

Environmental and Social Assessment and Action Plan:
BUILDING THE ADAPTIVE CAPACITY OF SUGARCANE FARMERS
IN NORTHERN BELIZE (BAC-SUF)



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(CCCCC)**

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ACRONYMS AND ABBREVIATIONS

ASR	AMERICAN SUGAR REFINING INC.
ARS/USDA	AGRICULTURE RESEARCH SERVICE OF THE US DEPARTMENT OF AGRICULTURE
BELCOGEN	BELIZE COGENERATION ENERGY LIMITED
BELTRAIDE	BELIZE TRADE AND INVESTMENT DEVELOPMENT SERVICE
BSCFA	BELIZE SUGAR CANE FARMERS AND ASSOCIATION
BSI	BELIZE SUGAR INDUSTRIES LTD.
CARICOM	CARIBBEAN COMMUNITY



CCCCC or 5C's	CARIBBEAN COMMUNITY CLIMATE CHANGE CENTER
CGA	COUNTRY GENDER ASSESSMENT
CO ₂	CARBON DIOXIDE
CSA	CLIMATE SMART AGRICULTURE
CSPCA	COROZAL SUGAR CANE FARMER ASSOCIATION
CPA	COUNTRY POVERTY ASSESSMENT
DFC	DEVELOPMENT FINANCE COOPERATION
EM	EXTRANEIOUS MATTER
ESS	ENVIRONMENTAL AND SOCIAL ASSESSMENT AND ACTION PLAN
Et	EVAPOTRANSPIRATION
ETA	EVAPOTRANSPIRATION ACTUAL
ETP	EVAPOTRANSPIRATION POTENTIAL
EU	EUROPEAN UNION
FI	FINANCIAL INSTITUTION
FFS	FARMER FIELD SCHOOL
FDI	FOREIGN DIRECT INVESTMENT
GCF	GREEN CLIMATE FUND
GDP	GROSS DOMESTIC PRODUCT
GOB	GOVERNMENT OF BELIZE
HDI	HUMAN DEVELOPMENT INDEX
IFC	INTERNATIONAL FINANCE CORPORATION
INM	INTEGRATED NUTRIENT MANAGEMENT
MSME	MICRO, SMALL, AND MEDIUM ENTERPRISES
NDC	NATIONALLY DETERMINED CONTRIBUTIONS
NPK	NITROGEN, PHOSPHORUS AND POTASSIUM
NSCGA	NORTHERN SUGAR CANE GROWERS' ASSOCIATION
OIRSA	INTERNATIONAL REGIONAL ORGANIZATION FOR AGRICULTURAL HEALTH
PE	PRODUCTION ESTIMATE
PSCPA	PROGRESSIVE SUGAR CANE FARMER ASSOCIATION
REDD+ DEGRADATION	REDUCING EMISSIONS FROM DEFORESTATION AND FOREST
REPD	RAPID ENVIRONMENTAL PARTICIPATORY DIAGNOSTIC
SCPC	SUGARCANE PRODUCTION COMMITTEE



SICB	SUGAR INDUSTRY CONTROL BOARD
SDG	SUSTAINABLE DEVELOPMENT GOALS
SIB	STATISTICAL INSTITUTE OF BELIZE
SIMIS	SUGAR INDUSTRY MANAGEMENT INFORMATION SYSTEM
SIRDI	SUGAR INDUSTRY RESEARCH AND DEVELOPMENT INSTITUTE
SPAC	SOIL-PLANT-ATMOSPHERE CONTINUUM
TAM	TOTAL AVAILABLE MOISTURE
UB	UNIVERSITY OF BELIZE
WD	WATER DEFICIENT
WS	WATER SURPLUS
WUE	WATER USE EFFICIENCY



Introduction

The Environmental and Social Assessment and Action Plan (ESS) report highlights the environmental and social impacts that are currently experienced, and that can be incurred with the implementation of Green Climate Fund (GCF) project proposal: “Building the Adaptive Capacity of Sugarcane Farmers in Northern Belize (BaC-SuF)” (“the project”). The assessment of current conditions and potential impacts from the information generated from this report will be used to ensure that the right interventions are included in the final project design.

Based on a pre-project screening process, the project is considered a low impact (explained in section 1.1) and anticipated to operate within the existing environmental frameworks and policies of Belize. Doing so will ensure that the project contributes towards existing efforts implemented by individual organisations, to meet the required targets and goals set by the relevant policies and certifications. Meeting these targets will drive the wellbeing of each organisation, their membership and the surrounding communities that benefit directly or indirectly from the contribution of the sugar.

1.1 Green Climate Fund Overview

The Green Climate Fund (GCF) – a critical element of the historic Paris Agreement – is the world's largest climate fund, mandated to support developing countries raise and realise their Nationally Determined Contributions (NDCs) ambitions towards low emissions, climate-resilient pathways. GCF's investments are aimed at achieving maximum impact in the developing world, supporting paradigm shifts in both mitigation and adaptation.

To simplify and streamline the approval of certain small-scale projects, GCF's Board has approved a new approach: The Simplified Approval Process (SAP). The simplifications in this new approach should lead to a reduction in time and effort required to go from project conception to implementation. The main criteria to qualify for SAP are:

1. Do you have a project that is ready for scaling up, and has the potential for transformation to adapt and/or mitigate climate change?
2. Does it require a GCF contribution of up to USD 25 million?
3. Are the environmental and social risks and impacts minimal?

The aim of the SAP is to enable simpler and faster access to GCF funding. Therefore, the same level of complexity of background studies and feasibility documents may not be required, compared to a standard funding proposal package, reducing the time to approval and implementation.

To categorise a project as for SAP, an environmental screening process has to be conducted to confirm minimum impact. This is an essential, and primary, step in the overall



assessment of the environmental and social risks and impacts of activities proposed for GCF financing. The result of the screening forms the basis on which the accredited entities assign the environmental and social risk category of the project and activities and informs decisions on the extent and depth of environmental and social due diligence that will be undertaken. However, even before a project is considered the CCCCC conducts its due diligence to determine if the project can proceed. This is the first step in its risk mitigation strategy. Project activities are checked against the no project activity list outlined in Annex 1 of the CCCCC Environmental and Social Management System. Where project activities are like those outlined in the Project Activities List then the activity is eliminated. If it so warrants, the entire project may be cancelled if significant portions of its activities fall in the Project Exclusion Activity List. (Annex 1)

Through this screening process, the project has been categorised as a Category C project, which validates the approach to apply for the GCF financing through the SAP (Annex 3 and 4). Category C projects are considered to include low-risk activities, including those that have minimal to no adverse environmental and social risks and impacts. Category C activities are typically those that have no physical elements or defined footprints. However, in certain contexts, activities that have physical elements or a footprint may also be considered as low risk, particularly where the activities are small-scale, undertaken within an already built environment, do not involve physical and economic displacement of people or have minimal or no adverse impacts on indigenous peoples. Some examples of category C activities include:

1. Capacity development, planning support, institutional development and strengthening, advisory services, communication and outreach, and early warning and other monitoring systems; and
2. Small-scale facilities, smallholder production and community-based conservation, rehabilitation and maintenance of existing small-scale infrastructure within an already built-up area and with no additional footprint.

1.2 Project Overview

The Environmental and Social Assessment and Action Plan report, as noted, forms part of the project proposal entitled: “Building the Adaptive Capacity of Sugarcane Farmers in Northern Belize (BaC-SuF)”. The project has progressed through stages of development from the concept note, developed with The Caribbean Community Climate Change Centre (CCCCC) along with a number of different stakeholders developed in October 2019, to the Baseline study and finally the development of the project design that will form the proposal.

The project design has identified three components with associated outcomes and outputs;

Components	Outputs
1.	Climate risk reduction and increased adaptive capacity through improved crop diversity of farmers.



Components	Outputs	
Outcome 1.1: Improved crop diversity and farming practices to reduce climate risk and adaptive capacity	1.1.1	Variety information release protocol and data sheet for each variety developed created and database developed
	1.2.1	Seed cane rollout master plan and distribution systems for 974 acres of seed cane nurseries
	1.3.1	10,000 acres of land replanted to climate adapted varieties.
	1.4.1	10,000 acres prepared to be mechanically harvested and 2,000 acres mechanically harvested.
	1.5.1	10,000 acres of land with improved soil health and 5000 acres with improved ratoon management.
2. Sustainable water and land management techniques for increased productivity and consistent supply chain.		
Outcome 2.1. Sustainable water and land management techniques increased for improved productivity and consistent supply chain.	2.1.1	Toolkit and Guidelines for climate resilient for irrigation and drainage developed.
	2.2.1	1,000 acres drainage and 2,000 acres irrigation implemented.
3. Knowledge and knowledge systems to proactively (early warning, investing) build resilience to climate impact while at the same time transforming farming systems for long-term adaptation.		
Outcome 3.1 Transformative knowledge and knowledge systems that build resilience to long and near-term climate impact.	3.1.1	Transformative knowledge and knowledge systems that build resilience to long and near-term climate impact.
	3.2.1	Smart Sugar Cluster and Sugar Industry Management Information System scaled.



Components	Outputs	
	3.3.1	Support the further development and roll out of the smart sugar cluster to distribute climate related data for good farmer decision making.
	3.4.1	Farmer vulnerability criteria and assessment guidelines.

Based on these three (3) components and associated outcomes, the project will aim to deliver a set of expected overarching outcomes (EO) which includes

EO1: More climate resilient farming operations, increased yield and productivity, increased revenue and ability of farmers to sustainably invest in other adaptive measures;

EO2: Stable and increased yields, increased productivity and income and a more resilient and consistent supply chain;

EO3: Farmers using knowledge and knowledge systems to proactively build resilience to climate impact while at the same time increasing productivity and decreasing the climate impacts in their farming operations.

The proposed components and expected outcomes were developed following Climate Smart Agricultural (CSA) guidelines which are based on three main pillars which also forms the foundation for the project design:

1. **Productivity:** CSA aims to sustainably increase agricultural productivity and incomes from crops, livestock and fish, without having a negative impact on the environment. This, in turn, will raise food and nutritional security. A key concept related to raising productivity is sustainable intensification.
2. **Adaptation:** CSA aims to reduce the farmer's exposure to short-term risks, while also strengthening their resilience by building their capacity to adapt and prosper in the face of shocks and longer-term stresses. Particular attention is given to protecting the services that ecosystems provide to farmers and others. These services are essential for maintaining productivity and our ability to adapt to climate changes.
3. **Mitigation:** Wherever and whenever possible, CSA should help to reduce greenhouse gas emissions. This implies that we reduce emissions for each calorie or kilogram of food, fibre and fuel that we produce, that we avoid deforestation from agriculture, and that we manage soils and trees in ways that maximise their potential to act as carbon sinks and absorb carbon dioxide (CO₂) from the atmosphere.

The ESS report highlights all the positive impacts that could be expected in introducing Good Agricultural Practices (GAP) and environmentally friendly technologies, identified by stakeholders and according to the CSA principles, and any impact or benefit that might result from the proposed scale of the project.



1.3 Environmental and Social Assessment Overview

The report has been divided into several sections. These sections provide the reader with a clear understanding of the status of the industry in terms of environmental and social impacts and the safeguards that are in place to prohibit significant damage. Finally, an assessment of impact currently experienced and those expected to be experienced through the project's interventions is done to inform the environmental and social action plan. The sections of the report are as follows:

1. Methodology: A brief description of the methodology used for conducting the environmental assessment.
2. Context: In depth description about the current industry, existing impacts of sugarcane, and laws and policies in the context of the environment and social well-being of affected communities. Existing initiatives and certifications within the industry that have been introduced, and implemented initiatives by organisations that are complying with certifications that drive towards best practices are also discussed to provide context on the progress toward a more sustainable environment and increased state of social well-being.
3. Project impact assessment: Having a good understanding of the context in which the project will operate, an assessment is done on the project components to determine how they will impact or mitigate against environmental and social impacts.
4. Action Plan: Using the assessment of the project components, a plan is developed to ensure the project mitigates against any negative impacts it might have, environmentally and socially.
5. Recommendations and Conclusion: Finally, the recommendation and conclusion will provide key takeaways for the design team to incorporate into the project design.

Methodology

The overarching methodology used in the assessment was presented at the inception stage of the project and included the methodology for the Environmental, social, gender and risk assessment development phase. This section of the project, conducting the ESS, will help ensure that the design chosen complies with the social and environmental standards required by the GCF. The GCF standards on social and environmental sustainability are based on the IFC's environmental and social performance standards and include safeguards with regards:

IFC Performance Standards	Project Impacts
Assessment and management of Social and Environmental risks and impacts	Increase in project social and environmental planning, alignment, coordinated and oversight tools that enhances impact and streamlining.



	<p>Reduction on pest pressure for a one monoculture variety and current damage occurring by pests of economic importance like frog hopper and cane borer.</p> <p>Reduction in air and land pollution due to residue burning and incorporation.</p> <p>Increase in usage of biodegradable material and recycling.</p> <p>Reduced use of inorganic fertiliser with beneficial impact on carbon emissions and less eutrophication and leaching</p>
<p>Labour and working conditions</p>	<p>Improve working conditions and efficiency of farmers in planting, cultivating, and harvesting of green cane and sub product usage to improve land diversity.</p> <p>Reduced exposure to increased temperatures by harvest labour due to more to mechanical green cane harvesting</p> <p>No impact of labour displacement due to low labour supply of cane cutters</p> <p>Reduce labour risk due to fire and fire outbreaks due to dry soil conditions in the field during high temperature seasons</p>
<p>Resource efficiency and pollution prevention</p>	<p>Increase in efficiency of land productivity and more bio circular economy with the use of local resources for improvement of the land</p> <p>Increase of crop efficiency with good agricultural practices and intercropping techniques</p> <p>Improvement of knowledge and efficiency in resource mobilisation for participation organisation, farmers group and beneficiaries</p>
<p>Community health, safety and security</p>	<p>Reduction of impact due to less burning and health related issues</p>
<p>Land acquisition and involuntary resettlement</p>	<p>Increase cooperation among farmers in organised planting to harvest process without resettling and affecting the farmer</p>



<p>Biodiversity conservation</p>	<p>Increase of germplasm base with new varieties that expands the diversity base of a monoculture crop with opportunity to diversify with other crops based on better good agricultural practices.</p> <p>Increase of biodiversity of cane fields that restore soil fertility, flora, and fauna with enhanced practices.</p> <p>Mapping of sensitive areas of high biodiversity which are excluded from project activities</p>
<p>Indigenous people</p>	<p>Improve livelihood of community based with introduction of environmentally friendly techniques</p> <p>Improvement of knowledge based with combined local practices</p>
<p>Cultural heritage</p>	<p>Improve collaboration among communities and livelihood improvement for no traditional and traditional farmers</p>

For the environmental impact assessment component of the ESS assessment the team will use a Rapid environmental participatory diagnostic (REPD) approach to access and define the impacts. This involves the following activities:

1. A review of all existing information on the environmental conditions of the site(s) under the consultancy TOR, aided with the latest satellite imagery available, GIS information stored and collected by the different stakeholders and any environmental physical map. This overview of information was verified by key stakeholder interviews that were conducted by the consultant (see list of persons interviewed in Annex 5).
2. A revision of any secondary information and databases will also be undertaken of the different site(s) to fill any information gaps
3. The specific sites and areas under consideration for the project, will then be characterised in terms of their natural resources, socioeconomic status, infrastructural development needs based on the information collected and structured stakeholder interviews. Some tools that may be used during this activity include:
 - a. Desktop review of relevant environmental and social plans, including primary and secondary sources
 - b. Stakeholder engagement to ensure most relevant aspects are captured
 - c. Structured interviews for specific answers to specific questions formulated from the research and stakeholder engagement
 - d. Assessment of all data, including forecasting

4. The REPD process then takes the information collected and evaluates it in terms of the possible impacts that the project has on the environmental status of the project area. These impacts are diagnosed both from an objective scientific perspective and from the perspective of the interested and affected parties through a comprehensive SWOT analysis
5. Feedback is then provided to interested and affected parties.
6. Thereafter the Environmental and Social Action Plan has been developed as per the requirements of the GCF for a Category C project

The method employed for the assessment therefore is as follows:

- **Literature review** – a thorough review of the literature relevant documents and/or reports from the Cane Farmer Associations, the Miller, Fairtrade documentation signed on by other development actors to allow a deeper understanding of critical aspects of the assessment. The impacts of the machine harvesting were then evaluated to ascertain the possible socio-economic impacts of this project in job loss for the cane cutter population.
- **Interviews with representatives of stakeholder groups.** Consultations with the representatives of the Association inclusive of Chairmen, utilising – face-to-face interviews, telephone interviews and email correspondences. (The findings are not meant to be statistically correct) Some information was also gleaned from previous stakeholder engagement sessions while composing the Gender Assessment Plan. Additionally the assessment was informed by consultations with representatives of Indigenous People (National Garifuna Council and Northern Maya Association).

During discussions we:

- Provided stakeholders with sufficient information about the project.
- Solicited views about the project and identified aspirations and concerns.
- Used stakeholders' feedback, data from observation, and technical knowledge to analyse the effects of impacts and make predictions against data received.

Finally, a series of actions are presented in an Environmental and Social Action Plan before final key takeaways are provided in the conclusion and recommendations section.

Current Context

This section provides a detailed account of the current context of the sugar industry in Northern Belize from an environmental and social perspective. The section identifies the existing impacts that the sector has, positive and negative, on environment and surrounding communities and provides an account of the existing efforts from industry and government to mitigate those impacts.



1.4 Country and Industry context

1.4.1 Country Social Context

Belize is a very ethnically diverse country with approximately eight major groups. These include the Mestizo (52.9%), Creole (25.9%), Maya (11.3%), Garifuna (6.1%), East Indian (3.9%), Mennonite (3.6%), Caucasian (1.2%), Asian (1%) and other (1.5%). Throughout the history of Belize, most of these groups have immigrated to the country and settled in various pockets of the country, allowing for geographic pre-eminence of each group, which then came to prominently define their respective culture within the context of Belize (Premdas, 2002).

Orange Walk and Corozal are no different from the rest of the country as they historically were inhabited by Mestizos from Mexico who had fled the Caste War beginning in 1847. The areas, although mixed, are defined as most populated with the northern mestizo culture within Belize.

The country poverty assessment carried out in 2010 showed that 41.3% of Belize's population or 31% of households were living below the poverty line and an increase to 52% in 2018 (Government of Belize and the Caribbean Development Bank, 2010). The 2018 CPA identifies 9% of the population as critically poor (indigent), 52% as living in poverty, and another 11% as vulnerable to poverty, indicating that over 52% or 201,616 of the population lived in vulnerable poverty. The percentage of persons living in poverty is also higher in rural than urban areas, in 2018 the poverty rates of Corozal and Orange Walk districts are 45% and 57% respectively. Moreover, Belize encounters an ongoing inequitable income distribution across all productive sectors.

Poverty, in this instance, is defined “as not having the per capita income to afford a market basket of basic food” (MFB), whereas indigence means “falling short of being able to afford even food” (Close, 2017, p. 276). The market basket is determined by calculating the minimum cost of a balanced diet, within a particular community, for an adult male consuming 2,400 calories/day.

Table 1: District Minimum Food Basket Costs for an Adult Male

District	Daily Cost	Annual Cost
Corozal	\$5.35	\$1,953.00
Orange Walk	\$5.32	\$1,942.00
Belize	\$5.36	\$1,958.00
Cayo	\$4.91	\$1,791.00
Stann Creek	\$5.99	\$2,186.00
Toledo	\$6.12	\$2,234.00
Country	\$5.50	\$2,005.00



Source: Government of Belize and the Caribbean Development Bank (2010)

An additional 13.8% of the population or 12.9% of households, while not poor, were considered vulnerable to poverty. When an individual or household expenditure is less than or equal to 25% above the General Poverty Line (GPL) of the community, then this individual or household is thought to be vulnerable to poverty. The GPL is derived from determining the average food share (of total expenses) of the poorest 40% of the community and then accounting for the difference (MFB x reciprocal of food share) in expenses.

The GPL also tells a story of the cost of living within particular areas of Belize. Of importance to this project are Corozal and Orange Walk specifically.

Table 2: District General Poverty Line

District	MFB Annual	Food Share	Annual General Poverty Line
Corozal	\$1,952.00	64%	\$3,041.00
Orange Walk	\$1,941.00	59%	\$3,308.00
Belize City & surrounding	\$1,920.00	50%	\$3,810.00
San Pedro Town	\$2,354.00	45%	\$5,279.00
Belmopan & surrounding	\$2,088.00	56%	\$3,730.00
San Ignacio/Santa Elena & surroundings	\$1,621.00	54%	\$3,537.00
Stann Creek	\$2,186.00	56%	\$3,906.00
Toledo	\$2,233.00	81%	\$2,753.00
Country	\$2,005.00	58%	\$3,429.00

Source: Government of Belize and the Caribbean Development Bank (2010)

Finally, Belize's not poor population constitutes 44.9%. These individuals have an expenditure that is more than 25% above the General Poverty Line. While the poverty situation in Belize might look dismal, it must be remembered that the actual "not poor" figure is 69%, which considers those who are vulnerable but not poor.

The Country Poverty Assessment Report also indicated that several external impacts created this picture of poverty in Belize, including but not limited to a sluggish economy due to a global recession, setbacks in several of the agricultural industries, a hurricane in 2007, and major floods in 2008 and now COVID-19 for which data is not available.

Table 3: Extent of Poverty

Category	Indigent	Poor/Not Indigent	Total Poor	Vulnerable	Not Poor	Total Not Poor	Grand Total
Households	8,539	16,852	25,390	10,583	45,927	56,510	81,900
	10.4%	20.6%	31%	12.9%	56.1%	69%	100%
Population	52,185	84,455	136,640	45,614	148,460	194,074	330,715
	15.8%	25.5%	41.3%	13.8%	44.9%	58.7%	100%

Source: Government of Belize and the Caribbean Development Bank (2010)

Belize District has 80,585 persons within its working-age population. Of this figure, 69% or 55,626 comprise the labour force. The remaining 41% do not comprise the labour force because they are not available or cannot work. This includes students, housewives, disabled and retired persons.

Table 4: Belize District Labour Force Distribution by Age Group

Age Group	Working Population	Age	Labour Force	Unemployed
14 – 24	24,555		10,846	3,415
25 – 34	19,472		17,325	1,848
35 – 44	15,133		13,312	1,308
45 – 54	10,650		9,045	448
55+	10,775		5,095	86
Total	80,585		55,626	7,105

Source: Statistical Institute of Belize (2010)

Moreover, forty thousand plus individuals in the labour force are males while 25,086 are females. The group of 25-34-year-olds have the highest representation in the labour force of the Belize District. This is followed by the 35-44-year-olds and the 14-24-year-olds, respectively. The bulk (41%) of the labour force in this district has only a primary level education; 31% has



a secondary level education; 21% has a tertiary level education, and the remaining have no education or were not sure.

The unemployment rate in the Belize District is 12.8%, which equates to 7,105 individuals. This is slightly higher than the national average of 11.1%. Unemployment among Belize District women is almost twice as high as that of men. Unemployment among men in the Belize District is the second highest in the country at 9.2%, trailing the male unemployment rate in the Stann Creek District by 0.3%.

The bulk of the unemployed has only a primary school level education, followed by those with only secondary school level education. Manual labour in agricultural fields is often sourced from countries seeking better wages, such as Guatemala, Mexico, El Salvador, Guatemala, and Honduras. COVID-19 has restricted this travel. The salary for this type of work is \$8 per ton versus fishing which has become more lucrative, with a pound of fish gaining \$12-15 dollars and a pound of lobster fetching \$25.00.

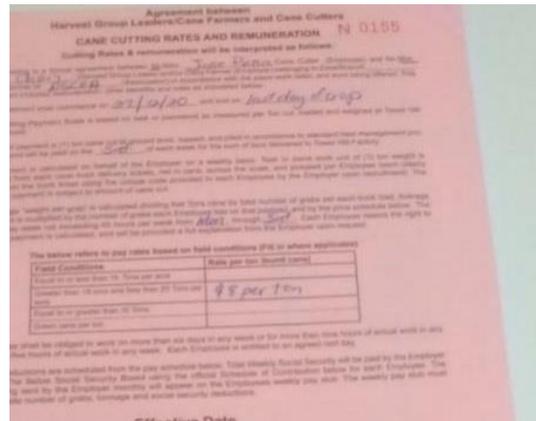


Figure SEQ Figure * ARABIC 1 Cane Cutter agreement

Mechanical harvesting is not expected to displace workers. As has been observed in the past years, and more particularly evident in 2022 and 2023, the output of cane logged during the crop reduced. This is attributed to two main factors:

1. Increase in temperatures have decreased the productivity of cutters from an average of 4 tons per day per to 2.5 tons per day¹. This loss of productivity reduces income earning potential for cutters.
2. Attrition of cane cutters during the year.

Due to the labour supply shortage of cane cutters, BSI/ASR is estimating a gap of 14,847 acres of cane remains unharvested annually. To cover this gap, BSI/ASR posits that the mill needs to go beyond the 28 weeks cane season. This in turn possesses related risks as the rainy season shuts down the crop.

Alternatively, farmers would have to seek migrant work, or leave unharvested cane in the field as has been the case in the past years.

Table 5: Belize District Labour Force Distribution by Highest Level of Education

Education Level	Working Population	Age	Labour Force	Unemployed
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¹ <https://edition.channel5belize.com/archives/254087> date accessed: 10/11/2023



None	6,124	3,780	316
Primary	38,271	22,863	4,278
Secondary	21,609	17,121	1,706
Tertiary	13,659	11,523	804
Other	257	-	-
Do not know/ Not sure	666	338	-
Total	80,585	55,626	7,105

Source: Statistical Institute of Belize (2010)

The bulk of economic activity in Orange Walk and Corozal is based on the Agricultural and mainly Cane Sugar industries. A new Beer manufacturer and existing Rum manufacturer are the significant economic earners and banks, commerce, and the free zones. An alternate livelihood source of recent has become fishing and tourism in Sarteneja, the shores of Corozal, and nearby San Pedro. However, with the dire poverty and unemployment rates, the sugar industry plays an enormous role in the fight against poverty for the most vulnerable, especially for those providing labour intensive services, such as cane cutting.

1.4.2 Sugar industry

Sugarcane is a key economic activity in over 100 countries, particularly in developing economies with a high level of poverty and unemployment. As a provider of income and employment, sugarcane-based agriculture has an important role to play in the economic growth of developing economies, especially in the upliftment of under-skilled rural people.

Global sugar production from both sugarcane and sugar beet grown in 130 countries was just over 168 Mt in 2010 (ISO Quarterly Market Outlook 2011), with sugarcane's share increasing to 79 % of global production. Developing countries share of sugar produced from sugarcane has grown from 67% in 1998 to approximately 72 % in 2010. Production is becoming more concentrated within certain countries, with the top ten producing countries increasing their share from 56 % in 1980 to around 70 % in 2010. The main driver for this expansion is increased world sugar consumption resulting from rising incomes and changes in food consumption patterns, particularly in Asia and Africa.²

Like in many developing countries, the sugar industry is a vital component of Belize's economy. The sector provides significant employment, foreign exchange earnings and other social and environmental benefits.

The sugarcane-sector is one of the largest in the agricultural sectors in Belize and is its single most important agriculture export product, with earnings from the industry being critical for maintaining a favourable current account balance and foreign exchange stability in Belize.

² GOOD MANAGEMENT PRACTISES MANUAL FOR THE CANE SUGAR INDUSTRY (FINAL)

Over the past 10 years, sugar accounted on average for 7.8% of total GDP and 33.6% to foreign exchange as a percentage of agricultural exports (World Bank, 2016),³ ranking as number 1 in foreign exchange generation during the last 4 years (Avila, 2018).

In the Caribbean region, Belize has historically had the lowest productivity for sugar cane production, less than 50% than the yield levels obtained in Guatemala, Nicaragua, and El Salvador. However, based on latest improvements, it is quite feasible for Belize to reduce this yield gap in the next 3 to 5 years by using good agricultural practices. This is shown by the total cane production recording record production during the last 2 years, approximately 1.29 million tons, far above the 7-year average of 1.13 million tons.

The sugar industry is largely concentrated in the rural areas of Corozal and Orange Walk, the two northernmost Districts of Belize covering an area of 2,508 sq. miles that contains the sugar belt. This area accounts for 27.4% of the total population in Belize and 56,300 or 38.8% of the 145,200 rural residents in the country. The industry therefore plays a crucial role in the standard of living of almost 40% of the rural population in Belize.⁴ In total, it is estimated that approximately 40,000 persons (10% of total population) rely on the industry for economic and social support.^{5 6}

However, to continue the production trajectory, basic problems of sugar production needs to be addressed:

- Low productive yield and low quality of the traditional production system,
- High cost of harvesting and transportation,
- Lack of reliable cane production information hindering the effective decision making of the industry,
- Insufficient affordable credit, financial education and entrepreneurial training for farmers.

In this context, the Project design is therefore very relevant to directly or indirectly address these problems. If the farmers are better trained and are able to adopt the recommendations of the project, they will improve cane yield and reduce unit cost through better economic decision making in field operations and more efficient use of labour and cash inputs, thereby enhancing profit margins.

For the Belize northern sugarcane industry to be an economically viable and environmentally sustainable sugar industry by 2023, cane production should be at 1.8 m tons, based on an average of 34 tons per acre and production cost of less than a 1/3 of the price paid per ton of cane. This would be achieved if 7,500 to 11,250 acres of cane area would be managed with best practices, at least 7,500 acres would be under comprehensive water management, and the rest of the cane area would be under block farming. In sum, farmers

³ [World Bank Document](#)

⁴ SDP, 2016. Sugar Industry, ASR/BSI. Belize.

⁵ [Belize: Selected Issues in: IMF Staff Country Reports Volume 2016 Issue 093 \(2016\)](#)

⁶ [Belize Sugar Industries | ASR Group \(asr-group.com\)](#)



would be producing 1.8 m tons of cane on approximately 52,900 acres of land compared to the current 1.2 m on at least 75,000 acres. If the production, cost and yield targets are achieved, BSI/ASR is committed to mobilising a US\$ 10 m investment for the factory in phase 1 and another US\$ 80 m in phase 3 of the plan of the upgrading project started in 2016 ⁷(BSI, 2021).

Cane farmers currently produce more cane than the 1.3 m tons the mill can crush, which discourages them from investing and improving cane production. In the recent past it was estimated that farmers were left with 360,000 tons of cane standing in their fields, and farmers have expressed their concern regarding a re-occurrence of problems with the mill. In addition, the cane farmers did complain about their cane being left too long in the field, which causes the cane to rapidly lose its quality, as much as 50% (Cardno 2016). BSI/ASR management expressed the view that if the farmers can produce more, the mill can handle it. Presently investments are being made to expand capacity to 1.5 m tons.

That was the case with the Credit Fund for replanting and ratoon maintenance which effectively failed with 62% (Eur 3.5 m) of the total available fund remaining undisbursed (Cardno 2016). The principal reason advanced for the low loan disbursement rate is that applicants are in deep debt. As such only 1 in 5 cane farmers who were technically vetted by SIRDI and applied to the Fund were successful. The other 4, due to too much debt with the commercial bank, posed a large risk of loan defaulting.

Weather and cane prices are very important factors for cane farming. The rains were very favourable for the 2016/17 crop season, whereas the past two years, Belize has experienced severe droughts. The volatile and unpredictable sugar prices on the world market, where Belize has to sell sugar from now on and which determines the price paid to farmers for cane delivered, is driven by world demand, which is out of the farmers' control.⁸ Over the past 5 years, yield and quality has improved, but more importantly, sugar prices has been favourable⁹ where farmers were paid \$64 per ton in 2017, compared to \$54.24 per ton in 2016. In 2017, farmers received \$81.3 m as total cane income, an increase of 20% over that of the previous crop. ¹⁰

Sugar production in the Corozal and Orange Walk districts, with cane production for 2018-2019 reaching 1,317,626 metric tons (MT), and sugar production 156,646 MT after 214 days of milling. Production for 2019-2020, which came to an end on July 21, saw cane farmers delivering only 893,662 MT, and the mill only produced 88,000MT after 189 days of grinding.¹¹

⁷ [Belize Sugar Industries | ASR Group \(asr-group.com\)](http://Belize Sugar Industries | ASR Group (asr-group.com))

⁸ CDB supports Relief Measures for Drought-Hit Farmers in Belize – CARICOM Today

⁹ Current global sugar price has increased by 5% from the 2018 level:
<https://tradingeconomics.com/commodity/sugar>

¹⁰ <https://lovefm.com/20162017-sugar-crop-deemed-a-success/>

¹¹ Sugar harvest/production way, way down! | Amadala Newspaper



BSI/ASR is very concerned about the effect of decreasing world market sugar prices on the sugar industry, hence its proactive approach on producing direct consumption sugars for CARICOM countries under the provisions of the single market and economy.

If cane prices decline, then the farmers' management inputs, investment and improvements will also decline. If cane price dips below \$50 per ton, farmers fear cane production will not be profitable or sustainable. Therefore, it is of utmost importance for the sugar industry to be proactive in working towards more sustainable and cost-effective practices or change the Business-as-Usual model currently operating in the entire sugar industry.

1.4.3 Agencies within the sugar industry

Institution	Legal/Administrative Mandates	Environmental protection role
Sugar Industry Control Board (SICB)	Regulates the entire sugar industry within the agriculture sector in Belize. The SICB is a quasi-government institution funded through the Sugar Industry Development fund.	The Sugar industry ensures that all the sugar cane stakeholders have a contribution toward the sustainable development of the sugar industry, providing policy and action plans that can benefit the industry through the participation of the stakeholders. The Ministry of agriculture has a strong leadership role
Sugar Cane Production Committee (SCPC)	The SCPC is an enforcement body, where all the sugar industry stakeholders that have a direct input in the industry, ensure compliance to the established guidelines and policies of the SICB. The body has a major role in sugar cane quality and delivery of sugar cane production.	The SCPC can provide assistance in following the guidelines of Fairtrade and ensure compliance to the different policies that ensure compliance to environmental compliance in the use of pesticides, good agricultural practices, burning of sugar cane and delivery
Sugar Industry Research and Development Institute (SIRDI)	SIRDI is an autonomous body under the SICB with the same stakeholders that should actively participate in Research and development using education, research and transfer of technology and implementation of several development projects	SIRDI has actively participate in training of farmers in different areas, using a Farmers Field School approach and training in different environmental awareness programmes



Ministry of Sustainable Development, Climate Change and Disaster Risk Management	Oversees sustainable development, climate change and disaster risk management portfolios.	Land use planning, coordination of Climate Change including REDD+, sustainable development planning.
Forest Department	Oversees the sustainable management of Belize’s forest resources.	Lead agency in development of REDD+ RPP, forest planning and monitoring, forest carbon assessment, and participation in International REDD + initiatives.
Reducing Emissions from Deforestation and Forest Degradation (REDD+) Coordination Unit	Planning and executing REDD+ activities.	Promoting the mainstreaming of REDD+ initiatives, activities and products into various sectors of the economy; development of proposals for national REDD+ pilot initiatives; planning and oversight of relevant research and studies as part of readiness activities. promoting collaboration and partnerships with local and national institutions towards achieving the objectives of the REDD+ Strategy.
National Climate Change Office	Relay information to the public and private sectors, local communities and schools on all aspects of Climate Change; guide the initiative of having both the public and private sectors work in conjunction with each other to build Belize’s resilience to Climate Change; ensure that Climate Change ideologies enter and remain in Belizean colloquialism, action and decision making.	Work closely with the REDD+ Coordination Unit in planning and executing REDD+ activities.
Protected Areas Conservation Trust (PACT)	To contribute to the sustainable management and development of Belize’s natural and cultural assets for the benefit of Belizeans and the global	Fiduciary agent of the REDD+ Readiness Preparation Grant



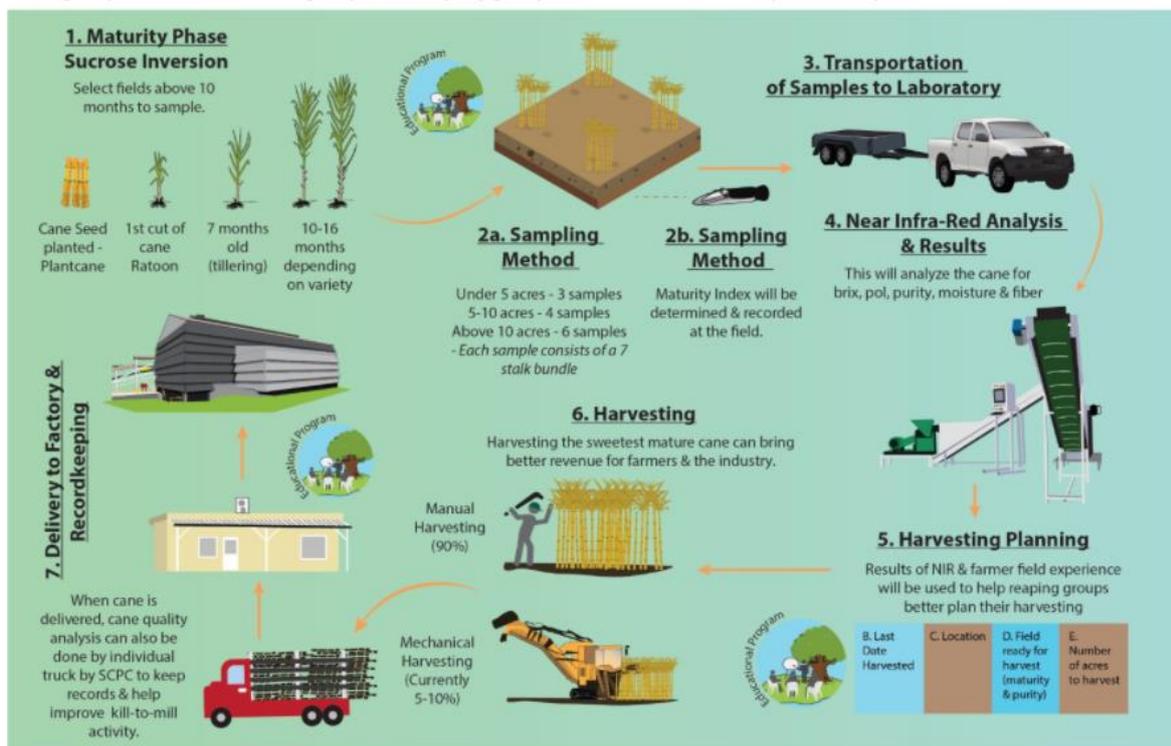
	community, both now and for future generations.	
Department of the Environment	Prevent and control environmental pollution, prohibit dumping, require and regulate environmental impact assessments, interpret issues regarding nutrients, environmental investigations and applying general penalties.	Conduct environmental monitoring, enforcement and require and regulate the conduct of environmental impact assessments (EIAs). This project do not trigger the EIA requirement of the DOE
Lands and Survey Department	Management and allocation of national lands, registration of land tenure, authentication of plans for all legal surveys, subdivision of lands, valuation of lands, land use planning, land information management.	Implementation of National Land Use Policy in particular in relation to land tenure and the rights of indigenous peoples.
Agriculture Department	Provide an environment that is conducive to increase production and productivity, promoting investment, and encouraging private sector involvement in agribusiness enterprises in a manner that ensures competitiveness, quality production, trade and sustainability.	Development of a climate resilient agriculture sector in Belize through the fulfilment of climate change adaptation and mitigation activities using sustainable practices and the promotion of climate smart agricultural technologies.
Labour Department	Provide an overview of the organisation in fulfilling the Labour Act and compliance. The Department also receives complains and takes corrective actions for violations of the Labour Act, in areas of child labour and employees' welfare.	The Department monitors and provides training and oversight of the industry in matters related to child labour or work permits for migrants in Belize.
Fairtrade International	Conduct certification of Farmers Associations and compliance to Fairtrade Standards, also sanctions non-compliance of standards by penalising the associations either by	The standards have strict environmental and social standards that farmers have to fulfil progressively until a fully sustainable status is obtained as



Pre-harvesting Sampling & Analysis Process



BSI and/or SCPC Field Officers will assist 6 test groups in the first year; another 6 in the second year and 4 in the third year to be able to conduct their own pre-harvest sampling and analysis process. This will happen through one-to-one and group exercises with test group and reaping group leaders. The team will follow the process below:



	suspending or loss of certification and therefore premium benefits	the process of certification advances.
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1.4.4 Sugarcane farming

The operating environment from a structural and institutional point of view for farming sugarcane is maintained by the various agencies. However, although these agencies provide guidance and insert various frameworks, policies, and initiatives to become more resilient, it is important to consider the physical act of farming when considering the environment and social impacts that sugarcane has.

Figure 2 below, describes the cyclical practice of sugarcane production in Belize. The production cycle at a high level includes field production, haulage to the factory and finally processing sugarcane to obtain sugar as the main product.

Figure 2: Sugarcane production cycle in Belize



The production cycle of sugarcane as an agricultural process, is highly reliant on the environment and environmental conditions. The effect of changing climate is felt at all levels of the production cycle displayed in figure 2.

- **Seed cane:** As climate changes and rainfall patterns change, new sugarcane varieties have to be tested and introduced to adapt to new conditions (namely to survive droughts and diseases).
- **Maturing phase:** The maturing phase for sugarcane is the growth period. During this period, it is crucial that the moisture is properly managed not to stress the cane, reducing yield and quality.
- **Harvesting plan:** The harvest plan is critical for the mill to ensure it has a constant supply of cane – no-cane stops are extremely costly. Climate change, through the variable rainfall experienced, pose a risk to the harvest plan especially when there are limited cane varieties that mature at a similar time.
- **Harvesting:** The harvesting process is historically labour intensive and at risk to delay with heavy rainfall. Improving the in-field drainage will allow water to flow off the fields, allow farmers to send in the harvest teams (cane cutters or mechanical harvesters)
- **Haulage and Processing:** Haulage of cane requires trucks to track the cut cane to the mill, often many kilometres away from the field. Seasonal rainfall and heavy downpours cause mud to be carried along with the cane to the mill and often causes trucks to be delayed due to poor road conditions in the rural areas of Belize.

Most importantly, each of these steps have specific areas that are directly impacted by climate change. At a recent consultation by Agricane in June 2021, sugar cane stakeholders indicated the different areas of concern with specific details of what action will need to be considered to mitigate these environmental concerns.

Table 6 below describes the main environmental challenges of the Belize Sugar industry based on consultation with stakeholders.

Table 6: Environmental Challenges

Crop	Main challenges	Other relevant challenges	Main environmental challenge	Other relevant environmental challenges
Sugar Cane	Low average yield production	Industry old ratoon	Burning of sugar cane field	Loss of organic matter
	Low sugar prices	Single sugarcane varieties dominate the sector.	Low organic matter content	Fertility of soil depletion
		Pest and diseases	Limited composting and	Erosion



			trash management	
			High level of fertiliser leaching	Drought
			High level of industrial waste that is move to landfill	Flooding of low-lying areas

Table 7 provides a list of potential actions identified by the stakeholders to mitigate against the challenges above. These actions highlight that farmers are mainly concerned with factors that impact low production and low sugar price.

Table 7: Potential Actions

Crops	Actions identified by stakeholders	Prioritised Actions
Sugarcane	Soil erosion control	Soil and land management (minimum tillage)- Trash management Water-efficient management/ reuse of wastewater (e.g., vinasse for irrigation)
	Protection of waterways and riparian forest	
	Mulching	
	Biopesticides	
	Preservation of wildlife	
	Protection against fire- Fire breakers	
	Source of organic matter	
	Follow land	
	Crop rotation	
	Intercropping	

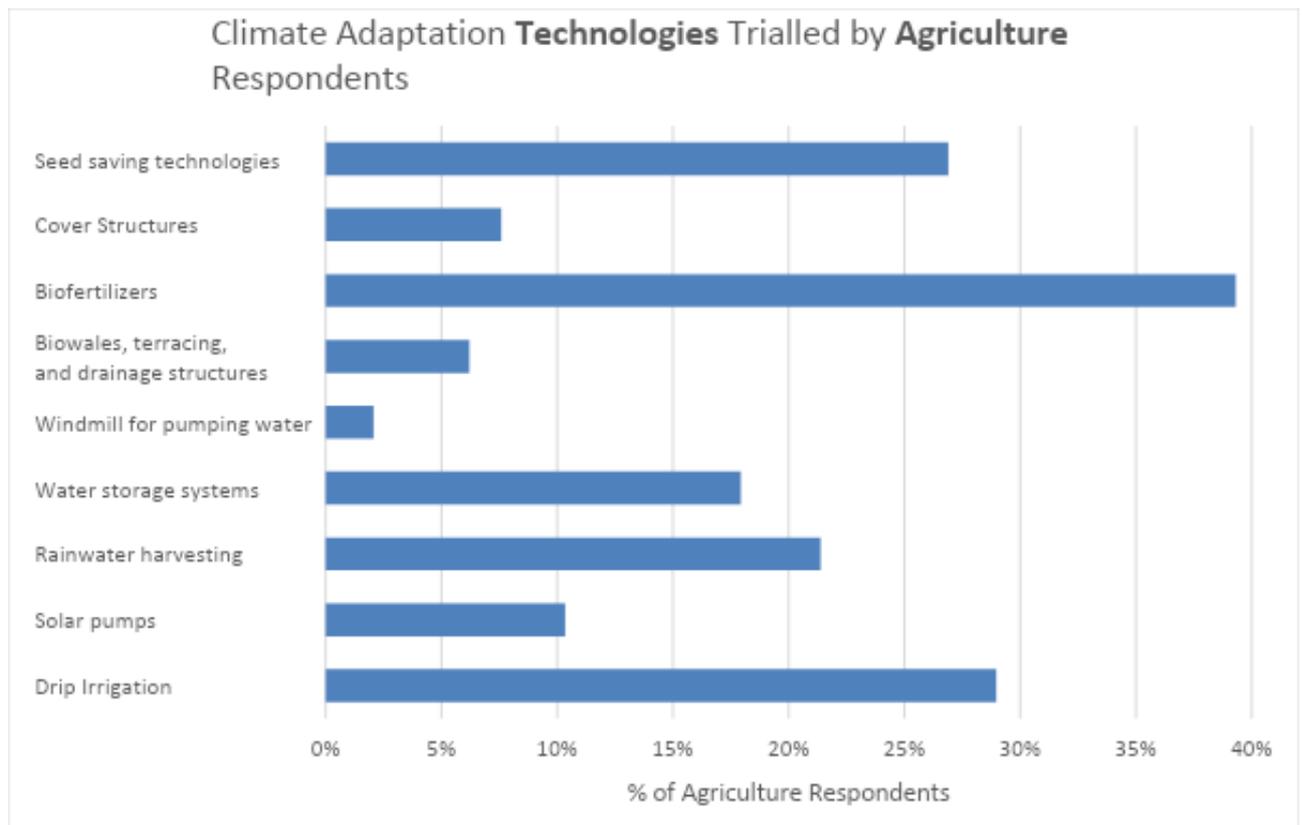


Figure 3: Climate adaptation technologies

Irrigation and green harvesting were two elements also raised in the consultation process and have also been elements that are being considered in several initiatives of the Irrigation and Drainage Master Plan. Mechanics in green cane harvesting have been considered under separate activities, being that green cane harvested had been limited to only piloted areas with limited consideration, the first being that farmers prefer to burn cane prior to harvesting as a standard practice.

The data showed mixed results in terms of the prior experience of respondents in trialling new technologies or practices to mitigate climate risks. While some were as high as 68% (soil and land management) others were as low as 2% (windmill for pumping water). The following charts provide more specific data points on common technologies/practices utilised by agriculture respondents in Belize. In terms of technologies, biofertilizers were the most trialled, with seed saving technologies and drip irrigation as the next most frequent. Overall levels of technology penetration were fairly low, none rising to more than 50% of agriculture respondents. Other solutions cited in the FGDs include butane equipment for storage, solar energy, drone technology and GIS mapping, and bio-secured chicken coops.

In terms of agricultural practices, soil and land management practices are commonly used, reaching almost 70% of respondents, as is crop rotation at almost 60%. Other practices, such as grafting techniques and plant density management, are much less known and represent opportunities for the project. The FGDs also brought out the importance of crop diversification in being resilient to climatic events and income disruptions. Crop

diversification programs have been implemented nationally, primarily in honey, onion and sheep along with vegetable and poultry.

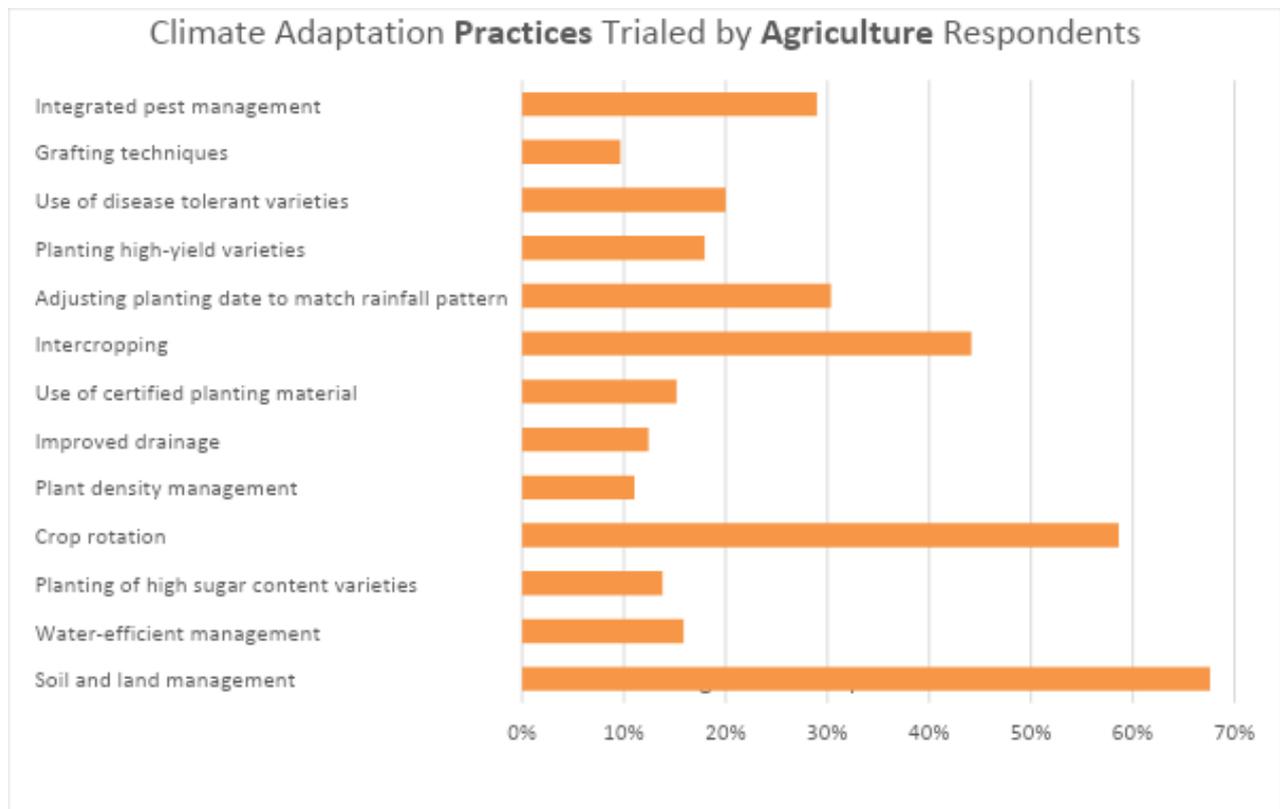


Figure 4: Climate Adaptation Practices

The challenge has been limited capacities in the country to deliver such programs and despite many interventions of international experts and exchanges, farmers are not willing to diversify due to risks of not having a market, financing and consistent technical support for implementation.

While there are a series of activities that can provide a solution to the challenges identified, farmers view the issue relating to soil nutrition and water efficiency as those that can provide an immediate solution to critical environmental problems and can also increase competitiveness and productivity of the land.

1.5 Social conditions and impacts

Over the last decade, various economic, social, and environmental issues have pushed the sugarcane sector in other parts of the world toward mechanical-based agricultural operations when harvesting and planting. Mechanisation in sugarcane agriculture in Belize has increased over the last few years, especially in harvesting and planting operations. However, the consequences of such a technological shift are not fully comprehended when multiple perspectives are considered, such as economic aspects, environmental regulations, and social context.

Historically, sugarcane production technology has been based on manpower and associated with the pre-harvesting burning of straw to reduce the risk of poisonous animals, decrease production costs, and improve field conditions for rural workers. Manual technologies are typically related to the highest job creation levels in other parts of the world; however, this is different in Belize, where manual labourers are hard to find and are often imported from Central American neighbours.

Although mechanical harvesting appears to consolidate its path in the sugarcane sector, many questions can still be raised regarding its sustainability. Some publications indicated that sugarcane mechanisation is related to lower production costs when compared with the manual system. Moreover, mechanical harvesting is associated with environmental benefits, such as reducing greenhouse gas (GHG) and particulate material emissions due to the elimination of sugarcane

burning. Although mechanisation in rural areas leads to lower job creation, this impact would be minimised by additional and better job opportunities in sectors such as machinery and inputs to agricultural production. Moreover, mechanisation would promote better working conditions and higher income when compared with the manual sugarcane production system.

In Belize, the local cane farmer associations agree that manual cutting is phasing itself out since cane cutters are an ageing group. The youth are not interested in manual labour and are seeking educational opportunities and alternate livelihoods. Several farmers have indicated that cutters are not reliable and affect them achieving their quotas. This means that if the Belizean industry does not shift to at least 35-50 % mechanisation, the cane farmer will be at terrible risk of inability to reap their harvests and stay up to date with deliveries at the mill. The eight dollars per ton paid to cutters as in the cane cutter agreement does not make this a compelling career choice, especially since the minimum wage in the Agricultural sector in Belize is \$3.30 per hour.

The only Association that asserts that cutters will be displaced is the BSCFA. . The BSCFA asserted that current acreage could not use mechanical harvesters as the terrain was not prepared with this technology in mind, and better preparation of the soil is required, which would be done with new crops. Most associations asserted that some fields are ready for Mechanical Harvesting based on Santander Sugar's preliminary assessment.

In evaluating the social impacts of the project, the gap in harvesting due to availability of cane cutters within the sugar industry was used to validate that the introduction of mechanical harvesting will not displace cane cutters. While BSCFA concludes that there may be displacement of cane cutters, consultation with other stakeholders within the



industry such as the BSI, SIRDl, and the other three farmer Associations has confirmed the opposite. This project will introduce mechanical harvesting to only 2000 acres of the 65000 acres of sugarcane within the northern sugar industry. When contrasted with the gap in availability of harvesters within the industry over the past three crop cycles 2021-2023, mechanical harvesting presents an opportunity to augment the shortfall in sugar cane harvesting¹². The study found that inter alia, intense heat has contributed to in this shortfall in available cane cutters, and ultimately harvesting of sugar cane¹³.

1.6 Environmental conditions and impacts

Farmers in Belize emphasised during interviews that droughts have lasted longer in recent years, and many are worried during the summer months where some weather stations were reporting up to fifty percent below normal rainfall. On the other extreme, floods are more severe, adequate drainage is lacking and water catchment/reservoirs are not adequately installed/planned to combat drought periods. Interviewees concurred to this trend of unpredictable extended climate conditions that are causing more severe drought and floods.

Climate adaptation and mitigation efforts by this group of farmers needs to be fast tracked to achieve a state of resiliency. During the interviews, farmers demonstrated awareness of climate risks and were open to innovations that could be reasonably sourced. Current precautionary measures and adaptation practices includes production of biofertilizer, use of biological control for pest management, storage facilities, trialling of new crop varieties, improving equipment, installing irrigation lines and aggregating services, crop rotation and diversification, and improved soil and planting methods, but is it enough to adapt to the anticipated climate change and mitigate against the damage that has already been done.

Therefore, we need to consider the impact sugarcane has and the current state of the soil, water, air and biodiversity in Belize.

1.6.1 Soil degradation

The soil is a living, dynamic system made up of different mineral particles, organic matter and an extremely diverse community of living and interacting microorganisms that is referred to as the soil ecosystem or the soil food web. Soil not only provides mankind with food and renewable energy sources, but also produces living space and food for billions of microorganisms. Conservation of this ecosystem is seen as vital for maintaining the physical, chemical and biological integrity of the soil and the sustainable cultivation of sugar crops (e.g., Morgan 1986; Meyer and Wood (2000).

¹²<https://amandala.com.bz/news/cane-harvesting-issues/>;<https://edition.channel5belize.com/archives/254087>;
https://maxhavelaarfrance.org/fileadmin/fairtrade/Etudes_impact/2018_BelizeSugarCaneCutters_Study.pdf date
accessed 10/11/2023

¹³ <https://edition.channel5belize.com/archives/254087> ; Date accessed 10/11/2023.



Sugarcane cultivation, particularly when grown as a continuous monoculture, can contribute to soil degradation and yield decline (Henry 1995, Meyer 1995, Garside et al 1997, Haynes and Hamilton, 1999). It is the use of intensive agricultural practices such as ripping and deep ploughing, overfertilization, no recycling of organic residues, no legume breaks, uncontrolled field traffic that lead to soil compaction, which in general represents a threat to soils in tropical areas (Meyer and van Antwerpen, 2001).

Where planting and production practices take place under conditions of high rainfall and steep terrain, the potential for soil loss through erosion and loss of nutrients is high. More so, this could also lead to the loss of diverse communities of soil organisms and cause material that is washed away into rivers to damage downstream ecosystems (such as coral reefs) and economic infrastructures (such as dams).

Belize soils conditions are heterogenous, in fact, some of the major problems currently being experienced include low chemical fertility of soil after much years of cultivation, limited soil depth or shallow agronomic soil layer related to the origin of soil, high soil compaction where mechanical harvesting occurs compounded with low organic matter content, this is also extended to the practice of slash and burn, high clay content in soils based on type, high calcium/high pH ratio in identified areas, extended problem in drainage, among others.

Irrespective of the soil order in the sugarcane growing areas of Northern Belize, the primary sugarcane nutrient need (Potassium) is extremely low. Measures to increase soil fertility and the soil holding capacity of the element is key within a changing environment of increased precipitation since the physicochemical characteristics of these soils will allow for immediate loss through run-off and erosion.

The current practice of slash and burn has created problems of biomass inefficiency and depletion of organic matter, therefore inherent nature of the soils within the sugar industry, being of low soil organic matter percentage (i.e., generally < 4%), coupled with the practice of annual sugarcane burning to allow for manual and mechanical harvesting are known existential threat to the further reduction of soil organic matter percent (%OM) in these soils.

The resulting effect of low organic matter and burning is the fostering of low biological activity within the soils of the sugarcane industry. Low biological activity directly and negatively impacts the efficiency of the nutrient cycle (i.e., uptake of mineral elements/nutrition by the plant).

Low soil Phosphorus (P) uptake as determined by Ortis, Ruben (2016) certainly can be ameliorated when measures are put in place to allow for an increase in soil organic matter. Green cane harvesting and the allowance of cane trash decomposition, micro-biological amendments to aid in cane trash decomposition and increased soil biological activity will enhance nutritional uptake and the overall soil physico-chemical characteristics. With the changing climatic factors, increasing the soils' biological activity through continuous inoculation with beneficial soil microorganisms will off-set their natural loss through burning

coupled with high soil temperature exposure as atmospheric temperature rises and the dry season gets longer.¹⁴

1.6.2 Water impact

Watercourses and aquatic habitats can be polluted by agrochemicals and sediments due to both sugarcane cultivation and downstream sugarcane processing. Groundwater can be contaminated by leaching of nutrients from fertilisers especially when applied to sandy soils that can extend to downstream coastal zone ecosystems (WWF 2003). With regard to pesticides and herbicides, while there is still considerable concern about the potential for pollution, it would appear from recent reports that the better management practices being employed by commercial agriculture are having increased benefits.

Most reports indicate that approximately 100 mm of water (effective rainfall or irrigation) is needed to produce 10 tc/ha (1 ML/ha/10 tc) (Isobe 1968; Humbert 1971; Scott 1971; Thompson and Boyce 1971). If one assumes that rainfall is only 70 % effective, then the water requirement translates into about 14 ML for a 100 t/ha crop of sugarcane. Other reports quoted by Cheesman (2004) provide estimates ranging from 15 to 54 ML/ha for irrigated cane growing in parts of northwest Australia (Wood et al. 1998). A subsequent study reported an allocation of 17ML/ha and a budgeted value of 22ML/ha (Gosnell 2002). Despite their importance to the industry, sugarcane irrigation systems have often been found to be inefficient, leading to wastage of water. Groundwater withdrawals are reported to exceed natural recharge rates of aquifers, leading to the lowering of water tables, potential salinization and land subsidence in many parts of the world (Gopinathan and Sudhakaran 2009). There are not enough water sources further that can be diverted for increased sugarcane production.

The effects of climate change are projected to intensify in future. Climate projections for Belize suggest that temperatures could rise 1.3 °C by the 2030s, 1.8 °C by 2050, and 2.1 °C by 2070. Climate models also show that rainfall is likely to decrease throughout the country, with decreases ranging from 7% in the northern zone to 10% in the southern zone. These changes in temperature and precipitation patterns will interact and produce effects that will severely impact crop and livestock production. The Intergovernmental Panel on Climate Change Coupled Model Intercomparison Project Phase 5 multi-model ensemble projects that severe drought likelihood will increase 0-67% by 2050 and 0-95% by 2100 compared to the historical baseline; the number of hot days will increase 19-87 days by 2050 and 83-196 days by 2100 compared to the historical baseline; and the daily probability of heat wave will increase 13-41% by 2050 and 35-75% by 2100 compared to the historical baseline.¹⁵

¹⁴ Usher W. 2021. Belize Northern Sugar Industry Soil Fertility Management for Increased Sugarcane Production. Building Adaptive Capacity of Sugarcane Farmers in Northern Belize Project Preparation. Agricane, Belize. 17 pg.

¹⁵ CIAT; World Bank. 2018. Climate-Smart Agriculture in Belize. CSA Country Profiles for Latin America and the Caribbean Series. International Center for Tropical Agriculture (CIAT); World Bank, Washington, D.C. 24 p.

1.6.3 Air pollution

Impact of burning the cultivation of cane can result in air pollution where the crop is burnt prior to harvesting. Many industries have established codes of burning practice to limit the nuisance value and danger of smoke on highways.

The cultivation of sugarcane results in varying levels of air pollution in the form of nitrogenous emissions from soils, arising from the use of nitrogenous fertilisers which release nitrous oxide from either the nitrification of ammonium or the denitrification of nitrate in wet environments.

In sugar industries with high rainfall (> 2 000 mm/y) or over-irrigation, the potential for nitrous oxide release is very high, especially where the soils are not well drained (Keating et al. 1997). Nitrous oxide is a potent greenhouse gas (GHG) that can add significantly to the carbon footprint of sugar or ethanol production. It is problematic not only because it is 298 times more absorptive than carbon dioxide but can also linger in the atmosphere for over a hundred years.

In GHG balance studies, calculating the global warming contribution from N fertiliser is uncertain and dependent on the fate of applied N. Nitrous oxide emissions can vary by more than two orders of magnitude, depending on the combination of soil composition, climate, crop and farming practices present (Rein 2010). Following the IPCC recommendations, the assumption is made that 1.325 % of N in nitrogen fertiliser is converted to N in N₂O through nitrification and denitrification. However, this is very general and should be based on at least the soil type and crop potential. N fertiliser use efficiency by the crop will vary widely from 25 to 60 % and will depend on soil type, application methods, cultivar and system of irrigation (Meyer et al. 2007). With drip irrigation and fertigation, N fertiliser use efficiency can be greatly improved and the downside risk of N loss through denitrification will be greatly diminished.

Greenhouse gases

Compared to many other countries, in Belize the contribution of agriculture to greenhouse gas (GHG) emissions is quite modest. In 2014, agriculture accounted for only about 3% of the country's total GHG emissions. Of that total, livestock were responsible for 56.2% and crops for 43.8%.

The main sources of GHG emissions in the country are waste management/burning of garbage (responsible for 73% of emissions), land-use change (19%), and energy and industrial processes (5% and 0.6%, respectively) Belize has moderately low CO₂ intensity (5,435 tons CO₂ eq/ million US\$ of GDP). Its annual CO₂ footprint is among the lowest in the world. About 0.54 million metric tons (MMt) of CO₂ were released in 2011, ranking Belize 182nd among 216 countries. With per capita CO₂ emissions of 1.67 MMt per year, its CO₂ intensity (kg per unit GDP 2005 PPP \$) is 0.18, which is lower than the average of 0.47 for its income group, the upper middle-income countries. Regarding the trend, total CO₂ emissions decreased by 45% during 2010–2011. Over the past five years, total CO₂ emissions have decreased by 45%, and, over the last decade, total CO₂ emissions have fallen by 38%.



CO₂ emissions for the country in 2014 were 12.08 Mt, a tiny fraction of the Latin America and the Caribbean total of 3,936 MMt.¹⁶

1.6.4 Biodiversity loss

All the above impacts, combined with the inherent displacement of biodiversity for sugarcane, contributes to unstable conditions for biodiversity to propagate and exist sustainably. The process by which natural ecosystems of endemic tropical and sub-tropical plants are cleared and then replaced by artificial ones, such as sugarcane, destroys much of the natural flora, fauna and soil biota biodiversity that formed part of the previous ecosystem.

Belize northern sugarcane development has already been established as a monoculture crop in the area and in new developed areas. Therefore, all forest was completely replaced by sugarcane. New efforts are being made to diversify current plots of existing and adjacent plots with different plants and crops, but it has been moving at a slow pace. Additionally, sugarcane cultivation contributes to the fragmentation of forest, reduction of biodiversity and some level of disturbance in areas where it has been established as highlighted in different reports.^{17 18}

1.7 Belize regulatory and operating environment

The regulatory environment governs the stakeholders that operate within it. Having a strong regulatory environment that is conducive to investments, but considers the environmental impacts those investments may have, will ensure that the system remains sustainable.

Belize has taken the initiative and are at the forefront in terms of their regulatory and operating environment. Many initiatives and regulations have been developed to ensure Belize is protecting its environment.

As can be seen in Table 8, several policies overlap and duplicate each other in coverage, authority, institutional responsibility, and operation. Consider, for instance, the issue of land management where jurisdiction is covered by the Land Utilisation Act, National Lands Act, Mines and Minerals Act, Forest Act, National Protected Areas Systems Act, Land Tax Act, and the Petroleum Act, among others. However, as a collective, these policies, acts and regulations ensure that the necessary guidelines and repercussions are in place to preserve the environment.

¹⁶ CIAT; World Bank. 2018. Climate-Smart Agriculture in Belize. CSA Country Profiles for Latin America and the Caribbean Series. International Center for Tropical Agriculture (CIAT); World Bank, Washington, D.C. 24 p.

¹⁷ [Belize's Ecosystems: Threats and Challenges to Conservation in Belize - Colin A. Young, 2008 \(sagepub.com\)](https://www.sagepub.com)

¹⁸ [Sugarcane producers promote replanting pilot project | CLAC Comercio Justo \(clac-comerciojusto.org\)](https://clac-comerciojusto.org)

1.7.1 Frameworks, Acts and Policies

Table 8: Frameworks, Acts and Policies

Document	Main elements/objectives
<p>National Land Use Policy and Integrated Planning Framework for Land Resource Development (Draft), Ministry of Natural Resources, November 2011</p>	<p>The National Land Use Policy was developed and endorsed in 2011 by the Ministry of Natural Resources to provide a comprehensive framework for management of Belize’s land resources. The National Land Use Policy though developed and endorsed by national stakeholders has never been adopted nor implemented. The Policy is currently being revised to reflect recent institutional changes within the public administrative systems. The fifteen strategies outlined in the Policy seek to adopt land use planning approaches that aim to safeguard the ecological integrity of Belize’s natural resource, support traditional economic activities, protect cultural and historical sites, and provide land for development areas. Governmental bodies overseeing land use are Lands and Forest Department, Geology and Petroleum Department, Department of the Environment, Forest Department.</p>
<p>National Protected Areas Policy and System Plan, 2015</p>	<p>Aim is to create a National Protected Area System in which all important sites are included in one coherent framework that meets all obligations under international law Belize is required to fulfil.</p>
<p>National Protected Areas System Act, 2015</p>	<p>At its second part, the National Protected Areas System Act sets its objectives, which include: establish a national protected areas system; promote long-term conservation, management, and sustainable use of Belize’s protected areas; promote conservation of ecologically viable areas representative of Belize’s biological diversity and its natural landscapes and seascapes; ensure maintenance of genetic diversity and the diversity of species and habitats within these areas, including but not limited to threatened species and species of economic, social or cultural value; ensure sustenance of the provision of ecosystem goods and services important for national development, including but not limited to timber and non-timber forest products, fish and other marine resources, genetic resources, water catchment services, removal of pollutants, soil regeneration, pollination, carbon storage, resilience and adaptability to climate change, protection against natural disasters, and natural environmental features of touristic, recreational, cultural or spiritual value; and promote the strengthening of coordination and collaboration between nature-based protected areas, and archaeological reserves, where deemed necessary.</p> <p>At its third part, the Act deals with the classification of Protected Areas, which include inter alia: national parks; nature reserves; forest reserves; marine reserve; and protected landscape or protected seascape.</p>



<p>National Biodiversity Strategy and Action Plan (NBSAP) (2016-2020), 2018</p>	<p>The NBSAP 2016 - 2020 is Belize’s Roadmap for biodiversity management towards 2020 and is included within Belize’s Growth and Sustainable Development Strategy. This Strategy recognizes Belize’s natural capital as an important asset in Belize’s national development. Implementation of the NBSAP is under the responsibility of MAFFESDI as lead agency.</p> <p>Among pressures and threats to biodiversity and ecosystems is Land use change (including deforestation, forest fragmentation, clearance of mangroves, filling of wetlands), which in Belize is mainly through activities that include deforestation, filling of freshwater and mangrove wetlands, and dredging of seagrass. Two primary drivers have been identified at the national scale: Agricultural Expansion (including aquaculture) and Population Expansion. The GSDS identifies a number of Flagship Actions for priority implementation between 2015 and 2018, including: 1) Implementation of sustainable forest management, including protected areas management, as a tool to ensure watershed protection for water and food security; 2) Completion and implementation of other critical policies, plans, and projects, in the area of forests, fisheries, oil spill contingency, land-based and marine pollution, readiness for the Green Climate Fund, sustainable livelihoods, and technology for climate change mitigation and adaptation.</p>
<p>Labour Act, Chapter 297 of Laws of Belize, Families and Children’s Act</p>	<p>The Act provides the legislation regarding various Labour codes, general labour and employment acts; Elimination of child labour, protection of children and young persons. The sugar industry has to abide by these laws and are supported by various initiatives mentioned in this report to ensure that practices abide by them.</p>

1.7.2 Environmental legal and policy frameworks

Table 9: Environmental, Legal and Policy Frameworks

Document	Main elements/objectives
<p>Environmental Protection (Amendment) Act (EPA), 2009</p>	<p>The Environmental Protection Act (2000) deals with the following issues, inter alia: Administrative matters; Prevention and Control of Environmental Pollution; Prohibition on Dumping; Environmental Impact Assessment (EIA); Environmental Management Fund (EMF); Nutrients; Investigation, Procedures and General Penalties. An amendment to the Environmental Protection Act was made in 2009, mainly targeting the following needs, inter alia: provision of greater environmental control and management of the petroleum industry; improved provisions for</p>



	<p>the protection of the Belize Barrier Reef System; establishment of an environmental management fund.</p> <p>Part III "Prevention and Control of Environmental Pollution", Paragraph 10(2): "in order to prevent soil pollution, chemicals and biologicals introduced directly or indirectly into the soil in the course of agricultural, forestry or mining activities shall not be used in quantities or in a manner such that the natural equilibrium is disturbed or, in particular, such that there is a harmful contamination of the soil or water, fauna or flora, or such that ecosystems are disturbed" (page 18).</p>
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1.7.3 Regulations for Agricultural sector

Table 10: Regulations for agriculture Sector

Document	Main elements/objectives
<p>National Agriculture and Food Policy of Belize (NAFP) (2015-2030), 2015</p>	<p>The National Agriculture and Food Policy set the Policy and Incentive framework and related Good Governance System for the agriculture and food sector of Belize over a 15-year time period from 2015 to 2030. The main objective is to provide an environment that is conducive to increasing production and productivity, promoting investment, and encouraging private sector involvement in agribusiness enterprises in a manner that ensures competitiveness, quality production, trade, and sustainability.</p> <p>Five pillars were identified to aid in achieving the goal, objectives, and targets of the NAFP: Pillar 1: Sustainable Production, Productivity and Competitiveness; Pillar 2: Market Development, Access and Penetration; Pillar 3: National Food and Nutrition Security and Rural Livelihoods; Pillar 4: Sustainable Agriculture and Risk Management; Pillar 5: Governance Accountability, Transparency, and Coordination Among the Policy Measures and Actions identified by NAFP, PM4.2.1 targets to "Improve Land and Water Governance and Management Systems", which includes: Formulation, review, and reform of Land Use Policy and Legislation; Development and implementation of soil and water conservation measures for agricultural production systems; Development and implementation of best practices for the management of fires related to agricultural land clearing in order to mitigate its</p>



	<p>adverse effects; and Supporting revision and updating of legislative and regulatory frameworks for the sustainable management of the forestry, fisheries, and genetic resources of Belize. Additionally, PM4.2.3 (“Support Development of Carbon Sequestration and Other Agro-Ecological Services through Good Agricultural Practices”) promotes the reduction of deforestation through intensification and increased productivity in areas under cultivation (pages 80,81).</p>
<p>National Adaptation Strategy to address Climate Change in the Agriculture Sector in Belize, 2014</p>	<p>A National Adaptation Strategy (NAS) and Action Plan were developed to address the current and projected impacts of climate change on the agriculture sector in Belize, with the provision of specific adaptation measures to reduce the impacts of climate change and climate variability on agriculture.</p> <p>An assessment was made on the agriculture sector including its vulnerability and adaptation to climate variability and climate change, with a review of the pertinent policies, legislation, institutions, organisations and resources directly or indirectly involved with agriculture, taking into consideration the views, concerns and recommendations of the key stakeholders; and the financial, institutional, human and other resource requirements to implement the strategic options proposed. The draft Strategy and Action Plan set the technical adaptation measures recommended to combat direct and indirect effects of Climate Change and Climate variability. The recommended measures for each of the direct and indirect effects will cover the following areas: Rainfall excesses and flooding; Rainfall deficit and drought; Rainfall variability; Temperature increase; Changes in pests and diseases; Changes in soil fertility; Aquaculture adaptation measures.</p>
<p>Agricultural Fires Act, 2000</p>	<p>The Agricultural Fires Act sets definitions and procedures for people willing to set fire on lands under cultivation or in the course of preparation for agricultural purposes.</p> <p>The Act clarifies that every person desirous of setting fire on land shall apply in writing or in person to the authorised officer for a licence to do so and shall state in his application the location and extent of such land and the reasons why, in his opinion, burning is necessary or justifiable</p>

1.8 Existing initiatives and certifications

The Belize sugar industry has several international certification and national compliance mechanisms that provide the general framework for safeguarding the environmental and social impact of the sugar industry to the Northern Sugar Industry communities. The following initiatives and certifications ensure the implementation of the best practise for the respective stakeholders to build a more sustainable industry.

1.8.1 Fairtrade

PSCPA, CSCPA and BSCFA are all Fairtrade Certified. NSCPA is in process of becoming certified, and has been notified that its certification process is being processed soon.

A Fairtrade certification is a product certification within the market-based movement for fair trade. Fairtrade changes the way trade works through better prices, decent working conditions and a fairer deal for farmers and workers in developing countries. Fairtrade's approach enables farmers and workers to have more control over their lives and decide how to invest in their future.¹⁹

The Fairtrade certification system is rigorous, independent, and in line with best-in-class certification practice. Independent certifiers audit producers, traders and companies to check compliance with our economic, social and environmental standards, including producers that receive Fairtrade Minimum Price and Premium.

Through an assurance system, Fairtrade makes sure the certification and licensing bodies operate effectively and independently to uphold the integrity of the FAIRTRADE Mark. This scheme is compliant with ISEAL's Assurance Code, an internationally recognized code for sustainability standards.

All producer organisations – whether small-scale producer groups, plantations or contract production set-ups – must go through an initial on-site audit before they can sell Fairtrade certified products.

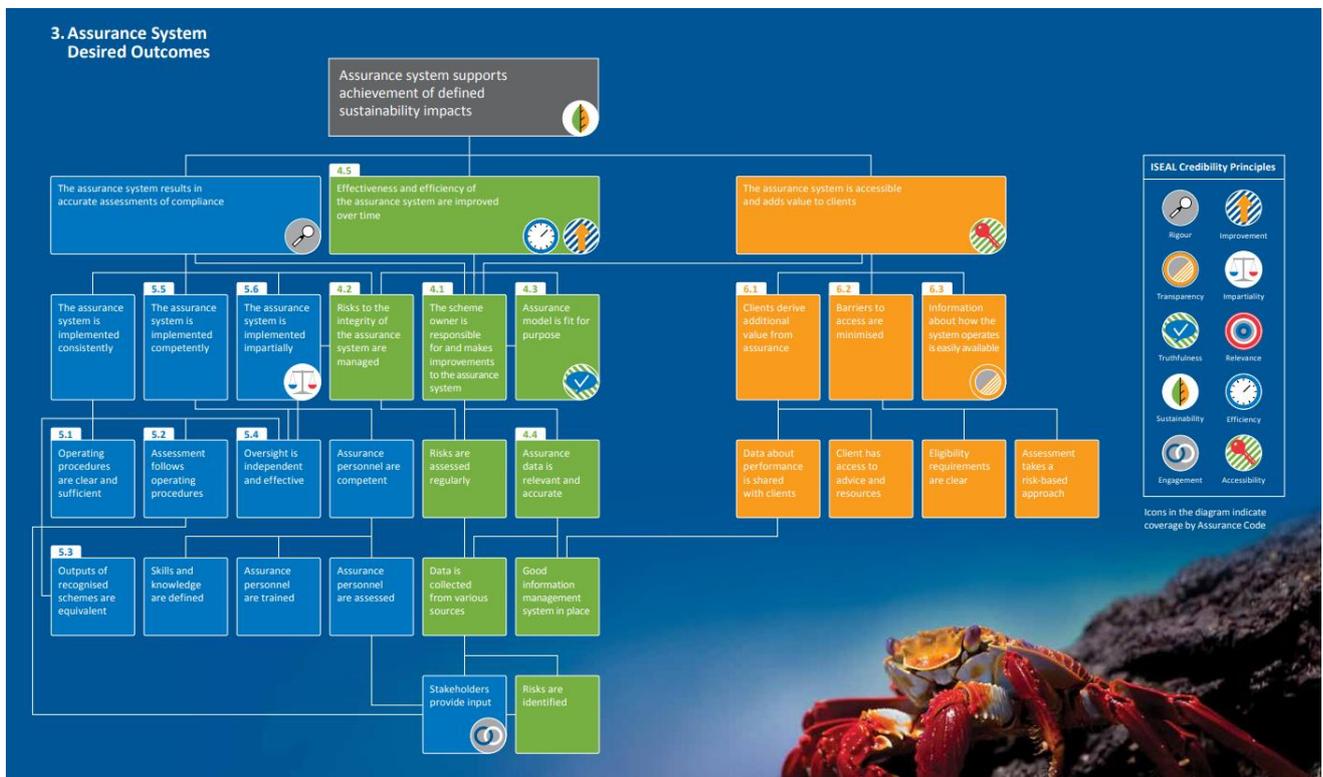
The goal of all ISEAL Codes of Good Practice is to support standard systems to deliver positive social and environmental impact. ISEAL Codes of Good Practice complement each other to achieve this:

1. The ISEAL Code of Good Practice for Setting Social and Environmental Standards (Standard-Setting Code)
2. The ISEAL Code of Good Practice for Assuring Compliance with Social and Environmental Standards (Assurance Code)
3. The ISEAL Code of Good Practice for Assessing the Impacts of Social and Environmental Standards Systems (Impacts Code)

The Fairtrade Certification provides the ISEAL Impacts Code: 2014. Code of Good Practice for Assessing the Impacts of Social and Environmental Standards, which complies with the following ISO compliance list.

¹⁹ <https://www.fairtrade.net/about/what-is-fairtrade>

1. ISO/IEC 2382:2015 Information Technology – Vocabulary
2. ISO 9000:2015 Quality Management Systems – Vocabulary



3. ISO 14001:2015 Environmental Management Systems – Requirements with guidance for use
4. ISO 17000:2004 Conformity assessment – Vocabulary and general principles
5. ISO 26000:2010 Guidance on Social Responsibility ISEAL Sustainability Claims Good Practice Guide (2015)

The following are all the different assurance system desired outcomes that provide environmental and social safeguards to the sugar industry when Fairtrade Certified.²⁰

Figure 7: ISEAL Assurance System Desired Outcomes

A huge benefit of being Fairtrade certified is that organisations will receive premiums — extra money that farmers and workers can invest in their businesses or the community. The BSCFA gets around \$3.5 million in premiums a year²¹ and has used that as grants for education, building and repairs, community spaces such as churches and libraries, funerals for impoverished families, water tank systems and more.

The BSCFA has continued advocacy and empowerment efforts to improve the working conditions of sugar cane farmers. In 2015, the BSCFA took a strong stance against child

²⁰ [ISEAL Assurance Code of Good Practice Version 2 0.pdf](#)

²¹ <https://fairtrade.ca/producers-products/sugar/bscfa/>

labour²², lobbying the government to make laws against child labour and personally suspending support of farms that violated Fairtrade practices.

Due to advocacy efforts such as these, the government of Belize has taken steps to stop child labour, such as working on bills that help others identify child labour situations and updating its Child Labour Policy²³ to add additional protection for children. It also established a Child Labour Secretariat that works on identifying and reporting child labour cases.

Fairtrade and the BSCFA have made significant strides in protecting the rights of sugar cane farmers while expanding the economy. These efforts are lifting people out of poverty and ensuring that fairness prevails.²⁴

A report by BSCFA indicates that the main areas of investment of the Fairtrade premiums includes:

1. Hire 18 agricultural extension officers to work with the over 5,000 members of BSCFA
2. The transformation of the harvesting and delivery process of sugar cane since 2010 has led to an increase in quality and yield from the crop. The price farmers receive increased as a result of the quality-related payment agreed with the mill and has led to an increase in farmer incomes.
3. Carrying out a comprehensive soil analysis project on all farms to map the nutritional needs of the different soils and target fertiliser use more accurately, resulting in increased productivity and reduced costs.
4. Implementing an integrated insecticide programme, which has reduced the use of chemical controls and increased the use of biological controls.
5. Buying and distributing fertilisers and herbicides (free of charge) to all cane farmers, to boost incomes following poor recent harvests.
6. Programmes to provide advice on safe use and storage of agrochemicals.
7. Introduction of a replanting programme aimed at doubling yields from existing land

1.8.2 Farmer Field Schools

A farmer field school (FFS) is a group-based learning process that has been used by a number of governments, NGOs, and international agencies to promote integrated pest management. The first FFSs were designed and managed by the UN Food and Agriculture Organization in Indonesia in 1989.²⁵

²² <http://www.sugarindustryofbelize.com/newsletter-vol-6-1/2017/6/12/bscfa-working-towards-increasing-the-wellbeing-of-children-and-youth-fairtrades-collaborative-approach>

²³ <https://www.dol.gov/agencies/ilab/resources/reports/child-labor/belize>

²⁴ [The BSCFA, Fairtrade and Sugar in Belize | The Borgen Project](#)

²⁵ [Farmer field school - Wikipedia](#)



The first attempt in using this approach of the Farmer Field School (FFS) program was funded by the Inter-American Development Bank with a project in Northern Belize and was implemented by SIRDI.

The Farmer Field School is implemented by SIRDI's highly trained extension team in 6 geographical zones in the northern sugar belt. The team selects 6 accessible and visible field plots belonging to participating farmers in the areas. The team recruits and registers 25 farmers per site and evaluates their current practices to establish a baseline. The FFS program commences in December of each year and runs for a period of 24 months following the crop cycle. The farmer students attend 11 hands-on field sessions that cover best practices in Sugarcane Cultivation. Throughout the program the participating farmers are monitored for the practices they conduct in their own fields to determine the adoption rate along with the cost benefit analysis.²⁶

The modules included: in the Best Agricultural Practices for Sugar Cane Manual:²⁷

1. Site Selection and Land Preparation
2. Planting of Sugarcane
3. Sugarcane Nutrition
4. Integrated Pest Management in Sugarcane
5. Calibration of Equipment
6. Pre-harvest and Harvest
7. Ratoon Maintenance
8. Occupational Health and Safety
9. Inclusion of Women and Youth
10. Environmental Sustainability

Project Activity Impact Assessment

1.9 Project activity impacts

The development and use of climate-smart processes and technologies can be used to ensure sugar cane farmers are in the best position to navigate increasingly dramatic weather events and are using the resources they have in the most environmentally and socially sustainable way possible.

While sugarcane farmers are able to evolve, most have a high indebtedness related to high cost of alternatives. Many farmers that are now ready to change, indicated that they would be interested in green loan products to help them finance such needs. Overwhelmingly, the largest constraint for respondents (87%) in trialling climate adaptation technologies or practices is cost. Many face to face interviews indicated that access to information is a

²⁶ [SIRDI's Background and Field School — Belize Sugar \(sugarindustryofbelize.com\)](#)

²⁷ [FFS+MANUAL+FINAL+ENGLISH+VERSION+-+SEP+20+2018.pdf \(squarespace.com\)](#)

critical component of the cost barrier – there is no national information regarding cost of production techniques, or a one-stop shop for support.

While access to finance is the resounding reason why trials have not been more widely done, interviewees have limited knowledge of the technologies that exist, and furthermore are trialling interventions on a response mode rather than making investments for long term mitigation and adaptation efforts. Beyond the Mennonite community, which historically has larger more commercial farms, most in the agricultural community do not have a farm plan or business plan in place. The capacity issue is one that will need to be addressed in order to ensure that financial productions aimed at climate solutions do not face the same repayment issues as past agricultural loans.

Using the GCF financial vehicle to overcome the cost-barrier, project activities to help adapt farmers to become more climate resilient can be implemented. These activities have their own impacts and benefits and are described below:

New varieties

The sugar industry is currently under constraints under the dominance of one variety. This one variety scheme already possesses a risk to the current sugar cane industry from different angles.

Those risks include:

1. By professional experience in the sector, no variety should pass the 20% benchmark and at least 5 varieties should be used for the entire sector of Belize in order to reduce the risk of varietal problems.
2. The false assumption that one variety is the best due to the adaptability of the different agro ecological zones in the sugar industry.
3. Farmers tend to replicate the variety by default without no other oversight consideration
4. The replication of pest and diseases due to available planting material and limited alternatives
5. Homogenous agronomic activities with very diversified agroecological zones affect farming due to the negative impact of practices that should be different for some areas.
6. Possible expansion of devastating pest due to variety dominance with rapid expansion and slow reaction to establishing proper pest management by farmers
7. Institutional constraints to address problems due to the vast expansion of areas where extension services and response is slow and lacking.
8. Losses in post-harvest losses and sugar production due to timely harvesting of cane at optimum maturity period based on current delivery system schemes.

The project will aim to support the rollout of a broader base of sugarcane varieties to provide a more diverse range of cane varieties that age at different times (early, medium, late), ensuring a constant supply to the mill.

Biological control

The current practice of introducing environmentally friendly technologies, like biocontrol, is tied up to the use of appropriate agronomic practices, including green cultivation of sugarcane. This activity is very limited if farmers continue the same devastating practice of burning and indiscriminate use of pesticide in some areas. While a high percentage of farmers (50%) have limited resources of adding fertiliser and chemicals, 50% have standard practices of using agrochemicals, due to the availability.

The use of biocontrol encourages the use of environmental practices to ensure success in the use of living organisms to control pests and diseases that are triggered by favourable conditions and ecological disbalances and reduce unsustainable practices. Based on experience from the Belize sector and working with farmers (Itza, 2021), the negative perception of biocontrol include:

1. Farmers that are accustomed to using agrochemicals usually are mentally fixed that the product requires to add fast, or you are required to see results fast, which is not usually the case when observing natural organisms, which have their own biological dynamic.
2. The use of biological control requires discipline, in the method and timing of application. The sunlight can act as a neutralizer of the benefit of biocontrol since it requires it to be applied preferably in the evenings.
3. Biocontrol that fails in one field, does not mean that it cannot develop a better performance in other areas, due to many variable factors, but has a negative reaction from farmers that are not well explained.
4. Biocontrol requires high investment of personnel and infrastructure to be produced locally and have many high competitions from neighbouring countries which can mass produce at cheaper rates. The local capacity is always challenged based on the number of expertise available as they are needed and required in Belize.

Soil amendments

The level of trash, residue, by-products, or biodegradable material is highly underutilised and usually disposed of in the field. In fact, a good amount of biomass lost in cane fields are the products of the efficiency of the plant to produce and the perception that once harvested the material is required to be burnt or removed. The volume of biomass produced by 1 acre of sugarcane plantation is said to be equivalent to an acre of forest. This also makes sense, since one acre of sugarcane plantation has an estimated 10 acres of leaf surface.

Nature has no waste. The current cultivation of sugarcane generates biomass and residues that if not recycled at the field, creates waste that affect sugarcane cultivation or deplete the soil of nutrients that is exhausted and is required to be introduced from other sources, like fertilisers and other nutrient sources. At all stages of cultivation, all residues can be returned to the field and improve the nutrient balance and therefore guarantee a stable production with limited external nutrient sources.

The use of crop residue, ~~factory industrial waste~~, composting and other practices can contribute to enhancing many other practices, that can guarantee increase of production

and productivity, that rapidly declines due to rapid soil nutrient depletion when these practices are not followed.

The project will be introducing best practises for soil management including the use of regenerative practises as highlighted below:

Green cane Harvesting

The production of sugarcane for mechanical green harvesting has a multiplying positive effect on the sugar cane sector. This multiplying effect if done properly can positively impact on those indicators that are considered of negative effect in the industry.

This positive effect includes:

1. Reduction of cane burning, especially the second burn, that remove the crop residue that could be used and incorporated and has positive effects of incorporating organic matter, retaining water and contribute to the development microorganisms in the field
2. Increase of the field biodiversity and wildlife which contributes to soil fertility and ecological balance.
3. Reduction in the use of weed control and pesticides due to mulching effect of crop residue
4. Increase in crop resistance to drought due to crop residue mulching effect and water humidity retention.

According to Fonseca et al, 2018, it highlights that other benefit of mechanical green harvesting includes:

1. Increase in sugarcane production per acre.
2. Increase in production from 2-5 years of continuous stable production.
3. Opportunities in the use of new varieties that adapt to the agro climatic condition and mechanical harvesting using a more homogenous process when cultivating.
4. Reduction in the use of agrochemicals and agricultural inputs for the estimated 5 years
5. There is reduced post-harvest losses, since green cane loses less weight when transported to the factory, compared to burnt cane which can lose up to 24% in this process.
6. Green cane produces 8% more, compared to burn which loses 10% only when burning.
7. Green cane also produces more production when compared to burnt cane with similar conditions.
8. Increase in the cost Benefit of income due to more efficiency in the use of human labour 9%
9. Reduction in the use of agrochemicals up to 27%
10. Reduction in flooding during rainy seasons
11. Reduces soil erosion, Eolic and hydro, due to mulching effects.
12. Has less impact in the use of machinery, therefore soil compaction is less of a problem.

13. Improves soil chemical and physical conditions.
14. Has available biomass that can be incorporated or used in other economic activity, like animal feed.
15. Reduces the risk that workers are exposed to high levels of heat and smog generated when burning, this also benefits the communities in the area.
16. Increase in land productivity per acre.
17. It can be done manually and mechanically, the manual generates more employment for more workers while reducing the efficiency in harvesting, but it can be optional, due to the impact of mechanical harvesting.

Mechanical harvesting

Mechanical harvesting is highly successful when the farmers integrate properly the following variables in consideration when entering from a manual to a mechanical harvesting process; field design, sugarcane varieties attributes, the mechanical harvester and the proper maintenance of the equipment, logistics of the harvesting and transporting. (Mantilla 2010)

The positive effects of mechanical harvesting include:

1. Increases efficiency during harvesting.
2. Can increase income on unit basis for harvesting activities due to the efficiency of cutting the required Production Estimate for a farmer
3. Provides more assurance when the last stages of harvesting where cane cutters tend to get tired and abandon cutting activities.
4. Tends to contribute to carbon emission reduction based on the total unit harvested.

Irrigation

A review of the infrastructure for the sector reveals a number of investment priorities. First and foremost, it is estimated that only about 2 percent of Belize's cultivated land is irrigated. Even though annual precipitation is moderate to heavy in Belize, from 40 inches in the north to 200 inches in the far south, irrigation is important in the dry season and to assure water for crops when it is needed during dry spells in the rainy season. It is a vital factor for both increasing yields and improving product quality. So far, the little irrigation that is available is mostly directed to traditional crops such as sugarcane and citrus plantations.

The positive effect of irrigation:

1. Irrigation reduces climate vulnerability of a rapid changing season pattern of uncertainty and during a drought or low precipitation season, which very prevalent in the northern part of the country
2. Irrigation can increase a crop production per unit of acre overall, since water is provided as the plant requires it, this has a rippling effect for increasing efficiency in crop fertilisation and other important activities.

The negative effect of irrigation:

1. Can create conditions of salinization if proper ferti-irrigation is not conducted properly.



2. Can deplete the water source or reduce the availability, depending on the sources and volume of extraction.

It is important to note that the irrigation proposed for the project will be undertaken as follows:

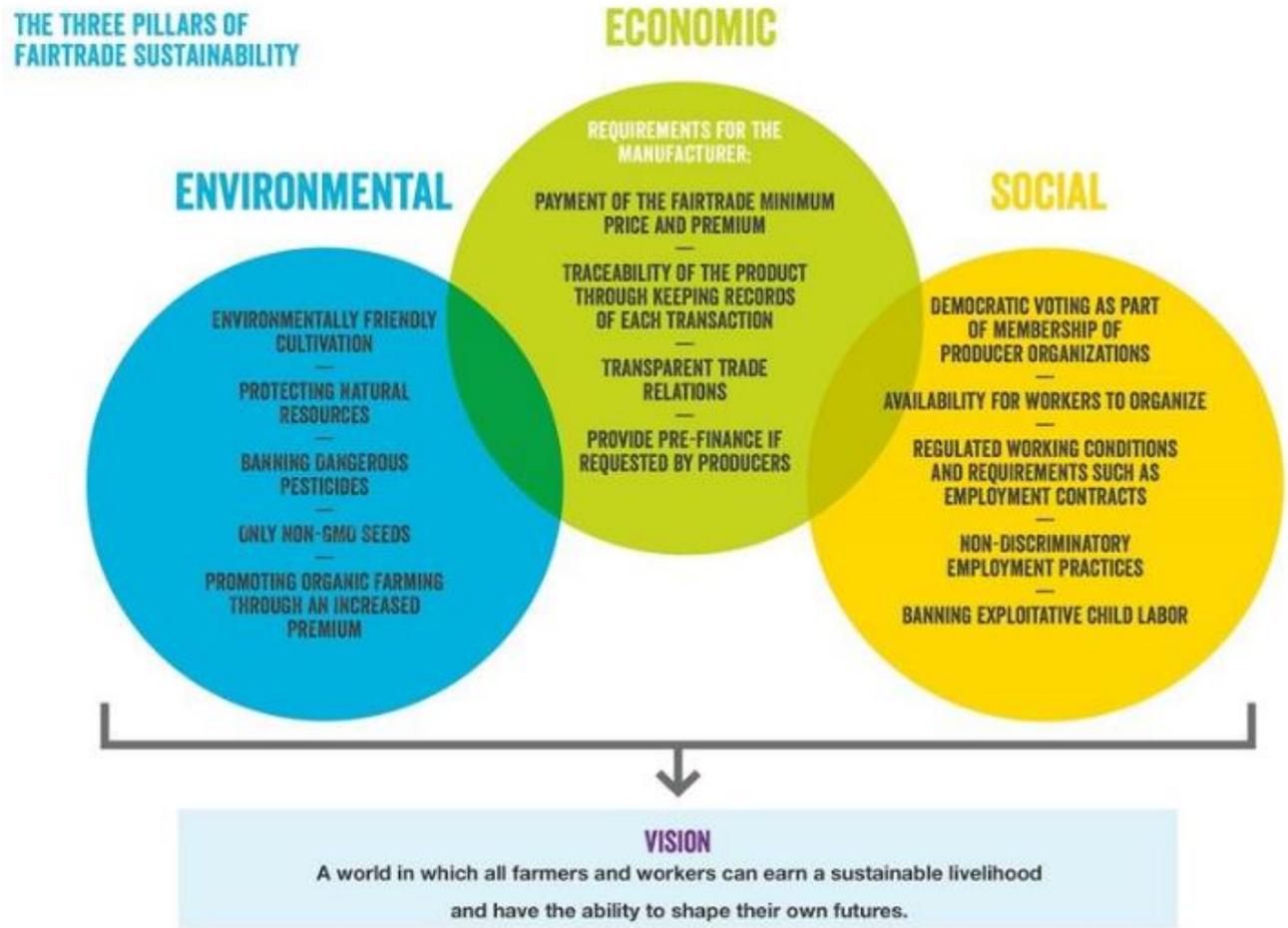
1. The technology to be used will consist of sub surface drip developed by N-Drip ([www, n-drip.com](http://www.n-drip.com)) This is simple drip technology which is both water and energy efficient
2. The irrigation design is for supplementary irrigation which will only provide water when the crop is in deficit (3-4 months of the year)
3. Energy to lift the water will be by means of a solar pump providing clean energy to the system.
4. Water will be drawn from existing wells or open water sources. No new wells will be established.

The above will ensure minimum impact of the proposed irrigation on the water resources of the area.

Social impacts

This report responds to the socio-economic environment in the current context of the Belize sugar cane Industry. The industry associations incorporate FAIRTRADE Economic and Social

components in their work plans, so they are entirely on board in ensuring a positive economic



Manual harvesting scenarios are typically related to higher risk due to the uncertainties associated with manual operations, especially those employed in green sugarcane harvesting. Considering the vertically integrated production systems, manual technologies are related to the highest job creation levels. However, in Belize, sugar cane cutters are ageing as mentioned previously. The young persons in the industry are interested in furthering their studies and supporting their families in other ways than cutting.



It must be noted that the farmers are happy to educate their children and offer them a better life.

Age Group	2019			2020			January to May 2020			January to May 2021		
	Female	Male	Total	Female	Male	Total	Female	Male	Total	Female	Male	Total
Total	113	4,068	4,201	90	3,966	4,056	77	3,641	3,718	85	3,793	3,788
Under 20 Years	1	124	125	2	182	184	1	174	175	4	126	130
20-24 Years	6	312	318	5	420	425	4	410	414	6	307	313
25-29 Years	4	340	344	2	424	426	2	400	402	0	381	381
30-34 Years	11	617	628	6	630	636	5	603	608	6	606	612
35-39 Years	19	581	600	6	503	509	3	459	462	4	486	490
40-44 Years	10	428	438	6	315	321	7	264	271	6	340	346
45-49 Years	2	291	293	2	223	225	2	178	180	1	211	212
50-54 Years												
55-59 Years	7	451	458	4	146	150	4	124	128	2	150	152
60-64 Years	5	65	70	4	91	95	4	82	86	4	83	87
65-69 Years	3	55	58	3	56	59	2	69	71	3	70	73
70-74 Years	45	617	662									
75-79 Years				4	50	54	3	57	60	3	68	71
80-84 Years				45	750	795	39	656	695	45	691	736
85 Years and Over	0	207	207	1	176	177	1	165	166	1	164	165

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Notes

In July 1, 2019 the contribution rate increased from 8% to 8.5% and the ceiling increased from \$320 to \$440

On January 6, 2020, the contribution rate increased from 8.5% to 9% and the ceiling increased from \$440 to \$480.

* Persons 60 years and over who have received or are receiving Social Security Benefit

Figure 9: Social Security Contributions in the Cane Industry

Belize and choosing the much more lucrative fishing industry or coconut plantations. Some may argue that manual cutting technology is associated with positive effects on employment rates. The minimum wage in the agricultural sector is \$3.30 BZD per hour, however a cane cutter receives \$8 BZD per tonne. Some cane cutters deliver 2-4 tonnes per day. This means that an hourly wage per day in another industry is possible with less back breaking work and is the preferable option. It is also worth noting that in the case that a cane cutter does not deliver sufficient tonnes of cane per day, they risk getting paid below the minimum wage. On the other hand, harvesting mechanisation scenarios are related to better working conditions since fewer occupational accidents and higher average wages are observed. Group leaders over the past second and third quarters of 2021 have been experiencing difficulty meeting their quotas and delivery schedules, affecting the farmer, the miller, and the industry's profitability.

Farmers and their associations see mechanical harvesting as the industry's saviour as this situation worsens. They must start improving the quality of their plantations so that the harvester does not damage their plantations for the following year's harvest, requiring replanting which would be another unanticipated expense. Based on data above in figure 7 the number of workers at the cane cutter level has dwindled significantly from 4,201 in 2019 to 3,788 in 2021. This chart also shows the ageing of the workers by indicating the number of Social Security contributors that are over 60 years of age.

Considering the environment in the social wellbeing analysis, bearing in mind the restrictions for sugarcane burning and practical difficulties of manual harvesting of green cane, mechanical harvesting is also seen as optimal as the danger to the canecutter in sweltering



conditions due to increased temperature conditions due to Global warming. Although the temperature records at 90 degrees Fahrenheit, the heat is measured to feel at 115 degrees, and we have already seen one death in the field due to dehydration for 2020. In addition, farmers being hurt on the job due to cutting accidents would be eradicated.

It is important to note that a cane farm plantation yielding less than 2000 tonnes cannot support his/her family and financial obligations with only cane farming and is forced to utilise alternative livelihoods to meet this gap. Many cane farmers do their own cutting. This project must understand that the move to mechanical harvesting must be weaned over several years in a sustainable way considering the impacts to those who do cane cutting and ensuring there are measures in place to support the cutters to shift to other employment.

This project is only 15,000 acres, but it is a continuance in the right direction of quality and quantity outputs about efficiency and best practice as started by Fairtrade. When all the sustainability impact categories are considered, the definition of the best scenario points squarely at the Mechanical Harvesting methodology, which this project plans to utilise with only positive gains to the stakeholders in the industry with reluctance by a few to hold onto the status quo.

1.10 Sexual Exploitation, Abuse, Harassment (SEAH)

SEAH is typically classified as an extreme form of human rights abuse. Despite violation of an individual, there is a lack of reporting exacerbated by the discrimination, shame and threats the victim experience by the perpetrator or family members²⁸. The survivors sometimes do not know where to report, seek assistance (including psychosocial support), lack trust in the justice system or that the report will remain confidential. SEAH disproportionately affects persons that are considered within the vulnerable or marginalised groups. This project is likely to alter power structures and relations within Cane farming associations and communities, therefore placing women in situations where they may be exposed to SEAH. Therefore, this project will proactively plan to combat SEAH. It is recognized that this project is contextualised within a space where usual forms of SEAH exist with communities in Belize, especially where patriarchal norms are widespread and have implications for sexual and reproductive rights in the north ²⁹.

Belize's Revised National Gender Policy (2013) highlighted that most victims of domestic violence are in the 20 to 49 age range. They are mostly women and are either in married or in common-law unions, followed by single women, women who are separated and women in visiting relationships. Although most of the cases were reported by women, there was a visible increase in the percentage of cases reported by men³⁰. Both women and men reported psychological violence and physical violence. Mostly women reported sexual violence. Most reported cases were repeated incidents of domestic violence. The reported aggressors were mostly common-law spouses, followed by spouses and ex-spouses. In the

²⁸ Government of Belize, National Gender-Based Violence Action Plan: A Multisectoral Plan to Prevent and Respond to Gender-Based Violence in Belize 2017 – 2020 (2017)

²⁹ Baksh and Associates, Country Gender Assessment- Belize (2016)

³⁰ Government of Belize, National Gender Policy (2013)



case of sexual abuse of Children, most offenders were identified as non-familial persons, followed by stepfathers and fathers. The National Gender Policy also identified that Commercial sexual exploitation of children and adolescents (CSEC) is an emerging issue in Belize³¹. Poverty was identified as a major cause of CSEC. To this end, the Commercial Sexual Exploitation of Children Prohibition Bill which passed in 2012, prohibits, and punishes acts of commercial sexual exploitation of children. The risk of CSEC on this project is expected to be low as a low level of child involvement and exposure is anticipated based on the activities on this project.

Where occurrence of SEAH in the workplace is concerned, the National Gender Policy posits that while there are many anecdotal reports of sexual harassment within the workplace, no cases have been tried in court. In two stakeholder interviews held during the development of this policy, women reported a need for more public education on this issue as well as amending the law to simplify the sexual harassment reporting procedures. The 2016 Country Gender Assessment for Belize identified that there is a general perception that women face considerably more challenges in the workplace than men do. These include inter alia sexual harassment³². Through the 2013 Gender policy, the Government of Belize has committed to increased protection from sexual harassment in the world of work.

The substantive laws of Belize prohibits sexual harassment in the workplace. Chapter 107, the Protection Against Sexual Harassment Act Rev.2000 identifies "that a person shall be taken to harass sexually another person if the first-mentioned person makes asexual advance, or an unwelcomed request for sexual favours, to the other person, or engages in other unwelcome conduct of a sexual nature to the other person, and- (a) the other person suffers any form of disadvantage in connection with that other person's employment or work or possible employment or possible work; or (b) the unwelcome request for sexual favours has the effect of interfering unreasonably with the other person's work performance or when it creates an intimidating, hostile or offensive working environment"³³. The law provides legal redress for the survivor through the courts. The law makes explicit that harassment can be from a current or potential employer, or supervisor, or a fellow worker. The court may order that the offender should stop the conduct complained of or "perform any reasonable act or course of conduct to redress any loss or damage suffered" by the person who was sexually harassed". This would appear to include compensation for monetary loss, reinstatement.

Under the Protection Against Sexual Harassment Act, an employer should take immediate and appropriate action to correct any act of sexual harassment in the workplace. If he fails to do so, he can be held responsible for the sexual harassment. An employer can also be held liable for sexual harassment if the employer knew that benefits or opportunities were being granted or refused based on one's submission or refusal to submit to sexual harassment. Notably, the law imposes fine or confinement penalties on a reporter who makes a false complaint.

³¹ Government of Belize, National Gender-Based Violence Action Plan: A Multisectoral Plan to Prevent and Respond to Gender-Based Violence in Belize 2017 – 2020 (2017)

³² Baksh and Associates, Country Gender Assessment- Belize (2016)

³³ <https://caribbean.unwomen.org/en/caribbean-gender-portal/caribbean-gbv-law-portal/gbv-country-resources/belize#DVA>, date accessed 11/8/2023



The Handbook on Sexual Violence (2012) published by the Women's Department of the Government of Belize, identified that even though there are laws which prohibit rape, sexual harassment and marital rape, few offenders are charged and convicted and there continues to be a critical situation of under-reporting in Belize³⁴. The Handbook acknowledges that violence can be from or towards both men and women, and it acknowledges that heterosexual and homosexual violence can occur. The referral pathways for Sexual violence response and reporting are identified in this handbook. Referral agencies include the Police, the Ministry of Human Development, the Office of the Ombudsman, and the Ministry of Health. While these response protocols may exist in theory, in practice, there is limited publicity and therefore public knowledge of the pathways and little evidence to support the efficacy of accessing these pathways for sexual related offences outside of sexual assault. Similarly, The National Gender Policy highlights that laws related to gender-based violence are fragmented. Different types of gender-based crimes, particularly sex crimes, are considered under separate legislation³⁵.

In addition to national instruments that prohibit Sexual violence, more specifically sexual assault and sexual harassment, Belize is a signatory to the Convention for the Elimination of Discrimination Against Women (CEDAW). Belize has also ratified key international and regional human rights instruments related to gender equality, namely the Inter-American Convention on the Prevention, Punishment and Eradication of Violence against Women.

To this end, though not fully effective in implementation, there are national, regional and international laws, conventions and regulations which prohibit SEAH within public and private spaces in Belize; and afford recourse mechanisms for survivors.

The CCCCC SEAH Policy of 2023 provides clear prohibitions for staff and contractors of the organisation from SEAH. The Policy also provides a complaint, referral and response mechanism and referral pathways. The Policy covers projects implemented by the Centre, including this project and applies to anyone who holds a contract. Importantly, the policy prohibits SEAH against stakeholders, thus restricting staff from using positions of power for sexual gain over project impacted populations.

The project related activities introduce low SEAH risks. This is based on the assessment that while there will be Transformational Officers and other project related staff working with farmers, the project will not introduce an influx of new workers into the project space. However, varied actors, including the Project Team, BSI/ASR and SIRDI will be engaging with farmers on the ground. As holders of project related benefits and decisions that benefit vulnerable farmers, personnel from these organisations wield a level of power that can result in exploitation and abuse. Positively, workers from these organisations have policies that prohibit forms of sexual violence. Where consultants are engaging communities on the ground, the project will expect that the Consultant's organisations have SEAH Prohibiting Policy and/or sign a declaration of tender that prohibits SEAH under the CCCCC SEAH

³⁴ Government of Belize, National Gender-Based Violence Action Plan: A Multisectoral Plan to Prevent and Respond to Gender-Based Violence in Belize 2017 – 2020 (2017)

³⁵ Government of Belize, National Gender Policy (2013)



policy. The expectation is that anyone interacting with communities will be trained on preventing SEAH, the prohibitions and sanctions.

Poverty and socio-economic deprivation generally result in situations where some women and girls may be vulnerable to SEAH during their interaction with project staff who share benefits such as farm inputs or extension services⁴¹. Poverty levels in the Project footprint area are comparable to most of the Country. The 2018/2019 poverty study demonstrated poverty rates of Corozal and Orange Walk districts were 45% and 57% respectively. At project inception, all project staff will be required to sign unto the project's Code of Conduct (CoC) and receive SEAH prevention training.

Sexual harassment is recognized as a risk for any work environment. Risk factors for SEAH include female laborers working alongside male laborers without adequate supervision, without separate washrooms for males and females; and without specific feedback mechanisms for females to share concerns about their working environments, including concerns about sexual harassment³⁶. None of these conditions are expected to be present within this project.

1.11 Risks and opportunities

The Sugar industry can be differentiated by 50% of farmers with a high level of input of fertiliser and 50% that do not add any fertiliser or pesticide. Both can be differentiated by the amount of production that they maintain in the production estimate and one that depends on what nature is able to provide with the basic effort of hand weed cleaning and maintenance. While the FAIRTRADE premium is based on the level of production, farmers with a high benefit can conduct more activities, while those with limited funding streamline many of those benefits to personal use and minimally invest it in the field. Therefore, this also reflects on the low productivity and production of many of those fields.

By assessing the various areas of assessment, current initiatives and certifications and project components, a list of risks and opportunities is developed through a SWOT analysis as seen in the table below.

Table 12: SWOT analysis

Area	Strength	Weakness	Opportunity	Threat
Fairtrade certification	3 out of 4 Associations certified (The fourth is in the process of certification)	Highly dependent on Fairtrade funds to implement plans	Match funding for areas of common interest	Loss of certification due to non-compliance

³⁶ Government of the Republic of Kenya, SEAH Prevention and Response Plan, 2022



Environmental compliance	Fairtrade has an establish guideline for what is required	Associations have limited scope of activities that impact only certain level of the industry	Stronger environmentally friendly technology	Impact of the any of the stakeholders that can affect marketing of sugar
Planning	Annual Planning is required	Additional training is required to achieve better planning standard	Improvement of competence and professionalism	Many funding that set the vision and not what membership desire
Cane farmers association	Committed membership	Farmers are not too satisfied with the benefits of cane production	Introduction of alternative livelihood while remaining in sugarcane	Unattended or lose of cane farmers with no commitment and therefore reduction of cane production capability
Technical capacity - environment	Technical officer in place	Not certified personnel	Certification of environmental officer	Loss of human capital and brain drain to other sector and countries
Environmental	Fairtrade certified and compliance to environmental requirements	Limited personnel specialised in environmental specific areas	Proper training of personnel with international standards	Loss of competent staff
Monitoring/ Evaluation	Areas are defined	Limited monitoring	Monitor those indicators that can provide incentive to the industry	Undefined progress
Administrative capacity	High number of administrative personnel that assist farmers organisation	Operational investment in office management and limited in field monitoring	Take in more small investment in critical areas with prepared staff	Lack of interest and development of staff



Financial	High investment of resources in productive area	Limited testing of impact of fertiliser and pesticide in field and water	Development of project portfolios for investment in critical areas	Stagnant development of the organisation due to failure in using resource effectively
Social compliance	Industry has implemented various initiatives that support health and safety of the labour force and environmentally friendly related activities	Monitoring of these initiatives are not always comprehensive	Capacitating and supporting existing initiatives will strengthen overall	Noncompliance to activities by stakeholders
SEAH Exposure	CCCCC and BSI/ASR have policies related to SEAH. There are legal frameworks in place that prohibit and provide pathways for complaint nationally.	Largely SEAH violations go unreported and unremedied. Survivors do not normally have the support and courage to continue through the process even when reports are made.	Associations, project staff, female farmers become more aware of systems in place for prevention of SEAH and understand prohibitive behaviour.	Noncompliance to activities by stakeholders

Environmental and Social Action Plan

1.12 Environmental actions

The project is categorised as Category C since the investment makes no establishment of infrastructures or elements that can heavily impact the social and environmental fabric of the Belize sugar industry negatively. It instead promotes more environmentally friendly practices and accelerates achievement of the objectives outlined in the industry strategic plans of farmers association and the social/environmental plans for a sustainable sugar industry. This objective would have been obtained far in the future without external intervention or if farmers depended on Fairtrade funds and internal resources only. Furthermore, any sub-project under the main project must comply with the requirements of

the main project. Therefore, sub-project falling under the main project cannot contain risks and impacts that will result in higher risk and impacts of the original project. Sub-projects will be screened using the same screening tool as the main project, for consistency. As a standard procedure for a project of this nature, the CCCCCC Environmental and Social Risk Assessment and Sexual Exploitation Abuse Harassment (SEAH) Screening Checklist (Annex 2 and 3) will be used to identify the risk category of all sub projects. The results of this screening are final. Activities with outcomes higher than those consistent with Category C and or are reflected within the project exclusion list (Annex 1)will be eliminated. The identification of farms for the installation of nurseries will be by a negotiated process during implementation (screening form for site selection). Only lands currently under sugarcane cultivation and owned by registered sugarcane farmers will be allowed to participate in negotiations.

The performance assessment was undertaken at the level taking into consideration the existing plans and the operational level of elements of intervention of the sugar industry. Also, the indicators used within the industry are generally of a medium- to long term impact, instead of short term, due to the nature of the industry. This therefore blends into the same structure found in the GCF guidelines which looks at long term impact.

Environmental impacts of production practices can largely be reduced by the adoption of general good management practices. In the case of agriculture this might involve the adoption of alternative cultivation systems (e.g., Integrated or precision methods) that provide more efficient use of chemicals, and subsurface drip irrigation to save on water and chemicals such as N fertiliser.

Many of the impacts of the cultivation of sugarcane are significantly influenced by local conditions, such as soil types and climatic factors, so appropriate planning as well as management are important factors in the reduction of cultivation impacts. The challenge to the grower community is to protect biodiversity through the maintenance of natural habitat fragments within the farmed landscape, and the adoption of more diverse cropping systems that include legumes to break the monoculture of sugarcane. A number of good management practice guides are available and should be considered in project interventions such as:

1. Land use planning and zoning: Biodiversity conservation and maintenance of ecosystems need to be addressed on a landscape level, as well as on individual fields. Without effective conservation measures, farms can quickly consume a dry region's water supplies, impacting specific species and critical habitat as well as biodiversity more generally.
2. Crop establishment: Soil specific guidelines need to be followed when planting, and production practices must protect soil ecology and fragility, particularly under conditions of high rainfall and steep terrain. The potential on steep terrain is high for loss of nutrients and soil structure, diverse communities of soil organisms and contamination of downstream ecosystems.
3. Planting on former cultivated lands: Planting on previously cultivated agricultural or pastureland involves less labour, machinery, pesticides and clearing than planting in natural habitat. Such areas are arguably more expendable from a conservation point of view.

4. Maintaining soil fertility: Fertiliser recommendations based on soil tests and soil specific advice should be always adhered to, followed by regular leaf sampling; recycling of mill organic wastes such as filter press mud (for phosphorus), fly or boiler ash (for silicon) and vinasse (for potassium)
5. Reduced use of inputs: Integrated Pest Management (IPM), precision application methods, spot applications as needed and the elimination of prophylactic use of agrochemicals are all ways to reduce inputs.
6. Reduction in water use: Reducing excessive water consumption by adoption of more appropriate irrigation practices; improved scheduling of irrigation to enhance water use efficiency; adoption of water-saving irrigation methods, recycling of drainage water, mulching or trashing to reduce evaporation.
7. Improving soil quality: Controlled infield traffic practices to reduce soil compaction and stool damage and the use of 'Low Ground Pressure (LGP) running gear' to control tyre pressure while the vehicle is moving, as well as the use of GPS on both harvesters and infield transport to prevent inadvertent 'straying' of machinery onto crop growing areas.
8. Reducing air pollution from pre-harvest burning of cane: Continued adoption of green cane harvesting/trash blanketing, already widely used in parts of the industry, yields a wide range of environmental benefits in terms of water saving and improved biodiversity.
9. Processing impacts: Two areas where good progress has been made in recent years are the recycling of water used in cane mills and the treatment of effluents. Available effluent treatment techniques include simple screening and settling of solid wastes, and more sophisticated (aerobic and anaerobic) methods for biological treatment. Further examples of practices where environmental impacts can be reduced are summarised below.

The industry currently has a range of environmental challenges as noted in this report, but with the implementation of the project the following elements are identified as the main activities that can assist in adapting and mitigating against environmental impacts.

1. Fairtrade alignment of plans
2. Training of personnel
3. Updating of environmental plan with areas of project concern
4. Conducting testing of soil where irrigation is intended to use.
5. Procurement of irrigation system according to the most efficient and adequate system
6. Use of organic based fertilisers including (EM, biofertilizer, compost, bogashi, among others).
7. Selection of the land that meets the criteria for mechanical harvesting or preparing them to meet the proper criteria.

1.13 Social and community actions

The project should consider the social impacts that are described in this report in the design and implementation of the project interventions.

Furthermore, it is the social recommendation for the project that it should drive towards:

1. Eradication of risk and danger to cane cutters meeting Fairtrade and OSHA standards (Heat, snakes, dangerous implements, burns)
2. Better environmental practices minimised emissions.
3. More effective methodology for greater efficiency. Caveat fields must be prepared. This cannot be done 100%.
4. Minimal occurrences of SEAH due to systems that are put in place to reduce the risk.

This project is expected to only be approximately 10,000 acres, but it is a continuance in the right direction of quality and quantity outputs about efficiency and best practice as started by Fairtrade. When all the sustainability impact categories are considered, the definition of the best scenario points squarely at the Mechanical Harvesting methodology, which this project plans to utilise with only positive gains to the stakeholders in the industry with reluctance by a few to hold onto the status quo.

Additional social actions that the project should consider incorporating into the project design could include building on existing initiatives, including training and capacity building into the delivery of project interventions, ensuring human rights and equal opportunity are always provided and sufficient support is provided to all parties involved to succeed.

Training and capacity building

Training specific to finances and attaining loans for adaptation interventions should be considered. Training and support to accompany loans should focus on the following key areas:

- Farm plan development with a specific focus on climate change adaptation and mitigation
- Technical guidance on installing new technologies, i.e., irrigation systems and solar energy
- Training on national and international quality standards, including farm safety and hygiene
- Capacity building for value-addition from other farm income generating activities
- Training in crop diversification
- Proper training and gear for the application of chemicals
- Business planning and development, including record keeping and marketing/sales
- Best Practices in Recycling, Reusing materials.
- SEAH Prohibitions and reporting channels.

These training workshops or other capacity building opportunities have to be attended by as many community members as possible. Provision of incentives and attendance schemes, group savings initiatives, insurance, canteen services, dispensary, clubs, sports and cultural events and PPE and uniforms could be used as tools to do so.



Human rights and equal opportunity

Compliance with national government labour and social regulations concerning minimum standards for workers must be upheld and communicated by the project. This could form part of the training and be incorporated in an employee benefit program to ensure all employees and labourers in the industry are being treated fairly.

Farming support

Smallholder farming model developments can work provided a holistic approach is applied to the out grower development, which involves the ongoing involvement and partnership between the host company, donors, banks and farmers, instead of just taking a technical approach which is unsustainable.

Farmer demonstration plots provided by the host company are essential as training grounds and to demonstrate techniques and sustainable management practices. Case study models of successful smallholder farming developments need to be written up and published, as a large part of future cane supplies will be generated by smallholder farmers in places like Africa.

Systems of data monitoring and data management should be implemented to capture activities and incidences on farms to ensure farmers are always informed about what is going on their farms and with their labour force. This could include risk assessments such as environmental, health and safety and performance results to be made available to all employees and company officials to see.



1.14 Stakeholder Engagement and Information Disclosure

1.14.1 Stakeholder Engagement Process

This stakeholder engagement process was designed with the following criteria in mind:

1. Develop a common vision and purpose with regards to the project design process.
2. Develop a process where honest and open communication can take place with stakeholders at each stage of the design process.
3. Empower stakeholders to make decisions and own each element of the project by giving them technical oversight into the project design process.
4. Align stakeholder competencies with project implementation needs.
5. Elicit broad agreement as to stakeholder roles and responsibilities in the project implementation.
6. Get full commitment of stakeholders to co-funding activities through the signing of a letter of commitment to co-fund.

During the project conceptualization phase the key stakeholders identified were consulted and a two-day working session was held with BSI and SIRD I to discuss the problem statement and needs (A full record of these engagements can be found in the approved project concept note for the project) Engagements were also held with other key stakeholders.

Stakeholders prioritised for engagement at this phase were based on the sugar value chain. The value chain actors were organised as follows: Farmers were grouped into harvest groups (HG), test groups (TG) and Farmers Associations. At Project development, there were 274 harvest groups, 19 test groups and 4 Farmers Associations. The primary purpose of the harvest groups is to provide logistical support to farmers through a harvest group leader system. This support is focussed on harvesting and haulage but may also include other areas of sugarcane production. Some harvest groups supply their members with inputs on credit while others provide crop husbandry services. The test groups are created to align deliveries with quality and to make payments according to the quality received from each group. The Farmers Associations are the apex farmer bodies and are responsible for the support, lobbying and overall welfare and sustainability of the farmers. The Farmers Associations are the institutions through which the project will connect with the individual farmers on the ground.

During the engagement process, each association, after a transparent and clear explanation of the project's intentions, showed similar levels of support for the project and the intended impact. The division of associations brings about a natural hesitancy and therefore using independent intermediaries (Agricane) was critical in the engagement with the Farmer Associations.

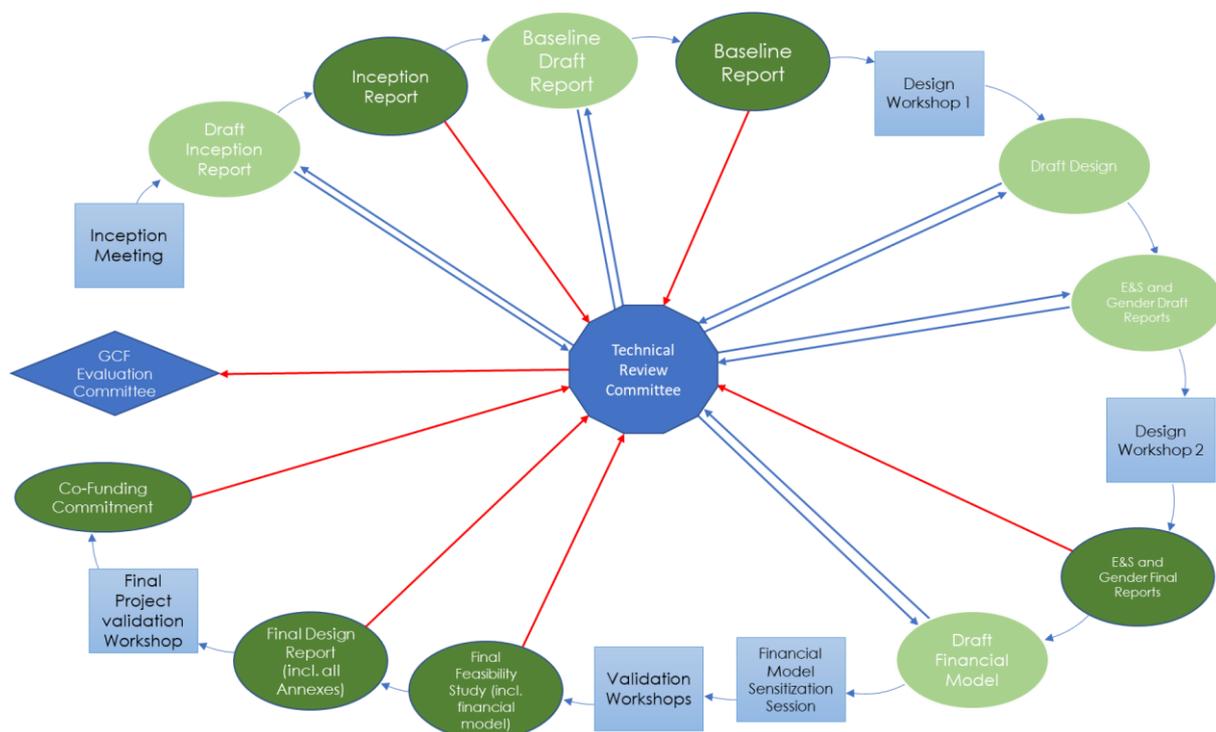
These engagements resulted in a conceptual project design being developed in response to the climate impact expected in the Belize sugar industry. This design was captured in the concept note. The elements of the project were clearly defined and captured in the

different project components. Project implementation modalities were not that well defined however and needed quite a bit of changing in the final project design.

During the project design stage, the stakeholder engagement became far more systematic and programmatic. A mix methodology for engagement of stakeholders was used and was tailored to stakeholder groups. In addition to face-to-face meetings with associations and representative groups, there were discussions through key informant interviews (KII), focus group discussions, and direct phone calls. It is important to note that due to COVID-19 many of the stakeholder engagement activities took place either virtually, or in person or through a combination of both. While this type of engagement, forced by the pandemic, was new to all concerned, having gone through this process as part of the design phase, it was determined that using a blended approach to stakeholder engagement is a very efficient way of engaging and will become normal in stakeholder engagements in future.

1.14.2 Stakeholders Consulted and Outcomes

The following diagram indicates the stakeholder engagement and activities and outcomes undertaken during the design phase:



Key to stakeholder buy-in and ownership during this phase of the project was the establishment of the technical review committee and the process of workshopping with stakeholders at every step of the design process. The technical review committee included representatives from all four cane farmers associations, SIRDI, BSI, Ministry of Economic Development, Ministry of Agriculture.

The technical review committee reviewed all the Agricane deliverables before sign-off from CCCCC. This ensured not only the technical correctness of the interventions but also



ensured the activities were aligned with the farmer’s needs. The workshops held during the different phases of the project design allowed the space for stakeholders to input freely into the design process.

Based on the above, the following stakeholders were engaged during the different phases of the project design process.

Table 13: Stakeholders Consulted During Development Phases

Project Development Phases	Stakeholders
Inception Report & Work Plan	CCCCC, SIRDI, BSI-ASR, Sugar Industry Control Board, PSCPA, CSCPA, NSCGA, BSCFA, Ministry of Economic Development
Baseline Report	CCCCC, SIRDI, BSI-ASR, Sugar Industry Control Board, PSCPA, CSCPA, NSCGA, BSCFA, Development Finance Corporation, Department of Agriculture, Community members
Gender assessment & action plan Environmental and Social Assessment and Action Plan	CCCCC, SIRDI, BSI-ASR, Sugar Industry Control Board, PSCPA, CSCPA, NSCGA, BSCFA, Development Finance Corporation, Department of Agriculture, Community members, Young sugar cane farmers, female farmers, Northern Maya Association of Belize, National Garifuna Council.
Draft Concept Project Design	CCCCC, SIRDI, BSI-ASR, Sugar Industry Control Board, PSCPA, CSCPA, NSCGA, BSCFA, Development Finance Corporation, Department of Agriculture, Community members
Draft Concept Project Design - Feasibility Study	CCCCC, SIRDI, BSI-ASR, Sugar Industry Control Board, PSCPA, CSCPA, NSCGA, BSCFA, Development Finance Corporation, Department of Agriculture, Community members
Risk Assessment & Mitigation Plan Stakeholder Analysis and Management and Engagement Plan	CCCCC, SIRDI, BSI-ASR, Sugar Industry Control Board, PSCPA, CSCPA, NSCGA, BSCFA, Development Finance Corporation, Department of Agriculture, Community members
Final Project Concept Design	CCCCC, SIRDI, BSI-ASR, Sugar Industry Control Board, PSCPA, CSCPA, NSCGA, BSCFA, Development Finance Corporation, Department of Agriculture, Community members, Northern Maya Association of Belize, National Garifuna Council.

Details regarding each stakeholder engagement with abbreviated notes can be read found in Annex 16-Stakeholder Analysis and Engagement Plan.

During the design phase there was strong alignment of stakeholders to the aims and objectives of the project with everyone supporting the need for the project and agreeing the interventions proposed would contribute to overcoming the barriers and help support the needs identified. Reflecting on this strong alignment, it was concluded that this was due to a well developed and thought through concept note which clearly addresses the farmers and industry needs and had a strong stakeholder process underpinning the conceptual design.

There were however some issues raised by stakeholders which needed addressing during the engagement process in order to ensure total alignment of all stakeholders to the project aims and objectives. These are summarised below.

1. Clarity was sought by stakeholders as to the exact role of the consultants (Agricane) in the process. Agricane had previously been engaged by the IDB with the support of BSI to develop several technical notes to support different elements of the sugar industry in Belize. This was resolved at the project inception meeting with all stakeholders where it was explained that CCCCCC had appointed Agricane to undertake the project preparation tasks on its behalf.
2. There was significant discussion during the inception meeting and first project design workshop held with BSCFA regarding project implementation modalities and budget. They wanted to see farmers being the main recipients of the project benefits. They felt that empowering local contractors would ensure benefits from the project would remain local and would contribute to the sustainability of the project. This input was discussed and changes to the project modalities were made which was aligned with the input received from BSCFA.
3. One clear issue that was raised continually by stakeholders was the capacity of the mill to crush more cane. This was raised by farmers based on their experience of having to carry over sugarcane when the mill was unable to receive it in good production years. It was explained to stakeholders that the aim of the project was not necessarily to produce more sugarcane but to produce a consistent volume of sugarcane from less land. Decrease the variability caused by climate change and be more productive thereby potentially releasing land for other crops and decreasing the pressure that farmers may feel to expand their land into environmentally sensitive areas. The project is clearly aligned with one of the principles of climate smart agriculture of increasing productivity and using less inputs to achieve more yield.
4. Other key issues raised during the stakeholder engagement which the project design does not address as it is outside the scope of the project but could impact the project outcome includes:
 - a. Roads and road infrastructure: This was raised on many occasions as an issue in the supply chain. This is strongly linked to climate as rainfall patterns and timing changes resulting in the need to harvest and haul in wet periods. This means deteriorating haulage roads and damaged fields. The project will not address the construction issues of roads directly due to the cost associated with this activity. Indirectly though the project design could mitigate some of the impacts through the introduction of new varieties which could have the impact of shortening the harvest period thus reducing the risk of harvesting during wet times.
 - b. Tension between the mill and certain farmer groups: This tension was evident throughout the stakeholder consultation. This tension is expected and is found in many sugar industries around the world where farmers and millers need

each other to exist but are often in competition over value distribution and power dynamics in the value chain. While not obvious, climate change is potentially fuelling this tension. This is because climate change is influencing the size and quality of the crop year on year. In a drought year, the crop is small, and the mill does not have enough crop to cover its fixed cost of operating. In a good rain year, the crop is too large resulting in some instances the mill not being able to mill all of the cane and farmers having carryover cane. Either scenario is not good resulting in raised tensions. One of the project outcomes is therefore to stabilise yields to allow for a more certain environment for decision making and investment by both growers and millers.

- c. Youth and Gender: Many stakeholders raised the need to include youth and gender aspects into the project. Based on the evaluation of the climate risks faced by the industry, the needs expressed by stakeholders and the barriers to change, it is not obviously clear what discrete set of activities can be introduced to specifically address these aspects of the sugarcane productive sector or Belizean livelihoods in general in the project area. What is clear is that the activities designed in response to the threats of climate change can have specific target areas and indicators that ensure that gender and youth issues are adequately addressed.

Form consultations with farmers, the Projects main beneficiaries the following needs were identified:

- Farmers need knowledge about the impacts of climate change on their farming operation and how they can build their adaptive capacity.
- Farmers need climate data and information on an on-going basis.
- Farmers need an incentive and the confidence to plant new varieties that are coming out of the breeding program.
- The industry needs a broader base of varieties to be planted to ensure the industry resilience to climate change and to ensure a range of varieties maturing at different times to better match the sugarcane maturity to the harvest window.
- Farmers need good quality seed cane available at the right time in the right place.
- The industry needs robust seed cane quality control processes and systems in place.
- Farmers need access to finance to allow replanting to happen as required.
- The industry needs a pool of well-resourced contractors able to undertake the work required to undertake the replanting operations.
- Contractors need a stringent framework to ensure the work that they undertake meets the specifications of that operation and is undertaken in a climate smart manner.
- Farmers need a system to link their replanting needs, with available funding/financing, with good contractors and a robust quality control mechanism and systems to ensure the efficiency and productivity of contractors.
- The industry needs some form of crop insurance scheme to mitigate catastrophic weather-related events.
- Farmers need to improve their soil health.

- Farmers need to understand the risks and benefits of moving to mechanical harvesting.
- Farmers need to understand the cost/benefit of introducing climate smart practices into their farming operation.
- Farmers need knowledge about irrigation and irrigation practices.
- The industry needs a pool of qualified irrigation and drainage contractors.
- Farmers need financial assistance to develop irrigation and drainage on their fields.
- The industry needs to develop different farm models to allow farmers to better organise themselves to adopt the new climate smart practices.
- Farmers need training on the social transformation aspects needed to build resilience to climate change.
- Farmers need to be more inclusive of gender and youth in farming and industry activities.

Overall, most of the issues raised by stakeholders during the stakeholder engagement process have been addressed in the project design. Needs are linked to respective activities within the project.

1.14.3 Validation Session

A final validation session was held with all stakeholders during the week of 2-9 April 2022. During these sessions the final funding proposal and project strategy was presented. Included in this was the exact co-funding requirements and commitment from each stakeholder. These sessions culminated in each of the stakeholders signing or committing to sign the co-funding letters.

A transformation workshop was also held as part of this series of engagements. The purpose of this workshop was to emphasise the transformational aspects of the project as well as to give some ideas as to how this transformation could be achieved.

1.14.4 Information Disclosure

This Environment and social study was made available to key stakeholders before finalisation of the ESAP. The ESAP was presented to the Technical Review Committee, including the four sugarcane farming associations, for review and feedback.

The ESAP will be made available for stakeholders upon request to the CCCCCC and through the regional clearing house.

1.15 Stakeholder Engagement Plan (SEP) for Project Implementation

Continued stakeholder engagement is critical to delivering an impactful project for the Northern Belize Sugar Cane Industry. Stakeholder consultations will remain ongoing with key stakeholders identified during the project development stage. Additionally, if new stakeholders are identified during implementation, the stakeholder engagement plan will be adjusted to suit the reality. During project development, the project received buy-in and



collaboration from all of the four (4) sugar cane farmer associations. Constant dialogue is necessary with the respective associations to ensure continued ownership of the project results. Through representation at the Project Steering Committee (PSC), these four associations will remain informed of the project's deliverables and progress. Engagement is planned to continue through meetings with the Associations, face to face dialogue, and document sharing.

Importantly, the project has garnered support and ownership from the private sector (BSI), Government of Belize (respective Government Ministries) and Quasi-Governmental body (SIRDI). It is important to ensure that representatives of these three stakeholder groups have decision making authority. Engagement methods will vary with these groups from PSC meetings to telephone conversations, on a continuing basis. The project will need to work together with these key stakeholder groups for successful impact.

Sugar cane farmers are identified as a separate category of stakeholders. As one of the primary beneficiary groups of the project, sugar cane farmers will be kept informed of project progress, as well as opportunities. Information will flow to farmers through their representative associations, meetings, presentations, and through the Project's Transformation Officers and the Project's Gender and Social Officer. Farmers will be informed of the Project's GRM, including SEAH reporting channels. Engagement with female farmers will be informed by the Project's Gender Action Plan.

Other representative groups of communities within the project footprint such as the Northern Maya Association will be consulted to ensure that the project continues to have no impact on their constituents. The Project's Gender and Social Officer will consult with and be a direct contact for these groups once needed. The representative groups will be consulted on the Project's GRM and will be informed of its finalisation.

The Stakeholder Engagement Matrix below outlines the engagement strategy and method for key stakeholders and stakeholder groups of the project.



Table 14: Stakeholder Engagement Matrix

Category of Stakeholders	Influence	Interest	Engagement outcome	Engagement Strategy	Frequency	Method of Engagement
Sugar Cane Farmer Associations	High	High	Work together	<p>Inform, Consult, Collaborate</p> <p>All elements of the project will be discussed with the Sugar Cane Farmer Associations. As co-implementers of the project, information provided to associations should ensure that they understand the project theory of change, and log frame along with activities and outputs being monitored.</p> <p>Through representation on the PSC, provide information on decisions of PSC.</p> <p>Inform farmers on the project GRM and SEAH prevention mechanisms.</p> <p>Collaborate to undertake on-farm activities required by the project.</p> <p>Consult and collaborate on training activities, including logistical and training expectations.</p>	As needed, once activities are activated.	<ul style="list-style-type: none"> ● PSC Meetings ● Presentations ● Face-to-Face Dialogue ● Document Sharing
Sugar Cane Farmers	Medium	High	Keep satisfied	<p>Inform, Consult, Collaborate</p> <p>Through farmer associations inform farmers on project progress and</p>	As needed, once activities are activated.	<ul style="list-style-type: none"> ● Presentations ● Face-to-Face dialogue ● Document Sharing



Category of Stakeholders	Influence	Interest	Engagement outcome	Engagement Strategy	Frequency	Method of Engagement
				<p>opportunities as they arise.</p> <p>Inform and collaborate with farmers on the project GRM and SEAH prevention mechanisms.</p> <p>Collaborate to undertake on-farm activities required by the project.</p> <p>Consult with female farmers in line with the Gender Action Plan to ensure full participation in project activities.</p> <p>Consult and collaborate on training activities, including logistical and training expectations.</p>		<ul style="list-style-type: none"> ● Gender and Social Specialist outreach. ● Transformation Officers outreach.
SIRDI	High	High	Work Together	<p>Inform, Consult, Collaborate</p> <p>As implementer of key project activities including leveraging block chain initiative into the project, continuous dialogue with BSI.</p> <p>As representative of PSC, provide information for informed decision making.</p>	Continuously, At quarterly PSC meetings.	<ul style="list-style-type: none"> ● PSC meetings, ● Documentation sharing, ● Technical meeting ● face to face dialogue ● Telephone interviews
BSI/ASR	High	High	Work Together	<p>Inform, Consult, Collaborate</p> <p>As executor of key project activities including training programmes and</p>	Continuously, At quarterly PSC meetings.	<ul style="list-style-type: none"> ● PSC meetings, ● Documentation sharing, ● Technical meeting



Category of Stakeholders	Influence	Interest	Engagement outcome	Engagement Strategy	Frequency	Method of Engagement
				secretariat for seed varieties, continuous dialogue with SIRDI. As representative of PSC, provide information for informed decision making.		<ul style="list-style-type: none"> ● Face to face dialogue ● Telephone interviews
Ministry of Agriculture	High	High	Work Together	Inform, Consult, Collaborate	Continuously, At quarterly PSC meetings.	<ul style="list-style-type: none"> ● PSC Meetings, ● Document sharing ● Technical meetings ● Face to Face Dialogue ● Telephone interviews
Ministry of Economic Development	High	High	Work Together	Inform, Consult, Collaborate	Continuously, On request	<ul style="list-style-type: none"> ● Face to Face Dialogue ● Document Sharing ● Technical Meetings ● Telephone interviews
Sugar Industry Control Board	Medium	Medium	Keep Satisfied	Inform	As needed.	<ul style="list-style-type: none"> ● Document sharing
Financial Institutions	High	High	Work Together	Inform, Consult, Collaborate	As needed, on request.	<ul style="list-style-type: none"> ● Documentation sharing, ● technical meetings ● face-to-face dialogue



Category of Stakeholders	Influence	Interest	Engagement outcome	Engagement Strategy	Frequency	Method of Engagement
Northern Maya Association of Belize ³⁷	Medium	Medium	Work Together	<p>Inform, Consult</p> <p>Keep open dialogue with NMAB as a representative group of northern maya.</p> <p>Dialogue to co-identify traditional knowledge and practices, if any, so that they may be promoted and strengthened through the implementation of the project.</p> <p>Dialogue to identify that there are no project impacts on indigenous people throughout the project cycle.</p> <p>Dialogue to identify that there are no project impacts on indigenous people.</p>	As needed, on request.	<ul style="list-style-type: none"> ● Face-to face dialogue. ● Document Sharing.
Ministry of Human Development, Families, and Indigenous People Affairs (Women’s Department)	Low	Low	Show consideration	<p>Inform, Collaborate</p> <p>Share projects with the district office and create referral relationships for SEAH.</p> <p>Consult on opportunities to maximise gender co-benefits.</p>	As needed	<ul style="list-style-type: none"> ● Face to Face dialogue ● Technical Meetings
Ministry of Natural Resources and Mining (National	Medium	High	Work Together	<p>Inform, Consult Collaborate,</p> <p>Provide information on plans and roll out</p>	As needed	<ul style="list-style-type: none"> ● Technical Meetings ● Document Sharing

³⁷ The National Garifuna Council is not represented as a key stakeholder in the SEP since consultations at project formulation identified that there is no known presence of Garinagu farmers and communities in the project footprint.

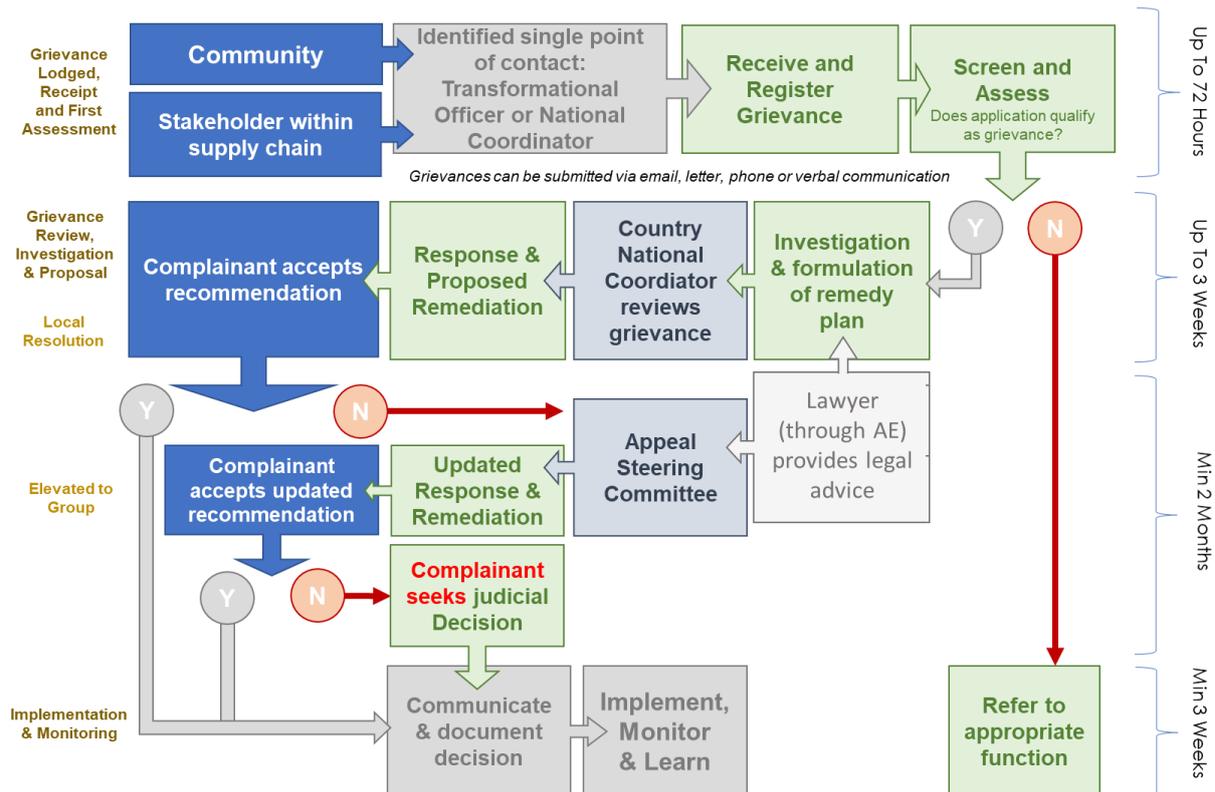


Category of Stakeholders	Influence	Interest	Engagement outcome	Engagement Strategy	Frequency	Method of Engagement
Hydrology Service)				of the irrigation component of the project. Share data as requested.		
Ministry of Rural Transformation, Labour and Local Government (Department of Rural Development)	Low	Medium	Show Consideration	Inform, Collaborate Provide information to facilitate co benefits to communities.	As needed	<ul style="list-style-type: none"> ● Face to Face dialogue ● Technical Meetings

1.16 Grievance Mechanism

A grievance mechanism can be referred to as a formal complaint process that can be used by individuals, or groups of people, that are being negatively affected by certain business activities and/or operations. The grievance mechanism is also designed to allocate roles and responsibilities during grievances and provide the guidance to reach a fair conclusion on the matter.

For the implementation of the project, a grievance mechanism should be installed that provides sufficient care to the sensitivity to the grievance while ensuring the process is simple and easily understood by all parties involved. The following process flow of the grievance mechanism has been developed:



The grievance mechanism process flow diagram shows the various roles and responsibilities that the project requires. Namely:

- Community / Project Stakeholder: The aggrieved party
- Transformational Officer / National Coordinator: Transformational Officers are the main point of communication between farmers and the project. The National Coordinator will communicate with all other project stakeholders.
- Gender and Social Officer: GSO is the main point of receipt and coordination of complaints related to SGBV or SEAH.
- National Coordinator: As the project manager, the national coordinator will take accountability of the project.
- Lawyer: Where required, the Accredited Entity (CCCCC) may be required to intervene through the support of legal advice.
- Steering Committee: Where required, the steering committee will represent an independent body with representatives from each of the project stakeholders, to provide guidance on selected cases.

This process ensures that all grievances are dealt with at the necessary level of management, independently and in a timely manner.

For the implementation of the project, it is important to engage project stakeholders throughout the project to ensure there is complete transparency in terms of the process of dealing with grievances and the process of decision making to reach the outcomes of each grievance.

Finally, an implement, monitor and learn process should be developed to ensure project stakeholders develop their understanding of each grievance and can limit future grievances of a similar nature.

The Project Level grievance mechanism will be fully elaborated in consultation with project stakeholders during project inception.

CCCCC GRM

Aggrieved parties can also access the CCCCC GRM. The scope of the CCCCC-GRM is to receive and address complaints, grievances, suggestions, requests for information, and other matters relating to the activities undertaken by the CCCCC. The issues raised may relate to projects in which the Centre is directly or indirectly involved as a funding, accrediting and/or implementing entity. The aim is to address such concerns and issues in a manner that respects the rights and interests of the complainant and other stakeholders involved.

The CCCCC-GRM aims to ensure the environmental and social integrity of all projects in which the CCCCC is involved as an intermediary, implementing or funding entity. For example, the Oversight & Project-level system addresses grievances on issues such as the review of the resolution of cases by project- level GRMs, complaints about lack of impartiality and/or fear of retaliation at project- level GRMs. Through the Oversight & Project-level System, the CCCCC-GRM will therefore play an oversight role of the BaC-Suf Project level GRM.

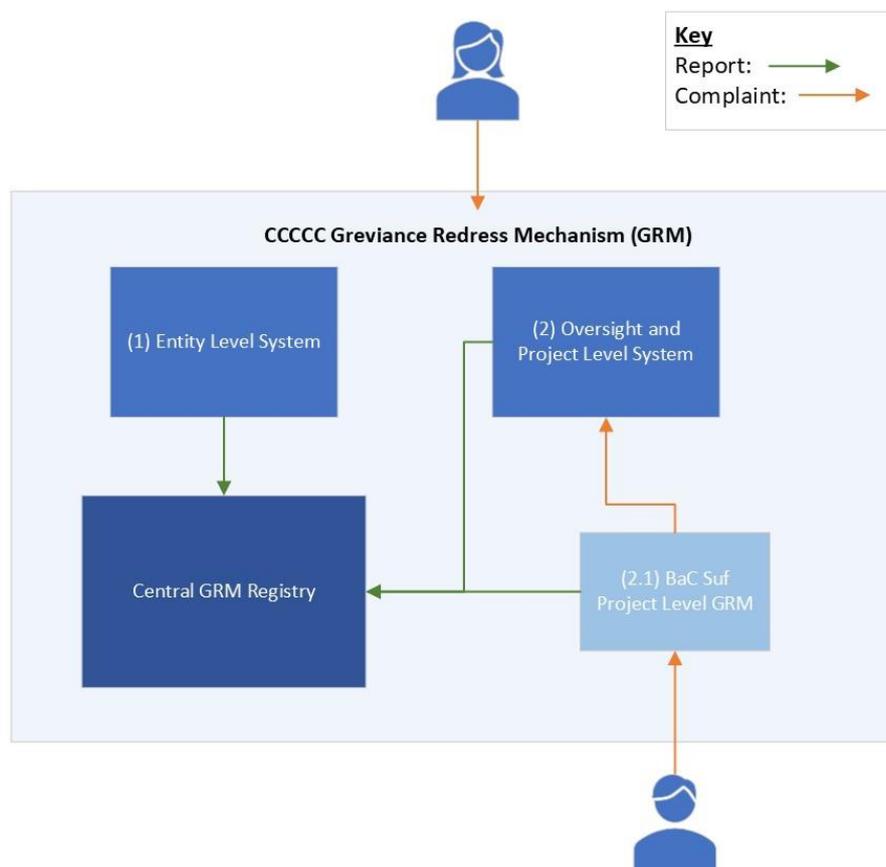


Figure 8: CCCCC GRM Architecture

Reporting on SEAH

As part of the GRM Process the CCCCC also provides a complaints and response process for reporting of incidents of Sexual Exploitation, Abuse and Harassment (SEAH). This reporting process is outlined in the CCCCC SEAH Policy. As identified by the Project's Gender Action Plan, the Project level GRM will be refined to include SEAH Reporting channels and referral pathways. In the revision process, it is critical that the following response measures are identified:

Where prevention of SEAH could not be achieved, the project will ensure that a survivor-centred and gender responsive approach is taken to addressing SEAH. This means:

- Every case must be treated with priority, respect, and confidentiality.
- The safety of survivors must be maintained.
- The identity of the survivor must be kept confidential and only revealed with the person's consent.
- The survivor's choices, wishes and rights must be always upheld.
- The survivor is provided with services and support without discrimination on any grounds. This extends to employees who are survivors of SEAH. Services may include identification of experts and referral of victims to local experts including inter alia, counselling/mental health services, medical services, advice on options available to the survivor for redress outside of the Project's or CCCCC GRM.

The project must also ensure that a rights-based approach is taken when addressing SEAH. As part of the response measures to SEAH the Project's GRM, once developed, must ensure that there are clear and identifiable channels for reporting SEAH. The SEAH reporting process must ensure that a survivor centred approach is taken. Therefore, careful identification of the party and alternate receiving SEAH related complaints is necessary. This role is currently vested in the Project's Social and Gender Officer who will be trained on SEAH. This is to ensure that the approach to taking the complaint does not victimise the survivor, nor turn the survivor away. The SEAH reporting procedures must consider the CCCCC reporting channels available for employees and stakeholders as part of the CCCCC SEAH Policy. Additionally, channels for reporting under Belizean Law including but not limited to the Protection Against Sexual Harassment Act 2000 revised edition.

Referral options away from the Project's GRM must be made clear. These options include but are not limited to:

- Complaint directly to the GCF's Independent Redress Mechanism in accordance with the Policy on the Prevention and Protection from Sexual Exploitation, Sexual Abuse, and Sexual Harassment.
- Complaint via legal and judicial channels.
- The use of a trained, neutral, or designated mediator.



1.17 Action plan

The work of the Project in Safeguarding that the project follows the required environmental and social safeguard is therefore aligned and protected, but it would be important that the project:

- Train staff from the Environmental Management Unit of the Farmers Association, SIRDI, Ministry of Agriculture and BSI in areas of Environmental and Social safeguards and compliance.
- Ensure that the Project GRM is accessible to all stakeholders and that there is knowledge of the GRM and its processes through stakeholder consultations.
- Institute and follow a labour hiring protocol including verification of legal requirements for working in Belize.
- Ensure that measures for SEAH prevention are instituted at the commencement of the project.



Table 15: Risk management and mitigation identification

Possible Performance Standard Triggered	Risk	Mitigation measures	Risk Significance and Priority Setting	Responsible party/person	Schedule	Expected results	Cost/Budget
PS-2: Labour and Working Standards PS-3 – Resource Efficiency and Pollution Prevention	Noncompliance with Health and Safety precaution during harvesting	<ul style="list-style-type: none"> ● Selection of experienced operators for field works. ● Provide training for service providers on best practice to avoid accidents/incidents related to mechanisation. ● Clearly defined protocols and guidelines established for emergency preparation and response. 	Low	Project Management Unit / Farmer Associations	Prior to commencement of works.	Avoid affecting plantation that were not scheduled for mechanical harvesting	\$77 500,00
			Low	Project Management Unit / Farmer Associations	During harvesting season	Training of cane cutting in different areas that can reintegrate or other alternative training	
PS-3 – Resource Efficiency and Pollution Prevention	Uncontrolled and unsustainable groundwater use due to the use of	Clearly defined protocols and guidelines with technical specification to control water use and abstraction established.	Low	Farmers	Prior to commencement of works.	Sustainable water supply and prevention of	



Possible Performance Standard Triggered	Risk	Mitigation measures	Risk Significance and Priority Setting	Responsible party/person	Schedule	Expected results	Cost/Budget
	solar powered irrigation.	Provide training on water scheduling techniques to end users.				excessive drawdown of groundwater	
		Identification of irrigation sites with existing boreholes/wells	Low	Project Management Unit / Farmer Association	Prior to commencement of works	Reduction in extraction of water from existing water sources	
		Educate farmers on the dismantling, recycling, recovery of solar panels materials and structures in accordance with recommendations for the Department of the Environment.	Low	Project Management Unit / Farmer Association	Post implementation of activity	Safe and sustainable decommissioning of solar panels	
	Water ponding due to inadequate water flow	Clearly defined protocols and guidelines established for the development of drains. Directional drains construction must follow the natural downward ground slopes not exceeding two feet (0.60 m). Utilise excavated topsoil for infill of depression along drainage path or spread alongside drains during construction. No soil should be transported off site.	Low	Farmers	Construction of drains between planting seasons and maintenance before during and after harvesting	Uniform drains ensure movement of water away sugar cane rows promoting plant growth. Avoidance of mosquito breeding sites and associated vector born disease.	



Possible Performance Standard Triggered	Risk	Mitigation measures	Risk Significance and Priority Setting	Responsible party/person	Schedule	Expected results	Cost/Budget
PS 1: Assessment and Management of Environmental, Social and Gender Risks and Impacts	Untrained or inadequately trained Contractors	Training - Development of contractor's skills and capacity to understanding the environmental, social and gender requirements, how to identify issues and apply the safeguards for prevention	Low	Project Management Unit / Contractors	Prior to commencement of works.	Train contractors on CSA and provide loan guarantee for new equipment	\$63 500,00
PS 1: Assessment and Management of Environmental, Social and Gender Risks and Impacts PS-3: Resource Efficiency and Pollution Prevention	Wrong variety selection and untimely replanting	Establish protocol and chain of custody from the selection of the sugar cane variety at the nursery to delivery to sugar cane farm, only properly trained personnel must be authorised to issue seed cane to farmers. Exclusion of invasive species including GMOs	Low	Project Management Unit / Farmer Associations	Prior to commencement of works and during planting season	A wider base of varieties across the industry Improved soil health and increased production. Avoidance of the cultivation of invasive species including GMOs are not used?	\$42 500,00
PS-9 – Stakeholder Engagement and	Uncooperative adjacent farmers that render block farming ineffective	Sensitization of farmers on benefits and advantages of the new farming model Biodiversity conservation and maintenance of ecosystems at a	Low	Project Management Unit / Farmer Association	During off peak season	Ensure the farmers are informed on the benefits of commercial and	\$145 000,00



Possible Performance Standard Triggered	Risk	Mitigation measures	Risk Significance and Priority Setting	Responsible party/person	Schedule	Expected results	Cost/Budget
Informed Disclosure³⁸		landscape level, as well as on individual fields.				other types of farming models	
PS 1: Assessment and Management of Environmental, Social and Gender Risks and Impacts , PS-3 – Resource Efficiency and Pollution Prevention	Inadequate moisture identification and management practices for optimal sugar cane growth	Conduct testing on soil irrigation parameters to determine optimal water use for efficient growth of the different sugar cane varieties	Low	Nursery operators/Farmers	Prior to commencement of works	Construct a baseline that permit monitoring of soil related parameters	
		Reduce excessive water consumption by adopting appropriate irrigation practices; improved scheduling of irrigation to enhance water use efficiency; adoption of water-saving irrigation methods, recycling of drainage water, mulching or trashing to reduce evaporation. Follow guidance provided by the Farmers Field School Handbook. Soil specific guidelines need to be followed when planting, and production practices must protect soil ecology and fragility, particularly under conditions of high rainfall and steep terrain	Low	Nursery operators/Farmers	Prior to commencement of works	Compliance to local laws and reduction in the use of natural water resources	

³⁸ Performance Standard 9 is specific to the CCCCC Environmental and Social Management System



Possible Performance Standard Triggered	Risk	Mitigation measures	Risk Significance and Priority Setting	Responsible party/person	Schedule	Expected results	Cost/Budget
		Procurement of irrigation system according to specification and training of moisture management	Low	Project Management Unit / Farmers Associations	Prior to commencement of works	Ensure that proper technology is used for the required operation and farmers have the knowledge to manage the systems	\$33 000,00 (training)
	Improper and ineffective integrated Pest Management measures	Integrated Pest Management (IPM), precision application methods, spot applications as needed and the elimination of prophylactic use of agrochemicals. Use of organic based fertilisers including (EM, biofertilizer, compost, bogashi, among others). Development of new environmentally friendly pest and disease management measures	Low	Project Management Unit / Farmer Associations	During planting season	Farmers informed on biological pest control measures	
		Identification of environmental No-Go areas Plant on previously cultivated agricultural or pastureland	Low	Association / Project Management Unit	Prior to implementation	Areas of high environmental importance not to be developed by the project	



Possible Performance Standard Triggered	Risk	Mitigation measures	Risk Significance and Priority Setting	Responsible party/person	Schedule	Expected results	Cost/Budget
		(consult the Farmer Field School Manual)					
PS-2: Labour and Working Standards, PS-9: Stakeholder Engagement and Informed Disclosure	Slow or inadequate implementation of the Social Plans	Strict adherence to the social safeguards particularly in capacity building. Participation in training of diverse personnel both male and female, elderly, youths including indigenous persons.	Low	Association / Project Management Unit	Prior to commencement of works	Increase of awareness and effectiveness of the technical personnel	
		Use of farmer vulnerability criteria	Low	Project Steering Committee	Prior to implementation	A set of vulnerability criteria including a range of indicators to inform who project beneficiaries will be	
PS 1: Assessment and Management of Environmental, Social and Gender Risks and Impacts; PS-2: Labour and Working Conditions, PS-4: Community Health, Safety and Security, PS-9: Stakeholder Engagement and	Inadequate Occupational Health and Safety compliance	<p>Conduct hazard assessment based on farm size and location.</p> <p>Regular check by the project management team on the effective implementation of occupational health, safety.</p> <p>Clearly defined protocols lined with established procedures for emergency preparation and response.</p> <p>Regular employees' exposure to health, safety and security measures building a culture of</p>	Low	Project Manager with assistance of Gender and stakeholder specialist and personnel responsible for Environmental and Social Management/ Health Safety, Security	During project implementation	Very low or not issues related to health, safety and security in the workplace	



Possible Performance Standard Triggered	Risk	Mitigation measures	Risk Significance and Priority Setting	Responsible party/person	Schedule	Expected results	Cost/Budget
Informed Disclosure		Health and Safety in the Workplace Mandatory employees' participation in health, safety and security awareness sessions					
		Due diligence – evaluation of first, second, third- and fourth-party suppliers of good and services where applicable Selection of the suppliers of goods and services based on the CCCCC approved procurement policies. Verification of goods and service suppliers' historical records	Very low	Project Manager	As required during project implementation	Compliance with local laws and	
	Exposure to SEAH	Ensure all Contractors sign Tender Declaration which acknowledges prohibitions, including abuse under the CCCCC Procurement Policy and Manual (2021).	Low	CCCCC/ Project Management Unit	Prior to commencement of works	Contractors are aware of SEAH prohibitions and consequences	
		Ensure all Project staff are trained in SEAH including prohibitions and the GRM.	Low	CCCCC/ Project Management Unit	Prior to implementation	Project staff are versed in SEAH prohibitions and know the	



Possible Performance Standard Triggered	Risk	Mitigation measures	Risk Significance and Priority Setting	Responsible party/person	Schedule	Expected results	Cost/Budget
						consequences of violation. Staff also are aware of the process for raising a complaint and the referral pathways.	
		Ensure all project staff sign the Project's Code of Conduct which will include SEAH prohibitions.	Low	CCCCC	Prior to implementation	Project Staff commit to not violating project affected populations or each other and are aware of consequences for violation.	
		Ensure the GRM is updated with clear SEAH related channels and is maintained and publicised.	Low	CCCCC/Project Management Unit	Prior to implementation	Community access to report SEAH through gender- responsive and survivor-centred GRM is maintained and there is knowledge of the reporting process.	



1.18 Institutional Arrangements for Implementation of Environmental and Social Risk

For an effective implementation of the ESAP, Coordination between project entities and personnel involved in the implementation of the project is paramount. Therefore, the roles and responsibilities of all those involved in the various stages must be defined, documented, and communicated. The Institutional responsibilities are outlined in this section.

The ESAP will be institutionalised using a dual-level approach. The two principal levels rest within the CCCCC (AE) and the Project Management Unit. However, the Farmer Associations will also be responsible for upholding the actions recommended by this ESAP. The AE will ensure that the project is implemented in accordance with the CCCCC Environmental and Social Management System, and the GCF's Environmental and Social Policy, and guidelines. Oversight and monitoring of the implementation of the ESAP are paramount to the CCCCC's responsibility. The PMU, during their day-to-day execution of the project will ensure that the ESAP mitigation measures are closely followed.

Regulatory and Statutory bodies will carry out their respective mandates where required under this project in accordance with national law.

The following outlines the responsibilities of the CCCCC, PMU and Farmers Association:

Caribbean Community Climate Change Centre (Accredited Entity)

- Recommend additional measures for strengthening the ESAP and implementation performance.
- Ensure that Gender, social, environmental co-benefits are derived from the project's implementation.
- Ensure the project adherence to the ESAP (including SEAH measures).
- Oversight of the Project Grievance Redress Mechanism.
- Receipt of project-level system grievances on issues such as the review of the resolution of cases by the project level GRM, and complaints about lack of impartiality and/or fear of retaliation at the project- level GRM.
- Hire Gender and Social Officer, Land and Water (Environmental) Officer.
- Monitor the implementation and compliance of the ESAP including SEAH prevention and response.
- Ensure onboarding of Project Management Unit and where training is required, build capacity of the PMU for implementation of the ESAP.



Project Management Unit (PMU)

- The National Coordinator will take accountability for the project and ultimately be responsible for oversight of all aspects of the project, including the ESAP. The National Coordinator, with support of the CCCCC Environmental and Social Specialist, and Gender and Stakeholder Specialist, will ensure that the Land and Water Officer and the Gender and Social Officer carry out their functions to ensure that the safeguards are adequately upheld and that no activities on the project's exclusion list are undertaken.
- The Gender and Social Officer will ensure that inter alia the social safeguards are upheld, that the stakeholder engagement plan is implemented and updated as needed, and that the grievance redress mechanism is publicised and operationalized.
- The Land and Water Officer will ensure that inter alia the project's environmental safeguards are upheld and that no activity on the project exclusion list is undertaken.
- Ensure that farmers and farmers associations are knowledgeable of environmental safeguards and safety measures established under the project and that these are upheld in the implementation of the project.

Farmer Associations

- Comply with environmental and social safeguards and safety measures established under the project.

It should also be noted that the efficacy and control of the implementation of mitigation and monitoring measures may benefit from the involvement and liaison with other relevant institutions and authorities, with special regard to:

- Ministry of Agriculture, Food Security and Enterprise
- National Institute of Culture and History (NICH)
- Pesticide Control Board (PCB)
- Ministry of Human Development, Families, and Indigenous People
- The Department of the Environment (DOE)
- Local authorities and communities



Table 16: Strategic administrative actions that can be undertaken by individual institutions while developing the project.

Area	Strategic recommendation
Fairtrade certification	Alignment of strategic actions of the project with elements of the Fairtrade existing plan
Environmental compliance	Strategic alignment with higher objectives and expected results
Planning	Establish proper strategic plan at the industry level with alignment to individual organisation
Cane farmers association	Improve productivity and production of sustainable can production to niche markets
Technical capacity - environment	Require that of environmental officers of the Accredited and Executing Entities are certified in environmental area
Environmental/Social	Development of highly specialised Training Programme in relevant areas
Monitoring/ Evaluation	Project monitoring and evaluation plan to include Social and Environmental considerations
Administrative capacity	Preparation of critical administration staff
Financial	Financial Sustainability planning and development

Annex 1: CCCCC Project Exclusion List

TYPE OF ACTIVITIES	TYPICAL EXAMPLES AND CLARIFICATIONS
Ammunition and Weapons, Military/Police Equipment, or Infrastructure.	<ul style="list-style-type: none"> ● Radioactive material does not apply to quality control (measurement) equipment where it can be demonstrated that the radioactive source is to be trivial or adequately shielded.
Projects which result in Limiting People’s Individual Rights and Freedom, or Violation of Human Rights.	<ul style="list-style-type: none"> ● Non-compliance with Fundamental Principles and Rights at Work International Labour Organisation.
Projects that knowingly require involuntary physical and or economic displacement of people.	<ul style="list-style-type: none"> ● Project that leads to voluntary or involuntary displacement of individuals, groups, and communities from homes and/or lands.
Projects unacceptable in Environmental and Social Terms (i.e., project activities with moderate to high risk).	<ul style="list-style-type: none"> ● Projects that significantly degrade Protected Areas, Critical Habitats and Heritage Sites, without adequate compensation/mitigation ● Project that supports the conversion of natural habitats such as forests to agricultural lands ● Materially significant unmitigated negative impacts on the environment or sensitive social groups for example, poor indigenous peoples. ● Project that supports the increased use of ground water abstraction.
Activities Prohibited by National Legislation, Regulations or Ratified International Conventions.	<ul style="list-style-type: none"> ● Genetically Modified Organisms (GMO); Abortion Clinics; Nuclear Energy; Etcetera. Wildlife or wildlife products; and Invasive Species regulated under the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). ● Pesticides, Herbicides Ozone Depleting Substances subject to international phase outs or bans defined by the International Convention on the Reduction and Elimination of Persistent Organic Pollutants and the Rotterdam, Stockholm Conventions and Montreal Protocol Lists. ● Pesticides that fall in WHO Recommended Classification of Pesticides by Hazard Class Ia (extremely hazardous); or Ib (highly hazardous) and in Class II (moderately hazardous) pesticides.



	<ul style="list-style-type: none"> ● Trans-boundary trade in waste or waste products defined under Basel convention and except for non-hazardous waste bound for recycling.
Ethically or Morally Controversial Projects.	<ul style="list-style-type: none"> ● Sex Trade and Related Infrastructure, Services and Media; Animal Testing*); Gambling and Related Equipment, Hotels with In-House Casinos; Tobacco (Production, Manufacturing, Processing, And Distribution) Alcoholic beverages excluding beer and rum.
Non-compliance with category C risk category	<ul style="list-style-type: none"> ● As a standard procedure for a project of this nature, the CCCCC Environmental and Social Screening Risk Assessment Screening Checklist will be used to identify the risk category of all sub projects. Activities with outcomes higher than those consistent with Category C will be eliminated

Annex 2: CCCCC Sexual Exploitation, Abuse and Harassment Screening

Project: Building the Adaptive Capacity of Sugarcane Farmers in Northern Belize (BaC-SuF)

Checklist for Appraising SEAH Risk	Comments
POLICY AND CODE OF CONDUCT	
Does the AE have a SEAH policy which covers the project?	Yes. AE SEAH Policy endorsed by Board of Directors in 2023
Does the project have a Code of Conduct prohibiting SEAH by workers?	Yes. The project will develop a project specific CoC for all workers.
Are clauses included in procurement contracts which commit contractors, subcontractors, suppliers, drivers and security personnel (if applicable) to adhere to the AE Code of Conduct (or EE equivalent)?	Yes. A Tender Declaration will be signed consistent with AE Procurement Manual
SUPERVISION AND TRAINING	
(For larger, longer-term projects) Is there a trained SEAH specialist in the project team?	The Project team will hire a Social and Gender Officer who will be the SEAH Focal point for the Project. This Officer will work along with the AEs Gender and Stakeholder Specialist.
Does the project plan to train all project workers on the Code of Conduct, SEAH and what is prohibited behaviour?	Yes. This is cost in the Gender Action Plan.



Checklist for Appraising SEAH Risk	Comments
RECRUITMENT AND PERFORMANCE ASSESSMENT	
Are recruitment procedures in place, with interview panels staffed by at least two people?	Yes. Recruitment handled by AE’s Human Resource Unit.
Are candidates' identities checked at the interview and are references requested?	Yes.
Are all workers required to be hired on formal contracts?	Yes.
Are written procedures in place for performance appraisals, promotions, and any performance-related pay increases (if applicable)?	No.
GRIEVANCE REDRESS MECHANISMS (GRM)	
Does the project have a GRM for community members to raise SEAH-related complaints and concerns and is it confidential and survivor-centred, with multiple reporting channels?	Yes.
Does the project have a GRM for project workers to raise SEAH-related complaints and concerns and is it confidential and survivor-centred, with multiple reporting channels?	Yes
Are the staff who manage the GRMs equipped and trained to respond to SEAH reports in a safe and effective way?	
Are persons, communities and countries affected or potentially affected by the activities consulted and that effective SEAH GRMs to receive complaints and feedback are established and function in a collaborative manner and in a way that is complementary to GCF independent Redress. Mechanism, and requiring that any gaps or weaknesses be addressed?	Yes. Consultations for the development of the GRM was a part of the stakeholder engagement process during project development.
Are affected communities (or likely to be affected, by the GCF-financed activities) informed about SEAH GRMs at all three levels – at the earliest. opportunity of the stakeholder engagement process and in an understandable format and in all relevant languages?	Yes. They will be.
INVESTIGATION AND RESPONSE	
Are there written procedures for dealing with SEAH complaints or concerns and a dedicated and trained female	Yes. Procedures for dealing with SEAH complaints are identified in the AE’s SEAH Policy.



Checklist for Appraising SEAH Risk	Comments
staff member to deal with these (if no specialist is available)?	
Has a service provider mapping been undertaken to identify which services are available for survivors of SEAH?	Yes.
If there are no public or private service providers in the area, has the project identified and budgeted for outside providers?	There are public sector providers in the area.
AWARENESS RAISING	
Will/have gender-sensitive and culturally appropriate outreach materials been prepared (such as posters, signage, etc.) on SEAH in all relevant languages?	Yes. Materials will be developed.
Has the community been informed about potential SEAH risks for the project and how to prevent them and use the GRM?	No. this is expected to be done during project kick off and initial consultations.
Have any rapid mobile surveys or text surveys been developed to regularly obtain feedback from workers and/or the community?	No.
PROCUREMENT AND PARTNERSHIP	
Have SEAH prohibitions and mitigation measures been included in procurement documents?	Yes
Are there clauses in the EE contract requiring them to prohibit SEAH in their workforce?	Yes
PHYSICAL WORKSPACE	
Will separate facilities for men and women be provided at all work sites?	N/A for this project.
Are SEAH risks included in workplace safety assessments, including worker accommodation and transportation?	N/A for this project.
Are project workers informed of areas that are off-limits, for example areas around schools (or other places where children are present)?	Yes. They will be.

Name of Proposed Project	Building the Adaptive Capacity of Sugarcane Farmers in Northern Belize (BaC-SuF)
Name and Post Screener	Elishah St. Luce, Gender and Stakeholder Specialist



Signature of screener	
Unit:	Project Development and Management Unit
Date	August 11 th , 2023

Annex 3: CCCC Environmental and Social Risk Screening

CONTENTS OF ENVIRONMENTAL PERFORMANCE STANDARDS CHECKLIST

ENVIRONMENTAL AND SOCIAL RISK SCREENING

The purpose of the environmental and social risk screening of projects is to determine their potential environment, disaster, climate change and social risks, opportunities for introducing enhanced environmental and social benefits. At the end a single category is assigned to each project that reflects the issue(s) with the greatest potential for environmental or social impacts. Projects are classified according to Categories A, B, C or FI. “Category A” contains “high risk” activities, Category B projects are those with moderate risk and Category C are typically those with low risk.

PROJECT OVERVIEW

“Building the Adaptive Capacity of Sugarcane Farmers in Northern Belize (BaC-SuF)” project has been developed to address the physical, financial, and institutional aspects of climate vulnerability identified among the sugarcane farmers in northern Belize. It is divided into three components. Components one and two look at building physical and financial resilience through the introduction of new climate adapted varieties, replanting and managing the sugarcane crop using climate smart practices and managing moisture through the introduction of irrigation and drainage. Component three has been designed to build the knowledge and knowledge systems to enable the farmers and other industry stakeholders to implement the physical changes in the farming systems envisaged in components one and two. It will also transform industry practices and systems to enable the project to realise the transformational and scaling up elements envisaged in the project design and to ensure maximum project impact. These activities are supported based on the principle of additionality and de-risking investment in new varieties and practices. This is critical as farmers lack the financial security (due to a history of underperforming crops and diminishing returns) and the knowledge required to transform – the project will be able to bridge the gap. Grant resources from GCF is needed to (1) the incentive required to make farmers embarked on climate resilient practices (2) the financing gap since the practices will not be immediately profitable (3) the cost of implementing climate resilient practices is higher than traditional non-climate resilient practices and (4) de-risk



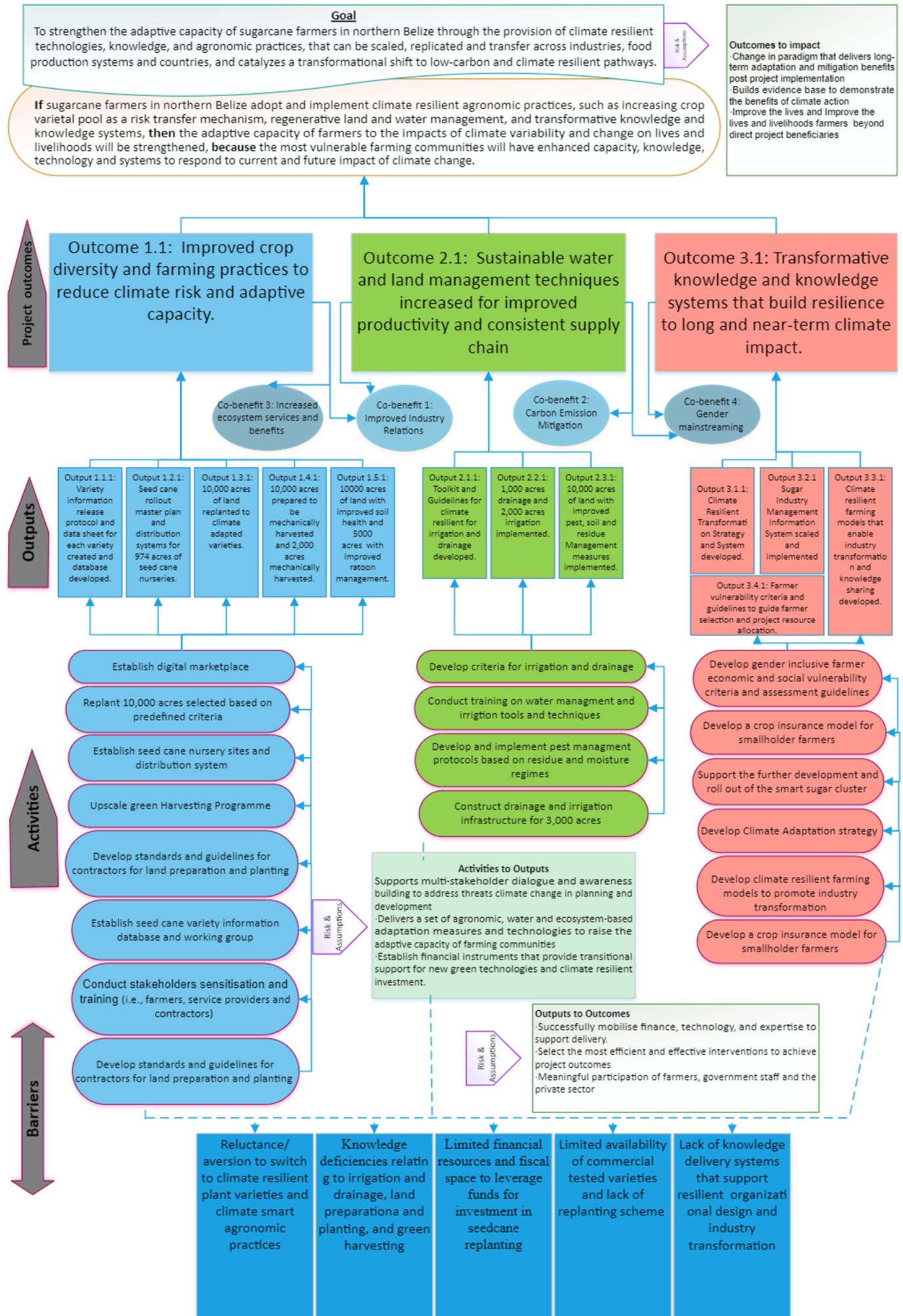
investments to a level that will encourage farmers and other investors to invest in climate resilient practices. The three components are:

Component 1: Climate risk reduction and increased adaptive capacity through improved crop diversity of farmers.

Component 2: Sustainable water and land management techniques for increased productivity and consistent supply chain.

Component 3: Knowledge and knowledge systems to proactively (early warning, investing) build resilience to climate impact while at the same time transforming farming systems for long-term adaptation.

The Theory of change diagram below captures the intended actions to achieve the desired goal of the project.





SECTION 1: RISK SCREENING

Question 1³⁹:

Has a combined environmental and social assessment/review that covers the proposed project already been completed by the National Partner, Project Implementation Partner, or other donor(s)?

Select answer below and follow instructions:

NO ... Continue to Question 2 (*do not fill out Table 1.1*)

YES ... No further environmental and social review is required if the existing documentation meets CCCCC’s requirements, and environmental and social management recommendations are integrated into the project concept note. The project will be categorised as “Category C”. Therefore, you should undertake the following steps to complete the screening process:

1. Use Table 1.1 below to assess existing documentation. If any of the seven questions result in a “No” answer, then continue to Question 2.
2. Ensure that the project concept incorporates the recommendations made in the National Partner/ Project Implementation Partner’s or donor’s environmental and social review.
3. Summarise the relevant information contained in the National Partner/ Project Implementation Partner’s or donor’s environmental and social review in the E&S Summary Note of the Environment and Screening Memorandum, selecting Category C.
4. Attach this Environmental and Social Performance Standards Checklist (ESPSC) and the Environmental and Social Screening Memorandum, to the project concept.
5. **IMPORTANT: SEE NOTES IN SECTION 4 OF THIS FORM**

Table 1.1	CHECKLIST FOR APPRAISING QUALITY ASSURANCE OF EXISTING ENVIRONMENTAL AND SOCIAL ASSESSMENT	Yes/No
1.	Does the assessment/review meet its TOR, both procedurally ⁴⁰ and substantively ⁴¹ ?	Yes – Preparation of the Environmental and Social Action Plan (ESAP) provided satisfactory and sufficient information on the industry’s Environmental and Social status, the information gaps and recommendations to ensure environmental and social protection.

³⁹ If the outcome of the screening resulted in “Category C” project risk then no further screening is necessary and the remaining sections will remain blank. However, ensure to review the remainder of this screening form to confirm that the most suitable “Risk Category” was identified.

⁴⁰ Procedurally – strictly followed the requirements laid out in the Terms of Reference

⁴¹ Substantially – providing sufficient information in the assessment beyond a desktop review and including primary data to form an opinion or conclusion.



Table 1.1	CHECKLIST FOR APPRAISING QUALITY ASSURANCE OF EXISTING ENVIRONMENTAL AND SOCIAL ASSESSMENT	Yes/No
2.	Does the assessment/review provide a satisfactory assessment of the proposed project ⁴² ?	Yes – an Environmental and Social Action Plan was prepared for the project. It provides environmental and social assessment of project activities to be implemented including the Environmental, Social, Gender and Risk assessment. Furthermore, the documents outline the individual care farmers association safeguards and due diligence for environmental and social protection of those impacted by sugarcane cultivation.
3.	Does the assessment/review contain the information required for decision-making?	Yes – see list in Table 1.1 below.
4.	Does the assessment/review describe specific environmental and social management measures (e.g. mitigation, monitoring, advocacy, and capacity development measures to be clarified during project preparation and implementation stages)?	Yes – see Table 15 of the ESAP
5.	Was the assessment/review developed through a consultative process with strong stakeholder engagement ⁴³ , including the view of men and women?	Yes – See section 5.3 of the ESAP
6.	Does the assessment/review assess the adequacy of the cost of and financing arrangements for environmental and social management issues?	Yes – see table 15 of the ESAP

Table 1.1 (continued) For any “No” answers, describe below how the issue has been or will be resolved (e.g. amendments made, or supplemental review conducted).

The project has been screened as a Category C project consistent with the Screening and Categorizing GCF-financed activities outlined in the Sustainability Guidance Notes⁴⁴ and the Environmental and Social Screening of Activities Proposed Under the Simplified Approval Process⁴⁵ recommended for small scale rural and urban community based-project. Typically a Category C is classified as one that will have minimal or no significant adverse environmental and social impacts or those that can be easily mitigated or avoided, sufficient environmental and

⁴² Satisfactory Assessment of the Project – Components of the project is present into activities or sub projects to allow a reasonable reader to interpret and understand the nature of the main project.

⁴³ Strong Stakeholder Engagement – Proper identification and facilitation for those that will be affected. Included are key organisations, leaders or persons in the community, representation for ungrouped persons. Methodology on selection of stakeholders

⁴⁴ Green Climate Fund, August 2019, Sustainability Guidance Notes – Screening and Categorizing GCF-Financed Activities, pp 9.

⁴⁵ GCF Guideline, January 2018, Environmental and Social Screening of Activities Proposed Under the Simplified Approval Process, pp1 paragraph 3 and 5 – Environmental and social screening requirements in the context of due diligence.

social review has already been conducted and environmental and social management recommendations have been incorporated into the project.

The outcome of Table 1.1 above, based on the screening criteria, resulted in the project being screened as a Category C since it is anticipated that the investment makes no establishment of infrastructures or elements that can heavily impact the social and environmental fabric of the Belize sugar industry and that recommended mitigation measures have been tried and proven to significantly reduce negative impacts and enhance positive benefits and co-benefits. It promotes more environmentally friendly practices and accelerates achievement of the objectives outlined in the industry strategic plans of farmers association and the social/environmental plans for a sustainable sugar industry. This objective would have been obtained in the future without external intervention or if farmers depended on Fairtrade funds and internal resources only.

The environmental and social assessments conducted identified the potential impacts and made recommendations for elimination or mitigation that have been incorporated into the Environmental and Social Action Plan (ESAP).

The assessment and recommended guidance documents include:

1. The Environmental and Social Action Plan (ESAP). This document identified the likely risk and recommendations for effective mitigation.
2. Digital Tools Assessment Report to assess with electronic monitoring
3. Best Management Practices Manual for the Cultivation of Sugar Cane
4. Irrigation research and trial report
5. Stakeholder Analysis, Management and Engagement Plan
6. Transformation Strategy and Training Plan
7. Sugar Cane Varieties Guidebook
8. Prohibitive Practices from National Legislation and those ratified by International Convention – (Table 8 of the ESAP)

Based on the assessments identified, conclusion provided and consistencies with the GCF's Environmental and Social Guidance Documents reviewed, it is accepted that this project was classified as a Category C. Therefore, this ends the screening, and no further screening will be conducted.

To ensure that the project remains a Category C some guidance notes are provided in Section 4 of this document related to the Performance Standards 1 through 9.

Question 2:



Does the project fall within any of the following categories?

- Education programmes not including infrastructure, which can catalyse profound transformation in mindsets with respect to the perception of human rights and capabilities, and their relations with poverty and inequalities.
- Health programmes, (not including hospital buildings and construction).
- Feasibility studies.
- Institutional development.
- National or Organisational Capacity Development.
- General technical assistance activities.
- Sustainable Infrastructure.
- Use of low technology
- Early Warning System
- Other (please Specify and provide justification) _____

Select answer below and follow instructions:

- NO... Continue to Question 3.
- YES... The proposed project will be categorised as “Category C”. No further environmental and social review required. Attach this Environmental and Social Performance Standards Checklist (ESPSC) and the Environmental and Social Screening Memorandum to the project concept. **(SEE NOTES IN SECTION 4 OF THIS FORM)**

Question 3:

Does the proposed project fit within one of the following sectors?

- Large-scale agriculture including livestock farming. Agro-industries including aquaculture.
- Large-scale agriculture including livestock farming, agro-industries including aquaculture
- Fisheries development.
- Large-scale infrastructure, including roads, sanitation, irrigation or water supply.
- Large-scale tourism developments including hotels and water parks.
- Ports, harbours and marinas.
- Airports.
- Forestry and forestry industries.
- Waste management facilities.
- Industrial plants and industrial estates.
- Storage facilities for petroleum, petrochemical or chemical products.
- Thermal power.
- Large scale hydro power.
- Rural electrification (large scale).
- Dams and impounding reservoirs.
- Mining and mineral processing.
- Oil and gas developments including pipelines.
- Large-scale land tenure, reclamation, or conversion of previously undeveloped land.
- Projects with potential impacts to environmentally sensitive areas such as coral reefs, mangrove swamps, and areas protected by national or international law.
- Projects requiring resettlement including the regulation of informal settlements or significant economic displacement, or with potential adverse impacts to vulnerable groups.
- Human development projects (education, health, skills training, youth development).
- Rural development, rural enterprise, shelter development.

Select the appropriate answer and follow instructions:

- NO ... Continue to Question 4.
- YES ... The proposed project will be categorised as “Category A”. Conduct the following steps to complete the screening process:
 1. Complete the E&S Screening Checklist and the E&S Summary Note and select “Category A”.
 2. Attach the completed Environmental and Social Performance Standards Checklist (ESPSC) and the Environmental and Social Screening Memorandum to the project concept.

Question 4:



If you have been directed to this question, the proposed project could still be categorised as “Category A” if it is likely to have a significant impact on one or more sensitive environmental or social components. You should now therefore complete Table 4.1 to enable a decision to be made about whether the project should be Category A or Category B.

If you answer “No” or “Not Applicable” to all questions in Table 4.1 then the answer to Question 4 is “No.” If you answer “Yes” to any questions in Table 4.1 (even one “Yes” indicate a significant issue that needs to be addressed through categorising the project as “Category A”) then the answer to Question 4 is “Yes”:

NO ... The proposed project will be categorised as “Category B”. Complete the E&S Summary Note by selecting “Category B” and attach the completed E&S Screening Checklist and the E&S Summary Note to the project concept.

YES ... Conduct the following steps to complete the screening process: 1. Select “Category A” in the E&S Summary Note, and attach this Environmental and Social Performance Standards Checklist (ESPSC) and the Environmental and Social Screening Memorandum to the project concept.

Table 4.1 : Additional Screening Questions based on environmental and social sensitivity (if the Environmental and Social Screening outcome is a “Category C” risk this table is not applicable and should not be populated)

1. Labour and Working Conditions	Answer (Yes/No/Not Applicable)	Remarks
1.1 Is the project likely to attract forced labour and/or child labour?	Not Applicable	
1.2 Will the proposed project have variable impacts on women and men, different ethnic groups, social classes?	Not Applicable	
1.3 Is there a moderate probability for occupational hazards (physical, chemical, biological, and radiological hazards, and specific threats to women)?	Not Applicable	
2. Resource Efficiency and Pollution Prevention	Answer (Yes/No/Not Applicable)	Remarks
2.1 Would the proposed project result in the release of pollutants to the environment with the potential for adverse local, regional, and transboundary impacts?	Not Applicable	
2.2 Would the proposed project result in the generation of waste that cannot be recovered, reused, or disposed of in an environmentally and socially sound manner?	Not Applicable	
2.3 Will the proposed project involve the manufacture, trade, release, and/or use of chemicals and hazardous materials subject to international action bans or phase-outs?	Not Applicable	
2.4 Is there a potential for the release, into the environment, of hazardous	Not Applicable	If the answer to any of these questions is a “Yes” this project should be assigned Category NO



Table 4.1 : Additional Screening Questions based on environmental and social sensitivity (if the Environmental and Social Screening outcome is a “Category C” risk this table is not applicable and should not be populated)		
materials (e.g., persistent organic pollutants, ozone depleting substances, mercury and/or other heavy metals, etc.) resulting from their production, transportation, handling, storage and/or use for project activities?		PROJECT since it is included on CCCCC’s Project Exclusion list. Please proceed to complete the ESS Summary Sheet.
2.5 Will the proposed project involve the application of pesticides that have a known negative effect on the environment or human health?	Not Applicable	
3. Community Health, Safety and Security	Answer (Yes/No/Not Applicable)	Remarks
3.1 Is there a highly likely ⁴⁶ or likely ⁴⁷ potential for the public (including workers and their families) to be exposed to hazards, particularly those that may be life threatening?	Not Applicable	
3.2 Is there a potential for community exposure to water-borne, water based, water-related, and vector-borne diseases, and communicable diseases that could result from project activities?	Not Applicable	
3.3 Would the proposed project be susceptible to or lead to increased vulnerability to earthquakes, subsidence, landslides, erosion, flooding or extreme climatic conditions?	Not Applicable	
4. Land Acquisition and Involuntary Resettlement	Answer (Yes/No/Not Applicable)	Remarks
4.1 Would the proposed project result in involuntary resettlement of populations?	Not Applicable	If the answer to this question is a “Yes” this project should be assigned Category NO PROJECT since it is included on CCCCC’s Project Exclusion list. Please proceed to complete the ESS Summary Sheet.
4.2 Would the proposed project result in voluntary resettlement of populations?	Not Applicable	
4.3 Would the proposed project result in economic displacement of populations due to changes in land use of the affected group or community?	Not Applicable	If the answer to this question is a “Yes” this project should be assigned Category NO PROJECT since it is included on CCCCC’s Project Exclusion list. Please proceed to complete the ESS Summary Sheet.
4.4 Is the proposed project likely to significantly affect land tenure arrangements and/or traditional cultural ownership patterns?	Not Applicable	

⁴⁶ Highly likely – could happen at any time

⁴⁷ Likely – could happen sometimes



Table 4.1 : Additional Screening Questions based on environmental and social sensitivity (if the Environmental and Social Screening outcome is a “Category C” risk this table is not applicable and should not be populated)		
5. Biodiversity and Natural Resources	Answer (Yes/No/Not Applicable)	Remarks
5.1 Would the proposed project result in the conversion or degradation of natural habitat or critical habitat?	Not Applicable	If the answer to any of these questions is a “Yes” this project should be assigned Category NO PROJECT since it is included in CCCCC’s Project Exclusion list. Please proceed to complete the ESS Summary Sheet.
5.2 Is the proposed project adjacent to a special area for protection of biodiversity (e.g. national park, natural reserve)?	Not Applicable	
5.3 Does the project involve natural forest harvesting or plantation development without an independent forest certification system for sustainable forest management?	Not Applicable	
5.4 Does the project involve the production and harvesting of fish populations or other aquatic species without an accepted system of independent certification to ensure sustainability?	Not Applicable	
5.5 Does the project involve significant new investments for extraction, diversion or containment of surface or groundwater?	Not Applicable	
5.6 Does the project pose a risk of degrading soils?	Not Applicable	
6. Indigenous Peoples	Answer (Yes/No/Not Applicable)	Remarks
6.1 Would the proposed project have environmental and social impacts that could affect indigenous people?	Not Applicable	If the answer to these questions is yes, an FPIC⁴⁸ is required.
6.2 Would the proposed project be located on, or commercially develop natural resources on lands traditionally owned by, or under the customary use of, Indigenous Peoples?	Not Applicable	
6.3 Would the proposed project significantly impact on critical cultural heritage ⁴⁹ What is essential to the identity and/or cultural, ceremonial, or spiritual aspects of Indigenous Peoples lives?	Not Applicable	
6.4 Would the proposed project result in involuntary resettlement of indigenous people?	Not Applicable	If the answer to this question is a “Yes” this project should be assigned Category NO PROJECT since it is included on CCCCC’s Project Exclusion list. Please proceed to complete the

⁴⁸ FPIC – Free Prior and Informed Consent

⁴⁹ Critical Cultural Heritage -



Table 4.1 : Additional Screening Questions based on environmental and social sensitivity (if the Environmental and Social Screening outcome is a “Category C” risk this table is not applicable and should not be populated)

7. Cultural Heritage	Answer (Yes/No/Not Applicable)	Remarks
7.1 Will the proposed project cause alteration, damage, or removal of any cultural heritage site?	Not Applicable	
7.2 Will the proposed project constraint access to cultural sites for the communities?	Not Applicable	
8. Stakeholder Engagement	Answer (Yes/No/Not Applicable)	Remarks
8.1 Will the activities include a continuing stakeholder engagement process	Not Applicable	
8.2 Will a grievance redress mechanism (GRM) be integrated into the management/implementation plans?	Not Applicable	



SECTION 2 – PROJECT RISK CATEGORY

To be filled in after the Screening Checklist has been completed.

Table I - Environmental and Social Screening Outcome	
<i>Select from the following:</i>	
<input type="checkbox"/> Category NO PROJECT	The proposed project is included in CCCCC’s Project Exclusion List since a “Yes” response was provided for one or more, of the following questions: 2.4, 4.1, 4.3, 5.1, 5.2, 6.1, 6.4 Further discussions and alternative design of the project will be required to reach a “No” response, and therefore, reconsideration before the project can proceed to Project Formulation stage.
<input type="checkbox"/> Category A	The proposed project is likely to induce significant and/or irreversible adverse environmental and/or social impacts that are sensitive, diverse, or unprecedented. A full Environmental and Social Impact Assessment (ESIA) and Environmental and Social Management Plan (ESMP) and a Gender Assessment and Action Plan (GAAP) will need to be completed during Project Formulation.
<input type="checkbox"/> Category B	The proposed project is likely to have potential for moderate adverse environmental or social impacts that are readily identified, and for which mitigation and management measures are known and available. Likely impacts will be few in number, site-specific, and few if any will be irreversible. An Environmental and Social Impact Assessment (ESIA), Environmental and Social Management Plan (ESMP), Gender Assessment and Action Plan (GAAP) will need to be completed during Project Formulation.
<input checked="" type="checkbox"/> Category C	The proposed project is likely to have minimal or no adverse social and/or environmental impacts, or sufficient environmental and social review has already been conducted and environmental and social management recommendations have been incorporated into the project. No further specific environmental and/or social assessment is required during Project Formulation, although those with procurement components may still have potential environmental and social sustainability considerations. These should be addressed as part of the regular project design activities.

SECTION 3: ENVIRONMENTAL AND SOCIAL SAFEGUARDS (ESS) ISSUES

If the proposed project category is **A or B**, please fill this table:

Table II - ESS Issues and Next Steps		
Performance Standard (PS)	Environmental and Social Issues⁵⁰	Next Steps⁵¹
PS 2: Labour and Working Conditions		
PS 3: Resource Efficiency and Pollution Prevention		
PS 4: Community Health, Safety and Security		
PS 5: Land Acquisition and Involuntary Resettlement		
PS 6: Biodiversity and Natural Resources		
PS 7: Indigenous Peoples		
PS 8: Cultural Heritage		

⁵⁰ In this section, you should list the key potential environmental and social issues raised by this project. This might include both environmental and social opportunities that could be seized on to strengthen the project, as well as risks that need to be managed. This information will inform the development of TOR for ESIA or ESMPs.

⁵¹ In this section, you should summarise how you intend to proceed with undertaking either ESIA (for Category A projects) or ESMP (for Category B projects), during Project Formulation.



SECTION 4 - ENVIRONMENTAL AND SOCIAL (E&S) SUMMARY NOTE

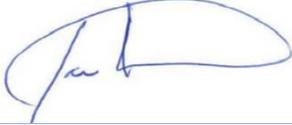
Screening is reflective of the information submitted by the Concept Note Preparer. The CCCCC is guided by its Environmental and Social Management System (ESMS) and the nine Environmental and Social Performance Standards.

CCCCC screening of the BaC-SuF Project resulted in a risk Category “C”. This category indicates that the project is likely to have minimal or no adverse environmental or social impacts but for which mitigation and management measures are known and available. Likely impacts will be few, site-specific, and most will be reversible. However, it must be noted that the project activities, especially those identified in the activities under Component 1, cannot be altered to such a degree that can result in elevating the negative impacts. Therefore, it will be necessary for the project to maintain compliance with CCCCC ESMS, GCF Safeguards, for the project to remain a “Category C”. Conditions includes but not limited to the following:

1. Labour and working conditions including fair labour practices, employment, worker’s organization, non-discrimination, equal opportunity, child labour, and forced labour of direct, contracted, and third-party workers are not violated.
2. Employees/Workers on the project and residents of nearby communities are not exposed to health, occupational health and safety risks including supply chain employees/workers. Small or no potential for conflict between workers and nearby community residents.
3. Activities during construction and operations will not generate additional: (1) harmful emissions to air; (2) untreated discharges to water; (3) activity-related greenhouse gas (GHG) emissions, (4) noise and vibration; and (5) wastes so far as not to reduce air, water and soil quality whether cumulatively or independently to below acceptable air, water and soil standards. Additionally, the activities will not utilise a significant number of natural resources including water and energy.
4. Activities will not generate risks and impacts to the health and safety of the nearby communities or residents and there be no need for an emergency preparedness and response plan necessary in times of emergency.
5. No land acquisition for the nurseries and for the planting of the different sugarcane varieties. Farms are not in or near protected areas, areas of ecological significance including critical habitats, key biodiversity areas and internationally recognized conservation sites.
6. Activities, primarily the seeding of 974 acres of nurseries and replanting of 10,000 acres farms must be existing, are not in the vicinity of protected areas and areas of ecological significance including critical habitats, key biodiversity areas and internationally recognized conservation sites.
7. Project will not introduce invasive alien species of flora and fauna affecting the biodiversity of the area. There will be very small to no impact on living natural resources.
8. Activities will not affect indigenous peoples, ethnic minorities, or vulnerable and marginalised groups in any way that would require further due diligence, free, prior and informed consent (FPIC) and documentation of development plans.
9. There will be no activities undertaken in or near cultural heritage sites and no restrictions to enter cultural heritage sites and properties.
10. Stakeholder engagement will continue throughout the project implementation phase.
11. Any activities prohibited under the exclusion list for the CCCCC (Annex 1 of the ESAP)

Name of Proposed Project	Building the Adaptive Capacity of Sugarcane Farmers in Northern Belize (BaC-SuF)
Name and Post Screener	Ian Morrison, Environmental and Social Specialist



Signature of screener	
Unit:	Project Development and Management Unit
Date	June 24, 2023

PDMU/Management Response	
Decision	Recommendation
<input type="checkbox"/> Cleared as per proposal by screener:	
<input type="checkbox"/> Cleared with following recommendation to be incorporated into TOR:	
<input type="checkbox"/> Drop the project or relocate based on following reasons:	

Name, Post:	
Signature:	
Date:	

Annex 4: Source of data for social assessment

- Phone and Live interviews – Executives, Farmers, Representatives groups of indigenous people
- Social Security board data - the number of Cane cutters and nationality.
- ESIA standards 2015
- Santos NB dos, Silva RP and Gadanha Jnr CD, Economic analysis for sizing sugarcane (*Saccharum spp.*) mechanised harvesting. Engenharia Agrícola (Impresso) 34:945–954 (2014).
- Santos NB dos, Fernandes HC and Gadanha Jnr CD, Economic impact of sugarcane (*Saccharum spp.*) loss in mechanical harvesting. Científica 43:16–21 (2015).
- Newnan DG, Eschenbach TG and Lavelle JP, Engineering Economic Analysis. Oxford University Press, New York (2004).
- News Stories

Annex 5: Source of data for the Environmental assessment

- PSCPA environmental Plan
- PSCPA Risk Management Plan
- CSCPA environmental Plan
- BSI DOE Environmental Compliance Plan
- Fairtrade STANDARDS FOR SMALL PRODUCER ORGANISATIONS
- ProTerra-Standard-V4.1_EN

Annex 6: List of stakeholders consulted.

Stakeholders consulted during the Environmental Assessment				
	Name:	Position:	Email	Phone #
1	Cosme Hernandez	General Manager of Progressive Sugar Cane Farmers Association (PSCFA)	ebhdz.pscpa@gmail.com	610-4207
2	Nelson Blanco	Chairman of PSCPA	nelsonb.z2m@gmail.com	
3	Abigail Pech	Project Manager, PSCPA	abpech1@gmail.com	622-0379
4	Anselmo Marin	Director of BMDC	marin_silverio@yahoo.com	615-9400
5	Vladimir Puck	Chairman of the Corozal Sugar Cane Farmers Association (CSCPA)	bloodymir8@gmail.com	670-2370
6	Jorge Cob	Director in Board of Directors		
7	Leonardo Folgarait	Environmental Officer CSCPA	rbahiaczl@yahoo.com	670-4626
8	Ezekiel Palomo	Chairman of the Northern Sugar	ezequiel.palomo733@gmail.com	614-1746



		Cane Farmers Association (NSCGA)		
9	Roy Navarro	Council at NSCGA Board of Management	nscgabelize@gmail.com	620-1550
10	Justaquio Pott	Vice Chairman of NSCGA, Board of Management	nscgabelize@gmail.com	
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