Building Climate Resilient Agriculture in Caribbean Countries: Belize

Belize's Agriculture Sector in Context

Agriculture is a key economic driver in Belize, contributing 10.7% to GDP in 2020, down from 11.7% in 2010, and is a major source of foreign exchange earnings as well as the foundation for food and nutrition security in the country. The sector, which is heavily reliant on natural resources and is sensitive to climate change, accounts for approximately 80% of domestic exports and provides direct employment to almost 18% of the population. Belizean agriculture has three main subsectors: (i) a well-organised export-oriented commercial subsector specializing mainly in banana, citrus, and sugar; (ii) a highly diverse, subsistence-oriented smallholder subsector producing a wide range of food crops, especially vegetables, mainly for local consumption; and (iii) a vertically integrated large-scale commercial subsector producing cereals and livestock products for both local and export markets. The country is becoming self-reliant in the production of corn, beans, chicken, eggs, beef and pork and has a high level of self-sufficiency in rice, potatoes, onions and vegetables.

Although 38% of Belize's total land area is considered suitable for agriculture, only 15% of this is currently used for agricultural purposes. Countrywide, production practices vary, with some farmers employing shifting practices, while others are fully or semi-mechanised. 90% of agriculture production is rain-fed, which makes the sector particularly susceptible to rainfall variability linked to climate change. In recent years, vulnerability to prolonged droughts has highlighted the importance of irrigation for ensuring adequate water supply for crops. A 2018 World Bank study on identifying investment priorities for climate-smart agriculture in Belize indicates that the value of agricultural production exposed to climate risks is significant, with up to USD 1.25 million of agricultural production exposed to flood risks, and up to USD 520,000 exposed to drought risks at any given time. Further, the COVID-19 pandemic and the Russia-Ukraine war have resulted in disruptions in the sector (e.g., elevated prices for inputs and increased food prices), which negatively impacted the economy and food security in the country.

Opportunities for diversifying the agriculture sector include further development of the agro-processing industry, which currently focuses mainly on fruits and vegetables, dairy, and bakery products. Additional opportunities for increasing processing output are linked to meat, poultry, honey as well as marine, fruit and vegetable products. The government has instituted several fiscal relief measures and incentives to encourage commercialization and value

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addition. Areas for improvement include access to markets, where market linkages for some products (e.g., honey) are weak.

Agriculture in Belize's NDCs

Belize's initial Nationally Determined Contribution (iNDC) (2016) did not specify agriculture as one of the sectors contributing to its mitigation targets. However, agriculture was defined as a priority sector for adaptation measures, with key actions related to improved crop and livestock husbandry practices; increased access to drought tolerant crops and livestock breeds; better soil and water management practices; reduced post-harvest losses; and early warning/meteorological forecasts and related information.

Source: Neufville, Zadie, Inter Press Service, September 5, 2018, https://www.ipsnews.net/2018/09/maya-farmers-central-belize-hold-strong-climate-change-experiment/.

For Belize's updated NDC (uNDC) (2021), agriculture was prioritised for both mitigation and adaptation. The mitigation target for the sector is to reduce methane emissions from livestock by 10% by 2030 and avoid emissions of at least 4.5 KtCO2e related to agriculturally driven land use change by 2025. The uNDC (2021) specified a total cost of USD 41,306,164 to cover sustainable crop production and livestock management actions that would result in the mitigation target specified. For adaptation, two overarching targets were identified for agriculture: one linked to reducing post-harvest losses and the other to developing and implementing an enhanced early warning system for drought and extreme weather events to support farmers in planning for and responding to the impacts of climate change. A total cost of USD 113,474,000 was specified to support delivering on the adaptation targets and related actions.

Emissions Profile of the Agriculture Sector in Belize

In 2017, agricultural emissions were 293.40 Gg CO2e (25% of total emissions, excluding forestry and other land use) with 55% coming from enteric fermentation and 24% from direct nitrous oxide (N2O) emissions from managed soils (the former has more than doubled since 1994, while the latter grew by 73% over the same period). Beef cattle were the largest contributors to enteric fermentation and poultry contributed the most to manure emissions. The Fourth National Greenhouse Gas (GHG) Inventory report (2020) also indicates that there has been an increase in the area of forest land that has been converted to cropland since 2010, which led to increased CO2 emissions. In 2017 it was estimated that 2,717.1 Gg CO2e were produced from these conversions.

Barriers to Inclusion of CRA Actions in NDCs

Belize's uNDC identifies a financing gap of USD 10 million and USD 72 million for its agriculture-related mitigation and adaptation targets, respectively. This presents a key barrier to implementing climate resilient agriculture (CRA) actions and can negatively impact further inclusion of CRA actions in future NDCs. Other barriers to widespread adoption of CRA include:

- Limitations in availability and accessibility of required data to support NDC-related analysis, target setting, monitoring, reporting and verification (MRV) as well as GHG inventory profiling.
- Human and financial resource constraints that hinder the achievement of mitigation and adaptation goals, for example, as it relates to facilitating the transition to new technologies, new practices, or new types of crop and livestock production.
- Weaknesses in institutional capacity, coordination efforts and commitment from key stakeholders.

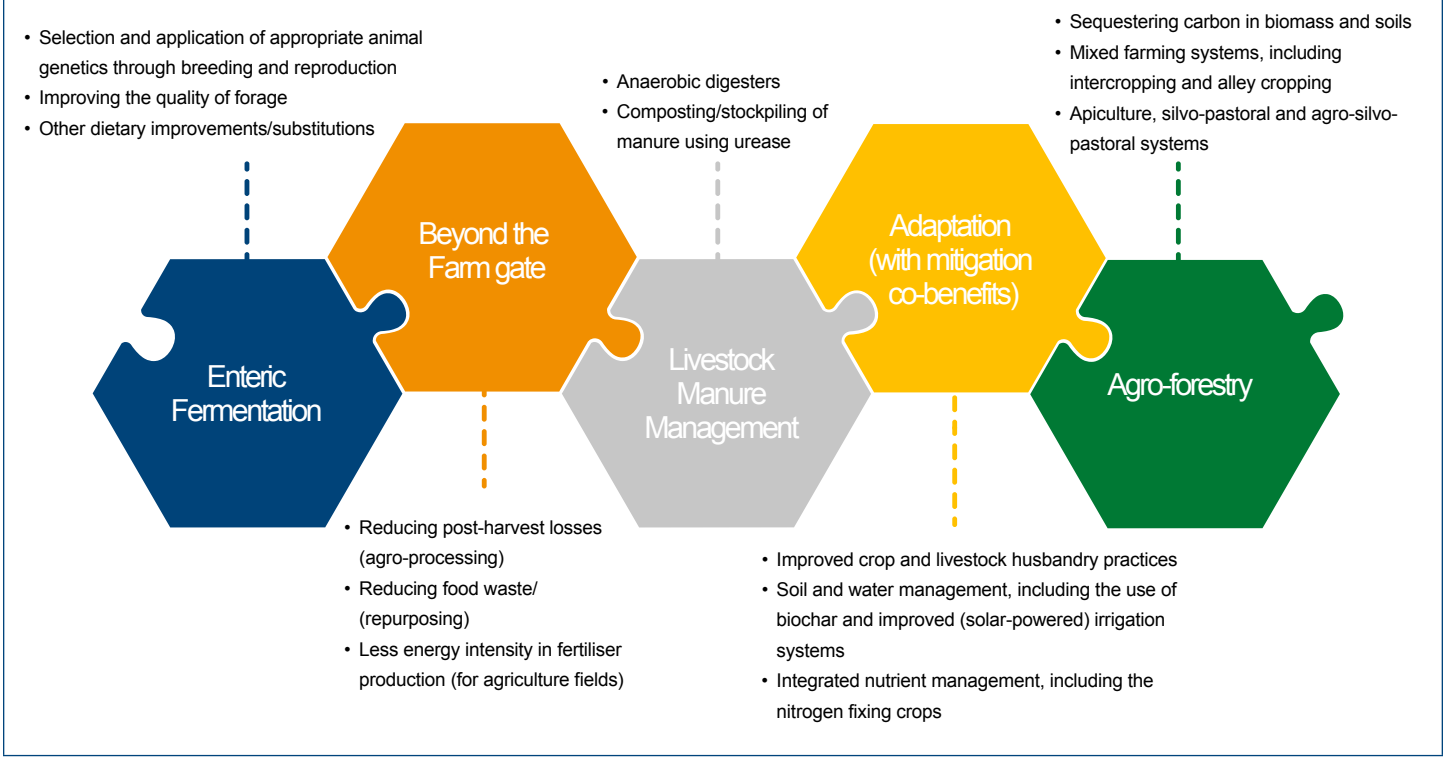
- Inadequate resources to finance investment in CRA, including limitations in availability, and accessibility to, affordable credit as well as risk transfer financing mechanisms.
- Farmers lacking the required information and technical knowledge about CSA practices to support wider adoption, in some instances.
- Uncertain land tenure, which limits investment and protection of natural resources.
- Developing a programme to promote the domestic growth and production of higher quality forage to both reduce emissions and improve productivity among livestock populations.
- Establishing anaerobic digesters near large and medium animal feeding operations, potentially collecting waste from multiple animal feeding operations (if feasible) to gain economies of scale and reduce emissions more cost-effectively.

Opportunities for Building CRA and Enhancing Climate Ambition in NDCs

It is recommended that Belize focus on the more significant emission sources present in the agriculture sector, namely enteric fermentation, livestock manure management, direct and indirect emissions of N2O from nitrogen inputs to agricultural fields, given that national emissions from rice cultivation and agricultural residue burning are quite small. Specifically for Belize, mitigation opportunities include:

Other key opportunities for building CRA and enhancing climate ambition in NDCs can be explored by considering implementation measures beyond the farmgate and adaptation actions, with mitigation co-benefits, such as those outlined in the uNDC, the National Adaptation Strategy to Address Climate Change in the Agriculture Sector in Belize and other guiding documents related to managing climate impact on the agriculture sector.

Opportunities for enhancing CRA in Belize



Capacity Needs for Building CRA in Belize

- Technical capacity to support CRA, including development of GHG inventories and run mitigation scenarios.
- Enhanced extension, research and development, climate and other advisory services that target commodities most at risk of being negatively impacted by climate change and to provide sound technical assistance and technology transfer to the sector on viable CRA practices.
- Data availability, quality and archiving.
- Research and development, including validation of technologies prior to adoption.
- Incorporation of digital technology in decision making.
- Enhanced multi-level governance and coordination across the food value chain.
- Financing to facilitate transition to new technologies, new practices and new types of crop production.
- Enhanced engagement of the private sector to promote wider adoption of CRA, including outreach and awareness to farmers and manufacturers to support changes in practices and behaviours, aligned with national climate and other policies.
- Genetics improvement programme for Belize National Herd, supported by access to niche markets.

Approaches and Steps to Enhancing Agriculture's Contribution to Future NDCs

- Alignment of agricultural climate targets, policies, and actions with National Adaptation Plans or Sustainable Development Goals.
- Enhancing financing for climate resilient agriculture.
- Strengthening Monitoring, Reporting and Verification (MRV) systems for better inventories, assessments of mitigation potentials or assessment of access to finance.
- Improvement of agricultural innovation and extension services.
- Identification of policies and measures to equitably clarify land tenure, protect small-scale farmers, and engage private sector in the CRA transition.
- Identification or prioritisation of actions that support both mitigation and adaptation.
- Improved description of co-benefits for mitigation and/or adaptation actions.
- Link to niche markets that could incentivize sustainable, lower emission products.
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The *Strengthening the Foundation for a Climate Responsive Agricultural Sector in the Caribbean Readiness* Project (CARICOM AgReady), financed by the Green Climate Fund, targets nine countries in the CARICOM region with The Ministry of Environment and Housing of The Bahamas as the lead National Designated Authority (NDA) and the Inter-American Institute for Cooperation on Agriculture (IICA) as the delivery partner. Covering Bahamas, Belize, Dominica, Haiti, St. Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines, Suriname, and Trinidad and Tobago, the project works to provide information and tools to enable greater participation from the agriculture sector in climate action and finance processes.

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