategic priorities for the region. It is well anchored in the GoB's national Growth and Sustainable Development Strategy (GSDS, 2016-2019). It is consistent with agricultural sector development planning as set out in the National Agriculture and Food Policy (NAFP, 2015). The programme complements other development organization initiatives in transport, trade, policy, education, tourism (e.g., WB, CDB, IDB), While the EU supports large farms in sugar and banana production, IFAD is currently the only institution targeting smallholder farmers in Belize.

29. The proposed Programme is expected to have a direct impact on achievements towards meeting several of the United Nations 17 Sustainable Development Goals (SDGs), including poverty

reduction, hunger reduction, gender equality, innovation and infrastructure, reducing income inequality and helping to promote sustainable communities.

II. Programme Description

A. Programme area and target group

30. According to the most recent Agricultural Census (2011), there are 19,200 farmers in Belize, of whom, 15,000 are smallholding farmers with between 1 to 25 acres.[30] These farmers are spread throughout the country.

31. To maximize programme impact and provide demonstration effects, the programme will select rural communities in five Districts. The criteria for identifying communities include: i) high concentration of smallholder farmers (women and men with less than 25 acres);[31] and, ii) existence of smallholders: a) able to work in selected value chains b) are market- oriented (i.e., not only subsistence farming); c) have a "willingness to help themselves"; and, d) are members of producer organisations (POs - formal or informal).[32].

32. The programme will initially operate in five *priority areas* (23 communities, grouped in five clusters):[33] five communities in Orange Walk District (San Carlos, Fire Burn, Indian Church, San Felipe and Santa Marta); six in Belize District (Nago Bank, Bomba, Boston, Maskall, Rockstone Pond and Santana); five in Cayo District (Valley of Peace, Buena Vista, La Gracia, San Antonio and Seven Miles); two in Stann Creek District (Cow Pen and San Juan); and, five in Toledo District (Trio, Bella Vista, San Isidro, San José and San Pablo).[34] Data on the numbers of households and numbers of farmers for each community can be found in Annex 3, Appendix 2. Other communities may be included as experiences from initial interventions are assessed.

33. The target group comprises: i) poor rural families (indigent and poor, whose income is below the poverty line);[35] ii) vulnerable rural families (whose income is ≤ 25% over the poverty line but are vulnerable to poverty due to climate change and/or external economic events); ii) households with less than 25 acres, engaged in part-time or full-time farming; and, iii) formal and informal producers organizations with the willingness and potential for improving productivity and farmer market access. Some 1,700 households with these characteristics have been identified in programme priority areas. An additional 300 will be identified during implementation. Of this group of 2,000 households, 40% are considered "poor farmers" and 60% "vulnerable farmers".

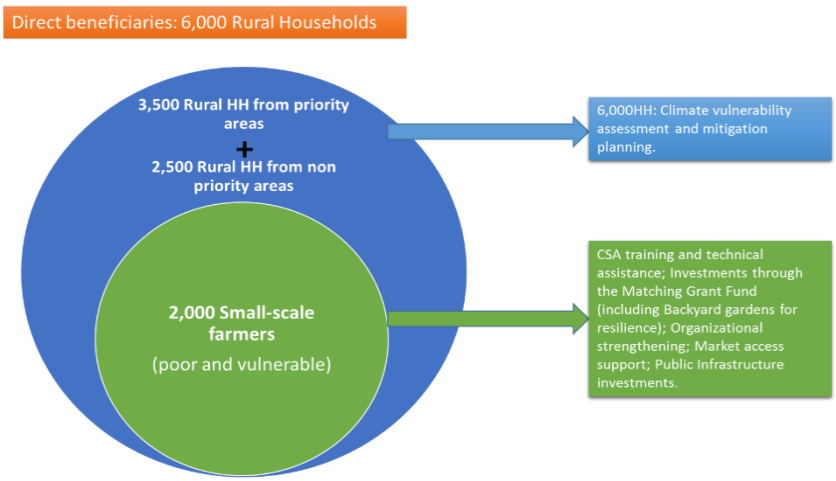
34. The programme will have 6,000 beneficiary households: 3,500 in the communities in priority areas, and 2,500 households to be identified during implementation. Beneficiaries will be male and female smallholder farmers in selected rural communities with a demonstrated willingness and potential for improving productivity and participating in commercial markets. Women and youth (male and female) will be 40% and 20% of programme beneficiaries respectively, and will participate in all programme interventions. Approximately 2,000 beneficiary households will benefit from matching grant fund (MGF) support to backyard gardens.

[30] On occasions a smallholder household may lease/own up to 50 acres, but only a few acres may be under cultivations.
[31] In Belize, farmers with less than 25 acres are classified as small farmers; typically, they only cultivate 5 to 8 acres of the total.
[32] The term "producers' organizations" refers to cooperatives or associations, which may be formal or informal.
[33] The terms community and village are often used interchangeably in Belize. For consistency, the term community will be used throughout this document.
[34] The Corozal District was not included as a priority area despite its high (and rising) incidence of rural poverty; it has received major investments from government and numerous development projects and, as such, was not considered as a priority by the government during the design mission. Also, many famers in this district remain reluctant to diversify out of sugar cane, a main farming activity in Corozal. The District also receives substantial investments from the GoB and several development projects. The programme will assess the District early in Programme to establish which communities' small farmers might be interested in diversifying out of sugar cane and what value chain opportunities might exist for them.

[35] Definitions of poverty and socio-economic vulnerability to climate change consider exposure to climate change risk, degree to which smallholders produce at a subsistence level, portion of land smallholders can/ do farm (e.g., some have up to 50 acres but farm only a small portion), women and youth, which comprise 30% and 37% of smallholder farmers respectively.

35. It should be noted that the programme target group is widely dispersed making it difficult to pre-identify all possible beneficiary households. This was particularly true for the Toledo District, which suffers from one of highest poverty rates in the country. Any new community added to the programme will be identified by the PMU in a manner consistent with targeting criteria upon approval from the Programme Oversight Committee (POC).

Figure 2: Direct Beneficiaries "Be-Resilient"



Programme actions to promote inclusion of Women and Youth.

36. Specific programme actions will address gender and youth inequalities, and help members of other disadvantaged/ vulnerable groups to overcome obstacles to equal access to development opportunities. Specifically, the programme will: i) ensure terms of reference for the Programme Management Unit (PMU) staff, supplier contracts, and Implementing Partner (IP) MOUs include a practical application of gender equality perspectives; ii) have meaningful participation of male and female beneficiary representative on the POC; iii) collect, assess, and report on data disaggregated by gender and age in order to meet beneficiary targets; iv) raise awareness of and provide appropriate training materials for all target beneficiary groups; v) provide community based training accessible to women and youth; and vi) ensure women and youth's participation in technical assistance (TA) and exchange visits/ study tours meet targeting goals. The programme activities will consider the needs of women (e.g., timing for farming, enterprise, domestic chores, child care provision for training activities, etc.).

37. The Matching Grants Fund (MGF) will take gender/ youth considerations into account by: i) ensuring calls for proposals explicitly invite female and youth farmers participation; ii) MGF selection criteria will include bonuses for competitive proposals made by youth, female farmers, and POs with 40% or more women membership; and, iii) business proposal demonstrating a reduction of workload for women (e.g., through proposed crop, technology, more equal distribution of domestic work amongst household members etc.) will receive bonus consideration. [36]

38. Specific attention will be paid to strengthening the low participation of women in POs. Organizational capacity-building activities will focus not only on administrative, business, and organizational skills, but on management confidence building and empowerment. Participation of women will also be promoted during the creation and strengthening of the water users' groups (WUGs). As women, constitute 30% of all smallholder farmers and are active participants in irrigation and water management schemes, their leadership, experience, and voice must be institutionalized in

[36] The social inclusion bonusing system will be defined in the final MGF selection criteria.

WUGs. Gender sensitive training and capacity building, as well as advancing women in leadership positions is critical for the success of WUGs.

39. Similarly, female participation in agriculture often has low visibility and is under-estimated as a result (even by agricultural extension workers), the MoA's staff and Climate extension agents of the PMU will receive training on gender and youth equality/ issues and on how to ensure equal participation for women and youth in extension, training, and TA. Climate extension and TA will be designed to meet the needs of men, women and youth. This is particularly important for targeted value chains where women are actively marketing produce, making their participation in market training, fairs and buyer/ seller encounters essential. New opportunities for youth and women in an agro-processing will also be continuously identified and supported.

40. IFAD has developed several Learning Routes, and participation in these as well as national and international study tours/exchange visits have been programmed for beneficiaries and the MoA's staff on Gender Equality. The MoA is one of the few ministries in Belize that has recently appointed a Gender Focal Point. The programme will support technical activities as identified by the Gender Focal Point, such as studies and workshops.

B. Development objective and impact indicators

41. The programme's Goal is to address climate change at the smallholder farm level, expanding resilient production systems and improving the livelihoods and food security of poor rural households. The programme aims to increase the economic, social, and environmental resilience of small farmers, creating the conditions for sustainable market access for their products, improving incomes and livelihoods.

42. The Development Objective is to increase and diversify agricultural production by smallholder farmers, facilitate access to commercial market chains of surplus production, while building overall resilience to climate change. In the context of smallholder agriculture in Belize, improved resilience is defined as the increasing smallholder capacity to cope with and recover from extreme climate events and ongoing changes to natural asset resources resulting from climate change. This requires improvements across the entire value chain for any given product from weaknesses in production systems, adding value to primary production, improving access to markets, and enhancing smallholder capacity to respond to market demand. The programme proposes a comprehensive approach to increasing smallholder farmer resilient through innovations in production methods, investing in climate-proof infrastructure, supporting member based POs, and improving competitive smallholder participation in local, national, and international value chains.

C. Outcomes/Components

43. The programme has two complementary components: Component 1: Climate Resilient Value Chains Development; and, Component 2: Climate Resilient Rural Infrastructural and Assets Development.

Component 1: Climate Resilient Value Chains Development

44. Designed to address the constraints and improve the profitability of the value chain, Component 1 aims to reduce financial, economic, and climate-related vulnerabilities facing small holder farmers. It will focus on strengthening smallholder membership Producer Organizations (POs), and increasing smallholder productivity and product diversification. To build climate change resilience in food production systems, the programme will support healthy food production and consumption through *inter alia* backyard gardening.[37] Through stakeholder participatory processes, the programme

[37] Backyard gardens are defined as plots of between 1/8th and 1/4th of an acre situated close to owner's home. Backyard gardens are often managed as smallholder enterprises, with product commercialization as the primary purpose. Only some produce is destined for household consumption. Climate smart backyard gardening has the potential to improve food security and strengthen beneficiary climate change resilience.

will support the development of select value chains and enhance sustainable smallholder farmer access to markets.

45. Value chain support will initially focus on the development of value chains for tomatoes, sweet peppers, hot peppers, cabbages, carrots, onions, pineapples, and beekeeping.[38] These products were selected from an initial set of over twenty identified by the GoB and community stakeholders. Three criteria were used to prioritize the selection: i) availability of market opportunities; ii) potential for smallholder farmer participation; and, iii) potential to increase smallholder profitability through improved productivity, quality, diversification, and market access. Up to five priority commodities per priority area can be selected, and the programme will support a maximum of two commodities per PO.

46. Component 1 has three subcomponents: i) infrastructure and production plans (IPPs); ii) strengthening of producers' organisations (POs); and iii) market-oriented value chains development.

Subcomponent 1.1: Infrastructure and Production Plans (IPP)

47. This subcomponent aims to generate information and analysis required for comprehensive and participatory value chain planning *via* the development of Climate Vulnerability Assessments, and Value Chains Analysis and Market Assessments. The assessments are complementary and provide a foundation for the elaboration of the IPPs (which also provide critical input to public infrastructure investment planning and development in Component 2).

48. **Climate Vulnerability Assessment (CVAs):** A detailed assessment of smallholder vulnerability to climate change will be conducted in each priority areas to define the risks posed by climate change and identify measures for resilience adaptation (other areas will be assessed if added to the programme). This will require both a macro top-down and micro bottom-up assessments. The former will focus primarily on biophysical impacts of climate change, and less on why, which, and how smallholder farmers are affected. The latter assessment will focus on the vulnerability of different social groups. It will consider the multifaceted nature of vulnerability, taking into consideration existing conditions of rural development and the interrelated socioeconomic and biophysical impacts of climate change. CVAs will enable the PMU (and other decision-makers) to identify the most vulnerable communities, sectors, value chains, and social groups, as well as appropriate mitigation interventions.

49. A specialised international institution, along with the programme Climate Specialist will conduct an evidence based assessment of the relationship between climate and biophysical processes. This top-down assessment will be complemented by a self-assessment in each priority area to identify local climatic impacts/ threats, and related levels exposure and communities/ smallholder capacity to respond. Participatory rural appraisal tools will used to include the different voices, perceptions, and experiences of impacted stakeholders. Together, the study and self-assessment will show common and variable vulnerabilities to climate change between priority areas, value chains, producer groups, and social groups, identifying key constraints and response priorities. Analysis will also evaluate social, economic, and environmental factors across three core areas: i) exposure to climate-related natural disasters and rising sea-levels; ii) human sensitivity to change (e.g., population patterns, natural resources, agricultural dependency, and conflicts etc.); and, iii) future vulnerability (e.g., adaptive capacity of infrastructure, social organization, agro-ecological characteristics etc.). The CVA will translate findings into programme guidelines for prioritizing agro-ecosystems – value chain and infrastructure climate change adaptation implementation strategies.

50. **Value Chain and Market Assessment (VCMA)*:*** VCMAs will define the commercial structure of select value chains, identifying strengths and constraints for profitable smallholder participation in the priority areas. Assessments will provide information *inter alia* on key actors (e.g., producers, transporters, packers, processors, traders, retailers, and end consumers), product seasonality, supply, demand, and price trends. It will identify strengths, weaknesses, opportunities, and threats chain development to both smallholder and other stakeholders, informing the programme on how best to

[38] The focus of this value chain will be honey, but may also include production of complementary products such as propolis and pollen. Livestock will be considered for inclusion during the startup phase of the programme.

improve the sustainable and profitable participation of smallholder farmers, women, and youth across the value chain.

51. The specific objective of VCMAs to provide evidence-based guidance for activity design, business plan development, and public infrastructure planning/ construction. To do this, VCMAs will: i) review existing value chain analyses and market assessments; ii) develop a methodology for primary and baseline data collection (e.g., market survey, market stakeholder and key informant interviews etc.); iii) plan and conduct analysis of applicable local, regional national/ international markets; and, iv) provide reports detailing viable, timely, and sustainable intervention recommendations. Data collected for value-chain assessments will be used in end-market studies employing a USAID methodology designed for assessing demand and processing for high-end markets segments. The study will be carried out by consultants, and provide a roadmap for programme implementation.

52. **Infrastructure and Production Plans (IPP)** The CVAs and the VCMAs will provide input to the creation of priority area **Infrastructure and Production Plans** (IPPs). These master plans will identify: i) climate change adaptation capacity strengthening and climate resilient needs/ plans; ii) infrastructure investments essential for CCA and disaster risk management (public and private); and; iii) value chains market opportunities, including locally appropriate on-farm production infrastructure for sustainable CCA. IPPs will describe socio-ecological and agricultural practices best suited for smallholder farmers (individually or collectively. This will help POs identify their own strengths and weaknesses, and related CCA production enhancement needs.

53. IPPs will provide a basis for the development of PO Business Plans (BPs) which have the objective of increasing climate resilience at the community and farm level. IPPs will also form the basis for Public Investment Plan (PIPs) which will identified and align public infrastructure needs with priority area IPPs.

Subcomponent 1.2: Strengthening of Producers' Organizations

54. Potential to improve the economic welfare and opportunities for poor smallholder farmers relies largely on production improvements, increased product value, improved market access, and stronger representation/ bargaining power within the value chains. These improvements require investments in human and social capital and "know-how" in *inter alia* production and post-production techniques finance, accounting, governance, and basic knowledge of legal contracts, negotiation, and market trends. Most farmers and POs in priority areas generally lack these capacities, resulting in a reliance on unprocessed and undifferentiated low-price sale of products. At present, some 20 POs (formal and informal) in various state of development have been identified in the five priority areas. Another ten POs with development potential will identified during year one of implementation for integration into the programme (either individually or via merger with existing PPs).

55. **Capacity building for producers' organizations:** An organizational development plan (ODP) for each PO will be developed in the first year of implementation, once capacity building and training needs are identified. IPPs will provide a general framework and some input to the development of ODPs. Assessment of PO organizational, administrative, and managerial capacities will be undertaken out by the PMU. Based on the combined training needs of POs, a common capacity-building programme will be developed by the PMU, which will be first tested on the most advanced POs, who will also serve as "role models" for least developed POs. With the support of the PMU, POs will prepare business plans (BPs) which will include programme TA support. BPs will also form the basis for PO MGF funding applications.

56. The PO capacity-building activities will be implemented in years two and three of the programme, and will provide theoretical and practical training for management committees (MC) members and regular PO members. It will include: i) a review organizational by-laws and governance procedures; ii) strengthening organizational and administrative capacity; iii) leadership training; iv) membership recruitment/ development execution; v) member service development support (for *inter alia* key commodities and relevant value chains); vi) revenue generation planning for organization sustainability; vii) development of simple ODPs; and, viii) facilitating exchange visits (national and international). Capacity building will emphasize integration of women and youth as MC members, and

preparation as future leaders. Capacity building activities will borrow relevant materials from the MoA and Department of Cooperatives (CDs).[39] It will be provided by the PMU's Rural Organisation Development Specialist with the support of two contract consultants. The team will work also closely with the DC to strengthen their capacities and to create synergy with other DC activities. Altogether, 450 men and women PO members will receive capacity-building training.

57. In year three of the programme, a pilot Local Managers programme will be implemented in ten POs with good organizational skill, membership services, and membership growth. The pilot will have two components: i) support to prepare young local men and women to become PO managers; and, ii) provision of basic office equipment (e.g., computer, furniture and materials for record keeping). Training would be intensive (approximately six months), taking place in Belize City or Belmopan. It would include a full range of management skills (e.g., operational, administration, accounting, membership areas, personal development, public speaking, and organisational representation). Once Local Managers start working in the POs, the PMU's Rural Organisation Development Specialist will provide ongoing mentorship and technical support, both to the Youth Managers and MC members overseeing PO operations. The Local Managers will report to PO MCs, and the programme will pay a small monthly stipend during training and for two years after training, after which POs will pay salaries.

58. It is important to note that in year two of the programme, POs will be eligible to apply for MGF to fund activities/ infrastructure supporting member producers' economic interests (e.g., production innovation, product collection, storage, input supply etc.).[40]

Subcomponent 1.3: Market-Oriented Value Chains Development

59. This subcomponent has three activities: i) Development of value chain Business Plans (BPs); ii) a Matching Grant Fund (MGF); and iii) Market support assistance. The activities are sequential and interlinked, providing inputs for investment decisions under the MGF, as well as for public infrastructure investments.

60. **Development of value chain BPs**: The elaboration and implementation of BPs for the formal and informal POs will be guided by the seven principles.

- **Business and market driven:** BPs will present promising, market-driven business opportunities, responding to investment needs and opportunities identified in value chains/ market assessments.
- **Climate Resilient:** PO BPs will develop clear linkages to IPP vulnerability assessments, incorporating climate resilient practices and technologies. Proposed community infrastructure will be climate proof in both design and construction.
- **Transparency:** PO BP plans will be developed in transparent manner. All eligible and interested applicants, as well as the public in the priority areas will be informed of call for proposals invitations and status. The same transparency will be provided to all interested enterprises operating in the food sector in the selected priority areas/ value chains.
- **Value Chain approach:** Value chain development proposals should consider strategic points of intervention with an end-market focus. Production expansion alone will not be supported.
- **Innovation:** PO proposals should feature organizational and/ or technical innovations, marketing, new products, and/ or responsiveness to emerging consumer trends.
- **Economic efficiency and financial viability:** Programme funding will have financial and economic viability, and support programme poverty reduction objectives.
- **Poverty Focus:** Programme-supported investments must involve meaningful participation of poor smallholder farmers. This include giving farmers a role in POs management and

[39] The DC has a training program with manuals that include: Module 1: Financial Literacy and Organizational Development; Module 2: What is a Co-operative?; Module 3: Co-operative Operation and Management; Module 4: Co-operative Finance and Accounting Procedures; Module 5: Marketing Co-operative; Module 6: Entrepreneurial Development.
[40] Note: POs may offer servicers and support to non-members as means to generate income.

investment decision-making, and receiving a fair share of resulting programme support benefits.

61. BPs will include basic PO and member information, level of PO organization, a diagnosis and proposed means to take advantage of a market opportunity, and an assessment of climate change related risks, expected results and benefits, the role of beneficiaries, and required technical assistance. Plans will include a budget, counterpart funding (own or loan funding), and project timeline (a detail plan format will be developed in the PIM). TA will be provided by the PMU and MoA, and will help POs identify and elaborate investments. The PMU will source specialized knowledge/ skills as required for promising proposals. TA required for the BP implementation will be financed as a part of BP plans.

62. Backyard gardens (BYGs) are also a part of this sub-component. When principles of climate resilient agriculture are applied, BYGs have the potential to improve food security and income/ expense savings, increasing smallholder household climate resilience. The MGF (see below) will support groups of individuals from the same priority areas to invest in their individual BYGs. Collective application will foster cooperative activities and decrease MGF administrative burdens. The programme Climate Resilient technical staff, in coordination with the agricultural extension service of the MoA will provide support to BYG activities.

63. **Matching Grant Fund (MGF):** Investments in resilient production and value chain development will be co-financed by the POs and the MGF for a total of US$ 5.48 million. The MGF will support investments that:

- improve agricultural production and safeguard food security in the context of existing and projected climate change effects;
- increase production and improve product quality;
- increase value-chain climate resilience, and market access opportunities; and
- develop value chain value addition opportunities (e.g., sorting, selection, packaging and labelling of products or the processing of raw material) benefiting the target market and POs.

64. The MGF will invest US$5.3 million, with approximately US$4.44 million targeting POs and individuals with backyard gardens, and will devote US$0.86 million to PO BP TA. The MGF will be a competitive fund open to formal and informal POs. Target beneficiaries, receiving support from the programme in other technical areas will also be eligible. MGF implementation details are presented in Appendix 4, including more specific eligibility criteria for the different investment categories to be defined in the final PIM. Preliminary investment categories include: i) climate resilient technologies and practices (i.e., solar panels, solar pumps or equipment, soil testing, water harvesting, agroforestry, tree nurseries); ii) climate resilient greenhouses and equipment; iii) climate proof storage, sorting, and packaging facilities; iv) irrigation (e.g., boring of wells and/or installation of on farm irrigation connecting to public water systems); v) drainage systems; vi) beekeeping equipment; vii) climate proof agro-processing facilities and equipment; and viii) backyard gardens. The MGF will not finance purchase or lease of land, debt payment or refinancing, or activities harmful to the environment or communities.

65. The MGF will have three financing windows: i) BPs presented by formal POs; ii) BPs presented by informal POs; and, iii) proposals for establishing/ improving backyard gardens (presented by individuals and informal groups of beneficiaries). Proposals from larger, formal POs will typically involve more than one investment, and tranche funding, based on completion of staged investments/ activities will be considered.[41] Smaller and informal PO BPs are expected to be simple, though may also have staged financing requirements. All BPs must describe required TA required for BP implementation (e.g., climate resilient production practices training, market access training, buyers

[41] Larger investments will likely require financing of separate but integrated activities within a value chain. That is, and for example, climate resilient technologies and irrigation in fruit production and related market access investments in solar panels for fruit drying, and product packaging facilities.

and producers meeting facilitation, etc). Smaller and informal BPs will require PMU approval only, while lager BPs will require approval of the POC.

66. Informal groups of beneficiaries will present backyard garden proposals, with each beneficiary responsible for his/ her backyard.[42] This window will have a simple application form appropriate for local educational levels. It will describe enterprise objectives, activities, participants, costs, and benefits. Priority beneficiaries will be female-headed households and, in order of priority, the extreme poor, poor and vulnerable households. Eligible proposals will be presented by POs with at least 80% of members belonging to the programme target group. Proposals will demonstrate technical soundness, respond to the identified investment categories, and comply with required beneficiary counterpart financing.

67. PO MGF applications will require 15% co- financing through an anticipated combination of in-kind and in-cash contributions.[43] Applicants can use their own funds or proceeds from a loan (e.g., from a Credit Union - CU).[44] The programme may work with and/or support CU lending for POs, for whereas they will have the experience/ probable willingness to fund individual smallholder, they do not have sufficient experience lending to PO type organizations (with limited assets and poor income streams). It is anticipated that CUs would consider lending to individual PO member aggregating funds for PO project with 85% MGF project finance. This may require PMU support to organize to achieve efficiencies of scale for the CUs. It should be noted that informal POs will not be able to access CU financing. Finally, backyard garden proposals will not require counterpart funding.

68. There will be two Calls for Proposals in the first years of Programme implementation, one for BPs (windows 1 and 2) and another for backyard gardens (window 3). The Climate Vulnerability Assessment and Value Chains Analysis and Market Assessments, and the IPPs for each priority area will provide guidance for application requirements found in MGF Call for Proposals. The PMU will start the MGF process by inviting POs and their members in priority areas to present “ideas” via radio and social media. Personnel from Village Councils, NGOs, Tourism Associations, MoA, Ministry of Rural Development (MRD) and others GOB departments would be asked to share information. Backyard garden proposals can made directly upon the opening of the MGF.

69. An *ad hoc* Technical Evaluation Committee (TEC) with representatives from the PMU, the MoA, the MRD, the Credit Unions (CUs),[45] the National Climate Change Office (NCCO), and other stakeholders will review ideas and make an initial selection according to predefined criteria.[46] Approved ideas will be categorized by investment type, and proposing groups will PMU technical staff support (and/ or specialized technical assistance procured by the PMU) to produce a full BP. Full operational details and requirements will be defined in the PIM. The final selection of financing will be competitive, and proposals will be ranked according to: i) climate change resilience; ii) anticipated sustainable economic and social benefits to PO members; and, iii) level of youth and female PO member organizational/plan participation. The TEC will review completed BPs, and may reject, approve, request additional information, or recommend improvements to proposals.

70. The PMU will support as efficient an approval and disbursement as prudential, transparent and accountable decision-making allows. It is estimated 30 formal POs will implement large-scale BPs and 20 informal POs will implement smaller BPs, benefitting in total approximately 900 households. Two thousand households would improve or establish backyard gardens.

71. **Market Support Assistance**: This activity will support PO climate resilient market development activities and is divided into four interventions:

[42] Proposals for backyard gardens’ will come from groups to avoid burdening the PMU with administrative processing, but implementation will take place on individual plots.
[43] Counterpart funding will be differentiated by investment category (to be defined in the PIM).
[44] Some CUs, especially those strengthened under the BRFP, have provided individual smallholder loans, and, in exceptional cases loans to POs. Some CUs also provide loan application and financial literacy training. The PMU would liaise with any CU concerning those POs that require this type of support.
[45] Many CUs will have had support from the closed BRFP and will have a good understanding of smallholder credit needs.
[46] The TEC will source technical support for proposals as required.

72. *Technical Assistance for Climate Resilient Production Planning*: TA will be provided for the introduction of new climate resilient production technologies that can: i) reduce water consumption and increasing resilience to droughts; ii) reduce erosion and decreasing use of external inputs (e.g., fertilizers); iii) increase fertility through minimum/no chemical fertilizers use; iv) increase soil water infiltration to reduce potential flooding; v) improve pest control and water contamination by limiting chemical pesticide and herbicide use; vi) increase carbon sequestration; and, vii) reduce external inputs to save energy, minimizing emissions, and production lower costs). Possible technologies include: crop rotation, integrated crop-livestock fertility, soil cover, polyculture systems, green manure and legumes fertilization, agro-forestry, contours planting, riparian planting and implementing community seedbanks. As significant physical crop and economic losses are directly related to unplanned, uninformed, and uncoordinated small farmers production systems, the programme would provide market driven crop planning tools. Crop planning processes will be implemented with support from a Value Chain Specialist, who will train farmers to coordinate and plan production based on market requirements.

73. *Technical Assistance on Marketing:* Promotion and support for agricultural product marketing will include *inter alia*: i) promoting farming as a business; ii) basic marketing skills and good marketing practices; iii) market trends analysis (particularly for high-end markets); and, iv) access to and use of appropriate market information technologies. The MoA's agricultural market price information system and the BMDC's role in providing wholesale and retail market prices will be improved to provide updated and regular information for farmers. TA will be provided to the BMDC and the Bureau of Standards (BoS) to strengthen their roles in product quality assurance, particularly for the high-end and processing markets. It will also be provided to the BMDC and Bos, as well as to producers and value chain actors on post-harvest activities (sorting, packaging and storage) and agro-processing (food preservation through dried fruits principally).

74. *Development of Partnerships and Market Linkages:* The development and implementation of post-harvest and agro-processing facilities will be supported through the MGF with the objective of assisting POs in the development of product value-added activities (e.g., collection, sorting, grading, storing, processing, transporting and marketing).[47] The programme will complement and strengthen/ establish linkages between PO/smallholder and key buyers in select value chains (e.g., hotels and restaurants in high-end markets and processors in industrial markets). There are a variety of market-based partnership models which can be pursued depending on the nature of each select value chain. Interventions would have, however, several common features including: i) meeting buyer market requirements; ii) product economies of scale for transaction cost reductions, investment, maintenance, compliance and enforcement etc.; and, iii) client service orientation. Building public-private-producer partnerships (PPPPs) with private entities and the MoA may also be required to enhance smallholder farmer benefits.

75. Meetings will be organized by the PMU, MoA and BMDC between buyers and sellers to establish direct contacts and share information, facilitate PO/smallholder confidence building, and to display products for sale. The programme will foster linkages using the farmers' markets in one or two locations (e.g., Belmopan and Belize City). The MoA and BMDC roles as neutral stakeholders will require some form of continued through the life of the programme and beyond.

76. **Establishment of Intermediate Markets:** A large portion of demand for food in Belize is met with imports and contraband products. High-end market buyer stakeholder dialogue suggests two smallholder farmer markets in Belize City, one in San Pedro and another in Caye Caulker would be viable and desirable. Farmer markets will feature groups of smallholder farmers selling directly to both

[47] Belize City offers the largest market for agricultural products in the country, and has a confluence of institutional and individual buyers such as hotels, restaurants, supermarkets, and food services that together comprise a wholesale market for large quantities of agricultural products. The Belize District also has the towns of San Pedro, Caye Caulker and Ambergris Caye, the main tourist destinations with high-end markets with strong demand for quality vegetables and fruits. These markets require more value-added functions in the product supply chain (e.g., sorting, packaging and/or processing). There is also a large urban retail food market in Belize City that demands a regular supply of high quality products. Together, the two provide a significant market opportunity for agricultural producers, particularly small farmers in nearby and outlying districts.

higher end wholesale and retail clients. Modest market infrastructure investments (along with value chain development and rural infrastructure investments) would allow POs/ smallholders to competitively sell larger volumes of produce over a longer time to high-end market buyers.

77. **Strengthening the MoA:** Actions to be taken to support small farmers' value chain participation and markets access development would include the strengthening of MoA's communication with POs and smallholders, and its capacity to coordinate, regulate, and enforce agriculture and food import policy.

78. Component 1 has a total cost estimated of US$7.9 million. The total allocated funds are US$3.2 million from IFAD loan (40%), US$3.6 million from Green Climate Fund (GCF) grant fund (45%), and US$0.46 million GoB (6%) contribution and beneficiaries US$0.8 (15% of MGF).

Outcomes

79. The programme will reach a total of 6,000 households, or 30,000 persons. The number of people with strengthened resilience would be 24,000 (80% of all persons reached).

80. Outcomes targeted under Component 1 is target beneficiaries to produce and market larger and more reliable supply of agricultural products via climate-resilient practices. Key results include:

- 60% of communities will be incorporated into the programme, and 40% will be able to produce and market incremental volumes of agricultural products and to adopt climate-resilient practices.
- At least 30 formal and informal POs will be strengthened, benefitting at least 4500 members, through improvement in their by-laws and in organizational and administrative skills. They will be able to increase their membership and generate revenues for their financial sustainability.
- Approximately 2,000 farmers will be trained in climate resilient agricultural technologies and practices for application to their production and marketing systems.
- Investments will be made in the rehabilitation/construction of approximately 300 structures (covered structures, storage facilities, etc.) and other climate resilient technologies and infrastructure
- Approximately 400 hectares of land will be brought under climate resilient management, benefiting from improved drainage and irrigation infrastructures, including about 240 ha under the newly developed public systems.
- At least 700 small farmers will build their entrepreneurial skills with training in business management and marketing.

81. More than 2,000 households, or approximately 9,300 poor and vulnerable rural men and women will benefit from Component 1 activities. Component 1 has a total estimated cost of US$8.0 million.

Component 2: Climate Resilient Rural Infrastructure and Assets Development (CRRIA)

82. The CRRIA will support Component 1 by providing drainage and irrigation infrastructure required to increase in agricultural productivity/ efficiency and though road construction support improved market. Infrastructure and Production Plans (IPP, see ¶ 53) will help *inter alia* identify infrastructure public good investments supporting POs and smallholder farmers and CCA/ disaster risk management.

83. This component will be undertaken in close partnership with programme area communities, POs, smallholder farmer beneficiaries, and other relevant stakeholders. The main selection criteria for infrastructure projects will be notable public benefits, climate adaptation potential, and enhancement of agribusiness and rural enterprise (e.g., supporting programmes selected for support under Component 1). Funds will be allocated through a participatory, demand-driven decision-making mechanism supported by a selection/ ranking procedure. The main infrastructure projects eligible for funding include local or feeder roads, and private/ public small-scale irrigation and drainage systems. The CRRIA component has three sub-components.

Sub-component 2.1: Investment in Rural Roads Improvements (RRI):

84. This subcomponent will focus investments on priority areas rural roads considered most vulnerable to climate change and to supporting component one investments and or goals. (e.g., assuring adequate year-around access to the programme-supported value chains/ commodity production investments). Improved roads will mostly be of the "last miles" of local or uncategorised feeder types. To ensure climate resilience of rehabilitated roads, eligible investments will also include road ancillaries (e.g., small bridges, drainage facilities, culverts, retaining walls, erosion protection etc.).

85. **Sub-component 2.2: Investment in Small-scale Irrigation and Drainage (SSID)**: Investments for this sub-component will support climate resilience and the objectives of Component 1. They will focus on small-scale irrigation and drainage systems, including intake structures (e.g., pumping station, rain harvesting ponds etc.), main and secondary distribution networks (e.g., open channels or polyethylene pipelines etc.), drainage networks, and flood protection structures. On-farm irrigation/ drainage systems connecting to main or secondary networks (e.g., drip, sprinkler, gravity ditches, or open field drains) will be funded by beneficiaries and/ or through the programme MGF. The project expects to reach 240 ha with public irrigation systems, most of which will be complemented by beneficiary farm irrigation/ drainage systems.

86. Provisions will be made for the development of institutional small-scale irrigation and drainage systems management, operation, and maintenance (MOM). This will include: i) international technical assistance in capacity building to the National Integrated Water Resource Authority (NIWRA); and ii) establishment and development of water user associations (WUAs) MOM of small-scale public irrigation and drainage systems. Support will include, but not limited to, irrigated agriculture, crop-water requirements, irrigation scheduling, MOM of irrigation and drainage networks, capacity building. It will also include support for water user groups (WUGs) capacity development to set and apply irrigation/ drainage service fees systems. Provision will be made for procurement of hydro/ agro-meteorological stations and other equipment required for irrigation application identified during programme implementation to support small-scale irrigation and drainage investment sustainability.

87. The main criteria for investment decisions include: i) verified climate change vulnerability; ii) links to support commodity/ value chain developments supported under Component 1; iii) common public infrastructure use; iv) technical feasibility; v) contribution by Government; vi) number of individuals assisted per US$1,000 of investment; vii) sound and plausible MOM procedures; and, viii) consistency with nationally applicable regulations on environmental impact.

Sub-component 2.3: Climate Information System

88. The sub-component will focus on the creation of the Climate Information System (CIS) that will become the principal mechanism through which information about climate is archived, analysed, modelled, exchanged, and processed. The CIS objective is to provide farmers with timely and accurate climate information, allowing them to plan production and minimize climate related losses. The CIS will authenticate and communicate all information regarding climate at a national level. Its functions will include: climate analysis and monitoring, data assessment and attribution, climate prediction (monthly, seasonal, and decadal) and projection (centennial scale). TV and radio broadcasting will be the primary means of dissemination, although cellular services may be considered.

89. The CRRIA component total cost is estimated at US$8.0 million. The total includes US$4.4 million for the RRI sub-component and US$3.6 million for the SSID sub-component. Besides investment in infrastructure, there is US$0.7 million for the development of engineering designs (6% of investment costs), independent review and environmental assessment of technical designs (1% of investment cost), and supervision of works (3% of investment cost). US$0.3 million is allocated for irrigation and drainage systems institutional development. The total allocated funds are US$2.9 million from IFAD loan (36%), US$3.5 million from Green Climate Fund (GCF) grant fund (44%), and US$1.6 million GoB contribution including 12.5% General Sales Tax (GST, currently levied at the rate of 20%). GCF grant funds will be used for 30% of works under the RRI sub-component and 80% of the SSID sub-component that are estimated for investments in improved climate change resilience.

90. Based on a review of recently completed construction projects implemented by the Ministry of Works, MNR, MRD funded by international donors, the indicative cost for improvement/ upgrading of 16-19-foot-wide stabilized gravel roadway with 1.6 foot-wide shoulders including drainage structures is between US$60,000 - 120,000 per mile (depending on status of the road, old pavement, and complexity of drainage). An average cost of US$80,000 per mile is a conservative estimate, with an average length of road of about 2 to 3 miles. Estimated investments for public intake structures, main and secondary canal/ pipe network for small-scale irrigation and drainage vary between US$2,000 - US$7,000 per acre depending on the type of system (gravity or pumped). An average cost of US$5,000 per acre for public small-scale irrigation and drainage is assumed. Improvement of on-farm system will be financed by beneficiaries from their own resources and/ or via the MGF under Component 1. The cost of engineering design and works supervision will be 5-7% and 2-3%, respectively of the cost of construction. An additional 1% of construction cost is allocated for independent design review and environmental and social assessment (environmental clearance) of technical designs.[48]

91. Anticipated outputs from this component are: i) 17 roads with a total extension of about 50 miles; ii) ten small-scale irrigation and/ or drainage systems supplying water to 240 ha of farmland; iii) a national-level CIS; and iv) 10 WUGs/WUAs formed. It is estimated that CRRIA investments would initially reach a total of about 750 rural households in the five priority areas, and an undefined number of households in to be defined non-priority areas.

92. Besides reducing overall risk from projected climate change vulnerability, improvements of the rural roads infrastructure will benefit households by supporting production increases, cutting transport cost, reducing output losses, and establishing market linkages. Irrigation during the dry season and drainage facilities in the wet season will support sustainable and efficient natural resources management (water and soil) and increased secure and quality agriculture production, including increased crop intensity. The construction of works will provide temporary employment for unskilled labour from the communities (a reported 15% of the cost of contracted works are used for construction related employment as a rule and contractors use local labour). The CIS will be a national-level public service providing farmers accurate and practical agricultural weather reports and forecasts, allowing them to anticipate potential seasonal disruptions helping them to prevent potential crop losses.

Outcomes

93. The Outcome targeted under Component 2 is that climate resilient public infrastructure and services support production and access to markets for targeted beneficiaries. Key results include:

- Smallholder production vulnerability will be reduced, and the anticipated impacts of climate variability strengthened in the five priority area communities. The quality of life and the efficiency of livestock/ agricultural production will be improved in these communities;
- Approximately ten community-level WUAs/ WUGs will be formed with the participation of men and women trained for irrigation and drainage systems management, operation, and maintenance;
- Approximately 400 rural households (2,000 people) will directly benefit from improved road infrastructure; and
- Approximately 350 rural households (1,750 people) will have reliable irrigation water supply and adequate drainage networks.

94. The total number of households benefitting from the CRRIA component will be 750 rural households (3,700 poor and vulnerable rural men and women).

[48] Figures are indicative only, based on estimated costs of rural infrastructure construction. There will be no pre-defined allocation for different types of infrastructure within each group, nor will the number of communities to be financed in each priority area be pre-determined. The infrastructure investment proposals ranking criteria will ensure that funds are allocated where the goal is best achieved of addressing climate change vulnerability and improving livelihoods and economic growth in disadvantaged targeted rural communities. The cost civil works includes GST.

Cross Cutting Activities

95. Supporting smallholder farmers and POs value chain developments and infrastructure investments requires supporting activities which cut-across component activities. Three main such activities proposed:

96. **Policy Engagement/Consultation:** The programme will fund public consultation involving a broad set of stakeholders (programme beneficiaries, POs, the private and public sectors, etc.) focused on policy and regulatory barriers to value chain development. The most notable challenges are those related to import tariffs and permits, food production quotas, and out-dated laws and regulations (e.g., cooperatives laws). Discussions would likely result in research commissioned on targeted policy/regulatory issues/ themes, or the strengthening relationships/ coordination among public and private institutions on specific challenges (e.g., updating and management/ enforcement of agricultural import laws and regulations).[49]

97. **Research and Development.** The programme will complement MoA research activities by undertaking targeted sustainable smallholder climate-change resilience production and market access research (e.g., extension-farmer linkages fostering access to locally-validated productivity and resilience enhancing agricultural technologies). Specific planned activities/ studies include:

- **Adaptation Strategies:** Support for the University of Belize's Faculty of Agriculture to conduct applied research on adaptation strategies and climate resilient practices (e.g., diversified production systems, agroforestry, protein banks windbreaks etc.);

- **Index-based insurance**: The CDB and CCRIF recently launched the "Integrated Sovereign Risk Management in the Caribbean" Project. The project includes a Disaster Recovery Fund for Caribbean countries, but has not yet defined a mechanism allowing smallholder farmers to access the fund. The proposed study will assess mechanisms to provide Belizean smallholders to climate disaster insurance, allowing them to make production investments with greater financial security. Potential mechanisms include index-based or conventional indemnity insurance.

- **Ecosystem Services Payments:** This study will assess the feasibility of using ecosystems payment services to stimulate maintenance and restoration of local ecologies (e.g., native forests) which provide essential environmental services, but income to landowners.

- **Smallholder Cane Farmer Production Diversification:** Many small "out-growers" in the Corozal District provide Tower Hill refinery cane using low-input, low-output, marginally profitable production systems. The end of preferred access to EU sugar markets for Belize will further depress smallholder incomes. The programme will support smallholder participatory research to explore potential diversification from cane. The study could lead to the inclusion of communities in the Corozal District into the programme.

98. **Public Authorities Capacity Building.** The MoA will play a central role supporting programme implementation. Institutional strengthening of its capacity to provide technical services to smallholder farmers, both for programme implementation and in the future, is essential. Within the MoA strengthen the Departments of Extension (DE), the Department of Cooperatives (DC), and the Belize Marketing and Development Corporation (BMDC) is equally important.

99. The DE has a presence in all Districts and has the responsibility of executing MoA operational activities at the local level. Intensive training/ capacity building of its personnel is planned for a range of strategic topics (e.g., climate change and resilient production practices and technologies; value chain development; marketing information communication/ management; rural organization

[49] As regards legal imports, POs agreements with MoA (borders closed when there is sufficient local production) will need to be replicated and fully complied with in a timely manner. To this effect, MoA will be sensitized to the damage caused by non-timely enforcement of protocols, and support will be provided for their efficient implementation.

management/ business development; social inclusion; development communications audio-visual training materials). The programme will employ six climate resilient agriculture specialists who will work with MoA extensions agents to provide services to target programme beneficiaries.

100. The DC has regulatory oversight of all non-financial co-operative enterprises including *inter alia* registration, management training, supervision and audit functions, and member enterprise development. The DC suffers from weak/ antiquated legislation and low staff capacity which limits its outreach effectiveness. The programme will work to strengthen the DC's capacities through staff training and capacity-building, resilient agriculture, social inclusion (gender and youth particularly) and value chain development.

101. Working closely with DE and the DC, a Rural Organisation Development Specialist of the PMU, along with two contract specialists, will develop and execute a technical assistance plan to strengthen MoA capacities and improve intra Ministerial/ departmental cooperation and collaboration. The plan will incorporate aspects of IFAD Learning Routes, and offer national and international study tours/exchange visits. As the MoA is one of a few ministries in the GoB with a Gender Focal Point, the programme will also support activities designed/ led by the Gender Focal Point (e.g., research, workshops, etc).

D. Lessons learned and adherence to IFAD policies

102. IFAD has financed three projects in Belize, most recently the Belize Rural Finance Programme (BRFP) which focused on rural finance, and did not directly support agricultural value chains or rural infrastructure.[50] Consequently, the extent to which programmatic lessons learned from BRFP are limited but three stand out. The BRFP Programme Completion Report cited the effectiveness of stakeholder driven financial system development leading to notable benefits to the rural poor, while increasing programmatic effectiveness/ efficiency. This led design of the propose programme to include the interests of the GCF and GoB as co-financiers, FAO and CDB as *inter alia* source of knowledge and experience, and smallholder POs as stakeholders.

103. A second key lesson from the BRFP and other previous IFAD projects, is the need for effective programme start up management. Specific considerations include: i) intense and well-structured programme start-up support; ii) early development and operationalise of programme monitoring and evaluation system; and, iii) clear definition, communication, and management of programme stakeholder expectations.

104. Finally, the BRFP also highlighted the potential effectiveness of Public-Private Partnership (PPP) models. BRFP worked primarily with private financial institutions (principally financial cooperatives) as a means to expand financial services to the rural poor. While the GoB played a vital role overseeing implementation, the programme was largely private sector driven. The experience is relevant to the proposed value chain development as the private sector will inevitably be involved. The BRFP's PPP experience is both instructive and precedential in this regard, even as public institutional support remains critical to Be-Resilient.[51]

105. Several lessons learnt from similar non-IFAD programme/project and interventions in Belize and lesson from similar IFAD programmes in other countries, also provide instructive lessons for the current proposal.

[50] Programmes funded by IFAD since 1986 include: the Toledo Small Farmer Development (TSFD) Project (1986-1995); the Community Initiated Agricultural and Resource Management (CARD) Project (1999-2005); and the Belize Rural Finance Programme (BRFP), a seven-year national programme that was completed in September 2016. The BRFP was approved in 2008 for US$6.04 million including US$3 million IFAD financing, co-financing by the Central American Bank for Economic Integration (CABEI) and the GoB.

[51] Strategies place emphasis on developing PPP models focused on external markets as the driver for expanding the agriculture sector. While this strategy remains important, the NAFP indicates that local markets are not sufficiently exploited, and emphasizes the need for effective PPP value chain development models involving smallholder farmers, as a means to improve local and foreign market access to smallholders.

106. **Gender Issues:** Targeted gender initiatives integrated throughout programme activities and management early in the programme will both set the pace and expectation for meeting equitable gender outcomes. Clear and consistent gender targets/ indicators in the Logical Framework provide an indispensable management and accountability mechanism in this regard.

107. **Value Chain/ Production Issues**:[52] Adoption of productivity and value chain enhancing innovations is more rapid and effective when introduced into clusters/ geographic concentrations of farmers, value added enterprises, input and service suppliers, and public infrastructure. Developing and adapting innovation is central to food security and to increasing quality food production on a competitive commercial basis in Belize. Similarly, and related, value chain organization and technological innovation supporting smallholder farmer-led productivity growth is vital to sustainable programmatic outcomes. Finally, maximizing target beneficiary impact of small-scale rural infrastructure development requires close synchronization with other programme interventions (e.g., productivity gains – see ¶110 for more details).

108. **Stakeholder Participation:** Experience shows integrated and meaningful community stakeholder involvement in and access to national programmes (e.g., decision-making, local capacity building etc.) lead to ongoing investments and greater programmatic outcome sustainability.

109. **Infrastructure**: To date, the great need for rural infrastructure development has not been substantially addressed by a development programme in Belize. An important lesson learned from non-rural infrastructure programmes in the country and consistent IFAD experience in other countries, is that public infrastructure investments can leverage substantial private and public co-financing, building robust public private producer partnerships in the process. Other lessons learned include: i) the need to demonstrate replicable mechanisms for climate change adaptation, infrastructure, and environment-related investment to support commercial businesses in programme areas; ii) the need to clearly and transparently specify consistently applied investment selection criteria; iii) when beneficiaries articulate their needs, sustainability and relevance is improved; iv) support based on demand-driven investment opportunities available to farmers, POs, and private sector services is often effective: and, v) the principle of cost sharing (by government, POs, farmers etc.), adoption of climate change adaptation mechanisms, and market pricing for all investments should be accepted.

Adherence to IFAD Policies

110. Belize does not have a Results-Based Country Strategic Opportunities Programme (RB-COSOP) because the 2016-2018 Performance Based Allocation system (PBAS) is only US$4.98 million. A Country Strategy Note (CSN), prepared and approved in March 2017, however, describes how IFAD will align programmes with GoB's priorities, and how they complement activities and plans of other donors and development actors active in the country (IDB, EU, UNDP, CDB, etc.).

111. The proposed programme is well-aligned with the two strategic objectives (SOs) of the CSN: SO1 - build, rehabilitate and maintain climate resilient rural infrastructure to enhance productive and marketing activities of the target population; and, SO2 - create small farmers' capacities to work with market-driven and climate change-adaptive farming practices and technology.

112. Programme design includes agro-ecological interventions to increase beneficiary climate change resilience (to both dramatic and ongoing events/ conditions) consistent with IFAD policy and practice. It defines poor and vulnerable target beneficiary groups, and addresses specific gender and youth challenges, supporting mechanisms for their meaningful programme inclusions and economic empowerment. Other key IFAD's policies include: partnership and cooperation with other institutions (e.g., GCF as a co-financier, CDB, UNDP, IDB); private sector partnerships; and, albeit indirectly, rural credit through MGF project smallholder/ PO co-financing.

[52] Except for the recently concluded FAO project on value chains (based on three commodities) focused smallholder farmers in northern part of the country, no project has addressed a commodity value chain development approach in the agricultural sector. The lessons learnt from the FAO project are still being documented and will be available soon.

III. Programme implementation

A. Approach

113. The climate of Belize is far from benign and the already apparent effects of climate change are likely to make the conditions for agriculture in general, and small farmers more particularly, uncertain over the long term. Increased ambient temperatures and reduced rainfall in increasingly unanticipated patterns and intensity bring new challenges to smallholder farming. The programme proposes a comprehensive approach to reduce climatic effects on smallholder farmers by strengthening their economic, social, and environmental resilience, and their capacity to recover in times of extreme stress.

114. The programme simultaneously addresses smallholder constraints to more sustainable agricultural production and improved market access. It will do this by promoting climate resilient agricultural practices and production technologies, investing in public and private climate proof infrastructure, supporting POs, strengthening value chains, and enhancing smallholder capacity to respond to market demand.

115. The programme approach is transparent and participatory, building on the needs and productive and marketing capacity of farmers, POs, and institutions in the targeted communities. It will provide demand driven capacity building, training, technical assistance, and market relationship to establish sustainable market access leveraging improved prices and incomes to smallholders. The programme approach proactively supports women and youth both in terms of programme implementation and participation. Finally, the programme has specific, measurable targets output and outcome targets to ensure performance accountability.

116. Finally, smallholder resilience and integration into growing value chains will be supported by policy and knowledge generation investments in the MoA and related policy, research, and innovation stakeholders.

Theory of change

117. The development goal of the programme is to build overall smallholder farmers resilience to climate change by increasing and diversifying agricultural production, and by facilitating their access to commercial market chains for the off-take of their surplus production.

118. The output of technical assistance, capacity building, and introducing innovation to smallholders and POs in Component 1 will increase knowledge and comfort with climate resilient production practices and new market development. This will have the combined outcome effect of smallholders producing and marketing larger and more reliable supply of agricultural products via climate-resilient practices, raising smallholder farm incomes, and growing/ protecting household assets.

119. Component 2 will provide improved rural tracks and access routes, multi-farm investments in public irrigation/ drainage infrastructure for climate resilience, with the outcome of resilient public infrastructure and services, supporting increased production and access to markets. This will lead to more employment, increased on and off farm employment/ enterprise opportunities, and more sustainable access to markets.

120. Cross cutting activities will increase public agencies' knowledge of and capacity to address/ support climate resilient value chain development. The outcome of this will be greater support for resilient smallholder production and market development, as well as a clear, consistent, and enforceable/ policy and regulatory environment for smallholder farming and value chain development.

121. The impact of the programme would be sustainable improvements to smallholder income and asset development, increased smallholder and national food security, and rural poverty alleviation.

B. Organizational framework

122. The Ministry of Finance (MoF) will represent the Borrower for all legal and financial matters, while the Ministry of Economic Development (MED) is the Lead Programme Agency (LPA) and will

have overall responsibility for programme implementation.[53] Working closely with MED and the PMU, the MoA will play a key role in programme implementation, and will ensure programmatic alignment with agricultural sector priorities and strategies.

123. **POC**: The programme Oversight Committee (POC) will be chaired by the MED and will include one representative from each of MoF, MoA, MoW, Ministry of Rural Development (MRD), Ministry of Natural Resources (MNR), and the National Climate Change Office. It will provide strategic direction and oversight, approve AWPBs and Procurement Plans (PP), as well as procurement of consultants, goods, and works. It will monitor programme implementation progress via monthly meetings and reports provided by the PMU. Prior to start-up, the POC will be responsible for procurement of key PMU staff (Programme Manager, Finance Officer, and Monitoring & Evaluation Specialist).

124. **PMU**: Day-to-day programme management and implementation will rest with the PMU, which will be anchored to the MED. The PMU's principal function will be to programme implementation and budgeting. This will include working with service providers, government ministries and departments, beneficiaries, producers' organizations, and municipalities in priority areas. The PMU will assume responsibility for the timely preparation of the AWPBs and PPs to be submitted to the POC for review and approval (and subsequently to IFAD for its "no-objection"). The PMU will lead the implementation programme components, and will work closely with the MoA and other IPs to ensure each component achieves expected outcomes. Guided by the PIM and reporting directly to the POC, the PMU will have programmatic financial and technical autonomy (with specific limits). It will have 11 staff members:

- *Programme Coordination and Administration*: Programme Manager, Finance Officer, Programme Accountant, Procurement Officer, and Administrative Assistant;
- *Monitoring & Evaluation*: Monitoring and Evaluation Specialist; and
- *Component Implementation*: Climate Smart Agriculture Specialist, Rural Infrastructure Engineer, Rural Organization Development Specialist, Institutional Development Specialist, and Value Chain Specialist.

125. **Implementing Partners**: The success of the programme will depend largely on establishing viable relationships with IPs including different government stakeholders, for the delivery of services. Relationships will be established *via* Memoranda of Understanding (MoU) between the programme and each IP. The PMU will be responsible for writing MoUs, managing IP relationships, and coordination of IP activities and services. The PMU will also facilitate execution of formal agreements between beneficiaries/ POs and the MGF Trustee. These agreements will detail the responsibilities of each party in the implementation and performance of the MGF.

C. Planning, Monitoring and Evaluation (M&E), learning and knowledge management

126. **Planning:** The programme log frame provides the basis for planning, implementation, management, and design of the programme's M&E system. It defines the results chain underlying the programme's design, linking activities to outputs and outcomes according to a Theory of Change cause-effect relationship. The system defines the criteria (indicators and targets) that will be used to assess, monitor, and evaluate the programme performance and results.

- The AWPB period will coincide with the GoB's annual budget period (April 1 to March 31). To meet IFAD's AWPB 60-day deadline of January 31, and to provide sufficient time for a participatory planning approach, AWPB planning will begin in October of each annual work plan period. The process will include planning sessions led by the programme Manager. It begins with a review of achievements to date, and targeted activities for the coming year. The AWPB will outline output targets and required implementation resources (*inter alia* financial, technical assistance, and other). IP representatives, POs, and other stakeholders will participate in the process. The AWPB and associated PP will be submitted to the POC

[53] The organizational framework for the programme is patterned on the successful BRFP programme.

for review in December. Once approved, the AWPB and PP will be submitted to IFAD for no-objection.

127. **Monitoring and Evaluation.** The main objectives of M&E are: i) to provide stakeholders with data and information on the use of the programme's resources (outputs), expected outcomes and related targets; ii) to ensure compliance with the programme's targeting strategy; iii) provide the programme with the capacity to measure outputs, outcomes, and impacts; iv) to develop evidence-based knowledge products; and, v) to identify and address implementation challenges.

128. The M&E Specialist will have the responsibility for managing M&E activities. Among other responsibilities, the M&E Specialist will design the M&E system, prepare an M&E Manual (as part of the PIM and within three months of start-up), contribute to the design of the programme MIS, monitor the programme's progress, and report to the PM and the POC on all matters related to performance monitoring. A M&E manual will describe the M&E system, providing operational details (e.g., processes, tools, and responsibilities). More details on the Planning, M&E and KM are provided in Appendix 6.

129. M&E will employ a participatory approach, and IPs will help to collect field data, provide input on data analysis, and identify/ recommend programmatic changes required for more effective programme implementation. M&E effectiveness will rely on the timely flow of performance data and reports to and between the POC, IFAD, IPs, and beneficiaries. This will ensure programmatic activities best serve beneficiaries and motivate their participation. For the PMU to make consistently timely management/ implementation decisions, M&E data/ information will be sufficiently disaggregated to ensure matching of activities to results, and to programme targets. To this end, and where possible, the programme will use mobile and internet technologies for simple, cost-efficient, and effective data collection and dissemination of results.

130. **Knowledge Management:** Knowledge management (KM) activities will provide programme stakeholders updates, insights, and trends on programme implementation. The M&E Specialist, with the input of programme stakeholders, will lead in the develop a Knowledge Management Plan (KMP) early in the first year of implementation. The KMP will outline strategies and plans for data/ knowledge collection/ documentation, consolidating information/ data, and reporting/ disseminating information to programme participants and stakeholders.

131. The output goal of KM activities is to document and communicate relevant programme experiences and lessons learned. Communication tools will include *inter alia* a programme website, print media, photographs, audio, and video documentaries. Knowledge dissemination will also employ a range of methods/ platforms (e.g., capacity building sessions, learning and knowledge sharing events and workshops, various media outlets including, for example, print publications, newspapers, media broadcasts and social media). IP MoUs will include the responsibility of supporting programme information/ lessons learned dissemination and to provide ongoing access to their own programme knowledge products (e.g., within the UB's Faculty of Agriculture library/ resource centre).

D. Financial management, procurement, and governance

132. **Financial Management Assessment.** As part of the design mission and in accordance with IFAD's policies and guidelines, a Financial Management Assessment was undertaken for the LPA, the MED. The assessment found the proposed PMU and related financial management (FM) structures offer a low risk level to successful programme implementation. As there are notable weaknesses/ challenges in Belize public sector management (e.g., MED's capacity, systems, procedures, and internal controls), proposed FM arrangements provide assurance of a satisfactory FM function. Information relating to the FM risk can be found in Appendix 7.

133. **Proposed Financial Management Structure.** The MED is assigned overall fiduciary responsibility as the LPA. It will ensure proper financial management and implementation of the programme through the creation of a dedicated PMU, which will operate with a high degree of independence from the MED. The PMU's finance team will be made up of a Finance Officer and an Accountant. The finance team will be responsible for: registering financial transactions in the accounting system; preparing annual financial statements and periodic financial reporting; ensuring

effective internal controls; managing flow of funds; monitoring programme liquidity; and overseeing the arrangements for external audits, in accordance with IFAD/GCF procedures and guidelines.

134. **Annual Work Plan and Budget.** Programme implementation is based on approved AWPBs. In the GoB's annual budget process, budget requests are elaborated by each public entity at the end of October, and subsequently submitted to the MoF. At least 60 days prior to IFAD's submission deadline, the PMU will obtain and review budget submissions of the planned activities from all concerned stakeholders and consolidate them for review and approval by the POC. Within five days of approval, the PMU will submit the AWPB to IFAD for no-objection. Based on the AWPB, the PMU will submit a request for the budget allotment of counterpart funds to the MED for the planned period. To facilitate budget monitoring and control, the PMU will prepare budget templates to record planned activity information in accordance with the chart of accounts, and to detail component and category expenditures, together with respective funding sources (IFAD, GCF, GoB, and beneficiaries).

135. **Funds Flow and Disbursement Arrangements.** IFAD and GCF's funds will be deposited in two US dollar-designated accounts in the Central Bank of Belize, opened and maintained by the MoF exclusively for the loan and grant proceeds. There will be one or more Operating Accounts in BZ$ opened and maintained in a bank selected by the Borrower to process payments for the day-to-day activities of the programme. The PMU will submit requests to the MoF to transfer IFAD and GCF funds from the designated accounts to the Operating Accounts. The GoB's counterpart contribution will be deposited to the Operating Accounts in quarterly tranches. The PMU will submit requests to the MoF for the release of counterpart funds as soon as the AWPB is approved.

136. **Accounting System.** The BRFP used QuickBooks as the accounting software. It is recommended a more advanced software be implemented for this programme. The software should be able to support numerous financial reporting functions, including those required for preparation of financial statements, interim financial reports, withdrawal applications, bank reconciliations, and asset management. The use of accounting software acceptable to IFAD will be a condition of loan and grant disbursements, and its design, installation, and related training requirements may be financed through retroactive financing mechanism and/ or start-up costs.

137. **Internal Controls, Policies, and Procedures**. The accounting systems, policies, procedures, and internal controls to be used by the PMU for accounting and managing programme funds will be documented in the Financial Procedures Manual (FPM) within the PIM. The FPM will describe the internal control procedures, the basis of accounting standards to be followed, authorization procedures, the financial reporting process, budgeting, the MGF, administration, in-kind and other beneficiary contribution recording, financial forecasting, financial data back-up procedures, contract management and fixed assets management. The PIM will include MGF recipient procedures. The FPM of the BFRP will be the basis for developing the FPM for the proposed Programme. IFAD's no-objection of the PIM will be a condition of disbursement of the loan and grant proceeds.

138. **Financial Reporting Arrangements.** The PMU will be responsible for preparing annual consolidated financial statements in accordance with International Public Sector Accounting Standards (IPSAS) for cash basis accounting (i.e., standards applicable to public entities in Belize and considered acceptable by IFAD). Financial statements will be submitted to IFAD within four months of the end of each fiscal year and include: i) yearly and prior-year statements of sources and application of funds, which should disclose separately IFAD, GCF, counterpart and beneficiaries' funds; ii) withdrawal application schedule/Statements of Expenditure (SOEs); iii) Designated Accounts reconciliation; iv) cumulative status of funds by category for each funding source; and, v) notes to the financial statements, including the fixed asset register.

139. **Internal and external audits.** There is no internal audit function in the MED. IFAD and the PMU will liaise with the Auditor General of Belize to assess the feasibility of including the programme in its audit work plans. The programme's external audit will be conducted annually by a qualified private audit firm in accordance International Standards on Auditing and in line with IFAD's Guidelines on Project Audits. Each annual audit report and the related management letter will be submitted to IFAD no later than six months after the end of each fiscal year.

140. **Retroactive Financing and Start-up Costs.** As an exception to section 4.08 (a) (ii) of the General Conditions, the mechanism of retroactive financing will be available to the programme for activities such as: the recruitment of key PMU personnel; the preparation of the PIM; the design and implementation of the accounting software; and, the production of studies and diagnostics. Under the retroactive financing mechanism, the GoB may pre-finance selected activities incurred from the date of the approval of the programme by the IFAD Quality Assurance Committee. Pre-financed expenditures would be reimbursed to the GoB once the disbursement conditions of the IFAD loan are met. The GoB and IFAD will agree on the specific activities and corresponding categories of expenditures that can be pre-financed under the retroactive financing mechanism. The maximum amount that may be financed through retroactive financing will be approximately US$400,000. In addition to retroactive financing, an advance can be requested to cover start-up costs for eligible expenditures related to preparatory activities incurred between the date of entry into force of the Financing Agreement and the date on which the disbursement conditions are met.

141. **Procurement.** As part of the detailed design for the programme, IFAD assessed the public procurement system in Belize and the capacity of the MED to handle procurement issues. Considering the challenges faced in Belize on public procurement,[54] the procurement of goods, works and services under the programme will be conducted in accordance with IFAD's Project Procurement Guidelines and Procurement Handbook, the provisions of the financing agreement and Letter to the Borrower, and the programme's financial, accounting, and administrative procedures manual. The PMU will be staffed with a Procurement Officer, responsible for organizing the procurement of programmed goods, works, and services. Before each fiscal year, the PMU will prepare a detailed PP derived from the AWPB. An assessment of Belize's procurement systems and the MED's procurement capacity, as well as a draft PP for the first 18 months of Programme implementation, are included in Appendix 8.

142. **Governance.** The primary responsibility for detecting fraud and corruption lies with the Borrower. IFAD applies a zero-tolerance policy towards fraudulent, corrupt, collusive, or coercive actions in projects and programmes financed through its loans and grants. The dissemination of IFAD's anti-corruption policy amongst the programme staff and stakeholders, as well as the adoption of IFAD's procurement guidelines, should reinforce the use of good practices.[55] Mechanisms will be established to ensure that the programme has effective governance and oversight procedures at various levels. The programme will have a POC responsible for fiduciary oversight, including the approval of AWPB and PPs, discussion of key internal and external audit findings, and review of Programme progress *via* monthly POC Meetings and reports provided by the PMU. Additionally, all Programme contracts and agreements will be submitted to the Office of the Contractor General of the Government for review and will require approval prior to signing. Furthermore, the programme will promote good governance through the involvement of the IPs and beneficiaries in both the preparation of the AWPB and the M&E of Programme activities.

E. Supervision

143. IFAD's supervisory function will be continuous, and will support the resolution of programme management and implementation challenges as they arise. Supervision Missions from the Latin America and Caribbean Division (LAC) will take place at least once per year, organized by IFAD´s Country Programme Manager (CPM) in consultation/ coordination with the Borrower, the LPA, and the PMU. The Supervision Missions will assess the effectiveness and timeliness of programme implementation, and progress towards meeting targeted output activities, beneficiary targeting, and Log Frame and RIMS indicators. Financial Management Supervision will be carried out by an IFAD Finance Officer and/ or a Financial Management Specialist during supervision missions consistent

[54] A law on Public Procurement does not exist yet in Belize. For more details, see Appendix 8.
[55] IFAD's anticorruption policy is available at www.ifad.org/governance/anticorruption/index.htm. The IFAD website also provides instructions on how to report any alleged wrongdoing to the Office of Audit and Oversight (http://www.ifad.org/governance/anticorruption/how.htm).

with IFAD's procedures and practices. Financial Management Supervision will focus on: financial management risk assessment and identification of risk-mitigating measures; improvement of financial management arrangements; internal control and flow of funds; review of Programme financial execution; and, monitoring of auditor's findings, among others.

F. Risk identification and mitigation

144. Table 1 provides a summary of the main potential risks and mitigation factors to address them.

Table 1: Risks and Mitigation Measures

Potential Risks	Mitigation Factors
MoA, including departments (e.g., DE and DE) may not have sufficient capacity to adequately provide technical advice to farmers consistent with programmatic aims of climate resilient production and value chain development.	The departments in the MoA (DE, DC, BDMC and BOS) will be strengthened through capacity building as described in the cross-cutting activities.
Lack of producer engagement to coordinate production planning and market access may result in a maintenance of the status quo (low prices, quality and reliability)	Support will only be given to farmers who are already in a PO. These groups will be screened, their strengths and weaknesses identified, and institutional strengthening activities of the programme (Sub-component 1.2) will improve their functioning.
Producers may be reluctant to offer in kind/ cash counterpart funds to finance production improvements through the MGF because of real/ perceived high weather-related, environmental, or market risk.	Only demand-driven activities will be supported. A Climate Vulnerability Assessment will be performed to select implementation methodologies and production/ post-production technologies to mitigate risks. Improvement of value chains (e.g., strengthened linkages between input suppliers, producers, and buyers; increased access to technical services, etc.) and upgrading product quality (e.g., use of better quality inputs, adoption of standards, better production, and marketing practices, etc.) will mitigate market risks.
GOB priorities may not always be consistent with the procedures established for the selection of investment proposals.	Component 2 is built on the empowerment of the targeted communities in decision-making. The AWPB approval process and programme management stakeholder inclusion approach provides ongoing opportunities for fine-tuning decision-making during implementation, minimizing the risk of policy shifts. The programme will also include funding to finance broad public/ stakeholder consultations regarding programme implementation challenges/ good practice. Where possible, consultations will use existing policy discussion platforms to ensure integration into policy development processes.
Funds available for infrastructure investments could be used to supplement investment for other international donor programmes and central/ local government budgets instead of serving project beneficiaries.	All proposals will demonstrate the need for climate change adaptation and commercial viability of the proposed activities. Funds will be allocated through a participatory and demand-driven decision-making mechanism supported by a selection/ranking procedure.
Over the medium to long term, there could be inadequate operation and maintenance of constructed/ rehabilitated assets (e.g., roads, market centres etc.).	The PMU will require realistic proposals for MOM of all asset types, including assignment of MOM responsibility. Institutional development technical assistance will be provided to help minimise MOM related the risk. Environmental Clearance will be obtained before starting any of the works.
Negative environmental impacts of project investments, such as inadequate handling	The PMU will be responsible for ensuring that the programme Environmental Management Plan will be implemented, and necessary Environmental Clearances will be requested/ received

Potential Risks	Mitigation Factors
of agrochemicals, excessive water withdrawal, deforestation among others listed in Table 3 of the SECAP Review Note in Appendix 12.	during the programme. The Environmental Management Plan lists the mitigation measures to minimize the negative environmental impacts.
Past IFAD projects in Belize have suffered from start-up difficulties, personnel turnover and poor M&E and could similarly affect programme performance.	At start-up, the PMU will focus on the effective development of key programme building blocks including, start-up planning/ design, programmes systems development (particularly, operationalized PIM, FM, M&E system etc.).

IV. Costs, financing, benefits, and sustainability

A. Programme costs and financing

145. The total Programme cost including physical and price contingencies is estimated at US$20.0 million, to be financed as follows: IFAD US$$8.0 million over two cycles, with a financing gap of US$2.2 million; GCF US$8.0 million; GoB US$3.2 million; and beneficiaries US$0.8 million. The financing gap will be covered by IFAD11 PBAS allocation or another co-financier (GCF expressed interest in increasing its co-financing and the CDB has expressed a co-financing interest).

146. Given positive feedback from GCF, no substantial IFAD and GCF financing misalignments are expected. IFAD financing is planned for submission to the April 2018 Executive Board. Approval by GCF Governing Bodies is expected by July 2018. It is also expected that the slight delay in GCF financing approval will not affect timely implementation, as the programme can start with IFAD-financed activities. Retroactive financing and start-up costs are also considered in the PDR, allowing some activities to begin with GoB advanced financing.

147. The programme financing by source include:

- **IFAD** will primarily finance costs related to investment and technical assistance to improve production, value-added activities and improving market access. It will cover the costs of strengthening organizations and public institutions. Its contribution will be allocated as follows: 39% of the total costs of Component 1 (US$3.2 million); 21% of Component 2 (US$1.8 million); and, 87% for Project Management (US$3.0 million).
- **The GCF** will finance the costs of activities related to improving knowledge on adaptation to climate change and to increase the productive resilience of the beneficiary households. Its contribution of US$8.0 million will be allocated as follows: 44% of the costs of Component 1 (US$3.6 million); 48% of the costs of Component 2 (US$4.1 million - primarily for irrigation and drainage works); and, 8% for Project Management (US$0.2 million).
- **The GoB** will provide counterpart funds covering cost of taxes and will complement financing of road infrastructure, irrigation and drainage works by 30%. The GoB's total contribution will be US$3.2 million allocated as follows: 6% of the costs of Component 1 (US$0.5 million); 30% of the costs of Component 2 (US$2.5 million); and, 5% to Project Management costs (US$0.2 million).
- **The beneficiaries and POs** will provide counterpart contributions in cash and/ or in kind of at least 10%, totalling US$0.8 million of the cost of Component 1 (based primarily on MGF funding).

148. The programme will be executed over six years. Tables 1 and 2 provide a summary of costs proposed financing arrangements by component; other financing tables are provided in Appendix 9.

Table 2: Summary of costs by component

	BZ	U$S	% Total Base Costs
1. Agricultural Production and Market Access	15.811.000	7.905.500	41
2. Climate Resilient Rural Infrastructure	16.500.000	8.250.000	42
3. Project Management Unit	6.545.260	3.272.630	17
Subtotal	38.856.260	19.428.130	100
Price Contingencies	1.145.415	572.708	3
Total	**40.001.675**	**20.000.838**	**103**

Table 3: Funding by source and component

	The Government		IFAD		GCF		Beneficiaries		Total	
	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%
1. Agricultural Production and Market Access	470.304	6	3.194.918	39	3.667.884	45	822.402	10	8.155.509	41
2. Climate Resilient Rural Infrastructure	2.542.740	30	1.810.483	21	4.129.734	49	-	-	8.482.956	42
3. Project Management Unit	169.547	5	2.992.504	89	200.322	6	-	-	3.362.373	17
Total PROJECT COSTS	**3.182.591**	**16**	**7.997.905**	**40**	**7.997.940**	**40**	**822.402**	**4**	**20.000.838**	**100**

B. Summary benefits and economic analysis

149. The programme will benefit 6,000 rural households directly; 3,500 rural households in priority areas communities, and 2,500 households from non-priority areas (to be identified during implementation). For the financial and economic analysis, sustainable production models were developed reflecting production improvements made by farmers as supported by the programme by projecting net income over a period of 15 years (including the implementation period). Nine production models were developed related to selected value chains. Each model incorporates adoption of improved production technology/ method, and considers requires initial investments. Each model projects estimates expected result of new production scenario including cash flow and net gains to income. Details of the financial and economic analysis are presented in Appendix 10.

150. Models indicate greater smallholder resilience, stability, with more competitive production after programme interventions. Models assume transitioning from an open field production system with poor or no irrigation infrastructure, no soil analysis, weak PO support services, poor accessibility to markets, and poor climate change adaptation vision, *to* an improved production system with more efficient use of natural resources, application of technologies to improve climate resilience and adaptation, improved organizational capacities, higher quality products, and better access to markets.

151. The models used the following assumptions and parameters for priority crops, including the incorporation of technological improvements in the production process:

152. **Onions:** There are 140 households involved in onion production, of which 60 will make investments in drainage and irrigation, 40 of which have irrigation systems and incorporate drainage systems, and 40 will become more involved in the value chain (e.g., marketing produce through new storage facilities). Interventions will extend onions supply by two to three months, reduce post-harvest losses, and decrease production recovery times after adverse climatic events. The model has yields increasing 32% and net income 100% to 400%.

153. **Tomatoes and sweet peppers:** There are 285 households producing these crops, of which, 160 will adopt drip irrigation, 100 will invest in greenhouses, and 25 will improve product marketability through use of new storage infrastructure. These investments will extend production periods from two to four months (and nine months in some areas), with better quality output leading to higher market prices. In addition, interventions will support a quicker return to production after adverse weather events. Net incomes are expected to increase by between 200% and 400%.

154. **Cabbages and carrots:** Some 165 households will install drip irrigation and drainage systems, apply climate resilient practices, and use newly constructed storage facilities improving product quality and marketability. These households will increase net incomes between an estimated 200% to 300%.

155. **Hot peppers:** 60 households will install drip irrigation and apply climate resilient production practices, improving yields by 50% and net incomes by 150%.

156. **Pineapples:** 150 households will introduce the new MD2 variety of pineapples (as required the primary processing plant in the country). They will also install drainage systems and market their product in a more coordinated and organized manner. These investments will be supported with programme technical assistance, which will stabilize productivity, expand variety diversification as per market demand, and increase yields by almost 100% and net income by 200%.

157. **Honey:** Some of the 95 households will improve current production system while others will start new production. Estimated annual household income will increase by BZ$2700 as a result.

158. A total of 785 households will make improvements in the production of the eight focus commodities, and 110 households will benefit from new storage and marketing facilities. All production/ post-harvest improvements will be supported by the programme with training, capacity building and specialized TA as required to ensure sustainability and scaling-up of interventions.

159. Estimated beneficiary production of produce represented in production models is equal to 20% of the national output of tomatoes and sweet peppers, 30% of cabbage and carrots, and 60% of hot peppers, onions, and pineapples. Expected production resulting from programme interventions would replace 70% of current imports for cabbages, and 45%, 40%, and 100% for onions, carrots and honey respectively. The expected increase in production of pineapples would be absorbed by the processing plant for juice production.

160. Benefits for road infrastructure investments included in the models are transportation costs (fuel and maintenance) and product transportation damage loss reductions. Investments will improve 17 sections of three miles each in different locations benefiting at least 500 farming families.

C. Financial and economic analysis

161. **Financial analysis.** The integration of the incremental costs and benefits in the total cost of the programme for all the models provides a net cash flow from which the following efficiency indicators were obtained: an Internal Rate of Return (IRR) of 15.74% and a Net Present Value (NPV) discounted at 10% of BZ$9.4 million, US$4.7 million. This level of return does not reflect full benefits, as the programme provides additional climate change adaptation and value chain participation benefits that would also contribute to greater economic growth of production and higher incomes.

162. **Economic analysis.** Current market price distortions were adjusted by eliminating the effect of taxes and subsidies, market influences, unemployment and the exchange rate to reflect the opportunity costs of employed resources. A programme IRR of 18.97% and NPV discounted at 6% of BZ$29.0 million (US$14.5 million).[56] This level of return may be understated as several factors with probable positive externalities related to climate resilience have not been incorporated in modelling.

163. Models were subjected to sensitivity analysis to assess variabilities in: i) product price change (-10%); ii) product price change (-10%) *and* input prices change (+10%); and, iii) delays in the proposed production improvements. Increasing product prices (10%) and production costs (10%) shows no notable change to returns on investments. Models shows robust changes introduced by the programme lead to reduced production costs, improved yields (quality and quantity), and enhanced product marketability efficiencies.

D. Sustainability

164. **Political and institutional sustainability.** The programme is aligned with the GoB rural and national development strategies. It is aligned with the national agricultural policy framework (as

[56] Estimated once economic prices were calculated for programme costs based on sustainable production models.

defined in the NAFP) as it addresses increasing food security, rural livelihoods opportunities, poverty reduction, opportunities for women and youth, and climate change. The programme responds to the need to improve agricultural production for selected value chains, and to enhance smallholder farmer resilience to climate change events/ vulnerabilities, and economic shocks. The GoB views the programme to provide a credible platform for the execution of the NAFP which relies on smallholder agriculture as the engine of rural economic growth, and development of key commodity value chains.

165. The governance of the proposed Programme will involve key institutions coordinating/ managing/ oversighting GoB's rural and agricultural development strategies and framework (including the MED, the MoF, the MoA, the MRD and the National Climate Change Office). These and other government agencies be variously involved in programme implementation to ensure post programme policy commitments and the sustainable application of gained knowledge/ experience in new policy initiatives. The programme will strengthen policy dialogue linkages between GoB institutions and programme stakeholders, including POs, community organizations, and other programme IPs.

166. The MoW will be responsible for road maintenance. The investment and maintenance funds are provided from the central budget. Annual MOM budget requirements are only 40% funded. This is sufficient to meet main road, and part of secondary roads maintenance, and has resulted in substantial deterioration of feeder road quality in rural areas. In the communities visited by the PDR mission, stakeholders report POs understand the economic and climate resilience benefits of operational roads, and will undertake routine maintenance as a result.

167. The MoA will be responsible for irrigation and drainage public assets management until the NIWRA becomes fully operational. However, only ownership of newly constructed public assets will be transferred to the NIWRA balance sheet, while the systems operation and maintenance will be the responsibility of WUAs. As the selection procedure for public investments is demand driven, institutional activities will begin in parallel with a participatory engineering/ design process. The procedure and planning for WUA formation will be developed during the first two years of programme implementation after an assessment of legal frameworks. As this is the first step to introducing public irrigation systems in Belize, it is assumed assessments will identify organizational structures best suited to sustainable, participatory irrigation management, and will detail required support for WUA creation and development (e.g., registration, management systems, governance, service fees etc).

168. **Strengthening of organizational management capacity**. The programme includes activities to strengthen the management capacity of the beneficiaries' community and economic organizations and to promote access to markets and marketing opportunities. PO and community leaders (existing and new) will be trained in organizational management and good governance. Capacity development will support the sustainable development of POs as they expand services in a participatory, inclusive manner benefiting members' economic interests. MoA's extension agents will also be trained to support POs initiatives. Relevant institutions, such as the BMDC and Bureau of Standards will be strengthened to support POs in their marketing initiatives and improved quality standards.

169. **Environmental sustainability.** Adoption of climate resilient production practices and sustainable natural resource management will enhance agricultural production and promote biodiversity. To this end, the programme will work to reduce unsustainable practices such as slash and burn cultivation, application of chemical fertilizers and pesticides resulting in *inter alia* soil degradation, deforestation, water shortages and floods. The programme will support restoration of degraded areas, provide alternatives to conventional production practices, improve water supply and soil quality. SECAP procedures developed during programme design support the design of such practices, as will programme training, capacity building and technical assistance.

170. The provision of public goods in CRRIA have built in sustainability considerations. The demand-driven, cost-sharing approach will enhance smallholder farmer and PO capacities to use natural resources more effectively, efficiently, profitably, and sustainably. This will enable beneficiaries to respond more resiliently to climate change challenges, as well increasing their capacity and interest in maintaining public goods investments in roads and irrigation. The programme will ensure environmental sustainability by screening of all CRRIA activities by the relevant authorities/ experts.

CRRIA investments will also require the endorsement by the relevant public institutions/ organizations and for yearly maintenance budget provisions commitments.

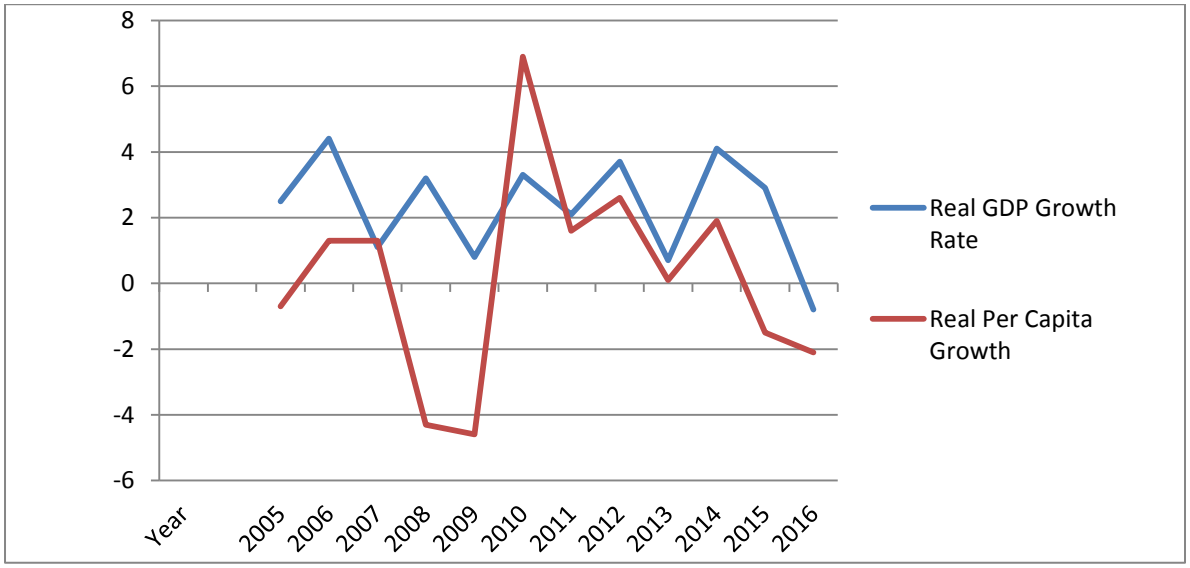
Appendix 1: Country and rural context background

Economy

1. Although Belize is an Upper Middle Income Country (UMIC), it is classified by the United Nations Department of Economic and Social Affairs (UNDESA) as a Small Island Developing State (SIDS) because it suffers from all the vulnerabilities that characterize a SIDS in addition to the more generalized challenges and deficiencies of a developing country.

2. Belize has a total land area of 8,867 square miles and an estimated population of about 385,766 inhabitants (2017), of whom 42.4% are urban dwellers. The country is a relatively sparsely populated one[57], the total population density being about 16 people per km². With a nominal GDP estimated to be about US$1.7 billion in 2016 (ranked 172 out of 194 in The World Bank Development Indicators), Belize's *per capita* income is around US$ 4,600. In general, GDP growth and per capita income growth since 2005 have been cyclical (Figure 1). Since 2005, *per capita* GDP has remained at a standstill and since 2006, economic growth has been cyclical but has trended downward, with significant declines in five of the last nine years. Since the economic and financial crisis of 2008, the economy is characterized by low but widely fluctuating growth rates, high inflation rates, high levels of unemployment and under-employment, low investment, persistently negative balance of payments, high public debts and high levels of poverty, with more than 40% of the population below the poverty line.

Figure 1: Rate of Growth of GDP and Per Capita Income, 2005-2016



3. As an open economy, Belize is highly vulnerable to external shocks, and is also significantly affected by climate-related and natural disasters. It is estimated that almost 25% of the population have been impacted and there were significant declines in agricultural production and infrastructure losses from the last three hurricanes which have been occurring with more frequency. Estimates indicate that GDP contracted by almost 1.0% in 2016 with the primary sector shrinking by almost 25%, due mainly to the flooding and damages and accompanying disease problems from Hurricane Earl. Except for sugarcane, production of all major export crops was down, and there were declines in farmed shrimp production, corn and rice, and papaya production significantly declined because of the closure of operations by the major producer.

[57] Belize's neighbors have much higher population densities: Guatemala (145 per km², 2014 data), Honduras (79 per km², 2017 projection), and Mexico (63 per km², 2017 estimate).

4. With regards to employment, although labour force participation increased, the average unemployment rate declined to a single digit (9.5%) in the last year, after several years of being in double digits, due to an expansion of services activities. The latest Labour Force Survey (LFS) of 2017 shows that 17% of the employed persons were in the agricultural sector, and males accounted for 90 percent of the country's agricultural workers. The LFA also indicates that 68% of the total unemployed were women and this group experienced a net loss of jobs in the rural areas while there was a net increase of males in employment[58]. In addition, the underemployed increased during the last year, with underemployment among women being disproportionately higher, and youths accounting for almost one-third of the total underemployed population. Youth are particularly affected, and skills shortages and mismatch are reportedly a major constraint to youth employment, productivity, and competitiveness. Other problems for the youth are the lack of parental guidance which leaves them lacking in motivation and social skills, and peer pressure which encourages negative behaviour and makes being studious "uncool".

Poverty

5. The latest poverty data for Belize date to 2009, and show an increase in the share of the total population below the poverty line, from 34% (in 2002) to 41% in 2009 and an increase of households below the poverty line from 24.5% (2002) to 31% in 2009. Based on population projections for 2016 and considering the poverty rate for each District (according to CPA 2009) and applying the mean household size per district (using data from the 2010 Census), it is estimated that in 2016 there are approximately 37,900 poor households in Belize (details in Appendix 2).

6. In 2009, the rural poverty rate for households was around twice as high as that prevailing in urban areas: 43% as against 21%. Rural and urban poverty rates increased between 2002 and 2009 with these changes being greater in both absolute and relative terms in rural areas, reflecting the increased problems faced by the rural sector. The highest levels of rural poverty are to be found in the northern District of Corozal, with many small farmers, and in the southern district of Toledo, with its large indigenous population of Mayan descent. Available data show that 46% of the households in Toledo and Corozal are poor (Table 5). The greatest change between 2002 and 2009, has been in Corozal where poverty has doubled, and indigence has almost tripled. Its poverty level approaches that of Toledo. Poverty in Toledo has fallen substantially since 2002, although this district remains the poorest district in the country with by far the highest level of indigence. Poverty and indigence at the household level have also both increased substantially in Orange Walk and Cayo since 2002; whereas increases in Belize and Stann Creek are less pronounced although indigence has risen substantially in the latter.

7. While more up to date data-based evidence is not available, according to the World Bank (2017) the increase in poverty can be explained by several factors – such as the effects of the global financial crisis in 2008; the several natural disasters faced by Belize, and the fuel price rises observed also in 2008 - indicate that poverty may have worsened. The CPA (2009), also mentions the serious setbacks in 2006/07 of production in sugar cane and bananas with the value of production decreasing by 13%, as an important cause for the increase of poverty especially in Corozal, as these sectors have substantial multiplier impacts.

8. The poorest people and communities in Belize are predominantly rural, and their livelihoods depend heavily on climate-sensitive sectors such as small-scale agriculture, fishing, and tourism (which impact their food security and livelihoods). Moreover, a large population of the poor living in coastal areas are exposed to the risks of hurricanes and storm surges, with those living near watersheds prone to flooding. These areas generally have lower levels of protective infrastructure, and housing is of lower quality, thus increasing their vulnerability to hurricane and flood risks.

[58] Women's participation in the labour market has always been more or less than that of men, and their unemployment rate has always been higher. Furthermore, women are at higher risk of being unemployed than men.

9. Rural poverty is dominated by agricultural workers while manufacturing and construction is the only other sector accounting for more than 10% of the poor population. Agriculture and fisheries sector employs a large segment of the working poor: 53% of the employed, indigent rural population work in agriculture and fisheries; 37% of the employed, poor rural population work in this sector; and 38% of the employed, rural population are concentrated in this sector. In Toledo, almost half of total employment is in agriculture. In Corozal, a third of the working population is employed in agriculture, mostly in the cultivation of sugar cane (which also dominates in Orange Walk). Approximately 93% of those employed in this sector are male, and 7% female, thus indicating that both benefits and challenges within the sector impact on male labourers more significantly than female labourers. However, the participation of women in the sector is often underestimated, with female participation often only recognized as “support to” the male head of the household; the agricultural census (2011) provided interesting data regarding male and female participation in agriculture. The household size is closely linked to the poverty status of a household. Over 75% of indigent households and 66% of all poor households have 5 or more persons compared with little over 25% of not poor households.

Agriculture

10. Agriculture (along with tourism) is the main source of rural livelihoods in Belize and is an important overall contributor to the national economy. Among the key concerns for Belize are how to best utilize the available and potential rural means of production, and how to engage the rural area population to exploit opportunities in a diversified and sustainable rural economy. The sector is critical for ensuring food security for Belize, in addition to its wider role for rural socio-economic stability.

11. The economy is an agricultural-based one that is still dependent on traditional export commodities such as sugar, citrus, bananas and marine products, while tourism has recently become an important contributor to GDP. The sector’s contribution to the economy has been uneven but has continuously declined from its peak of 15% in 2005 to less than 10% in 2016. Growth of the agricultural and food sector over the last decade has fluctuated greatly, with high real growth rates more than 10% achieved in only two years in the period, 2010 and 2012. For the remaining years, growth has stagnated and even declined on average in the last few years.

12. According to the latest Labour Force Survey in April 2017, the total number of employed persons was estimated to be 150,112, with agriculture accounting for 17% of the employment. Males accounted for 90 percent of the country’s agricultural workers, with the Belize district having the largest gain in agricultural employment. Although the official data indicates that women’s employment in the sector is low, it is widely recognized that female employment is under-reported.

13. Traditional agricultural exports contribute more than 70% of total domestic exports. Although Belize is still dependent on traditional export commodities such as sugar, citrus, bananas and marine products, it has become self-sufficient in many food products over the last two decades, namely poultry meat, eggs, beef, pork, beans, rice and corn, and is now exporting some of these products to countries in the CARICOM and Central America. Despite this positive performance in food production, Belize’s import food bill has almost doubled in the last 10 years.

14. The sector is characterized as having three main sub-sectors – a well-organized traditional one that comprises the export commodities of sugar, banana, citrus and marine products; a well-integrated large- medium-scale commercial sector; and small-scale agriculture that have mainly mixed farming systems that produce food for local consumption.

15. In the new agricultural policy framework, the National Food and Agricultural Policy 2015 -2030 (NFAP), the government’s strategy focuses on greater diversification and achieving self-reliance for food products. The policy has placed much emphasis on encouraging and supporting research on value addition and post-harvest handling, ensuring household and national food and nutrition security for all, increasing the incomes of farming households engaged in crops, livestock, aquaculture and value addition activities and the profitability of those enterprises, promote the development of rural areas through targeted inclusion of small scale/family farmers in the food and agriculture development

process and increasing the resilience of livelihoods to threats and crisis, in particularly natural disasters and economic shocks, among others.

16. Notwithstanding the important role of agriculture, the NFAP identifies several issues and challenges to be addressed in the sector: (i) increasing the resilience of the economy and reducing its increased vulnerability following expiry of the preferential market arrangements in the EU for sugar and bananas; (ii) improving the country's competitiveness in external markets; (iii) developing the products along selective value chains, technologies of production, and marketing arrangements that can bring small-and medium scale producers into the ambit of competitiveness and generate more income per acre for them; (iv) enhancing development of agro- processing and other value added activities; (v) reducing its expanding food imports; (vi) the high level of poverty, estimated at more than 40%; (vii) moderate and in some areas a high level of food insecurity and malnutrition; (viii) changing food consumption and dietary patterns contribute to increased levels of obesity and related non-communicable diseases such as, diabetes, hypertension, stroke, heart diseases and cancer; (ix) increasing the country's resilience and improving its adaptation to climate related and natural disasters (hurricanes, rainfall, increased flooding, droughts and the accompanying pests and diseases); (x) reducing the vulnerability of rural communities, particularly small farmers, women and the indigenous and poor groups who depend on agriculture; (xi) improving rural infrastructure; and (xii) improving the use and management of its natural resource base.

17. The banana and sugar sectors and their diversification and the development of small farm agriculture are central to rural development and poverty alleviation in Belize. However, small farmers cannot compete with large farmers in these sectors. Small farmers are not involved in commercial banana production, and the rural communities in the southern districts supply labour to the banana industry. In the case of sugar, small farmers with less than 10 acres comprise about 70% of all farmers, but their efficiency level is low, averaging between 18 and 24 tons of cane/acre. The current EU project seeks to increase productivity to about 35 tons/acre.

18. Various studies have identified several opportunities for addressing rural poverty. The most fundamental is diversification within the traditional sector (more value added products such as fruit processing and to a greater number of markets) and other sectors (both for food crops and livestock, for the domestic and international market), and increasing the incomes of rural producers. Other agriculture-related ones include increasing production efficiency and output of vegetables to reduce the high importation of foodstuff through the implementation of new technologies such as irrigation systems and covered structures and the development of new crops (e.g. papayas and pepper). There is much potential to increase productivity by moving away from a reliance on rain-fed agriculture and adopting improved technology in the non-traditional production systems. However, the main constraints to these opportunities have been identified as a lack of access to land (for food security and diversification of household income), limited market access by small farmers (small volumes, high transport costs, low quality product), lack of appropriate and timely market information and poor transport infrastructure.

19. Rural areas also suffer from the lack of other beneficial factors which are more readily available in the rest of the economy. Particularly important among these are appropriate technological innovations, organised market intelligence systems and accommodation in the established supply chains. Most noteworthy is the apparent inability of small producers to establish among themselves reliable measures of standards and quality in production which can open market access to their outputs beyond their immediate environment.

Rural context, natural resources and climate

20. The economy is largely rural and natural-resource dependent and greatly depends on climatic conditions. Agriculture, animal husbandry, forestry, fishing and tourism are all activities that rely heavily on the climate. The natural resource sectors relevant to rural development include agriculture (the main source of employment and income), fisheries (characterised by increasing production and

some new products such as farmed shrimp). Other sectors include transport (for road infrastructure), education (for the development of human capital) and health.

21. Because of its geographic position, Belize is strongly affected by hurricanes and storms, which cause both human and material losses as well as serious damage to infrastructure that has a considerable impact on agriculture and rural livelihoods. Over the last 15 years, natural disasters have severely affected the country - Hurricane Keith in 2002, inflicted economic losses totalling approximately 30% of GDP; Hurricane Dan, which struck in 2007, caused losses equivalent to 90 million dollars (7% of GDP), 64% of which corresponded to the agricultural sector; and Hurricane Earl in 2016 which resulted in a GDP decline of almost 1.0% and the primary sector contracting by almost 25%[59]. In between, the country has also experienced various storms and droughts that have caused many losses to various sectors, particularly agriculture and the livelihoods of rural people. Of more importance however, are the adverse effects of these events on distinct groups of the population; (i) persons living in rural areas, many of whom were agriculturalists and subsistence farmers, and have little or no resources to easily recover; (ii) poor marginalized and indigent persons who could be found in both rural and urban areas; and (iii) single women who are head of households with few alternative sources of income. These groups are ill-equipped and have insufficient resources to hold them over when there is extensive flooding over a long period, as well resources to reinvest and recuperate from their physical losses.

22. It is expected that climate change would have severe impacts on the agriculture sector of Belize. The threats of climate change and sea level rise, hurricanes and storm surges are particularly acute along the lowlands and coastal belt of Belize, where soils are most suitable for cultivation and where a large percentage of the population resides. Thus, climate change will cause both human and material losses as well as serious damage to infrastructure, with a considerable impact on the agricultural sector. Decreasing rainfall amounts and increased variability of rainfall will make it more difficult to plan for agricultural production. Yields of the major crops (which are already grown near their limits of temperature tolerance), namely sugarcane, rice, bananas, citrus, corn and beans, are all expected to decrease. These decreases in crop yields would result from increased temperatures and variable rainfall that reduces plant resistance to pests and diseases, increases water stress, increases respiration rate which stunts growth and development and shortens growth periods (see details in the SECAP Paper, Appendix 14).

Infrastructure

23. One of the major constraints that affect agricultural production and market assess by small farmers is the poor condition of rural infrastructure – roads, and lack of irrigation and drainage. The lack of appropriate access roads and productive infrastructure such as irrigation and drainage networks, often cause the loss of assets and livelihood options by the poor during the extreme weather events. For agriculture and livestock production to develop commercially, an adequate and climate resilient infrastructure network, improved natural resource management to preserve the environment is required.

24. Rural infrastructure in Belize is not adequate to provide the necessary public services to enable the required enterprise development needed for sustainable rural economic growth. These shortcomings inhibit rural entrepreneurs and farmers to initiate business ventures. The current state of infrastructure contributes greatly to low agricultural and livestock productivity and production quality, hence making the rural business environment riskier in Belize. Furthermore, the observed climatic trends require a new approach to infrastructures to ensure their use and potential in view of the recorded and foreseen climatic changes.

[59] Belize has the highest Climate Risk Index (CRI) among Central American countries. The Index shows countries that have been affected by extreme weather events, and takes into account the total deaths per 100,000 inhabitants, the absolute losses in millions of U.S. dollars and losses as a percentage of GDP. These indicators imply the development and vulnerability levels of the countries at risk.

25. Analyses of the status of rural infrastructure highlight an obvious need for continued investment for development of infrastructure in Belize's rural areas. Different studies and surveys[60] shows that poor rural households/smallholders as well as the economically active rural households/smallholders living in these areas, besides the high climate related vulnerability, are particularly affected by the lack of adequate irrigation and drainage networks, which is a significant barrier to productivity, especially for vegetable producers. The studies and surveys also reveal that poor road conditions, especially for the economically active rural households/smallholders, is another key barrier to accessing markets, increasing productivity, as well as working together with other smallholders.

26. As indicated above, there is a requirement for significant investment in irrigation water supply systems and drainage network to cope with recorded climate changes; and for all-weather local rural roads and ancillary structures (bridges) to ensure year-around access of rural households to market towns, processing facilities and production areas. Much of the investment required is strategic in nature; that is, its improvement will reduce the vulnerability to climate problems and will facilitate and induce a greater subsequent level of farming and other business investment, and thereby contribute to raising incomes and the overall levels of economic activity in the proposed programme area.

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[60] A National Adaptation Strategy to Address Climate Change in the Agriculture Sector (GOB/Caribbean Community Climate Change Centre/EU, 2015); Belize Technology Needs Assessment Adaptation (Identification and Prioritization of Adaptation Technologies for Belize, January 10, 2017); National Food and Agricultural Policy (2002 – 2020); National Environmental Policy and Strategy (2014 – 2024); An Irrigation Policy and Strategy for Belize (GOB/FAO, 2011); Agricultural Water Management Investment Plan (GOB/FAO, 2014).

Appendix 2: Poverty, targeting and gender

A. Characterization of the population in the Programme area

1. **Territory.** Belize has a total land area of 22,700 km² of which 38% is suitable for agriculture and livestock raising; it is estimated that only about 15% of the potential is used in any given year. The country shares its borders with Mexico in the North and Guatemala to the West and South, and there is a small direct sea link to Honduras but no land border. The East is bounded by the Caribbean Sea, in which are located over 120 offshore Cayes (islands). The western border consists variously of lowland forest, highland plateau and the Maya mountains in the south. Most rivers rise in the west of the country and flow eastwards to the sea through low-lying, often swampy, coastal plains. About 60% of the country is covered by forest containing an abundance of fauna and flora. Larger scale agriculture, involving bananas, citrus and sugar cane, is concentrated in the low-lying areas; elsewhere most cultivation is small-scale and largely for subsistence. The Mayan population and rural Guatemalan migrants employ variations of slash-and-burn shifting (known as milpa) cultivation.

2. Belize is located in the hurricane belt and, frequently, is affected by these. The agricultural sector is significantly constrained by infrastructure weaknesses and is vulnerable to adverse weather events. In particular, recurring natural disasters and the effects of climate change have significantly impacted agricultural yields, food production, food prices, and the livelihood of the rural population. The impact of Hurricane Earl in August 2016 worsened an already difficult economic situation, causing significant losses in agriculture and tourism, and an economic cost estimated at about 5.5% of GDP.

3. **Population.** According to the "Labour Force Survey" (April 2017), the Belize´s population is estimated at 385,766 inhabitants (Table 1), of whom 42.4% are urban dwellers. Belize is a relatively sparsely populated country[61], the total population density being about 16 people per km².

Table 1: Belize Population by District and Sex (2017)

		District						
		Total	**Corozal**	**Orange Walk**	**Belize**	**Cayo**	**Stann Creek**	**Toledo**
Sex	**Total**	385 766	47 231	50 807	116 489	92 760	41 975	36 504
	Male	192 885	23 558	25 485	57 493	46 334	21 742	18 273
	Female	192 881	23 673	25 322	58 996	46 426	20 233	18 231
Source: April 2017 Labour Force Survey. Statistical Institute of Belize								

4. There are 4 main ethnic groups in Belize. The most prevalent are the Mestizo that constitutes almost half of the population, and they are concentrated mainly in Northern Belize where they comprise over three-quarters of the population. The second largest group are the Creoles, who used to be the largest group but who now accounts for only 27% of the population as a result of Mestizo immigration. The Creoles are the predominant group in Belize district, where they account for over half the population. The two other main groups are the Maya who were the first known inhabitants of Belize and the Garifuna that together represent about 18% of the population. The Maya is concentrated in Toledo in the south where they comprise just under 70% of the population. The Garifuna are the smallest of the four main ethnic groups, are concentrated in the Stann Creek district where they represent over 40% of the population there and 6% of Belize's population.

[61] Belize's neighbors have much higher population densities: Guatemala (145 per km², 2014 data), Honduras (79 per km², 2017 projection), and Mexico (63 per km², 2017 estimate).

5. **Poverty.** Rather than being confined simply to the inability to satisfy basic consumption requirements or a single dimensional issue related to inadequate income, poverty is seen as a multi-faceted issue that involves: voicelessness, powerlessness, vulnerability, lack of self-esteem and lack of opportunity (Country Poverty Assessment 2010). In general, poverty in Belize is associated with living from hand to mouth and some days going hungry, lack of jobs, inadequate or absent amenities, poor housing, lack of good quality water, education and/or the money to send the children to school, and a general struggle to survive.

6. The Country Poverty Assessment (CPA) of 2009 provides the latest poverty data for Belize. It shows an increase in the share of the total population below the poverty line, from 34% (in 2002) to 41% in 2009, and an increase of households below the poverty line, from 24.5% (2002) to 31% in 2009 (Table 2).

Table 2: Extend of poverty at household and individual level (2009)

	Poor		Non poor		Total
	Indigent	Poor	Vulnerable	Other non-poor	
Household (#)	8 539	16 852	10 533	45 977	**81 901**
(%)	10.4	20.6	12.9	56.1	**100**
Population (#)	52 185	84 455	46 614	147 460	**330 714**
(%)	15.8	25.5	14.1	44.6	**100**
Source: CPA, 2009					

7. On the basis of population projections for 2016 and taking into account the poverty rate for each District (according to CPA 2009) and applying the mean household size per district (using data from the 2010 Census), it is estimated that there are approximately 37,900 poor households in Belize in 2016 (Table 3). The new Poverty Assessment planned for 2018, would be an important tool to update these estimates; however, for the Programme´s targeting strategy, the data presented in Table 3 provide an acceptable indication.

Table 3: Estimates of population, poverty rates, mean HH size and poor rural households by District

District	Total Population (Projection for 2016)	% Poverty Rate (2009, CPA)	Poor Population (Projection for 2016)	Mean HH Size (2010, Census)	Estimated # Poor HHs (2016)
Toledo	35,800	60.4%	21,623	4.7	4,601
Cayo	90,579	40.6%	36,775	4.4	8,358
Stann Creek	41,033	43.7%	17,931	3.8	4,719
Belize	113,878	28.8%	32,797	3.5	9,371
Orange Walk	50,207	42.8%	21,489	4.4	4,884
Corozal	46,471	56.2%	26,117	4.4	5,936
Total	**377,968**	**41.3%**	**156,732**	**4.1**	**37,867**
Source: The Statistical Institute of Belize. Census 2010 & Poverty Assessment Report, 2009.					

8. **Who are the poor and what are their key characteristics?** The poorest people and communities in Belize are predominantly rural, and their livelihoods depend heavily on climate-sensitive sectors such as small-scale agriculture, fishing, and tourism (which impact their food security and livelihoods). Moreover, a large population of the poor living in coastal areas are exposed to the risks of hurricanes and storm surges, with those living near watersheds prone to flooding. These areas generally have lower levels of protective infrastructure, and housing is of lower quality, thus increasing their vulnerability to hurricane and flood risks.

9. Rural poverty is dominated by agricultural workers while manufacturing and construction is the only other sector accounting for more than 10% of the poor population. Agriculture and fisheries sector employs a large segment of the working poor: 53% of the employed, indigent rural population work in agriculture and fisheries; 37% of the employed, poor rural population work in this sector; and 38% of the employed, rural population are concentrated in this sector. In Toledo, almost half of total

employment is in agriculture. In Corozal, a third of the working population is employed in agriculture, mostly in the cultivation of sugar cane (which also dominates in Orange Walk). Approximately 93% of those employed in this sector are male, and 7% female, thus indicating that both benefits and challenges within the sector impact on male labourers more significantly than female labourers. However, the participation of women in the sector is often underestimated, with female participation often only recognized as "support to" the male head of the household; the agricultural census (2011) provided interesting data regarding male and female participation in agriculture (see Table 6).

10. The household size is closely linked to the poverty status of a household. Over 75% of indigent households and 66% of all poor households have 5 or more persons compared with little over 25% of not poor households. Poverty rates for households with 5, 6 and 7 persons are respectively, 40%, 52% and 70% compared with 17% for smaller households. If a household has 5 or more people living in it, the chances of it being poor are 3 times greater than if it had 1 to 4 persons. The average size of poor households is 5.3 persons as against 3.4 for not poor households.

11. Households that do not have children under 18 present have a much lower poverty rate (17%) than households with children under 18 (39%); this type of household makes up 35% of the total number of households in Belize. Also, the poverty rate amongst households that are "extended" and have the presence of grandchildren, siblings, cousins or nephews/ nieces is high at 46% (these account for 13% of the total households in Belize).

12. The sex of the individual has little influence on poverty rates with men having slightly higher poverty rates (42% of men are poor compared to 40% of women). However, the hardships caused by poverty necessarily fall equally on men and women; due to the responsibilities assigned by society to women, they will often experience the sharp end of having to deal with the lack of adequate funds to maintain their household, particularly where they have no independent source of income (CPA, 2009).

13. Of the population surveyed for the 2009 Country Poverty Assessment (CPA), 70% of males declared that they were the head of household, while 30% of females declared that they were the head. This percentage composition was consistent across all consumption quintiles. Contrary to the situation in many Latin American and Caribbean countries, in Belize female headed households are not more prone to be poor than male headed households. Most of these women manage to bring up their children in a non-poor environment, even without male financial or emotional assistance.

14. The great majority of poor households have at least one person working and thus have some income from employment. The poverty rate for households that depend almost entirely on non-employment sources of income (e.g. family support, social assistance, pensions) is approximately 50%, much higher than the average (31%).

15. As is well known, poverty reduces substantially as the head of household's education level increases. Around half of households where the head of the household did not complete primary school are poor compared with under 15% of those with some secondary or tertiary education, i.e. the risk of poverty is more than halved.

16. **Where do the poor live?** In 2009, the rural poverty rate for households was around twice as high as that prevailing in urban areas: 43% as against 21% (Table 4). Rural and urban poverty rates increased between 2002 and 2009 with these changes being greater in both absolute and relative terms in rural areas, reflecting the increased problems faced by the rural sector.

Table 4: Extreme poor and poor households in rural and urban areas (2009)

	Rural (in %)	Urban (in %)
Indigent HH	18.1	4.1
Poor HH	25	17
Total poor HH	**43.1%**	**21.1%**
Source: CPA, 2009		

17. The highest levels of rural poverty are to be found in the northern District of Corozal, with a large number of small farmers, and in the southern district of Toledo, with its large indigenous

population of Mayan descent. Available data show that 46% of the households in Toledo and Corozal are poor (Table 5). The greatest change between 2002 and 2009, has been in Corozal where poverty has doubled and indigence has almost tripled. Its poverty level approaches that of Toledo. Poverty in Toledo has fallen substantially since 2002, although this district remains the poorest district in the country with by far the highest level of indigence. Poverty and indigence at the household level have also both increased substantially in Orange Walk and Cayo since 2002; whereas increases in Belize and Stann Creek are less pronounced although indigence has risen substantially in the latter.

18. While more up to date data-based evidence is not available, according to the World Bank (2017) the increase in poverty can be explained by several factors – such as the effects of the global financial crisis in 2008; the several natural disasters faced by Belize, and the fuel price rises observed also in 2008 - indicate that poverty may have worsened. The CPA (2009), also mentions the serious setbacks in 2006/07 of production in sugar cane and bananas with the value of production decreasing by 13%, as an important cause for the increase of poverty especially in Corozal, as these sectors have substantial multiplier impacts.

Table 5: Poor and non-poor, by District (2009)

District	Indigent (extreme poor) (in %)	Poor (in %)	Total poor (in %)	Non poor (include the vulnerable, in %)
Corozal	15.7	30.4	46.1	53.9
Orange Walk	11.4	25.3	36.7	63.3
Belize	3.9	17.0	20.9	79.1
Cayo	7.1	22.7	29.8	70.2
Stann Creek	11.9	19.8	31.7	68.3
Toledo	37.5	8.9	46.4	53.6
Country	10.4	20.6	31.0	69.0

Source: CPA, 2009

19. **Food and nutrition security.** Almost 50% of poor households are concerned about their ability to provide enough food while between a fifth and a third considered that they, on occasion could not provide enough. Though around 12% of poor households experienced hunger and a demonstrable lack of enough food during the last month, a majority of poor households are able to obtain adequate food most of the time (CPA, 2009).

20. According to the Multiple Indicator Cluster Survey (MICS, 2015-2016), children in the Toledo region/district had the highest rate (33%) to be stunted (deviation below the median height-for-age of a reference population and is a reflection of chronic malnutrition) compared to other children in the country. The percentage of wasted children (weight-for-height deviation below the median and shows a recent nutritional deficiency) is highest in Stann Creek region and Belize City Southside (3% each), whereas the rural areas of the Belize district presented the highest percentages of overweight children (11%).

21. **Male and female participation in agriculture.** As mentioned before, female participation in agriculture is often underestimated and invisible, even for the agriculture extension workers. The 2011 agricultural census sheds some light on this as it included an analysis of the division of work in agricultural related activities, including production, harvesting, and marketing. In addition to the 30% of farmers that are females (in charge of all activities), women do participate actively in a number of tasks when farming is a family business. The key activities that engage more than 25% of women are: irrigation and water management, harvesting of own permanent crops and fruits, milling, grinding and sun drying, and livestock rearing: cattle, but also sheep, pigs and poultry.

22. These data provide an important orientation to “Be Resilient” Programme implementation, as it clearly shows that climate resilient extension, farmer to farmer training, and technical assistance needs to reach and benefit both men and women. Women´s participation in irrigation and water management (27%) is also an indication that the rural infrastructure component and setting up of Water Users Groups, women need to be involved as well. While women are less involved in marketing, the Programme´s marketing support should take into consideration that between 14-18%

of marketing of grains, permanent crops, and vegetables are carried out by women, and that their participation in training, fairs, buyer/seller encounters, is essential.

Table 6: Participation in farm activities, by age group (child, adult) and sex (2011)

	# Children	# Male adult	% Male participation	# Female adult	% Female participation	Total
Temporary crops	15	5 317	91	513	9	5 845
Permanent crops	48	10 910	76	3 338	23	14 296
Land preparation/slash&brun	29	8 189	91	754	8	8 972
Planting/seeding	34	8 105	86	1 250	13	9 389
Mgt. of nursery for temp. crops	4	1 877	90	216	10	2 097
Transplating crops	11	2 756	85	469	14	3 236
Fertilizing/Applying pesticides	17	6 679	91	680	9	7 376
Weeding	46	7 961	83	1 535	16	9 542
Irrigating/Water Management	21	2 968	72	1 112	27	4 101
Harvesting/Threshing temporary crops	31	4 854	81	1 072	18	5 957
Harvesting own permanent crops & fruits	139	9 343	69	3 966	29	13 448
Milling/Grinding/Sun drying	6	1 573	74	560	26	2 139
Marketing rice/maize/other cereals	2	1 297	86	209	14	1 508
Marketing of vegetables & temp. crops	5	1 657	84	312	16	1 974
Marketing permanent crops	10	3 526	82	778	18	4 314
Responsible for livestock	7	4 333	56	3 415	44	7 755
Feeding/Managing cattle & buffalo	7	1 946	77	578	23	2 531
Feeding/Shepherding goats and sheep	4	388	74	131	25	523
Feeding/Managing pigs	24	1 422	58	1 015	41	2 461
Feeding/Managing poultry	185	3 625	31	7 829	67	11 639
Responsible for aquaculture activities	0	214	80	52	20	266

Source: Agriculture Census 2011. The Statistical Institute of Belize.

23. **Other social, youth and gender equality issues relevant to the Programme.** While the general poverty assessment shows no significant disadvantage for women, in the labor market, gender imbalances have been observed with only 49% of women participating in the labor market. Youth are particularly affected by unemployment; skills shortages and mismatch are reportedly a major constraint to youth employment, productivity, and competitiveness. The official unemployment rate is 14%, and is higher among youth: 23%. According to a labor survey conducted in 2014, women, the majority of whom were under the age of 25, constitute two-thirds of the unemployed population. Furthermore, women are at higher risk of being unemployed than men, with 22% of the female labor force being unemployed in 2014 compared to 8% of the male labor force. Other problems for the youth are the lack of parental guidance which leaves them lacking in motivation and social skills, and peer pressure which encourages negative behaviour and makes being studious “uncool".

24. Whether young people are interested in farming depends on the possibilities they see in terms of work, wages and livelihoods. Though there is a strong stigma amongst young women and men that agriculture is not attractive, discussions have shown that many young men and women are interested in farming if: (i) it is profitable, (ii) has quick turn-over, (iii) uses modern technology, and (iv) training is provided. Young people need support if they are to see farming as a career option: they need to be able to develop appropriate financial and business skills, be empowered to access land and credit and have control over the resulting financial returns from their activities. Although the usual factors of better access to credit, more frequent visits by extension officers and access to affordable agricultural

inputs are often mentioned as key constraints facing young people, a positive environment is mentioned as an even more important factor. Key elements of this "enabling environment" is the need to reverse the often negative attitudes to farming embedded at an early age during school and for agricultural extension services to broaden their traditional horizons.

25. The CPA states that fact that households where women are employed are less likely to be poor indicates that poverty would be reduced if more women in poor households were able to work. However, there are two important challenges. Firstly, improving female participation rates is partly dependent on the availability of employment opportunities. Secondly, many women, especially in poor households are occupied with child care; providing work for this group is thus directly linked to the supply of adequate child care arrangements during working hours, e.g. pre-school day care and education, after school activities or a more equitable share of domestic chores, including child care between spouses/partners.

26. Nationwide, around 85% of those who complete primary school do proceed to secondary school. Whereas 54% of primary school pupils lived in rural areas, only 23% of secondary school students were from rural areas indicating a much lower level of secondary schooling in rural areas. However, with regard to gender parity Belize has reached this for primary and secondary school enrollment rates, women and men having similar levels of education (20% of women have primary education, 37% have secondary education and 20% have higher level education. For men, a similar proportion have primary school and secondary school education, while only the percentage for higher-level education is slightly lower than for women (UNICEF, 2016). Ninety-three (93%)percent women and 91 percent of men aged 15-24 living in Belize are literate. Literacy is slightly higher among women and men in the urban areas (97% and 95% respectively) than in rural areas (90% and 89% respectively).

B. The programme intervention area, target group and direct beneficiaries

27. **Priority areas for Programme implementation.** The Programme will intervene at the national level, starting in selected 23 rural communities in five (5) priority areas or districts. Additional communities for intervention will be identified during programme implementation and will be phased-in accordingly.

28. The main criteria used for identifying the five priority areas are that there should be:

- male and female small-scale farmers (equal/less than 25 acres);
- farmers participating in a clear identified key commodity/value chain;
- farmers that are market oriented, rather than subsistence farming; and
- farmers with the "willingness to help themselves" and of whom at least some are members of formal or informal producers´ association or cooperative.

29. The five priority areas include a total of 23 communities from 5 districts. The distribution of communities from the five priority areas is as follows: 5 in Orange Walk District (San Carlos, Fire Burn, Indian Church, San Felipe, and Santa Marta), 6 in the Belize District (Nago Bank, Bomba, Boston, Maskall, Rockstone Pond, Santana), 5 communities in Cayo District (Valley of Peace, Buena Vista, La Gracia, San Antonio, Seven Miles), 2 communities in Stann creek District (Cow Pen and San Juan) and 5 communities in Toledo District (Trio, Bella Vista, San Isidro, San José, San Pablo). Data on the numbers of households and numbers of farmers for each community are presented in Annex 3.

30. It should be noted that the programme´s target group of poor and vulnerable farmers or agricultural workers, is scattered throughout the country and that IFAD together with the Ministry of Agriculture have made the effort of identifying their location, which has resulted in the first group of communities that constitute the five priority areas. As the focus of the Be-Resilient programme is mainly on poor and vulnerable market oriented farmers with the potential to improve productivity and insertion in value chains rather than subsistence farming, the communities with poor subsistence (not market oriented) farmers (most of whom indigenous people) of the Toledo district, have not been included in the priority areas; even though Toledo is one of the districts with the highest poverty

levels. However, as new communities still need to be identified and phased-in during programme implementation, some additional communities from Toledo might be considered.

31. In addition, the Corozal District was not included as a priority area despite its rising incidence of rural poverty as it is perceived that many farmers are reluctant to diversify out of sugar. Furthermore, the district has received major investments from government and numerous development projects and, as such, was not considered as a priority by the government. However, a study on Corozal will be carried out early in programme implementation in order to establish in which communities, small-scale producers might be interested in diversifying out of sugar, their value chain opportunities, their socio economic (including gender) characteristics, amongst others. As a consequence, inclusion of communities from Corozal that fit the established criteria (see above), could be considered during programme implementation.

32. Any new community (also identified in the design document as non-priority area) to be phased-in during programme implementation will be identified by the PMU, in line with the targeting criteria, the GOB's priorities and the orientation from the Programme Oversight Committee (POC).

33. A short description of each of the five priority areas follows:

34. **Toledo**. The communities of Trio, Bella Vista, San Isidro, San José, and San Pablo in the Toledo district are made up of approximately 1,280 rural households. Many of the inhabitants are by now Belizean citizens but are originally from El Salvador, Honduras and Guatemala. According to the CPA, about 40% of the households are poor[62]. Many farmers are also agricultural workers, but their socio-economic situation worsened when one of the banana plantations closed, and several banana farms were consolidated into fewer operations. The small–scale farmers (approximately 750) of these communities produce a variety of crops for self-consumption: corn and beans, banana, plantain and vegetables (tomato, sweet pepper, etc.). Whenever possible they sell these products also in local markets to generate some income to buy foodstuff and meet other household needs. Almost all farmers produce **pineapple**, most of which are sold to the Citrus Processing plant. Their main constraint with this market is their limited negotiating position as they depend on the plant to buy their fruit, and the fact that the plant has changed the variety of pineapple (to MD2) that it needs for processing. At the time of Programme design not all farmers have been able to make the shift. Pineapple is also often bought by middlemen but at lower prices. Furthermore, their challenges are related to poor rural infrastructure such as a lack of drainage and poor feeder roads that contribute to higher production costs. The farmers who produce vegetables (there are 7 greenhouses in Trio) have difficulty selling their products, as supplies from the Cayo district flood the local markets. There are three (3) formal farmers' organisations: El Paraiso Farmers' Cooperative, Trio Farmers for Development Cooperative, Cooperative los Buenos Amigos (41 male and 7 female members) in these communities. These organisations are weak and they do not provide services to their members, a major reason why they experienced a decrease in membership. Though female participation is very low in the organizations, they are open to inviting new male, female and young members. There are also two (2) producers groups in Bella Vista, mainly women, who made initial investments (building and equipment) through assistance from "Vision Verde" to solar dry pineapple, and they have identified a potential buyer in Punta Gorda. Finally, it is important to mention that especially in Bella Vista which is s larger community, most families have backyard gardens as part of their coping strategy for household food security. This activity is particularly important for single mothers.

35. **Stann Creek**. Cow Penn and San Juan are the priority communities in the Stann Creek district. There are approximately 160 farmers out of 400 rural households in these communities, of whom 20% are poor households. Most farmers are subsistence farmers who lease the land and who produce mainly for self-consumption (corn, beans, banana, plantain, tomato, sweet pepper,) and sell to the local markets whenever a marketable surplus is available. There is an informal group of 32 male farmers who produce **hot pepper** (habanero) for the Marie Sharp processing enterprise that produces

[62] Data is normally reported on official villages and not on communities. However, given the terms village and community are often used interchangeably in Belize, the term community will be used in this document.

hot pepper sauce that is sold both locally and exported. Women participate in production, but do not form part of the group. The group has no written agreement with the factory and apparently the price received for their product has remained the same over the last couple of years, though their production costs have increased. The men produce only the amount agreed upon with the factory and then return to work on the banana plantations. This group could improve the productivity and produce hot pepper the whole year instead of being part-time farmers, if they could receive technical assistance, have their fields irrigated, or could produce in green houses. A visit to the Marie Sharp factory during the design mission found that the factory is applying for certification to export to Europe; if obtained the factory's demand for hot pepper would at least double to 1.0 million lbs./year. There is also another hot peeper processor, "Hot Mama's", that is located in the Cayo District.

36. **Cayo**. The priority communities in this district comprise a total of 1,000 rural households in Valley of Peace (65% poor), La Gracia (50% poor), San Antonio (34% poor, of whom half are indigent), Buena Vista (47% poor), and Seven Miles (poverty data not available). Overall there are around 400 small farmers, and most of the larger farmers are mainly located in San Antonio. Valley of Peace was founded in 1982 as a refugee community for immigrants fleeing from the civil war, especially from El Salvador, and other Central American immigrants joined the community during the same time. Most of the refugees were farmers, and each family was given 1 acre of land to live on and 50 acres to farm. Valley of Peace and surrounding villages have grown to become predominant suppliers of fruits (e.g. water melon) and **fresh vegetables** (e.g. cabbage, cucumber, tomatoes, sweet pepper) to the Belmopan Market, and even to Belize City and markets in Stann Creek and Toledo. No agro processing is done at the moment but groups of women have expressed their interest in this as an income generating activity. Although men and women are both involved in the production process, women are under-represented in the different formal and informal producers' associations[63] in this priority area (97 men and 10 women). The under representation of women has mainly to do with land tenure. The 50 acres per family were assigned to the head of the household (men) who then, as landowners, became eligible as members of the organization; this is however not "written in stone" and can be arranged through changes in the organizations´ by-laws. Most of the organizations are weak, the members don´t produce together and don´t market together, meaning that the organizations basically do not provide any services to the members. Only the "Valley of Peace Agricultural Producers Association" grow 5 acres (of a total of 20 acres of collective land) of plantain together in order to generate revenue for the functioning of their organization and to assist members in emergencies. While marketing has its challenges (conditions of feeder roads, contraband from Mexico, low prices when they sell to middlemen), there seems to be little effort from the farmers themselves to address the situation: they haven´t been able to plan their production in order to avoid flooding of the market and there haven´t been initiatives to sell produce in restaurants or supermarkets or approach the company "del Norte" that produces ketchup.

37. **Belize**. The villages of Maskall, Nago Bank, Bomba, Boston, Rockstone pond, and Santana and their 350 households make up this priority area. Between 20-25% of the households in this area are poor, according to the Poverty Assessment. Many of the households have at least one member working in the tourism industry or as a civil servant or in construction. There are around 110 full-time small farmers who mainly produce a variety of **fresh vegetables** like tomato, onions, sweet pepper for the local markets (sold directly by the farmers or through middlemen), but also sorted and packaged vegetables for restaurants and supermarkets in Belize city and Belmopan. Land tenure is a challenge as most of the land is privately owned by people not living in Belize and is being used by farmers in the area for production (future land conflicts might arise if not properly addressed). Drought in the area is getting worse and irrigation in some farm fields is required. The condition of the feeder roads in a major constraint to get the produce out to the markets without damaging it; furthermore, there is an opportunity in penetrating the high end market in San Pedro if the access through the river at

[63] Cooperativa de productores de frutas tradicionales Bromelia, Sta. Familia Grains, Vegetables and Legumes, San Antonio Peanuts and Grains Cooperative, Osmulkah agroprocessing youth Cooperative, Association Agrícola Valle, Valley of Peace Agricultural Producers Association, and Farmers Group La Gracia.

Bomba could be improved (dredging). In the area there are four producers´ organizations, with 69 members (48 men and 21 women): Maskall Farmers´ Cooperative, Los pequeños agricultores y ganaderos de Nago Bank, Bomba United Farmers Group, and Rockstone Pond Farmers Group. Like in Cayo district, there is no agro processing happening at the moment, but women have expressed their interest in this as an income generating activity. The Maskall Farmers´ Cooperative is building a small storage facility for agricultural input and will be starting to provide these services to the farmers in the priority area, whereas the Nago Bank organization is constructing a small packaging facility to increase the quantity and quality of the products they sell to Brodies supermarket and restaurants in Belize city.

38. **Orange Walk**. This priority area is made up of five villages: San Carlos (60% of the households are poor), Fire Burn (70% poor), Indian Church (39% poor), San Felipe (44% poor), and Santa Marta (40% poor) and its approximately 580 households. In total there are around 280 small farmers that grow fruits such as water melon and a variety of vegetables. The main vegetables oriented to the market are: **onions, carrots, and potatoes**. Only San Carlos produces for instance 300,000 pounds of onions a year of the 2,500,000 pounds the country annually produces and of the 5,000,000 pounds of onion is demands on a yearly basis (the difference is imported). The 25 families in San Carlos are mainly immigrants from El Salvador; their Cooperative "New Farmers´ Cooperative" owns 1,300 acres of land and each family has been assigned 50 acres as farm land and then some for living. The production of onions, carrots and potato is done collectively. There are no green houses in the area. Besides the crops oriented towards the market, the families grow corn, soy, beans, tomato, amongst others for self-consumption and local markets. The small farmers face major challenges with the market, e.g. contraband from Mexico and import licenses authorized by the Ministry of Agriculture that compete with the locally produced vegetables due to poor coordination. There are some structures to store onions for a couple of months (FAO project), but these are far too small for the amount being produced in the area.

39. **Target group.** Targeting criteria used to identify the target group include poverty levels and socio-economic vulnerability, as well as vulnerability to climate change effects. The definition of the target group takes into account the following facts:

- Farmers and farm activities in Belize are highly vulnerable to climate change effects[64];
- Small farmers are found throughout the country in "pockets" of areas with agricultural production potential;
- Amongst the small-scale farmers both subsistence farmers and market oriented farmers can be found;
- Though many small-scale farmers may lease or own 25 or even up to 50 acres, they would only cultivate a small part of the land;
- Many small-scale farmers are poor (below the poverty line) or vulnerable (25% above the poverty line);
- Almost one third of the small-scale farmers are women; and
- Around 37% of the farmers are between 15 and 39 years old.

40. The target group can be defined as poor (whose income is below the poverty line) and vulnerable rural families (their income is 25% over the poverty line, but likely to fall into poverty as a result of increased climate change effects (e.g. drought, floods) and economic external shocks (changes in prices), with less than 25 acres, that are engaged in part-time or full-time farming or that are agricultural workers and that have the willingness and potential for improving productivity and access to markets.

41. The fact that the target group is defined as poor or vulnerable rural families doesn't contradict the fact that these families are, even though at present only marginally, engaged in market oriented

[64] Rainfall is projected to decrease slightly and become more variable leading to intense rains and flooding on the one hand and droughts on the other; warmer temperatures would also worsen drought conditions.

farming and have the interest of further moving towards a more business oriented approach to farming, rather than the subsistence farming in which many other poor are presently involved.

42. The Poverty Assessment for Belize gives an indication of some of the characteristics of the poorer and vulnerable members of the target group. The poorer members of the target group are mainly those with:

- With 5 or more people in the household;
- That have food in security issues in certain periods of the year;
- Whose head of the household with maximum primary education; and
- Without piped water or a flushtoilet in the dwelling.

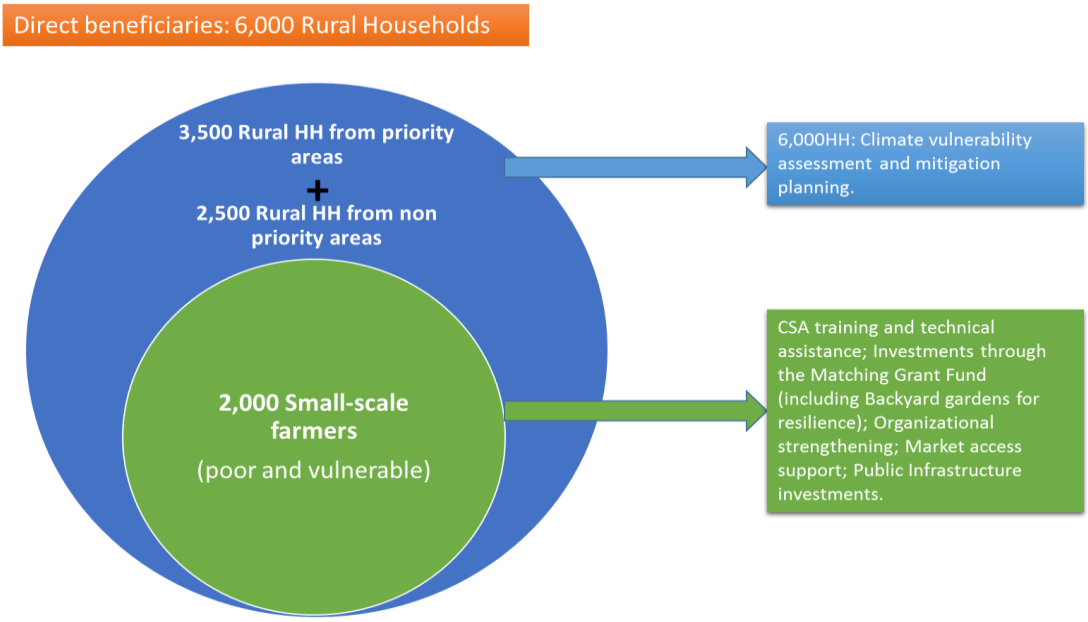
43. The vulnerable members of the target group are mainly those that:

- Have less than 5 household members;
- Have no food security issues;
- Whose head of the household has secondary education; and
- Would contract workers for agricultural activities.

44. **Direct beneficiaries.** The direct beneficiaries will be 6,000 rural households: 3,500 rural households in the villages and communities that make up the priority areas for programme implementation and 2,500 households from non-priority areas, to be identified during implementation. The beneficiaries will comprise male and female inhabitants and small-scale farmers from these households in selected rural villages that have the willingness and potential for improving productivity and access to markets.

45. All 6,000 rural households will benefit from the climate vulnerability assessment and mitigation plans that will be developed in a participatory manner in response to the fact that the future climate for Belize is projected to be characterized by increasing temperatures and declining levels of precipitation with far reaching effects on agriculture and food security. Approximately 2,000 of these households will also benefit from support to the establishment or improvement of backyard gardens as one of the strategies to increase climate change resilience; they can apply through informal groups to receive support from the MGF for this specific purpose. Furthermore, many of these households will benefit from the implementation of approved proposals in support of rural resilient infrastructure (Component 2).

Figure 1: Direct Beneficiaries "Be-Resilient"



46. Taking into account the effect the changes in climate will have on farmers and the role of farmers in the Nation's food supply, this group has been identified as a specific target group amongst the 6,000 rural households (see Table 1). According to the last Agricultural Census (2011), all together there are 19,200 farmers in Belize, of whom approximately 15,000 are small-scale farmers with land holdings from less than 1 acre up to around 25 acres[65]. Of these 15,000 small-scale famers, around 1,700 are located in the priority areas identified for programme implementation (see Table 7) and an additional 300 will be identified during programme implementation, making a total of 2,000 small-scale farmers. These 2,000 small-scale farmers will benefit from climate resilient training and technical assistance, investments through the Matching Grant Fund (MGF), backyard garden improvement/establishment, organizational strengthening, and market access support. This group of 2,000 small-scale farmers would be made up of 40% "poor farmers" and 60% "vulnerable farmers".

Table 7: Number of small-scale and large-scale farmers in identified priority areas (2011)

Priority area in each District	Number of small scale famers	Number of large scale farmers	Total number of farmers in priority areas
Orange Walk	280	60	330
Belize	110	30	130
Cayo	400	150	550
Toledo	750	150	900
Stann Creek	160	10	170
Total	**1,700**	**400**	**2,100**

Source: Agriculture Census 2011. The Statistical Institute of Belize.

47. Taking into account that 30% of farmers in Belize are women, that women are engaged in several farming and marketing activities (table 6), as well as responsible for backyard gardening, forty percent of all programme beneficiaries will be women and sixty percent will be men. Amongst all beneficiaries, youth participation is expected to be 20% (both male and female). Female participation (40%) is expected to happen in all key programme interventions: development of climate vulnerability

[65] On occasions up to 50 acres may have been assigned to a family, but only a few acres would be under cultivations.

assessment and mitigation plans; climate resilient agricultural practices training and TA, market training and support; strengthening of Producers Organizations (PO) and Water Users Associations, MGF proposals and investments; amongst others.

48. Furthermore, the Programme will benefit approximately 50 professional staff from the Ministry of Agriculture (Extension, Cooperative Dept., BMDC) through capacity building and training (this is further detailed in Appendix 4).

C. Strategy for Social Inclusion and Gender Equality

49. Affirmative actions are specific activities designed to address inequalities in a society and help members of a disadvantaged group or a more vulnerable group to overcome obstacles to equal access to development opportunities. Implementation of the “Be Resilient” Programme will take into consideration, amongst others:

- Terms of Reference of all PMU staff as well as contracts and MOUs with implementing partners and service providers will include understanding and demonstrated experience in working from a gender equality perspective, as a requirement;
- Participation of a male and a female representative of beneficiaries in the Programme Oversight Committee (POC);
- The strengthening of Producers Organizations (PO) and creation of Water Users Organizations (Component 2) will promote the participation of women;
- Monitoring and evaluation will use disaggregated data (registration, collection, analysis and reporting) and the Programme´s implementation strategy will be adjusted, if gender and poor population targets are not met;
- Awareness raising and training materials will be adequate and understandable for its specific audiences;
- Provisions would be made for training to be implemented as much as possible in rural communities to make them more accessible to women; and
- Women´s and youth participation in technical assistance and exchange visits or study tours organized or financed by the Programme will be facilitated.

50. The Matching Grants Fund (MGF) (Component 1) is a competitive fund to which organizations (formal and informal) of male and female small-scale farmers can submit business proposals in line with their reality, needs and opportunities. The MGF will also have certain gender considerations.

51. These would include but are not limited to:

- The Calls for proposals for the Matching Grants Fund, will explicitly mention the Programme´s target group and specifically invite young and female farmers to participate;
- Selection criteria for the proposals presented to the Matching Grants Fund will include a bonus for business proposals presented by young farmers, female farmers or organizations that have at least 40% women in their membership; and
- Any business proposal that includes the reduction of women´s workload, either through the proposed technology to be introduced, or other measures (e.g. more equal distribution of domestic work amongst household members), would receive a bonus. This will be defined in the selection criteria for Business proposals for the MGF.

52. Through the MGF, the Programme would support beneficiaries with investments for climate resilient and market and value-added support technologies and practices. Investments such as cookstoves using renewable energy sources and that have as a co-benefit the reduction of women´s workload could be part of Business Plans. This would increase the time available to women to participate in leadership positions, training and technical assistance, and/or to become engaged in new or existing productive and income earning activities.

53. Youth are a very diverse population, as are their employment and self-employment expectations. Many youth are interested in activities that they believe will offer them some sort of "status" or provide a better salary. In general, young people need quicker responses to their proposals

than individuals from older age groups, as they are known to lose interest faster; this implies a challenge for government and non-governmental institutions whose processes often have too much red tape. In the case of the Be-Resilient Programme, this means that quick responses with regard to the MGF are expected.

54. As female participation in agriculture is often underestimated and invisible, also by the agriculture extension workers, the MoA staff and Climate extension agents (PMU) will receive training in gender equality concepts and practical tips as how to ensure equal male and female participation in extension, training, farmer to farmer training, and technical assistance. The key farm activities in which more than 25% of women are directly involved include irrigation and water management, harvesting of own permanent crops and fruits, milling, grinding and sun drying, and livestock rearing: cattle, but also sheep, pigs and poultry. These data provide an important orientation to “Be Resilient” Programme implementation, as it clearly shows that Climate extension and technical assistance needs to reach and benefit both men and women. While women are less involved in marketing, the Programme´s marketing support should take into consideration that between 14-18% of marketing of grains, permanent crops, and vegetables are carried out by women, and that their participation in training, fairs, buyer/seller encounters, is essential. Finally, new opportunities for young men and in particular women, to become engaged in an agroprocessing business as part of the value chain approach, will continuously be identified and supported.

55. Under Component 1, there will be specific attention to strengthening gender equality in the Producers´ Organizations (PO) as at present the female participation in these organizations is very low (30%). Awareness raising amongst POs members of women´s and young people´s potential as members and leaders, and the strengthening of their capacities and leadership skills are important elements. Therefore, the capacity building programme to be developed and implemented with the Producers´ Organizations will not only focus on administrative, business and organizational skills, but also social inclusion (youth and women), confidence building, leadership training, and rural empowerment. In addition, the POs will receive training from the PMU regarding gender equality, identification of inequalities and affirmative actions, including actions a PO can take to increase their economic empowerment and to reduce women´s workload (e.g. working towards more equitable share of domestic chores, including child care between spouses/partners). The Rural Organizational Strengthening Specialist will be responsible for achieving this and will work closely together with staff from MoA s Department of Cooperatives.

56. The Programme will make special considerations for women who are occupied with domestic chores and child care. In this regard, the Programme will invest in temporary day-care facilities when required during training sessions held either by the PMU or Service Providers, in order to facilitate the participation of women who can bring their small children to trainings and workshops. This measure involves a minor investment in some plastic chairs for children, educational toys, drawing materials, etc., as well as the hiring of a local person (male/female) who can take care of the children in the same area where their mothers are receiving their training.

57. IFAD has developed several Learning Routes and participation in these as well as national and international study tours/exchange visits have been programmed for beneficiaries and MoA staff in Gender Equality.

58. The assumption that women are only concerned about water for domestic purposes and men are responsible for productive water use, has been proven incorrect. In Belize, women’s participation in irrigation and water management is at present 27%, which is an indication that also in the rural infrastructure component and setting up of Water Users Associations (WUAs), women need to be involved as well. The Terms of reference for the International consultant to be contracted under Component 2 to strengthen WUAs would include gender equality considerations. Women´s participation is foreseen to happen from the start: the creation of the WUAs, as members and as leaders involved in decision making; and then continuously their training and capacity building.

59. As one of the few ministries in Belize, the MoA has a recently appointed Gender Focal Point. The Programme would support some technical activities as identified by the Gender Focal Point, such as studies, workshops, etc.

D. Implementation Arrangements and Human Resources

60. Social inclusion, youth and gender equality are mainstreamed throughout the Programme objectives, activities, targets, and resources. Funds have specifically been included in the budget for: (i) Training in gender equality for PMU staff; (ii) Training in gender equality for Ministry of Agriculture (Extension, BMDC, and Coop. Dept.); (iii) Gender equality learning route for beneficiaries and staff; (iv) Support to Gender focal point activities in MoA; and (v) Gender equality impact study.

61. The implementation of the targeting strategy and gender considerations is a shared responsibility of the PMU staff and all institutions that implement and provide services to the Programme, but ultimately the responsibility lies with the Programme Manager. The Rural Organizational Strengthening Specialist would be directly in charge of the implementation of the targeting strategy and gender considerations, whereas the M&E Specialist would be in charge of monitoring compliance with targeting criteria, progress and meeting AWP&B and LF targets.

Annex 1: IFAD'S targeting policy - design checklist

Questions Design Issues	Recommendations
1) Does the **main target group** - those expected to benefit most - correspond to IFAD's target group as defined by the Targeting Policy (the extremely poor and food insecure)?	The target group comprises the rural poor as well as vulnerable groups. In the case of Belize it is particularly important to include the vulnerable groups as they are at risk to fall under the poverty line as a result of climate change effects, droughts, floods or economic shocks. Of the sub target group of 1,700 small farmers would be 40% "poor farmers" and 60% "vulnerable farmers".
2) Have **target sub-groups** been identified and described according to their different socio-economic characteristics, assets and livelihoods - with due attention to gender differences?	Taking into account the effect the changes in climate will have on small farmers and their role in food security for the country, this group has been identified as a specific target group. 30% of the farmers are women; their present participation in specific farm and marketing activities has been identified.
3) Is evidence provided of **interest in and likely uptake of the proposed activities** by the identified target sub-groups (self-targeting)?	Design took into consideration interests among male and female farmers as expressed by them during the Design Mission. Meetings and field visits gave insight in the interests of the target sub-group.
4) Does the design document describe a feasible and operational **targeting strategy** in line with the Targeting Policy? The targeting strategy will involve either all or some of the following measures and methods.	The targeting strategy includes with geographic targeting (5 priority areas); describes targeting criteria; includes affirmative actions in design for gender equality and describes direct targeting as a feature that is key to the functioning of the MGF.
4.1) Geographic targeting based on poverty data or proxy indicators to identify, for area-based projects or programmes, geographic areas (and within these, communities) with high concentrations of poor people	The targeting strategy is based amongst others on geographic targeting: 5 priority areas have been identified and described (as well as the criteria for their selection).
4.2) Enabling measures including measures to strengthen stakeholders' and partners' attitude and commitment to poverty targeting, gender equality and women's empowerment, including policy dialogue, awareness-raising and capacity-building, and appropriate project/programme management arrangements (references in ToR, PCU composition); language in describing staff positions (s/he; masculine/feminine).	Specific affirmative actions, activities, selection criteria for investments and other gender considerations have been included and are described in Section D. of Appendix 2.
4.3) Empowerment and capacity-building measures including information and communication, focused capacity- and confidence-building measures, organisational support, in order to empower and encourage a more active inclusion in planning and decision making of people who traditionally have less voice and power.	Under Component 1 there will be specific attention paid to strengthening gender equality in the producers´ organizations. The capacity-building programme to be developed and implemented with the producers´ organizations will focus not only on administrative, business and organizational skills, but also on confidence-building and rural empowerment and will boost young male and female self-esteem and capacity.
4.5) Attention to procedural measures that could militate against participation by the intended target groups (such as, excessive beneficiary contributions; cumbersome legal requirements, etc.).	Beneficiary contribution will be small and a combination of in-kind and cash contributions. Also, the MGF has several gender considerations.
5) Monitoring targeting performance. Does the design document specify that targeting performance will be monitored using participatory M&E, and also be assessed at Mid-term review	The main text, Appendix 2 and 6 (M&E) refer to monitoring of targeting performance. All people-related indicators would be disaggregated by sex and age, so that the PMU can monitor differential participation and impact by sex and age group.

Annex 2: Features of gender sensitive design

Questions Design Issues	Recommendations
1. The project design document contains – and project implementation is based on - gender-disaggregated poverty data and analysis of gender differences in the activities or sectors concerned.	Design takes into consideration gender disaggregated data when available (poverty, unemployment, membership of producers´ organisations, famers and gender division of farm activities). Targeting includes gender considerations and specifies targets by sex.
2. The project design report articulates – or the project implements actions with aim to: • Expand women's economic empowerment through access to and control over fundamental assets; • Strengthen women's decision-making role in community affairs and representation in local institutions; and • Improve women's knowledge and well-being and ease their workloads by facilitating their access to basic rural services and infrastructure.	The main text, Appendix 2 and 4 present information about the role of women and men in agriculture, distribution of work, limited participation in producers´ organisations. In the main text and Appendix 2 (Section D) a proposal is presented with overall activities for Programme implementation to ensure access to interventions and co-financing by women (gender in Terms of Reference, adequate training methods and materials, etc.) and other specific gender considerations for implementation.
3. The design document describes - and the project/programme implements - operational measures to ensure gender-equitable participation in, and benefit from, project activities. These will generally include: 3.1 Allocating adequate resources to implement the gender strategy; 3.2 Ensuring and supporting women's active participation in project-related decision-making bodies and committees; 3.3 Ensuring that project/programme management arrangements (composition of the project management unit/programme coordination unit, project terms of reference) reflect attention to gender equality and women's empowerment concerns; and 3.4 Ensuring direct project/programme outreach to women (for example, through appropriate numbers and qualification of field staff), especially where women's mobility is limited.	Overall in all programme activities, female participation is 40% and male participation 60%. Section D of Appendix 2, describes overall project gender equality considerations, e.g.: include experience of working with youth and gender equality in the Terms of Reference of all PMU staff and contracts/MOUs with the service providers; participation of male and female beneficiaries´ representatives in POC; training in communities to facilitate female participation; gender specific selection criteria for MGF investments; women´s workload; youth and female leadership in PO; amongst others. Training in gender equality of PMU and MoA staff is foreseen.
4. The project's Logical Framework and M&E system specifies in design – and project M&E units collect – gender disaggregated performance and impact data.	Monitoring (registration, collection, analysis and reporting) and evaluation will use disaggregated data by sex and age group. Also, a specific gender equality impact study has been planned and budgeted for Y5.

Annex 3: Number of direct beneficiaries in priority areas (in households) and poverty levels

District	*Community*	*Number of Households*	*Percentage of poor*
Orange Walk	FIRE BURN	24	70
	INDIAN CHURCH	62	39
	SAN CARLOS	27	60
	SAN FELIPE	326	44
	SANTA MARTA	133	40
SUB TOTAL		**572**	
Belize	BOMBA	25	20
	BOSTON	37	23
	MASKALL	205	22
	ROCKSTONE POND	39	na
	SANTANA	29	25
	NAGO BANK	11	na
SUB TOTAL		**346**	
Cayo	BUENA VISTA	102	47
	LA GRACIA	37	50
	SAN ANTONIO	380	34
	SEVEN MILES	96	na
	VALLEY OF PEACE	397	65
SUB TOTAL		**1012**	
Stann Creek	COW PEN	282	21
	SAN JUAN	123	10
SUB TOTAL		**405**	
Toledo	BELLA VISTA	819	44
	SAN ISIDRO	71	na
	SAN JOSE	175	na
	SAN PABLO	41	88
	TRIO	178	40
SUB TOTAL		**1284**	
GRAND TOTAL		**3619**	

Source: The Statistical Institute of Belize. Census 2010 and CPA (2009).

Appendix 3: Country performance and lessons learned

1. Since 1986, IFAD has funded three operations in Belize: The Toledo Small Farmer Development (TSFD) Project (1986-1995); the Community Initiated Agricultural and Resource Management (CARD) Project (1999-2005); the Belize Rural Finance Programme (BRFP), a 7-year national programme that was completed in September 2016. The BRFP was approved in 2008 for US$6.04 million including US$3.0 million financing from IFAD, and co-financing from the Central American Bank for Economic Integration (CABEI) and the GOB. According to the Programme Completion Report, the BRFP can be considered a success in achieving its purpose of putting in place an institutionally-driven sustainable system of direct increased access to financial services for the rural poor in Belize. The BRFP reached 5,703 households, promoting access to financial services to 5,960 new Credit Union members and 1,278 active borrowers, as well as 1,231 trained youth and women running a business.

Main Lessons Learnt

2. Given BRFP's strong focus on rural finance, with no activities directly involving agricultural value chains and rural infrastructure, the extent to which lessons learned are available is limited. In this regard, the Programme should make the most possible use of partnerships, focusing on the GCF/GOB as co-financiers, and on other development partners, especially the FAO, CABEI and the CDB as sources of knowledge for the planned activities.

3. The main lessons learnt from previous IFAD projects call for improved support to development projects in Belize including: (i) intensive support at project start-up to ensure that the design is effectively translated into implementation; (ii) more emphasis at the start-up of the project to install and operationalise an appropriate monitoring system that will respond to the management information needs of the implementers, partners, and assist in detecting when a project deviates from its planned approach; (iii) there is a need for future project initiatives to clearly state intentions and gauge and manage the level of expectations generated.

4. **Project design.** The design of the CARD project was found to be relevant to the target group and the National Poverty Elimination Strategy focusing on the poverty "hotspot" of the Toledo District, and supporting ecologically sustainable agricultural practices and addressing concerns with the traditional Milpa agricultural system. Though the Be-Resilient Programme focuses on poor rural households and communities, it is different from the previous SFDP and CARD projects and this requires a different formulation and operational strategy. Strategy formulation in the Be-Resilient Programme took into account lessons that were mainly learnt during implementation of the recently completed BRF Programme, although that was not agricultural-based or addressed infrastructure constraints.

5. An additional lesson from the CARD project is that it was designed to build from the activities of previous projects and it aimed to respond to the stated interests of the communities that had participated in its design. That project was based on a community-initiated approach that in theory allowed the communities to have a say in their own development. However, due to both the context in Southern Belize (indigenous communities, milpa production system, etc.) and the difficulties experienced in implementation, the potential of the design was not fully realized. The Be-resilience Programme is designed with the inputs of the beneficiaries but there are many complexities in the rural communities targeted (cultural, gender, etc.) and constraints (organizational, logistical, etc.) which require a more gradual approach to programme execution. Initial start-up, logistical requirements and speedy disbursements in execution and management of sub-projects are the most important challenges that rural development projects face in Belize.

6. **Gender Issues:** Targeted gender impact initiatives can work and yield tangible results and outcomes, especially if addressed comprehensively (e.g. on several fronts), and addressed early in

the programme. Gender targets/indicators as established in the Logical Framework must be clear and consistent.

7. **Public-Private Partnership.** The BRFP project highlights that Public Private Partnership (PPP) models can be effective in introducing and implementing access-to-finance programmes in poor rural markets. Although the government played a vital partnership role in overseeing implementation, that project was largely private sector driven and its innovative model can most likely be credited for why the programme was so effectively implemented in a timely and minimal delays and within budget. In the case of this programme the PPP model is also a useful one but it will have different dimensions that are critical to contributing to its success. Small farmers do have the required resources and are unable to undertake the investments in technical services and developing the market linkages between producers and buyers. Public institutional support is critical and a PPP model involving producers, buyers and governmental institutions (MOA, BMDC, etc.) needs to be developed to ensure longer term success and sustainability[66].

8. **Other Lessons.** There are lessons learnt from similar projects and interventions in Belize by regional and international organizations that are worthwhile highlighting for this Programme; (i) depending on market opportunities, productivity and innovation can be strongly influenced by clusters or geographic concentrations of farmers, related businesses, suppliers, service providers, and logistical infrastructure in a particular industry or sub-sector; (ii) it is important to make sure that the communities can access national programmes and that there be greater involvement of local leaders in decision-making, building local capacity and longer term investments to ensure longer term sustainability; (iii) to increase food production at competitive prices and quality, developing and adapting technological components can be achieved by greater efficiencies in using better genetic materials, drip irrigation, nutrient recycling, and in some cases labour implements; and (iv) to be efficient and competitive for food security, Belize needs to build on organizational, market, technological and diversification systems and innovations to support a small farmer-led productivity growth in food production and distribution.

9. **Commodity Value Chain:** Except for the recently concluded FAO project on value chains (on 3 commodities) that focused on small farmers in the northern part of the country, no project has addressed the commodity value chain approach in the agricultural sector. The lessons learnt from the FAO project are still being documented and will be available soon. Given some similarities of that project with the proposed programme, the lessons learnt from that project should be invaluable for the final design and implementation of this Programme.

10. **Infrastructure**: In rural Belize there is huge unsatisfied demand for rural infrastructure and the CRRIA activities will be the first intervention in rural infrastructure by a foreign donor institution. So far, the improvements of rural level public infrastructure have been funded exclusively from the central budgets (mainly the rural roads by the Ministry of Works) with limited amount or by farmers themselves limited technical efficiency. However, the design of the component will build upon experience from other donor institutions (World Bank, Inter-American Development Bank (IDB), Caribbean Development Bank (CDB)) and IFAD experience and lessons learned from the similar activities.

11. A key and positive lesson learnt is that public infrastructure investments can leverage substantial private and public co-financing, building robust producers-public-private partnership. Early indications from both authorities and smallholders in Belize are encouraging.

12. The main lesson from the similar IFAD activities is that to maximize the impact of small-scale rural infrastructure, it is essential they are closely synchronised with other programme interventions to

[66] So far strategies have placed much emphasis on developing PPP models that focus on external markets for Belize's products, because the agricultural strategy has pursued export-led growth as the driver for expanding the sector. While this strategy is still important, the NAFP indicates that local markets are not sufficiently exploited, and it emphasizes the need for effective PPP models to be developed particularly involving small farmers if there are to be improvements in value chains and accessibility to markets, both local and foreign,

achieve the desired complimentarily wherever relevant and demanded. It is also essential to fully define maintenance arrangements of build infrastructure and also put emphasis on environmental assessment and operation of infrastructure.

13. Thus, the main design considerations for CRRIA component activities are consequently:

- The need to develop and demonstrate replicable mechanisms for climate change adaptation, infrastructure and environmental related investment to support commercial, market-oriented businesses in the programme area;
- Specification of clearly defined, transparent and consistently applied investment selection criteria including technical feasibility, and climate change vulnerability and support for agricultural commodity chains or clusters;
- When beneficiaries articulate their needs, sustainability and relevance is improved. Hence support should be provided on the basis of demand-driven investment opportunities available to individual farmers, farmer/producer organizations and private sector services;
- Acceptance of the principle of cost sharing in investment (by Government at public level and by farmers at the on-farm level) and the adoption of climate change adaptation and market terms for all investments under consideration.

14. **Sustainability**. As CARD and other projects have shown, programme sustainability requires that there be **c**ontinued investment in the priority areas and communities. The full benefits from project investments can only be realized with continued investments at the production and community levels. It is important that the beneficiaries access national programmes, and that the investments be more targeted (such as upkeep of rural infrastructures, etc.) and support from institutions like the MOA and the BMDC (technical and other advisory services, etc.), greater involvement of local leaders in decision-making, building local capacity and longer term investments.

Appendix 4: Detailed Programme Description

1. Located in the Caribbean hurricane belt, Belize's vulnerability to the impacts of climate change is reflected in increased frequency and intensity of tropical storms and hurricanes, documented trends of increased droughts, flooding, and significant rainfall pattern variations[67] Small farmers are amongst the most vulnerable as they suffer devastating losses, most dramatically in the occurrence of an extreme event but similarly through the impacts of persistent and unpredictable seasonal variations. This vulnerability is exacerbated by limited access and poor conditions for marketing their products. With their current assets, capacities and connections to markets, smallholders are not equipped to deliver a regular supply of adequate volumes of quality products required for sustainable market access. As such, markets have turned towards importing a large proportion of the food needs, including vegetables and fruits that have traditionally been supplied by smallholders and that, with the appropriate support, can be competitively produced in Belize.

2. The Be-resilient Programme is a joint effort by IFAD and the Government of Belize (GOB) to contribute to the economic growth of Belize and to improve the livelihoods of poor rural households. The Programme aims to increase the economic, social and environmental resilience of small farmers, by creating the conditions for them to have a sustainable production and market access for their products, thus improving their incomes and their overall livelihoods. Its overall objective is to increase and diversify agricultural production by small farmers, and to facilitate their access to commercial market chains for the off-take of their surplus production, while building overall resilience to climate change. Furthermore, it will broadly address some of the main challenges and issues regarding the country's sustainable development, from increasing food security and rural livelihoods and poverty reduction to increasing resilience against climate adversities, gender, and opportunities for women and youth.

3. In the context of small farmer agriculture in Belize, improved resilience is defined as the capacity to minimize the impacts of climatic and economic shocks, enabling farmers to confront periodic variations and strengthening their capacity to cope and recover in times of extreme stress. This requires significant improvements across the entire value chain for any given commodity, as weaknesses in production systems and practices, fragile and variable physical access to markets, and limited capacity to respond to market demands are all factors that contribute to farmers' vulnerability. The Programme proposes a comprehensive approach to reducing small farmers' exposure to climate and economic shocks by promoting climate resilient production, investing in climate resilient infrastructure, supporting producer organizations, enhancing market access, and strengthening value chains to insert small farmers as reliable, competitive suppliers of farm products in the domestic market. The Programme's interventions are largely based on the need to address several constraints and challenges facing small farmers in Belize, enhancing their role in national food security and addressing rural poverty.

4. **Small Farm Agriculture and Production.** Belize's agricultural policy emphasizes market-led strategies, increasing diversification, the development of small farm agriculture, improving value chains and achieving self-reliance for food products as the main goals. The agricultural sector, including fisheries, is an important sector in the economy and it plays a critical role in food security and rural development. This is in light of the fact that the country's rural communities in Belize are largely agrarian in nature with a high dependence on agriculture for employment, income and food security. The country is relatively self-sufficient in staple food products such as corn, rice, beans, bananas, plantains, root crops and fruits. Some vegetables such as tomatoes, lettuce, broccoli, carrots, celery and cabbage are generally produced seasonally as a result of a primarily rain-fed production system.

[67] Please refer to the Social, Environmental and Climate Analysis in Appendix 12 for a comprehensive description of climate impacts in Belize.

5. Small farmers dominate Belize's agricultural sector. The 2011 Agricultural Census showed that there are 19,200 farmers in Belize, and 78% of these are smallholders with less than 25 acres per household. This census also showed that Toledo district has approximately 25% of the farms in Belize and the highest level of concentration of small farms, followed by Orange Walk and Corozal Districts.

6. Many small farms are mixed farms with most involved in subsistence agriculture, with some livestock. Small farmers usually produce commodities such as corn, rice and beans, and predominantly vegetables and fruits as income generation crops on a variety of farming systems in Belize's six districts. These commodities are mainly grown as cash crops in a set of villages in the Cayo, Belize, Orange Walk and Toledo Districts. Most vegetables (tomato, sweet pepper, cabbage, etc.) and some fruits (pineapple, watermelon, mango, etc.) are produced for the domestic markets.

Table 1: Production of Thirteen Main Vegetables (2014-2016)

VEGETABLE	PRODUCTION MEASURE	UNIT	YEAR		
			2,014	2,015	2,016
CABBAGE	Total Production	lb	1,854,025	884,500	1,121,500
	Acres Harvested	ac	70	35	53
	Average Yield	lb/ac	26,486	25,092	21,085
CUCUMBER	Total Production	lb	593,000	365,300	382,480
	Acres Harvested	ac	71	45	51
	Average Yield	lb/ac	8,352	8,163	7,469
HOT PEPPER	Total Production	lb	582,900	309,975	422,028
	Acres Harvested	ac	92	42	55
	Average Yield	lb/ac	6,336	7,469	7,737
OKRA	Total Production	lb	46,155	54,675	29,500
	Acres Harvested	ac	13	8	5
	Average Yield	lb/ac	3,550	6,729	5,900
SQUASH	Total Production	lb	237,000	125,000	45,000
	Acres Harvested	ac	39	28	15
	Average Yield	lb/ac	6,077	4,464	3,000
PUMPKIN	Total Production	lb	394,500	408,875	225,600
	Acres Harvested	ac	69	71	32
	Average Yield	lb/ac	5,717	5,800	7,050
SWEET PEPPER	Total Production	lb	918,115	1,407,125	3,424,963
	Acres Harvested	ac	82	90	152
	Average Yield	lb/ac	11,265	15,652	22,585
TOMATOES	Total Production	lb	1,908,000	2,335,563	4,903,925
	Acres Harvested	ac	103	109	201
	Average Yield	lb/ac	18,524	21,526	24,422
IRISH POTATO	Total Production	lb	650,000	750,000	805,000
	Acres Harvested	ac	65	70	74
	Average Yield	lb/ac	10,000	10,714	10,952
ONION	Total Production	lb	1,886,603	2,023,500	2,127,100
	Acres Harvested	ac	114	108	121
	Average Yield	lb/ac	16,549	18,736	17,638
CARROTS	Total Production	lb	391,001	362,000	466,500
	Acres Harvested	ac	28	26	32
	Average Yield	lb/ac	13,964	13,923	14,670
STRING BEANS	Total Production	lb	16,350	4,200	2,000
	Acres Harvested	ac	6	4	2
	Average Yield	lb/ac	2,637	1,050	1,000
LETTUCE	Total Production	lb	887,900	375,450	189,720
	Acres Harvested	ac	34	11	6
	Average Yield	lb/ac	25,886	35,588	34,495

7. Belize has made slow progress over the years to meet its demand requirements for vegetables and fruits. Table 1 shows the production of 13 main vegetables in the last three years. There has been an expansion in production of certain crops like tomatoes, sweet peppers, potatoes, onions and carrots. However, production is cyclical and the harvested area and volume of production for these crops are relatively small, a reflection of low productivity, the smallness of the production systems and vulnerability to weather-related factors. The country imports about one-half of its food needs (both official and through contraband inflows, mainly from Mexico) and the trend has consistently increased in the last decade. Much of this import can be met from small farm production but these producers face many constraints. In addition, the sector is highly vulnerable to climate-related factors such as hurricanes, storms and droughts, and to external shocks such as high input costs, fuel prices, transportation, etc. Therefore, the cost of production is a major concern if the sector is to compete in both the domestic and export markets.

8. **Current market situation.** An extensive review of primary and secondary sources of information available indicates that no previous market studies were done on the various agricultural and food markets in Belize. Multiple interviews were conducted with different institutions in Belize, such as the MoA and BMDC, and with various farmers and buyers, as well as a review of the markets during the design mission. This helped to identify the constraints that small farmers face to access markets for their products. Some of these include: (i) weak marketing system services such as inadequate transportation, storage, packaging and the lack of adequate standards that result in higher post-harvest losses and reduce farmers' ability to access several value-added markets (processed and organic, supermarket and hotel outlets) because of unreliable quality, consistency and timeliness; (ii) an inadequate market information system to provide price, volume and other market data on a timely basis, resulting in limited effective decision-making and their efficient allocation of resources and the required dynamism to compete with imports and contraband products; (iii) limited incentives such as access to credit and lower cost input supplies which increases the level of risk involved in investing in existing and new agricultural ventures but which could reduce costs and related transaction costs; and (iv) inadequate attention to market development that results in continued dependence on a limited range of products and uncertain markets. These constraints are exacerbated by the impacts of climate change, as increased variability and intensity of rainfall strongly affects the growing season and therefore, producers' capacity to supply markets.

9. Analysis of markets during the design mission suggested that there is much potential for small farmers to sell their products to local markets, and identified two sets of buyers of products with whom rural producers could be engaged: institutional buyers (hotels, restaurants, etc.) and retail buyers. These two segments in the various districts comprise the major component of the domestic market for vegetables and fruits, in which small farmers have opportunities to establish sustainable linkages with buyers. The buyers, particularly the high-end institutional ones, indicated that lower quality, unreliability of supplies and high prices are the three main factors that reduce their willingness to purchase from local producers.

10. In addition, Belize has a large and growing tourist sector that is a potential market for agricultural products. However, this market remains largely untapped for domestic producers. The potential for substitution of commodity imports combined with the demand for high-quality vegetables, fruits and other agricultural products by the tourism/hospitality sector provides much potential for increasing these products. This provides an expansion opportunity for small farmers if they can improve the quality, quantity and reliability of their supplies. Furthermore, land availability is not a constraining factor for agricultural production as the six districts of Corozal, Orange Walk, Belize, Cayo, Stann Creek and Toledo. All districts together have an agriculture potential of about 800,000 ha, or 38% of the land area, that is suitable for agriculture, of which approximately 15% is cultivated in any given year.

11. Except for the organized export sector (e.g., sugar), small farmers are poorly organized for both production and marketing of their products. As a result, their bargaining power is weak and they are often "forced" to sell their products to middlemen at lower prices. In addition, the lack of coordination among producers and the absence of storage facilities and agro-processing activities often result in an oversupply of products at the same time, usually after harvest, situation that pushes prices down worsening the situation of small farmers. .

Current Situation of Farmers and Producers Organizations

12. Few small farmers in Belize are organized as cooperatives or associations (formal or informal), existing producer organisations have very weak organisational, administrative and technical capabilities. At the moment, most organizations provide limited services to their members (Valley of Peace, Trio, and San Carlos) while those that do provide some services are located in Maskall and Nago Bank. The administrative and operational activities within the producer organisations are conducted by Management Committee members as volunteers. None of the producer organisations have any paid staff (technical or administrative). Nevertheless, producers recognize the importance for them to be organized in order to access technical assistance more easily, and to improve their

negotiating and competitive position in the local market. Some of the services the POs provide are: sharing of market information, collective production of plantain, market outlet and price negotiation, storage facility, introduction of new pineapple variety, amongst others. While the PO members are satisfied with these services, they realize it is not enough and that they are not using their PO to its full potential. From discussions with the PO leaders and members, it is clear that the POs are highly interested in being strengthened in order to provide a wider range of services and that this would attract new members as well.

13. Smallholder farmers face several constraints and an increasing number of challenges including (i) low farm productivity that affects farm income levels and limited ability to compete with legal and illegal imports of food products; (ii) high production costs due to poor secondary and feeder roads in rural areas and high fuel and electricity costs; (iii) inadequate drainage and irrigation facilities that limit the length of the cropping season, resulting in low yields and low product quality; (iv) inadequate research and technology development to address small farmer needs and increase their chances of being competitive in quality and price, particularly for the main food crops; (v) lack of infrastructure to collect and store market products; (vi) cycles of gluts and shortages in the market due to inadequate product planning and infrastructure; (vii) inadequate services, particularly weak input support and systems related to standards, surveillance, quarantine, and pest and disease control and protection measures; (viii) weak coordination among producers, farmer's organizations, suppliers, buyers, the government and other stakeholders; and (ix) high vulnerability to climate-related and natural disasters (hurricanes, rainfall, increased flooding, droughts and the accompanying pests and diseases) which significantly affect rural communities, particularly small farmers, women and the indigenous and poor groups who depend on agriculture. Furthermore, the frequency of climate-related events in the last two decades has increased and severely affected growth and development of small farmers, as they have had to reinvest their limited savings to recuperate from frequent production and infrastructure losses. In the five priority areas, around 20 producers' organisations have initially been identified (see table 2, other POs exist and will be indentified in Y1 of programme implementation). They are small, mainly made up of male producers and few women and young people as shown in the table below.

Table 2: Formal and Informal producer organizations

Name organization (formal and informal)	Village	District	Male	Female	Total
New River Farmers Cooperative	San Carlos	Orange Walk	24	1	25
San Felipe Honey Group	San Felipe	Orange Walk	7	6	13
Maskall Farmers Cooperative	Maskall	Belize	7	5	12
Los pequeños agricultores y ganaderos de Nago Bank	Nago Bank	Belize	14	5	19
Bomba United Farmers Group	Bomba	Belize	20	6	26
Rockstone Pond Farmers Group	Rockstone Pond	Belize	12	0	12
El Paraiso Farmers Cooperative	Trio	Toledo	19	2	21
Trio Farmers for Development Cooperative	Trio	Toledo	5	4	9
Cooperative los Buenos Amigos	Trio	Toledo	17	1	18
Cooperativa de productores de frutas tradicionales Bromelia		Cayo	10	0	10
Sta. Familia Grains, Vegetables and Legumes		Cayo	8	0	8
San Antonio Peanuts and Grains Cooperative	San Antonio	Cayo	15	0	15
Osmulkah agroprocessing youth Cooperative	San Antonio	Cayo	2	10	12
Asociación Agrícola Valle	Valley of Peace	Cayo	20	0	20
Valley of Peace Agricultural Producers Asociation	Valley of Peace	Cayo	32	0	32
Farmers Group La Gracia	La Gracia	Cayo	10	0	10
Total			**222**	**40**	**262**

Source: Cooperative Department of Belize (2016)

14. In the Toledo priority area there are three formal farmers' organisations: El Paraiso Farmers' Cooperative, Trio Farmers for Development Cooperative, and Cooperative Los Buenos Amigos (41 male and 7 female members). These organisations are weak as they do not provide many services to their members. Though female participation is very low in the organizations, they are open to inviting new male, female and young members. There are two producers' groups in Bella Vista, mainly women, who have the initial investments through assistance from "Vision Verde" (building and equipment) to solar dry pineapple.

- In Stann Creek priority area there is an informal group of 32 male farmers who produce hot pepper for the Marie Sharp factory that produces hot pepper sauce. Women participate in production, but do not form part of the group.
- Most of the organizations in Cayo District are weak; the members do not produce or market together, meaning that the organizations basically do not provide any services to the members. These organizations have had problems in planning production and consolidating produce as demanded by the market; as a result many end up selling to middlemen instead of through their organizations. Only the "Valley of Peace Agricultural Producers Association" grows five acres (out of a total of 20 acres of collective land) of plantain together and sell in an organized manner in order to generate revenue for the functioning of their organization and to assist members in emergencies.
- In the priority area of the Belize District there are four producers´ organizations, with 69 members (48 men and 21 women): Maskall Farmers´ Cooperative, Los Pequeños Agricultores y Ganaderos de Nago Bank, Bomba United Farmers Group, and Rockstone Pond Farmers Group. The Maskall Farmers´ Cooperative is building a small storage facility for agricultural inputs and will be starting to provide services to the farmers in the priority area, whereas the Nago Bank organization is constructing a small packaging facility to increase the quantity and quality of the products they sell to Brodies supermarket and restaurants in Belize City.
- In the San Carlos area of Orange Walk District, the "New Farmers´ Cooperative" owns 1,300 acres of land and each family has been assigned 50 acres as farm land and then some for living. The production of onions, carrots and potatoes is done collectively; market information is shared and the quantities demanded by the market are consolidated from the produce of individual farmers; marketing is not carried out as a collective activity through the Cooperative.

15. Despite the many challenges, there are several opportunities to improve production and increase competitiveness and market access at local and new markets for smallholders, if the existing producers' organisations can be strengthened and eventually informal groups can be formalized.

16. **Priority areas for implementation.** The Programme's focus and interventions, including identification of the priority geographic areas and beneficiaries, and the priority commodities to be targeted were jointly agreed to by the GoB and IFAD during the identification and design missions. (Annex 3 of Appendix 2 provides a list of agreed upon priority areas and data on households and poverty levels).In addition, a series of meetings involving the design mission and the MoA's staff and various stakeholders in the agricultural and rural sector were held to agree on the approach and targets of the proposed Programme. A participatory workshop was carried out with key staff of the MoA (including staff of the De and DC) to discuss the strategic priorities of the Government for agricultural development and rural development, and to further define the commodities to be targeted by the Programme. A participatory process was also carried out through field visits to most of the targeted communities where discussions were held with stakeholders (community leaders, farmers and farmers' cooperatives and organizations, including female and young producers) to better understand their socio-economic situation, their production systems, competitiveness of the products in Belizean markets, the commodities with good production and market potential, farmers' constraints and their access to markets. This was complemented by a rapid review of processing activities and the various markets to which the communities sell their products.

17. The proposed Programme will intervene at the national level in selected rural communities and specifically in five priority areas or Districts where Programme activities will start. A set of criteria was defined for identifying the priority areas or Districts for intervention (see Appendix 2 for more details). The Programme will have a fairly wide geographic distribution with five priority areas -Toledo, Stann Creek, Cayo, Belize, and Orange Walk Districts, focusing on a total of 23 communities that the government considered as priority for interventions (see Table 3). The direct beneficiaries will be 6,000 rural households: 3,500 rural households in the villages and communities that make up the priority areas and 2,500 households from non-priority areas to be identified during implementation (see details in Appendix 2).

Table 3: Priority Areas and corresponding villages identified per District

Detail	Belize	Orange Walk	Cayo	Stann Creek	Toledo District
Villages	Bomba	Fire Burn	Buena Vista	Cow Pen	Bella Vista
	Boston	Indian Church	La Gracia	San Juan	San Isidro
	Maskall	San Carlos	San Antonio		San Jose
	Rockstone Pond	San Felipe	Seven Miles		San Pablo
	Santana	Santa Marta	Valley of Peace		Trio
	Nago Bank				
Total	**6**	**5**	**5**	**2**	**5**

18. In addition to the constraints faced by small farmers, there are varied risks that affect the development of commercially viable and sustainable commodity primary production along with agro-processing facilities, down the value chains of three sets of commodities, taking into account that vagaries of weather, unpredictable nature of biological processes, seasonality of production, prices and market demand fluctuations/cycles, and geographical distance of production and end users, are factors that generate risks over production.

19. Within the Programme areas, small farmers face the following main types of risk: (i) weather-related risks including periodic deficit and/or excess rainfall or temperature as well as natural disasters (hurricanes, flood, droughts, etc.) which significantly affect communities and particularly small farmers[68]; (ii) environmental risks, including crop and beekeeping pests and diseases as well as contamination and degradation of natural resources and contamination of commodity processing; (iii) market-related risks including changes in supply and/or demand that affect domestic prices of inputs and products/commodities; changes in demand of quality attributes as well as timing of product delivery; (iv) logistical risks considering changes in transport, communication and energy costs and availability; (v) operational risks, including farmers' poor operation decisions in: production planning, use of adequate inputs, quality control, changing products/processes and markets, and assets allocation; (vi) institutional risks, including changing and/or uncertain commodity imports/trade and market policies, and governance uncertainties due to weak governance; and (vii) political risks, including security-related risks and uncertainty related to tackle crime phenomena or threats to property.

20. Thus in order to mitigate the risks associated with small farmers' primary production, and the critical constrains affecting the development of primary production, the program will adopt a set of **three strategies** that will help strengthening and climate proofing the production systems, while allowing farmers realize the productive potential of their available resources and overcome the challenges imposed by climate change. Making small farmers' climate resilient will contribute to increasing their income and reducing poverty while increasing competitiveness in the market. The first strategy focuses on *process upgrading*: (i) improved production/growing/harvesting season for increased volumes of supplies; (ii) investments in irrigation systems to increase marketable yields and reduce unit costs of production and increase profitability; (iii) updated technological packages considering improved techniques and practices; (iv) investments in post-harvest/storage handling and processing technology (drying) infrastructures; (v) improved access to productive innovations to increase value chain efficiency, and (vi) improved road infrastructure and stronger linkages developed with buyers in the market place.

21. The second focuses on *chain functions upgrading* including: (i) improved coordination and linkages between input/technology suppliers, farmers and MoA extension services; (ii) improved farm management practices with market-driven production planning; (iii) increased producers access to support services as technical assistance and training to improve skills and know how; (iv) improved knowledge exchange and capacity building for key stakeholders, (v) improved access to market

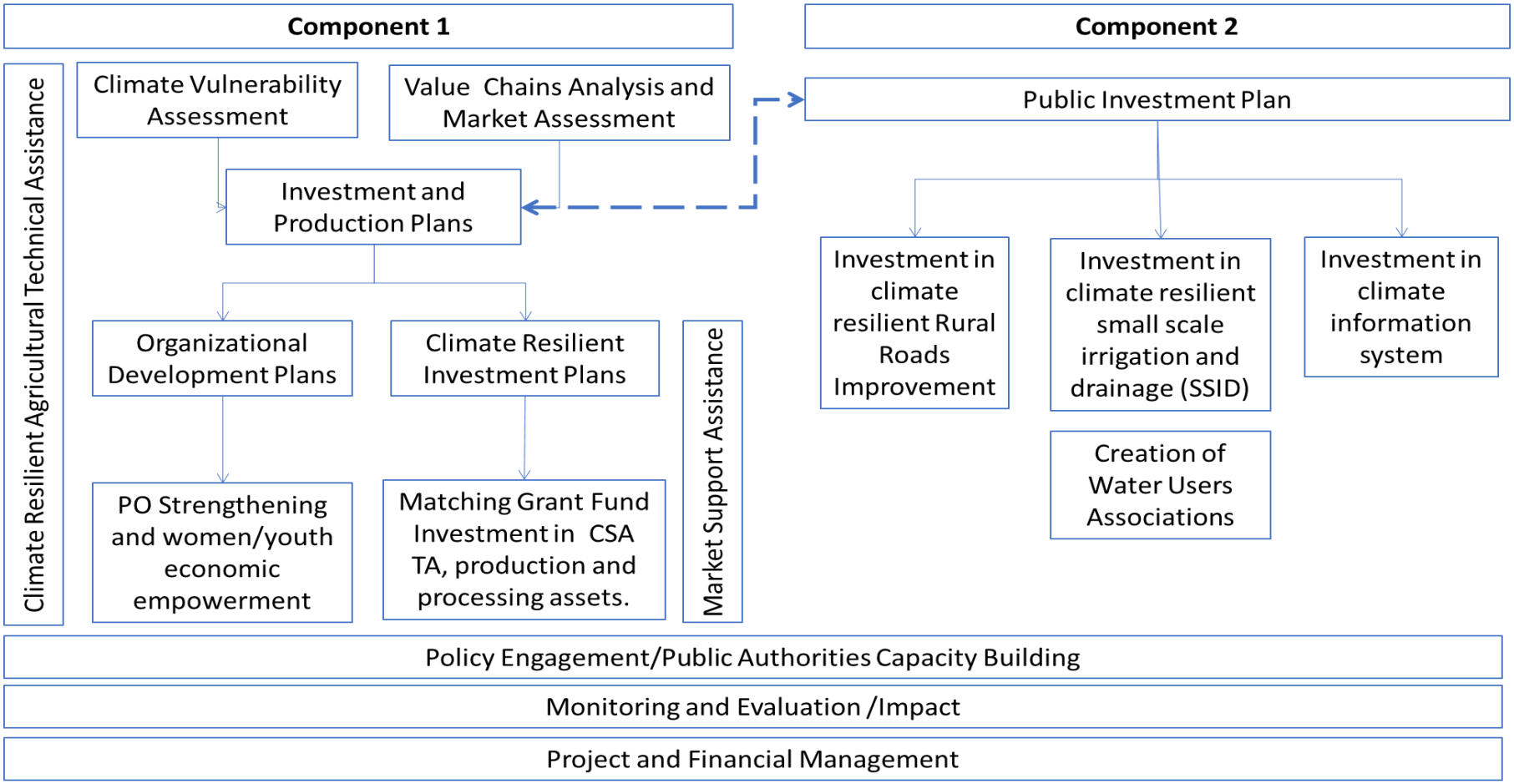
[68] Furthermore, the frequency of climate related events in the last two decades has severely affected growth and development of small farmers, as they have had to reinvest their limited savings to recover from frequent production and infrastructure losses.

information and production planning; and (vi) improved access to funding as an incentive for investing in infrastructure and equipment.

22. The third strategy focuses on *product upgrading*: (i) access to improved seeds, planting and genetic materials for production systems climate resistant varieties ; (ii) enhanced quality of products linked to better production and harvesting practices; and (iii) increased product standard certifications and/or geographic indications

23. To achieve the objectives of the Programme, several interventions will be implemented over a six-year period that is organized in two components: (i) Component 1 - Climate Resilient Value Chain Development; (ii) and Component 2 - Climate Resilient Rural Infrastructure and Assets. Alongside the two components, there a cross-cutting section on Policy engagement and Public Authorities Capacity Building as shown in the figure below. All components and sections are interlinked and provide the basis for integrated and coherent support for the development of the entire climate resilient value chains – from production to final sale to the consumer.

Figure 1 Programme Structure.



Component 1: Climate Resilient Value Chains Development

24. This component aims to address the constraints and improve the profitability of the value chain process within the context of developing climate resilient agriculture, while reducing the financial, economic and climate-related vulnerabilities that producers and households currently experience. This component will focus on increased productivity and diversification of production, facilitation, innovation development and strengthening producer organizations. It will implement a participatory value-chain development approach, and create the conditions to produce a marketable surplus of higher quality products and enhance smallholders' accessibility to existing markets in a sustainable manner.

25. Activities will initially focus on three sets of commodities: vegetables (tomatoes, sweet peppers, hot peppers, cabbages, carrots and onions), fruit (pineapple) and honey.. A total of eight commodities will be targeted for value-chain development, selected from an initial set of more than 20 commodities identified by the government and community stakeholders through a participatory process[69]. The Programme will support one or two commodities in each producer organizations. Further commodities may be identified during project implementation, on the basis of the Value Chain and Market Assessment and/or after taking stock of progress and results achieved with the initial set of commodities. Annex 14 provides information on the selected commodities per priority area and community, while Annex 2 shows the main commodity value chain targeted per district.

26. The following main outcome is expected from this component: (i) Communities produce and market larger and more reliable supply of agricultural products via climate-resilient practices. At the end of the programme, at least 40% of households will have adopted environmentally sustainable and climate improved resilient inputs, technologies or practices; and 40% of household will increase their volume of production.

27. In terms of main outputs, (i) approximately 2,000 rural producers will be trained in climate resilient agriculture technologies and agricultural practices; (ii) approximately 30 producers' organizations and 450 members will benefit from organizational strengthening of cooperatives and farmers' groups (40% women and 20% youth); (iii) a total of 700 persons trained to improve their entrepreneurial capabilities to identify and exploit market opportunities including business management and marketing (40% women and 20% youth); and (iv) at least 300 facilities will benefit from improved climate related infrastructure (covered structures, storage facilities, greenhouses) and (v) 240 hectares of land brought under climate-resilient management.

28. This component will focus on three key pillars to overcome the constraints and improve resilience in the production stage of the value chain process: (1.1) Infrastructure and Production Plans; (1.2) Strengthening of Producer Organizations, and (1.3) Market-Oriented Value Chains Development.

29. **Subcomponents 1.1: Infrastructure and Production Plans (IPP):** This subcomponent aims to ensure that the Project generates the information and analysis required for a proper participatory planning in each of the areas of intervention via the elaboration of a Climate Vulnerability Assessment and a Value Chain and Market Assessment. Both assessment complement each other and provide the foundation for the elaboration of the IPPs, as well as feeding key information to the government planning for investment in public infrastructure (rural roads, irrigation and drainage, and other complementary investments in assets) as shown in Figure 1.

30. ***Climate Vulnerability Assessment:*** A detailed assessment of the vulnerability to climate change will be conducted to define the risks posed by climate change and provide information for identifying measures to adapt to climate change impacts in the 5 priority areas of the programme. Additional villages in yet to be identified areas will be phased-in by demand during the programme

[69] Four criteria were used to prioritize the commodities: (i) they are on the priority list of commodities for development by the MoA; (ii) market opportunities exist for the selected commodities; (iii) the current organization of farmers and their production potential for expansion; and (iv) the potential to increase profitability through improved productivity, product quality and market access.

implementation. These assessments will enable the PMU and other decision-makers to identify the most vulnerable areas, sectors, value chains and social groups, as well as the required actions to mitigate the key climate impacts. Comprehensively assessing vulnerability to rapid climate change requires an integration of both top-down and bottom-up approaches as they can provide complementary information. The first focuses mostly on the biophysical impacts of climate change but say less about why, which and how people are vulnerable. Bottom-up approaches, on the other hand, mainly provide information about the vulnerability of different social groups. The latter type of vulnerability is by nature also linked to many other stimuli, e.g. a generally low status of rural development, and is difficult to distinguish completely from the impacts of climate change. This demand is rooted in the fact that climate change vulnerability is multifaceted, with interactions between socioeconomic and biophysical aspects The Climate Vulnerability assessment will enable the PMU and other decision-makers to identify the most vulnerable areas, sectors, value chains and social groups, as well as the required actions to mitigate the key climate impacts.

31. The vulnerability assessment will be carried out at a local level (one in each priority area) using participatory methods and tools as well local climate data (bottom-up and top-down assessments). In order to promote adaptation strategies that are appropriate and specific to specific locations and to transition to a more resilient production system, it is important first to have an understanding, both by the programme team and the communities themselves, of the impact of climate change in the districts, and to assess the level of vulnerability and response capacity of the targeted communities and their agro-ecosystems.

32. First, a specialised international institution, in partnership with the climate specialist of the Programme, will conduct a study to provide a scientifically sound analysis that is based on a state-of-the-art understanding of the relationships between climate variables and biophysical processes. After the initial top-down approach, the study will be complemented by a self-assessment in each priority area to identify the climatic threats and the community level of exposure and to determine the response capacity. The self-assessment follows a simple graphic methodology that allows people in the community to assess whether their agroecosystems could withstand a severe climatic event (drought, flood or hurricane). The methodology allows community member to identify the climatic threats and the community level of exposure, and then to determine their response capacity to each threat by establishing a set of indicators related to two main factors: (i) the type of agro-ecological infrastructure (landscape heterogeneity, crop diversity and genetic diversity, soil quality and coverage, soil conservation practices, water management practices, etc.); and (ii) the social characteristics of the community (levels of organization and networking, food self-sufficiency, etc.).

33. The scientific study and the self-assessment will indicate that the vulnerability to climate change will vary between priority areas, value chains, producer and social groups. Thus, the vulnerability assessments will use best-available tools and methodologies to rank the effects of climate change in each priority area, identify the key constraints, and prioritize response measures. This will include the analysis of factors that influence the exposure and response capacity of an area to absorb climatic and economic shocks while conserving its organizational structure and agricultural production. It will evaluate social, economic and environmental factors to assess regional vulnerabilities across three core areas: (i) exposure to climate-related natural disasters and sea-level rise; (ii) human sensitivity, in terms of population patterns, development, natural resources, agricultural dependency and conflicts; and (iii) future vulnerability by considering the adaptive capacity of an area to climate change determined by its infrastructure, level of social organization and agro-ecological characteristics. The Climate Vulnerability Assessment will translate these findings into guidelines to prioritize management strategies for climate change adaptation and to develop actions that increase the resilience of infrastructure and agro-ecosystems to climate change.

34. ***Value Chains Analysis and Market Assessment:*** The value chain assessment aims to understand the market situation of the three groups of commodities (vegetable, fruits and beekeeping products along with other commodities or product that have market potential), the strengths and constraints for their production, and networks with other key players in the market chain with a view to increase profit margin at the producer level as well as along the market chain. The market/value chain assessment will provide information on key actors (producers/farmers, transporters,

packers/processors, traders/retailers, and if possible end consumers), product seasonality, trend of prices, supply and demand, market conditions, strengths, weaknesses, opportunities and threats. Particular attention will also be given to analysing the role of women and youth in the value chain. This information will be used to improve efficiencies in the production, processing and marketing of the products and promote women's participation in all stages of the value chain through the implementation of the business plans.

35. The overall objective of this assignment is to carry out a Value Chain Analysis and Market Assessment of agricultural commodities, initially for the 5 selected priority areas to provide evidence-based information to inform activity design, business plan development and construction of public infrastructure. In particular, the Value Chain Analysis and Market Assessment should shed light on the status and viability of existing and potential markets and determine which hold promise of employment opportunities, product expansion, market viability, value addition opportunities, quality improvement and input availability to small producers.

36. The specific objectives are: (1) Review any existing Value Chain Analyses and Market Assessments of agricultural markets, baseline data and relevant project documents, (2) Draft an appropriate methodology for primary data collection and develop data collection tools (e.g. market survey, interviews with market actors, key informant interviews) that will be used to conduct the Market Assessment and Value Chain Analysis (to be reviewed by IFAD and the PMU). The methodology should specifically consult, and identify opportunities for both women and men, (3) Plan and conduct a Market Assessment and Value Chain Analysis focusing on identification of major local, regional and, if applicable, distant markets; assess the size of markets, volume of sales, market integration , segmentation, local market structure and enabling environment (e.g. security issues or policies affecting market access), gender representation at all stages of the value chain, market actors (consumers, sellers, traders, middle-men, employers) behaviour, procurement mechanisms, market requirements (standards, conditions for delivery) and prices, wage rates and employment conditions, and other areas as identified by the methodology and data collection; (4) Draft a Market Analysis and Value Chain Analysis report, which includes an executive summary, weak links of the value chain and practical recommendations that can be used to inform the intervention in Belize and ensure viability, appropriateness, and ultimately sustainability.

37. Furthermore, for specific Value Chains, an end-market assessment will be carried out, applying a validated methodology that has been developed by USAID.[70] This study will research the demand of the selected high-end, processing and domestic markets for the eight selected commodities and provide an analysis to facilitate decision-making around choice, context, channels, customers, competitors, and communication. The study will be carried out by consultants (Value Chain Specialists) and will provide a clear roadmap for implementation to the PMU and stakeholders, taking into account farmers' information needs, their production and market potentials, and the different market characteristics and requirements in Belize.

38. From the above assessments, an Infrastructure and Production Plan (IPP) will be developed. This master plan will define better climate resilient practices and technology to be adopted, infrastructure designs and management practices that will improve farmers' production, while enhancing their resilience[71]. It will describe specifically the main socio-ecological characteristics and practices that small farmers can use individually or collectively (in cooperatives, etc.) to improve the adaptive capacity of their farming systems to climate change. With this information, each group will be able to detect its own strengths and weaknesses and identify climate-smart designs and management practices that improve production.

[70] Value Chain End-market Research is a toolkit on the process and value of End-market Research efforts for Value Chain development. It was developed and validated by the United States Agency for International Development in 2008. It provides a portfolio of tools, grounding these tools through case studies of their practical application.

39. ***Development of Infrastructure Production Plans (IPP):*** This activity aims to ensure that the territorial market oriented climate resilient development planning is holistic, participatory, climate adapted and market oriented. The indicator of successful outcome implementation is that all five priority areas (and later phased in areas) in the programme have prepared a medium-term IPP that comprises: (i) the climate change adaptation capacity strengthening needs translated into a climate resilient informed plan,(ii) identification of the Infrastructure investments that will provide public good and collective benefits essential for CCA and disaster risk management, and (iii) the identification of the value chains market opportunities, as well as the required production infrastructure for the sustainable and CCA development of the selected crops in the different areas of intervention. These plans will include adequate knowledge of the area, guidelines, planning tools for the priority area and commune, climate-informed, market-oriented SEDP implementation; The PMU together with the communities will prepared them. The IPP, builds on the Climate Vulnerability assessment and the Value Chains Analysis and Market Assessments, and will be the basis for the development of Business Plans (BPs) proposed by the producers organizations, aiming to increase resilience at the village and farm level. All BPs will have to be aligned with the IPP of the priority area, demonstrate that production is market oriented, and that farmers will receive training and sensitizing to respond to specific commodity market requirements for the targeted commodities, ensuring that there is improvement in their output with respect to quality, reliability and sustainability.[72]

[72] To supply the commodities at competitive prices throughout the year.

Subcomponent 1.2: Strengthening of Producers' Organizations

40. The objective of the sub-component is to provide the required technical, social and organizational knowledge to improve the management, functioning and overall performance of the main actors in the selected value chains to be developed. The possibility to improve the economic conditions of poor farmers relies largely on production improvements, improved market opportunities and increased product value as well as stronger representation and bargaining power of their organizations within the value chains. These, in turn, require investments in human and social capital and comprehensive know-how in different areas ranging from production and post-production techniques to finance, accounting, VC governance and basic comprehension of legal contracts, negotiation and market trends. At present, the majority of farmers and their cooperatives in the program area largely lack these skills. This is causing small farmers and less advanced cooperatives to sell their output in raw, unprocessed, undifferentiated form.

41. Although, already about 20 POs have been identified in the 5 priority areas, it will be necessary during the first year to identify additional formal PO and particularly other existing informal producer groups with the potential to be formalized or integrate existing formal POs.

42. ***Capacity building for producer organizations:*** During the first year of implementation, once the needs for capacity building and training are identified an Organizational Development Plan for each PO will be developed based on the IPP that result from the Climate Vulnerability and Value Chains Analysis and Market Assessments will provide the general framework as well as provide some input for the Organizational Development Plans; however, a specific analysis on organizational, administrative and managerial capacities will need to be carried out by the PMU. On the basis of the individual training needs and these organizational plans, a capacity-building programme for all producers' organizations (formal and informal) will be developed, starting with those that are considered the ones with the most potential and converting them in "role models" for the least developed producer organizations. All producer organizations will be supported to prepare Business Plans to be summited for financing to the Matching Grand Fund (MGF) and to request technical assistance provided by the Programme.

43. The capacity-building programme will be implemented in years two and three of Programme implementation and will involve theoretical and practical training for Management Committee members and regular members including: (i) a review of the organization's by-laws and governance procedures; (ii) strengthening organizational and administrative skills; (iii) leadership training; (iv) increasing the membership; (v) developing and enhancement of services provided by the organization to the members in relation to the key commodities they manage and the value chain they are part of; (vi) generating revenues for the organization for its financial sustainability; (vii) developing simple organizational development plan with an action plan for the first year; and (viii) facilitating exchange visits (national and international). The capacity-building programme will particularly emphasize the integration of women and young men and women as members of the POs and their preparation as future leaders in positions in Management Committees.

44. The capacity-building programme will leverage the already-developed manuals of the MoA's DC[73]. In coordination with the marketing sub-component, planning of production and meetings to bring producers and potential buyers together might be part of this programme. In year two, the MGF will provide producers' organisations with the opportunity to apply for funding to invest in certain infrastructures to provide more services (such as product collection, storage, input supply) to their members and other producers in the area that will allow them to generate revenue. Altogether, it is

[73] The Dept. of Cooperatives' has a training program with manuals that include the following: Module 1: Financial Literacy and Organizational Development; Module 2: What is a Co-operative; Module 3: Co-operative Operation and Management; Module 4: Co-operative Finance and Accounting Procedures; Module 5: Marketing Co-operative; Module 6: Entrepreneurial Development.

expected that at least 300 male and female members of organizations will be part of the Producers Organizations' capacity-building programme.

45. The PMU will provide technical assistance through its Rural Organisation Development Specialist and two consultants who will be contracted to execute the Capacity Building Programme. They will work closely with officers from the DC to strengthen their capacities and to create synergy with other activities carried out by the Department.

46. ***Pilot Implementation:*** This sub component also includes the development and implementation of a "Pilot local management programme" in year 3 with ten selected producers' organisations that have developed significant organizational skills, are providing already a additional services to their members, and have shown some increase in membership. The "pilot" programme has two main aspects: (i) preparation of young men and women from the communities to be local managers of the organizations (two to three per organization selected on the basis of criteria and interviews conducted by the Management Committee members with assistance of the PMU); and (ii) provision of basic equipment (e.g., computer, furniture and materials for record keeping) to facilitate their operations. Training of the young men and women would be intensive for approximately six months and could take place in Belize City or Belmopan. The training would be comprehensive and include: administration, accounting, record keeping, QuickBooks, taxes, pricing, sales, inventory, management skills, organizational strengthening, membership registration, understanding the market, planning of production for the market, skills to develop customer relationships, self-presentation, and public speaking.

47. Once these young Local Managers start working in the organisations, the PMU's Rural Organisation Development Specialist will continue to provide technical support, both to the Local Managers and the Management Committee members who will have to oversee the operations of their organizations. The Local Managers will report to the Management Committees, and the Programme will pay a small monthly stipend to the Managers during their training and for approximately another two years, after which the producers´ organization should continue paying for their salaries. For the "Pilot Local Management Program," the PMU, will procure a consultant/consulting firm to develop and implement the intensive six-month training program. To this end, the Procurement Officer will work closely with the Rural Organization Development Specialist to procure at national or regional[74] level service providers who can provide the necessary technical assistance to develop and implement this training programme.

Subcomponent 3: Market-Oriented Value Chains Development

48. The Be Resilient Program facilitates the integration of commodity-based value chain development and climate change adaptation, and vertically upgrades it to district level. This subcomponent consists of three activities including: (i) Developing of Value Chain Business Plans (BPs) (ii) Matching Grant Fund (MGF), and (iii) Market Support Assistance. The activities are consecutive and interlinked providing inputs for investment decisions under the MGF as well as for the public infrastructure investment Plans.

49. ***Developing of value chain Business Plans (BPs):*** The development and implementation of business plans for the formal and informal producer organizations will be guided by the following principles:

- **Business and market driven process:** Investment plans should respond to promising business opportunities and should be market driven. They should respond the investment needs and opportunities identified during the marker and value chain assessment.
- **Climate Resilient:** The proposed investment plans will develop clear linkages with the vulnerability assessments and IPPs, responding to the key climate vulnerabilities identified in this process. Business plans will incorporate climate resilient practices and technologies, and

[74] At regional level, for instance a potential service provider that could be considered in the procurement process could be the Grenada Investment Development Corporation (GIDC).

ensure that all proposed community level infrastructure is climate proof in its design and construction.

- **Transparency:** All project support and decisions should be carried in an open and transparent manner. All potentially eligible and interested applicants as well as the general public in the project areas will be informed through public advertisement, invitation for proposals and public disclosure. Support to cooperatives will be made public. The same level information will be provided to all potentially interested enterprises operating in the food business sector that are working with producer organizations in the selected districts.
- **Value Chain approach:** Support of investment proposals should consider the complete value chain and would take an end-market focus. Pure production expansion will not be supported.
- **Innovation:** Investment proposals should be featured by a high level of innovation. Innovative features could include organizational and technical innovation, marketing and product promotion, new product presentation, responsiveness to emerging consumer trends and preferences, etc.
- **Economic efficiency and financial viability:** All project funding should meet standard economic viability criteria and should aim for a high financial viability, which in turn will be critical for meeting the poverty objective.
- **Poverty Focus:** Each project investment must involve strong features of participation and outreach to poor farmers. This should include giving poor farmers a due role in the organization and investment decision making and securing a fair share of the benefits going to the poor farmers.

50. The BPs would include basic information on the applicants, the number of beneficiaries (by age and by sex), level of organization of the PO, a diagnosis of the problem and the proposed solution(s), climate change related problems and solutions, production and market related information, the objective, expected results and benefits, activities, sustainability, the role of beneficiaries in the implementation of the BP, technical assistance (type and for how long) required for implementation, budget, counterpart funding (own funds or loan), and timeline. A detail format will be developed in the PIM.

51. For the preparation of the BPs and identification of specific investments to be made, technical assistance will be provided to producers organizations (formal or informal), the technical staff of the PMU and MOA partners will assist POs with the development of their business proposals, however, when specialized knowledge or skills is required this will be procured by the PMU in order to ensure good quality and timely BPs. The technical assistance required for the implementation of Ps will be an integral part of the BPs as part of the financing from the MGF. An example of potential investment could be climate resilient greenhouses to for the production of vegetables as they allow multi-harvest production and hence income generation throughout the year. These protective structures also act as a barrier to pests that reduce the need for pesticide use. Most vegetable farmers in Belize produce on land holdings smaller than one hectare. This makes them ideal for the introduction of protected cropping technologies as production under these increases the total annual yield per unit area, with yields being 2 to 3 times higher than those of open field crops, and results in a higher quality product. Furthermore, to be competitive these small farmers must strive to achieve a high-quality product and extended production cycles to minimize the effects of gluts and shortages in a shorter cycle. Production under structures also offers other benefits, including early harvests, cleaner and better quality product, more efficient use of water and fertilizer, reduced leaching of fertilizers, and better management of pests, weeds and diseases. These all reduce the amounts of agricultural inputs required. The Programme proposes to support the establishment of protected structures on small farms as key part of the investments.

52. ***Matching Grant Fund (MGF):*** Investments in resilient production and support to the value chain will be financed through funding from the MGF. This mechanism will support the target group with specific investments that will allow them to:

- Improve the resilience of agricultural production and safeguard food security in the context of existing and projected climate change effects.

- Increase production and improve product quality.
- Establish infrastructures for value-chain resilience in the context of changing climate conditions, as well as to better plan when to access the market in order to receive better prices for the products.
- Provide opportunities for adding to the value chain and increase the income generated through sorting, selection, packaging and labelling of products or the processing of raw material.

53. The Matching Grant Fund (MGF) will be established with US$5.3 million that includes approximately US$4.44 million for investments (business plans from formal POs, informal producers groups and individual promoting backyard gardens) and US$0.86 million for Technical Assistance to assist POs with the development and implementation of their business plan.

54. The MGF is a competitive fund, to which producer organizations and informal groups can present proposals for financing. Members of the Be-Resilient target group, defined as poor and vulnerable small farmers, who are formally and informally organized and are receiving support from the Programme in other technical areas, are eligible to apply to the MGF. Specific eligibility criteria for the different investment categories would be defined in the Programme Implementation Manual.

55. Investment categories include: (i) Climate resilient technologies and practices (i.e. solar panels, solar pumps or equipment, water harvesting, hydroponics, soil testing, agroforestry, tree nurseries); (ii) climate resilient greenhouses and equipment; (iii) climate proof storage, sorting, and packaging facilities; (iv) irrigation (boring of wells and installation or connecting to water systems); (v) drainage; (vi) equipment for beekeeping; (vii) climate proof agro-processing facilities and equipment; and (viii) backyard gardens. The MGF will not finance land purchase or lease, refinancing or payment of debts, activities that might harm the environment, etc.

56. The MGF can finance proposals through the following windows:

- Business plans presented by formal POs.
- Business plans presented by informal producers groups.
- Proposals for the establishment or improvement of backyards presented by informal groups of beneficiaries.

57. The large BPs from formal POs are expected to go beyond one single investment and refer to an articulated set of investments throughout the value chain; that is, investments for improved resilience and production (e.g. climate resilient technologies, irrigation), and investments required to facilitate market access (e.g. solar panels for drying of fruits, packaging facility, etc.). All BPs need to describe the kind of TA required for implementing the BP; this could also include further training in climate resilient agricultural practices, market training, meetings between buyers and producers, etc. The smaller BPs from informal producers groups will have a simpler format and the approval process can be fast-tracked by the PMU, for instance by planning more frequent meetings of the Technical Evaluation Committee. These BPs can include one or several complementing investments, depending on the available budget. Large BPs require approval by the POC whereas small BPs and investments in backyards don´t.

Table 3: Ceiling per participant and PO, investment categories and counterpart contribution, per MTG window

Window	Ceiling per participant	Ceiling per PO	Investment categories	Counterpart contribution
Business Plans from formal Producers Organizations	Ceiling per participant equivalent to USD 7,000	Ceiling per Producer organization of USD 120,000. An increase of the ceiling per PO up to 30% is possible and will be decided upon by the Technical Evaluation Committee, in case the proposal includes more expensive infrastructure such as storage, packaging or agro- processing facilities.	(i) Climate resilient technologies and practices (e.g., solar panels, solar pumps, water harvesting, hydroponics, agroforestry, tree nurseries); (ii) greenhouses and equipment; (iii) storage, sorting, and packaging facilities; (iv) irrigation (boring of wells and installation or connecting to water systems); (v) drainage; (vi) equipment for beekeeping; (vii) agro-processing facilities and equipment.	10% in cash and 5% in-kind contribution of the PO and its members.
Business Plans from informal producers groups	Ceiling per participant equivalent to USD 3,000	Ceiling per Producer organization of USD 30,000.	(i) Climate resilient technologies and practices (e.g., solar panels, solar pumps, water harvesting, hydroponics, agroforestry, tree nurseries); (ii) greenhouses and equipment; (iii) irrigation (boring of wells and installation or connecting to water systems); (iv) drainage; (v) equipment for beekeeping.	5% in cash and 5% in-kind contribution of the PO and its members.
Proposals for the establishment or improvement of backyards by informal groups	Grant per participant equivalent to USD 150	NA	Inputs and tools for backyard gardens.	Not required

58. With regard to the third window, proposals to the MGF in this category shall be presented by informal groups of beneficiaries for the establishment or improvement for backyard gardens. The establishment or improvement of backyards will be on an individual or household basis; with each beneficiary responsible for his/her backyard. Backyards are often managed as a small holder farm with the priority on selling the produce and only secondary to increase consumption at home. Backyard gardens, in particular when principles of climate resilient agriculture are applied, have the potential to improve food security and thereby to strengthen the resilience of the beneficiaries. In the Be-Resilient context, backyard gardens will be defined as plots close to the beneficiaries' home with an average size between 1/8 and ¼ acre. When possible, integrated backyard gardens with small livestock such as goats, chicken and rabbits should be preferred over backyard gardens exclusively focusing on vegetable and/or fruit trees. A seasonal calendar should provide the information which crops have to be planted at what time to increase the accessibility of food throughout the year. Backyard gardens need to be accompanied by the Climate Resilience technical staff in coordination with the agricultural extension services of the MoA. This window doesn't require a Business Plan, but only the presentation of a simple format, adequate for the educational levels of the target population, to describe the objectives, activities, participants, costs and benefits of the initiative. Priority beneficiaries will be female-headed households and in order, the extreme poor, poor and then vulnerable households.

59. Eligible proposals are those that are presented by organized formal or informal groups with at least 80% of members belonging to the target group, and that contribute to the objectives of the Programme and the expected results of the MGF (see above). Proposals have to be technically sound, should respond to the identified investment categories, and should comply with the required beneficiary counterpart financing.

60. Business plans presented by POs, require counterpart financing up to 15% through a combination of in-kind and in-cash contributions. Proposals for the establishment or improvement of backyards require as counterpart funding only the land where to establish the gardens. Counterpart funding would be differentiated by investment category, taking into consideration that some investments may generate a return faster than others (e.g., greenhouses compared to agroforestry systems). The exact counterpart contribution per investment category will be defined in the Programme Implementation Manual (PIM).

61. For the counterpart financing, the applicant could use own funds (e.g., savings) or could take a loan, for instance from one of the Credit Unions (CUs). Several poor and vulnerable smallholders and farmers have been found to be members already of a CU, partially because the previous IFAD-co-financed BRFP assisted CUs with their rural outreach programmes that resulted in an increase of poor and vulnerable CU clients. Furthermore, many CUs, especially those that were strengthened under the previous BRFP Programme, provide loan application and financial literacy training. The PMU would liaise with any CU in support to those POs that require this type of support.

62. There will be two Calls for Proposals (with a predefined format and criteria) in the first years of Programme implementation in the 23 villages that constitute the five priority areas. One Call for Proposals is for Business Plans (window 1 and 2) and another Call for Proposals is for Backyard garden support (window 3). The previously carried out Climate Vulnerability and Value Chains Analysis and Market Assessments that led to the Infrastructure and Production Plans for each priority area are important guidance for the content of the Call for Proposals.

63. Subsequent Calls for Proposals can be organized by the PMU as required, including a follow-up Call for Proposals in the second year of Programme in non-priority areas (i.e., those not yet identified). At this stage of the process, the Programme would invite members of the target group to present “ideas” instead of full-fledged BPs. The Call for Proposals will be widespread, using the media (radio and social media). Personnel from Village Councils, NGOs, the Tourism Association, and Field Officers from the MoA, the Ministry of Rural Development and others would be informed and asked to share the information with the target group. These professionals could also assist interested members of the target groups in defining the “ideas” and filling out and submitting the required formats.

64. An *ad hoc* Technical Evaluation Committee (TEC) will be convened with representatives from the PMU, the MoA, the MDR, the Credit Unions, the National Climate Change Office, and other relevant stakeholders to review the ideas and make an initial selection according to predefined criteria. The approved ideas will be organized by the PMU according to the investment categories, and the groups will receive support to develop full-fledged BPs from the PMU technical staff and through specialized technical assistance that will be procured by the PMU as required.

65. The format for the Call for Proposals, for the presentation of Ideas and for the presentation of BPs, as well as selection criteria, will be further defined in the PIM. The format should be simple and adequate to the educational attainment levels of the beneficiaries to ensure empowerment. The type of formats and content should be also chosen in consultation with financial institutions with operations in rural areas, such as the Credit Unions (CU).

66. The selection of proposals will consist of a competitive process. Proposals will be ranked according to a set of criteria relating to: a) the contribution of the proposal to increased climate change resilience; b) the relation and logic between the solutions proposed and the problem to be solved; c) the level of participation of young and female members of POs in the development and planned implementation of the proposal. In addition, BPs from POs with at least 40% of female and youth amongst their membership will rank higher. The Technical Evaluation Committee will review the

completed BPs, and may reject, approve, request additional information or recommend improvements to the proposal. According to the type of proposal, additional members knowledgeable on the topic may be added to the Technical Evaluation Committee.

67. Procedures for disbursement should be speedy enough to avoid frustrations, while ensuring transparency and accountability. Payments would be done directly by the Programme Management Unit (PMU) to suppliers, whenever possible. Even though the Matching Grant Fund is a demand driven fund, it was estimated that 30 formal POs will implement large scale BPs and 20 informal POs will benefit from the implementation of smaller BPs; benefitting all together approximately 900 households from the implementation of business plans. In addition 2000 households would increase resilience through support for improving or establishing backyard gardens.

68. ***Market Support Assistance:*** This activity is in turn divided in four types of interventions: (a) Technical Assistance for Climate Resilient Production, (b) Technical assistance on marketing, (c) Developing of Partnerships and Market Linkages, (d) Establishment of Intermediate Markets.

69. **Technical Assistance for Climate Resilient production planning:** As significant physical crop and economic losses are directly related to unplanned, uninformed and uncoordinated production decisions by small farmers, the Programme would provide crop planning tools based on market needs. The crop planning process will be implemented with support from the Value Chain Specialist and Climate Resilient Specialist. The whole exercise is to train the farmers to coordinate and plan their production based on market requirements. The production planning process is an integrated effort that will help the small farmers to understand what to grow, when to grow, and how to grow to respond to the market needs. Furthermore, the Value Chain Specialist together with the Climate Resilience extension services will provide technical assistance for the introduction of new climate resilient production technologies focused on post-harvest loss reduction, storage, standards compliance, packaging and transformation.

70. **Technical assistance on marketing**: Specialized support will be provided in terms of marketing of agricultural products, including (i) promoting farming as a business; (ii) basic marketing skills and good marketing practices; (iii) market situation and trends in the high-end[75], processing and domestic markets relevant to planning production; and (iv) access and use of market information technologies (mobile tools). The MoA's agricultural market price information system and the BMDC role on providing wholesale and retail market prices will be improved so as to be an important source of updated and regular information for farmers[76]. In addition, technical assistance will be provided to the BMDC and the Bureau of Standards (BOS) to strengthen their roles in product quality assurance, particularly for the high end and processing markets. The Programme will also provide technical assistance and training to these institutions and producers on post-harvest activities (sorting, packaging and storage) and agro-processing (food preservation through dried fruits principally). These are important activities for coping with market vulnerabilities and providing more incentives for farmers to invest in their operations. Technical assistance and capacity building to farmers and their organizations will be provided through the MoA's Extension Staff who will be in turn trained in marketing, the market information needs relevant to planning production, simple market data analysis techniques and effective information dissemination tools.

71. **Developing of Partnerships and Market Linkages:** The development and implementation of post-harvest and agro-processing facilities will be supported through the MGF as a demand-driven mechanism. These activities seek to exploit the opportunities of farmers' organizations to take on new value-added functions such as product collection, sorting, grading, storing, processing, transporting and marketing[77]. To complement these investments, the program will work in strengthening the

[75] The San Pedro and Placencia markets have a demand of some 60 vegetables and fruits (considering traditional, non-traditional and organic fruits and vegetables).
[76] As well as MOA information on vegetables imports.
[77] Belize City offers the largest market for agricultural products and has a confluence of institutional buyers and individual buyers such as hotels, restaurants, supermarkets and food services that together comprise a wholesale market that buy large quantities of agricultural products on a regular basis. The Belize District also has the towns of San Pedro, Caye Caulker and

linkages between producers and buyers as well as in supporting the formation of partnerships with key institutional actors like hotels and restaurants in high-end markets and processors in industrial markets as part of the upgrading strategy. It will facilitate and promote the establishment of commercial partnerships linking producers and their cooperatives with buyers. Market analysis suggests that there is a variety of partnership models depending on the number of actors and steps involved in the value chains. Interventions have a number of common features including (i) need to meet market requirements from buyers; (ii) the need to reach some level of scale in order to reduce the impact of transaction, investment, maintenance, compliance and enforcement costs; and (iii) need to be client-oriented and seek commercial feedback. Furthermore, as institutional buyers in high-end and processing markets are private-sector businesses considered as potential business partners. Building public-private-producer partnerships (PPPPs) with these private entities as well as the MOA can result in a win-win situation especially for producers. The project will foster the development of potential PPPPs.

72. Meetings and forums will be organized between buyers and sellers, initially to establish direct contacts and share information, facilitate confidence building and display products for sale that will be facilitated by the MoA and BMDC to help producers to respond to market needs, understand market trends and plan their production to targeted markets. The PMU will organize events periodically to bring producers and buyers together for dialogue and providing market information to farmers; and specialized technical assistance and training provision to improve the marketing processes carried out by the farmers. The Programme will foster linkages initially using the farmers market in one or two locations (Belmopan and Belize City) as forums for linking producers with buyers and exchanging information. The need for the MoA and the BMDC to play an important role is critical because of their neutral position, their public institutional role in the sector and the need for them to continue their facilitating role beyond the life-time of the Programme. These events will be the basis for New Business Opportunities Exchange Meetings between buyers and producers that will take place on a regular basis.

73. Establishment of Intermediate Markets: Presently, a large portion of the market demand is met with imports and contraband products. Information from high-end market buyers indicate that there are opportunities to establish two farmers' markets in Belize City, one in San Pedro and one in Caye Caulker, in which organized groups of small farmers can sell directly to both wholesale and retail consumers. With investments in infrastructure for collection, storage, packing, etc., farmers' organizations can sell a larger volume of their products over a longer time period to these high-end markets. With increases in productivity, they would compete with imported products on a more sustainable basis if the right investments in infrastructure are made, if they receive the required training in entrepreneurship and marketing, and if they can successfully establish direct relationships with buyers. Farmers in Nago Bank, Maskall, Bomba and surrounding villages in the Belize District have the opportunity to increase their supply of the targeted vegetables and fruits to Belize City, San Pedro and Caye Caulker high-end markets. Farmers and farmers' organizations in San Carlos, San Felipe, Indian Church, Fire Burn and surrounding villages in the Orange Walk District could also supply these markets.

Component 2: Climate Resilient Rural Infrastructure And Assets (CRRIA)

74. From a topographical point of view Belize is divided into two main physiographic regions. The first is distinguished by the Maya Mountains and the associated basins and plateaus that dominate all but the narrow coastal plain in the southern half of the country. The mountains rise to heights of about 3,600 ft. above sea level and covered with shallow, highly erodible soils of low fertility. These heavily forested highlands are very sparsely populated. The second region comprises the northern lowlands,

Ambergris Caye, the main tourist destinations with high-end markets that have a high demand for vegetables and fruits of a high quality. These high-end markets require more value-added functions in the product supply chain like sorting, packaging and/or processing. There is also a large urban retail food market in Belize City that demands a regular supply of high quality products. Together, the two types of markets provide a significant market opportunity for agricultural producers, particularly small farmers in nearby and outlying districts.

along with the southern coastal plain. Eighteen major rivers and many perennial streams drain these low-land areas. The coastline is flat and swampy, with many lagoons, especially in the northern and central parts of the country. Westward from the northern coastal areas, the terrain changes from mangrove swamp to tropical savannah and hardwood forest.

75. Belize is characterized as a country with tropical climate with pronounced wet and dry seasons, though there are significant variations in weather patterns by region. Temperatures vary according to elevation, proximity to the coast, and the moderating effects of the north-east trade winds off the Caribbean. Average temperature in the coastal regions range from 24°C in January to 27°C in July. Temperature is slightly higher inland, except for the southern highland plateaus, where it is noticeably cooler year-round. Overall, the seasons are marked more by differences in humidity and rainfall rather than in temperature. Average rainfall varies considerably, ranging from 53.2 inches (in) in the North and West to over 177.2 (in) in the extreme South. Seasonal differences in rainfall are greatest in the northern and central regions where, between January and May, the monthly rainfall is lower than 4 (in). The dry season is shorter in the south, normally from February to April.

76. From the climate change point of view Belize is considered to be among the most vulnerable countries in the world. Climate change forecasts for Belize for the period 2001-2080 for two basic meteorological parameters, temperature and precipitation, shows increases in average seasonal temperature until 2080 between 2ºC and 4ºC depending on the season and area. As far as precipitation, the forecast predicts decrease of average rainfall by 100 mm (4 in) and changing in distribution. Although annual rainfall volumes are more than adequate for most crops, the increasing intensity aggravated by climate change of the marked rainy and dry seasons mean that many parts of the country suffer from a distribution of rainfall that provokes floods and droughts. Details on climate parameters, change projections and vulnerability are provided in the Social, Economic and Climate Assessment Paper (SECAP, Appendix 13).

77. Belize's road network consists of 603 km of main roads (mainly consisting of the Hummingbird, Southern, Philip S. W. Goldson and George Price Highways); 783 km of secondary/distributary roads; 2,160 km of feeder roads; and 970 km of village streets. Approximately 18% of the total network is paved, of which 65% is in good and 35% in fair condition. The road network includes a total of 313 bridges.

78. Investment, operation and maintenance of entire road network in Belize are under the responsibility of the Ministry of Works. The investment and maintenance funds are provided from the central budget. Annual requirement of operation and maintenance is funded to only about 40% of actual need. It was reported that available funds are hardly enough to cover the main and part of the secondary roads resulting in deterioration of many feeder roads at rural level. In many villages, the feeder roads are in such a bad state that most of them are practically unusable for regular transportation, especially during the rainy season.

79. In the villages visited it was reported that the roads that will be considered for improved under the component will mainly serve farmers' organizations who, besides the climate resilience issues, have particular economic interests to keep these roads in proper conditions (at least the routine maintenance will be carried out by farmers themselves). It was therefore the Design mission's assessment that if the adequate quality of works ensured and selected proposals are directly linked with the activities under the component 1, i.e. the particular economic interests of beneficiaries ensured, the sustainability of the roads investments would most likely be ensured.

80. Irrigated agriculture is not widely practised in Belize. For the country with as much rainfall as Belize appears to have, the need to invest in irrigation may not be as immediately obvious as for drainage. However, the data and analysis provided in the Agricultural Water Management Investment Plan (FAO/CDB, 2014) clearly confirm both the need to provide for drainage infrastructure and strategic opportunity for irrigated agricultural development in Belize. Analysis of crop specific irrigation requirements provided in the aforementioned report clearly highlight that, first there is a distinct difference in mean precipitation between the North-West and South-East halves of the country,

Second, the rainfall is seasonal, meaning that there are periods within the year when it cannot be relied on to maintain root zone moisture at optimal level. Third, the length of this dry season is becoming increasingly variable due to climate change. As it was evidenced by the field visits most of the big commercial farmers are practised irrigation for their produce. Furthermore, many of smallholder individual farmers (mainly involved in high value crop production such as vegetables) apply irrigation by digging individual wells and installing drip irrigation systems, though not very modern or efficient. These are only private and very small systems for individual farmers. Given the availability of water resources (rivers, lagoons and possibility for rainwater harvest) there is an opportunity to develop small-scale rural level public irrigation systems for group of farmers to benefit. And there was a clear request for that both from farmers and Government.

81. The main constrain in investing in public irrigation and/or a drainage system in Belize is lack of an institution that would be the owner of the constructed assets. It was agreed with the Government that the constructed assets will be transferred to the balance sheet of the Natural Integrated Water Resource Authority (NIWRA) under the Ministry of Natural Resources, while the programme will support the capacity building in NIWRA and development of institutional setup, and establishment of Water Users' Associations to whom eventually the responsibility for management, operation and maintenance of the public assets will be transferred.

82. The CRRIA component is designed to reduce physical vulnerability and anticipated impacts of climate variability and enhances access to markets through a range of public infrastructure investments which will be undertaken in close partnership with programme area villages/communities, rural cooperatives, producers' associations. The main selection criteria will be infrastructure schemes of common use (public) that address adaptation to projected climate change events and enhance the opportunities for agribusiness and rural enterprise. It will not be a stand-alone component from which any public infrastructure investment could be financed. All cases will have to demonstrate the need for climate change adaptation and commercial viability of the proposed venture (selected for support under the component 1 and included in the Market Oriented Climate Resilient Plans), of which the infrastructure investment is a link, and its capacity to increase climate resilience and economic opportunities. The allocation of funds will be done through a highly participatory and demand-driven decision-making mechanism supported by a selection/ranking procedure, and will also be pre-identified during the Climate Vulnerability Assessment and Value Chains Analysis and Market Assessment.

83. The main types of infrastructure that will be eligible under the CRRIA component will include public infrastructure of common use such as local or feeder roads including required ancillary structures, and small-scale irrigation and drainage systems. The CRRIA component will consist of three sub-components:

84. **Sub-component 2.1: Investment in Rural Roads Improvements (RRI):** This subcomponent will be directed in rural roads and ancillary structures the most vulnerable to the climate variability and that complement and strengthen the programme objectives, and considered in the Market Oriented Climate Resilient Plans (MOCRP) to be developed and supported under the Component 1, for example by assuring adequate year/around access to the programme-supported value chains/commodity production areas and facilitating marketing of their produce. The roads to be improved will comprise mainly of last mileage of local or uncategorised feeder roads in rural areas. Eligible investments will include also road ancillaries such as small bridges, drainage facilities, culverts, retaining walls and other erosion protection works to ensure climate resilience of the rehabilitated roads.

85. **Sub-component 2.2: Investment in Small-scale Irrigation and Drainage (SSID)**: In the prioritised area, the activities under this subcomponent will support villages/communities on a pragmatic basis based on climate vulnerability and support the objectives of the component 1 and considered in the relevant MOCRP. The investments will focus on small-scale irrigation and drainage systems including intake structures (river diversion, pumping station, rain harvesting ponds), main and secondary distribution network (open channels or polyethylene pipelines), drainage network, and flood

protection structures. On-farm irrigation/drainage systems for connecting to the main or secondary network (drip, sprinkler, gravity ditches or field open drains) will be provided by beneficiaries either from their own resources or through the matching grant/investment fund facilities under the component 1. All these will ensure better climate, environmental, social and economic resilience as the reliability of water supply as well as agriculture land management will improve.

86. Under this sub-component provisions are made for institutional development in small-scale irrigation and drainage systems management, operation and maintenance (MOM). This will include international technical assistance in capacity building within the NIWRA, establishment and development of Water Users' Associations for MOM of small-scale public irrigation and drainage systems to be constructed in the framework of the CRRIA component. The support will include but not limited with capacity building in irrigated agriculture, crop-water requirements, irrigation scheduling, operation and maintenance of irrigation and drainage networks, determination and application of irrigation/drainage service fee. Provisions are also made for procurement of hydro/agro meteorological stations and other equipment for efficient irrigation application as it would be identified in the course of programme implementation. This will ensure sustainability of investments in small-scale irrigation and drainage development.

87. The main criteria for investment decision will be:

- verified climate change vulnerability;
- verified direct link to supporting inclusive rural economic growth in the commodity/value chain supported under the component 1;
- public infrastructure of common use;
- technical feasibility;
- contribution by Government;
- number of individuals assisted per USD 1,000 of investment;
- sound and plausible operation and maintenance procedure elaborated, and
- consistency with nationally applicable regulations on environmental impact.

88. **Sub-component 2.3: Investment in territorial climate resilient assets:** This subcomponent will focus on the creation of the a Climate Information System (CIS) that will become the principal mechanism through which information about climate – past, present and future – is archived, analysed, modelled, exchanged and processed. The CIS objective is to provide farmers with timely and accurate climate information, allowing them to plan their activities accordingly and minimize climate related losses. The CIS will be able to authenticate and communicate all information regarding climate at a national level. Its functions include climate analysis and monitoring, assessment and attribution, prediction (monthly, seasonal, decadal) and projection (centennial scale). TV and radio broadcasting will be the primary means of dissemination, although cellular services may also be considered.

89. The CRRIA component total budget valued at USD 8.0 million. The total sum includes USD 4.4 million for RRI sub-component and USD 3.6 million for SSID sub-component. Besides investment in works this include about USD 0.7 million for development of engineering design (6% of investment cost), independent review, and environmental and social assessment of technical designs (1% of investment cost) and supervision of works (3% of investment cost). Some USD 0.3 million allocated for support in irrigation and drainage systems institutional development. The total allocated funds consist of about USD 2.9 million from IFAD loan (36%), USD 3.5 million from GCF grant fund (44%) and USD 1.6 million Government contribution including 12.5% GST (20%). GCF grant funds will be used for 30% of works under the RRI sub-component and 80% of SSID sub-component that are estimated for investments in improved climate change resilience.

90. Based on the review of recently completed construction works implemented by Ministry of Works, Ministry of Natural Resources, Ministry of Rural Development and other international donors funded projects, the indicative cost for improvement/upgrading of 16-19 foot (ft.) wide stabilized gravel

roadway with 1.6 ft. shoulders, required drainage structures may vary between USD 60,000 up to USD 120,000 per mile (mi), depending on the status of the road, old pavement and complexity of drainage structure. An average cost of USD 80,000 per mile (about USD 50,000 per km) may be considered a conservative estimate, with an average length per road of about 2 to 3 mi. Estimated investments for public intake structures, main and secondary canal/pipe network for small-scale irrigation and drainage may vary between USD 2,000 to USD 7,000 per acre depending of type of system (gravity or pumped). An average cost of USD 5,000 per acre for public small-scale irrigation and drainage is assumed for budgeting purposes. Improvement of on-farm system will be responsibility of beneficiaries from their own resources or through the matching grant facility under the component 1.

91. The cost of the civil works listed above includes General Sale Tax (GST). In line with the market prices in Belize, the cost for engineering design and works daily supervision will be 5-7% and 2-3% of the total cost of construction respectively. Additional 1% of construction cost is allocated for independent design review (as it would be required) and environmental assessment (or environmental clearance, as they call it in Belize) of technical designs.

92. The cost of communications, information campaigns, staff salaries and allowances and equipment and vehicle operational costs will be incorporated into entire programme operating budget.

93. The above figures are indicative only, based on the estimated costs of rural infrastructure construction. There will be no pre-defined allocation for different types of infrastructure within each group, nor will the number of villages to be financed in each district or priority area be pre-determined. The infrastructure investment proposals ranking criteria will ensure that funds are allocated where the goal of addressing the climate change vulnerability and improving livelihoods and economic growth in disadvantaged targeted rural communities.

94. The anticipated outputs from the CRRIA component implementation are expected to be (i) some 17 roads with total lengths of about 50 mi; (ii) 10 small-scale irrigation and/or drainage systems, and (iii) a national level Climate Information System. It is estimated that CRRIA investments would reach a total of about 750 rural households in villages inititally in the 5 prioritised programme areas and then later to be phased-in additional areas, reducing the projected climate change vulnerability risks and providing opportunities for improved livelihoods and economic growth through the improvement of public utilities and road access.

95. Beside the reducing the overall risk from the projected climate change vulnerability, improvements of the rural roads infrastructure will benefit households in increasing their production, cutting their transport cost, reduce their output losses and establish market linkages. The benefits extended by the availability of irrigation water during the dry season and drainage facilities during the wet season will be in terms of sustainable and efficient natural resources management (water and soil) and increased secure and quality agriculture production, including increased crop intensity. The Climate Information system will a national level public service that will provide farmers with accurate and practical agricultural weather reports and forecasts, allowing them to anticipate any potential seasonal disruptions and prevent potential losses.

96. In addition, the construction works associated with CRRIA component will have a direct impact in terms of temporary employment generation, as it is a common practice among local contractors to hire unqualified labour from the villages. It was reported that about 15% of the cost contracted works are used for construction related employment as a rule.

Cross Cutting Activities

97. This section has three main activities, (1) Policy Engagement, (2) Research and Development, and (3) Public Authorities Capacity Building

98. ***Policy Engagement/Consultation:*** There are a number of policy bottlenecks to private sector development which have been identified by the project design team and partners, the most notable of which are import tariffs and permits, quotas and out-dated laws and regulations such as the Law on

Cooperatives. This cross-cutting activity would make funding available to finance public consultations with a broad set of national and local stakeholders about the barriers to private sector development in applicable value chains. Wherever possible, consultations should prioritize utilizing existing spaces for policy discussion, so as to increase the chances that actions identified by the consultations feed into the policy process. Participants should include project participants, their organizations, the private sector and public sector actors from local and national agencies and government. These activities may also generate the need for additional studies / evidence, e.g. on specific regulatory or legal changes to laws such as the Law of Cooperatives or strengthening of the coordination between government institutions as regards illegal imports, increase of surprise controls, and enforcement of laws and regulations.[78]Complementary to the Policy Engagement activities, the program will also contribute with a series of studies and research activities to help the government advance some key areas such as climate related insurances, environmental services, production conversion, etc.,

99. ***Research and development*.** The program will invest resources for Research and Development (R&D) in order to advance further more toward acclimate change resilience, and toward a sustainable and profitable agriculture in Belize. The MoA liaises with local, regional and international agricultural institutions, stakeholders and agricultural enterprises to promote improved agricultural practices; however, much more needs to be done by local institutions in the area of R&D for small farmers. The Programme will strengthen a research-extension-farmer linkage that fosters farmers' access to a wide variety of locally validated agricultural technologies that aim to increase productivity and resilience. The Programme could support for instance the UB's Faculty of Agriculture to conduct applied research on pro-active adaptation strategies and Climate Resilient practices that include diversified production systems (e.g., plantain and vegetable integration, crop and animal integration, and aquaculture), agroforestry, protein banks, and windbreaks.

100. Furthermore, some studies are foreseen to be executed to support certain existing work of the MoA's, such as:

- **Index-based insurance**: The CDB and CCRIF recently launched the "Integrated Sovereign Risk Management in the Caribbean" Project, which includes a Disaster Recovery Fund. While this Fund will be available for Disaster Risk Management in the Caribbean countries, a mechanism that allows especially small farmers to access the fund has not been envisioned yet. This study will explore and compare potential mechanisms to link vulnerable small farmers from Belize with the existing fund, with the aim of allowing small farmers to invest in increasing their resilience. Potential mechanisms include an index-based insurance or conventional indemnity insurance. While the implementation of such mechanism is beyond the scope of the proposed Programme, additional funding could be pursued from partners like CBD and GCF for this purpose.
- **Payments for Environmental Services**. This study will conduct a feasibility assessment of establishing a pilot project on short-term Payments for Ecosystem Services (PES) as an economic incentive to stimulate the maintenance and restoration of native forests (mature, secondary, or riparian), which offer important environmental services but do not generate revenue for landowners. The study will assess the interest of landowners to participate in a pilot project, estimate payments per acre and costs of the entire pilot project, and potential partners and sources of funding. The study will identify core areas to establish connectivity corridors[79]. The study will need to determine core areas to establish connectivity corridors and the number of landowners that fall into these areas.

[78] As regards legal imports, farmers' organizations' agreements with MoA (borders closed when there is sufficient local production) will need to be replicated and fully complied with in a timely manner. To this effect, MoA will be sensitized to the damage caused by non-timely enforcement of protocols, and support will be provided for their efficient implementation.
[79] Connectivity corridors are "stretches of tree or shrub vegetation connecting fragments of natural ecosystems through riparian strips, pastures with high tree density, living fences and other elements of the landscape". They may include buffer strips along streams and rivers, or agroforestry systems (scattered trees in crops and pastures and windbreaks).

- A study will be carried out in Corozal dirstrict early in the Programme's implementation of small farmer cane growers who are currently supplying the Tower Hill factory of Belize Sugar Industries Ltd. Many of these small "out-growers" have low-input low-output production systems that have been only marginally remunerative in the past because of low yields, poor quality cane, and high cutting and transport costs. The end of Belize's access to EU markets for raw sugar under preferential terms, as of September 2017, will inevitably put downward pressure on revenues paid to cane growers. The study will establish in which communities small farmers might be interested in diversifying out of sugar cane production, and will examine their value chain opportunities with alternative commodities and their socio-economic (including gender) characteristics. As a consequence, inclusion and phasing-in of communities from the Corozal District that fit the established criteria could be considered during Programme's implementation.

101. ***Public authorities Capacity Building:*** The MoA will have a key role during the implementation of the Programme and for the sustainability of its achievements. Thus, the institutional strengthening of the MoA to provide technical services for small farmers' development is another expected result.

102. This is an important aspect of the Programme not only for the purpose of sustainability but also to introduce new concepts and skills and to strengthen existing capacities in the DE, the DC and the BMDC.

103. The extension service of the Ministry has presence in each district and is responsible for carrying out the programs and operational plans of the MoA. Intensive training and capacity building in a range of topics is required to build the capacity of the minister staff in areas including; Resilient agriculture , market access, and agro-processing of primary products. Training in climate change and resilient practices and technologies, value chain development, modern communication for market information management, rural organization development with a focus on business development, social inclusion, the development of modern audio-visual materials for training of both staff and male and female farmers; and rural empowerment have been planned for officers of the DE and the DC. The project will employ six climate resilient agriculture specialists who will work in partnership with the MoA extensions agents in providing technical support to all beneficiaries during the project lifetime.

104. The DC has regulatory oversight of co-operative enterprises in Belize *via* Chapter 313 of the Laws of Belize in the following areas: (i) registration and dissolution of cooperatives; (ii) training, qualifying, and certifying of co-operative enterprises; (iii) maintaining records on cooperative enterprises; (iv) checking, inspecting and auditing finances and financial records; and (v) fostering enterprise development through entrepreneurship development and capacity-building. The programs and services of the DC are extended and provided to non-cooperatives such as enterprises/collectives, and even individuals, with a view to foster and further develop entrepreneurship capacities and to encourage and promote cluster formation among individuals. At present, the Department's work is affected by a weak and antiquated legislation and under-trained staff. The project includes activities to strengthen the capacities of the DC through in-service training, specific capacity-building,

105. To carry out these activities, the PMU will provide technical assistance through its Rural Organisation Development Specialist and through the support of two consultants who will be contracted to execute the Capacity Building Programme. They will work closely with officers from the DC to strengthen their capacities and to create synergy with other activities carried out by the Department.

106. IFAD has developed several Learning Routes as well as national and international study tours/exchange visits; the project will finance the participation of MoA's staff to look at aspects related to climate resiliency, rural organisations strengthening, and gender equality. MoA is one of the few ministries in Belize to have recently appointed a Gender Focal Point. The Programme will also support some technical activities as identified by the Gender Focal Point such as studies and workshops.

Annex 1: Selected Production Areas Commodities and Status of Poor Households

Description	Belize District	Orange Walk District	Cayo District	Toledo District	Stan Creek District
Key Commodities: Vegetable Fruits and Beekeeping Value Chains	Sweet Pepper Tomato Onion	Onion Carrots	Sweer Pepper Tomato Cabbage	Pineapple	Hot Pepper
	Beekeeping (Honey)	Beekeeping (Honey)		Beekeeping	
Production Areas / Villages	Nago Bank Rockstone Pond Maskall Bomba Santana	San Carlos San Felipe Indian Church Fire Burn Santa Martha	Valley of Peace La Gracia Buena Vista Seven Miles San Antonio	Trio Bella Vista San Pablo San Isidro San Jose	Cow Pen San Juan
Rural Poor Representation	Between 20-25% of the households in this area are poor, according to the Poverty Assessment.	San Carlos (60% of the households are poor), Fire Burn (70% poor), Indian Church (39% poor), San Felipe (44% poor), and Santa Marta (40% poor)	Valley of Peace (65% poor), La Gracia (50% poor), San Antonio (34% poor, of whom half are indigent), Buena Vista (47% poor), and Seven Miles (poverty data not available).	According to the Poverty assessment about 40% of the households are poor.	According to the Poverty assessment about 20% of the households are poor.

Annex 2: Main Commodity Value Chain per District

District	Main Commodity Value Chains		
	Vegetables	Fruits	Beekeeping
Belize			
Orange Walk			
Cayo			
Toledo			

Appendix 5: Institutional aspects and implementation arrangements

Programme Organizational Structure

1. This section describes the governance of the Programme as well as the role of the main implementing partners. A key ambition is to promote improved coordination and synergies among core partners, as follows: i) close alignment with MED by anchoring the PCU within this Ministry and taking advantage of MED's experience in implementation of other externally-financed projects; ii) close alignment with MoA through full involvement of this Ministry and its extension and cooperatives services in Programme implementation; iii) innovations and institutionalization of approaches, as well as support to public-private partnerships in climate resilient infrastructure leveraging investments by municipalities, central government and the private sector.

Key Partners and their responsibilities

2. The MoF will represent the Borrower for all financial and legal aspects of the Programme. The MED will be designated as LPA with overall responsibility for programme implementation. The proposed structure takes into account the cross-cutting nature of this Programme and replicates the similar successful model of the previous IFAD-funded programme, in which the MED served as the LPA. The MoA will play a key role in Programme implementation and will work closely with the MED and the PMU to ensure that agricultural sector priorities and strategies are duly taken into account throughout Programme implementation.

3. Strategic direction and oversight will be provided by a POC that will be chaired by the MED, and will include one representative from each of the following institutions: MoF, MoA, Ministry of Works, Ministry of Rural Development, Ministry of Natural Resources and the National Climate Change Office. Additional members may be considered according to their institutional relevance for programme implementation. In addition to providing strategic direction and oversight, the POC will provide initial approval of the AWPB and PP, approval on the procurement of consultants, goods and works, and will monitor the progress of Programme implementation *via* monthly POC Meetings and reports provided by the PMU. Prior to start-up, the POC will additionally be responsible for the procurement of key PMU Staff, which include the Programme Manager, the Finance Officer and the M&E Specialist.

4. Day-to-day management and implementation of the project will rest with the PMU, which will be anchored to the MED. The principal mandate of the PMU will be to carry out the overall programming and budgeting and to take the lead for overall Programme implementation, which will include working with service providers, Government Ministries and Departments, individual beneficiaries, producers' organizations and the municipalities of the Programme's target areas. Specifically, the PMU will assume responsibility for the timely preparation of the AWPBs and PPs to be submitted to the POC for review and approval and subsequently to IFAD for no-objection. The PMU will lead in the implementation of the Programme components and will work closely with the MoA and other Implementing Partners (IPs), with the primary objective of ensuring that each component achieves its desired outcomes. In addition, the PMU will be vested with financial and technical autonomy, guided by the PIM and reporting directly to the POC.

5. The PMU will comprise a total of 11 staff members:

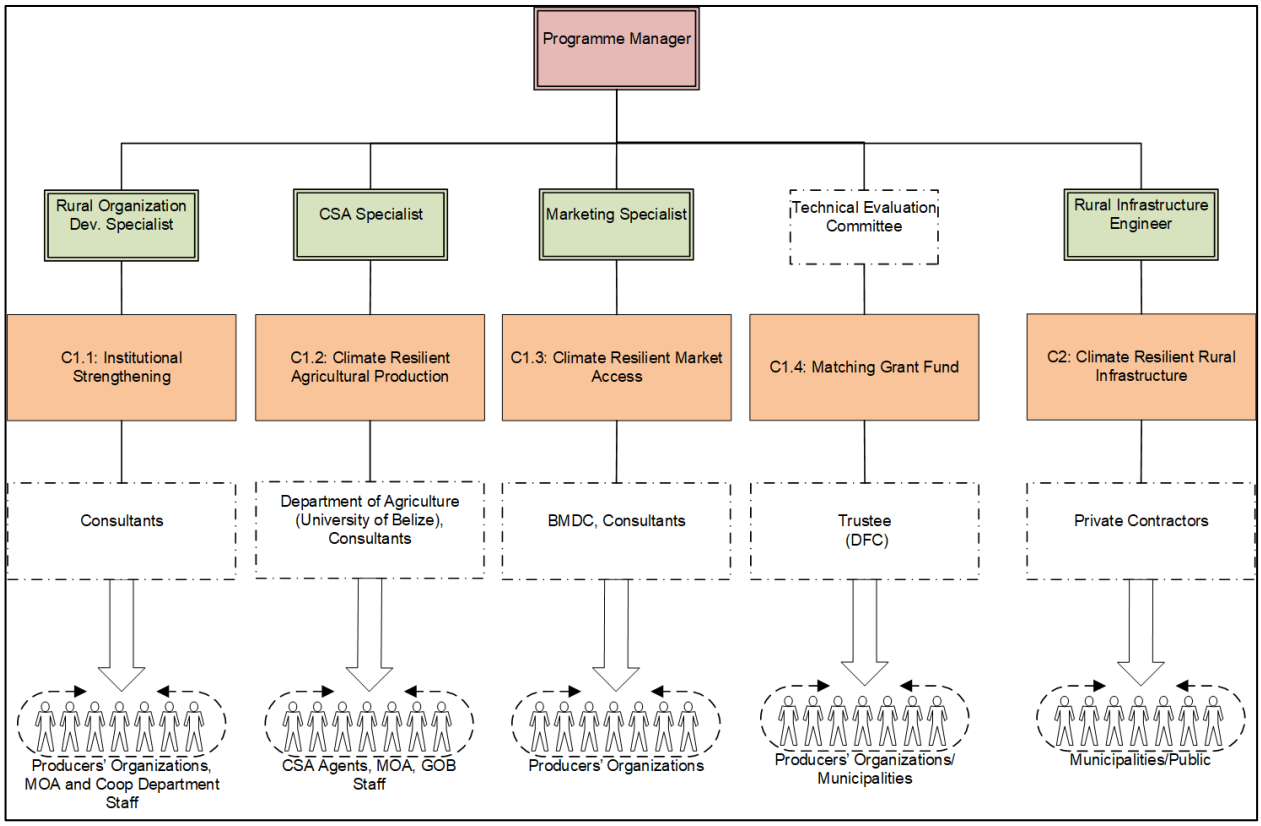
- **Programme Coordination and Administration:** Programme Manager, Finance Officer, Programme Accountant, Procurement Officer and Administrative Assistant;
- **Monitoring & Evaluation:** Monitoring and Evaluation Specialist;
- **Components Implementation:** Climate Smart Agriculture Specialist, Rural Infrastructure Engineer, Institutional Development for public Infrastructure, Rural Organization Development Specialist, Value Chain Specialist.

Implementation Arrangements

6. **Programme Coordination and Administration.** The principal mandate of the PMU will be to manage and execute the Programme and its overall programming and budgeting, with the primary objective being to ensure that each component achieves its desired outcomes. The PMU will work closely with Implementing Partners (IPs), including Government Ministries and Departments, service providers, individual beneficiaries, producers' organizations and the different municipalities of the programme's target areas. Specifically, the PMU will assume responsibility for the timely preparation of the AWPBs and PPs to be submitted to the POC for review and approval, prior to obtaining IFAD's no-objection.

7. **Implementing Partners.** Success of the Programme will depend largely on establishing viable relationships with external partners for delivery of specialized services to the Programme's beneficiaries, including the different governmental stakeholders. Relationships will be established *via* Memoranda of Understanding (MOU) to be signed between the Programme and each IP, for providing services through the Programme. The PMU will be responsible for the development of the MOUs, management of the relationships and for coordinating the provision of services and activities to be provided by each IP for their respective components. With respect to beneficiaries and producers' organizations (i.e., cooperatives, clusters, etc.), the PMU will facilitate the execution of formal agreements between these organizations and Credit Unions. These agreements will detail the responsibilities of each party in the implementation and performance of the MGF. All MOUs and the MGF Agreements will require approval from the POC and subsequent no-objection from IFAD. Figure 3 provides an illustration of the Implementing Partners' Organizational Structure.

Figure 1: Implementation Partners' Organizational Structure



8. **Component 1: Climate Resilient Value Chains Development.** Under the overall responsibility of the Programme Manager, the PMU's Value Chain Specialist, the Rural Organization Development Specialist and the Climate Specialist will coordinate and execute all the activities in this component – including procurement of technical assistance, calls for proposals and selection of

private investment proposals under the MGF, coordination of technical assistance, and procurement of equipment. IPs could include the DC and the ED of the MoA, the Faculty of Agriculture of the University of Belize (UB), the BMDC and the Beneficiaries (Individual Beneficiaries, Producers' Organizations, Informal Groups, etc.).

9. **Subcomponent 1.1: Market Oriented Climate Resilient Plans (MOCRP).** This subcomponent aims to ensure that the Programme generates the information and analysis required for proper participatory planning in each of the areas of intervention via the elaboration of a Climate Vulnerability Assessment and a Value Chain and Market Assessment. The Climate Specialist, with support from the PMU, will procure a specialized international institution to conduct the climate vulnerability assessment, specific to each targeted area.

10. The vulnerability assessments will combine two aspects: a Climate Change Vulnerability Index and a Value Chains Analyses and Market Assessment. With the information from the index, the Climate Specialist and the international institution will assist the communities to conduct their own vulnerability self-assessments. The self-assessments will assist the communities to identify their own strengths and weaknesses, and formulate climate-smart designs and management practices to improve their production and access to markets, while enhancing their resilience to climatic hazards.

11. Through the support of the Value Chain Specialist, the PMU will procure consultant/s (Value Chain Specialists) to conduct the Value Chain Analyses and Market Assessment, which should ultimately provide evidence-based information to inform activity design, business plan development and construction of public infrastructure; and shed light on the status and viability of existing and potential markets and determine which hold promise of employment opportunities, product expansion, market viability, value addition opportunities, quality improvement and input availability to small producers.

12. These assessments will ultimately result in the development of MOCRPs for each of the targeted areas and will form the basis for the development of Business Plans (BPs) proposed by the farmers' groups, aiming to increase resilience at the village and farm level. MOCRPs will be developed by the PMU Value Chain Specialist with the support of the international institution and with the full participation of the communities to ensure that the plans are holistic, climate adapted and market oriented and have the full support and buy-in from the communities during implementation.

13. **Subcomponent 1.2: Strengthening of cooperatives and producers' organizations.** This subcomponent will focus on providing the required technical, social and organizational knowledge to improve the management, functioning and overall performance of the main actors in the selected value chains to be developed. The possibility to improve the economic conditions of poor farmers relies largely on production improvements, improved market opportunities and increased product value as well as stronger representation and bargaining power of their organizations within the value chains. .

14. The PMU will provide technical assistance through its Rural Organisation Development Specialist and two consultants who will be contracted to execute the sub component on organizational strengthening, which includes the development of Organizational Development Plans, which will include specific analyses on organizational, administrative and managerial capacities of producers' organizations, and which will form the basis for the development of a capacity-building programme for all producers' organizations (formal and informal)Capacity Building Programme. They will work closely with officers from the DC to strengthen their capacities and to create synergy with other activities carried out by the Department.

15. For the "Pilot Local Management Program," the PMU, through the support of the Rural Organization Development Specialist, will procure a consultant/consulting firm to develop and implement the intensive six-month training program in order to prepare young men and women from the communities to be local managers of the producers' organizations. Once these young Local Managers start working in the organisations, the PMU's Rural Organisation Development Specialist will continue to provide technical support, both to the Local Managers and the Management

Committee members who will have to oversee the operations of their organizations. The Procurement Officer will work closely with the Rural Organization Development Specialist to procure nationally or in the region service providers who can provide the necessary technical assistance to develop and implement this training programme. At regional level, for instance a potential service provider that could be invited to the procurement process could be the Grenada Investment Development Corporation (GIDC).

16. **Subcomponent 1.3: Market-Oriented Value Chains Development.** This subcomponent will consist of three consecutive and interlinked activities: (i) Developing of Value Chain Business Plans (BPs) (ii) Matching Grant Fund (MGF), and (iii) Market Support Assistance. These activities will provide inputs for investment decisions under the MGF as well as for the public infrastructure investment plan for the targeted areas. The PMU will provide the necessary technical assistance to producers' organizations (formal or informal) for the development of the BPs, which will identify specific investments to be made, which will support them in the implementation of their IPPs at both the community and group level, with financing from the MGF for those IPP that have been approved for funding. In the event specialized knowledge or skills is required, the PMU will procure the necessary technical assistance in order to ensure good quality and timely BPs.

17. **Matching Grant Fund.** The MGF, which will be administered by the PMU, will support the target group by providing financing for investments in resilient production and support to the value chain through activities such as climate-smart technologies, irrigation and drainage structures, greenhouses, storage and packaging, agro-processing facilities, and renewable energy infrastructure. This funding will support small farmers: to improve climate-resilient agricultural production, increase productivity and improve quality; to allow for the storage of products; to improve production planning to access markets and receive better prices; to provide opportunities for adding to the value chain; and to increase their incomes through selection, packaging and labelling or the processing of raw materials.

18. As the MGF will be a competitive fund, the POC, with the assistance of the PMU, will establish an ad hoc Technical Evaluation Committee (TEC) that will be responsible for evaluating BPs for funding by the MGF. Members of the Programme target group, defined as poor and vulnerable small farmers, who are formally and informally organized and are receiving support from the Programme in other technical areas, are eligible to apply to the MGF. The TEC will be composed of representatives from the POC, the MoA, the MRD, the PMU and the National Climate Change Office. Eventually CUs could participate in the TEC as well, when deemed relevant. BPs will be evaluated against a pre-defined set of criteria to be approved by the POC and included in the PIM. The POC will approve the basic principles for the selection criteria (e.g., the ceilings per investment, the type of investments to be financed, simple procurement rules to ensure transparency and accountability, as well as considering the adequacy of the amounts involved).

19. Large BPs from formal and informal groups will require final approval from the POC and no-objection from IFAD in order to access the MGF. Smaller BPs for investments in backyard gardens will not require approval by the POC, but will follow the pre-defined criteria for approval. Once BPs receive the appropriate approval, the PMU will proceed with the provision of funding and administration. Funds will be disbursed in tranches and payments will be made directly to suppliers, whenever possible. In addition, procedures for disbursement will be speedy enough to avoid frustrations, while ensuring transparency and accountability.

20. Because the MGF will be a co-financing facility, POs will be required to make a counterpart contribution of up to 15% of the total cost – combination of in-kind and in cash – towards their investments (depending on the BP). Regarding cash contribution, the applicants may use their own funds (e.g., savings), and where necessary, engage their local credit unions as an option to obtain a loan for their respective contributions. It was found that several poor and vulnerable small farmers are already members of local credit unions, partially because the BRFP had assisted credit unions with their rural outreach programs that resulted in an increase of poor and vulnerable CU members. While the Programme would not have any influence on CUs (which are private and independent

organizations) on the credit application process, it will support beneficiaries' credit applications by creating awareness of the Programme and the MGF with these organizations. This is to ensure that investment proposals are evaluated and available to be included with credit applications, and furnishing beneficiaries with a certificate of Programme participation and proposal selection, which may help to boost their chances of obtaining the funding from their credit applications.

21. **Market Support Assistance**. This activity is divided in four types of interventions: (a) Technical Assistance for Climate Resilient Production, (b) Technical assistance on marketing, (c) Development of Partnerships and Market Linkages, (d) Establishment of Intermediate Markets.

22. **Technical Assistance for Climate Resilient production planning:** As significant physical crop and economic losses are directly related to unplanned, uninformed and uncoordinated production decisions by small farmers, the PMU, through the Value Chain Specialist, will implement the crop planning process, which will provide crop planning tools based on market needs. The production planning process is an integrated effort that will help the small farmers to understand what to grow, when to grow, and how to grow to respond to the market needs. Furthermore, the Value Chain Specialist together with the Climate Resilience Extension Services will provide technical assistance for the introduction of new climate resilient production technologies focused on post-harvest loss reduction, storage, standards compliance, packaging and transformation.

23. As the GOB, and specifically the MoA, has limited human resources to support secondment of staff, the Programme will contract six Climate Extension Agents (CEA) to be assigned to each of the MoA's six District Offices. The CEAs will work in close collaboration with the MoA's Extension Officers. In order to build local capacity and to ensure that both extension services are aligned to the activities and outcomes of the Programme, the extension agents (specialized and from the government) will be part of an intensive training programme on Climate at the beginning of implementation.

24. **Technical Assistance on Marketing**. The PMU, through the Procurement Officer will work with the Value Chain Specialist to procure the necessary technical assistance to provide support for the improvement of the MoA's agricultural market price information system and the BMDC's role in providing wholesale and retail market price information. Additionally, technical assistance and training will be provided to the BMDC and the BOS to strengthen their roles in product quality assurance. Technical assistance and capacity building to farmers and their organizations will be provided through the MoA's Extension Staff who will be in turn trained in marketing, the market information needs relevant to planning production, simple market data analysis techniques and effective information dissemination tools.

25. **Development of Partnerships and Market Linkages**. To complement investment activities by producers, the PMU will strengthen the linkages between producers and buyers by supporting the formation of partnerships with key institutional actors like hotels and restaurants in high-end markets and processors in industrial markets as part of the upgrading strategy. Additionally, the PMU will facilitate and promote the establishment of commercial partnerships linking producers and their cooperatives with buyers and support the building of PPPPs among these institutional buyers, the MoA and producers.

26. The BMDC will be engaged as an IP to assist with facilitating the exchange meetings and strengthening linkages between producers and buyers and, in so doing, strengthening its own capacity to coordinate the dissemination of market information among all stakeholders (producers, buyers, regulators, etc.), and in turn the overall market information system. In addition, through technical assistance from the Programme, the BMDC will be strengthened to provide quality assurance to ensure that product standards are met by farmers for supplying the high-end, processor and domestic markets.

27. **Component 2: Climate Resilient Rural Infrastructural Development (CRRIA).** The main tasks of the PMU in respect of this component will be: (i) conducting information campaigns in the Programme area villages; (ii) technical analysis of proposals received for public infrastructure

investment; (iii) screening and selection of proposals to be funded under the CRRIA component; (iv) development of TORs for selected proposals design; (v) procurement, review and approval of engineering designs; (vi) procurement and supervision of civil works; and (vii) support in institutional development for sustainable MOM of small-scale irrigation and drainage systems. The staff involved in implementation of the CRRIA component will consist of a Rural Infrastructure Engineer and an Institutional Development Specialist (draft Terms of References are provided in the Annex 1). Coordination of the CRRIA component activities will be the responsibility of the PMU Rural Infrastructure Engineer.

28. Given the dispersed nature of the infrastructure interventions to be carried out and the relatively small-scale nature of the works involved, a programmatic approach will be adopted where Programme works will not be pre-identified before the start of the operation but will be selected on a periodic (annual) basis on specified criteria and demand. The investment proposals selection criteria and scoring procedure for ranking of investment proposals are provided in the PIM (Appendix 11).

29. All proposals for infrastructure investment funding award will require approval by the POC and no-objection from IFAD. The PMU will review and evaluate applications and provide recommendation to the POC for funding award.

30. To ensure competitiveness, infrastructure proposals will be reviewed by the POC once per year (during the AWPB process) for approval and the appropriation of funding in the upcoming programme year. Depending on pace of implementation of infrastructure activities, the PMU may present for review and approval by the POC and subsequent no-objection from IFAD, infrastructure proposals for funding during the current Programme year. The number of infrastructure investments for each year will depend on the size of each investment and the projected pace of implementation of infrastructure activities as well as the performance of activities in Component 1.+

31. The main tasks of the PMU, with specific support from the Rural Infrastructure Engineer, will be:

- To publicize the availability of the competitive funding for infrastructure rehabilitation support;
- To undertake technical and climate vulnerability analysis of investment proposals;
- Based on technical and climate vulnerability analysis, evaluate and rank proposed applications in accordance with the guidelines and mechanisms described;
- To submit recommendations for infrastructure funding award with required supporting documents for POC approval and IFAD no-objection;
- To develop TORs for development of engineering designs for approved proposals;
- To conduct procurement of services for development of engineering designs and submit evaluation reports to IFAD for review and written no-objection;
- To conduct independent technical review and environmental assessment of design solutions and approve the designs;
- To conduct procurement of civil works and submit evaluation reports to IFAD for review and written no-objection;
- To monitor and carry out supervision of civil works implementation of investment projects by contractors;
- To Develop TORs for International Technical Assistance, procurement of an individual international consultant for support in establishment of WUAs and capacity building for MOM of small-scale irrigation and drainage systems to be constructed in the framework of the Programme;
- To conduct training and capacity building of relevant staff from the DE of the MoA and WUAs.

32. **Subcomponent 2.1: Investment in Rural Roads Improvement**. The Rural Infrastructure Engineer, with support from the PMU, will be responsible for the coordination of CRRIA activities: procurement of technical assistance and contractors, solicitation and selection of public investment proposals, coordination of technical assistance, and procurement of equipment, including ensuring adherence to the selection criteria for infrastructure investments. Construction and daily supervision

of the road improvement works will be carried out by the PMU through private sector consultants and contractors selected on a competitive basis.

33. Environmental Assessment of the proposed design solutions, as per the applicable laws of Belize, will be carried out by the Department of Environment of the MoA. In addition, the MOA will be delegated the responsibility of maintenance of the future irrigation and drainage infrastructure under a new mechanism to be established under the NIWRA during Programme implementation. These will be financed through the Irrigation Service Fee to be developed and applied[80]. The Ministry of Works will undertake the operations and maintenance of roads over the life of the Programme and these will be financed independently of the Programme budget.

34. **Subcomponent 2.2: Investment in Small-scale Irrigation and Drainage**. The Programme will provide institutional development in small-scale irrigation and drainage systems management, operation and maintenance (MOM). The PMU, through the support of the Institutional Development Specialist, will procure international technical assistance for capacity building within the NIWRA, establishment and development of Water Users' Associations for MOM of small-scale public irrigation and drainage systems to be constructed in the framework of the CRRIA component. The support will include but not limited to capacity building in irrigated agriculture, crop-water requirements, irrigation scheduling, operation and maintenance of irrigation and drainage networks, determination and application of irrigation/drainage service fee. In addition, the PMU will procure hydro/agro meteorological stations and other equipment for efficient irrigation application as it would be identified in the course of Programme implementation. This will ensure sustainability of investments in small-scale irrigation and drainage development

35. **Subcomponent 2.3: Investment in Territorial Climate Resilient Assets**. This subcomponent will focus on the creation of the Climate Information System (CIS) that will become the principal mechanism through which information about climate – past, present and future – is archived, analysed, modelled, exchanged and processed. The Climate Specialist, with the support of the Procurement Officer, will procure the necessary technical assistance and equipment for the development of the CIS. The PMU will coordinate with the appropriate department with the Ministry of Natural Resources for the establishment of an agreement that will govern the development and implementation of the CIS.

36. **Cross-Cutting Activities**. This includes three main activities: (i) Policy Engagement; (ii) Research and Development; and (iii) Public Authorities Capacity Building.

37. **Policy Engagement**. The PMU will support public consultations with a broad set of national and local stakeholders about the barriers to private sector development in applicable value chains. Wherever possible, consultations should prioritize utilizing existing spaces for policy discussion, so as to increase the chances that actions identified by the consultations feed into the policy process. Participants should include project participants, their organizations, the private sector and public sector actors from local and national agencies and government.

38. **Research and Development**. The Programme will strengthen a research-extension-farmer linkage that fosters farmers' access to a wide variety of locally validated agricultural technologies that aim to increase productivity and resilience. The PMU will formulate a MOU for instance with the University of Belize (UB) to provide support to the UB's Faculty of Agriculture to conduct applied research on pro-active adaptation strategies and Climate Resilient practices that include diversified production systems (e.g., plantain and vegetable integration, crop and animal integration, and aquaculture), agroforestry, protein banks, and windbreaks.

39. Additionally, the PMU will procure consultant/s to conduct studies on Index-based Insurance, Payments for Environmental Services and Socio-economic Study on the Corozal District. On index-

[80] The need to identify the institution that will be owner of the assets of public irrigation and/or drainage systems to be constructed under the CRRI component was discussed during the design mission.

based insurance, the study will explore and compare potential mechanisms to link vulnerable small farmers from Belize with the existing fund, with the aim of allowing small farmers to invest in increasing their resilience. Potential mechanisms include an index-based insurance or conventional indemnity insurance. However, implementation of any such scheme is beyond the scope of the Programme. On payments for environmental services, the study will conduct a feasibility assessment of establishing a pilot project on short-term Payments for Ecosystem Services (PES) as an economic incentive to stimulate the maintenance and restoration of native forests (mature, secondary, or riparian), which offer important environmental services but do not generate revenue for landowners. On the Corozal District, the study will focus on the socio-economic impact and viability of diversification of farmers from sugar cane.

40. **Public Authorities Capacity Building**. As the GOB, and specifically the MoA, has limited human resources to support secondment of staff, the Programme will contract six Climate Extension Agents (CEA) to be assigned to each of the MoA's six District Offices. The CEAs will work in close collaboration with the MoA's Extension Officers. In order to build local capacity and to ensure that both extension services are aligned to the activities and outcomes of the Programme, the extension agents (specialized and from the government) will be part of an intensive training climate change and resilient practices and technologies, value chain development, modern communication for market information management, rural organization development with a focus on business development, social inclusion, the development of modern audio-visual materials for training of both staff and male and female farmers. The CEAs and the MoA's extension agents will in turn continue to train small farmers (men, women and youth) and disseminate best approaches for transitioning agricultural systems towards climate resilient farming, using a number of participatory methods such as farmer field schools, field days, on-farm demonstrations, farmers' cross-visits, etc.

41. In addition, the PMU will provide technical assistance through its Rural Organisation Development Specialist and through the support of two consultants who will be contracted to execute the Capacity Building Programme. They will work closely with officers from the DC to strengthen their capacities and to create synergy with other activities carried out by the Department.

Annex 1: Terms of Reference for Key Programme Staff

Terms of Reference: Programme Manager

1. The Programme Manager (PM) will provide overall leadership and management of the Programme Management Unit (PMU) and its Staff, will coordinate the activities to be implemented, and will have the ultimate responsibility for planning, budget preparation and management and execution to achieve the programme's objectives and targets. In addition, the PM will report to the Programme Oversight Committee on policy matters, will act on the MED's behalf in his/her contacts with public and international institutions, and provide overall supervision of service providers contracted by the programme.

Specific Responsibilities

2. Specific responsibilities of the Programme Manager will include:

- Preparation of all strategic planning, management and related documents that is important to overall programme implementation, particularly the Programme Implementation Manual to be presented for approval to the Programme Oversight Committee (POC).
- Establish and maintain, on behalf of the programme, excellent relations with the International Fund for Agricultural Development (IFAD) and the Green Climate Fund (GCF), and all direct programme partners (Ministry of Economic Development, Ministry of Finance, Ministry of Agriculture, Ministry of Works, Department of Cooperatives, the National Climate Change Office, the Development Finance Corporation, and with other agencies.
- Inform the focal point of the Ministry of Economic Development (MED) on important issues and the programme´s status on a regular basis;
- Represent the programme in forums in which it participates or its results are being featured;
- Participate in the selection of the PMU staff;
- Oversee all contracting of services, and delegating responsibilities where appropriate to PMU staff.
- Monitor and assess the performance of the PMU staff and service providers;
- Lead the preparation of a results-oriented Annual Work Plans and Budgets (AWPBs) for the programme, in close collaboration with the PMU and implementing partners, and present the AWPB to the POC annually, ensuring that an approved AWPB is sent to IFAD and the GCF in a timely manner, as stated in the Programme Implementation Manual.
- Network with other agencies and stakeholders to ensure implementation of the activities as detailed in the AWPB.
- Monitor implementation of the AWPB, making adjustments as necessary, and work closely with the Monitoring & Evaluation (M&E) Specialist on setting benchmarks and gender/age disaggregated indicators to assess programme delivery and impacts.
- Ensure implementation of the programme according to the implementation strategy as indicated in the Final Programme Design documents, and ensure gender equity is included and cross-cutting in the programme monitoring and evaluation, as well as in the annual planning.
- Develop, maintain and update the Programme Implementation Manual incorporating the relevant legal and other regulations governing the implementation of the programme.
- Execute all procurement in accordance with IFAD's Financing Agreement and Procurement Guidelines.
- Manage the programme's budget and ensure that all expenditures are in keeping with the programme objectives and activities.
- Prepare all programme reports and present these to the POC when required.
- Forge linkages with other national and regional programmes involved in rural development in Belize and to ensure complementarity of efforts.

- Collaborate with private sector initiatives.

Qualification and Experience

3. The Programme Manager will possess a graduate degree in business administration, finance or in an area related to the main components of the programme or rural development. He/she will have at least five years of proven experience in:

- Managing projects financed by external donors in a management position;
- Leading technical teams and managing human resources;
- Developing, negotiating and managing contracts for consultancies and technical services;
- Liaising with public and private sector institutions at the management level;
- Planning and reporting on programme/project performance and achievements;
- Working in rural development, particularly in rural communities and with the rural poor.

Desirable Skills and Personal Qualities:

- Experience with IFAD, WB or CDB financed projects;
- A solid understanding of rural development, with a focus on business development and entrepreneurship;
- Excellent command of the English language, spoken and written. Spanish language proficiency would be an asset;
- Leadership skills and good communication skills;
- Solid managerial capabilities for managing human and financial resources, and fostering teamwork (including mediation and conflict resolution);
- Ability to negotiate and foster partnerships with stakeholders and other institutions;
- Willingness to work outside of formal working hours;
- Willingness to promote and conduct regular meetings with all stakeholders.

Reporting

4. The PM will report to the Programme Oversight Committee (POC).

Terms of Reference: Finance Officer

5. The Finance Officer (FO) will be responsible for managing and coordinating the overall financial management activities of the programme in strict compliance with the requirements of the Financing Agreements between the Government of Belize and IFAD and GCF, respectively, with the Programme Implementation Manual (PIM) and appropriate financial management best practices and international accounting standards. He/she will provide all possible support to the Programme Manager and the PMU, of which he/she is a member, in order to achieve successful programme implementation.

Position Responsibilities

6. Specific responsibilities of the Finance Officer will include:

- Implementing and updating the financial management procedures that apply to programme receipts and payments, and ensuring that the funds are used for the purposes intended in an open and transparent manner, ensuring that the Programme Manager (PM) is aware of risks arising from any weaknesses in the internal control system, and take steps to minimize the risks.
- Ensuring that all financial documents related to the programme (expenses, and all other ledger transactions, registers, payroll records including benefits, contributions and tax deductions, invoices and all vouchers) are retained by the PMU and are made available for inspection by the MED, MOF, external auditors and joint IFAD/GCF supervision mission teams.
- Implementing and maintaining the programme accounting system and ensure that the chart of accounts and reporting system can provide information linkages between the programme activities by categories, components and funding sources.
- Managing and administering all payments for contracts, MOUs of Implementing Partners in accordance with the IFAD Guidelines.
- Maintaining and regularly updating the following: Fixed Assets, Staff, MOU and Contract Registers and conduct a quarterly inventory of programme assets, ensuring that insurance coverage is obtained for the same.
- In close collaboration with the M&E Specialist, assisting the Programme Manager with the preparation, monitoring, consolidation and review of the Annual Work Plan and Budget.
- Consolidating budget plans and activities and review for consistency and provide advice to the Programme manager on the optimal use of resources.
- Calculating and analysing the cost of services, translate activity requirements into financial information for the POC's review and guidance, identify the problematic areas and propose actions to be taken to improve the cost-efficiency of the services, without affecting the quality.
- Monitoring and providing advice on advance financing to implementing partners (if applicable) and monitor and analyse activities undertaken by these in accordance with the POW.
- Reviewing and proposing alternative financial solutions to the Programme Manager and the POC to facilitate the transparent and efficient allocation of resources for the activities of the Programme.
- Preparing monthly projected liquidity flow statements, analyses and timely requests to the MED for projected counterpart funding for expenditures financed by the Government.
- Reconciling and reviewing expense statements for Withdrawal Application requests to IFAD.
- Reviewing insurance coverage of assets during implementation/construction.
- Reviewing all payroll and relevant worksheets, payments to suppliers, utilities, contractors, payments, service providers and implementing partners prepared by the accountant.
- Preparing interim and yearly financial statements for management, the POC and IFAD and liaise with the external auditors.
- Supervising the Accountant and organizing appropriate training, career development plan, guidance to ensure successful attainment of tasks assigned.

- Visiting programme areas periodically as part of monitoring of the activities.
- Performing any other financial management duties that may be assigned by the Programme Manager.

Qualification and Experience

7. The Finance Officer shall possess a minimum of a bachelor's degree in accounting, finance or business administration.

8. At least six years of proven experience in:

- Accounting for projects financed by external donors in a management position;
- Preparing balance sheets according to Government of Belize's guidelines and international standards;
- Preparing withdrawal applications for external funding agencies;
- Liaising with the Ministry of Finance for replenishment of project accounts from external funding and for making payments to suppliers, service providers and staff;
- Planning and presenting financial needs according to Government of Belize's budgetary cycle and procedures based on activities planned.
- Working on project financing in rural development projects, particularly those involving rural organizations and groups.

Desirable Skills and Personal Qualities:

- Experience with IFAD, WB or CDB financed projects;
- Solid understanding of project accounting and financial reporting;
- Excellent command of the English language, spoken and written. Spanish language proficiency would be an asset.
- Practical understanding of external financing procedures of government and donor agencies;
- Leadership skills and ability to operate effectively in a team and contributing positively to working relationships;
- Willingness to work outside of formal working hours;
- Willingness to link with service providers to verify the use of standard accounting practices in reporting.

Reporting

9. The Finance Officer shall be responsible for executing his/her job responsibilities as outlined in this TOR. He/she shall report to the Programme Manager (PM) on all matters of financial management related to programme implementation, ensuring compliance with the FM requirements of Article IX of IFAD's General Conditions for Agricultural Development Financing (2014) (GC) and as per these TOR, endorse and submit all reports to the Programme Manager, the POC, MOF, MED, IFAD and GCF as required.

Article IX – Financial Reporting and Information

Section 9.01. Financial Records

10. The Project parties shall maintain separate accounts and records in accordance with consistently maintained appropriate accounting practices adequate to reflect the operations, resources and expenditures related to the Project until the Financing Closing date, and shall retain such accounts and records for at least ten (10) years thereafter.

Section 9.02. Financial Records

11. The Borrower/Recipient shall deliver to the Fund detailed financial statements of the operations, resources and expenditures related to the Project for each Fiscal Year prepared in accordance with standards and procedures acceptable to the Fund and deliver such financial statements to the Fund within four (4) months of the end of each Fiscal Year.

Section 9.03. Audit of Accounts

12. The Borrower/Recipient shall:

- each Fiscal Year, have the accounts relating to the Project audited in accordance with auditing standards acceptable to the Fund and the Fund's Guidelines on Projects Audits (for Borrowers' Use) by independent auditors acceptable to the Fund.
- Within six (6) months of the end of each Fiscal Year, furnish to the Fund a certified copy of the audit Report. The Borrower/Recipient shall submit to the Fund the reply to the management letter of the auditors within one month of the receipt thereof.
- If the Borrower/Recipient does not timely furnish any required audit report in satisfactory form and the Fund determines that the Borrower/Recipient is unlikely to do so within a reasonable period, the Fund may engage independent auditors of its choice to audit the accounts relating the Project. The Fund may finance the cost of such audits by withdrawal from the Loan and/or Grant Accounts

Section 9.04. Other Financial Reports and Information

13. In addition to the reports and information required by the foregoing provisions of this Article:

14. The Borrower/Recipient and the Project Parties shall promptly furnish to the Fund such other reports and information as the Fund shall reasonably request on any financial matter relating to the Financing or the Project or any Project Party.

Terms of Reference: Monitoring and Evaluation Specialist

15. The M&E Specialist is responsible for guiding the overall M&E strategy and implementation of related activities within the programme and via key implementing partners, and providing timely and relevant information to programme stakeholders. This requires close communication with all involved in programme implementation and coordination, including the Programme Oversight Committee, the Programme Manager, PMU staff, Implementing Partners and programme beneficiaries.

Position Responsibilities

16. Specific responsibilities of the M&E Specialist will include:

- Providing leadership to the PMU's work on M&E through orientation and coordination of M&E activities with stakeholders.
- Organizing and facilitating programme start-up workshops in coordination with PMU staff and stakeholders.
- Supporting the annual planning process (development of AWPB), including the organization of annual planning and evaluation workshops with beneficiaries and key implementing partners.
- Developing, with support from the Programme Manager, the TOR for the design and development of the M&E Management Information System.
- Supervising the development of the M&E Management Information System for use by different stakeholders that satisfies their demand for information, and provides an ongoing monitoring of project activities (AWPB), LF and RIMS output and higher-level results, including targeting performance and gender equity.
- Monitoring compliance of the targeting strategy and outreach to vulnerable groups.
- Monitoring (data collection and registration, analysis and feedback) of progress of the implementation of the AWPB, in coordination with PMU staff and key implementing partners.
- Guiding the process for identifying and designing the key indicators for each component, recording and reporting physical progress against the AWPB and steering the process for designing the format of progress reports.
- Developing a comprehensive and detailed M&E plan and manual that provides all the information required for stakeholders to understand what has to be done, how to do it, when to do it, and who is responsible. The plan should cover all the components of the M&E and MIS system.
- Training and supporting PMU staff and key implementers in the use of the M&E and Management Information Systems.
- Assuring the quality of the data, and that information is registered according to the agreed upon timing and frequency, and that the database remains up-to-date.
- Responding to specific information needs of the PM, the POC, the Borrower, IFAD and GCF.
- Developing the TOR for design and execution of a baseline survey and impact studies (RIMS and LF indicators) and supervising consultants that are contracted to execute the surveys and studies required for evaluating programme effectiveness and impact.
- Guiding staff and implementing partners in preparing their progress reports, and preparing consolidated progress reports for management to submit to the relevant bodies (POC, IFAD, GCF), in accordance with approved reporting formats and timing.
- Making regular reports to the PMU and POC, highlighting areas of concern and preparing the documentation for review at meetings.
- Undertaking regular visits to the field to support implementation of M&E activities and identifying where adaptations might be needed.
- Guiding the regular sharing of the outputs of M&E findings with programme staff, implementing partners, primary stakeholders, public media, and social media.
- Identifying lessons learned, knowledge generation and knowledge sharing and assisting with feedback of the lessons learned and relevant experiences to policy makers and IFAD.

- Coordinating with the Programme Manager and stakeholders, the planning and implementation of the “Closing Workshops”.
- Assisting the Programme Manager and Consultants in the execution of the final evaluation, the preparation of the Programme Completion Report, and other programme activities that may be identified.

Qualification and Experience

17. The M&E Specialist will possess a minimum of a bachelor’s degree in development studies, statistics, social science or a related field, and have at least five years of proven experience in:

- Design and implementation of M&E systems;
- Application of M&E methodologies and approaches (including quantitative, qualitative and participatory);
- Preparation and use of the logical framework approach and other strategic planning approaches;
- Training in M&E systems and implementation;
- Facilitating learning-oriented analysis sessions of M&E data with multiple stakeholders;
- Information analyses and report writing;
- Development of evidence-based knowledge products.
- Experience of working with age and gender disaggregated indicators.

Desirable Skills and Personal Qualities

- A solid understanding of rural development, with a focus on participatory processes;
- Good analytical and data analysis skills;
- Good report writing and computer skills (experience in data processing);
- Leadership qualities, personnel and team management (including mediation and conflict resolution);
- Willingness to work outside of formal working hours;
- Willingness to undertake regular field visits and interact with different stakeholders, especially primary stakeholders.

Reporting

18. The M&E Specialist will report directly to the Programme Manager and will be supported by the PMU Administrative Staff.

Terms of Reference: Procurement Officer

19. The Procurement Officer would be responsible for procurement of goods, works and services in the framework of the Be-Resilient Programme. Within this overall role, the following tasks would be the specific responsibility of the PMU Procurement Officer:

- Prepare the annual Procurement Plans in accordance with the Annual Work Plans and Budgets;
- Draft the public announcement for each tender;
- Prepare Bidding Documents for each procurement activity in accordance with the approved Standard Bidding Documents;
- Coordinate bid opening, evaluation and preparation of required documentation such as minutes of bid opening ceremony, written proposals and recommendations for contract award;
- Prepare and submit to IFAD all required information for prior review and no-objection for contracts award in accordance with the IFAD Project Procurement Guidelines and Procurement Handbook, the provisions of the financing agreement and Letter to the Borrower, and the Be-Resilient financial, accounting and administrative procedures manual.
- After agreement with IFAD on contract award, initiate the contract signing procedure;
- Manage the procurement monitoring database system, prepare periodic reports on the status of procurement for the programme.
- Compile and confidentially keep up-to-date reports, documents and records of all procurement activities, ensuring proper documentation, transparency and ease of reference.
- Monitor the administrative implementation of contracts in coordination with the Programme Manager and other relevant PMU staff.
- Carry out any other activities that are assigned by the Programme Manager.

Qualifications and Experience

- University degree in Law, Business Administration, Economics, Public Administration or a related field.
- A minimum of five years working experience in procurement related activities with at least two in public procurement, preferably in donor-funded projects;
- Certification in Procurement or other qualifications specifically related to procurement will be an asset.
- Proven ability to work in a multi-disciplinary team.
- Familiarity with relevant legislation and procedures of Belize.
- Fluent English, both spoken and written.
- Computer literate.

Desirable Skills and Personal Qualities

- Demonstrated ability to set priorities, plan, coordinate, and monitor work performance;
- Proven capacity to work under pressure and in coordination with high-level multi-sector staff;
- Be results-oriented;
- Very good integrity and high ethical standards;
- Self-starter and self-motivated with minimal supervision required;
- Willingness to work outside of formal working hours;
- Willing to undertake regular field visits and interact with different stakeholders, especially primary stakeholders;

Reporting

20. The Procurement Officer will report directly to the Programme Manager and will be supported by the PMU Administrative Staff.

Terms of Reference: Rural Organization Development Specialist

21. The Rural Organization Development (ROD) Specialist will be a member of the PMU and will be responsible for the successful strengthening of rural producers' organizations. He/she will supervise and receive support from two consultants who will be contracted to help carry out the capacity building programme. The ROD Specialist and consultants will work closely together with officers from the Department of Cooperatives in order to strengthen the officers' capacities and create synergy with other activities being carried out by the department.

22. The ROD Specialist will lead the implementation of the programme´s strategy for Social Inclusion and Gender Equality, including identifying and implementing affirmative actions designed to address gender inequalities and help members of disadvantaged or more vulnerable groups to overcome obstacles to equal access to development opportunities.

Position Responsibilities

23. Specific responsibilities of the ROD Specialist will include:

- Identifying producers' organizations and informal farmers groups interested in getting organized; and identifying their training and capacity building needs;
- Developing an individual capacity building programme for each organization;
- Developing, in coordination with the M&E Specialist, the methodology and instruments for measuring and following up on changes in producers organizations – organizational, administrative and management skills; membership (inclusion of new male farmers, female and young farmers); social and human capital; services provided by the organization to the members in relation to the key commodities they manage and value chain(s) they are a part of; and generation of revenues and financial sustainability;
- Organizing, coordinating and participating in the implementation of the capacity building programme;
- Developing, in coordination with the Department of Cooperatives, manuals, training materials and instruments for producers' organizations;
- Assisting producers' organizations in developing proposals for the Matching Grant Fund, and the implementation of proposals, if approved;
- Identifying potential service providers for quality training of young local managers;
- Coordinating and following up on the implementation of the "Pilot Local Management Programme" with selected producers' organizations;
- Developing a detailed strategy for Social Inclusion and Gender Equality for programme implementation in general and in particular, rural organizational development, including identifying and implementing affirmative actions designed to address existing gender inequalities;
- Developing a strengthening and "in-service capacity building" plan for the Officers from the Department of Cooperatives;
- Organizing Learning Routes and national and international study tours/exchange visits for MOA staff in Rural Organizations Strengthening and Gender Equality;
- Organizing Learning Routes and national and international study tours/exchange visits for beneficiaries in Rural Organizations Strengthening, and Gender Equality.
- Coordinating and following up on implementation of technical activities (studies, workshops, etc.) in support of the MOA Gender Focal Point;
- Organizing and supervising, in coordination with the M&E Specialist, the development of at least two (2) systematizations of relevant experiences related to rural organizations´ strengthening, human and social capital building, gender equity or youth participation;
- Helping to develop and implement mechanisms that contribute to feeding back lessons learnt and knowledge developed to IFAD's country or regional-level policy dialogue, and programme development work, national policy formulators, legislators and executive bodies.

Qualification and Experience

24. The ROD Specialist will possess a minimum of a bachelor's degree in business development, business administration or related field, and have at least five years of proven experience in:

- community and rural development, strategic planning for small organisations, participatory methodologies and applied and practical training method;
- working with gender equity and inclusion of rural youth in rural organizations;
- working with age and gender disaggregated indicators.

Desirable Skills and Personal Qualities

- A solid understanding of and experience with the development of rural organizations (producers' groups, associations, cooperatives, women's groups) in the agriculture sector, specific to the Belize;
- Good analytical and data analysis skills;
- Successful work experience in similar projects would be considered an asset.
- Good report writing and computer skills (experience in data processing);
- Leadership qualities, personnel and team management (including mediation and conflict resolution);
- Willingness to work outside of formal working hours;
- Willingness to undertake regular field visits and interact with different stakeholders, especially primary stakeholders.

Reporting

25. The ROD Specialist will report directly to the Programme Manager and will coordinate intensively with the PMU staff and in the field with the Climate Extension Agents. The ROD Specialist would be contracted on a year-to-year basis.

Draft Terms of References: Rural Infrastructure Engineer

Responsible to: PMU Director/Programme Manager

Qualifications and Experience

26. A higher degree or an equivalent qualification in Civil Engineering with sound knowledge of contemporary issues in the rural infrastructure of Belize in particular. A minimum of five years working experience with projects for infrastructure rehabilitation including design and construction supervision with proven ability to work in a multi-disciplinary team and with rural population. Familiarity with engineering design requirements and construction supervision procedures of Belize, as well as with the procurement procedures applicable under foreign donors' funded projects. Computer literate. The selected candidate will have a pragmatic, creative and energetic approach to problem solving and decision-making and the capacity to operate effectively with contractors and rural population.

Job Description

27. Under the direct supervision of the PMU Director/Programme Manager the Rural Infrastructure Engineer will be responsible for overall guidance and management of the infrastructure investment related activities under the Climate Resilient Rural Infrastructure (CRRIA) component of the Resilient Rural Belize Programme (B-Resilient) in accordance with the B-Resilient Programme Implementation Manual (PIM), and regulations and procedures for supervision of design and civil works as per the applicable legislation of Belize. The Rural Infrastructure Engineer will be responsible for supervising and guiding activities of PMU Institutional Development Specialist, consultants involved in design and supervision of works that due regard is given to the quality and quantity of works to be implemented throughout PMU operations in the framework of the B-Resilient/CRRIA component. Within this overall role, the following tasks would be the specific responsibility of the PMU Rural Infrastructure Engineer.

- In cooperation with the PMU relevant staff to participate in information workshops and sensitize rural communities about the component, its objectives and eligibility criteria, and application and selection procedure.
- Screen and rank the proposals in accordance with the criteria and procedure described in the PIM and develop recommendations for infrastructure fund award for POC review and approval.
- Assess whether the proposed civil works are required or whether other, more appropriate structures may be more suitable.
- Review proposed works in relation to other possible alternatives.
- Develop Terms of Reference for development of engineering designs for selected proposals.
- Monitor and guide consultants' activities selected for development of engineering designs.
- Review detailed engineering designs in terms of sound technical solutions, quality and identified scope and volumes of works. Obtain independent review of designs (if required) and environmental impact assessment from relevant institutions as per the legislation of Belize.
- Participate in Bid Opening and Evaluation Committee in evaluation of bids for consultancy services and civil woks implementation.
- Act as Contract Manager for all contracts for works procured by the PMU for the implementation of the CRRIA component, including approvals of contractors' submittals (payment certificates, variation orders, completion certificates, etc.) and notifications to the contractors (defects, penalties, etc.) and any other issues as specified in the general and special conditions of contract.
- Participate and contribute in discussions with applicant, design companies and other interested parties in decision making during the construction stage.
- Supervise the implementation of civil works and coordinate activities of site supervisors in accordance with agreed procedure and standard formats.

- Ensure the compliance of design works and construction works with the technical requirements as well as the overall quality of works.
- Organize the handover of completed infrastructure facilities to the relevant institutions according to stipulated procedures.
- As a member of the PMU, prepare annual work plans and budgets for the CRRIA component, provide reports and information on infrastructure investment operations as necessary to the PMU Director/Programme Manager and contribute to progress reports.

PMU Institutional Development Specialist

Responsible to: PMU Rural Infrastructure Engineer

Qualifications and Experience

28. A higher degree or an equivalent qualification in Agriculture Water Management with sound knowledge of contemporary issues in the water management related aspects of Belize in particular. Familiarity with existing water related and non-governmental rural organizations legislation, as well as with the general principles and aspects of irrigation and drainage systems participatory management in the neighbouring countries (Mexico). Computer literate. The selected candidate will have a pragmatic, creative and energetic approach to problem solving and decision-making and the capacity to operate effectively with rural population.

Job Description

29. Under the direct supervision of the PMU Rural Infrastructure Engineer the Institutional Development Specialist will be responsible for overall guidance and management of the institutional development related activities under the Climate Resilient Rural Infrastructure (CRRIA) component of the Resilient Rural Belize Programme (B-Resilient) in accordance with the recommendations to be provided by the International Consultant to be requited at initial stage of programme implementation. The Institutional Development Specialist will be responsible for activities related to training, supporting and guiding activities of the farmers' group in establishment of Water Users' Associations and in all the related aspects to ensure sustainable operation and maintenance of the irrigation and drainage assets constructed in the framework of the CRRIA component. Within this overall role, the following tasks would be the specific responsibility of the PMU Institutional Development Specialist.

30. In cooperation and under the overall guidance of the International Consultant:

- Review and identify the relevant legislation in Belize based on which participatory irrigation management approach could be developed and applied in Belize.
- Develop the relevant statues and step by step guidance for establishment of Water Users' Associations in Belize rural areas.
- Develop relevant training manuals for all aspects of irrigation management including operations of Water Users' Associations, crop water requirement, irrigation scheduling, methods of irrigation, irrigation service fee determination and application, financial management of WUAs, decision making, conflict resolution etc.
- Provide relevant support and training to group of farmers for establishment of their WUAs and on operational aspects.
- Participate and contribute in discussions with applicant, design companies and other interested parties in decision making during the construction stage.
- As a member of the PMU, prepare annual work plans and budgets for institutional development related activities, provide reports and information on infrastructure investment operations as necessary to the PMU Director/Programme Manager and contribute to progress reports.

Terms of Reference: Climate Specialist

31. The Climate Specialist will be a member of the PMU and will be responsible for the successful implementation of a climate smart agriculture program empowering smallholder farmers to meet the

needs of formal markets and become competitive actors in the national food system. He/she will supervise and receive support from six (6) Climate Extension Agents specialized in climate smart agricultural practices who will be contracted to provide advice and assistance to producers in the field. The Climate Extension Agents will work closely together with extension agents from the Ministry of Agriculture (MOA) in order to strengthen their capacities and create synergies with other activities being carried out by the MOA.

32. The Climate Specialist will lead the implementation of the programme´s strategy for farmer-level support that assists farmers produce climate adapted, higher quality, more nutritious crops, including strengthening the design, planning and implementation of programmes in resilience building, productive safety-nets, disaster-risk reduction and preparedness from production to post-harvest.

Position Responsibilities

33. Specific responsibilities of the Climate Specialist will include:

- Conducting desk review, including the programme description, programme documents and programme result data, such as reports, M&E data, case studies, success stories, and other relevant materials generated by the programme;
- Designing a draft work plan for review by the programme manager;
- Conducting fieldwork according to the work plan;
- Analysing and documenting key findings in clear, concise and usable case studies. In collaboration with Climate Extension Agents, develop at least 2 case studies that focus on the Climate interventions. Each of these case studies should answer the following questions: (i) What is working well in current programming? How do you know? (ii) What is not working well in current programming? How do you know? (iii) How are the programme's interventions addressing the climate-induced stresses and shocks in Belize?
- Preparing a draft report for programme management feedback;
- Preparing a final report and PowerPoint presentation summarizing findings, making presentations

  to programme management, the donor and partners
- Engaging multi-actors' interests and promoting their active involvement, ensuring adequate capacity at different levels to perform the actions and changes needed, and political will to support the implementation of climate-smart actions;
- In collaboration with the Value Chain Specialist, the ROD Specialist, and the Climate extension agents, identifying formal and informal farmers groups, individual farmers and women interested in accessing markets, improving backyard gardens, producing more sustainably and adapting their agricultural practices to climate change; and identifying their training and capacity building needs;
- In collaboration with the Climate extension agents, developing a self-vulnerability assessment for each targeted community; and supervising the execution of the self-vulnerability assessments;
- Coordinating and supervising the development of an individual production and climate resilience programme for each farmer organization that will be carried-out by the Climate extension agents;
- In coordination with the M&E Specialist, designing the methodology for measuring and following up progress of the producers organizations, women's backyard gardens and individual farmers – increased production, crop quality and added value; reduced post-harvest losses; diversified production; increased farmers climate resilient knowledge; increased access to markets; improved/increased women's backyards; increased food security; communities awareness on their natural resources; communities awareness of climate change threats, vulnerability and response capacity; MoA extension agents knowledge on all of the above mentioned subjects.

- In coordination with University of Belize Central Farm (UBCF), developing training courses, and manuals on climate resilient practices, disaster risk-reduction and preparedness, post-harvest solutions and transformation, and storage solutions. Courses will be directed to farmers, MOA staff and extension agents;
- In collaboration with UBCF, identifying potential farms to carry out farmer-to-farmer trainings and exchanges; and coordinating the field visits.
- Revising producers' organizations proposals for the Matching Grant Fund, and supervising the implementation of proposals, if approved;
- Developing longer-term resilience programmes, developed in partnership and aligned to national and local priorities;
- To the extent possible, working to catalyze changes needed in the institutional set up of public extension away from a system of separate extension services for agriculture, forestry, and environment, to a unified system or better alignment between sectoral extension services with a greater focus on natural resources management (NRM).
- Identifying vulnerable communities and households, and implementing actions to build their resilience to shocks and ensuring long-term food security;
- Ensuring good relationships, communication and coordination between Climate and MoA extension agents;
- Informing the Ministry of Agriculture and the Climate Change office on important issues and the programme´s status on a regular basis;
- Participating in the selection of the Climate extension agents.

Qualification and Experience

34. The Climate Specialist will possess a minimum of a bachelor's degree in Agriculture, a post-graduate degree in Environmental Management/Conservation and have at least five years of proven experience working with farmers in sustainable agricultural production.

Desirable Skills and Personal Qualities

- A solid understanding of rural development; knowledge and experience with agroforestry, and agroecology is an asset;
- Excellent command of the English language, spoken and written. Spanish language proficiency would be an asset;
- Leadership skills and good communication skills;
- Solid managerial capabilities for managing human and financial resources, and fostering teamwork (including mediation and conflict resolution);
- Ability to negotiate and foster partnerships with stakeholders and other institutions;
- Willingness to work outside of formal working hours;
- Willingness to promote and conduct regular meetings with all stakeholders.

Reporting

35. The Climate Specialist will report directly to the Programme Manager.

Terms of Reference: Climate Extension Agent

36. The Climate Extension Agent will be responsible for building climate smart farmers and ensuring that smallholder farmers meet the needs of formal markets and become competitive actors in the national food system. He/she will cover a specific area and will provide advice and assistance to producers directly in the field, guaranteeing the dissemination and uptake of climate smart technologies, tools and practices that respond to specific local needs. The Climate Extension Agent will work closely together with extension agents from the Ministry of Agriculture (MOA) in order to strengthen their capacities and create synergies with other activities being carried out by the MOA.

Position Responsibilities

37. Specific responsibilities of the Climate Extension Agent will include:

- Conducting desk reviews, including the programme description, programme documents and programme result data, such as reports, M&E data, case studies, success stories, and other relevant materials generated by the programme;
- Designing a draft work plan for review by the Climate Specialist;
- Conducting fieldwork according to the work plan;
- Analysing and documenting key findings in clear, concise and usable case studies. In collaboration with the Climate Specialist develop at least 2 case studies that focus on one of the climate resilient interventions. The case studies should answer the following questions: (i) What is working well in current programming? How do you know? (ii) What is not working well in current programming? How do you know? (iii) How are the project's interventions addressing the climate-induced stresses and shocks in Belize?
- Preparing a final report and PowerPoint presentation summarizing findings, clearly identifying the advantages linked to the adoption of climate smart management tools and approaches; and making oral debriefings to the Climate Specialist;
- Conducting site-specific assessments to identify suitable agricultural technologies and practices needed for climate resilient practices using participatory methods and approaches (e.g., self-vulnerability assessment, and Resilience Plan);
- Identifying training and capacity building needs of formal and informal farmer groups, individual farmers and women in the assigned working area;
- Determining what types of adaptive changes farmers need to make and when to make them, and ensuring that relevant technologies and modes of dissemination keep up with the need for ever changing climate change adjustments;
- Ensuring climate resilient technologies and practices embed high-value traditional agriculture skills and tools, easily recognized and accepted by farmers.
- Disseminating climate resilient technologies and identifying best dissemination approaches including traditional extension modes (e.g., interpersonal interaction, demonstrations, field days, printed materials, etc.), ICTs (radio, mobile phones, video, social media), rural resource centres, farmer-to-farmer extension, and farmer field schools.
- Collaborating with local researchers (e.g., University of Belize Central Farm - UBCF) to come up with practices to address climate change, getting involved in looking for technological solutions for boosting agricultural productivity sustainably, searching for good practices in adapting to climate change from historical experiences, identifying lessons from other regions (at national or international level), and giving feedback to researchers on how technological interventions are working;
- Building farmers' decision-making and problem-solving capacity, ensuring farmers draw on local and scientific knowledge, sharpen their observational and experimental skills and improving their critical thinking and problem-solving abilities to be able to make their own decisions about appropriate practices and diversified and resilient income opportunities from a menu of options;
- Building resilience after extreme climate events by working closely with humanitarian agencies to distribute seeds and inputs;

- Proposing and discussing with the Climate Specialist methodologies for measuring and following up progress of farmer organizations, women backyard gardens and individual farmers;
- Assisting producers' organizations in developing proposals for the Matching Grant Fund, and the implementation of proposals, if approved;
- Ensuring a good working relationship, constant communication and coordination with MOA extension agents.
- Informing the Climate Specialist on important issues and the programme´s status on a regular basis.

Qualification and Experience

38. The Climate Extension Agent will possess a minimum of a bachelor's degree in Agriculture, and have at least three years of proven experience working with farmers in sustainable agricultural production and managing natural resources at the landscape level.

Desirable Skills and Personal Qualities

- Strong interdisciplinary vision;
- Humility and capacity to listen to the voice of farmers;
- "Soft" skills (e.g. communications, facilitation, co-learning, sensitivity to gender and diversity issues, managing power and conflict dynamics, etc.) and in specialized areas such as marketing;
- Experience with non-formal education and experiential learning approaches (e.g. farmer field schools and farmer learning groups and local agricultural research committees) that focus on enhancing farmer experimentation and problem-solving abilities;
- A solid understanding of rural development; knowledge and experience with agroforestry, and agroecology is an asset;
- Excellent command of English and Spanish, spoken and written.
- Leadership skills and good communication skills;
- Willingness to work outside of formal working hours.

Reporting

39. The Climate Extension Agent will report directly to the Climate Specialist.

Terms of Reference: Agricultural Marketing Specialist

40. The Agricultural Marketing Specialist will assist the identification and links of the smallholder farmers on district level to suitable local markets by providing marketing technical assistance and linkages, advise and coach the Climate Extension Agents at district/village and farmers' organizations level. This job is a joint/combination of agricultural marketing, production and sound business skills.

Position Responsibilities:

41. Specific responsibilities of the Agricultural Marketing Specialist will include market identification and quantification related activities, including: using effective, responsive, and sustainable market information system to support smallholder farmers and other value chain actors to make informed decisions. This effort will include:

- Securing ease of accessibility to the existing market information sources;
- Operating the implementation of effective primary data collection systems including crop budgets, costs of production, prices and break-even cost for target commodities;
- Supporting data analysis efforts and forecasting, as well as data updating;
- Coordinating and supporting the implementation of efficient information dissemination techniques including coordination with MOA and networking with other entities;
- Coordinating and supporting the implementation of effective data update strategy;
- Coordinating and supporting all necessary key stakeholders training to develop market access strategies, highlight the opportunities open for farmer groups;
- Supporting the development and dissemination of marketing reports, situation and outlook reports, and commodity profiles; and

42. Market Linkages activities, including:

- Providing support to establish solid linkages with the market to enable farmers' groups and organizations to market their products profitably including: supporting the development of marketing strategies and plans based on findings/results of the Value Chain End-Market Research, in order to facilitate farmers' decision-making process around Six Cs: Choice, Context, Channels, Customers, Competitors and Communication;
- Supporting information process flow with key market actors to promote farmers' organizations products and create awareness;
- Working closely with the programme staff to develop profitable cropping patterns and advise on types of crops highly demanded in the market, optimum timing of production, standards, and market access information in order to tailor production to the market needs;
- Collaborating in the evaluation of marketing section/approach of plans (Business Plans, Market Oriented Resilience Plans) effectiveness and recommend any improvements and fine tunings needed to advance marketing activities;
- Supporting the development of simple traceability systems, coaching the Climate Extension Agents on sources of information as well as basics of the traceability systems;
- Communicating and coordinating with key public and private institutions as relevant sources of information on validated technologies/innovations to improve the value chain stages.

Qualification and Experience:

43. The Agricultural Marketing Specialist will possess a minimum of a bachelor's degree in Agribusiness or related field with solid background in Agricultural Marketing and Agriculture Production Systems.

Desirable Skills and Personal Qualities:

- Solid agriculture production background with proven qualifications and practical experience in agricultural value chains and business linkages.
- Good communication and presentation skills, proven by previous work;

- Familiarity with fresh produce business and packing, cooling, cold chain, etc. proven by work related to that directly;
- Familiarity with basic commodity traceability systems as well as horticulture, fruticulture and beekeeping production technologies;
- Solid multicultural communication (oral and written) and professional presentation skills;
- Ability to manage training processes with programme staff, farmers and other value chain actors as well as communicate effectively.
- Demonstrated ability to collaborate, willingness to innovate and ability to think systematically.
- Highly developed negotiating and interpersonal skills.
- Ability to analyse issues and develop sound project-specific recommendations.
- Ability to define problems, collect and analyze data, establish facts, and draw valid conclusions.
- Willingness to travel as project needs dictate.

The ideal candidate:

- Should have solid marketing, value chain and agriculture background;
- Should be very cognizant and have previous hand on experience on marketing commodities as well as commodities perishability, sensitivity, market complexity and special handling considering mainly horticulture, fruticulture and beekeeping commodities/products;
- Should be able to coach the Climate Extension Agents on proper agriculture innovation inputs/techniques to comply with selected markets product requirements/demands; and
- Will make use of marketing reports, presentations, situation and outlook reports, and he/she should be able to present the results to farmers and farmers' organizations effectively.
- Will work with complex data and should be able to collect, understand, summarize and conclude results professionally.
- Will support the process of linking farmer groups and organizations with markets. He/she should be able to communicate with different market segments considering: importers, processors, high-end buyers and different marketers/traders in domestic markets, quantifying their needs and translating market signals to the Resilient Production team to facilitate production and support establishing solid sustainable market linkages.

Reporting:

The Agricultural Marketing Specialist will report directly to the Value Chain Specialist.

Appendix 6: Planning, M&E and learning and knowledge management

A. Introduction

1. The Log Frame is the core of planning, implementation, management and design of the M&E system of the Programme. It defines the implicit results' chain underlying Programme design options and links activities to outputs and outcomes according to a cause-effect relationship. In addition, the Log Frame defines the criteria (indicators and targets) that will be used to assess, monitor and evaluate Programme performance and results. The Log Frame is presented at the beginning of the document, together with the theory of change underlying Programme design (Annex 1 below). Within three months of the start of implementation, an M&E Manual will be developed by the M&E Specialist as part of the PIM, which will describe the M&E System and provide the necessary operational details in terms of processes, tools and responsibilities.

B. Planning

2. The AWPB period will coincide with the GoB's annual budget period, from April 1 to March 31. For this reason and in order to meet IFAD's AWPB 60-day deadline of January 31 as well as to provide sufficient time for a participatory planning approach, the planning process will commence in October of the current annual work plan period. This will also serve the purpose of being able to provide the LPA with an estimate of the Programme's counterpart funding requirements to be included in the GoB's annual budget preparation for the upcoming budget period that is due by the end of November.

3. The planning process will include a number of planning sessions per year, which will be led by the Programme Manager. The process will commence with the first planning session, that will entail a review of the current AWPB to obtain a clear understanding of what has been achieved and what is likely to be achieved for the remainder of the current work plan period. That information, combined with the overall Programme targets, will be used to identify the outputs to be achieved during the new work plan period, the activities to be implemented and the resources (financial, technical assistance and other) that are required to deliver the planned outputs. This session will include participation from representatives of the IPs, producers' organizations and other stakeholders. Their involvement at this stage of the planning process will be crucial to ensure that planned activities take into account the issues being faced in the field, as well as to ensure stakeholders' ownership of the plan for implementation success.

4. The PMU will use a pre-defined AWPB template (see Annex 2 below) for planning that was designed as a tool for results-based management. The detailed AWPB Table will be accompanied by a short narrative (10 pages maximum) that will provide a quick overview of the key results achieved in the previous 12 months and of cumulative progress to date, together with a rationale for the key activities and targets planned for the next annual work plan period. Based on the activities to be implemented and the resources required, the PMU will also prepare the Annual Procurement Plan (APP) that will provide details of the procurement (consultancy services, works and goods) necessary to execute the planned activities.

5. The AWPB and the APP together will be submitted to the POC for initial review and approval in December and subsequently to IFAD for its no-objection. This will provide the PMU with sufficient time to make revisions, if required by the POC, and to re-submit for approval. Once approved, which should be in January (if revisions are required), the AWPB and APP will be submitted to IFAD for its no-objection by the 60-day deadline of January 31.

C. Monitoring and Evaluation

6. The main objective of M&E is to provide Programme stakeholders with data and information to:

- monitor the use of Programme resources and the timely addressing of problems for achieving Programme objectives, expected outcomes and targets;
- ensure compliance with the Programme's targeting strategy;
- provide the Programme with the capability to measure its impact; and
- develop specific evidence-based knowledge products.

7. The main objective of knowledge management (KM) is to provide stakeholders with knowledge-based information that can serve as inputs for scaling-up strategies, and for policy discussion and development on similar interventions.

8. For the Programme, M&E and KM will set out specifically to accomplish the following objectives:

- Provide the Borrower (MoF), the POC, relevant stakeholders, including the IPs and IFAD with information on the Programme's progress in relation to the parameters defined in the Logical Framework and the RIMS Indicators.
- Provide specific information on implementation progress and any problems that may be encountered during execution, which would help in decision-making by the PMU at the implementation level, the POC at the governance level and to IFAD at the funding level, for the successful execution of activities and ultimately, the successful achievement of the Programme's overarching objectives.
- Generate and share knowledge-based information on the Programme's experiences (positive and negative) that can lead to further innovation, replication of best practices by others and uPOCaling where the possibility exists.
- Provide the GoB (including the relevant departments and ministries), other stakeholders and IFAD with information and knowledge that would be useful for effective policy dialogue and improve on future similar interventions.

9. **M&E Strategy.** M&E activities will use a participatory approach in which Programme participants (including IPs and representatives of producers' organizations) will be fully engaged in the collection of field data, discussion and analysis of this data, and decision-making regarding changes that may be required for more effective Programme implementation. This means that the IPs such as the MoA and the DC will play an active role in data collection and its submission to the PMU. The PMU will be responsible for analysing the data against the AWPBs and overall Programme targets to monitor, assess Programme implementation progress and effectiveness and reporting the results to the POC and IFAD.

10. For M&E to be effective, information flows must be multi-directional; information must flow upward to the POC and IFAD, horizontally to the IPs and downward to Programme beneficiaries; the latter two will participate in data collection and the outputs from the M&E Systems must be beneficial to them to ensure their continued participation. At the governance level, the results of the analyses will be used for discussion on implementation progress and to make decisions on improvements and/or corrective measures on programme implementation strategies, where necessary. At the implementation level, the information will be used as a learning mechanism to guide the PMU, the IPs and Programme beneficiaries on the execution of Programme activities for achieving optimal results. The information will provide sufficient details to improve decisions and implementation: matching results to activities and evaluating those results against targets, in order to assist the PMU with timely decision-making for improvements and/or corrections to programme intervention, where necessary; to keep the programme on track; to assist beneficiaries on understanding how changes in agricultural practices, improvements in farm technologies and capacity building have contributed to the changes in their productivity, and in turn contribute to improving their rural livelihood and development; and to assist IPs (such as the MOA, the

DOC and other relevant partners) by providing up-to-date and relevant information on key metrics (on target and non-target areas) for strategy and policy development after programme completion.

11. Data collection will be done at different levels:

- At the beneficiary (farm) level: data will be collected on activities executed and resources expended (including extension visits, improvements to farms, etc.), in addition to data on changes in farm investments, production, productivity improvements, crop diversification, post-harvest losses, access to markets, sales, etc.
- At the Producers' Organizations level: information will be generated on changes in business and management practices (financial, reporting, marketing, etc.), changes in membership, registration of new cooperative organizations and cluster groups, coordination of activities (crop planting planning, sales organization, etc.) and the implementation of business plans.
- At the community level: data will be collected on rehabilitation of public infrastructure (roads, drainage, etc.) including storage and processing facilities constructed.

12. The programme will take advantage of mobile and internet technologies to provide a simple, cost-effective system for the collection of data and the dissemination of results. It will utilize a comprehensive Management Information System (MIS) that will cater for the collection, compilation and reporting of data to aid in the monitoring of progress toward programme objectives and targets, and support decision-making at the implementation and governance levels. The MIS will have sufficient tools (information dashboards, charting tools, and custom reports) for data review, analysis and dissemination.

13. The programme will make extensive use of tablets and online database applications to enable direct data collection and entry into the M&E's MIS. Data collection at the household level will be closely linked to the business management training, in which all the households and producers' organizations that are supported will be assisted to keep records (Farm Diaries) of their farm investments and farm business activities. The Climate Extension Agents (CEA) and the MOA's Extension Officers (AEO) will aid in this effort, and they will be provided with tablets for gathering household production and business data at least once per quarter. In addition, the PMU will take advantage of social media tools to improve communication and information sharing within the programme and among partners and other stakeholders.

D. Monitoring

14. Monitoring will be done at different levels and will track key elements of the programme – resources use, activities executed, whether intended products are delivered, whether implementation is on track and whether the intended objectives, targets and outcomes are achieved. It will assist the Programme Manager to address one of the key challenges in programme management - to verify whether the activities are executed according to the work plan and whether the programme's resources are being utilized effectively and efficiently. The M&E and MI Systems will be developed to provide the PMU and in turn the POC, with a continuous flow of information throughout the programme's implementation for effective decision-making, as well as to ensure compliance with the programme's targeting strategy, adherence to the AWPB and achievement of Log Frame and RIMS Indicator Targets.

15. Monitoring will take the form of qualitative and quantitative data (aided by the MIS and remote collection tools) to be collected in the field by the CEAs and AEOs, as well as field visits to the intervention areas by the Programme Manager and the M&E Specialist. Since the CEAs and AEOs will be located in the MOA District Offices, the PMU will have a crucial role in monitoring compliance to the programme's targeting strategy in the field. Disaggregated (by age and sex) data will facilitate monitoring of the targeting strategy and outreach to vulnerable groups. Field visits will be made on a monthly basis by the M&E Specialist to verify the quality of the data that is being collected, and on a quarterly basis (minimum) by the Programme Manager to verify the progress of implementation vis-à-vis the AWPB. The M&E Specialist will be responsible for ensuring that quality data is collected and that information is

registered according to the established timelines and frequency to ensure that the database is has the most up-to-date information. Monitoring of the AWPB's implementation progress and the achievement of Log Frame and RIMS indicators will be a shared responsibility of the PMU and the IPs.

16. The Programme will collect data in the field through the use of tablets. Training and support will be provided to the PMU and other users of the MIS in data collection and in the general use of the MIS. The information will be uploaded to a central MIS Server, which will be housed within the PMU. While access to MIS data will be readily available for all programme stakeholders (so they can monitor the activities they are responsible for and remain informed as to overall implementation progress), the PMU will ultimately be responsible for analysing the data and providing feedback to the IPs and other stakeholders on a timely basis and according to their specific needs.

E. Evaluation

17. Evaluation aims at determining the relevance, contributions, effectiveness and efficiency of the activities on the beneficiaries and the achievement of the targeted outcomes and desired results of the Programme. It assesses the changes in the well-being of the beneficiaries, while trying to compare the situation ex-ante (from baseline information) with the ex-post (after programme completion) situation. In the evaluation process, external factors that can interfere with the activities to achieve the desired impact on the target group are also taken into account. Furthermore, it contributes to improving the stakeholders' capacity to know and understand the results of the Programme's interventions, and identify best institutional practices and lessons learnt.

18. The PMU, in close collaboration with key IPs will be responsible for the assessment of changes generated by the interventions in the target population, as well as the progress toward objectives and goals. The MIS will be developed as a system to aid evaluation also, in which the required data is recorded and it provides reports for the POC, the PMU and IPs to measure changes in the programme´s indicators.

19. **Reporting.** Monthly Status Reports will be prepared by the M&E Specialist and submitted to the Programme Manager for endorsement before submission to the POC. The M&E Specialist will prepare status reports using the data collected via the MIS, information submitted by the CEAs and AEOs as well as field visits carried out. More detailed, mandatory semi-annual and annual reports will be prepared for submission to the Borrower and IFAD with input from all PMU staff and consolidated by the M&E Specialist. The latter would be presented to and approved by the POC before submission to IFAD. These reports would inform on the progress of execution of the AWPB and the Log Frame Indicators. An overview of the information flow through the M&E System is provided in Figure 1.

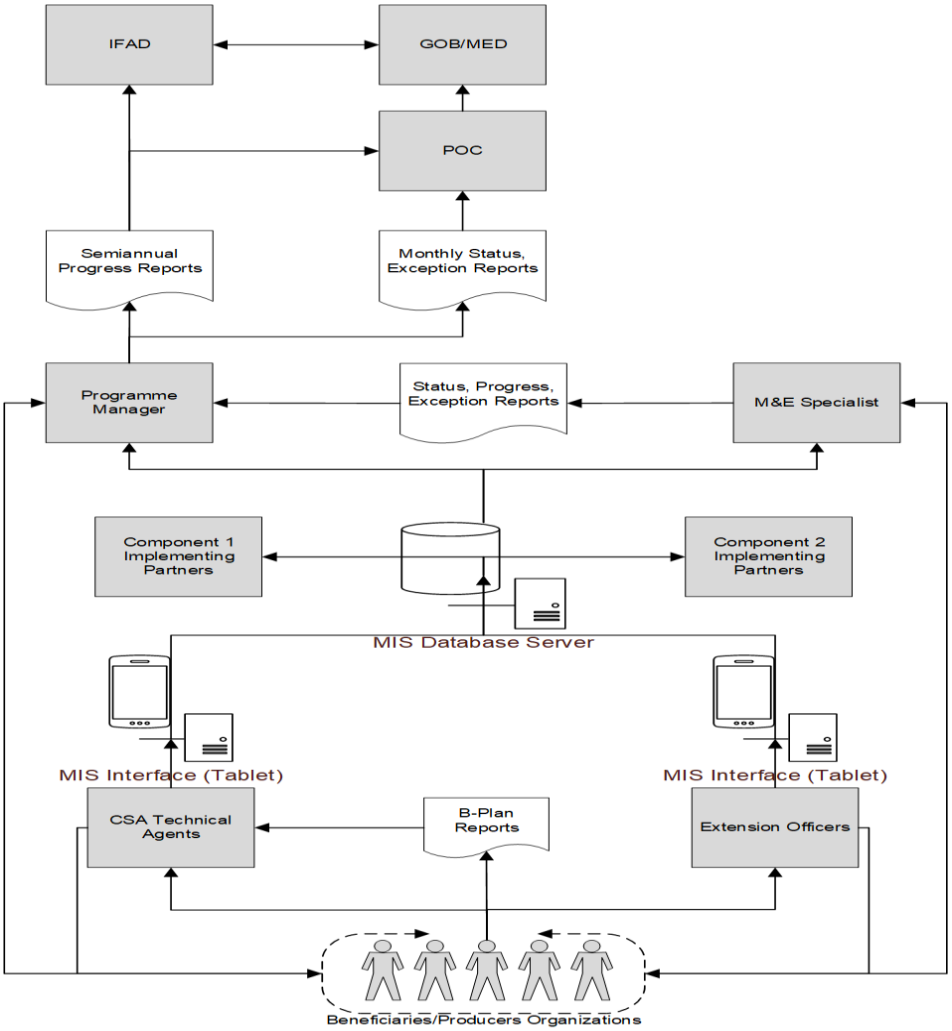
F. Results and Impact Management System (RIMS)

20. The purpose of RIMS is to continuously monitor the progress towards achieving the intended results, and this should guide the management strategy and implementation of activities. Lessons based on experiences (positive and negative) must be applied to address shortcomings and to increase the likelihood that the intended results will be achieved. The M&E and MIS will incorporate IFAD's RIMS Framework and the newly implemented Operational Results Measurement System (ORMS), which links expected results (as per the Log frame) with progress achieved (as documented in the supervision reports), to results actually achieved (as reported in project completion report). The RIMS (adopted by IFAD in 2003) was revised in 2017 and includes a number of Outreach and mandatory Core Indicators (CIs) that have been incorporated into the programme's Log Frame. These CIs, the cornerstone of the RIMS, will be tracked throughout the programme's implementation cycle and will be aggregated to provide a snapshot to IFAD of results achieved at any point in time.

21. Specifically, the M&E and the MIS will incorporate relevant indicators to monitor and track the achievement of results of rural organizational strengthening, capacity building, improvement of backyard

gardens, on-farm investments, uses of the MGF, the Market Access and rural public infrastructure activities to be implemented under the Climate Resilient and Smart Agricultural Production and Market Access (C-SAP), and the Climate Resilient Rural Infrastructure (CRRIA) Components. The MIS will collect data on all relevant indicators (at least on a quarterly basis) to provide the PMU and IPs with timely and reliable information on developments in each of the intervention areas, so that investment plans and activities can be managed appropriately for the achievement of established results, outcomes and impact. The analysed data will provide useful information for programme stakeholders (including beneficiaries) as they begin and continue to work on new investment activities. Beneficiaries and Producers' Organizations will receive support for the preparation of reports to track the progress of the implementation of their business plans. These reports will be provided to the PMU and will be used to monitor progress and to develop activities that would improve implementation to achieve the intended results.

Figure 1: M&E System Information Flow



22. The programme will utilize a system of "rolling baselines" in which baseline data would be generated on each beneficiary group (cooperatives, cluster groups, individual producers, etc.) at the start of the intervention activities. This information will then be used to track changes in the key indicators as programme implementation progresses and results are achieved. The information will be used by the PMU to make improvements and/or take corrective actions on the intervention, as may be needed.

23. **Baseline and impact study.** In order to evaluate progress achieved and impacts made over time, it is essential to have baseline data on key variables of the targeted areas and the beneficiaries. Therefore, it is imperative that a baseline study be conducted by the PMU (through a capable service provider contracted for this specific purpose) to generate the data that reflects the initial situation at programme start-up. The minimum requirement of the baseline data is that it provides the information to measure the indicators defined in the LF and RIMS Outreach and Core Indicators in the start-up phase. The PMU will be responsible for data collection and analysis of the LF and RIMS indicators. A Baseline Study to be completed during the first year of implementation and one Impact Study to be completed at the end of programme implementation have been planned and budgeted for.

G. Mid-Term Review

24. A Mid-Term Review (MTR) will be carried out three years after programme start-up. This will be an external review led by IFAD, the scope of which will be wide-ranging in order to assess implementation progress and the achievement of LF and RIMS Indicators, progress towards the objectives and outcomes, effectiveness of institutional arrangements and resources used. The MTR will be executed to allow sufficient time for adjustments to be made to the implementing strategy for the remaining period of execution. The MTR will also assess the effectiveness of the targeting approach and of the gender equality affirmative actions. It is also anticipated that the MTR will specifically assess the evaluation and the timeliness of response to investment proposals, the delivery of intervention activities, the performance of the MGF, the performance of the PMU, and the extent to which activities under both components have been effective in helping beneficiaries to improve their assets, income, climate resilience capabilities and access to markets.

H. Programme Supervision

25. IFAD's supervisory function will be ongoing and support will be provided to resolve issues that may arise during implementation. Supervision Missions from the Latin America and Caribbean Division (LAC) will take place at least once per year and will be organized by IFAD´s Country Programme Manager (CPM) in coordination with the Borrower, the LPA and the PMU. The Supervision Missions will pay particular attention to smooth and timely implementation of the programme and to the achievement of its intended objectives and outcomes, and to the progress made on achieving the LF and RIMS indicators.

26. The following key tasks will be undertaken by the supervision missions:

- Assisting in identifying and discussing actual and potential/emerging problems and constraints, and agreeing on solutions, changes or improvements needed and the responsibilities for their implementation.
- Assessing the appropriateness of the targeting strategy and its effective execution by the PMU and IPs, suggesting the necessary adjustments to increase outreach and impact, and reviewing programme performance in terms of youth and gender-equity considerations.
- Reviewing the programme's implementation progress against Final Design Report targets and the AWPB, using the key indicators as defined in the LF.
- Discussing the perception of the programme and their participation in its implementation with the PMU and representatives of IPs, and actively seeking their opinion on improving programme performance.
- Discussing with beneficiaries the level of their participation and access to programme services and results achieved to date, and actively seek their opinion on improving programme performance.
- Undertaking field visits to the targeted areas to spot check and verify reported physical progress.
- Exploring the adequacy of the M&E and the MIS and its use by different stakeholders, and assessing whether the system satisfies the information needs of programme stakeholders, and providing on-going monitoring information of programme activities (AWPB), LF and RIMS output and higher-level results, including targeting performance and gender equity.

- Examining programme expenditures and making realistic estimates as to whether the programme can be completed within the original cost estimates (foreign currency and local currency).
- Identifying possible cost overruns/savings on IFAD's categories of expenditures and ascertaining the need for a reallocation of funding resources between categories, or cancellation due to savings.
- Reviewing the progress of procurement and disbursements based on comparisons of the records of IFAD and the Programme, and verifying the terms of the contracts awarded and the commitments and disbursements made, and obtaining copies of approved contracts not yet submitted to IFAD.
- Checking a sample of Statements of Expenditure (SOEs) to verify their accuracy against IFAD's records.
- Reviewing the financial and accounting systems of the programme and IPs (if applicable), and ensuring that these systems are adequate for IFAD's reporting requirements.
- Reviewing compliance by the Borrower with the loan agreement.
- Exploring such other matters related to the programme that may delay or adversely affect programme implementation and that would impact the achievement of the expected results.

I. Programme Completion Process and Report

27. The programme completion review is a process undertaken by the Borrower in close coordination with IFAD at the end of the implementation cycle in order to report on the results achieved through programme interventions. The main purposes of the review process are to promote accountability, reflect on programme performance, elicit lessons learnt to inform new programme/project designs, define an exit strategy and to define an appropriate post-programme strategy for sustainability. The learning dimension of the completion process should be regarded by both IFAD and the Borrower as providing useful information for improvements in future programme/project designs and programming. The completion review process is also critical for identifying opportunities for scaling-up of best practices.

28. A well-managed completion process is important for identifying ways and means to enhance the sustainability of programme interventions. It provides all stakeholders with a unique opportunity to reflect on overall programme design and performance, and generate useful lessons learnt from implementation. Key findings of the completion review will be summarized in a standard Programme Completion Report (PCR).

29. At the end of the Programme, the PMU will organize and implement a Closing Workshop with the various stakeholders. The objective of the workshop is to discuss programme experiences and results, identify best practices and success stories and obstacles encountered during implementation, and which will also provide inputs to the Programme Completion Report (PCR).

J. Knowledge Generation and Sharing

30. The main objective of knowledge management is to create, share, use and manage the knowledge-based information from the programme with stakeholders that can serve as inputs for scaling-up strategies, and for policy discussion and development of future programmes and projects. Communicating and showcasing success stories of the programme's beneficiaries (including young men and women) is important to demonstrate successful business models in agriculture, changing the image of agriculture, and motivating young people to establish profitable farming enterprises and develop their potential business ideas.

31. Knowledge management will start with the development of a Knowledge Management Plan (KMP) during the first year of programme implementation to be led by the M&E Specialist. The KMP will encompass strategies and plans for the consolidation of knowledge information and the dissemination of that information to programme participants and interested stakeholders. Specific evidence-based knowledge products will be developed on the basis of the programme's experiences, in order to extract

lessons and best practices, replicate innovative solutions, achieve better outcomes, have greater impact from the use of resources, and strategically disseminate the knowledge generated to support decision making and the policy process. To ensure that KM is effective in promoting change, the programme will link M&E activities with KM activities, so that the lessons generated from programme implementation will be credible and evidence-based.

32. Approaches to documenting and communicating experiences and lessons learned will include a range of methods and products, such as the programme's website, print media (brochures and booklets with case studies, policy briefs, etc.), photographs, audio and video documentaries, which have proven to be very effective for bolstering training. Dissemination will be done using a range of methods and platforms, such as capacity building sessions, learning and knowledge sharing events and workshops, as well as multiple media outlets (e.g. print publications such as the Agriculture Report, newspapers, media broadcasts and social media – Facebook, YouTube, Pinterest, Instagram).

33. In addition, through the MOU to be established with IPs such as the UB's Faculty of Agriculture, the programme will be able to establish mechanisms for the continuity in the dissemination and promotion of best practices and lessons learnt. KM products such as videos and literature will be supplied to the University Library so that the information will be easily available to faculty and students and other interested parties to use as a resource in their training and the development of their farming practices.

K. Implementation Arrangements and Human Resources

34. M&E will be the primary responsibility of the M&E Specialist, who will be a member of the PMU and who will be procured at the start of the programme. The M&E Specialist will contribute to the design of the MIS, and among other responsibilities, will monitor the progress of the programme in achieving its targets and objectives, report to the Programme Manager and the POC on all matters related to the programme's progress, disseminate relevant information to stakeholders and develop the programme's knowledge products. The Specialist is expected to be with the programme for its entirety and will be one of the key start-up staff to be procured for ensuring that an effective M&E System is designed and developed from programme commencement. The Programme Manager will be responsible to assure that the M&E Specialist has appropriate and direct support from the Administrative Assistant, in addition to full team support, and to ensure that an effective M&E system is in place and there is satisfactory completion of all M&E activities.

L. Budgetary Allocation

35. The budget includes funds for one M&E Specialist during the 6 years of implementation. Resources have been allocated in the budget to acquire the following for implementing the M&E system: (i) Consultancy to design and develop the MIS; (ii) Training in M&E and in the MIS; (iii) M&E training materials; (iv) Equipment (12 Tablets, Database Server and Equipment, Broadband Internet, UPS for Server, Laptop, and Cisco Router, GPS, Camera, Printer, Projector); (v) Start-up, Systematization and Closing Workshops; (vi) RIMS Studies; (vii) development of Knowledge Management Products; (viii) Gender Equality Impact Study; and (ix) preparation of the Programme Completion Report.

Annex 1: Annual Work Plan and Budget Template

Results #	Budget Line	Objectives / Expected Results	Indicators		Timetable for implementation				Responsible Unit / Staff	Implementation targets								Budget (USD'000)													
			Project Indicators	RIMS Indicators	Q 1	Q 2	Q 3	Q 4		Appraisal (Total)	Revised (Total)	Planned (Annual)	Unit Cost	Achieved (Cumulative)	%	Achieved (Annual)	%	Appraisal (Total)	Revised (Total)	Fund Balances					Planned (Annual)	Budget Category	Financiers			
																				Total	IFAD	GCF	GOB	Ben			IFAD	GCF	GOB	Ben
		(A)	(B)	(C)					(E)	(F)	(F.a)	(G)	(Ga)	(H)	(I)	(J)	(K)	(L)	(L.a)	(M)	(M.a)	(M.b)	(M.c)	(M.d)	(N)	(O)	(P)			
Total Budget:																														

Appendix 7: Financial management and disbursement arrangements

1. **Financial Management Assessment results**. As part of the design and in accordance with IFAD's Financial Management policies and guidelines, a Financial Management Assessment was undertaken for the proposed programme's arrangements within the Lead Programme Agency, the Ministry of Economic Development, Petroleum, Investment, Trade and Commerce (MED). The results of the assessment indicate that the proposed set up of the Programme Management Unit (PMU) along with the systems and procedures requirements identified in this Appendix would position the Programme at a low risk level from a financial management perspective. Although there are important weaknesses and challenges in Belize's public sector and specifically the MED having limitations in terms of capacity, systems, procedures and internal controls, the proposed measures and arrangements provide assurance of a satisfactory financial management function.

2. **Inherent Financial Management Risk.** The inherent risk has been assessed mainly by relaying of diagnostics elaborated by other international financial institutions. The Transparency International (TI) Corruption Perceptions Index, which is normally used as an indication of financial management health at country level, is currently unavailable for Belize. Belize has been absent from the TI list since 2008 when it was ranked 109th out of 180 countries. From 2008 onwards, TI has been unable to assess Belize due to insufficient information availability. The latest IFAD Rural Sector Performance score (RSP) for Accountability, Transparency, and Corruption in Rural Areas for Belize are 3.5, which represents a medium risk level.

3. The most recent Public Financial Management Performance Report using PEFA methodology was prepared in 2014. The study was based on the 28 indicators, each measuring performance of Public Financial Management (PFM) against a scale from A to D, with A being the highest. About three quarters of the indicators scored C or lower, thus indicating that Belize's PFM system required significant improvements in most areas. It needs to be noted that more than half of the indicators improved in comparison to the previous PEFA assessment from 2008.

4. The 2014 PEFA report highlighted good credibility, comprehensiveness and improved transparency of the budget. This was mainly due to the robust budget preparation system and execution controls facilitated by the IT-based budget execution, reporting and accounting system (SmartStream). It was also mentioned that budget execution and cash and debt management were strengthened, but comprehensive cash flow forecasting was not yet implemented. The main weakness in PFM were the internal controls, especially in the area of payroll and procurement while controls over non-salary expenditures showed improvement after the introduction of the Funds Control Module of SmartStream in 2012. The report also noted that the internal control systems still relied heavily on the use of manual procedures, that internal control rules were not enforced, and that systematic training did not take place. The PEFA report recommended the revision of the public expenditure manuals and financial regulations, along with the provision of training courses to enhance staff understanding of internal control systems and procedures. The last annual financial statements reviewed by the PEFA team were incomplete to the extent that the Auditor General was withholding the opinion on the financial statements due to the significant material errors and omissions identified.

5. The PEFA review concluded that although GOB had been implementing PFM reforms for a number of years, progress had not been sufficiently rapid. Limitations in terms of resources and capacity were the main influencing factors which had delayed the implementation of reforms. The report underlined that development partners continued to use their own procurement, auditing and financial reporting/accounting procedures, while increasingly using GOB's budget execution systems.

6. Based on the above, the inherent financial management risk was assessed as Medium/High.

7. **Programme Specific Assessment –** Below is the overall summary of risk ratings at design, derived from the Lead Programme Agency and the proposed arrangements of the PMU.

Table 1: Risk Assessment and Mitigation Measures

	Initial Risk	Proposed Mitigation	Final Risk
Inherent Risk			
TI Index, PEFA and RSP Score	**M/H**	The creation of a dedicated PMU within the LPA, with a high degree of independence from the LPA's systems and procedures will ensure that FM arrangements will comply with IFAD standards and improve the internal control environment.	**L**
Control Risks			
Organization and Staffing	**M**	MED does not possess sufficient capacity to carry out the FM tasks of the Programme. A Finance Officer, an Accountant and support administrative staff will be recruited as part of the PMU to ensure that FM duties are adequately covered. It is unlikely that the recruited FM staff will have sufficient knowledge and experience of IFAD projects or projects funded by other IFIs/international organizations. IFAD will have to provide FM training to ensure that FM tasks are carried out efficiently and in line with its requirements.	**L**
Budgeting	**L**		**L**
Funds flow and Disbursement Arrangements	**L**		**L**
Internal Controls	**M**	Internal control procedures will need to be clearly established in the PIM and staff will need to be trained.	**L**
Accounting Systems, Policies & Procedures	**M**	A new accounting system will be designed and implemented for the Programme, and all policies and procedures will need to be detailed in the PIM. Staff will require full training. Retroactive financing and start-up costs will be available to for these preparatory activities.	**L**
Reporting and Monitoring	**M**	The new accounting system will be designed in line with IFAD reporting requirements.	**L**
Internal Audit[81]	**H**	There is no internal audit function in MED. Considering the small size of the entity, there are no plans to establish one. Oversight functions are performed by the Auditor General, but the frequency of these controls is unclear. IFAD will liaise with the General Audit to include the Programme in its audit work plan.	**H**
External Audit[82]	**L**	External audit will be conducted by a private audit firm according to IFAD Guidelines on Project Audits.	**L**
Project Fiduciary Risk @ Design	**M**		**L**

8. The assessment concluded that the proposed FM arrangements for the Programme will satisfy IFAD's minimum requirements for sound financial management, and that the risk level will be low after the inclusion of the measures incorporated in the Design.

9. **Proposed Financial Management organisation structure.** The Ministry of Economic Development, Petroleum, Investment, Trade and Commerce (MED) is assigned overall fiduciary responsibility as Lead Programme Agency. It will ensure proper financial management and implementation of the Programme through the creation of a dedicated PMU, which will operate with a high degree of independence from MED system.

10. The PMU finance team is to be composed of a Finance Officer who reports to the Programme Manager with the support of an Accountant and other administrative staff. The PMU finance team will be responsible for the financial management function of the Programme, such as registering financial transactions in the system; preparing annual financial statements and periodic financial reporting; ensuring effective internal controls; managing fund flows and monitoring programme liquidity; and overseeing the arrangements for external audits, in accordance with IFAD/GCF procedures and guidelines. The Finance staff responsibilities will be detailed in their Terms of Reference (TORs) as a basis for their evaluation. Draft TORs for key staff are included in the draft PIM.

11. Programme finance staff will be competitively recruited, and the appointment for the Finance Officer will be a condition for disbursements of the loan and grant proceeds. Considering the limited availability in Belize of finance professionals experienced with projects funded by international financial institutions or other international organizations, IFAD will provide training on its procedures and requirements at the very initial phase of implementation. The mechanism of retroactive financing will be available to finance preparatory activities including the recruitment process of the Finance Officer and other PMU staff. More details on the retroactive finding mechanism and the corresponding eligible activities are described further ahead in this section.

12. **Annual Work Plan and Budget (AWPB).** The Programme will be implemented on the basis of approved Annual Work Plans and Budgets (AWPBs). In the GOB annual budget process, at the end of October budget requests are elaborated by each public entity, and subsequently submitted to MOF. MOF consolidates the requests and prepares a consolidated budget for presentation to the House of Representatives of Belize for debate and subsequent approval.

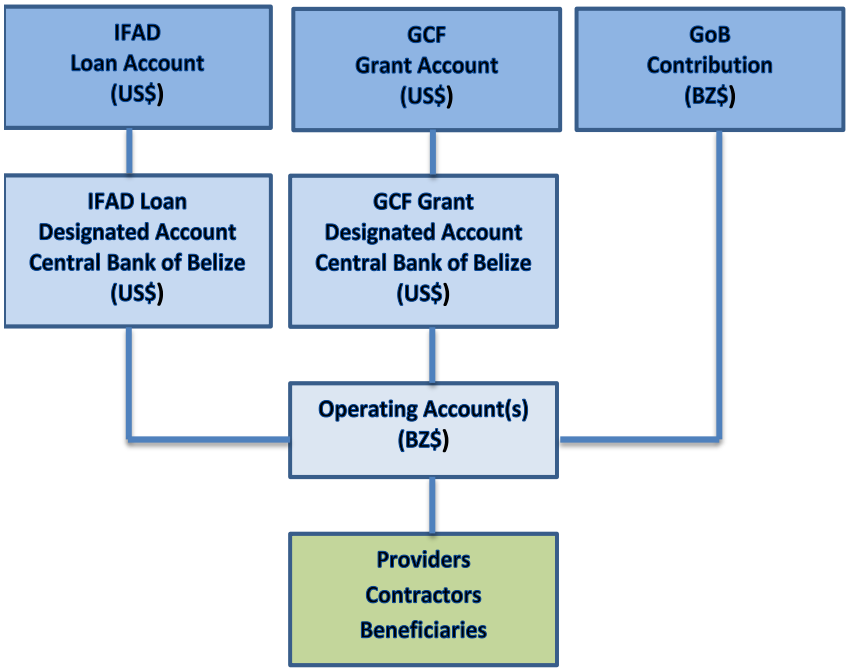
13. At least 60 days prior to IFAD submission deadline, the PMU will obtain budget submissions of planned activities from all concerned stakeholders of the Programme, review these for consistency and appropriateness, provide inclusion of costs thereon and consolidate all the budget requests so as to present the overall programme budget for review and approval to the Programme Oversight Committee (POC). Once approved by the POC, within 5 days of approval, the PMU will submit the AWPB to IFAD for its No-objection. Based on the AWPB, the PMU will submit to MED the request for budget allotment for the counterpart funds for the AWPB period. To facilitate proper budget monitoring and control, the PMU will prepare appropriate budget templates to record planned activity information in accordance with the chart of accounts and also to reflect component and category of expenditure information, together with the respective funding sources (IFAD, GCF, GOB and beneficiaries).

14. **Funds Flow and Disbursement Arrangements**. IFAD and GCF funds will be deposited in two designated accounts in US$ opened and maintained by MOF, exclusively for the loan and grant proceeds, in the Central Bank of Belize. There will be one or more Operating Accounts in BZS opened and maintained in a bank selected by the Borrower to process payments for the day-to-day activities of the Programme. The PMU will submit requests to MOF for the transfer of IFAD and GCF funds from the designated accounts to the Operating Account(s). GOB counterpart contribution will also be deposited to the Operating Account(s) in quarterly tranches. The PMU will submit requests to MOF for the release of counterpart funds as soon as the AWPB is approved.

15. There will be an initial advance disbursement from the IFAD loan account to the corresponding designated account. Subsequent disbursements shall be based upon submission of withdrawal

applications, mainly Statements of Expenditure, for at least 30% of the advanced amount. Further disbursement details and procedures are to be included in the Letter to the Borrower (LTB) which will be prepared by IFAD and sent to the Borrower upon entry into force of the Financing Agreement. Disbursement procedures and requirements relating to the GCF will also be addressed in the LTB. It is expected that the Programme will benefit from the use of the IFAD Client Portal (ICP) platform for submission by MOF of electronic Withdrawal Applications to IFAD for disbursements.

16. The funds flow chart is provided in Figure 1 below.



17. **Accounting Systems.** MED utilizes the SmartStream system for budgetary, accounting and reporting purposes. As this system does not comply with IFAD requirements in terms of chart of accounts and financial reporting, an additional accounting system will have to be implemented. The previous Programme financed by IFAD in Belize utilised QuickBooks as the additional accounting software. However, it is recommended that a more advanced software be implemented for the Programme. The software should possess features for the production of financial reports, including those required for the preparation of financial statements, interim financial reports, withdrawal applications, bank reconciliations, and asset management. The implementation of an accounting software acceptable to IFAD will be a condition for disbursement for the loan and grant proceeds, and its design, installation and related training may be financed through retroactive financing mechanism and/or start-up costs.

18. **Internal Controls, Policies and Procedures:** The PMU will operate with a high degree of independence from MED's systems and procedures. The financial procedures in place at MED are based mostly on dated manuals that would not comply with IFAD requirements. The accounting systems, policies, procedures and internal controls to be used by the PMU for accounting and managing Programme funds will be documented in the Financial Procedures Manual within the PIM. The manual will describe the internal control procedures, basis of accounting, standards to be followed, authorization, financial reporting process, budgeting, matching grant fund, administration, in-kind and other beneficiary contribution recording, financial forecasting, as well as financial data back-up procedures, contract management and fixed assets management. In addition, the PIM will include procedures to be undertaken for the selection of recipients of the matching grant fund. The Financial Procedures Manual of the IFAD previous funded Programme in Belize will be the basis for developing the manual for the Be-Resilient Programme. IFAD's no objection of the PIM will be a condition for disbursements for the loan and grant proceeds.

19. The PMU will maintain an adequate filing system of all relevant supporting documentation and copies of financial reports. MED will be responsible for ensuring that documentation is kept for 10 years after the financing closing date. In line with IFAD's requirements, documentation will be reviewed by supervision missions and during external audit exercises.

20. Adherence to the internal control framework will be verified during the external audit exercises with reporting to IFAD through submission of the management letter, in line with IFAD's Guidelines for Project Audits. Furthermore, compliance with internal controls will be part of the financial assessment performed during supervision missions.

21. **Financial Reporting Arrangements:** The PMU will be responsible for preparing annual consolidated financial statements in accordance with International Public Sector Accounting Standards (IPSAS) cash basis, as these are the standards applicable to public entities in Belize, and are considered acceptable for IFAD. The financial statements will be submitted to IFAD within four months of the end of each fiscal year. The financial statements will include the following: (i) Yearly and prior-year statements of sources and application of funds, which should disclose separately IFAD's funds, GCF, counterpart funds and beneficiaries' funds; (ii) Withdrawal application schedule – SOEs; (iii) Designated Accounts reconciliation; (iv) Cumulative status of funds by category for each funding source; (v) Notes to the financial statements, including the fixed asset register.

22. The PMU will be required to prepare and submit to IFAD separate interim financial reports to account for the Programme. The content and frequency of submission of the interim financial reports will be detailed in the PIM.

23. **Internal and external audits**: There is no internal audit function in MED. IFAD and the PMU will liaise with the Auditor General of Belize to assess the feasibility of including the Programme in its audit work plans.

24. The external audit of the Programme will be conducted annually in accordance International Standards on Auditing and in line with IFAD Guidelines on Project Audits. In consideration of the limited capacity of the Supreme Audit Institution of Belize, the audit exercise will be carried out by a qualified private audit firm.

25. The PMU will be responsible for timely contracting the audit firm and the Programme will bear the costs for the external audit. Each annual audit report together with the related management letter is to be submitted to IFAD no later than six months after the end of each fiscal year. Internal control recommendations and other relevant audit findings will be required to be addressed and resolved by the PMU. During supervision missions, IFAD will monitor the status of implementation of actions aimed at resolving the issues identified by the auditor. The PMU will be responsible for preparing the terms of reference for the auditor, which will include the auditor's visit to the recipient of the matching grant fund. Sample draft terms of reference for external audit are attached at the end of this Appendix (which may need to be adjusted as IFAD Guidelines on Project Audits are updated).

26. **Retroactive financing and Start-up costs**: As an exception to section 4.08(a) (ii) of the General Conditions, the mechanism of retroactive financing will be available to the Programme for activities such as the recruitment of key PMU personnel; the preparation of the Programme Implementation Manual; the design and implementation of the accounting software; and the production of studies and diagnostics. Under the retroactive financing mechanism, the GOB may pre-finance selected activities incurred from the date of the approval of the Programme by IFAD's Executive Board. Pre-financed expenditures would be reimbursed to GOB once disbursements conditions of the IFAD loan are fulfilled. GOB and IFAD would have to agree in advance on the specific activities, and corresponding categories of expenditures, that can be pre-financed under the retroactive financing mechanism. The maximum amount that may be financed from the loan account through the retroactive financing mechanism will be approximately US$ 400 000.

27. In addition to this retroactive financing, an advance can be requested to cover start-up costs for eligible expenditures related to preparatory activities incurred between the date of entry into force of the Financing Agreement and the satisfaction of the conditions precedent to withdrawal.

28. **Supervision**. Financial Management Supervision will be carried out by an IFAD Finance Officer and/or a Financial Management Specialist during supervision missions in line with IFAD procedures and practices. It is expected that at least one supervision mission will be carried out over a one-year period. Financial management supervision will focus on financial management risk assessment and identification of risk mitigating measures; improvement of financial management arrangements, internal control and flow of funds; review of programme financial execution; and monitoring of auditor's findings, among others.

Annex 1: Auditor's Sample Terms of Reference

Terms of reference for an audit of the IFAD funded [programme name]

1. The following are the terms of reference (TORs) on the basis of which the Lead Programme Agency (LPA) agrees to engage the audit firm ("the auditor") to perform an audit and to report in connection with the agreement with the International Fund for Agricultural Development (IFAD) concerning [title of the programme and loan/grant number].

Responsibilities of the parties to the engagement

2. The LPA refers to the entity that executes the programme on behalf of the borrower/recipient.

3. The LPA is responsible for providing financial statements for the activities financed by the financing agreement and for ensuring that these financial statements can be properly reconciled to the LPA records and accounts in respect of these services.

4. The LPA accepts that the ability of the auditor to perform the procedures required by this engagement effectively depends on the LPA's providing full and free access to its staff and records and accounts.

5. The LPA shall provide the auditor with all necessary documentation to perform the assignment properly; in particular, the following information shall be provided to the auditor before the beginning of the assignment:

- Financing agreement;
- Annual progress report;
- Programme implementation manual;
- Financial management manual;
- Organizational charts along with names and titles of senior managers;
- Names and qualifications of officers responsible for financial management, accounting and internal audit;
- Description of information technology facilities and computer systems in use; and
- Copies of the minutes of negotiations, the programme design document, the annual work programme and budget, and the Letter to the Borrower, if available.

6. "The auditor" refers to the auditor who is responsible for performing the agreed procedures as specified in these TORs, and for submitting a report of factual findings to the LPA.

7. The auditor shall provide:

- A separate opinion on the programme financial statements (PFSs).

8. Minimum content of the PFSs to be provided by the programme:

- Yearly and cumulative statements of sources and application of funds, which should disclose separately IFAD's funds, other donors' funds and beneficiaries' funds;
- Yearly and cumulative SOEs by withdrawal application and category of expenditures;
- Reconciliation between the amounts shown as received by the programme and those shown as being disbursed by IFAD should be attached as an annex to the PFSs. As part of that reconciliation, the auditor will indicate the procedure used for disbursement (SA funds, letters of credit, special commitments, reimbursement or direct payment) and indicate whether the expenditure is fully documented or uses the summary of expenditures format;
- Cumulative status of funds by category;
- Reconciliation of designated accounts statement;
- A statement of comparison between actual expenditures and budget estimates;
- Notes accompanying the PFSs; fixed assets;
- Full disclosure of cash balances; and

- Other statements or disclosures relevant to the programme, e.g. financial monitoring reports, credit lines, etc.

9. A separate opinion on the use of the designated accounts. The auditor is also required to audit the activities of the designated accounts associated with the programme, including the initial advance, replenishments, interest that may accrue on the outstanding balances, and the year-end balances. The auditor must form an opinion as to the degree of compliance with IFAD procedures and the balances of the designated accounts at year-end. The audit should examine: (i) the eligibility of withdrawals from the designated accounts during the period under review; (ii) the operation of the designated accounts in accordance with the financing agreement and other instructions provided to the borrower/recipient by IFAD; (iii) the adequacy of internal controls within the programme appropriate for this disbursement mechanism; and (iv) the use of correct exchange rate(s) to convert local currency expenditures to the denominated currency of the designated accounts.

10. A separate opinion on withdrawal applications/statements of expenditure/ summary of expenditures (SOEs).

11. The audit will include a review of SOEs used as the basis for submitting withdrawal applications. The auditor will carry out tests and reviews as necessary and relevant to the circumstances. SOE expenditures will be carefully compared for eligibility with relevant financial agreements and the disbursement letter, with reference to the programme design report for guidance when necessary. Where ineligible expenditures are identified as having been included in withdrawal applications and reimbursed, auditors will note these separately. A schedule listing individual SOEs withdrawal applications by reference number and amount should be attached to the PFSs. The total withdrawals under the SOE procedure should be part of the overall reconciliation of IFAD disbursements described above. The auditor's opinion should deal with the adequacy of the procedures used by the programme for preparing SOEs and should include a statement that amounts withdrawn from the programme account on the basis of such SOEs were used for the purposes intended under the agreement.

12. A separate management letter addressing the adequacy of the accounting and internal control systems of the programme, including compliance with the IFAD Procurement Guidelines and such other matters as IFAD may notify the LPA to include in the audit.

13. The auditor is requested to comment on:

- Economy, efficiency and effectiveness in the use of programme resources;
- Achievement of planned programme results;
- Legal and financial obligations and commitments of the programme and the extent of compliance or non-compliance thereof;
- Systems and procedures such as improvements in accounting, information technology or computer systems, and operations that may be under development, on which the auditor's comments are necessary to ensure effective controls; and
- Other activities on which the auditor may consider appropriate to report.

14. Auditors shall certify:

- Whether the PFSs are drawn up in conformity with internationally accepted accounting standards;
- Whether the PFSs are accurate and are drawn up from the books of accounts maintained by the programme;
- Whether the provisions of the financing agreement are adhered to;
- Whether procurement has been undertaken by the programme in accordance with applicable procurement procedures and the IFAD Procurement Guidelines;
- The existence of any significant assets purchased and confirm their existence and use for programme purposes;
- Whether the programme has an effective system of financial supervision or internal audit at all levels; and

- Whether the expenditures claimed through SOEs are properly approved, classified and supported by adequate documentation.

15. The auditor is a member of the Institute of Registered Auditors of [country], which in turn is a member of the International Federation of Accountants (IFAC).

Subject of the engagement

16. The subjects of this engagement are the financial statements dated [dd/mm/yyyy] in connection with the agreement for the period covering [dd/mm/yyyy to dd/mm/yyyy]. The information, both financial and non-financial, that is subject to verification by the auditor is all information that makes it possible to verify that the expenditures claimed by the LPA in financial statements have occurred, and are accurate and eligible.

Reason for the engagement

17. The LPA is required to submit to IFAD an audit report produced by an external auditor under article IX of the General Conditions for Agricultural Development Financing.

Engagement type and objective

18. This constitutes an engagement to perform specific agreed procedures following the IFAD Guidelines on Project Audits provided to the auditors by the LPA. The objective of this audit is for the auditor:

- To verify that the expenditures claimed by the LPA in the financial statements for the activities covered by the agreement have occurred ("reality"), are accurate ("exact") and are eligible (i.e. that expenditure has been incurred in accordance with the terms and conditions of the agreement); and
- To submit a report of factual findings with regard to the agreed procedures performed.

Scope of work

19. The auditor shall undertake this engagement in accordance with these TORs and with:

- International Standards on Auditing (ISAs) to perform agreed procedures regarding financial information as promulgated by IFAC;
- The Code of Ethics for Professional Accountants issued by IFAC. Although the International Standard on Related Services 4400 provides that independence is not a requirement for agreed procedures engagement, IFAD requires that the auditor also complies with the independence requirements of the Code of Ethics for Professional Accountants.
- IFAD Guidelines on Project Audits.

20. Terms and conditions of the agreement

21. The auditor verifies that the funds provided by the agreement were spent in accordance with the terms and conditions of the agreement.

22. Planning, procedures, documentation and evidence

23. The auditor should plan the work so that an effective audit can be performed. For this purpose, the auditor performs the procedures specified in the IFAD Guidelines on Project Audits and uses the evidence obtained from these procedures as the basis for the report of factual findings. The auditor should document matters that are important in providing evidence to support the report of factual findings, and evidence that the work was carried out in accordance with ISAs and these TORs.

Reporting

24. The report on this audit should describe the purpose and the agreed procedures of the engagement in sufficient detail to enable the LPA and IFAD to understand the nature and extent of the procedures performed by the auditor. Use of financial and audit reporting is governed by IFAD rules.

Appendix 8: Procurement

A. Belize public procurement system and its assessment

1. In Belize there is no procurement legislation as such. The only law referring to public procurement is the 2005 Finance and Audit Act. According to this law all contracts made, for and on behalf of the Government shall be lawfully signed by a Minister, or an Ambassador or High Commissioner, or Chief Executive Officer or Permanent Representative. The law specifies that any procurement on behalf of the Government will be subject to the written scrutiny of the Contractor-General. The law does not specify procurement methods to be used for acquiring goods, works and services but indicates that any procurement above USD 2,5 million shall be subject to the open tendering procedure.

2. Major donors operating in the country (i.e. IADB, WB, CDB, and EU) use their own procedures in regard to procurement. The last IFAD financed programme in the country (2009-2016) used IFAD's procurement guidelines. According to the 2014 PEFA, procurement is a weak area. Procurement regulations do not include all of the requirements of a sound public procurement system including efficiency, fairness, and transparency. Subjective criteria in the application of selective tendering, a widely applied procurement method, undermine the objective of promoting competition. A procurement regulatory unit in the Ministry of Finance and Economic Development (MFED) has yet to be established. A Public Procurement handbook has been awaiting Cabinet approval for a long time. Open competitive tendering is not explicitly the default method of procurement, the justification for using limited competition procurement methods result in a non-transparent process and public access to information is limited. The Contractor General's Office is the only dedicated administrative procurement oversight and complaints receiver mechanism, but is under-staffed and has very limited capacity.

3. There is no procurement unit within the proposed Executing Agency, the Ministry of Economic Development (MED). Procurement capacity is delegated to the single programme/project management units that implement programmes/projects by the MED. However, based on national standard practice and previous IFAD's own experiences with the past programme, procurement above USD 10,000 is subject to the Project Oversight Committee's approval.

4. Based on the above and on the mission's assessment, procurement for the proposed project would be carried out in accordance with IFAD's Guidelines dated September 2010, and the provisions stipulated in IFAD's General Conditions for Financing. For each contract to be financed by the Loan and/or Grant, the different procurement methods or consultant selection methods, the need for prequalification, estimated costs, prior review requirements, and time frame are to be agreed upon between the Borrower and the IFAD in the Procurement Plan (PP).

B. Be-Resilient procurement arrangements

5. The PMU will be required to prepare and submit to IFAD (together with the AWPB) for no objection, an annual procurement plan organized by type of procurement (goods, works and services) and by project component. For each component, the PP will show: the reference to the AWPB, the estimated cost, the procurement method, the detailed timeline (from preparation of TOR/specifications to signature of contract) and the need for IFAD's prior review. The Procurement Plan will be updated at least annually or as required, to reflect the actual programme implementation needs and improvements in institutional capacity. Thresholds for the applicable procurement methods will be as follows as shown in Table 1 below.

6. The acceptable selection methods for consulting services will also include (i) Quality-based Selection; (ii) Selection under a Fixed Budget; (iii) Least Cost Selection; (iv) Selection based on Consultants' Qualifications; (v) Single-source Selection of consulting firms; (vi) Procedures for competitive selection of Individual Consultants; and (vii) Single-source procedures for the Selection of

Individual Consultants. The applicable rules and procedures related to project procurement will be detailed in the PIM.

Table 1: Thresholds for applicable procurement methods

Method	International Competitive Bidding	National Competitive Bidding	Quality- and Cost-based Selection	Shopping
Goods	> US$ 200,000	> US$ 50,000 ≤ US$ 200,000		≤ US$ 50,000
Works	> US$ 1,000,000	> US$ 100,000 ≤ US$ 1,000,000		≤ US$ 100,000
Consulting services	> US$ 100,000	N/A	≤ US$ 100,000	N/A
Non-consulting services[83]	> US$ 200,000		> US$ 20,000 ≤ US$ 200,000	≤ US$ 20,000

7. IFAD's prior review procedures will be on the TORs, bidding documents, evaluation reports and contracts, and will apply to the procurement of goods valued at US$ 50,000 or more, non-consulting services valued at US$ 20,000 or more, works valued at US$ 100,000 or more and consulting services valued at US$ 20,000 or more[84]. Furthermore, IFAD's prior review (or prior no objection) will be required for all procurement under direct contracting or single source selection, regardless of the contract value. Contracts below the prior review thresholds will be subject to post review as part of IFAD's supervision missions.

8. Pre-qualification[85] will be used for the design/supervision of consulting services related to works under Component 2 (engineering firms for the design/supervision of infrastructure works).

9. As part of the annual audit exercise, the Programme's auditors will be requested to ensure that procurement of goods, works, consulting services and non-consulting services financed from the IFAD loan is conducted in compliance with the provisions of the financing agreement, the letter to the borrower and the IFAD Project Procurement guidelines. Any exception noted will have to be mentioned in the audit report and/or the management letter issued by the auditors. The PMU will be staffed with a Procurement Officer. Under the direct supervision of the Programme Manager, the Procurement Officer will be responsible for organizing the procurement of goods, works and services in the framework of the Programme. He/she will be responsible, among other things, for (i) preparation and updating of the procurement plans; (ii) the conduct of the procurement process in accordance with applicable rules and procedures; (iii) the monitoring of the procurement plan, and the related reporting on a monthly basis; and (iv) the management of contracts. A draft Terms of Reference of the Procurement Officer are included in the detailed design document (see Appendix 5).

[83] Non-consulting services are those whereby a company or individual is appointed to undertake a task in the name of the programme without implying an intellectual or advisory specialization. These services can include: catering services, driving services, cleaning services, security services etc.
[84] These thresholds may be revised when the LTB is issued.
[85] Pre-qualification is used to identify bidders who have adequate capabilities, resources and experience to perform a contract, prior to the invitation and submission of detailed tenders. It serves the purpose of obtaining and assessing information on the qualifications of potential bidders, in order to restrict actual tendering to a list of qualified bidders. This is achieved through the publication of a prequalification notice, the receipt of submissions and the evaluation of submissions against predefined criteria.

Annex 1	**Belize - Procurement plan**
Project name:	**Resilient Rural Belize (B - Resilient)**
Period covered:	**18 months**

Goods

Component	Description	Quantities	Estimated Cost USD	Selection Method	IFAD prior review
3	5 4WD Double-cab Trucks and 6 motorcycles for field CSA specialist	various	274 000	ICB	yes
3	PMU Office Furniture	1	18 150	NS	no
3	11 Computers (5 desktops and 6 laptops), 2 laser printers (1 High Volume Color and 2 mobile color), 1 High volume Scanner, 1 Digital Projector, 6 tablets, 6 GPS devices, 2 Digital Cameras for PMU staff	various	38 320	NS	no
3	Stationery and Supplies	various	5 400	NS	no
3	Comunication materials and services	various	7 500	NS	no
Total Goods			343 370		

Procurement plan Belize	
Project name:	**Resilient Rural Belize (B - Resilient)**
Period covered:	**18 months**

Consulting services

Component	Description	Quantities	Estimated Cost USD	Selection Method	IFAD prior review
	Consultant to identify capacity building needs	1	20 000	QCBS	no
1	Rural organizations and institutional capacity strenghtening TA/2 Consultants (one Y1, two Y2)	2	54 000	QCBS	yes
1	6 Technical training sessions for MOA staff	6	15 000	QCBS	no
1	1 Training session in rural organizations strengthening for MOA Dept	1	7 500	QCBS	no
1	2 Consultant for Training and TA to BMDC	2	50 000	QCBS	yes
1	Climate Vulnerability Diagnostic and Ranking	1	64 000	QCBS	yes
1	1 CSA International TA contract for Training CSA Technicians, Univ, M	1	150 000	QCBS/ICB	yes
1	CSA Training - 1 national consultant	1	60 000	QCBS	yes
1	CSA TA 6 field specialists	6	64 800	QCBS	yes
1	Institutional contract for R&D for resilient VCs	1	50 000	QCBS	yes
1	Value Chains Analysis and market assessment study	1	100 000	QCBS/ICB	yes
1	2 Field Value Chain Specialists	2	64 800	QCBS	yes
2	1 Engineering Design contract for rural roads improvement (RRI)	1	120 000	QCBS	yes
2	1 Environmental Assesment and Independednt Review of RRI	1	20 000	QCBS	yes
2	1 contract for Supervision of works for RRI	1	24 000	QCBS	yes
2	1 Engineering Design contract for Small-scale irrigation and drainage	1	90 000	QCBS	yes
2	Environmental Assesment and Independent Review contract of SSID	1	15 000	QCBS	no
2	1 contract for Supervision of works for SSID	1	18 000	QCBS	no
2	International TA contract for Institutional Development of water management public entity	1	100 000	QCBS/ICB	yes
3	1 Training Package for PMU Staff (10 staff)	1	45 000	QCBS	yes
3	2 Trainings in gender equality, one for PMU and one MOA	2	10 500	QCBS	no
3	Consultant to develop MIS (M&E)	1	46 200	QCBS	yes
3	Start-up Workshop (M&E)	1	16 500	QCBS	no
3	RIMS Studies (M&E)	1	46 200	QCBS	yes
3	M&E Training	1	11 000	QCBS	no
Total Consulting services			1 262 500		

Annex 1

Annex 1	**Belize - Procurement plan**				
Project name:	**Resilient Rural Belize (B - Resilient)**				
Period covered:	**18 months**				
Goods					
Component	Description	Quantities	Estimated Cost USD	Selection Method	IFAD prior review
3	5 4WD Double-cab Trucks and 6 motorcycles for field CSA specialist	various	274 000	ICB	yes
3	PMU Office Furniture	1	18 150	NS	no
3	11 Computers (5 desktops and 6 laptops), 2 laser printers (1 High Volume Color and 2 mobile color), 1 High volume Scanner, 1 Digital Projector, 6 tablets, 6 GPS devices, 2 Digital Cameras for PMU staff	various	38 320	NS	no
3	Stationery and Supplies	various	5 400	NS	no
3	Comunication materials and services	various	7 500	NS	no
Total Goods			343 370		

Procurement plan					
Project name:	**Resilient Rural Belize (B - Resilient)**				
Period covered:	**18 months**				
Works					
Compoonent	Description	Quantities	Estimated Cost USD	Selection Method	IFAD prior review
2	Construction works for RRI for 10 miles	10	800 000	NCB	yes
2	Construction works for SSID systems for 120 acres	120	600 000	NCB	yes
Total works			1 400 000		

Appendix 9: Programme cost and financing

A. Introduction

1. This Appendix presents the costs and financing of the Programme based on its design and execution - components, activities, the sources of funding, the institutions involved in its implementation, and the categories of expenditures related to the disbursements from IFAD, the GCF and the GoB. Specifically, these costs are presented in tables below with their respective explanations and they show the various aspects of the Programme as a whole and of each funding source. Several factors are discussed below that relate to the design of the Programme, the projected costs and sources of funding.

2. Regarding the investments to be undertaken, the following have been taken into account:

- The limited availability of trained human resources in the MoA and other institutions indicates that there is a need for the Programme to execute institutional strengthening activities for public sector organizations and the hiring of specialists in different disciplines/topics to provide the quality of services in the intervention activities during implementation and beyond.
- The strengthening of POs requires not only the provision of technical assistance but also the provision of certain basic infrastructure facilities for their business and administrative operations.
- The vulnerability of Belize's agricultural producers to climate change, especially small farmers, generates the need for specific studies on their vulnerability and implementation of specific actions in this area.
- A central aspect of strengthening the value chains is the link between production and the domestic markets in order to move towards more import substitution of fresh products during most of the year and to increase the potential for processing (production of juices, sauces and others).
- The investments to be financed through the MGF are based on the different activities to improve resilient production and market access for the value chains selected in the Programme. There is a high participation of small farmers and their organizations in the value chains and this is consistent with the priority of the GoB to improve small farm development in the country.
- The investments through the MGF require a 15% counterpart contribution from the beneficiary families and/or their organizations. This contribution of USD 822,400 is included in the total cost of the MGF. The purpose of these investments - although they are aimed at improving the quality and reliability of supply of the products demanded by the markets, increasing productivity, and improving net family income - is to increase the adaptability and the productive-environmental resilience of the rural communities from climate change effects.
- Other investments include the installation of greenhouses, collection and storage facilities, drainage and irrigation systems, agroforestry, renewable energy and agro-processing. This fund also covers the costs of training and specialized private technical assistance.
- Infrastructure investments include, in addition to the works, the disaggregated costs of design, environmental assessment and supervision. The works related to irrigation and drainage systems provide support also for their management.
- The unit costs of the activities, goods and services to be financed by the Programme were estimated in Belize Dollars. They were calculated based on market prices and verified with officials of the GoB.

3. The following is highlighted on the sources and purposes of the financing of the Programme:

- Investment activities that are directly related to increasing resilience to climate change have been assigned to the GCF. These include hiring of specialists in climate resilient agriculture for

training, technical assistance, management and specialized studies; and investments related to adaptation to climate change and production resilience such as infrastructure for irrigation and drainage, and rural road improvement/upgrading.

- Investments that relate to the reduction of vulnerability of small farmers that support organizational strengthening and gender equity, increase net family income in a sustainable way, and access to markets have been allocated to financing from IFAD.
- IFAD and GCF together will finance 80% of the total cost of the Programme.
- The GoB will finance all taxes incurred in the costs of Programme activities and a proportion of the cost of the planned infrastructure works, and the beneficiaries will make a contribution of 15% of the investments under the MGF.

4. Other aspects of Programme financing include:

- The expenditure categories used for the Programme are those commonly used by IFAD in rural development projects.
- The implementation phase of the Programme will be 6 years, starting from the date of entry into force of the IFAD loan, which is scheduled to start in 2018.
- The annual distribution/phasing of the costs respond to the implementation of the different activities during the life of the Programme. During the first and second year, the following will be executed: contracting of the PMU's staff and specialized consultants; identification and feasibility studies of infrastructure works; a diagnosis of the POs, the domestic markets and climate related studies; training of PMU staff, extension technicians of public institutions and the beneficiaries; identification and formulation of the first investment sub-projects and the acquisition of the necessary equipment for project management. Both the infrastructure works on rural roads as well as irrigation and drainage, as well as the first investments financed by the MGF will begin in the second year of the Programme.
- During the last year of the Programme, it is expected that the infrastructure works and the execution of projects financed by the MGF will be concluded, so that the activities to be carried out will be related only to the closing and consolidation of the actions executed the previous five years, and the preparation of reports.
- The phasing of the investment costs during the life of the Programme is presented in Table 1.

Table 1: Percentage Phasing of Costs

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
8%	16%	25%	31%	16%	4%

- The costs of the Programme during the six years of execution have been calculated considering an annual inflation of 1%. This estimate is based on the following: the average general inflation rate in the last 20 years was 1.5% per year; the average rate during for the last 7 years was 0.5% per year; and the average inflation rate associated with the costs for corresponding goods and services (main investments of the Programme's funds) during the last 15 years was 1% per year, without great variations.
- The country has maintained a fixed exchange rate of 2 Belize dollars per USD since 1981 and no change in this rate is expected for the next six years.
- No physical contingencies are foreseen because the Belize does not have complex procedures that are likely to delay the execution of acquisitions and contracting. In addition, an independent PMU will speed up the process of acquiring goods and services. As for the investments planned for the MGF, they will be defined in the sub-projects that will be formulated with technical assistance for approval. Financing under this mechanism will include the establishment of ceilings per beneficiary/organization, so that any changes in the costs of goods and services to be acquired that increase the budget of the proposals presented should come from savings from acquisitions or additional contributions by the beneficiaries.

- The costs of infrastructure works include 5% of physical contingencies, which is a standard practice. This investment is a high priority in the agricultural and rural sector, so it receives specialized technical support and with little delay for its execution.
- Regarding taxes, the GST of 12.5% was considered for all goods and services to be acquired. On income taxes, the Programme considered a rate of 25% based on information provided to the design mission by the MED[86]. In most cases, independent specialists will be hired. The staff of the PMU will have a contract modality, which is not affected by the tax burden.
- For all purchases made under the MGF and whose ownership is directly by the target beneficiaries and their organizations, the tax component will have been covered from the 15% that will be provided by the beneficiaries themselves.
- Regarding the technical assistance and training services to be provided to the beneficiary organizations and families, if a longer term or more services are required than those provided in the proposals of the subprojects, these could be provided by the DE and the DC of the MoA and the BMDC, as these organizations would have benefited from training to be provided during the first year of execution. In addition, hiring the same technical assistance for more than one organization will also generate additional savings.

5. This Appendix includes the following programme costs and financing tables: (i) programme cost per component and per year, with the detailed cost of each component, total cost by expense category and component; (ii) programme financing by component of each funding agency and by expenditure category; and (iii) the phasing of disbursements by category, by component and by funding source, which will provide for the projection of the annual budget, and the disbursement funds to be requested per year.

B. Costs

6. The total Programme cost including physical and prices contingencies is estimated at US$20.0 million. The Programme will be financed as follows: IFAD US$8.0 million over two cycles, with a financing gap of US$2.2 million; the GCF US$8.0 million, Government of Belize US$3.2 million; and the beneficiaries US$0.8 million. The financing gap will be covered by IFAD11 PBAS allocation or resources from another co-financier. GCF has expressed interest in increasing its co-financing. CABEI has also expressed interest in co-financing.

7. The Programme has two components: (i) Component 1 - Agricultural Production and Market Access; and (ii) Component 2 - Climate Resilient Rural Infrastructure. In addition there are costs related to the PMU.

Table 2: Summary of Costs by Component

	BZ	U$S	% Total Base Costs
1. Agricultural Production and Market Access	15.811.000	7.905.500	41
2. Climate Resilient Rural Infrastructure	16.500.000	8.250.000	42
3. Project Management Unit	6.545.260	3.272.630	17
Subtotal	38.856.260	19.428.130	100
Price Contingencies	1.145.415	572.708	3
Total	**40.001.675**	**20.000.838**	**103**

[86] The rate varies for independent consultants depending on their residence, whether from Belize, outside of Belize but from CARICOM-member countries (15%) or from other countries (25%).

8. The costs per category of activities per year are presented in Table 2 below. The detailed costs per component and activity over the six-year period of the Programme and their funding sources are presented in Tables 3, 4 and 5 below.

9. Component 1 includes activities related to: improving the value chain through improving resilience, adapting and sustainability of agricultural production of small and medium producers to climate changes, and access to market; organizational strengthening, training in climate resilient agriculture, and improving knowledge and linkages of producers with domestic markets, in order to carry out viable and sustainable investment projects. The total cost of these activities is US$8.08 million or 40.5% of total Programme cost.

10. The activities of Component 2 include improvement/upgrading of the infrastructure of rural roads, the construction and management of irrigation and drainage works and the implementation of a climate information system. The cost of these activities account for US$8.5 million or 42.4% of the total Programme costs.

11. The remaining 17% of the total cost will cover the establishment and operations of the PMU, which will be responsible for coordinating and executing the Programme. The PMU will implement execution of the necessary studies and service contracts for technical assistance and training. The costs of these activities may not be considered as Programme management costs. Therefore, if the operating costs of the PMU are strictly considered (recurrent costs), their impact on Programme costs is reduced to 13.6%. The rest of the funds will go towards institutional strengthening, PMU training, equipment, and specific studies on climate change, gender equity and markets.

Table 3: Total Cost per Year (US$)

	2018	2019	2020	2021	2022	2023	TOTAL
1. Agricultural Production and Market Access	524.560	1.021.648	1.682.354	2.640.715	2.017.153	192.187	8.078.616
2. Climate Resilient Rural Infrastructure	168.840	1.683.968	2.802.898	3.073.223	754.027	-	8.482.956
3. Project Management Unit	904.932	507.789	489.800	504.949	494.939	536.857	3.439.266
Total Project Costs	1.598.332	3.213.405	4.975.052	6.218.886	3.266.118	729.045	20.000.838

Costs by Expenditure Category

12. The Programme has six Categories of Expenditure within the classification as established by IFAD: (i) vehicles, equipment and materials; (ii) grants; (iii) consultancies, training and technical assistance: (iv) works; (v) salaries and allowance; and (vi) operating costs. Categories 1, 2, 3 and 4 are investment costs, while categories 5 and 6 are recurrent costs. The details of these costs are presented in Table 6 below.

13. The GoB, and especially the MED , has experience in the implementation of externally financed projects and is knowledgeable of the Categories of Expenditure for organizing disbursements and applying the percentages of financing according to the different funding sources.

Table 4. Detailed Costs for Component 1: Agricultural Production and Market Access (US$)

	Unit	Quantities							Unit Cost	Total Amount (US$)							Finance source			
		2018	2019	2020	2021	2022	2023	Total	(US$)	2018	2019	2020	2021	2022	2023	Total	GOV	IFAD	GCF	BENEF
I. Investment Costs																				
A. Strengthening of producers org. and public institutions /a																				
1. Producers Organizations /b																				
Identification capacity building needs	unit	10	10	10	-	-	-	30	1,000	10.050	10.151	10.252	-	-	-	30.453	13%	88%	0%	0%
Implementation capacity building programme for org. /c	unit	2	8	10	10	-	-	30	6,000	12.060	48.722	61.512	62.127	-	-	184.422	13%	88%	0%	0%
Gender equality learning route for beneficiaries	unit	-	-	1	-	-	-	1	15,000	-	-	15.378	-	-	-	15.378	13%	88%	0%	0%
Training programme Managers for Producer org. /d	unit	-	-	10	-	-	-	10	10,000	-	-	102.520	-	-	-	102.520	13%	88%	0%	0%
Incentive for young Managers in Producer org. /e	month incentive	-	-	12	12	12	-	36	2,500	-	-	30.756	31.064	31.374	-	93.194	13%	88%	0%	0%
National exchange visits for Producer organizations	unit	-	1	1	-	-	-	2	5,000	-	5.075	5.126	-	-	-	10.201	13%	88%	0%	0%
International exchange visits for Producer org.	unit	-	1	-	1	-	-	2	15,000	-	15.226	-	15.532	-	-	30.758	0%	100%	0%	0%
Office equipment for Producer organizations	units	-	-	10	-	-	-	10	2,500	-	-	25.630	-	-	-	25.630	13%	88%	0%	0%
Rural org. and institutional capacity strenghtening TA/Consultants /f	month consultant	6	24	24	-	-	-	54	1,800	10.854	43.850	44.289	-	-	-	98.993	25%	75%	0%	0%
Subtotal										32.964	123.024	295.463	108.723	31.374	-	591.548	14%	86%	0%	0%
2. Institutional strenghtening /g																				
Technical training for MOA staff /h	unit	2	4	3	3	3	-	15	2,500	5.025	10.151	7.689	7.766	7.844	-	38.474	13%	88%	0%	0%
Climate smart agriculture Learning route	unit	-	1	-	-	-	-	1	15,000	-	15.226	-	-	-	-	15.226	13%	0%	88%	0%
Integration of CSA in MOA extension materials /i	unit	-	1	-	-	-	-	1	15,000	-	15.226	-	-	-	-	15.226	25%	0%	75%	0%
Training in rural organizations strengthening Dep. Coop.	unit	1	2	1	-	-	-	4	2,500	2.513	5.075	2.563	-	-	-	10.151	13%	88%	0%	0%
Training and TA to BMDC /j	unit	2	2	-	-	-	-	4	12,500	25.125	25.376	-	-	-	-	50.501	13%	88%	0%	0%
International exchange visit on Cooperative development	unit	-	1	-	-	-	-	1	15,000	-	15.226	-	-	-	-	15.226	0%	100%	0%	0%
Training in gender equality for Ministry of Agriculture /k	unit	1	2	1	1	-	-	5	2,500	2.513	5.075	2.563	2.589	-	-	12.739	13%	88%	0%	0%
Support to Gender focal point activities in MOA	unit	-	1	1	-	-	-	2	5,000	-	5.075	5.126	-	-	-	10.201	25%	75%	0%	0%
Subtotal										35.175	96.430	17.941	10.355	7.844	-	167.744	13%	72%	15%	0%
Total A										**68.139**	**219.454**	**313.404**	**119.077**	**39.218**	**-**	**759.291**	**14%**	**83%**	**3%**	**0%**

	Unit	Quantities							Unit Cost	Total Amount (US$)							Finance source			
		2018	2019	2020	2021	2022	2023	Total	(US$)	2018	2019	2020	2021	2022	2023	Total	GOV	IFAD	GCF	BENEF
B. Resilient Production																				
Climate Vulnerability Diagnostic and Ranking	unit	8	-	-	-	-	-	8	8,000	64.320	-	-	-	-	-	64.320	13%	0%	88%	0%
Climate Smart Agriculture International Technical Assistance /l	contract	0,5	0,1	0,1	0,1	0,1	0,1	1	50,000	75.375	15.226	15.378	15.532	15.687	15.844	153.042	25%	0%	75%	0%
Climate Smart Agriculture Training /m	contract	0,5	0,1	0,1	0,1	0,1	0,1	1	00,000	50.250	10.151	10.252	10.355	10.458	10.563	102.028	25%	0%	75%	0%
Open CSA workshops for farmers /n	workshops	12	-	12	-	12	-	36	1,500	18.090	-	18.454	-	18.825	-	55.368	13%	0%	88%	0%
CSA Technical Assistance /o	month contract	36	72	72	72	72	72	396	1,800	65.124	131.550	132.866	134.195	135.537	136.892	736.164	25%	0%	75%	0%
Research and development of resilient value chains /p	unit	0,5	0,5	-	-	-	-	1	50,000	25.125	25.376	-	-	-	-	50.501	25%	0%	75%	0%
Farmer to farmer training	exchange visits	6	6	6	6	6	-	30	1,000	6.030	6.090	6.151	6.213	6.275	-	30.759	13%	0%	88%	0%
Training on homegardening resiliace	trainings	-	20	20	20	-	-	60	500	-	10.151	10.252	10.355	-	-	30.757	13%	0%	88%	0%
Motorcycles /q	unit	6	-	-	-	-	-	6	4,000	24.120	-	-	-	-	-	24.120	13%	0%	88%	0%
Total B										**328.434**	**198.544**	**193.353**	**176.648**	**186.781**	**163.299**	**1.247.059**	**23%**	**0%**	**77%**	**0%**
C. Market Access																				
Value Chains Analysis and market assessment study /r	study	10	-	-	-	-	-	10	10,000	100.500	-	-	-	-	-	100.500	13%	57%	31%	0%
Intermediation activities between Buyers and Producers	unit	1	3	4	4	3	1	16	2,000	2.010	6.090	8.202	8.284	6.275	2.113	32.973	0%	100%	0%	0%
Technical Assistance for Business and Contract Development /s	unit	-	2	5	3	-	-	10	4,000	-	8.120	20.504	12.425	-	-	41.050	25%	75%	0%	0%
Fairs to establish market linkages	fairs	-	-	2	6	4	-	12	4,000	-	-	8.202	24.851	16.733	-	49.785	13%	88%	0%	0%
Marketing campaign of CSA products /t	unit	-	-	-	2	2	-	4	25,000	-	-	-	51.773	52.290	-	104.063	13%	0%	88%	0%
Producers org. coordination with BMDC and Bureau Standard /u	visits	15	30	30	30	30	15	150	250	3.769	7.613	7.689	7.766	7.844	3.961	38.641	0%	100%	0%	0%
Value Chain Specialists /v	unit	12	24	24	24	24	12	120	1,800	21.708	43.850	44.289	44.732	45.179	22.815	222.573	13%	88%	0%	0%
Total C										**127.987**	**65.674**	**88.885**	**149.830**	**128.321**	**28.889**	**589.585**	**12%**	**67%**	**21%**	**0%**
D. Matching Grant Fund																				
CSA production and market related investments	unit	-	90	180	360	270	-	900	4,600	-	420.231	848.866	1.714.709	1.298.892	-	4.282.698	0%	45%	40%	15%
Specialized technical asistance for resilient business plan	TA / project	-	90	180	360	270	-	900	55.556	-	87.294	176.334	356.196	269.818	-	889.643	0%	20%	65%	15%
Backyard Gardens Assets	unit	-	200	400	800	600	-	2.000	150	-	30.452	61.512	124.254	94.123	-	310.340	0%	20%	65%	15%
Total D										**-**	**537.977**	**1.086.713**	**2.195.159**	**1.662.833**	**-**	**5.482.682**	**0%**	**40%**	**45%**	**15%**
Total Component 1										**524.560**	**1.021.648**	**1.682.354**	**2.640.715**	**2.017.153**	**192.187**	**8.078.616**	**6%**	**40%**	**45%**	**10%**

25. \a Cooperatives, Producer associations, Informal clusters, \b Trainings, Specialists, exchange visits for producers organizations \c lump-sum for trainers, materials, meetings \d 20 young from 10 organizations \e 10young managers – US$ 250/month, during 3 years \f Field Technical Assistance. 1 consultant Y1, 2 consultants Y2 Y3 \g Training, TA, learning route \h 3 workshops per topic: climate change, CSA, pest mgt., agro-processing business mgt., market access and linkages \i Manuals, brochures \j Two consultant to train BMDC technicians \k Extensionists, Cooperative Department, BDMC \l One five year contract with an International Institution. Training CSA Technicians, University, MoA \m One National Institution Contract \n Independent of size of farm and type of commodity. \o Six permanent field staff. CSA technicians of the PMU. Institutional relation with Belize University \p Institutional contract with educational facilities \q Motorcycles for the field staff \r Sample study in high end and processing markets in depth studies regarding vegetables, fruits and beekeeping products \s Two consultant giving marketing TA to farmers and organizations \t Business contract campaign \u Inspection quantities and qualities \v 2 Field Marketing Specialists

Table 5: Detailed Costs for Component 2: Climate Resilient Rural Infrastructure (US$)

	Unit	Quantities							Unit Cost	Totals Including Contingencies (US$)							Finance source		
		2018	2019	2020	2021	2022	2023	Total	(US$)	2018	2019	2020	2021	2022	2023	Total	GOV	IFAD	GCF
I. Investment Costs																			
A. Rural Roads Improvements																			
Development of Engineering Design /a	miles	10	15	20	5	-	-	50	4,800	48,240	73,084	98,419	24,851	-	-	244,594	30%	40%	30%
Environmental Assesment and Independednt Review of Design /b	miles	10	15	20	5	-	-	50	800	8,040	12,181	16,403	4,142	-	-	40,766	30%	40%	30%
Construction	miles	-	10	15	20	5	-	50	80,000	-	812,040	1,230,241	1,656,724	418,323	-	4,117,327	30%	40%	30%
Supervision /c	miles	-	10	15	20	5	-	50	2,400	-	24,361	36,907	49,702	12,550	-	123,520	30%	40%	30%
Subtotal										**56,280**	**921,665**	**1,381,970**	**1,735,418**	**430,872**	**-**	**4,526,207**	**30%**	**40%**	**30%**
B. Small-Scale Irrigation and Drainage																			
Development of Engineering Design	acres	120	180	240	60	-	-	600	300	36,180	54,813	73,814	18,638	-	-	183,445	30%	0%	70%
Environmental Assesment and Independent Review of Design	acres	120	180	240	60	-	-	600	50	6,030	9,135	12,302	3,106	-	-	30,574	30%	0%	70%
Construction	acres	-	120	180	240	60	-	600	5,000	-	609,030	922,680	1,242,543	313,742	-	3,087,996	30%	0%	70%
Supervision	acres	-	120	180	240	60	-	600	150	-	18,271	27,680	37,276	9,412	-	92,640	30%	0%	70%
International TA for Institutional Development	man/months	2	2	1	1	-	-	6	25,000	50,250	50,753	25,630	25,886	-	-	152,519	30%	0%	70%
Printing and publishing of Training Materials and Manuals	lump sum	2	2	1	1	-	-	6	10,000	20,100	20,301	10,252	10,355	-	-	61,008	100%	0%	0%
Equipment for Irrigation Management	lump sum	-	-	1	-	-	-	1	90,000	-	-	92,268	-	-	-	92,268	30%	0%	70%
Subtotal										**112,560**	**762,303**	**1,164,628**	**1,337,805**	**323,154**	**-**	**3,700,449**	**31%**	**0%**	**69%**
C. Climate Resiliant Assets																			
CSA Information System	unit	-	-	1	-	-	-	1	50,000	-	-	256,300	-	-	-	256,300	13%	0%	88%
Subtotal										**-**	**-**	**256,300**	**-**	**-**	**-**	**256,300**	**13%**	**0%**	**88%**
Total										**168,840**	**1,683,968**	**2,802,898**	**3,073,223**	**754,027**	**-**	**8,482,956**	**30%**	**21%**	**49%**

\a Development of Engineering Design cost is estimated at 6% of the construction cost \b Environmental Assessment and Independent Design Review cost at 1% of construction cost \c Supervision cost is estimated at 3% of construction cost

Table 6. Detailed Costs for the Project Management and cross cutting activities (US$)

	Unit	Quantities							Unit Cost	Totals Including Contingencies (US$)							Finance source		
		2018	2019	2020	2021	2022	2023	Total	(US$)	2018	2019	2020	2021	2022	2023	Total	GOV	IFAD	GCF
I. Investment Costs																			
A. Consultancies & Training																			
PMU Staff Training	unit	5	5	-	-	-	-	10	4,500	22.613	22.839	-	-	-	-	45.451	13%	88%	0%
Training in gender equality for PMU	unit	1	-	-	-	-	-	1	3,000	3.015	-	-	-	-	-	3.015	13%	88%	0%
Gender equality impact study	unit	-	-	-	-	1	-	1	15,000	-	-	-	-	15.687	-	15.687	13%	88%	0%
Consultant to develop MIS (M&E)	unit	1	-	-	-	-	-	1	46,200	46.431	-	-	-	-	-	46.431	13%	88%	0%
RIMS Studies (M&E)	unit	2	-	-	-	-	-	2	46,200	92.862	-	-	-	-	-	92.862	13%	88%	0%
Programme Completion Report (M&E)	unit	-	-	-	-	-	1	1	50,000	-	-	-	-	-	52.813	52.813	13%	88%	0%
Knowledge Management Products (M&E)	unit	-	-	-	-	1	1	2	5,500	-	-	-	-	5.752	5.809	11.561	13%	88%	0%
Training in use of MIS (M&E)	unit	1	-	-	-	-	-	1	5,500	5.528	-	-	-	-	-	5.528	13%	88%	0%
Start-up and Closing Workshop (M&E)	unit	1	-	-	-	-	1	2	16,500	16.583	-	-	-	-	17.428	34.011	13%	88%	0%
Systematization Workshop (M&E)	unit	-	-	-	1	-	-	1	9,900	-	-	-	10.251	-	-	10.251	13%	88%	0%
M&E Training	unit	1	-	-	-	-	-	1	5,500	5.528	-	-	-	-	-	5.528	13%	88%	0%
Subtotal										192.558	22.839	-	10.251	21.439	76.051	323.138	13%	88%	0%
B. Policy engagement																			
Climate insurance Study /a	study	-	-	1	-	-	-	1	25,000	-	-	25.630	-	-	-	25.630	13%	0%	88%
Payments for eviromental services Study	study	-	-	-	1	-	-	1	25,000	-	-	-	25.886	-	-	25.886	13%	0%	88%
Study in Corozal livelyhood diversification	study	-	1	-	-	-	-	1	25,000	-	25.376	-	-	-	-	25.376	13%	0%	88%
Subtotal										-	25.376	25.630	25.886	-	-	76.893	13%	0%	88%
C. Vehicles and Equipment																			
4WD Double-cab Trucks	unit	5	-	-	-	-	-	5	50,000	251.250	-	-	-	-	-	251.250	13%	88%	0%
Office Furniture /b	unit	11	-	-	-	-	-	11	1,650	18.241	-	-	-	-	-	18.241	13%	88%	0%
Desktop Computers	unit	5	-	-	-	-	-	5	2,000	10.050	-	-	-	-	-	10.050	13%	88%	0%
Laptop Computers /c	unit	6	-	-	-	-	-	6	2,200	13.266	-	-	-	-	-	13.266	13%	88%	0%
High Volume Color Laser Printer	unit	1	-	-	-	-	-	1	3,300	3.317	-	-	-	-	-	3.317	13%	88%	0%
Mobile Color Laser Printer	unit	2	-	-	-	-	-	2	770	1.548	-	-	-	-	-	1.548	13%	88%	0%
High Volume Scanner	unit	1	-	-	-	-	-	1	1,540	1.548	-	-	-	-	-	1.548	13%	88%	0%
Digital Projector	unit	2	-	-	-	-	-	2	880	1.769	-	-	-	-	-	1.769	13%	88%	0%
Tablets	unit	6	-	-	-	-	-	6	330	1.990	-	-	-	-	-	1.990	13%	88%	0%
GPS Devices	unit	6	-	-	-	-	-	6	500	3.015	-	-	-	-	-	3.015	13%	88%	0%
Digital Camera	unit	2	-	-	-	-	-	2	1,000	2.010	-	-	-	-	-	2.010	13%	88%	0%
Subtotal										308.002	-	-	-	-	-	308.002	13%	88%	0%
Total Investment Costs										**500.560**	**48.215**	**25.630**	**36.137**	**21.439**	**76.051**	**708.033**	**13%**	**78%**	**10%**

	Unit	Quantities							Unit Cost	Totals Including Contingencies (US$)							Finance source		
		2018	2019	2020	2021	2022	2023	Total	(US$)	2018	2019	2020	2021	2022	2023	Total	GOV	IFAD	GCF
II. Recurrent Costs																			
A. Staff salaries																			
Programme Manager	month salaries	12	12	12	12	12	12	72	3,500	42.210	42.632	43.058	43.489	43.924	44.363	259.677	0%	100%	0%
Finance Officer	month salaries	12	12	12	12	12	12	72	2,700	32.562	32.888	33.216	33.549	33.884	34.223	200.322	0%	100%	0%
Accountant	month salaries	-	12	12	12	12	1	49	1,500	-	18.271	18.454	18.638	18.825	1.584	75.772	0%	100%	0%
Procurement Officer	month salaries	12	12	12	12	12	12	72	2,700	32.562	32.888	33.216	33.549	33.884	34.223	200.322	0%	100%	0%
Administrative Assistant	month salaries	12	12	12	12	12	12	72	1,200	14.472	14.617	14.763	14.911	15.060	15.210	89.032	0%	100%	0%
Environmental Specialist	month salaries	12	12	12	12	12	12	72	2,700	32.562	32.888	33.216	33.549	33.884	34.223	200.322	0%	0%	100%
Infrastructure Engineer	month salaries	12	12	12	12	12	12	72	2,700	32.562	32.888	33.216	33.549	33.884	34.223	200.322	0%	100%	0%
Institutional Development Specialist for public infrastructure	month salaries	-	12	12	12	12	12	60	2,700	-	32.888	33.216	33.549	33.884	34.223	167.760	0%	100%	0%
Rural Organization strengthtening specialist	month salaries	12	12	12	12	12	12	72	2,700	32.562	32.888	33.216	33.549	33.884	34.223	200.322	0%	100%	0%
Value Chain Specialist	month salaries	12	12	12	12	12	12	72	2,700	32.562	32.888	33.216	33.549	33.884	34.223	200.322	0%	100%	0%
M&E Officer	month salaries	12	12	12	12	12	12	72	2,700	32.562	32.888	33.216	33.549	33.884	34.223	200.322	0%	100%	0%
Subtotal										284.616	338.621	342.007	345.427	348.881	334.942	1.994.493	0%	90%	10%
B. Operations																			
Vehicle Operations & Maintenance	veh/month	60	60	60	60	60	60	360	660	39.798	40.196	40.598	41.004	41.414	41.828	244.838	13%	88%	0%
Office Equipment & Maintenance	month	12	12	12	12	12	12	72	230	2.774	2.802	2.830	2.858	2.886	2.915	17.064	13%	88%	0%
PMU Operational Costs	month	12	12	12	12	12	12	72	1,650	19.899	20.098	20.299	20.502	20.707	20.914	122.419	13%	88%	0%
Stationery and Supplies	month	12	12	12	12	12	12	72	450	5.427	5.481	5.536	5.591	5.647	5.704	33.387	13%	88%	0%
Travel and Subsistence	pers/month	60	60	60	60	60	60	360	475	28.643	28.929	29.218	29.510	29.806	30.104	176.209	0%	100%	0%
Travel and Subsistence (M&E)	unit	12	12	12	12	12	12	72	200	2.412	2.436	2.460	2.485	2.510	2.535	14.839	0%	100%	0%
Comunication materials and services	lump sum	1	1	1	1	1	1	6	7,500	7.538	7.613	7.689	7.766	7.844	7.922	46.371	13%	88%	0%
Other Staff Costs /d	pers/month	12	12	12	12	12	12	72	1,100	13.266	13.399	13.533	13.668	13.805	13.943	81.613	40%	60%	0%
Subtotal										119.756	120.953	122.163	123.385	124.618	125.865	736.739	12%	88%	0%
Total Recurrent Costs										**404.372**	**459.574**	**464.170**	**468.811**	**473.500**	**460.806**	**2.731.233**	**3%**	**89%**	**7%**
Total										**904.932**	**507.789**	**489.800**	**504.949**	**494.939**	**536.857**	**3.439.266**	**5%**	**87%**	**8%**

\a Delivery of climate insurance mechanism for households \b Includes M&E \c Includes M&E \d 12 months of costs per year for PMU

Table 7. Project Costs by Component and Expenditure Category (US$)

	Agricultural Production and Market Access	Climate Resilient Rural Infrastructure	PMU and cross cutting act.	Total	Finance source			
					GOV	IFAD	GCF	BENEF
I. Investment Costs								
A. Vehicles, equipments and materials	24.120	92.268	308.002	424.390	16%	64%	20%	0%
B. Grants	5.508.312	-	-	5.508.312	0%	40%	45%	15%
C. Consultancies, Training and TA	2.546.185	1.185.365	400.030	4.131.580	21%	35%	44%	0%
D. Works	-	7.205.323	-	7.205.323	30%	23%	47%	0%
Total Investment Costs	**8.078.616**	**8.482.956**	**708.033**	**17.269.605**	18%	32%	45%	5%
II. Recurrent Costs								
A. Salaries and allowance	-	-	1.994.493	1.994.493	0%	90%	10%	0%
B. Operating Costs	-	-	736.739	736.739	12%	88%	0%	0%
Total Recurrent Costs	**-**	**-**	**2.731.233**	**2.731.233**	3%	89%	7%	0%
Total Project Costs	**8.078.616**	**8.482.956**	**3.439.266**	**20.000.838**	16%	40%	40%	4%
Taxes	460.693	1.079.434	156.716	1.696.843	100%			

14. The categories of expenditure of the Programme are as follows:

- Vehicles, equipment and materials: This expense category includes the acquisition of goods required for the management of the Programme such as vehicles, motorcycles and office equipment (furniture, computers, etc.).
- Grants: Under this category of expenditure the investments provided in the MGF are for the implementation of the sub-projects in the different value chains. In addition, it contemplates the acquisition of goods to improve the adaptability to climate change in home gardens and financing basic equipment as part of the activities of strengthening the organizations of small farmers.
- Consultancies, training and technical assistance: This includes funds for studies and analysis, supervision, technical assistance, training and workshops.
- Works: This category consists of costs directly related to the improvement of rural roads as well as the construction of irrigation systems and drainage canals.
- Salaries and allowance: It includes the hiring of the personnel designated for the coordination and execution of the Programme.
- Operating Costs; this covers the operating costs of the PMU such as vehicle maintenance and office, stationery and supplies, travel and subsistence and other operative costs. This category only provides funds for the payment of incremental costs generated by the execution of the Programme.

C. Financing of the Programme

15. The Programme's total cost of US$20.0 million will be financed as follows: (i) IFAD, with a contribution of US$8.0 million over two cycles (40%); (ii) the GCF, with a contribution of US$8.0 million (40%); (iii) the GoB with a contribution of USD$3.2 million (16%);and (iv) the beneficiaries, with a contribution of US$822,400 (4%). These contributions are detailed by Component and Expenditure Category by source of funding in Tables 7 and 8 below.

16. Activities will be financed as follows:

- IFAD will primarily finance costs related to investment and technical assistance to improve production, value added activities and improving market access. It will also cover the costs of strengthening organizations and public institutions. Its contribution will be allocated as follows: 40% of the total costs of Component 1 (US$3.2 million); 21% of Component 2 (US$1.8 million); and 87% of the PMU and cross-cutting activities costs (US$3.0 million).

- The GCF will finance the costs of activities related to incorporating measures and improving knowledge on adaptation to climate change, and to increase the productive resilience of the beneficiary households. Its contribution of US$8.0 million will be allocated as follows: 45% of the costs of Component 1 (US$3.6 million); 49% of the costs of Component 2, especially for irrigation, drainage works and climate information systems (US$4.1 million); and 8% of PMU and cross-cutting activities costs (US$0.27 million).
- The GoB will provide counterpart funds to cover the costs of the total taxes related to Programme implementation, and will complement the financing of road infrastructure and irrigation and drainage works by 30%. The GoB's total contribution will be US$3.2 million and this will be allocated as follows: 6% of the total costs of Component 1 (US$0.46 million); 30% of the costs of Component 2 (US$2.5 million); and 5% of PMU and cross-cutting activities costs (US$0.18 million).
- The beneficiaries and their organizations will present proposals for funding under the Programme to improve resilient production and adaptation to climate change. They will provide a counterpart contribution in cash and/or in kind of at least 15% of the MGF, totalling US$0.8 million (for investment + technical assistance). The MGF will provide complementary funding, up to a maximum of 85%.
- The table below provides a summary by Programme component and proposed financing arrangement, while other summary financing tables are provided in Appendix 9.

Table 8. Funding by source and component (US$)

	The Government		IFAD		GCF		Beneficiaries		Total	
	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%
1. Agricultural Production and Market Access	460.693	6	3.194.918	40	3.600.603	45	822.402	10	8.078.616	40
2. Climate Resilient Rural Infrastructure	2.542.740	30	1.810.483	21	4.129.734	49	-	-	8.482.956	42
3. Project Management Unit	179.159	5	2.992.504	87	267.603	8	-	-	3.439.266	17
Total PROJECT COSTS	**3.182.591**	**16**	**7.997.905**	**40**	**7.997.940**	**40**	**822.402**	**4**	**20.000.838**	**100**

Table 9. Project Costs by Category of Expenditure and by Source of Financing (US$)

	GOV	%	IFAD	%	GCF	%	BENEF	%	TOTAL	%	Taxes
A. Vehicles, equipments and materials	69.196	16	269.502	64	85.693	20	-	-	424.390	2	53.049
B. Grants	3.204	0,1	2.189.637	40	2.493.068	45	822.402	15	5.508.312	28	3.204
C. Consultancies, Training and TA	857.940	21	1.451.578	35	1.822.062	44	-	-	4.131.580	21	671.713
D. Works	2.161.597	30	1.646.931	23	3.396.795	47	-	-	7.205.323	36	900.665
E. Salaries and operating costs	90.655	3	2.440.256	89	200.322	7	-	-	2.731.233	14	68.211
Total Project costs	3.182.591	16	7.997.905	40	7.997.940	40	822.402	4	20.000.838	100	1.696.843

17. The allocation of funding by source was determined according to the following propositions:

- The GCF will finance all those costs to be incurred for infrastructure works (30% roads and 70% irrigation and drainage), and investment initiatives of small farmers and their organizations to incorporate adaptation measures to climate change and increase their capacity for production resilience (40% Matching Fund and 65% technical assistance). In addition, it will cover costs for conducting studies, and training in climate resilient agriculture for both public and private institutions. In this regard, it is important to emphasize that the overall goal of the Programme is to develop productive systems and value chains that are resilient and adapted to the effects of climate change, which is why technical assistance as a whole will have a strong focus on climate resilient agriculture.
- IFAD will primarily finance project costs related to productive investment and value-adding (45% MGF), access to markets, strengthening of organizations and public institutions, technical assistance and training for productivity improvement and improved linkages along the value chain, road infrastructure (40%) and the costs of programme management (excluding taxes).

- The GoB will provide counterpart funds to cover the entire tax burden on acquisitions of goods and services by the Programme and will complement the financing of road infrastructure and irrigation and drainage works (30%).
- The beneficiaries of the Programme and their organizations that agree to finance investment initiatives with their corresponding technical assistance through the MGF will make a contribution of 15% of its total cost.

D. Loan Disbursements and Counterpart Funding

18. Tables 9 and 10 below provide the expected disbursement by expenditure category by year and the aggregated costs per category of expenditure. These provide information to guide the various funding bodies to plan their respective disbursement for funding the programme during the 6 years of execution.

19. Figure 1 below shows the projection of the phasing of the expenditures per year for the programme. Expenditures progressively increase until year 4 during which time the bulk of the costs would have incurred. In the fifth year, expenditures are expected to decline by 50%, with 4% of the total Programme cost in the last year.

20. Tables 11, 12, 13 and 14 provide details of the expenditures of each category by the four funding sources – the GoB, IFAD, the GCF and the Beneficiaries respectively.

Table 10. Expected Disbursement per Year by Expenditure Category (US$)

	2018	2019	2020	2021	2022	2023	TOTAL
I. Investment Costs							
A. Vehicles, equipments and materials	330.470	-	90.000	-	-	-	420.470
B. Grants	-	530.000	1.085.000	2.120.000	1.590.000	-	5.325.000
C. Consultancies, Training and TA	857.550	783.000	1.125.000	633.200	380.300	253.950	4.033.000
D. Works	-	1.400.000	2.100.000	2.800.000	700.000	-	7.000.000
Total Investment Costs	1.188.020	2.713.000	4.400.000	5.553.200	2.670.300	253.950	16.778.470
II. Recurrent Costs							
A. Salaries and allowance	283.200	333.600	333.600	333.600	333.600	317.100	1.934.700
B. Operating Costs	119.160	119.160	119.160	119.160	119.160	119.160	714.960
Total Recurrent Costs	402.360	452.760	452.760	452.760	452.760	436.260	2.649.660
Total BASELINE COSTS	1.590.380	3.165.760	4.852.760	6.005.960	3.123.060	690.210	19.428.130
Local Inflation	7.952	47.645	122.292	212.926	143.058	38.835	572.708
Total PROJECT COSTS	**1.598.332**	**3.213.405**	**4.975.052**	**6.218.886**	**3.266.118**	**729.045**	**20.000.838**

Table 11. Expenditures by Year by Component (US$)

	2018	2019	2020	2021	2022	2023	TOTAL
1. Agricultural Production and Market Access	524.560	1.021.648	1.682.354	2.640.715	2.017.153	192.187	8.078.616
2. Climate Resilient Rural Infrastructure	168.840	1.683.968	2.802.898	3.073.223	754.027	-	8.482.956
3. Project Management Unit	904.932	507.789	489.800	504.949	494.939	536.857	3.439.266
Total Project Costs	1.598.332	3.213.405	4.975.052	6.218.886	3.266.118	729.045	20.000.838

Figure 1. Phasing of Programme Execution

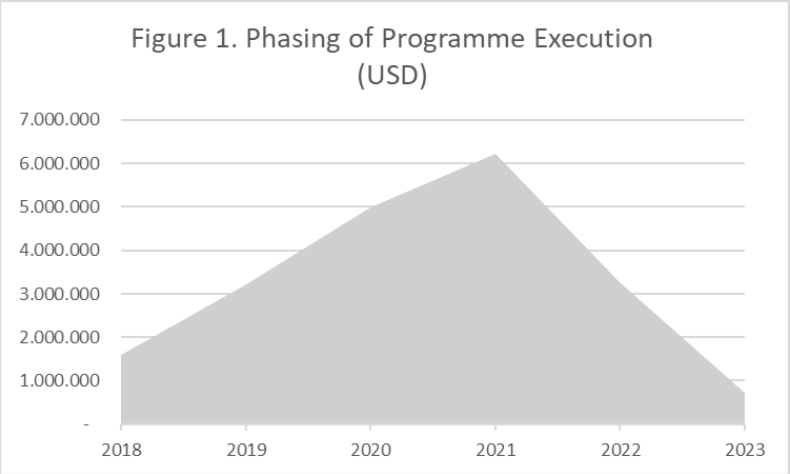


Table 12. Projected Expenditures by Year by Component GOB (US$)

GOV	2018	2019	2020	2021	2022	2023	TOTAL
C1 Agricultural Production and Market Access	93,189	86,761	101,021	73,310	62,735	43,677	460,693
C2 Climate Resilient Rural Infrastructure	64,722	519,401	803,193	929,215	226,208	-	2,542,740
C3 Table 3. Project Management and cross cutting activities	77,306	20,910	18,236	19,699	18,014	24,994	179,159
Total Project Costs	**235,216**	**627,073**	**922,450**	**1,022,225**	**306,957**	**68,670**	**3,182,591**

Table 13. Projected Expenditures by Year by Component IFAD (US$)

IFAD	2018	2019	2020	2021	2022	2023	TOTAL
C1 Agricultural Production and Market Access	140,198	433,883	774,808	1,060,096	759,896	26,037	3,194,918
C2 Climate Resilient Rural Infrastructure	22,512	368,666	552,788	694,167	172,349	-	1,810,483
C3 Table 3. Project Management and cross cutting activities	795,064	431,787	415,921	429,050	443,040	477,640	2,992,504
Total Project Costs	**957,774**	**1,234,336**	**1,743,517**	**2,183,314**	**1,375,286**	**503,677**	**7,997,905**

Table 14. Projected Expenditures by Year by Component GCF (US$)

GCF	2018	2019	2020	2021	2022	2023	TOTAL
C1 Agricultural Production and Market Access	291,174	420,307	643,518	1,178,034	945,096	122,474	3,600,603
C2 Climate Resilient Rural Infrastructure	81,606	795,901	1,446,917	1,449,841	355,470	-	4,129,734
C3 Table 3. Project Management and cross cutting activities	32,562	55,092	55,643	56,199	33,884	34,223	267,603
Total Project Costs	**405,342**	**1,271,299**	**2,146,078**	**2,684,074**	**1,334,450**	**156,697**	**7,997,940**

Table 15. Projected Expenditures by Year by Component Beneficiaries (US$)

BENEF	2018	2019	2020	2021	2022	2023	TOTAL
C1 Agricultural Production and Market Access	-	80,696	163,007	329,274	249,425	-	822,402
C2 Climate Resilient Rural Infrastructure							
C3 Table 3. Project Management and cross cutting activities							
Total Project Costs	**-**	**80,696**	**163,007**	**329,274**	**249,425**	**-**	**822,402**

GCF Financing:

21. The main objective of the financing provided by GCF is to incorporate in this Program of rural development the capacity of productive and economic resilience in the face of the consequences generated by climate change. Particularly in Belize, this problem is of great importance, since it is one of the countries in which climate change is expressed in events that generate significant and frequent damages (especially hurricanes and floods).
22. The main destination of these funds is that the investments foreseen both for the development of value chains and for investments in infrastructure, are adapted to climate change. The consequence of not contemplating this adaptation will cause a low impact and a poor sustainability of the program's intervention in the territory.
23. An estimate of the expected results of the Programme without the participation of the GCF shows a cash flow with a null return IRR = - 0.21% and a negative net present value (discounted at 6% per annum) NPV = BZ$ -6.0 million (US$ -3.0 million).

Table 16.

VPN	6%	-$ 5,948,793
IRR		-0.21%

	Y1	Y2	Y3	Y4	Y5	Y6	Y7
TOTAL PROGRAMME COSTS	2,405,651	2,175,458	2,745,339	2,465,367	1,589,271	1,169,243	
CASH FLOW PRODUCTIVE MODELS	-	- 1,558,811	- 2,177,350	- 2,966,374	- 71,260	2,135,058	2,175,760
NET PROGRAMME CASH FLOW	- 2,405,651	- 3,734,268	- 4,922,689	- 5,431,741	- 1,660,531	965,815	2,175,760

	Y8	Y9	Y10	Y11	Y12	Y13	Y14	Y15
TOTAL PROGRAMME COSTS								
CASH FLOW PRODUCTIVE MODELS	1,928,315	1,424,716	1,526,966	1,893,557	2,037,137	1,930,308	1,931,062	2,048,371
NET PROGRAMME CASH FLOW	1,928,315	1,424,716	1,526,966	1,893,557	2,037,137	1,930,308	1,931,062	2,048,371

Appendix 10: Economic and Financial Analysis

A. Introduction

1. This Working Document presents the financial and economic analysis of the Programme, and assesses the financial and economic feasibility and sustainability for the direct beneficiaries and for wider society. To this end, sustainable production models have been developed that reflect the production situation of the beneficiary families in the selected value chains. These models apply and cost a large number of actions of the Programme, and estimate the benefits that will be generated from their implementation.

2. The overall financial analysis incorporates all the costs of the Programme, including a projection of the costs and incremental revenue that flow in all the models, and beneficiaries' participation in each subproject. For the economic analysis, it is necessary to adjust the financial flows by making adjustments to the market prices used in the financial analysis. This is done by eliminating the effects of taxes and subsidies, the prices of tradable goods and the labour cost are adjusted to economic values, and estimates of positive and negative externalities that are generated with the execution of the Programme are incorporated.

B. Financial Analysis

Methodology

3. Cost-Benefit analysis is used to carry out the financial analysis of the Programme. The financial analysis was conducted using market prices in Belize dollars and the discount rate used was 10%, which is used in similar analyses in Belize. Calculations of the net incremental benefit flows for a period of 15 years from the start of the Programme were considered as adequate to reflect the maturity achieved of the activities that are supported and/or promoted by the Programme, and to assume that new technologies/investments will be required after that period by the beneficiaries to maintain their production and productivity in a sustainable way. This implies that the technologies and practices will need to continue to adapt to the effects of climate change and enhancing resilience in each priority area.

4. Nine production models were developed that are related to the prioritized value chains. Although eight of these models are analysed for each participating household, all the proposals implicitly imply an approach that reflects that beneficiaries will be organized in groups or in associations. One of the models is structured with the beneficiaries explicitly organized in a group for the production of honey. Finally, an estimate of the benefits generated by investments in road infrastructure is added for the analysis. In this way, all the models include the participating beneficiaries, the investments to be made in the various activities and the corresponding future benefits that flow from outputs and investments.

5. The construction of the models was developed with inputs from the extension technicians of the MoA, and the information was validated and improved with inputs from several producers of the different priority areas and with information provided by qualified references and other specialized sources. The selected value chains on which the models were developed are the following:

- Tomato and sweet pepper for internal consumption.
- Hot pepper and pineapple for fresh consumption and for local and export processing.
- Cabbage, onion and carrots for fresh domestic consumption, replacing part of the volume currently imported from neighbouring countries.
- Honey, promoting its local production and incorporation into the family production system as a secondary generating income activity.

6. The estimated current level of output of the products from all the beneficiaries as indicated in the production models represent 20% of the national output of tomato and sweet pepper, 30% of the production of cabbage and carrots and 60% of the production of hot pepper, onions and pineapple. The expected production increase with the implementation of the Programme would cover 70% of the current imports of cabbage, 45% of the onion import, 40% of the import of carrots and an estimated 100% of the imports of honey. Regarding pineapple, the expected increase in production would be absorbed by the citrus processing plant for juice production.

7. The Programme will channel its interventions to rural families that have less than 25 acres that are associated and/or organized in any type of organization (cooperative, cluster, association, etc.). It is through a Technical Evaluation committee that the sub-projects and proposals of the organized beneficiaries will be selected and approved.

8. The technologies adopted in the models seek to improve output in the current production models (without the Programme) to resilient, more stable and competitive production systems (with the Programme). This implies a transition from open field production systems in some cases with poor irrigation infrastructure, without any analysis of the soil, organizational weaknesses and lacking an adaptive vision regarding climate change, to an improved production system that applies methods for more efficient use of the natural resources, application of technologies to improve climate resilience and adaptation, and improved organizational capacities and access to market opportunities.

9. The number of households that will be incorporated to carry out each of these adaptive and technological changes in the different prioritized value chains has been estimated, based on data provided by the MoA and the Statistical Institute of Belize (SIB):

- **Onion**: 140 total households of which 60 will incorporate investments in drainage and irrigation, 40 that already have drip irrigation systems will incorporate improved drainage systems and 40 will increase their marketing of the product through establishment of storage infrastructure.
- **Tomato and Sweet pepper**: 285 total households of which 160 will adopt drip irrigation, 100 will invest and produce in greenhouses, and 25 will invest in storage infrastructure to improve marketability of their production.
- **Cabbage**: total households of 115, of which 100 will incorporate drip irrigation system and 15 will improve their storage infrastructure to improve marketability of their product.
- **Carrots**: 50 total households will have improved drainage and drip irrigation system in their farms and will be included in POs that will be involved in coordination of storage and marketing of the product.
- **Hot pepper**: 60 total households of which 50 will adopt a drip irrigation system and 10 will improve their storage infrastructure and marketing.
- **Pineapple**: 150 households that will implement drainage system in their plots and will market as a producers' group.
- **Honey**: 95 households of which 75 will be assimilated into 19 production groups and 20 will establish improved infrastructure for extraction, processing and marketing the product.

Production Models and their Feasibility and Financial Sustainability

10. The models reflect more adoption of improved technology in the production system that are not unknown by farmers. Some farmers have applied similar technologies or have seen them operate on neighbouring farms, but the use of inadequate techniques and the non-adaptation of them to adverse climatic effects caused their deterioration and loss. In few small or medium farms, these technologies are being well used and they are highly recommended by MoA extension technicians.

11. It is important to highlight some additional assumptions used in the methodology in all the models:

- Production models have been formulated considering their benefits and expected incremental costs, with improvements done on the main activity of the farm, keeping the remaining activities unchanged (and not included in the model). Usually family farming has a combination of two or more activities that complement and diversify their incomes and basically use family labour for all production activities, with hiring of labour when needed and for very specific periods in the production cycle. Modelling has not ignored this characteristic of family farming in Belize, although for the purposes of the calculations the production of one commodity is considered as the main activity for the development of the value chain, and its access to markets and for increasing and stabilizing family income.
- For the "without Programme" situation, the frequency of adverse weather events (hurricanes, floods and droughts) was included due to their impacts on production and losses in quality (and causing delay in the recovery of production in the following year). The "with Programme" situation includes the adoption of technologies and climate resilient practices, and measures to adapt to climate change, increase of productivity, improvement in the value chain and access to markets. There are no additional land requirements and incremental labour needs (which are not significant) are covered by the family labour supply.
- The prices that have been considered for inputs and outputs reflect the financial reality of the farmer.
- The adoption of improved technology is done progressively over time and its impact on family income is likewise. The expected improvements in yields and product quality are in line with the capacities of small producers that receive specialized technical assistance. Both assumptions have been validated by national specialists with extensive experience in agricultural production in the communities before they were incorporated in the models.
- Not all investment destinations that will be made necessarily correspond to the models identified and presented in this document, but the models have been useful for defining the levels of financial support to agricultural producers through the MGF[87].
- Finally, the Internal Rate of Return (IRR) and Net Present Value (NPV) were calculated on the cash flow for a period of 10 years, assuming that the results stabilize after the third or fourth year, and that the proposed technology used will be maintained for at least 10 years. This is considered a reasonable period after which it is necessary to incorporate new technologies and improved practices.

Description of Models

12. These models represent technological improvements to be applied by each household that has been approved to participate in the programme. Different families are expected to participate in the various models of sustainable production. There are 785 households that participate in the nine production models and 110 additional households are incorporated as partners in the facilities to be established for storage. It is anticipated that those that will benefit from the use of improved rural roads will be 895 households.

13. All the activities that will be carried out will receive specialized technical assistance, which will create synergy to accelerate the learning period and will contribute to the families achieving the full potential benefits of the proposed technologies.

[87] This is to clarify that the models reflect the investments to be made in the Programme. It is possible that sub-projects may be approved and financed during implementation with other types of greenhouses, different irrigation systems, or that will have the need for some specific machinery or that the honey production groups receive more or less than 20 hives each.

14. Good agricultural practices will reduce costs, incorporate safety and agricultural health aspects in production, strengthen organizations and will involve the whole family in the production process and contribute to improving the quality of the product and family income.

15. All models reflect the local reality in terms of the coefficients used, the number of beneficiaries in each value chain, the results to be achieved, technologies to be incorporated, options for expanding output, etc. While an “optimal” situation has been simulated, the models present situations that are considered "normal" and reflect the use of technologies and results that have been obtained in similar projects. The expected impacts on output and income from the adoption and use of improved technologies in the production models are discussed further below.

16. The **onion** farm models have as their main objective to reduce losses through investments mainly in drainage and storage facilities. Improvements in the drainage system reduce the damage caused by frequent flooding, and substantially improve the output and quality of the product. The facilities for collection and storage improve product quality and shelf life, and allow the supply period to be extended beyond the current 2 or 3 months. This prevents over-supply of the product for only a short period during the year at low prices, and reduce post-harvest losses and minimize pest and diseases problems. Some 60 families that currently produce onions with surface irrigation systems will incorporate investments in drip irrigation, which together with drainage and technical assistance will allow them progressively to increase their yields from 17,000 to 25,000 pounds per acre. The 100 onion-producing families that participate in these models would increase their current net income by 2 to 4 times. Planning production in advance will further extend the period of the supply of onions produced in the country and thereby reduce imports.

17. The **tomato and sweet pepper** models are subdivided into two models, each with different technology based on the initial capacities of the different households. One of them proposes to move from open field production with surface irrigation to field production with drip irrigation; the other is more ambitious in that the transition is from field production with drip irrigation to intensive production in greenhouses. Both proposals contemplate investments in climate resilient practices: collection, sorting, consolidation of the output and better organization of the marketing, and technical support.

18. There are several advantages with the use of the new technology. With greenhouses, the production period extends from the current 2 or 3 months to 9 months with better market prices, the use of agrochemicals is significantly reduced, current open production areas are released for other production, the whole family is involved in the workforce, it allows a rapid restart of production when adverse weather events occur and it stimulates a higher demand in the various markets given that a better quality product is produced.

19. One metric of the expected productivity change is that open field production models incorporating drip irrigation and technical assistance (160 households) increase their yields from 16,800 to 24,000 pounds per acre. Those that anticipate intensive production systems in greenhouses on 0.1 acres (100 households) increase yields from 4,000 to 11,250 pounds. With regard to post-harvest facilities, storage will allow adding value to production through sorting and collective packaging. This will enable producers to improve their negotiating marketing position to obtain better prices and strengthen their organizational capacities for planning production and marketing. The 260 families that produce tomato and sweet pepper in these models will be able to increase their net income by 3 to 5 times. Both tomato and sweet pepper possess similar production characteristics and economic margins; to simplify the analysis, only tomato was the product considered in the models.

20. For the production of **cabbage** and **carrots**, the main technological improvement is the incorporation of drip irrigation. In the case of cabbage, production will move from a surface irrigation system to a combined drip irrigation system with small sprinklers. These are very effective and

economical for the control of a lepidopteran, the green caterpillar of the cabbage (*Plutella xylostella*), that causes high production losses. It should be noted that this technique was developed by small producers and is currently highly recommended by extension technicians. Technological advancement in the irrigation system together with improvements resulting from specialized technical assistance will allow cabbage producers to increase their yields per acre from 15,000 to 20,000 pounds.

21. The technological transition in the case of carrots is more ambitious, from the current production on dry land to a system of drip irrigation with drainage channels that increases the quality and yield and reduce losses from flood. The addition of drip irrigation in carrot production together with technical support and drainage systems, will increase yields from 10,000 to 20,000 pounds per acre.

22. For both cabbage and carrots, the Programme will invest in climate resilient technologies and practices in the production system to increase resilience to the effects of climate change, and install collection, sorting, and packaging facilities for these and other commodities (tomato, sweet pepper and hot pepper), to improve the quality of the marketed output at higher prices. The 100 families producing cabbage in these models will be able to increase their net income by 2 to 3 times, while the 50 families producing carrots will increase their current net income about 4 times.

23. Improving pineapple production in the south of the country requires incorporating measures to reduce the losses caused by frequent flooding. It is proposed to adopt the same drainage systems in family farms as in those farmed by producers' cooperatives. Diversification will also be promoted by introducing the MD2 variety to the current Sugarloaf variety that is destined for fresh processing and consumption. This variety is already being used by a cooperative of small producers in the town of Trio. Planting is done at a higher density of plants per acre than Sugarloaf, and the fruit has a higher weight. This product is highly demanded by the juice processing industries at a price of BZ$ 0.21 per pound, and a small portion of production (approximately 10%) can be channelled to the fresh consumer retail market at an average price of BZ$ 0.25 per pound. The investments to be made in drainage and providing technical assistance for inclusion of this variety (MD2) in the production system will increase the yields per acre from 48,000 to 80,000 pounds. Collection and storage facilities will improve quality sorting and marketing of the fruit for the fresh consumer market. The 150 families producing pineapple participating in this model will be able to increase their net income more than 3 times.

24. Another commodity that is strongly linked to a competitive and growing industry is **hot pepper** that is produced in different parts of the country. However, the Programme will focus on the production areas of Cow Pen and surrounding areas that are located in the central-south east of the country. Production is done with rudimentary techniques, and the current quality requirement for the export market implies the need to use improved technologies. In this regard, the model changes the technology from a rudimentary irrigation system to a drip irrigation system. In addition, it plans to invest in climate resilient agriculture practices and infrastructure, complemented by technical assistance that will support the production of other vegetables (tomato, sweet pepper, cabbage, carrots and hot pepper). These improvements will enable families participating in this model to increase their yields from 10,500 to 15,000 pounds, and their net income will at least double and be more stable.

25. The **beekeeping model** is designed to be carried out by producer groups of four households each. A group will begin its bee production with a total of 20 hives. The 75 families that will participate in this model will form a total of 19 production groups. The Programme will provide technical assistance the installation of three storage and processing plants, which can be utilized also by other honey producers. This activity will be added to the productive system of the 75 households; labour needs are not high and it will promote the inclusion of young people, and generates income starting at around BZ$ 2,700 per year. The investments in small storages will allow the groups to access services of collection and production of by-products, besides facilitating better management of production and marketing.

26. The technologies proposed in previous models are described in more detail below:

27. **Irrigation technologies**: In all cases these investments seek to incorporate drip irrigation systems. This technology is highly efficient in the use of water, reduces the risks of salinization considerably, uses a smaller amount of fertilizers, consumes fewer hours of family labour in the task of watering, improves the quality of the products and increases productivity by keeping the soil moisture close to the roots stable. In 83% of the cases (350 farmers), the water source will come from the planned infrastructure, which will have a pressurized connection to each farm, so it will not be necessary for each producer to purchase pumps. For the remaining 17%, the source of water will come mainly from wells.

28. The estimated amount of investments in drip irrigation systems connected to the infrastructure works provided for in this Programme is approximately BZ$ 1500/acre and the required investment in systems with water intake from wells is BZ$ 14,000/household. In all cases, the hoses should be replaced every 3 or 4 years (BZ$ 1,000/acre). The Programme plans to finance this irrigation technology for 420 families.

29. **Greenhouses**: Production in greenhouses is on 0.1 acre that is equivalent in volume to field production on 0.5 acres, but the product quality is significantly higher. The recommended structure is the Tropical Greenhouse which has an estimated cost of BZ$ 21,000. The common size is 82 ft. in length by 52 ft. wide and 22 ft. in height. It is covered by Antiviral Netting on its sides and UV plastic on the roof. The structure also includes rain gutters for rain harvesting and a Dutch Trellising System which is ideal for Tomato and Sweet Pepper production. It can be rapidly dismantled when strong winds are forecast. The external coverage is an effective pest control shield. The tunnel structure is more widespread, with a size from 60 feet in length by 14 feet wide and 11-12 feet in height with a plastic cover, and has a low cost (BZ $ 3,000). However, it has very low resistance to winds and its productivity is usually affected by the high internal temperatures.

30. **Drainage**: The frequency of flooding has increased, especially in low lying areas and in the south of the country. As a result, mechanisms to extract surplus water are required, especially for certain highly sensitive crops such as pineapple, onions and carrots. These drains are channels of approximately 30 cm deep and 15 cm wide that are arranged parallel to the crop rows planted and allow the drainage of excess water. These drains are done with contracted machinery services that require 4 hours of work per acre at a cost of BZ$ 300/hr. Maintenance is required for them every 3 years.

31. **Climate Smart Agriculture Investments**: These cover a diversity of small investments that make production more resilient to the adverse effects of climate change. They include, among others, agroforestry, forest curtains, drainage, solar panels, forage reserves, sheds. These measures reduce exposure to hurricanes and floods and allow for a faster post-event production recovery. It is estimated that the investments will be made for 635 households to increase their production resilience, and combined with technical assistance, the average cost is estimated at BZ$ 1,300 BZ/household.

32. **Storage**: The Programme proposes to build a total of 14 storage facilities that will be managed by POs:

- Three are for the collection and post-harvest storage of onion. They should be designed according to the preservation needs of this product and the ease of cleaning, proper drainage, etc. This number is not exhaustive, as several small storage facilities can be built. This will be defined during the final design stage and evaluation of the sub-projects.
- Six structures are for the collection, sorting, packing and marketing of tomato, sweet pepper, cabbage, hot pepper, carrots and other vegetables and fruits. These structures will allow better organization of the deliveries and sale of products, to reduce the role of middlemen, and for producers to link and negotiate directly with buyers, plan production according to the market requirements, to sort by product quality, etc.

- Two structures are destined to improve marketing of pineapple, especially the part of output that is to be sold for fresh consumption.
- The remaining three structures are intended for the collection and processing of bee products. Each will be managed, on average, by six groups of four households each that will start with 20 hives/ group.

33. The estimated cost for each structure and equipment is BZ$ 275,000, except for those destined to beekeeping that will cost BZ$ 60,000. However, the amount of storage for the different production models will depend on the needs and technical proposals that are approved for the sub-projects.

34. **Soil analysis**: This is a service that will form part of the technical assistance that each beneficiary family will receive. Presently, there is high usage of fertilizers in most agricultural production and technicians indicate that soil testing and analysis could contribute to reduced fertilizer use in production by about 40%.

35. With regards to investments to improve the **road infrastructure**, a number of benefits were estimated related to the reduction in transportation costs (fuel and maintenance) for inputs and the marketed output, and the reduction in the damage and losses of the products transported. The investment will improve 17 sections of three miles each in different locations. Each stretch of road will cover at least 100 acres in production and directly benefit at least 30 rural households.

36. The reduction in transportation costs was estimated at 20% for both rural families and freight trucks traveling on these roads. The cost per mile for trucks, which includes fuel, wear and maintenance expense is BZ$ 3.00/mile and the corresponding one for automobiles is BZ$ 1.00/mile. It is also estimated that a truck has the capacity to transport 15,000 pounds on average, which is equivalent to the production volume of one acre per season of 6 months. This would allow for 24,000 truck trips per year (100 acres x 2 seasons/year x 17 roads x 6 miles round trip). A family uses these roads at least twice per week which equates to 576 miles travelled per family per year.

37. On the other hand, the reduction of losses of damages to products during their transport was estimated at a minimum of 25% of perishable products like tomato and sweet pepper (information provided by various producers and extension technicians). Considering that the roads to be improved will correspond to the areas with the highest concentration of production, it is estimated that for these 17 sections, 75% of the tomato and sweet pepper production will be transported, with an average price of BZ$ 1.00/lb. For other vegetables and fruits, losses were estimated at a minimum of 10% with a weighted price of BZ$ 0.47/pound. The estimated percentage of the production that will transit these roads is cabbage 75%, onion 35%, hot pepper 90%, carrots 90% and pineapple 50%.

38. Rural roads currently have a high level of deterioration and a high cost of repair due to rains, as they have not been built with drainage systems, slopes and other suitable measures for their use and conservation. These repairs are performed infrequently and are of short duration. The Programme will improve these tracks by incorporating measures to adapt to climate change and adverse weather conditions, which will reduce exposure to deterioration and consequently the cost of maintaining it. This cost was estimated at 1.5% of the total cost of the investment to be incurred. It is estimated that the expense to be incurred will be equivalent to the current expenditure, and so it was not included in the projected flow of this model.

39. **Technical assistance**: All sub-projects that are approved and implemented will receive specialized technical assistance to ensure a higher rate of success in production, adaptation to climate change, and stable and cost-effective inclusion in the value chain. The cost of technical assistance during the first year of implementation of the sub-projects for the different investment activities varies between BZ$ 1,300 and BZ$ 3,500 per household. As for technical support for storage infrastructure, a cost of BZ$ 21,000 was estimated for each producer organization.

40. The technical and production details for each model are presented in Annex I below.

Analysis of the financial viability of the production models

41. The indicators used to analyse the financial viability of the models are: the incremental net benefits at market prices compared to the "without programme" situation; the Net Present Value and the Internal Rate of Return. Each model includes as outflows:

- The total of investments, both those financed with program funds and the counterpart financing of the beneficiaries.
- The costs of the proposed specialized technical assistance.
- The costs of production of each commodity.
- Total sales in each model.

42. Table 1 summarizes the financial analysis of each production model. It shows the net income obtained by each participating household, once it reaches a level that reflects constant income and expenditure. For each model, it also shows the incremental income generated by the Programme, the net present value discounted at 10% and the IRR for the period of 10 years. In most cases, the ratio between the incremental net benefit achieved by each family with the execution of the Programme and the net income obtained without it, is higher than 1.

Table 1: Results of financial analysis

Sustainable production models	Gross income	Costs	Net Income	Incremental Net Income "with" - "without" Project	Increased net income vs. Net income without project	IIR (%)	NPV (10%)	Investments
Onion 1	**15,750**	**5,952**	**9,798**	**7,827**	**3.97**	**56.15%**	**$ 29,581**	Drip irrigation, drenaige, storage
Onion 2	**15,750**	**5,952**	**9,798**	**4,799**	**0.96**	**77.99%**	**$ 21,407**	Dreanaige, storage
Tomato - S. Pepper 1	**20,400**	**7,360**	**13,040**	**8,262**	**1.73**	**70%**	**$ 28,700**	Drip irrigation, CSA, storage
Tomato - S. Pepper 2	**13,500**	**1,913**	**11,587**	**9,786**	**5.43**	**41%**	**$ 31,877**	Greenhouses, CSA, storage
Cabagge	**13,000**	**3,533**	**9,467**	**6,749**	**2.48**	**48%**	**$ 19,714**	Drip irrigation, CSA, storage
Carrots	**14,000**	**4,148**	**9,852**	**8,957**	**5.99**	**91%**	**$ 36,088**	Drip irrigation, CSA, drenaige, storage
Pineapple	**17,440**	**4,162**	**13,279**	**9,015**	**2.11**		**$ 48,846**	Drenaige, CSA, storage
Hot Pepper	**16,500**	**4,909**	**11,591**	**6,782**	**1.41**	**71%**	**$ 22,481**	Drip irrigation, CSA, storage
Honney	**14,400**	**3,622**	**10,778**	**10,778**	**-**	**29%**	**$ 31,252**	groups of 20 hives, CSA, storages

Analysis of project financial viability

43. Table 2 shows the incorporation of the beneficiaries on an annual basis as Programme execution expands. To verify the financial viability of the Programme, the Annual Net Incremental Benefit Flow generated over a 15-year period was calculated for the beneficiaries who are incorporating technological improvements in their production system promoted by the Programme (from the second year of execution). The details of this are presented in the financial analysis in Table 3.

Table 2: Incorporation of Beneficiaries by Model and by Year

	No.	PY1	PY2	PY3	PY4	PY5	PY6
Onion 1	60		6	12	24	18	
Onion 2	40		4	8	16	12	
Tomato - S. Pepper 1	160		16	32	64	48	
Tomato - S. Pepper 2	100		10	20	40	30	
Cabagge	100		10	20	40	30	
Carrots	50		5	10	20	15	
Pineapple	150		15	30	60	45	
Hot Pepper	50		5	10	20	15	
Honney	75		30	60	120	90	
New storage members	110		11	22	44	33	
TOTAL	895		112	224	448	336	

Table 3 Financial Analysis (BZ$)

Models	Q	PY1	PY2	PY3	PY4	PY5	PY6	PY7	PY8	PY9	PY10	PY11	PY12	PY13	PY14	PY15
Onion 1	60		- 68,593	- 108,044	- 174,549	44,426	401,663	461,152	464,827	442,033	447,430	470,224	467,227	443,233	449,830	469,621
Onion 2	40		- 23,351	- 29,273	- 40,950	56,448	185,052	196,016	196,081	188,211	188,146	196,016	197,681	189,011	189,746	191,951
Tomato - S. Pepper 1	160		- 113,627	- 188,164	- 277,480	130,647	879,802	1,109,898	1,152,874	1,073,738	1,091,146	1,219,242	1,220,489	1,109,449	1,162,569	1,321,929
Tomato - S. Pepper 2	100		- 200,170	- 341,473	- 578,752	- 58,298	887,950	981,767	950,771	920,459	951,455	981,767	944,435	907,287	925,111	978,583
Cabagge	100		- 96,209	- 157,930	- 263,832	14,369	494,541	556,501	547,921	492,461	514,041	595,501	608,881	542,881	575,881	674,881
Carrots	50		- 36,947	- 43,808	- 54,811	116,397	345,333	385,663	400,873	392,393	384,183	406,663	437,353	426,853	432,103	447,853
Pineapple	150		5,911	135,537	406,297	907,764	1,269,256	1,243,818	1,169,901	1,195,339	1,260,711	1,324,887	1,368,039	1,338,843	1,342,191	1,352,235
Hot Pepper	50		- 27,191	- 44,099	- 66,607	32,522	210,683	270,251	287,348	260,368	258,533	297,888	308,328	277,578	292,953	339,078
Honney	19		- 54,862	- 99,505	- 181,268	- 67,749	163,058	196,574	204,782	204,782	204,782	204,782	204,782	204,782	204,782	204,782
Infraestructure	400		- 1,600,000	- 1,929,018	- 2,022,545	1,319,419	2,354,910	2,354,910	2,354,910	2,354,910	2,354,910	2,354,910	2,354,910	2,354,910	2,354,910	2,354,910
TOTAL NET INCREMENTAL BENEFITS			**- 2,215,037**	**- 2,805,777**	**- 3,254,497**	**2,495,947**	**7,192,250**	**7,756,550**	**7,730,287**	**7,524,694**	**7,655,338**	**8,051,880**	**8,112,125**	**7,794,827**	**7,930,076**	**8,335,823**
PROJECT COSTS (not included in the models)		**3,196,664**	**3,843,891**	**5,564,609**	**5,227,073**	**2,694,131**	**1,458,089**									
1. Agricultural Production and Market Access		1,049,120	1,060,377	1,379,213	1,270,729	996,200	384,375									
2. Climate Resilient Rural Infrastructure		337,680	1,767,936	3,205,796	2,946,446	708,054	-									
3. Project Management and cross cutting act.		1,809,864	1,015,578	979,600	1,009,898	989,877	1,073,715									
PROJECT TOTAL FUND FLOW		**- 3,196,664**	**- 6,058,928**	**- 8,370,386**	**- 8,481,570**	**- 198,184**	**5,734,160**	**7,756,550**	**7,730,287**	**7,524,694**	**7,655,338**	**8,051,880**	**8,112,125**	**7,794,827**	**7,930,076**	**8,335,823**
	IRR=	**15.74%**	**VAN 10%**		**9,455,895**											

44. In order to carry out the financial analysis of the Programme, a cash flow was prepared with the following information:

- Total estimated costs for the execution of the Programme (see Appendix 9).
- Incremental income and expenditure corresponding to the nine sustainable production models for all the beneficiaries.
- Reduction of losses estimated by the improvement of rural roads.
- All costs related to the Programme that were included in the models and in the estimation of benefits generated by the improvement of rural roads were deducted from the total costs of the Programme

45. The resulting cash flow, through which the performance was analysed, was quantified in BZ$ and the discount rate used to calculate the NPV was 10%, a value usually used for this type of analysis

46. The financial viability indicators of the project were that show a financial Internal Rate of Return (IRR) of 15.74% and a Net Present Value (NPV) discounted at 10% of BZ$ 9.4 million. This level of return could be considered as intermediate, because the Programme will execute a large number of actions that increase adaptation to climate change and greater inclusion in the market, while inducing more stability of production and higher income, also provides indirect benefits to the beneficiaries.

Economic Analysis

Methodology

47. To perform the Economic Analysis, the Cost-Benefit methodology was used based on the calculation of the Net Incremental Annual Benefit Flow for the selected period of 15 years from the start of the Programme. The cost-benefit or cost effectiveness analysis was carried out using the IRR and the NPV. For both income and costs, shadow prices were used.

48. Only the incremental benefits and additional costs associated with project interventions were considered. All of them were valued at economic prices and projected over time according to the maturity of the technologies and practices adopted, and the expected results of the interventions supported by the Programme. As a basis for the analysis, future benefits were calculated through sustainable production models and improved rural roads.

49. The existence of positive externalities is recognized, but not all have been incorporated in the analysis. A more in-depth analysis is needed that will identify correctly the externalities, a more precise assessment of their scope and impact that are attributable to the actions of this Programme. Some positive externalities identified in a preliminary form that can be considered in this analysis are:

- Increased labour opportunities in rural areas for young people and women (agro-processing and agricultural and commercial services).
- Expansion in the supply of better quality products with less use of agrochemicals, along with backyard production trainings will improve food security.
- Environmental improvements and increased productive resilience. While many of the Programme's actions will lead to reduced damage and greater productive resilience in the face of major climatic events (hurricanes and large floods), public spending usually undertaken by the government in these situations can be directed more towards the reduction in the restart of the production cyclesthan to the recovery of goods not adapted to the climate change that were damaged. This will result in a faster economic recovery in rural areas.
- The planned creation of a water resources management entity supported by this Programme, along with irrigation works to be carried out, will help farmers, the community and the state to

maintain greater control of the quality of irrigation water. This will increasingly improve productivity and reduce diseases.

- The promotion of beekeeping also contributes to raising controls on the rational use of agrochemicals, especially insecticides, which allows for the recovery and maintenance of biodiversity, and the opportunity to carry out integrated pest control that reduces the cost of production.
- Specialized technical assistance safety and hygiene and climate resilient agriculture, will also improve the structure and natural fertility of soils and reduce the incidence of diseases in crops. Some examples are provided in the model on cabbage production with the incorporation of natural methods of insect control, and in the model on tomato production with the use of greenhouses that significantly reduce the use of agrochemicals.
- The higher productivity per unit area estimated in the sustainable fruit and vegetable production models will allow the freeing of land areas that are already conditioned for agricultural production or for other uses (forestry, watershed management, livestock, etc.).
- Improvements in rural roads will generate positive impacts on the accessibility to schools (fewer absences), health centres (treatment follow-up), cultural and community activities and considerable time savings in transportation and vehicular repairing.

50. For the analysis of the cash flows of sustainable production models, **shadow prices** have been used in all cases where market prices are distorted. In this regard, these prices were corrected by eliminating the effect of taxes and subsidies, market distortions, unemployment and the exchange rate in order to reflect more closely their opportunity cost. The **discount rate** used to obtain the NPV was the average annual rate of 6%, an average rate that Belize at which obtains its financing[88].

51. The following are the variables that were included for estimating the economic prices for goods, labour, and other services:

- **Taxes**: The tax component has been eliminated from the prices used for both the cost calculation of the Programme and those corresponding to the models.
  - ✓ **General Sale Tax (GST)**: a tax on consumers' expenditures, at the point of importation and for business transactions when goods change hands or services are performed. The value of this tax is 12.5%. This tax was considered in the following Programme costs: contracting of consulting firms or registered consultants for conducting studies and trainings; acquisition of equipment; operating costs; transports and mobility; events associated costs, constructions and supervisions. Some goods, many of which are included in sustainable production models, are exempt from the application of this tax such as fruits and vegetables, and various inputs for production such as seeds, fertilizers, pesticides, fungicides and herbicides, land preparation and harvesting. The main assets covered by this tax in the production models are the construction of storages, greenhouses, hives, equipment and a few operating costs like threads, bags and others.
  - ✓ **Income tax** is applied on the income of those people who exceed an income of BZ$ 26,000/year. The value of this tax is 25%. This tax was considered in the following costs: contracts of individual consultants to carry out field technical assistance, training, specialized advice and facilitating.
  - ✓ **Fuel tax:** The tax on fuels and diesel is of the order of 45%.
- **Price of labour:** The level of unemployment reported by the Statistical Institute of Belize (SIB) for rural areas is 9.3%. This value is the one that has been used to adjust labour prices in the productive models. There is no information available on unemployment for skilled workers, but considering that it is usually significantly lower than that of unskilled workers. Given that 9.3% was applied, that number took account of skilled employment also.

[88] In 2017, Belize offers floating rate notes at 10 years at 5% + Inflation

- **Shadow Exchange Rate:** The calculation of this rate was based on the average values of the last five years of the balance of payments account considering outflows/inflows. The index obtained was 1.16 (see Table 6). All project costs and sustainable production models were corrected by this exchange rate adjustment factor.

Table 4: Calculation of the shadow exchange rate

BALANCE OF PAYMENTS
$mn

	Convertion Factor	2.011				2.012				2.013				2.014				2.015				2.016			
		GOODS	SERVICE	INC.	TOTAL	GOODS	SERV.	INC.	TOTAL	GOODS	SERV.	INC.	TOTAL	GOODS	SERV.	INC.	TOTAL	GOODS	SERV.	INC.	TOTAL	GOODS	SERV.	INC.	TOTAL
OUTFLOWS		1.549	343	204	**2.096**	1.636	370	251	**2.257**	1.777	390	251	**2.418**	1.877	403	292	**2.573**	1.923	443	279	**2.644**	906	202	163	**1.271**
INFLOWS		1.207	679	10	**1.896**	1.243	814	10	**2.067**	1.216	896	12	**2.124**	1.178	975	17	**2.169**	1.075	1.065	15	**2.155**	463	576	7	**1.046**
SER	**1,16**	1,28	0,51	21,40	**1,11**	1,32	0,46	24,53	**1,09**	1,46	0,44	20,60	**1,14**	1,59	0,41	17,47	**1,19**	1,79	0,42	19,16	**1,23**	1,96	0,35	22,65	**1,21**
BALANCE		-342	336	-194	**-201**	-393	443	-240	**-190**	-561	506	-238	**-294**	-700	571	-276	**-404**	-847	622	-264	**-489**	-443	374	-156	**-225**

Sources: SIB and CBB

- **Conversion Factors for tradable goods**: In order to calculate the conversion factor to adjust market prices to economic prices for tradable goods, two types of products were analysed: export and import. For exported goods, the economic price is the same as the market price; these products are exempt from of export taxes, GST and other internal taxes. In the case of commonly imported goods, the CIF value was obtained considering the costs of loading and unloading, transportation to the production area, and environmental import tax (2%). The GST was not applied since the majority of inputs for agricultural production are exempt from it. The results of the conversion factors adjusted by the shadow exchange rate are: 1.17 for importable goods; and 1.16 for exportable goods.

- **Exportable goods:**
  - ✓ Market price = Border price (no export and no internal taxes) = 1
  - ✓ Economic or Shadow price = Border price x SER = 1 X 1,16 = 1,16
  - ✓ CF = Shadow price / Market price = 1,16 / 1 = **1,16**
- **Importable goods:**
  - ✓ Border price = Market price – import taxes (Environmental taxes 2%) + Transport and handling internal costs[89] (average: 0,03 BZ/lb) = 1 – 0,02 + 0,03 = 1,01
  - ✓ Economic or Shadow price = Border price x SER = 1,01 X 1,16 = 1,1716
  - ✓ CF = Shadow price / Market price = 1,1716 /1 = **1,1716**

[89] Load and unload (BZ/pound = 0,004) and transport cost (BZ/pound = 0,021)

Table 5: Economic Analysis (BZ$)

Models	Q	PY1	PY2	PY3	PY4	PY5	PY6	PY7	PY8	PY9	PY10	PY11	PY12	PY13	PY14	PY15
Onion 1	60		- 66,285	- 97,095	- 144,690	102,085	480,367	548,784	553,380	527,258	533,185	559,307	556,234	528,790	536,248	558,623
Onion 2	40		- 22,082	- 23,340	- 26,476	82,350	215,179	225,777	226,075	217,158	216,860	225,777	227,977	218,179	218,902	221,072
Tomato - S. Pepper 1	160		- 102,734	- 155,897	- 191,480	271,205	1,068,787	1,334,532	1,382,052	1,291,421	1,313,946	1,461,371	1,459,321	1,330,770	1,392,646	1,578,271
Tomato - S. Pepper 2	100		- 191,136	- 311,780	- 503,237	61,504	1,029,159	1,128,907	1,094,715	1,068,961	1,103,152	1,128,907	1,086,189	1,051,410	1,068,049	1,117,969
Cabagge	100		- 92,761	- 142,043	- 219,533	98,959	611,310	682,455	671,044	607,439	633,930	727,695	741,029	664,469	702,749	817,589
Carrots	50		- 33,419	- 31,089	- 22,910	170,016	410,542	456,961	473,875	464,403	455,608	481,321	515,828	503,648	509,738	528,008
Pineapple	150		22,123	188,723	535,273	1,105,579	1,485,603	1,459,686	1,381,124	1,407,042	1,472,100	1,546,544	1,596,600	1,562,733	1,566,616	1,578,267
Hot Pepper	50		- 21,900	- 29,915	- 32,464	81,078	265,420	334,154	353,258	322,326	320,926	366,213	377,231	341,561	359,396	412,901
Honney	19		- 52,058	- 92,796	- 166,512	- 50,831	175,983	210,542	219,005	219,005	219,005	219,005	219,005	219,005	219,005	219,005
Infraestructure	400		- 1,649,778	- 1,931,584	- 1,941,849	1,618,983	2,715,413	2,715,413	2,715,413	2,715,413	2,715,413	2,715,413	2,715,413	2,715,413	2,715,413	2,715,413
TOTAL NET INCREMENTAL BENEFITS			**- 2,210,030**	**- 2,626,816**	**- 2,713,876**	**3,540,927**	**8,457,763**	**9,097,209**	**9,069,943**	**8,840,426**	**8,984,125**	**9,431,552**	**9,494,827**	**9,135,977**	**9,288,762**	**9,747,118**
PROJECT COSTS (not included in the models)		**3,241,304**	**3,971,790**	**5,722,954**	**5,527,905**	**2,981,703**	**1,458,880**									
1. Agricultural Production and Market Access		995,802	1,147,065	1,579,293	1,714,016	1,276,539	326,192									
2. Climate Resilient Rural Infrastructure		326,540	1,703,492	3,068,103	2,718,234	638,741	-									
3. Project Management Unit		1,918,962	1,121,233	1,075,558	1,095,655	1,066,423	1,132,688									
PROJECT TOTAL FUND FLOW		**- 3,241,304**	**- 6,181,821**	**- 8,349,770**	**- 8,241,781**	**559,224**	**6,998,884**	**9,097,209**	**9,069,943**	**8,840,426**	**8,984,125**	**9,431,552**	**9,494,827**	**9,135,977**	**9,288,762**	**9,747,118**

IRR=	**18.97%**	**VAN 6 %**	**29,032,661.69**

Economic Viability of the Project

52. The Project was economically viable, since the economic analysis indicators that were estimated are positive: (i) the IRR is 18.97%; and (ii) the NPV discounted at 6% is BZ$ 29 million.

Project Risks and Sensitivity to Scenario Changes

53. A sensitivity analysis was done of the models to estimate their performance in relation to: (i) a 10% reduction in product prices; (ii) a reduction in product prices of 10% and an increase in input prices of 10%; (iii) delays in the proposed improvements in production.

54. The results of these simulations are shown in Table 8 below. It shows that the Programme's cash flow indicators (NPV, IRR) show a low variability in relation to a decrease in the prices of the products. Although the indicators decline with a decline in product prices, they are still positive. By increasing product prices (10%) and increasing production costs (10%) simultaneously, there is practically no change in the returns of the Programme. This is due to the fact that in most of the models a reduction in production costs is obtained by greater efficiency through the adoption of better agricultural and climatic-resilient practices, which not only makes the family production system much more stable, but also increases the competitiveness of the products in the market due to lower production costs, higher quality and a greater reliability of supplies.

Table 6: Sensitivity Analysis (BZ$)

10% Output price reduction	NPV (6%) = BZ$ 22.226.045	IRR = 16.2%
10% reduction in output prices & 10% increase in costs	NPV (6%) = BZ$ 21.974.170	IRR = 16.09%
Late start works and production projects (1 year later)	NPV (6%) = BZ$ 22.180.192	IRR = 15.8%

55. In terms of institutional capacities for Programme implementation, risks may be considered low because it is a country with prior experience in the implementation of rural development projects, and the Programme's actions include various training interventions that will increase the capacities of a range of individuals and institutions - public sector institutions and field technicians, and the development of water management associations. The activities that contribute to organizational strengthening and the development of linkages between producers and the local markets also provide some protection against production and market risks. Finally, the multiple actions in CSA and the overall strategy of developing a level of resilience significantly higher than what currently exists will generate production and marketing systems that will be more stable and adapted to changing climatic conditions and the market dynamics.

56. The budgetary contributions of the GoB needed per year for the execution of the Programme are not significant. The required local contributions increase progressively until year 5 and in the sixth year they fall considerably.

57. The technologies proposed include techniques and practices that are proven and available to family farmers, so that there are no risks due to limitations to access them. In addition, strong technical assistance will be provided which is intended precisely to ensure the success of implementation and optimizing benefits for the beneficiaries. Potential beneficiaries expressed on several occasions during the design mission their commitment and interest to participate in the Programme and to make the expected counterpart contributions.

58. Regarding environmental risks, although all the Programme's activities will be supervised and overseen by the Climate specialists and other technical personnel of the PMU and stakeholder institutions, an agricultural information system for climate conditions will be stablished, it will be necessary to maintain permanent monitoring in the use of water, the correct use of agrochemicals that are applied for good agricultural practices, and the effective realization of investments that increase the adaptation of the farms to the current climatic conditions.

Sustainability

59. The Programme is constructed on a solid foundation to provide sustainability as its objectives are implicitly based on the premise of increasing production resilience and the sustained increase in family income. This is validated both in the expected results from the sustainable production models, as well as in the support activities for which resources are assigned. The cash flows of the different production models presented indicate positive viability even with variations in yields and prices of the outputs.

60. In the onion and pineapple production models, the net present value is still positive, although there is no change in performance and price with respect to the project situation. This is a clear demonstration of the increase of the resilience in production that is obtained from the realization of improvements in drainage and the reduction of post-harvest losses as a result of storage infrastructure.

61. In the case of carrots and cabbage, even with a decline in 40% of the yield the model continues to be economically viable, indicating the positive impact on resilience in production with the investments. If there are no changes in the output price, with the improvement in product quality and a longer supply period, the IRR exceeds 30% in both models. For tomatoes, the incorporation of drip irrigation remains profitable even without changes in yield (a very unlikely situation), and in the hypothetical case where the market does not respond with any increase in the price, the IRR would be 48%. Investment in greenhouses remains economically viable even with a 30% drop in the expected return, or unchanged market price. In the production model for hot peppers, the economic viability remains positive even with a decline in yield up to 30% and the market price remains constant. Finally, the honey production model maintains its economic viability even with a decline in yield or price of up to 40%.

62. Given the Programme's overall cash flow (total cost and expected benefits), the NPV and IRR indicators were estimated when there is a possible decrease in the gross income obtained from the sale of the products in the proposed models and an increase in their production costs. The following results were obtained:

- In view of a simultaneous change in the decrease in revenues and increase in production costs of 41%, the NPV is equal to 0.
- With a 42.6% price decrease and without any change in production costs, the NPV is 0.
- With an increase of 1150% in the production costs and no change in gross income, the NPV is 0.

63. The above results make it possible to identify, among others, two determinants for the success of the Programme: (i) that producers obtain higher prices for their products that are expected from the investments in their production due to quality improvement and a longer supply period; and (ii) that the technologies adopted will allow them to achieve the expected increases in yields.

Annex1

60 FARMERS INCORPORATING DRAINAGE, AND DRIP IRRIG, STORAGE

ONION	PY 1	PY 2	PY 3	PY 4	PY 5	PY 6	PY 7	PY 8	PY 9	PY 10	PY 1	PY 2	PY 3	PY 4	PY 5	PY 6	PY 7	PY 8	PY 9	PY 10
	WITHOUT PROJECT										WITH PROJECT									
Progress of Yield											30%	60%	90%	100%	100%	100%	100%	100%	100%	100%
Loose production floods		50%				50%				50%		20%				20%				20%
Loose production for temporary excess supply	30%		30%	30%	30%		30%	30%	30%		15%									
Soil annalysis - reduce fertilizants											40%	50%	60%	60%	60%	60%	60%	60%	60%	60%
Loose price - coordinate import licences BMDC	5%		5%	5%	5%		5%	5%	5%		5%									
Output																				
Yield pounds/acre	17,000	8,500	17,000	17,000	17,000	8,500	17,000	17,000	17,000	8,500	19,400	17,440	24,200	25,000	25,000	20,000	25,000	25,000	25,000	20,000
Producers price $/pound	0.57	0.60	0.57	0.57	0.57	0.60	0.57	0.57	0.57	0.60	0.60	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63
Gross income	6,783	5,100	6,783	6,783	6,783	5,100	6,783	6,783	6,783	5,100	9,869	10,987	15,246	15,750	15,750	12,600	15,750	15,750	15,750	12,600
Inputs																				
Land preparation	$220	$220	$220	$220	$220	$220	$220	$220	$220	$220	$220	$220	$220	$220	$220	$220	$220	$220	$220	$220
Labor	$1,330	$1,280	$1,330	$1,330	$1,330	$1,280	$1,330	$1,330	$1,330	$1,280	$1,293	$1,273	$1,293	$1,293	$1,293	$1,273	$1,293	$1,293	$1,293	$1,273
Storage management											$514	$514	$514	$514	$514	$514	$514	$514	$514	$514
Inputs	$1,225	$1,013	$1,225	$1,225	$1,225	$1,013	$1,225	$1,225	$1,225	$1,013	$1,225	$1,225	$1,225	$1,225	$1,225	$1,140	$1,225	$1,225	$1,225	$1,140
Insecticide	$42	$42	$42	$42	$42	$42	$42	$42	$42	$42	$42	$42	$42	$42	$42	$42	$42	$42	$42	$42
Fungicide	$582	$582	$582	$582	$582	$582	$582	$582	$582	$582	$582	$582	$582	$582	$582	$582	$582	$582	$582	$582
Fertilizer	$528	$528	$528	$528	$528	$528	$528	$528	$528	$528	$737	$614	$491	$491	$491	$491	$491	$491	$491	$491
Post-harvest	$250	$125	$250	$250	$250	$125	$250	$250	$250	$125	$250	$250	$250	$250	$250	$200	$250	$250	$250	$200
Irrigation	$635	$635	$635	$635	$635	$635	$635	$635	$635	$635	$635	$635	$635	$635	$635	$635	$635	$635	$635	$635
Soil annalysis											$100	$100	$100	$100	$100	$100	$100	$100	$100	$100
INVESTMENT																				
Storage											5,883									
Drainage											1,200				600				600	
Drip											3,750		1,000				1,000			
Technical asistance for implementation											2,900									
NET INCOME	1,971	676	1,971	1,971	1,971	676	1,971	1,971	1,971	676	-9,461	5,532	8,894	10,398	9,798	7,403	9,398	10,398	9,798	7,403
INCREMENTAL INCOME											-11,432	4,857	6,923	8,427	7,827	6,728	7,427	8,427	7,827	6,728

VPN	10%	29,581
IRR		56%

40 FARMERS INCORPORATING DRAINAGE, AND STORAGE (ALREADY HAVE DRIP IRRIGATION)

ONION	PY 1	PY 2	PY 3	PY 4	PY 5	PY 6	PY 7	PY 8	PY 9	PY 10	PY 1	PY 2	PY 3	PY 4	PY 5	PY 6	PY 7	PY 8	PY 9	PY 10
	WITHOUT PROJECT										WITH PROJECT									
Loose production floods		50%				50%				50%		20%				20%				20%
Loose production for temporary excess supply	30%		30%	30%	30%		30%	30%	30%		15%									
Soil annalysis - reduce fertilizants											40%	50%	60%	60%	60%	60%	60%	60%	60%	60%
Loose price - coordinate import licences BMDC	5%		5%	5%	5%		5%	5%	5%		5%									
Output																				
Yield pounds/acre	25,000	12,500	25,000	25,000	25,000	12,500	25,000	25,000	25,000	12,500	25,000	20,000	25,000	25,000	25,000	20,000	25,000	25,000	25,000	20,000
Producers price $/pound	0.60	0.63	0.60	0.60	0.60	0.63	0.60	0.60	0.60	0.63	0.60	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63
Gross income	10,474	7,875	10,474	10,474	10,474	7,875	10,474	10,474	10,474	7,875	12,718	12,600	15,750	15,750	15,750	12,600	15,750	15,750	15,750	12,600
Inputs																				
Land preparation	220	220	220	220	220	220	220	220	220	220	220	220	220	220	220	220	220	220	220	220
Labor	1,293	1,243	1,293	1,293	1,293	1,243	1,293	1,293	1,293	1,243	1,293	1,273	1,293	1,293	1,293	1,273	1,293	1,293	1,293	1,273
Storage management											514	514	514	514	514	514	514	514	514	514
Inputs	1,225	1,013	1,225	1,225	1,225	1,013	1,225	1,225	1,225	1,013	1,225	1,225	1,225	1,225	1,225	1,140	1,225	1,225	1,225	1,140
Insecticide	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42
Fungicide	582	582	582	582	582	582	582	582	582	582	582	582	582	582	582	582	582	582	582	582
Fertilizer	1,228	1,228	1,228	1,228	1,228	1,228	1,228	1,228	1,228	1,228	737	614	491	491	491	491	491	491	491	491
Post-harvest	250	125	250	250	250	125	250	250	250	125	250	250	250	250	250	200	250	250	250	200
Irrigation	635	635	635	635	635	635	635	635	635	635	635	635	635	635	635	635	635	635	635	635
Soil annalysis											100	100	100	100	100	100	100	100	100	100
INVESTMENT																				
Storage											5,883									
Drainage											1,200				600				600	
Drip			1,000				1,000						1,000				1,000			
Technical asistance for implementation											876									
NET INCOME	4,999	2,788	4,999	4,999	4,999	2,788	4,999	4,999	4,999	2,788	-838	7,145	9,398	10,398	9,798	7,403	9,398	10,398	9,798	7,403
INCREMENTAL INCOME											-5,838	4,357	4,399	5,399	4,799	4,615	4,399	5,399	4,799	4,615

VPN	10%	21,407
IRR		78%

160 FARMERS FROM SURFACE TO DRIP IRRIGATION 1 ACRE

TOMATO/SWEET PEPPER	PY 1	PY 2	PY 3	PY 4	PY 5	PY 6	PY 7	PY 8	PY 9	PY 10	PY 1	PY 2	PY 3	PY 4	PY 5	PY 6	PY 7	PY 8	PY 9	PY 10
	WITHOUT PROJECT										WITH PROJECT									
Loose production hurricanes		80%	30%			80%	30%			80%		70%	10%			60%	10%			60%
Progress of Yield											50%	75%	100%	100%	100%	100%	100%	100%	100%	100%
excess supply	10%			10%	10%			10%	10%		10%		5%	5%						
Output																				
Yield pounds/acre	16,800	3,360	11,760	16,800	16,800	3,360	11,760	16,800	16,800	3,360	20,400	6,660	21,600	24,000	24,000	9,600	21,600	24,000	24,000	9,600
Producers price $/pound	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Gross income	11,340	2,520	8,820	11,340	11,340	2,520	8,820	11,340	11,340	2,520	15,606	5,661	17,442	19,380	20,400	8,160	18,360	20,400	20,400	8,160
Inputs																				
Land Preparation:	$180	$180	$180	$180	$180	$180	$180	$180	$180	$180	$180	$180	$180	$180	$180	$180	$180	$180	$180	$180
Inputs	$3,484	$3,484	$3,484	$3,484	$3,484	$3,484	$3,484	$3,484	$3,484	$3,484	$3,484	$3,484	$3,484	$3,484	$3,484	$3,484	$3,484	$3,484	$3,484	$3,484
Fertilizer	$463	$463	$463	$463	$463	$463	$463	$463	$463	$463	$648	$648	$648	$648	$648	$648	$648	$648	$648	$648
Labor	$1,500	$1,500	$1,500	$1,500	$1,500	$1,500	$1,500	$1,500	$1,500	$1,500	$1,260	$1,260	$1,260	$1,260	$1,260	$1,260	$1,260	$1,260	$1,260	$1,260
Storage management											$753	$753	$753	$753	$753	$753	$753	$753	$753	$753
Post harvest	$300	$300	$300	$300	$300	$300	$300	$300	$300	$300	$300	$300	$300	$300	$300	$300	$300	$300	$300	$300
Irrigation	$635	$635	$635	$635	$635	$635	$635	$635	$635	$635	$635	$635	$635	$635	$635	$635	$635	$635	$635	$635
Soil annalysis											$100		$100		$100		$100		$100	
INVESTMENT																				
Irrigation sistem											3,750		1,000				1,000			
Storage											3,230		646				646			
CSA											1,314									
Technical asistance for implementation											2,276									
NET INCOME	4,778	-4,042	2,258	4,778	4,778	-4,042	2,258	4,778	4,778	-4,042	-2,324	-1,599	8,436	12,120	13,040	900	9,354	13,140	13,040	900
INCREMENTAL INCOME											-7,102	2,443	6,178	7,342	8,262	4,942	7,096	8,362	8,262	4,942

VPN	10%	28,700
IRR		70%

100 FARMERS FROM DRIP IRRIGATION LAND TO DRIP IRRIGATION GREEN HOUSE (4.300 pies 2 - 53x83 pies - 750 pl)

TOMATO/SWEET PEPPER	PY 1	PY 2	PY 3	PY 4	PY 5	PY 6	PY 7	PY 8	PY 9	PY 10	PY 1	PY 2	PY 3	PY 4	PY 5	PY 6	PY 7	PY 8	PY 9	PY 10
	WITHOUT PROJECT										WITH PROJECT									
Loose production hurricanes		80%	30%			80%	30%			80%		40%				30%				30%
Progress of Yield											80%	90%	100%	100%	100%	100%	100%	100%	100%	100%
excess supply	10%			10%	10%			10%	10%											
Output																				
Yield pounds/acre	3,960	792	2,772	3,960	3,960	792	2,772	3,960	3,960	792	9,000	6,075	11,250	11,250	11,250	7,875	11,250	11,250	11,250	7,875
Producers price $/pound	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	1.08	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20
Gross income	2,851	634	2,218	2,851	2,851	634	2,218	2,851	2,851	634	9,720	7,290	13,500	13,500	13,500	9,450	13,500	13,500	13,500	9,450
Inputs																				
Land Preparation:	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90
Inputs	270	270	270	270	270	270	270	270	270	270	308	308	308	308	308	308	308	308	308	308
Insecticides	117	117	117	117	117	117	117	117	117	117	58	58	58	58	58	58	58	58	58	58
Fungicida	24	24	24	24	24	24	24	24	24	24	7	7	7	7	7	7	7	7	7	7
Herbicide	19	19	19	19	19	19	19	19	19	19										
Fertilizer	65	65	65	65	65	65	65	65	65	65	24	24	24	24	24	24	24	24	24	24
Labor	252	252	252	252	252	252	252	252	252	252	216	216	259	259	259	259	259	259	259	259
Storage management											753	753	753	753	753	753	753	753	753	753
Post harvest	150	150	150	150	150	150	150	150	150	150	300	300	300	300	300	300	300	300	300	300
Irrigation	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64
Soil annalysis											50		50		50		50		50	
INVESTMENT																				
Green house											21,000									
Drip T tape			100				100						100				100			
Storage											3,230		646				646			
CSA											1,314									
Technical asistance for											3,752									
NET INCOME	1,801	-417	1,168	1,801	1,801	-417	1,168	1,801	1,801	-417	-18,216	5,470	11,587	11,637	11,587	7,587	11,587	11,637	11,587	7,587
INCREMENTAL INCOME											-20,017	5,887	10,419	9,836	9,786	8,003	10,419	9,836	9,786	8,003

VPN	10%	31,877
IRR		41%

100 FARMERS FROM SURFACE TO DRIP IRRIGATION 1 ACRE

CABBAGE	PY 1	PY 2	PY 3	PY 4	PY 5	PY 6	PY 7	PY 8	PY 9	PY 10	PY 1	PY 2	PY 3	PY 4	PY 5	PY 6	PY 7	PY 8	PY 9	PY 10
	WITHOUT PROJECT										WITH PROJECT									
Loose production hurricanes		80%	30%			80%	30%			80%		60%	5%			60%	5%			60%
Progress of Yield											80%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Loose production for temporary excess supply	20%			20%	20%			20%	20%		10%			5%	5%					
Output																				
Yield pounds/acre	15,000	3,000	10,500	15,000	15,000	3,000	10,500	15,000	15,000	3,000	16,000	8,000	19,000	20,000	20,000	8,000	19,000	20,000	20,000	8,000
Producers price $/pound	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65
Gross income	6,000	1,500	5,250	6,000	6,000	1,500	5,250	6,000	6,000	1,500	7,200	5,200	12,350	12,350	12,350	5,200	12,350	13,000	13,000	5,200
Inputs																				
Land Preparation	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180
Inputs	860	860	860	860	860	860	860	860	860	860	1,080	1,080	1,080	1,080	1,080	1,080	1,080	1,080	1,080	1,080
Insecticide	410	410	410	410	410	410	410	410	410	410	195	195	195	195	195	195	195	195	195	195
Fungicide	268	268	268	268	268	268	268	268	268	268	187	187	187	187	187	187	187	187	187	187
Hebicide	125	125	125	125	125	125	125	125	125	125	63	63	63	63	63	63	63	63	63	63
Fertilizer	607	607	607	607	607	607	607	607	607	607	252	252	252	252	252	252	252	252	252	252
Labour	712	712	712	712	712	712	712	712	712	712	532	532	532	532	532	532	532	532	532	532
Irrigation	120	120	120	120	120	120	120	120	120	120	192	192	192	192	192	192	192	192	192	192
Storage management											753	753	753	753	753	753	753	753	753	753
Soil annalysis											100	100	100	100	100	100	100	100	100	100
INVESTMENT																				
Irrigation sistem											3,750		1,000				1,000			
Storage											3,230		646				646			
CSA											1,314									
Technical asistance for implementation											2,276									
NET INCOME	2,718	-1,782	1,968	2,718	2,718	-1,782	1,968	2,718	2,718	-1,782	-6,903	1,667	7,171	8,817	8,817	1,667	7,171	9,467	9,467	1,667
INCREMENTAL INCOME											-9,621	3,449	5,203	6,099	6,099	3,449	5,203	6,749	6,749	3,449

VPN	10%	19,714
IRR		48%

50 FARMERS FROM NO IRRIGATED TO DRIP IRRIGATION 1 ACRE

CARROTS	PY 1	PY 2	PY 3	PY 4	PY 5	PY 6	PY 7	PY 8	PY 9	PY 10	PY 1	PY 2	PY 3	PY 4	PY 5	PY 6	PY 7	PY 8	PY 9	PY 10
	WITHOUT PROJECT										WITH PROJECT									
Loose production floods		50%				50%				50%		30%				20%				20%
Progress of Yield											80%	95%	100%	100%	100%	100%	100%	100%	100%	100%
Loose production for temporary excess supply	15%			15%	15%			15%	15%		10%			5%	5%					
Output																				
Yield pounds/acre	10,000	5,000	10,000	10,000	10,000	5,000	10,000	10,000	10,000	5,000	16,000	13,300	20,000	20,000	20,000	16,000	20,000	20,000	20,000	16,000
Producers price $/pound	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.60	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70
Gross income	4,250	2,500	5,000	4,250	4,250	2,500	5,000	4,250	4,250	2,500	8,640	9,310	14,000	13,300	13,300	11,200	14,000	14,000	14,000	11,200
Inputs																				
Land Preparation	180	180	180	180	180	180	180	180	180	180	325	325	325	325	325	325	325	325	325	325
Sowing	308	308	308	308	308	308	308	308	308	308	524	524	524	524	524	524	524	524	524	524
Fertilizer	400	400	400	400	400	400	400	400	400	400	316	316	316	316	316	316	316	316	316	316
Weed Control	1,024	1,024	1,024	1,024	1,024	1,024	1,024	1,024	1,024	1,024	384	384	384	384	384	384	384	384	384	384
Pest and Disease Control	587	587	587	587	587	587	587	587	587	587	386	386	386	386	386	386	386	386	386	386
Harvesting	256	256	256	256	256	256	256	256	256	256	480	480	480	480	480	480	480	480	480	480
Irrigation											280	280	280	280	280	280	280	280	280	280
Storage management											753	753	753	753	753	753	753	753	753	753
Soil annalysis											100	100	100	100	100	100	100	100	100	100
INVESTMENT																				
Irrigation sistem											3,750		1,000				1,000			
Storage											3,230		646				646			
CSA											1,314									
Drainage											1,200				600				600	
Technical asistance for implementation											2,693									
NET INCOME	1,495	-255	2,245	1,495	1,495	-255	2,245	1,495	1,495	-255	-5,894	5,762	8,806	9,752	9,752	7,652	8,806	10,452	10,452	7,652
INCREMENTAL INCOME											-7,389	6,017	6,561	8,257	8,257	7,907	6,561	8,957	8,957	7,907

VPN	10%	36,088
IRR		91%

150 FARMERS FROM SUGARLOAF TO MD2 INCORPORATING DRAINAGE AND STORAGE

PINEAPPLE	PY 1	PY 2	PY 3	PY 4	PY 5	PY 6	PY 7	PY 8	PY 9	PY 10	PY 1	PY 2	PY 3	PY 4	PY 5	PY 6	PY 7	PY 8	PY 9	PY 10
	WITHOUT PROJECT										WITH PROJECT									
Perdidas por falta de drenaje	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	10%									
Perdidas por inundaciones		50%				50%				50%		30%				30%				20%
Output																				
Yield pounds/acre	38,400	19,200	38,400	38,400	38,400	19,200	38,400	38,400	38,400	19,200	72,000	56,000	80,000	80,000	80,000	56,000	80,000	80,000	80,000	64,000
Producers price $/pound	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22
Gross income	7,930	3,965	7,930	7,930	7,930	3,965	7,930	7,930	7,930	3,965	15,696	12,208	17,440	17,440	17,440	12,208	17,440	17,440	17,440	13,952
Inputs																				
Land preparation	225	225	225	225	225	225	225	225	225	225	225	225	225	225	225	225	225	225	225	225
Inputs	120		120		120		120		120		620		620		620		620		620	
Fertilizers	746	746	746	746	746	746	746	746	746	746	366	366	366	366	366	366	366	366	366	366
Pest and Disease Control	85	85	85	85	85	85	85	85	85	85	261	261	261	261	261	261	261	261	261	261
Labor	2,490	2,490	2,490	2,490	2,490	2,490	2,490	2,490	2,490	2,490	2,590	2,590	2,590	2,590	2,590	2,590	2,590	2,590	2,590	2,590
Soil annalysis											100	100	100	100	100	100	100	100	100	100
INVESTMENT																				
Drenaje											1,200			1,200			1,200			1,200
CSA											1,314									
Storage											3,661				1,830					
Technical asistance for implementation											702									
NET INCOME	4,264	419	4,264	4,384	4,264	419	4,264	4,384	4,264	419	4,658	8,667	13,279	12,699	11,448	8,667	12,079	13,899	13,279	9,211
INCREMENTAL INCOME											394	8,248	9,015	8,315	7,185	8,248	7,815	9,515	9,015	8,792

VPN	10%	48,846
IRR		

50 FARMERS FROM SURFACE TO DRIP IRRIGATION 1 ACRE INCORPORATING STORAGE

HOT PEPPERS	PY 1	PY 2	PY 3	PY 4	PY 5	PY 6	PY 7	PY 8	PY 9	PY 10	PY 1	PY 2	PY 3	PY 4	PY 5	PY 6	PY 7	PY 8	PY 9	PY 10
	WITHOUT PROJECT										WITH PROJECT									
Loose production hurricanes		80%	30%			80%	30%			80%		70%	10%			60%	10%			60%
Progress of Yield											80%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Loose production for temporary excess supply	15%			15%	15%			15%	15%		10%		5%	5%						
Output																				
Yield pounds/acre	10,500	2,100	7,350	10,500	10,500	2,100	7,350	10,500	10,500	2,100	15,000	4,500	13,500	15,000	15,000	6,000	13,500	15,000	15,000	6,000
Producers price $/pound	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10
Gross income	8,925	2,100	7,350	8,925	8,925	2,100	7,350	8,925	8,925	2,100	14,850	4,950	14,108	15,675	16,500	6,600	14,850	16,500	16,500	6,600
Inputs																				
Land Preparation	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180
Inputs	650	650	650	650	650	650	650	650	650	650	650	650	650	650	650	650	650	650	650	650
Fertilizer	461	461	461	461	461	461	461	461	461	461	344	344	344	344	344	344	344	344	344	344
Fungicide	502	502	502	502	502	502	502	502	502	502	416	416	416	416	416	416	416	416	416	416
Storage management											753	753	753	753	753	753	753	753	753	753
Insecticide	631	631	631	631	631	631	631	631	631	631	631	631	631	631	631	631	631	631	631	631
Herbicide	132	132	132	132	132	132	132	132	132	132	96	96	96	96	96	96	96	96	96	96
Labour	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,380	1,380	1,380	1,380	1,380	1,380	1,380	1,380	1,380	1,380
Irrigation	360	360	360	360	360	360	360	360	360	360	360	360	360	360	360	360	360	360	360	360
Soil annalysis											100	100	100	100	100	100	100	100	100	100
INVESTMENT																				
Irrigation sistem											3,750		1,000				1,000			
Storage											3,230		646				646			
CSA											1,314									
Technical asistance for implementation											2,276									
NET INCOME	4,809	-2,016	3,234	4,809	4,809	-2,016	3,234	4,809	4,809	-2,016	-629	41	7,552	10,766	11,591	1,691	8,295	11,591	11,591	1,691
INCREMENTAL INCOME											-5,438	2,057	4,318	5,957	6,782	3,707	5,061	6,782	6,782	3,707

VPN	10%	22,481
IRR		71%

19 GROUPS OF 76 HOUSEHOLDS, 4 HOUSEHOLDS IN EACH GROUP

HONEY	PY 0	PY 1	PY 2	PY 3	PY 4	PY 5	PY 6	PY 7	PY 8	PY 9	PY 10
Honey production (pounds)		2,500	3,600	4,000	4,000	4,000	4,000	4,000	4,000	4,000	4,000
Price $/pound		3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6
Gross income		9,000	12,960	14,400	14,400	14,400	14,400	14,400	14,400	14,400	14,400
Inputs		2,692	2,692	2,692	2,692	2,692	2,692	2,692	2,692	2,692	2,692
Labour		930	930	930	930	930	930	930	930	930	930
INVESTMENT											
Equipment and materials	8,000										
CSA	5,255										
Technical asistance for impler	8,040										
Storage	7,579										
NET INCOME	- 28,875	5,378	9,338	10,778	10,778	10,778	10,778	10,778	10,778	10,778	10,778
INCREMENTAL INCOME	- 28,875	5,378	9,338	10,778	10,778	10,778	10,778	10,778	10,778	10,778	10,778

VPN	10%	31,252
IRR		29%

510 HH WITH IMPROVEMENT ROADS											
ROADS BENEFITS		PY 1	PY 2	PY 3	PY 4	PY 5	PY 6	PY 7	PY 8	PY 9	PY 10
Miles construct			10	15	20	5					
Beneficiary households				102	255	459	510	510	510	510	510
Family transfers Miles	576			58.752	146.880	264.384	293.760	293.760	293.760	293.760	293.760
Reduction of transport costs families	20%			11.750	29.376	52.877	58.752	58.752	58.752	58.752	58.752
Trucks transfers Miles	20.400			4.080	10.200	18.360	20.400	20.400	20.400	20.400	20.400
Reduction of transport costs trucks	20%			2.448	6.120	11.016	12.240	12.240	12.240	12.240	12.240
Truck Transport cost/mile	3										
Reduction losses 25% (tomato and sweet pepper). Pounds	7.500.000			375.000	937.500	1.687.500	1.875.000	1.875.000	1.875.000	1.875.000	1.875.000
Reduction losses 10% (other vegetables). Pounds	8.700.383			174.008	435.019	783.034	870.038	870.038	870.038	870.038	870.038
tomato and sweet pepper $/lb	1			375.000	937.500	1.687.500	1.875.000	1.875.000	1.875.000	1.875.000	1.875.000
other vegetables $/lb	0,47			81.784	204.459	368.026	408.918	408.918	408.918	408.918	408.918
Investment on road improvement			1.600.000	2.400.000	3.200.000	800.000					
Net cash flow			- 1.600.000	- 1.929.018	- 2.022.545	1.319.419	2.354.910	2.354.910	2.354.910	2.354.910	2.354.910
VPN		10%	$ 2.430.073								
IRR			21%								

Appendix 11: Draft programme implementation manual

Be-Resilient

I. Introduction

A. Purpose and contents of the manual
B. Intended use and users
C. Scope and limitations
D. Documents referred

II. Strategic Framework

A. Programme location
B. Programme Objectives

1. Description of the programme goal, objectives, outcomes and outputs (based on the LogFrame)

C. Programme strategy and approach

2. Description of the strategy and approach to small farmers' constraints, vulnerability to climate and economic shocks, rural livelihood and gender equality. An overview of gender equaity constraints and the affirmative actions to be implemented to overcome these constraints.

D. Programme area, target group and direct beneficiaries

3. A detailed description of the priority areas, target group and sub target groups, as well as the direct beneficiaries (who and how many, per key programme intervention). Targeting criteria; how to define and identify the programme target group and gender equality.

E. Programe Components, Outcomes and the Matching Grant Fund

4. Description of both components and their outcomes

F. Sustainability

III. Legal Framework

5. Description of the agreement between the Government of Belize and IFAD for the financing and execution of the Programme

IV. Institutional Framework

A. Programme structure and organization
B. Implementing agency
C. Programme Oversight Committee (POC)
Composition and role of the POC
D. Programme Management Unit (PMU)
E. Composition and role of the PMU
F. Planning

6. Description of planning the programme for execution (annual work programme, budget, approval process, etc.)

G. Implementation arrangements

7. Detail of activities to be carried out by the PMU, specifying the role of each PMU staff

Component 1
To be provided

8. Component 2: Climate Resilient Rural Infrastructure (CRRIA)

9. (to be improved/completed in the further course of programme design and finalised during the start-up workshop)

10. The component will award competitive funding for investments in broad range of public (for common use) infrastructure that will reduce physical vulnerability and anticipated impacts of climate variability and enable and enhance private sector investments and activities in programme priority areas.

11. The main types of infrastructure that will be eligible under the CRRIA component will include public infrastructure of common use such as local or feeder roads including required ancillary structures, and small-scale irrigation and drainage systems. The CRRIA component will consist of three sub-components:

12. Sub-component 2.1: Investment in Rural Roads Improvements (RRI) will be directed in rural roads and ancillary structures the most vulnerable to the climate variability and that complement and strengthen the project objectives under the component 1. The roads to be improved will comprise mainly of last mileage of local or uncategorised feeder roads in rural areas. Eligible investments will include also road ancillaries such as small bridges, drainage facilities and erosion protection works to ensure climate resilience of the rehabilitated roads.

13. Sub-component 2.2: Investment in Small-scale Irrigation and Drainage (SSID) in the prioritised area will support villages/communities based on climate vulnerability and support the objectives of component 1. The investments will focus on small-scale irrigation and drainage systems including intake structures (river diversion, pumping station, rain harvesting ponds), main and secondary distribution network (open channels or polyethylene pipelines), drainage network and flood protection structures. On-farm irrigation/drainage systems for connecting to the main or secondary network (drip, sprinkler, gravity ditches or field open drains) will be provided by beneficiaries either from their own resources or through the matching grant/investment fund facilities under the component 1

14. Under this sub-component provisions are also made for institutional development in small-scale irrigation and drainage systems management, operation and maintenance (MOM). This will include international technical assistance in establishment of Water Users' Associations for MOM of small-scale public irrigation and drainage systems to be constructed in the framework of the CRRIA component including capacity building in irrigated agriculture, crop-water requirements, irrigation scheduling, operation and maintenance of irrigation and drainage networks, determination and application of irrigation/drainage service fee. Provisions are also made for procurement of hydro/agro meteorological stations and other equipment for efficient irrigation application as it would be identified in the course of programme implementation.

15. A programmatic approach will be adopted for the component where programme works will not be pre-identified before the start of the operation, but will be selected on a periodic (annual) basis on specified criteria and demand.

16. Implementation Arrangements

17. The implementation of the CRRIA component will be managed by a Project Management Unit (PMU) to be established under the Ministry of Economic Development (MED). The main tasks of the PMU will be: (i) conducting information campaign in the programme area villages; (ii) technical analysis of received proposals for public infrastructure investment; (iii) screening and selection of proposals to be funded under the CRRIA component; (iv) development of TORs for selected proposals design; (v) procurement, review and approval of engineering designs; (vi) procurement and supervision of civil works; (vii) support in institutional development for sustainable management, operation and maintenance of small/scale irrigation and drainage systems. The staff involved in CRRIA component implementation will consist of a Rural Infrastructure Engineer and an Institutional Development Specialist. Coordination of the CRRIA component activities will be the responsibility of the PMU Rural Infrastructure Engineer.

18. The main tasks of the PMU will be:

- To publicize the availability of the competitive funding for infrastructure rehabilitation support.
- To undertake technical and climate vulnerability analysis of investment proposals.
- Based on technical and climate vulnerability analysis, evaluate and rank proposed applications in accordance with the guidelines and mechanisms described.

- To submit recommendations for infrastructure funding award with required supporting documents for POC and IFAD approval.
- To develop TORs for development of engineering designs for approved proposals.
- To conduct procurement of services for development of engineering designs and submit evaluation reports to IFAD for review and written no-objection.
- To conduct independent technical review and environmental assessment of design solutions and approve the designs.
- To conduct procurement of civil works and submit evaluation reports to IFAD for review and written no-objection.
- To monitor and carry out supervision of civil works implementation of investment projects by contractors.
- Development of TORs for International Technical Assistance, procurement of an individual international consultant for support in establishment of Water Users' Associations (WUAs) and capacity building for management, operations and maintenance of small-scale irrigation and drainage systems to be constructed in the framework of the programme.
- To conduct training and capacity building of relevant staff from the Extension Unit of the Ministry of Agriculture and WUAs.

19. Development of engineering designs, independent technical review, construction and daily supervision of the construction works will be carried out by the PMU through the private sector consultants and contractors selected on a competitive basis.

20. Environmental Assessment of the proposed design solutions, as per the applicable laws of Belize, will be carried out by the Environment Department of the Ministry of Agriculture, Fisheries, Forestry, Environment and Sustainable Development (MOA). In addition, the MOA will undertake the operations and maintenance of irrigation and drainage systems through the Water Users' Associations and these will be financed through the Irrigation Service Fee to be developed and applied. The Ministry of Works will undertake the operations and maintenance of the roads over the life of the project and these will be financed from the state budget.

21. Detailed Selection Procedures

22. Information and Awareness Campaign. The information and awareness campaign will be undertaken by the PMU staff in their respective area of responsibilities through workshops organized within three months after the loan effectiveness, and will include village authorities, rural entrepreneurs, agro-processors, producer and village cooperatives and associations, small and medium-size farmers, MOA extension staff. An estimated 6 information workshops will be conducted, one for each programme priority area. The objective of these workshops will be to sensitize rural communities about the component, its objectives and eligibility criteria, and application and selection procedure.

23. Application. Request for funding from the CRRIA component will come from village authorities based on thorough consultation with farmers' interest groups, formal producers' associations and cooperatives, informal clusters, and local entrepreneurs/businesses. The application will be done in writing and should consist of required information and data for PMU decision making. Sample application forms are provided in the Annex 1.

24. All applications will go through three steps selection process of: (i) pre-qualification; (ii) screening and ranking; and (iii) final selection. The three steps are described below.

25. Pre-qualification

26. The first step will consist of a desk review of the applications submitted to the PMU. It will be carried out by PMU Rural Infrastructure Engineer shortly after the set deadline for submission of applications for infrastructure funding. The following applications will be refused without further consideration: (i) application is not provided in accordance with agreed format or missing key data; (ii) investment proposals are out of the programme priority area; (iii) infrastructure other than roads and irrigation/drainage systems. Following the desk review the PMU will conduct field visits to verify the accuracy of the provided data, link with the entire programme target group and activities supported

under the component 1. The field review will also assess the current condition of the proposed infrastructure and technical feasibility of the proposed investment. Only investment proposals estimated to less than of USD 0.25 million under the RRI sub-component and USD 0.5 million under the SSID sub-component will be considered at this stage for further processing.

27. Screening and Ranking

28. All the remaining pre-qualified investment proposals will be ranked, using the following system. The highest score for each of the evaluation criteria would be given a score of 1.00. The scores for evaluation criteria of the other proposals would then be computed on a sliding scale as a proportion of the highest score.

29. The ranking will consist of the calculation, for pre-qualified project proposals, of a synthetic indicator including: (i) climate change vulnerability and (ii) number of beneficiaries per USD 1,000 spent. The respective weights given to the two factors would be 0.5 each (i.e. the climate vulnerability and the number of beneficiaries would be the main determinants for investment's prioritization). The following formula will be used for calculation of the ranking value:

30. Ranking Value = 0.5×(A) + 0.5×(B)

A – Score for Vulnerability ranking

B – Score for number of beneficiaries per USD 1,000 spent

31. The proposals will then be ranked in descending order until all the available funds for a given year are allocated. Details for ranking procedure are provided in Annex 2.

32. The main responsibility for carrying out ranking of investments will rest with the PMU, based on the climate vulnerability ranking and data provided in the application and verified through the field visits and other relevant sources.

33. All the proposals for infrastructure investment funding award will be approved by the Project Steering Committees (POC). The PMU will review and evaluate applications and provide recommendation to the POC for funding award.

34. To ensure competitiveness the POC meetings will be held once a year (preferably at the end of the year), to review and approve proposals for the next year funding award. The number of infrastructure investments for each year will depend on the size of each investment and budget allocation for particular year. After approval by the POC a request for review and no-objection for each proposal will be sent to IFAD prior to final decision on funding award.

Final Selection

35. The PMU will submit the results of the selection process to the POC for final selection and inclusion in the Annual Work Plan and Budget (AWPB). The implementation of eligible investments in excess of annual budget will be postponed to the following AWPB.

36. Approval by IFAD of the selection of sub-projects will be required prior to the start of their implementation.

37. Allocated Budget per Project. No fixed pre-allocation of funds per village or priority area will be undertaken for infrastructure investments. The award of competitive funding will be on a voluntary, demand-driven basis for eligible investment proposals. Proposals targeting to an individual business or with limited possibilities for future multiplier effect will not be considered as eligible under the infrastructure component investment.

38. Environmental Guidelines. Given the small scale and mainly rehabilitative nature of the interventions, no significant negative environmental impacts are expected from the infrastructure investment. The main foreseeable environmental concerns are the ones associated with the management and disposal of excavated materials, conservation of borrow pits, and construction debris. However, all approved proposals/designs that are to be implemented through the CRRIA component funding will be required to meet requirements of the environmental legislation of Belize, to be verified by environmental assessment of each developed design. Submission of required

documents for Environmental Clearance will be under the responsibility of PMU and will be financed from the component budget.

39. Institutional Development for Irrigation and Drainage systems. Procurement of an International Consultant for support in irrigation and drainage institutional development will be initiated by the PMU within the first 6 months of programme effectiveness. Draft TORs, including schedule of activities for the proposed services will be developed in the further course of the progarmme design and finalized during the start-up.

40. Government Contribution Payment. Procedures for contribution payment by government will be discussed and agreed during the programme start up workshop and provided in the final version of the PIM.

41. Operation and Maintenance. The essential requirement for the sustainability and longevity of the infrastructure investment is operation and maintenance responsibility. The application must consist of an gardenendorsement letter from the relevant institution (Ministry of Works for roads and Ministry of Natural Resources/MOA for irrigation and drainage) that the rehabilitated/constructed infrastructure (fixed assets) will be revalued on their balance sheet and provisions will be made in the budget for maintenance of the infrastructure.

42. Procurement and Execution of Services, Goods and Works. The PMU will have the main responsibility for procurement of consultancy services for development of engineering designs and supervision of works; good and works under the component. Procurement of services, goods and works will be carried out in accordance with the IFAD Procurement Guidelines and Sample Bidding Documents for procurement of consultancy services (Quality and Cost Based Selection), goods (Local Shopping) and civil works (National Competitive Bidding). Details are provided in the procurement section of the PIM.

43. Supervision of Civil Works. Supervision of civil works will be carried out by design companies, who developed the respective design documents, under the direct guidance of the PMU Rural Infrastructure Engineer. The Rural Infrastructure Engineer and supervisor (design company) will verify bill of completed quantities, cumulative bill of quantities, and requests for interim payment, as well as completion certificate prepared by contractors. Representatives of relevant village councils and cooperatives/associations/clusters will be members of the acceptance committee issuing the Certificate of Final Completion on the works. *The detailed formats of works supervision as well as the TORs for consultancy services will be discussed and included in the PIM during the project start up workshop.*

44. Monitoring Indicators to be collected by PCU for CSRI Component. The PMU's M&E staff will be responsible for collecting information for the programme output indicators under the infrastructure component. *The M&E system will be set-up within two months after the project start-up with the IFAD support and incorporated into the PIM.* The indicators that will be required for the infrastructure component will include at least:

45. Output indicators (by gender, as applicable):

- Number of irrigation and drainage systems and roads outputs in terms of typology, acre and mi as applicable;
- Number of people benefiting from each type of infrastructure;
- Distribution of the above by villages and types of infrastructure.

46. Outcome and impact indicators (by gender, as applicable):

47. Rural Roads Improvements impact

- Reduction in climate vulnerability;
- Transportation time/costs reduced;
- Increase in producer (received prices) for production;
- Reduction in production losses;
- Operation and maintenance.

- Small-scale Irrigation and Drainage impact
- Assessment of impact on climate vulnerability;
- Price of water (before and after investment);
- Increase in productivity;
- Decrease in water losses;
- Acres of irrigated land;
- Crop structure;
- Yields and prices of agricultural production attributable to the investment;
- Volumes and prices of produce sold attributable to the investment;
- Increase in income for farmers attributable to the investment;
- Increase in farmers' assets attributable to the investment;
- Improvement in socioeconomic situation attributable to the investment;
- Operation and maintenance.

CRRIA component cost and funding sources.

48. The detailed cost of component activities and funding sources from the COSTTAB will be provided.

ANNEX 1

Draft Sample Application Forms For Infrastructure Investments

Rural Roads Improvements (RRI)

Date:

District:
Village(s):
Number of households:
Proposed investment in RRI infrastructure (include type, indicative width and length):
Rationale/expected direct benefits from investments (current condition, improved climate vulnerability, livestock and agricultural production, etc.):
Direct beneficiaries from the road (people/households):
Setup for road operation and maintenance and source of financing:
Complementarity with the B-Resilient other activities and other projects:
Would the proposed road support the development or expansion of small business in the village? (description):
Proposed mitigation of any adverse environmental impacts/conflicts among farmers:
Estimated total investment cost:

Attachments:

- Map (showing the proposed road, connections, rural settlements and sections to be improved).
- Endorsement by the Ministry of Works to provide the follow up O&M of the assets.
- Decision of village council for submission of proposal.

Small-scale Irrigation and Drainage (SSID)

Date:

District:
Village(s):
Number of households:
Proposed investment in SSID infrastructure (include type, indicative command/service area (acre), water source):

Rationale/expected direct benefits from investments (current service level, climate change impact mitigation, improved agricultural production, etc.):
Direct beneficiaries from the system (people/households):
Complementarity with the B-Resilient other activities and other projects:
Would the proposed investment support the development or expansion of small business in the community? (description):
Would the investment improve the water supply for livestock as well? Number of animals?
Would the investment provide opportunities for irrigation and/or drainage? Estimated area and crops:
Proposed source (type, existing or to be developed) and users sharing the source:
Proposed mitigation of any adverse environmental impacts/conflicts among water users:
Estimated total investment cost:

Attachments:

- Water Extraction Right from the proposed source
- Endorsement by the Ministry of Natural Resources and village council in support of establishment of Water Users' Associations to provide follow up O&M of the assets.
- Decision of village council for submission of proposal.

Annex 2

Proposals Ranking System

1. A ranking system as described further will be employed to ensure that the proposed investments are appropriately targeted. The main criteria, initial weightings and ranking procedure are described in the main part of the PIM. In this Annex, an example of ranking is illustrated for a number of assumed indicative infrastructure investment proposals.

2. In the table below the required data (assumption) for ranking for 3 different infrastructure investment proposals are illustrated (for RRI sub-component). The same method will be applied for ranking of proposals under the SSID sub-component. These data are the main outcomes from the climate vulnerability ranking, application forms and field visit verification of the pre-qualified proposals.

Table 1: Ranking system

Village/ District	Investment Proposal	Estimated Investment Cost (USD)	Climate Vulnerability ranking as per the Village Climate Vulnerability assessment report*	Number of Beneficiaries	Number of individuals assisted per USD 1,000 spent
(1)	(2)	(3)	(4)	(5)	(6)=(5)x1000/(3)
X	Upgrading of a feeder road of 1.5 mi length.	120,000	3	67	0.56
Y	Full Rehabilitation of a feeder road of 3 mi with required ancillary structures for drainage.	240,000	5	125	0.52
Z	Rehabilitation of 1 mi feeder road section and of a bridge.	90,000	4	82	0.91

*For this example, an assumption is taken that the villages will be given vulnerability rating 5 as the highest and 1 as the lowest.

3. The first step is the scoring of each criterion. The highest score for each of the evaluation criteria would be given a score of 1.00. From the initial data (Table above) the highest score of 1.00 is given for Climate Vulnerability to the investment in in the village **Y** (the highest vulnerability risk of 5), for number of individuals assisted per USD 1000 to the village **Z** (the highest number of people of 0.91). The scores for evaluation criteria of the other proposals would then be computed on a sliding scale as a proportion of the highest score.

Table 2: Scoring of Proposals

Village/ District	Investment Proposal	Climate Vulnerability	Score	Number of individuals assisted per USD 1,000 spent	Score
X	Upgrading of a feeder road of 1.5 mi length.	3	0.6	0.56	0.62
Y	Full Rehabilitation of a feeder road of 3 mi with required ancillary structures for	5	1.00	0.52	0.57

Village/ District	Investment Proposal	Climate Vulnerability	Score	Number of individuals assisted per USD 1,000 spent	Score
	drainage.				
Z	Rehabilitation of 1 mi feeder road section and of a bridge.	4	0.8	0.91	1.00

4. The next step is to calculate the ranking value for each proposal using the following formula:

I = 0.50×(A) + 0.50×(B)

Where:

A – Climate Vulnerability Score;

B – Number of individuals assisted per USD 1 000 spent Score.

Table 3: Ranking Value

Village/ District	Investment Proposal	Climate Vulnerability	Score	Number of individuals assisted per USD 1,000 spent	Score	Total Ranking Value
(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)=0.5*(4)+0.5*(6)**
X	Upgrading of a feeder road of 1.5 mi length.	3	0.6	0.56	0.62	0.61
Y	Full Rehabilitation of a feeder road of 3 mi with required ancillary structures for drainage.	5	1.00	0.52	0.57	0.79
Z	Rehabilitation of 1 mi feeder road section and of a bridge.	4	0.8	0.91	1.00	0.90

5. Now we can rank the proposals in descending order.

Table 4: Ranking of Proposals

Village/ District	Investment Proposal	Total Ranking Value	Rank	Estimated Investment Cost (USD)	Number of Beneficiaries
X	Upgrading of a feeder road of 1.5 mi length.	**0.61**	**III**	120,000	67
Y	Full Rehabilitation of a feeder road of 3 mi with required ancillary structures for drainage.	**0.79**	**II**	240,000	125

Village/ District	Investment Proposal	Total Ranking Value	Rank	Estimated Investment Cost (USD)	Number of Beneficiaries
Z	Rehabilitation of 1 mi feeder road section and of a bridge.	**0.90**	**I**	90,000	82

6. Thus, from the 3 proposals in this example the highest priority for investment under the RRI sub-component will have the proposal from village **Z**.

H. Coordination

V. Financing And Costs
- **A. Financing the Programme**
- **B. Programme Costs**

VI. Administration And Human Resource
- **A. Procedures for recruitment**
- **B. Evaluation of performance**

VII. Administration – Finance And Accounting
- **A. Flow of funds**
- **B. IFAD disbursement procedures**
- **C. Financial and accounting procedures**
- **D. Internal controls**
- **E. Procurement procedures**
- **F. Audit**

VIII. Monitoring And Evaluation
- **A. Monitoring plan**
- **B. Baseline study**
- **C. Review, evaluation and impacts**
  Description of the different review and evaluation activities and expected results (midterm review and final evaluation)
- **D. Supervision**
- **E. Reporting requirements**
  Description of the reporting to be done including its frequency, review and approval
- **F. Knowledge Management and Communication**
- **G. Lessons learned**
- **H. Exit strategy**
- **I. Completion and Closing (As per IFAD Guidelines)**

Project Implementation Manual

1. A draft outline of the Programme Implementation Manual (PIM) is presented below. It provides preliminary information at this stage that will be used to guide the preparation of the Manual. A detailed PIM will be developed during the final design stage of the Programme.

Article I. Introduction

Article II. Purpose and contents of the manual

2. This Project Implementation Manual (PIM) provides the basis for the implementation of the Be-Resilient Programme. It outlines the Strategic and Institutional Framework of the Programme, and provides guidance on the overall implementation framework, planning, coordination among stakeholders, the institutional and management arrangements, the administrative, fiduciary and contractual procedures, and monitoring, evaluation and reporting. It will establish effective implementation procedures and mechanisms, which will ensure the achievement of the overall objectives as outlined in the programme's design document and the log frame.

3. The lessons learned from previous IFAD interventions in Belize and the region will inform the design of the manual. This manual will be used in conjunction with the Final Design Document and will be updated regularly by the POC and the PMU. It will be updated from time to time and will reflect any changes that are agreed upon between the Government of Belize (GOB) and IFAD.

Article III. Intended Use and Users

- List all stakeholders.

Article IV. Scope and Limitations

4. The manual is only a guide for the effective management and implementation of the programme, in accordance with its objectives, intended results to be achieved and expected impacts. It does not provide decisions for every circumstance of the Programme. It is intended to serve as a guide in implementation, and where and when needed, it should be reviewed and updated to reflect changed conditions and thus different implementation requirements. In particular, it guides the PMU in the following areas:

- Target group and project area focus
- Project organisation, management and coordination
- Planning, budgeting and reporting
- Components, activities and expected outcomes
- Contractual agreements and Memorandum of Understanding
- Procedures for staff selection and recruitment
- Administrative, accounting and evaluation arrangements

5. Unforeseen circumstances or any controversy that may result from the implementation of the programme will be presented to the POC for review and resolution.

Article V. Documents referred

6. The following documents should be consulted in the preparing and updating of the PIM:

- IFAD Project Final Design Report and its Working Papers and Appendices
- IFAD Guidelines for Procurement
- IFAD Guidelines for Supervision
- Project Financing Agreements with the IFAD
- IFAD General Conditions

- Letter to the Borrower
- IFAD Guidelines for Audit

Article VI. Strategic Framework

Article VII. Legal Framework

7. The Be-resilient Programme is implemented by the Government of Belize (GOB) and is financed by loan and grant from the International Fund for Agricultural Development (IFAD) and the Global Climate Fund (GCF) respectively, with counterpart contributions from the GOB and Beneficiaries of the Programme. The IFAD Loan Number (*to be inserted)/grant Number (to be inserted) was approved by the board on the …… and* has been signed on the *(to be inserted) and has been declared effective on the ……...* It should be noted, the Programme closure date is decided from the signature date of the financing agreement not date of Board approval.

8. (Other Clauses to be inserted).

9. The Financing Agreement ……

10. The Programme is expected to start implementation in (to be inserted), and be completed …… years.

11. The implementation of this project should be in conformity with the Financier (IFAD) applicable rules …….

Article VIII. Institutional Framework

A. Programme structure and organization
B. Implementing agency
C. Programme Oversight Committee (POC)

12. The Programme Oversight Committee (POC) will be chaired by the MED, and will include one representative from each of the following: the Ministry of Finance, Ministry of Agriculture (MOA), Ministry of Works, Ministry of Rural Development, Ministry of Natural Resources and the National Climate Change Office. The POC will provide strategic direction and oversight, initial approval of the AWPB and Procurement Plan, procurement of key PMU Staff that include the Programme Manager, the Finance Officer and the Monitoring & Evaluation (M&E) Specialist. approval of the selection of consultants, goods and works, and will monitor the progress of programme implementation via monthly POC Meetings and reports provided by the PMU.

D. Programme Management Unit (PMU)

13. The PMU will be responsible for Programme implementation under the strategic guidance of the POC. It will be vested with complete financial and technical autonomy, guided by the Programme Implementation Manual (PIM) and reporting directly to the POC. ……..

E. Planning

14. Development of the AWPB, process and timing of AWPB development,
15. Who reviews the AWPB, when, timing (role key implementers, POC, IFAD, GCF)

F. Implementation arrangements

Component 1: Climate Resilient Value Chain Development
Component 2: Component 2: Climate resilient rural infrastructural development (CRRIA)

G. Coordination

Article IX. Financing And Costs

A. Financing the Programme

B. Programme Costs

Article X. Administration And Human Resource

A. Procedures for recruitment

B. Evaluation of performance

Article XI. ADMINISTRATION – FINANCE AND ACCOUNTING

A. Flow of funds

B. IFAD disbursement procedures

C. Financial and accounting procedures

D. Internal controls

E. Procurement procedures

F. Audit

Article XII. MONITORING AND EVALUATION

A. Monitoring plan

16. Detailed description of Objetive of M&E, M&E of Programme LF and RIMS indicators, Baseline and Imapct studies. Record keeping, data collection, M&E by PMU, by Implementers, by beneficiaries of Business Plans (why, how, when), feedback of conclusions and recomendations. Development of use of Management Information System (MIS). Use of M&E by PM and by POC.

B. Baseline study

17. Baseline studies to be done, by whom, when and use of the information.

C. Review, evaluation and impacts

18. Timing, organization of missions, role GOB, PMU, IFAD CPM. Key aspects that will be reviewed. Format of reporting on missions´ findings; follow-up.

D. Supervision

E. Reporting requirements

F. Knowledge Management and Communication

19. Objective, type of products, development of knowledge products, process of communicating results to induce change. Role of PMU in communication of programme results, informing government, informing the public (resources, timing), coordination with GOB communition and PR Units

G. Lessons learned

H. Exit strategy

I. Completion and Closing (As per IFAD Guidelines)

20. Overview of key steps in completion and closing process

Appendix 12: Compliance with IFAD policies

1. This Appendix contains the Be-Resilient compliance with IFAD policies, as well as the social, environmental and climate assessment procedures note (SECAP).

Table 1.Compliance with IFAD policies

Compliance with the country strategy note (CSN)	• Belize does not have a Result Based Country Strategic Opportunities Programme (RB-COSOP) as IFAD has insufficient country knowledge and the 2016-2018 PBAS allocation is only of US$ 4.98 million. However, instead of a RB-COSOP, a CSN was prepared and approved in March 2017. The CSN describes how IFAD will align with the GoB priorities and complement with the activities and plans of the rest of the donors and developments actors active in the country (IDB, EU, UNDP, CDB etc..). • Be-Resilient is fully aligned with the two strategic objectives of the CSN, which are: (SO1) *Build, rehabilitate and maintain climate resilient rural infrastructure to enhance productive and marketing activities of the target population*; and (SO2) *Create smallholder farmers' capacities to work with market-driven and climate change-adaptive farming practices and technology*. The CSN was prepared just few weeks before the inception of the design process hence the strong compliance.
Compliance with the IFAD private sector strategy	• The strategy states that private-sector companies that IFAD projects will be working with cannot be selected in advance and will depend on the context and opportunities that may arise during implementation. They should also be selected in the interest of farmers and the companies themselves. It also underlines that the support or partnership should be driven first and foremost by the interests and needs of small farmers and poor rural producers. • In that perspective, several small and medium-sized private sector actors were consulted during Be-Resilient design, as well as several farmers already engaged in a commercial partnership with these private actors. Whenever possible and requested by the smallholders themselves, and if a clear win-win situation can be achieved, the Be-Resilient will facilitate linkages and contract farming opportunities with the private sector. The programme will also comply and contribute to the operationalization of the IFAD private sector strategy by involving in project's implementation lead farmers and agro-enterprises who can serve as champions/ models to demonstrate the viability of new approaches to increase rural resilience and provide potential development pathways for the poor.
Compliance with the IFAD policy on gender equality and women's empowerment	• The design is fully in accordance with the targeting policy. The target groups have been profiled and beneficiary groups for proposed project activities identified. the completed targeting checklist is included as an annex to appendix 2.
Compliance with the IFAD policy on targeting	• The design is fully in accordance with the gender policy. the specific challenges facing rural women have been identified and opportunities for their economic empowerment, representation and workload reduction identified. The completed gender checklist is included as an annex to Appendix 2.
Compliance with IFAD scaling-up agenda	• IFAD will pursue opportunities for scaling up results as a key priority. Belize is largely rural and agricultural based, and most of its poor communities are scattered in various rural areas of the country. Although the Programme will focus initially on 23 villages in five priority areas, it has the potential to expand and replicate the interventions in other communities that have similar characteristics and challenges of the beneficiary groups. The Programme provides an excellent model that reflects the need for a more encompassing approach to address the issues of small farmer development, rural poverty and food security, while addressing the challenge of climate resilience

Appendix 13: SECAP Review Note

A. Major Characteristics and Issues (Social, Natural Resources and Climate)

Socio-Economic Context

1. Belize has an area of 22,960 square kilometres (8,800 sq. mi) and a population of 374,600 (2017). Thus, it is the most sparsely populated nation in Central America (16 people per km²). The country's population growth rate of 1.87% per year (2015) is the second highest in the region. Slightly more than half of the people live in rural areas (54%) and most of the population is located in the coastal zone and lowlands of Belize, where the bulk of economic activity takes place.

2. Belize is dependent upon natural resources for its economic livelihood. Agricultural products, fisheries, forests, and the ecosystems that serve as tourist attractions support more than thirty percent of the Gross Domestic Product (GDP) and through export products these natural resources generate significant amounts of foreign exchange earnings.

3. Agriculture constitutes a great portion of national GDP in Belize (Table 1). The sector is significantly constrained by infrastructure weaknesses and is vulnerable to adverse weather events. In particular, recurring natural disasters and the effects of climate change have significantly impacted agricultural yields, food production, food prices, and the livelihoods of the rural population. The impact of hurricanes and climate change worsen an already difficult economic situation, causing significant losses in agriculture and tourism, with economic costs estimated at about 5.5% of GDP (Detailed information on contribution to gross domestic product by activity can be found in annex 2 of PDR).

4. The poorest people and communities in Belize are predominantly rural, and their livelihoods depend heavily on climate-sensitive sectors such as small-scale agriculture, fishing, and tourism (which impact their food security and livelihoods). Moreover, a large population of the poor living in coastal areas is exposed to the risks of hurricanes and storm surges, with those living near rivers prone to flooding. These areas generally have lower levels of protective infrastructure, and housing is of lower quality, thus increasing their vulnerability to hurricane and flood risks.

5. The five priority rural areas where the Programme will start activities are in the Districts of Toledo, Stann Creek, Cayo, Belize, and Orange Walk. Many of the inhabitants in these areas are by now Belizean citizens but originally come from El Salvador, Honduras and Guatemala. Depending on the District, the percentage of poor households varies between 20% and 65% (see annex 2 for poverty information disaggregated by District).

6. Small farmers in these areas produce a variety of crops for subsistence consumption and the local markets including corn and beans, banana, plantain, fruits (pineapple, watermelon, cantaloupe), and vegetables (tomato, sweet pepper, cucumber, carrot, onion, potato). All produce is marketed locally through middlemen, farmers markets or retail outlets.

7. Vegetable production is important in reducing household spending in the southern districts whereas they are mainly grown as cash crops in the Cayo, Belize and Orange Walk Districts. Vegetables are not exported but production for the domestic market provides significant foreign exchange savings whilst contributing to the potential for food security if widespread access and affordability can be secured for consumers across the nation.

8. The main production systems practiced by small farmers are milpa,[90] semi-mechanized, irrigated open plots and covered structures. Size of open plots ranges from 1/8 acre to about five acres. Covered structures are about 3,000 to 4,000 sq. ft. These structures play a key role in reducing unit costs of production and ensuring a longer growing season.

9. Women and men play different roles in guaranteeing food security for their households and communities. While men grow mainly field crops, women are usually responsible for growing and preparing most of the food consumed at home (most families have backyard gardens as part of their coping strategy and household food security). Women also carry out most home food processing, which ensures a diverse diet, minimizes losses and provides marketable products. Women are more likely to spend their incomes on food and children's needs.

10. In these areas, the main constraints related to markets have to do with the farmers' disadvantaged negotiation position with middlemen and nearby processing plants, flooding from nearby markets and contraband from Mexico especially in the northern districts. However, they could alleviate the situation if they were able to organize themselves and plan agricultural production during the year in order to avoid flooding of the market.

11. Challenges related to rural infrastructure include bad conditions of feeder roads (especially during the rainy season) that prevent getting produce to markets without damage. In the northern districts irrigation has become a requirement as drought periods are getting worse, whereas in other areas (Cayo District) drainage systems are needed as flooding resulting from heavy rainfall events are damaging crops.

12. Some farmers are loosely organized into cooperatives and associations, although most producers operate individually. In Stann Creek District, most farmers lease the land, and thus they are loosely organized in informal groups. In Belize District land tenure is a challenge as most of the land is privately owned by people not living in Belize and is being used by farmers in the area for production. Therefore, future land conflicts might arise if not properly addressed. Women are widely under-represented in formal and informal producers' groups. For example, in Valley of Peace the under-representation of women has mainly to do with land tenure, as only landowners are eligible as members of an organization and landowners are mostly the men. This, however, can be arranged through changes in the organizations´ by-laws.

Natural resources and NRM

13. **Land use**. The total surface area of the country is 22,960 square kilometres (Table 1). Approximately 800,000 hectares or about 38% of Belize's total land area, is considered suitable for agriculture but only 9.7% (about 78,000 hectares) is used for crop and livestock production. About half of this area is under pasture, with the remainder in a variety of permanent and annual crops.

14. Privately-owned land comprises 54% (about 12,400 km²) of the total land area. More than 10,000 km² of these private lands are distributed as rural parcels of more than 40 ha, while small, private, urban parcels account for less than 0.1% of the total land area. Public lands make up 46% (approximately 10,560 km²) of the total area of Belize. Those lands are further divided in (a) protected areas and forest reserves that comprise more than 30% of the total land area; and (b) other "national lands" (16% of the total), which consist of both lands that are allocated under lease contracts from the State and unleased public lands. It is estimated that there are between 100,000 parcels in rural areas that could become part of the national land registry and contribute to a dynamic market of investments (ECLAC 2013).

[90] Traditional slash-and-burn agriculture.

15. **Protected areas.** Belize is located in the Mesoamerican biodiversity hotspot and has a variety of terrestrial, marine and freshwater ecosystems. More specifically, 85 terrestrial ecosystems, 15 marine ecosystems, and 43 riverine ecosystems have been classified in the country. There are 103 protected areas in Belize and these include all the statutory sites, private protected areas and archaeological reserves that are recognized as being part of the national system.

Table 1: Belize Land USE, 2009

	Thousands of hectares	Percentages [a]
Total	2 297	
Land area	2 281	100.00
Agricultural area	152	6.66
Arable land and permanent crops	102	4.47
Arable land	70	3.07
Permanent crops	32	1.40
Permanent grasslands and pastures	50	2.19
Forest area	1 412	61.91
Other lands	717	31.42
Internal waters	16	0.70

Source: FAOSTAT.
[a] Percentages based on land area.

16. In Belize, communities and non-governmental organizations play an important role in working with the Government for the protection and conservation of the environment and biodiversity in protected areas. This situation has occurred because of the limitations being faced by the Government relating to insufficient human and financial resources for the management of terrestrial and marine protected areas (National Environmental Policy and Strategy 2014-2024).

17. **Forest resources.** Belize has been able to maintain one of the highest percentages of forest covers in Latin America, approximately 62% of its total land mass (Cherrington et al., 2012). However, the forests of Belize over the past 30 years have undergone extensive change. At a deforestation rate of approximately 0.6 percent, the greatest driver of deforestation has been conversion into agricultural land. Other pressures arise from increasing demand for fuel-wood, fodder and timber; inadequacy of protection measures, and illegal logging.

18. Many of Belize's protected areas and forest reserves are recharge areas for groundwater and act as buffers against surface runoff during storm events. Moreover, forests maintain the most important natural resources used in agriculture: (i) clean and abundant water, (ii) diverse species of pollinators; and (iii) an ecological balance of beneficial organisms that control pests and diseases. De-reservation of sections of these sensitive forest reserves for agriculture expansion is unsustainable and should be discouraged (Belize National Environmental Policy and Strategy 2014-2024).

19. There is the urgent need for the GoB to develop an integrated policy framework that balances the conservation and the development agendas. This tension between them became apparent in the communities of Nago Bank and Maskall, in which small farmers who were allocated State lands for agricultural use are encroaching on the surrounding forest. In places like these, there is a clear need for essential environmental safeguards or incentives (e.g., payments for environmental services) for production systems that go hand-in-hand with ecosystem conservation (e.g., agroforestry) .

20. At present, many of the existing instruments need to be aligned, coordinated and made more robust to ensure monitoring and enforcement of existing laws (Belize National Environmental Policy and Strategy 2014-2024), especially in villages neighbouring protected areas and forest reserves. Trio, for instance, is located between two Forest Reserves (Swasey Bladen and Deep River), both of which are under threat of agricultural encroachment and illegal logging.

21. Recognizing the need for integrated management of the forest ecosystems, the Forest Department is in the process of finalizing the National Forest Policy for Belize. Considerations are being made for forest-dependent people and their livelihoods, issues related to climate change impacts, hurricane damage, national security, indigenous peoples' rights, payments for environmental services schemes and increasing competitiveness of the forest sector through the manufacture of value-ded products from forest resources.

22. **Water resources.** Belize is a country rich in surface water sources and aquifers found in calcareous rock. Due to its geographic location, low population, high level of forest cover, and 16 different water catchment areas, Belize has one of the highest volumes of freshwater availability *per capita* in Latin America (National Meteorological Service, 2010).

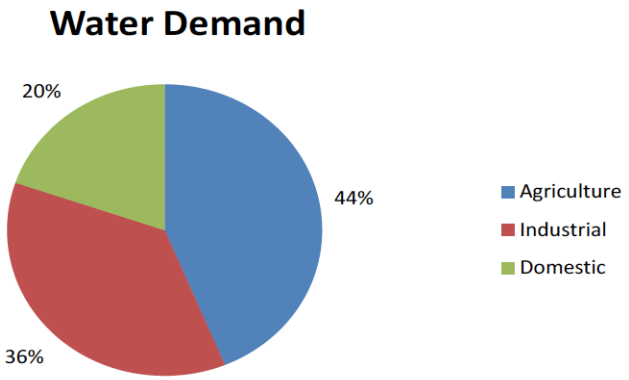
23. The demand for fresh water resources in Belize is 579 million m^3 and derives from the agricultural, industrial and domestic/residential sub-sectors (Figure 1). There is, however, an increased stress on these supplies due to population growth and increases in agricultural activities, as well as an increase in droughts (BEST 2009; CARIBSAVE 2012). Reduced availability of water also threatens the security of Belize's electricity supply which comes mainly from hydroelectric dams (hydropower supplies 47.5 MW to the nation). Any significant change in the hydrological cycle would lead to higher costs of electricity as the country would become increasingly reliant on diesel-burning thermal plants (National Climate Change Office, 2016).

24. In rural areas 95% of fresh water is extracted from ground-water sources. Where there is no access to piped water service, or no local provider, water is accessed using hand pumps (CARIBSAVE, 2012). The distribution of all wells drilled or hand-dug is unknown. The Irrigation Unit of the MoA promotes irrigation systems using underground water. However, no assessment of the underground water resources is done prior to the installation of the irrigation systems, so the knowledge of groundwater resources and quality is limited (BEST, 2009).

25. Key issues with water vulnerability in Belize relate to the fact that the distribution of water resources has not been well quantified and there is a lack of hydrological data and modelling. Especially for the central and northern regions (Orange Walk and Corozal Districts) with the largest populations and smaller water resources, hydrological modelling is of special importance.

26. There is a lack of coordination between the Belize Water Services (BWS), the agency responsible for water distribution in the country, and the local village water boards. The development of a mechanism to facilitate Integrated Water Resources Management (IWRM) in the form of a water management authority was formed in MoA in 2008, but the institution remains weak and in need of strengthening. The equitable management of water resources will be particularly important with declining water resources under climate change (CARIBSAVE, 2012).

Figure 3: Water demand in Belize by sector. Source: Belize Third National Communication submitted to UNFCCC, 2016



Climate

27. **Current Situation.** Situated at latitude of 16-18°N, Belize has a typically moist tropical climate with little seasonal variation in temperature, but with distinct wet and dry seasons. The rainy season occurs from June to November and brings approximately 60 inches of rain in the north to 160 inches of rain in the south. Rainfall varies from year to year in many areas, except in the Southern parts of the country where annual rainfall average is consistent. The heaviest amount of rainfall is usually expected in June or early July and is punctuated by a break in late July or August while the dry season occurs from November to May. The change from dry to wet seasons is gradual with a cool transition from November to February and a warm transition from March to May.

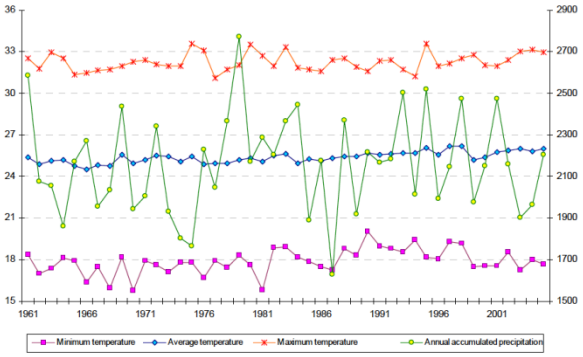
28. The mean temperature in Belize ranges from 27°C (maximum 30.1°C, minimum 22.6°C) along the coast to 21°C (maximum 25.3°C, minimum 17.7°C) at higher elevations, with the coldest month being January and the warmest May. The winds blow at an average of five knots from east to south-east all year long. The country is also affected by tropical storms, tropical waves and hurricanes that move westward through the Caribbean from June to November. Belize is affected by a major hurricane or storm every 2½ years with damages usually predominant in the northern portion of the country.

29. Inter-annual variations in climate in southern Central America are caused by the El Niño Southern Oscillation (ENSO). El Niño events bring relatively warm and dry conditions between June and August, and decreased frequencies of Atlantic tropical cyclones, whilst La Niña episodes bring colder and wetter conditions at that time of year and more frequent tropical cyclones (McSweeney et al., 2010).

30. **Climate change.** Over the last few years, extreme weather events have intensified causing social, environmental and economic losses. Losses associated to extreme weather events as a percentage of GDP stand at 5.5%, the highest in Central America.

31. In the last few decades, the average annual temperature in Belize has shown a slight tendency to increase. The annual accumulated amount of precipitation has varied greatly from year to year (Figure 2).

Figure 4: Belize Temperature and Precipitation, 1961-2001. Source: ECLAC Report, 2013

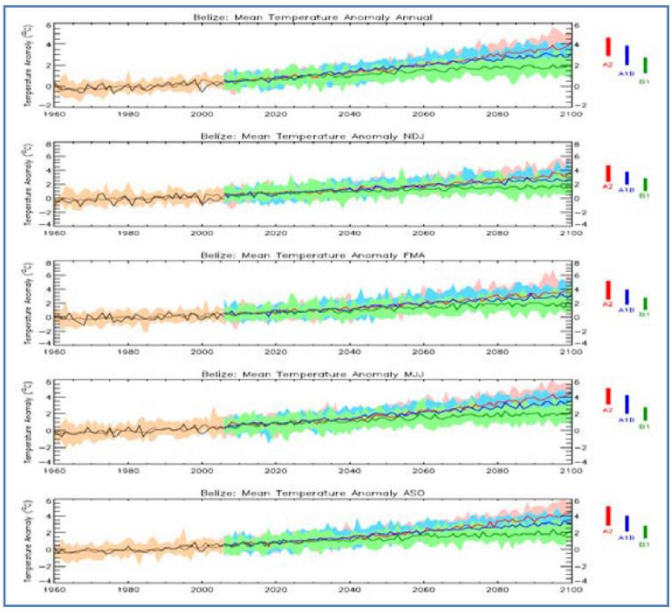


32. The economic effects of climate variability and extremes are already noticeable, as seen in recent incidents of flooding and drought (BEST, 2009). Changes in climate are already affecting the agriculture sector. Increased temperatures and unpredictable rainfall patterns are altering agricultural productivity in the form of increased incidence of weeds, pests and diseases, widespread perturbation of the growing season, variability in harvests, problems of soil drainage and erosion, salt water intrusion in drought prone areas, and damage of protective cropping structures (greenhouses) of smallholder vegetable farmers. To respond to reduced yields, farmers are increasing irrigation, using more chemicals and fertilizers, and changing the choice and mix of crops, all of which increase the costs of agricultural production, cause negative environmental impacts and threaten overall food security.

33. The future climate will likely be characterized by increasing temperatures and declining levels of precipitation, but with significant fluctuations, with an increased number of extreme precipitation events (likely owing to variability commonly attributed to ENSO, which occurs at irregular intervals).

34. **Air Temperature.** According to future climate scenarios from the UNDP Country Profiles for Belize, mean annual air temperature is projected to increase by a minimum of 0.4 °C to a maximum of 1.7 °C in the 2030s depending on the emissions scenario used (high emissions (A2), low emissions (B1) and medium emissions (A1B) from the IPCC Fourth Assessment Report (2007)). Similarly, in the 2060s, the mean annual air temperature is projected to increase by 0.8 °C to 2.9 °C, and in the 2090s, by 1.3 °C to 4.6 °C (Figure 3) (McSweeney et al., 2010).

Figure 5: Observed (1960-2006) and projected (to 2100) annual and seasonal air temperature anomalies for Belize (referenced to 1970-1999)



Source: Singh et al., 2014

35. As for the climate models ECHAM5 and HadCM3Q11 consistently project an increase in temperature that ranges from 2°C to 4°C (°C) for all districts of Belize and for all seasons (2060-2069) when compared to the present (1961-1990). On account of the marine influence, the temperature increases are lower in coastal areas (< 2.0 °C) (Figures 4 and 5) (Singh et al., 2014).

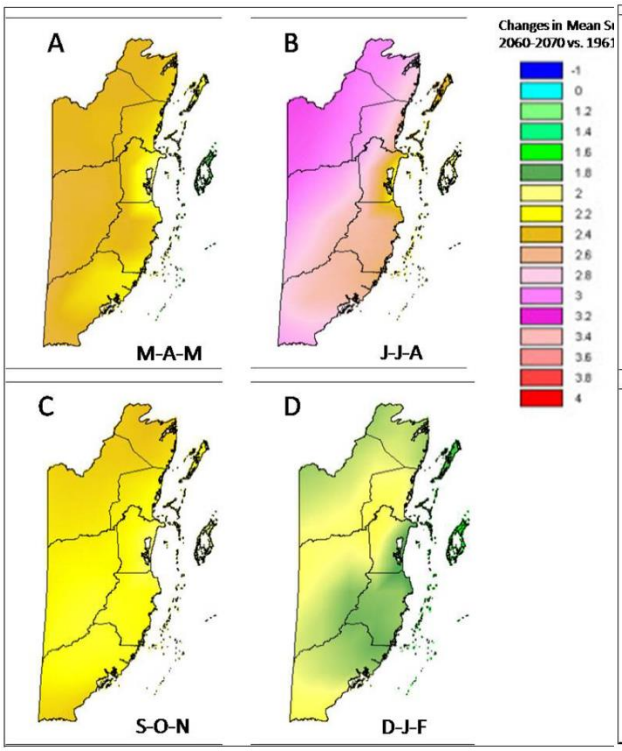


Figure 6:. Changes in mean seasonal air temperature (°C) (2060-2070 vs 1961-1990)) for the March-April-May (A), June-July-August (B), September-October-November (C), and December-January-February (D) season according to the ECHAM5 climate model. Source: Singh et al, 2014

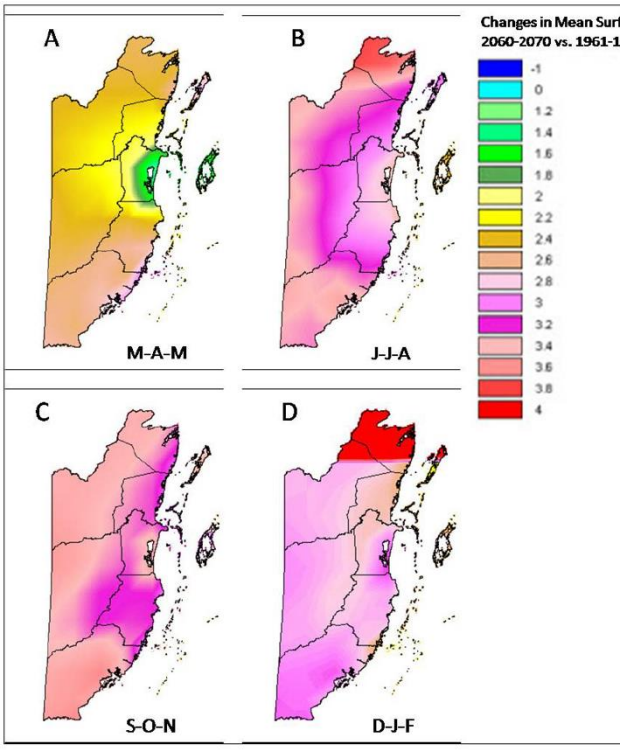
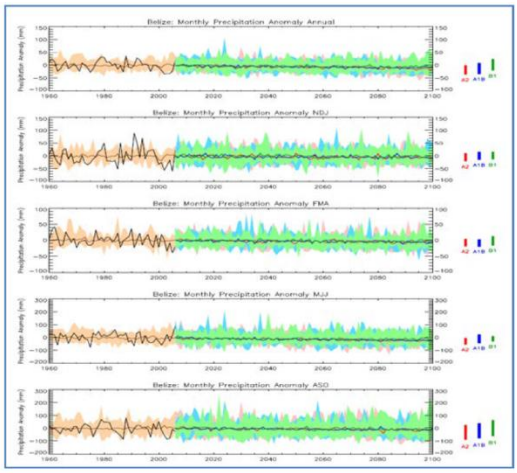


Figure 7:. Changes in mean seasonal air temperature (°C) (2060-2070 vs 1961-1990)) for the March-April-May (A), June-July-August (B), September-October-November (C), and December-January-February (D) season according to the HadCM3Q11 climate model. Source: Singh et al., 2014

36. **Precipitation/Rainfall.** Atmosphere-Ocean General Circulation Models (A-OGCMs) projections of mean annual rainfall project a wide range of changes in precipitation for Belize. Ensemble minimum and median values of rainfall changes (mm/month) by the 2030s, 2060s and 2090s, however, are generally and consistently negative for all seasons and emissions scenarios. Overall, ensemble A-OGCM projections of mean annual rainfall decreases more and more from the 2030s to the 2090s. Furthermore, mean seasonal rainfall vary between a reduction of -26 % (FMA- February March April) to an increase of +55 % (ASO- August September October) by the 2090s, but with median values overall reductions of between -1 % (NDJ) and -26 % (FMA) (Figure 6) (McSweeney et al., 2010).

Figure 8:Observed (1960-2006) and projected (to 2100) annual and seasonal air precipitation anomalies (mm) for Belize (referenced to 1970-1999). Source: Singh et al., 2014



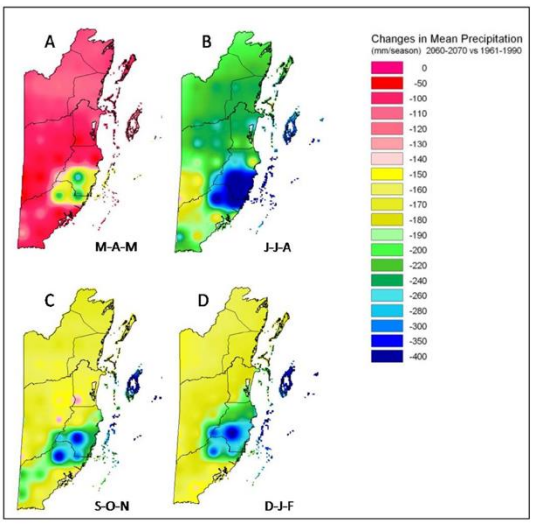


Figure 9:. Changes in mean seasonal rainfall (mm/season) (2060-2070 vs 1961-1990) for the March-April-May (A), June-July-August (B), September-October-November (C), and December-January-February (D) season according to the ECHAM5 climate model. Source: Singh et al., 2014

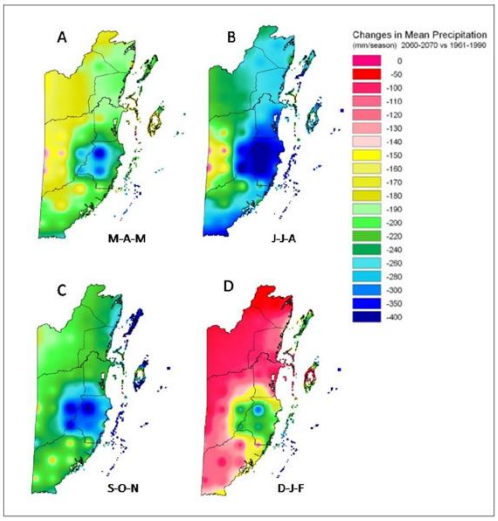


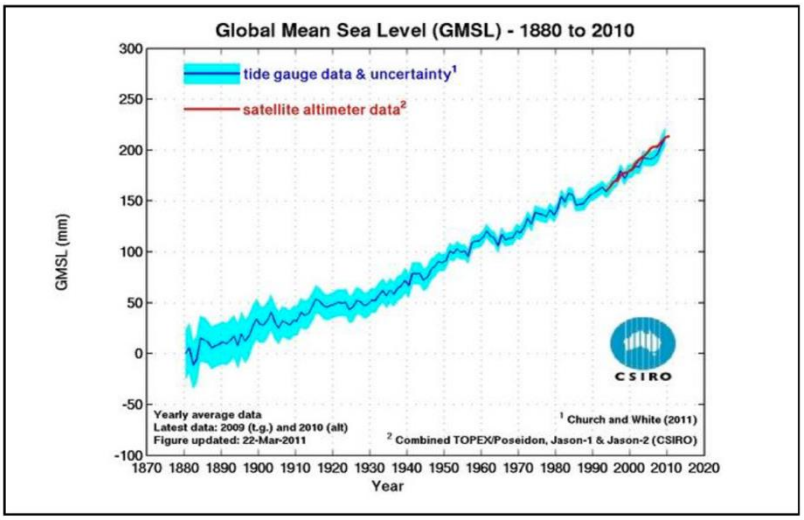
Figure10:. Changes in mean seasonal rainfall (mm/season) (2060-2070 vs 1961-1990) for the March-April-May (A), June-July-August (B), September-October-November (C), and December-January-February (D) season according to the HadCM3Q11 climate model. Source: Singh et al., 2014

37. The ECHAM5 and HadCM3Q11 climate models (Figure 7 and 8) generally project an overall decrease in seasonal rainfall in all seasons in the future (2060-2069) when compared to the present (1961-1990), especially in the June-July-August rainy season. Furthermore, wide temporal and spatial variations in seasonal rainfall are projected for Belize. In a zone centred over Stann Creek District and parts of Cayo, Toledo and Belize Districts including the offshore Cayes and atolls, the decreases in seasonal rainfall are most significant.

38. **Sea-level Rise.** According to global climate model projections SRES (IPCC, 2013) and historic trends (Figure 9), the coastal lowlands of Belize will be vulnerable to sea-level rise. By the 2090s, sea-level will rise between 0.18 to 0.56 m relative to 1980-1999. However, recent reports have claimed these sea level changes to be rather conservative, estimating that sea level will rise more than 1 meter by 2100, at least double the IPCC (2007) estimates and even more than previously thought, largely due to increased mass loss from the ice sheets mainly in the Arctic regions (Rahmstorf, 2010; Horton et al., 2008; Vermeer and Rahmstorf, 2009; Grinsted et al., 2009). Low-lying coastal areas of the coastal zone of Belize would therefore be particularly at risk from storm

surges and increased saline intrusion into ground and surface water, which will reduce fresh water availability for domestic and agricultural use.

Figure 11: Global Sea level rise - historic Trend from 1880 to 2010



Source: CISRO, 2011

39. **Sea Surface Temperature (SST).** Belize is strongly affected by hurricanes and tropical storms. Projected increases in sea surface temperatures (SST) range from +0.7 °C to +2.7 °C by the 2080s. This trend of warmer SST will energize the hydrological cycle and will likely favour more intense hurricanes. (Belize's Third National Communication to the United Nations Framework Convention on Climate Change, 2016). Storm surges are also expected to increase in intensity (Climate Change Risk Atlas, CARIBSAVE, 2009-2011).

40. Other risks attributed to climate change are increased droughts and heat waves, and intense rainfall events (IPCC, 2007; UNDP, 2009; GOB, 2nd National Communication to the UNFCCC, 2010). These changes will have significant impacts on Belize, especially the coastal zone and the major socio-economic sectors of Belize, namely water resources, agriculture, tourism, fisheries and human health.

B. Effects of climate change in the agricultural sector

41. It is expected that climate change will have severe impacts on the agriculture sector of Belize. The threats of climate change and sea-level rise, hurricanes and storm surges are particularly acute along the lowlands and coastal belt of Belize, where soils are most suitable for cultivation and where a large percentage of the population of Belize resides. Thus, climate change will cause both human and material losses as well as serious damage to infrastructure.

42. Decreasing rainfall amounts and increased variability of rainfall will make it more difficult to plan for agricultural production. Due to changes in temperature and precipitation, evaporation will increase and plant transpiration will accelerate (NichoLls et al., 2015). Increased potential evapo-transpiration is likely to intensify drought stress, and sea-level rise is likely to intensify saline water intrusion into the groundwater, especially in the semi-arid districts (Belize and Orange Walk Districts). This means that rain-fed agricultural production systems will require a transition towards irrigation, leading to increased production costs and conflicts over access to water. Lower water-table levels and the consequent increase in energy needed to pump water would make irrigation more expensive, particularly when drier conditions require more water per hectare. In the case where there will be excess water in the soil due to higher rainfall during extreme climate events, production costs will also likely increase

because new drainage infrastructure will be necessary (IPCC, 2007; UNDP, 2009; GOB, 2nd National Communication to the UNFCCC, 2010).

43. Yields of the major crops (which are already grown near their limits of temperature tolerance), namely sugarcane, rice, bananas, citrus, maize and beans, are all expected to decrease. These decreases in crop yields would result from increased temperatures and variable rainfall that reduces plant resistance to pests and diseases, increases water stress, increases respiration rate which stunts growth and development, shortens growth periods, and inhibits grain filling (IPCC, 2007).

44. Production models project reductions in yields of 17-22% for maize, 10-14% for rice, and 14-19% for beans, staple crops important for Belize's food security as well as for export income. Reductions in yield for these crops alone would represent BZ$13-18 million in lost revenue (UNDP 2009).

45. Smallholder and subsistence farmers are particularly vulnerable to any type of climatic or economic shock owing to their high dependence on local natural resources for their livelihoods, their chronic food insecurity, physical isolation and lack of access to formal safety nets (e.g., insurance). Small farmers in Belize are more exposed to pest and disease outbreaks, droughts and extreme weather events (particularly hurricanes), which cause significant crop and income losses and exacerbate food insecurity (detailed information on food insecurity can be found in Annex 2 of PDR). Although small farmers use a variety of informal risk-coping strategies (storing water, seeds and food, replanting crops, rebuilding homes with local materials, finding temporary work), these are insufficient to prevent them from remaining food insecure and reduce their vulnerability. Due to the limited resources and technical capacity of the MoA, few farmers have adjusted their farming strategies in response to climate change. Thus, urgent technical, financial and institutional support is needed to improve the agricultural production and food security of small farmers in Belize and make their livelihoods resilient to climate change.

C. Key Issues

46. **Climate change.** Changes in temperature and rainfall are having significant impacts on Belize, especially in the poorest communities of smallholder and subsistence farmers. Climate change places a high demand on management techniques for agricultural production and extra inputs (e.g., irrigation, drainage, protective covered structures, and climate proof facilities) into agriculture thereby resulting in an increase in cost of production. However, the costs of reconstruction after disasters are proven to be far more expensive than the costs of adaptation and risk reduction (UNDP 2009). Proactive adaptation responses could reduce the vulnerability of farmers and agriculture sector-dependent communities while saving important social and economic costs. Climate change only exacerbates problems that already exist. Furthermore, the adaptive capacities of local communities to cope with the effects of severe climate impacts decline if there is a lack of physical, economic and institutional resources.

47. **Access to markets.** Among marketing constraints identified by small farmers interviewed during Programme design were: (a) poor feeder roads and high transport costs that impedes access to markets, exacerbated during extreme climate events; (b) poor bargaining power in the main markets and with local processing plants; (c) low prices paid by middlemen; and (d) flooding of the markets from legal and illegal imports from Mexico.

48. **Agricultural production.** Among production constraints identified by small farmers interviewed during Programme design were: (a) climate-induced crop losses, (b) weak farmers' organizations and associations (c) high taxes and duties on inputs and equipment; (d) limited access to finance; and (e) limited access to production technology, such as irrigation and greenhouses.

49. **Institutional capacity.** The ratio of trained and equipped agriculture personnel to farmers is critically small. There is also a need to improve the technical capacity of agricultural personnel. Specifically, there exists a need for more trained personnel in climate resilient agriculture practices, integrated crop/pest management, food processing, hydrology, monitoring and documentation, research methods, Information Technology (IT) and Geographic Information Systems (GIS). This expertise must be established in the MoA so that these critical services can be available at the national level and for the benefit of all farmers (Caribbean Community Climate Change Centre, 2014)

D. Potential social, environmental and climate change impacts and risks of the Programme

Potential impacts

50. The Programme aims to increase the economic, social and environmental resilience of small farmers by promoting climate resilient agriculture production, investing in climate-proof infrastructure, supporting producer associations and strengthening value chains. Due to the nature of the Programme's activities, it is expected that the main negative environmental impacts can be prevented. The investments in public infrastructure include rigorous environmental safeguards and the BPs for on-farm investments will be supported by a comprehensive resilience plan that integrates activities for the integral management of water, soils and vegetation cover (annex 4). Nevertheless, due to the biophysical fragility of the context where the activities of the Programme will be developed, it is necessary to consider possible environmental and social repercussions that must be neutralized.

Table 3.Project component: Impacts and risks

Project component	Realm	Impacts/ Risks
1	Social	• Inappropriate agro-chemical handling and excessive use, resulting in health problems of both producers and consumers and waste of money. • Risk of losing food security at the household level due to focus on commodity production and markets. • Risk of abandonment or elite capture of agro-processing and storage facilities. If cooperatives fail to become organized, facilities could be abandoned or passed on to external businesses, exacerbating already existing problems of asymmetric bargaining power on prices.
	Environmental	• Risk of deforestation. Farmers prospering as a consequence of the Programme might want to encroach on the forest to expand agricultural areas. This could be the case for the cooperative in Nago Bank. • Unbalanced focus on market demand may ignore the need for crop rotation, inter-cropping and biodiversity, which can lead to soil degradation, genetic uniformity, greater pest incidence and reduced resilience. • Agro-chemical runoff and contamination of water sources due to insufficient understanding of agro-chemical use. • Lack of coordination and understanding between the Programme's and MoA's extension agents could result in contradictory agricultural advice to farmers and consequent unsustainable farming practices.
2	Social	• Increased costs and conflicts over access to water especially during the dryer months due to lack of hydrological models and climatic data that allow a correct assessment of available water resources. • Risk of elite capture of irrigation, road improvements, processing and storage facilities could increase value of the land and farmers might want to sell to bigger, richer farmers; this is especially the case for the communities in Trio. • Risk of public infrastructure damage due to lack of maintenance
	Environmental	• The improvement of the feeder road in Nago Bank could contribute to further deforestation and encroachment of the surrounding forest. • Risk of overuse of water resources. Irrigation may ignore sufficient availability of groundwater due to lack of hydrological data that allow a correct assessment of available water for agricultural purposes • Impacts of natural resource mining necessary to build the road (such as sands and rocks)

51. These potential unintended consequences have been discussed with the Programme's design team and relevant stakeholders. Based on IFAD's social and environmental guidelines as well as Belize's environmental policies, the following mitigation measures are proposed to reduce potential risks and maximize positive impacts on social, environmental and climatic attributes.

52. **Conflicts over water and water over-use.** Promote research and development of native climate adapted crops and varieties; promote rainwater harvesting; promote water-efficient irrigation systems (e.g., drip irrigation) and enhance water drainage on agricultural land; promote water conservation practices such as green cover crops; active involvement of rural communities in both the planning and implementation stages; support watershed assessments and sustainable land-use plans; maintain vegetation as a buffer zone along all streams and bodies of water, emphasizing the importance of riparian vegetation; provide adequate facilities for the disposal of agricultural wastes; reward upstream land practices that improve the quality and quantity of water available for downstream users; explore options for rewarding communities for watershed or ecosystem services (financial and nonfinancial) or benefit-sharing mechanisms. The potential impacts of climate change on water availability should be thoroughly examined determining periods of water stress.

53. **Human health risk associated with pesticide use.** The Programme's specialized extension agents should investigate the options for using available safe pesticides and non-pesticide alternatives; promote the application of integrated pest management (IPM); ensure the proper application, storage and disposal of agricultural chemicals in line with national and international standards; promote low-input farming practices; cultivation of locally adapted crops and varieties and diversification of crops and varieties cultivated on farm; use of locally available natural bio pesticides and pest-repellent crops, with adapted cultivation strategies (seeding periods and methods, etc.); raise environmental awareness.

54. **Risk of deforestation and land degradation.** Encourage agroforestry practices particularly in the buffer zones of protected areas and forest reserves; encourage zero-deforestation value chains and develop certification schemes; support landscape planning involving local communities and the strengthening of local governance capacity; identify areas that should not be cleared (e.g., streams and bodies of water) and limit the clearing of land to the areas that are most suitable for agricultural production; avoid the use of fire as a land clearing method; establish multi-purpose forest areas such as grazing reserves; increase awareness and education on sustainable forest management; promote forest-based alternative livelihoods involving women; research and disseminate local wild foods and non-timber forest products (NTFPs). The Programme should explore opportunities for tapping financial resources in carbon and ecosystem markets, and invest in building the capacity of national and local institutions so they can obtain access to international financial mechanisms and benefit from these.

55. **Water pollution with agro-chemicals.** The Programme's specialized extension agents should explore the potential for increasing production without the use of chemical fertilizers, especially using indigenous technologies (e.g., milpa systems); supporting integrated soil fertility systems like crop-livestock systems; avoiding chemical fertilizers in favour of local options that are available on-farm such as animal manure and crop residues; promote community education on improving indigenous practices to maximize production; use of nitrogen-fixing trees, where feasible (agroforestry); promote rotations (e.g., inclusion of legumes, multi-cropping); ensure the efficiency of fertilizer use through appropriate fertilizer selection, timing and split applications; the use and application of agro-chemicals should be carried out under the guidance of IFAD statements and Belize's Pesticides Control Board (PCB); ensure observance of the mandatory sixty-six feet riparian natural vegetation, and staggered planting on contours when utilizing sloping land for agricultural production.

E. Climate Change and Adaptation

56. Below is a discussion of specific adaptation measures recommended for both government and small farmer beneficiaries of the Programme, disaggregated by stage in the value chain.

Production

At farmer level

57. Use locally-adapted technologies where farming can be practised without altering the local ecosystem; avoid importing foreign technologies and produce inputs from local resources; adjust planting dates to match rainfall patterns; install efficient irrigation systems and improve drainage; plant local crop varieties (heat, pest and flood-resilient); introduce IPM; build climate-proof crop cover structures; implement integrated soil fertility systems (e.g., fertigation from tilapia ponds); conserve native fruit trees and other varieties of locally-adapted crops; maintain genetic diversity in fields and herds; create both temporal and spatial diversity in fields (with multi- and inter-cropping, agro-forestry and livestock-crop systems); practice fallow and no-tillage to cope with soil moisture and nutrient deficiencies; maintain and promote backyard gardens; replace poultry with climate-adapted fowl (ducks).

At government level:

- Farmers from the drought-prone districts in the north cultivating vegetables (of high water intake) should be encouraged to slowly transit to high value, drought adapted crops.
- Safeguard the knowledge, practices and benefits of regional ancestral agricultural techniques, which form the basis for current and future agricultural innovations and improved technologies. Promote a diversified use of the landscape.
- Develop a **climate information systems** that allow farmers to plan the timing of operations.
- Study the implementation of an **index-based crop insurance** and **Payments for Environmental Services Schemes**.
- **Storage.** Promote skills and technologies of food preservation and storage among women and youth. Maintain strategic local food and seed reserves, though Community Seedbanks. Build climate-proof storage facilities.
- **Processing.** Build climate-proof agro-processing facilities; conserve water, and ensure correct disposal of wastewater. Run facilities with autonomous energy systems
- **Marketing.** Advocate for local agricultural production from sustainable family farmers. Maximize selling of value-added products.
- **Consumption.** Encourage a local and diversified diet.
- **Transversal.** Strengthen formal and informal farmers' associations. A strong sense of community and ownership is vital for quick recovery from extreme climate events and effective dissemination of climate adapted technologies and farming practices.

58. These adaptation options may face a variety of challenges and barriers in Belize including: economic resources, technical knowledge and adaptive capacity in the agriculture sector. Climate change may, therefore, present possible opportunities and priorities for the modernization of agriculture in Belize by enabling effective and proactive adaptation to climate change.

Environmental and social category

59. The Programme will focus on strengthening small farmers' productive skills and assets to increase their production, lower unit costs and improve access to markets. This will include investment in infrastructure at the farm/village level, including greenhouses, irrigation, drainage, small-scale water catchment and/or harvesting, and storage facilities. The Programme will also invest in infrastructure to facilitate market access, including agro-processing facilities and climate-resilient roads.

60. The Programme will ensure that all infrastructure investment is fully compliant with IFAD and national environmental standards. In particular, any water harvesting and/or storage investment will

be designed not to interfere with ecological water flows or natural drainage of water bodies. Life-cycle waste management practices will be applied in agro-processing facilities, with recycling and/or waste to energy facilities implemented where appropriate. Climate-resilient road rehabilitation will reduce interference with natural drainage and minimize erosion. The promotion of climate resilient agricultural practices will promote improved soil management, soil restoration and agro-forestry where applicable.

61. No expansion of agricultural land use is expected. The Programme will foster environmentally-sound pesticide and fertilizer management techniques, including the application of organic fertilizers and pesticides. The Programme does not envisage any adverse social impact and is not expected to engage with Indigenous Peoples.

62. Based on the above considerations, the Programme's Social and Environmental categorization is B. Any adverse social and environmental impacts would be short term, and would be remedied or mitigated through actions included in the Programme's activities.

Climate risk category

63. A major objective of the Programme is to reduce the vulnerability of beneficiaries to the impact of climate change. Belize is classified as a SIDS; the United Nations Framework Convention on Climate Change recognizes the particularly high vulnerability to climate change of SIDSs and supports actions to address the special needs of these states. Two detailed measurements of individual countries' vulnerability to climate threats have been made: (a) the University of Notre Dame's Global Adaptation Index (GAI) rates Belize's adaptive capacity at 114 out of 181 countries; and (b) over the twenty-year period 1996-2015, Belize was ranked 26th out of 181 countries in the Global Climate Risk Index (CRI) prepared by the NGO Germanwatch in Bonn. The index calculates the level of exposure and vulnerability to extreme climate-related events. Germanwatch estimates that Belize suffers up to 3% losses in GDP in any one year due to extreme weather-related events.

64. Over the past 50 years, global temperatures have been rising steadily, with a measured average increase of 0.6° C, and are projected to continue along this trend. In Belize, rainfall variability has increased and will likely become more pronounced in the future. While overall total rainfall is expected to increase marginally, it is likely to be less predictable and concentrated in more intense events, thus leading to both extended dry periods and higher flooding potential. Belize is particularly vulnerable to hurricanes and tropical storms, which are expected to increase in both frequency and magnitude in the Caribbean.

65. The Programme is considered to be of high climate risk. As a result, the Programme design has been enhanced in its focus on climate change by mainstreaming climate resilience across all its components and activities. Financing from the GCF will be sought for this purpose, recognizing the higher costs that climate change imposes on the development efforts and investments by vulnerable developing countries.

F. Recommended features of Programme design and implementation

Mitigation measures

66. **Agro-ecology and biodiversity conservation in agro-ecosystems.** Component 1 and Cross Cutting Activities of the Programme contemplates the hiring of specialized extension agents who will train in and encourage agricultural practices such as mixed cropping, agro-forestry and home gardens, which have proved beneficial for climate change adaptation while improving agricultural productivity. In parallel, the Programme will carry out a feasibility study of a Payment for Environmental Services Scheme as a financial incentive to promote agro-forestry systems and

conservation of riparian corridors (detailed information on PES feasibility study is in Appendix 4 of PDR).

67. To the extent possible, the Programme should complement Component 1 with the following activities that could be implemented in parallel:

(a) The promotion of value chains that offer opportunities to market products derived from diversified production systems (e.g., timber and non-timber forest products), in conjunction with the BMDC.
(b) The strengthening of research, exchange and documentation of agro-forestry experiences and promising multi-purpose tree species. Possible allies include the National Climate Change Office, Caribbean Community Climate Change Centre, University of Belize Central Farm and the National Coordinating Committee for Research and Development.
(c) The strengthening of the meristem facility of the University of Belize to advance on the production of propagules of selected tree and crop species with potential to be used in agro-forestry systems.

68. **Capacity building**. Training is a long-term commitment. To maximize training activities during the Programme, and to guarantee widespread dissemination of best practices after conclusion of the Programme, training under the Programme should: (i) focus on identifying pioneer farmers (who are already implementing innovative and sustainable farming technologies) in strategic locations; (ii) support and encourage these farmers; and (iii) establish a farmer-to-farmer training mechanism, allowing farmers themselves will serve as multipliers in their communities.

69. **Women and youth involvement.** The Programme will support the identification, development and diffusion of backyard gardens, a sustainable agricultural technology that fosters food security, while strengthening women's leadership and influence in decision-making in the household, and NRM in the community. In order to increase participation of youth and women, the Programme's field extension agents should give priority to women and youth in training activities related to nursery implementation and management, food storage and processing, seed selection and breeding, marketing, organization and negotiation skills. Empowering women and youth can change overall gender inequality, safeguard food security and ensure long-term results of the Programme by giving youth reasons to stay instead of migrating to cities.

Multi-benefit approaches

70. By promoting agro-forestry systems and home gardens through Component 1, the Programme will stimulate a long-term approach of multiple benefits for diversified and increased production, poverty reduction, enhanced risk management among small farmers, enhanced ecosystems services and biodiversity within agricultural landscapes, reduced deforestation and increased resilience.

71. Agro-forestry systems in San Jose (Toledo District) almost entirely meet a family's needs for food and wood, and generate at least 62% of family income. These systems can be considered a multi-benefit approach because they: (i) increase productivity in a sustainable way; (ii) diversify production in space and time - a fundamental risk management tool of the small farmer; (iii) conserve the natural resource base through afforestation and reforestation while providing economic benefits to the farmer; (iv) act as a buffer against changing patterns of precipitation, temperature, and new pests and diseases, and thus are resilient to extreme weather events as well as market shocks; (v) sequester carbon and lower GHG emissions; (vi) prevent deforestation and forest degradation by providing firewood and timber products, reducing pressure on adjacent natural forests and improving the coexistence of small-scale agriculture with forest ecosystems; and (vii) contribute to the achievement of food security and the sustainable development goals.

72. Many circumstances in Belize make viable the promotion and scaling of agro-forestry systems:

(a) Agro-forestry is an ancestral tradition that has been practised in the region for centuries. It is an existing technology used mainly by small farmers on farms averaging between 10 to 25 acres in order to have different products at different times of the year. In the southern-most District, Toledo, an increasing number of farmers are growing cacao and raising bees under the cover of the natural forest. In Stann Creek District, farmers are planting pineapples between the citrus trees. In north-west Belize, coffee is being planted within the natural forest. Combinations of corn, plantains, chickens, cattle and pigs might all be included in the mix.
(b) Agro-forestry systems are one of the technologies prioritized by the GoB for climate change adaptation in the agricultural sector. As such, an Agro-forestry Land Management Section will be housed and coordinated within the Crop Research and Development Unit of the MoA with strong public and private sector support. The Section will possess the capacity to advise farmers on agroforestry and silvo-pastoral techniques, fallow, and green fertilizer, particularly as it relates to soil conservation and soil nutrient replenishment (National Climate Change Office, 2017).
(c) Belize has simplified internal regulations and policies that allow small farmers to carry out the issuance of permits for the sustainable use of wood in agro-forestry systems without any cumbersome procedures (Detlefsen y Scheelje 2011).

73. Home gardens or backyard gardens are one of the oldest forms of managed land-use systems, and are considered to be an epitome of sustainability. They are given special consideration in the Programme because it is an effective way to include women and youth while generating multiple benefits, including:

(a) As intimate, multi-story combinations of various trees and crops, sometimes in association with domestic animals, around homesteads, women traditionally use their backyards for a variety of needs such as food, energy, shelter and medicines.
(b) They reduce household expenditures on food, and add diversity to diet, promote more local foods and add to food security.
(c) Although interest in backyard gardens has been primarily focused on producing subsistence items, its role in generating additional cash income cannot be overlooked.
(d) Home gardens are an important reserve of local germplasm and biodiversity often having many species of trees, crops and varieties of the same crop. As such they play central roles in climate change adaptation (Kumar 2014, Nichols 2015).
(e) Farmers use backyard gardens for experimentation with new species and varieties and their management (Niñez 1987).
(f) They have a variety of outputs with both production and service values including aesthetic and ecological benefits (Kumar 2004).
(g) They are important for building strong social networks and social resilience, as plants are generously shared within the women and farmers of the community.

Incentives for good practices

74. Payments for Ecosystem services (PES) have been widely used as an economic incentive to stimulate agricultural systems that integrate biodiversity into the productive models. These payments also promote an incentive to maintain and restore native forests (mature, secondary, or riparian), which offer important environmental services but do not generate obvious revenue for most landowners. The feasibility study done by the Programme will assess the interest of participation by landowners in a PES scheme, estimate payments per acre paid by the scheme, costs of the entire scheme, and potential partners and sources of funding (detailed information on the PES study can be found in Appendix 4).

75. Farms that are close to the main tourist sites in Belize and that also adopt good agricultural practices could have access to an important source of income through agro-tourism. Currently the Ministries of Tourism and Agriculture are advancing on a project that will support and advise farmers and villagers in the construction of “nature trails”, adaptation of infrastructure to offer home stay services, providing a space for a farmers market in the touristic villages. The Programme could have a

positive impact on this by improving public infrastructure, strengthening the farmers' organizational skills, and promoting climate resilient agriculture practices, all key for the development of an agro-tourism industry.

76. Another economic incentive for adopting good farming practices has to do with access to high-end markets that pay a premium price for sustainable and clean products. By strengthening farmers' capacity to access markets and by training farmers on climate resilient agricultural practices, the Programme will bring farmers a step closer to access untapped green high-end markets. The Programme could advocate for eco-labelling schemes that certify sustainable farming practices.

Participatory processes

77. To improve farmers' production and resilience, the Programme will perform a self-vulnerability assessment following a participatory approach, in which farmers will be able to identify the climate threats that they are exposed to and determine their response capacity and practices they need to improve in order to achieve resilience at the farm level.

78. Additionally, the Programme will facilitate face-to-face meetings between buyers and producers, in which producers will be able to hear first-hand the market demands and requirements to access those markets. Similarly, buyers will have the opportunity to hear problems to meet those demands from producers themselves, and together will be able to devise win-win solutions. The most powerful feature of these participatory discussions is that the producers will have the opportunity to influence market demand as well, since they will be able to propose lesser-known products with good marketing potential.

Analysis of alternatives

79. The proposed measures in the previous sections have been envisaged taking into consideration the Programme's scope, Belize's socio-economic context and the technical capacities within governmental institutions. Thus, it can be said that these measures have a high to medium technical feasibility, and can be implemented by the Programme through Component 1.

G. Institutional analysis

Institutional framework

80. The MED will be the LPA with overall responsibility for programme implementation, based on the following considerations: (i) the long-standing successful partnership between IFAD and the MED; and (ii) the multi-sectorial cross-cutting nature of the Programme. Programme Coordination and Administration, Implementation and M&E will be under the direct responsibility of an autonomous PMU established within the MED. The PMU's physical location will be identified by the GoB, outside sectorial institutions.

81. Strategic direction and oversight will be provided by a POC that will be chaired by the MED, and will include one representative from each of the MoF, the MoA, the Ministry of Works, the Ministry of Rural Development, the Ministry of Natural Resources and the National Climate Change Office.

Capacity building

82. Aiming for a long transformation that will enhance the communities' resilience and coping capacities, the following capacity-building needs among farmers, villagers and government staff have been identified during Programme design:

(a) Production planning in relation to market demand.
(b) Training on agroforestry, and climate-smart agricultural practices.

(c) Networking, leadership, cooperativism, conflict resolution, negotiation, procurement of goods.
(d) Skills for disaster response, for economic use of excess produce and for adding value to produce such as: non-refrigerated storage of food (which includes fresh and preserved fruit, meat, meat products, vegetables, jams, jellies, and cooked products). This is especially important for communities without reliable supplies of electrical power and/or vulnerable to loss of power due to climate disasters.
(e) Production skills, like carpentry, logging, and silviculture that contribute to the development of well-rounded young individuals who could actively participate in different economic activities in the community and any disaster recovery effort.
(f) Monitoring, documentation and analysis of Climate Change impacts.
(g) Management of watersheds, vegetation, wetlands and biological refuges to inform their decision-making in such a way that it becomes a normal part of their everyday farming activities.

Additional funding

83. The Programme is estimated to cost US$20.0 million. It will be financed by an IFAD US$4.98 million ordinary term loan, with a financing gap of US$3.0 million. The financing gap will be filled through IFAD11 PBAS resources or alternative financing. Beneficiaries' contribution for on-farm investments will be approximately 15%, in cash or in-kind. The Government's counterpart contribution will be 20% of the total Programme cost, including taxes. The residual Government contribution after deduction of the tax element will be allocated as contribution to public infrastructure.

84. The Government has requested IFAD to access GCF grant resources for US$8.0 million. GCF grant financing is mainstreamed throughout the Programme proposal with a strong emphasis on climate-proof public infrastructure, investment in climate-resilient value chains, and promotion of climate resilient practices and technologies. Preliminary discussions with the GCF indicate that the Programme is well aligned with the Fund's programming guidelines. However, in order to apply for GCF funds, feasibility assessments for each of the activities proposed by the Programme in Components 1 and 2 will need to be completed.

Monitoring and Evaluation

85. The following set of indicators are proposed to monitor and evaluate social, environmental and climate objectives:

Component 1:

- Number of self-vulnerability assessments and resilience plans.
- Percentage of households reporting enhanced coping and resilience capacities.
- Number of households reporting capacity to feed themselves.
- 20% of the framers associations and cooperatives report a shared vision and collective approach to plan productive and marketing activities.

86. The monitoring of these indicators should be included in the Programme's M&E system, as well as the indicators that are included in the Log Frame.

Further information required to complete screening

87. Based on the nature of the Programme's interventions and the environmental and climatic risk classifications, it has been determined that it will not be necessary to carry outadditional studies for an Environmental and Social Impact Assessment (ESIA) or a climate risk analysis.

Record of consultations with beneficiaries, civil society, general public etc.

88. Field trips and interviews were held with people from the communities targeted by the project including farmers, village council, and women. Meetings were held in Belmopan with key actors from government institutions, which are listed below:

- Men and women from the following villages: Trio, Valley of Peace, Maskal, Nago Bank, San Carlos
- Staff from the Ministry of Agriculture: Field extension agents, Climate change Office, Backyard garden program Coordinator, Central Farm

- UNDP country program officer
- University of Belize Central Farm

Environmental and Social Management Plan

89. It is proposed that the following parameters are monitored during the implementation of the Programme as part of the ESMP:

Parameter	Activity	Performance Indicator	Target	Responsibility for monitoring during programme implementation	Monitoring means	Recommended frequency of monitoring
Small scale processing and marketing of agricultural produce	Prepare a waste disposal management plan	Existence of waste disposal management plan (Yes/No)	All processing facilities will have a plan	PMU in collaboration with MoA extension officers	As part of sub-project approval	Prior to sub project approval, one year after sub project implementation, and project end
Natural resources extraction to renovate rural roads and for drainage networks	Request authorization of competent government entities with regard to the extraction of building material	Existence of Environmental Clearance for the construction of rural roads and drainage systems (Yes/No)	All infrastructure works with Environmental Clearance	PMU and MoA Department of the Environment	As part of works approval	Before construction
Increased use and discharge of agrochemicals	Ensure agrochemical application plan is based on soil test (to avoid overuse) and that discharge of agrochemicals is acceptable to avoid soil degradation and water pollution.	Soil test has been done to define use of agrochemicals (Yes/No)	All PO's test representative soil samples of production sites	PMU in collaboration with MoA extension officers	As part of sub-project approval	Before sub-project approval
		Discharge of agrochemicals is acceptable (Yes/No)	All PO's develop and implement agrochemical discharge procedures	PMU in collaboration with MoA extension officers	As part of project environmental monitoring by PMU	Annual
	Develop and apply organic pesticide alternative.	Is the organic alternative being applied (Yes/No)	All PO's apply organic alternative	PMU in collaboration with MoA extension officers	As part of project environmental monitoring by PMU	Annual reports, mid-term report, closing

Parameter	Activity	Performance Indicator	Target	Responsibility for monitoring during programme implementation	Monitoring means	Recommended frequency of monitoring
Sustainable use of water resources	Request authorization of water use for irrigation and drainage	Existence of Environmental Clearance and Water Abstraction Licence (Yes/No)	All Irrigation/Drainage with Environmental Clearance and Water Abstraction Licence (Yes/No)	PMU and MOA Department of Environment	As part of works approval	Before construction
	Monitor access, quality and usage of water for agriculture and agro-processing	Quality of water effluent from supported farms	Acceptable levels of nutrients, chemical residues, and sediments from irrigation and drainage works	PMU in collaboration with MoA extension officers	As part of project environmental monitoring by PMU	Annual in each priority area
Renewable energy	Monitor the quantity of renewable energy installed	KW of renewable power installed in the targeted communities	At least 80% of new energy installed is a renewable	PMU	M&E system and completion study	Annual reports, mid-term report, closing

Appendix 14: Contents of the Project Life File

A. List of persons met

Meeting with the Ministry of Economic Development

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Meeting with the Ministry of Agriculture

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Meeting with the Ministry Finance

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Meeting with the Development Finance Corporation

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Field visit / Trio and surrounding areas - Local authorities responsible for agriculture, roads and NRM

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Field visit / Nago Bank and surrounding areas - Local authorities responsible for agriculture, roads and NRM

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Griselda Aranza Mendez	LPAN		
Ruben Pineda Calderon	LPAN		
Jose Pompilio Flores	MFC		
Carlos Aranza Mendez	LPAN		
Isaias Beltran	MFC		
Carlos Lopez			
Omar Gonzalez	LPAN		
Jorge Guevara			
Gerson Aranza Mendez	LPAN		
Manuel Gonzalez	LPAN		
Jose Alfredo Guevara			
Gerardo Pineda	LPAN		
Amilcar Sanchez	MFC		
Jose Sanchez	MFC		
Maud Gongora Estrada	LPAN		
Angel Padilla			
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Field visit / Nago Bank and surrounding areas - Local private sector/Value chain actors

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Field visit / Nago Bank and surrounding areas - NGOs working in the project areas.

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Field visit / San Carlos and surrounding areas - NGOs working in the project areas.

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