



2023-24 ANNUAL TECHNICAL REPORT

Ministry of
Agriculture,
Food
Security
and
Enterprise

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A Message from the Minister

Hon. Jose Abelardo Mai
Minister of Agriculture, Food Security and Enterprise

Agriculture is everybody's business because we all eat. In these times, however, being a farmer is for the bold, the courageous and the intrepid. Rising input costs, outbreaks of major pests and diseases, threats from hurricanes and other natural disasters, extended drought and other climate change issues bring uncertainty, market instability and other challenges. Despite this, farmers persevere, and so I must salute all farmers in this country – from the cane farmers in Corozal, Orange Walk and Cayo, to the rice farmers in Toledo and Blue Creek, the corn farmers in Spanish Lookout and the vegetable farmers in Bomba, Concepcion, Nagu Bank, Seven Miles and San Antonio, to name a few villages, and particularly all women farmers, young farmers in the high schools across the country participating in school gardens, and finally towns and cities doing a little backyard gardening.



2023 was indeed a challenging year for us, particularly for our traditional exports of citrus, bananas and shrimp, all of which have been struggling from major disease outbreaks, or flooding combined with the chronic neglect of the last administration. As the official statistics show, we have braced these challenges over the last three and a half years with the interventions outlined in our *#planBelize* manifesto and this very articulate plan combined with the resilience of the farmers, and with the support of strong leadership and advocacy from our Ministry, and a progressive minded Development Finance Corporation and other partners in development, these traditional industries are performing well in the first couple months of 2024 and new export industries such as cattle, soybean and animal feed, and coconuts are growing in importance.

The agriculture sector will always remain a foundation to our economy and food security will be a mantra of the PUP's political wagon. It is because of our success in local food production, in our Farm to Table approach outlined in *#planBelize*, that our country received accolades at the recently held Caricom Heads of Government meeting held in Georgetown, Guyana. Caricom leaders hailed the success of Belize in achieving 80% of our targets as outlined in the 25 by 2025 initiative, a regional effort to reduce the food import bill in Caricom by 25% by 2025. Belize was a close second in this effort and was only beaten slightly by Guyana that had achieved 82%.

Let's all rally behind our farmers as they continue to persevere despite challenges. Let's support them by buying their products and ensuring the economy does well. Let's continue to build Belize.

A Message from the Chief Executive Officer

Servulo Baeza

Greetings to all Belizeans as we stand on the eve of another year when we report on the state of agriculture for our jewel, Belize.

Despite the many challenges facing agriculture—climate change, input costs, pests and diseases which are ever present, last year was a productive year for Belizean farmers and agriculture because of their resilience. Most of the sub-sectors in agriculture have shown growth and improvement compared to previous years, and for this I am happy and give our farmers thanks. Some sub-sectors, such as shrimp, are on a well-defined path to recovery; some sub-sectors are poised to take advantage of the burgeoning export markets that loom just ahead.



Particular mention must be made of the cattle sub-sector, which once again shows upward movement, a very positive sign as we have taken advantage of the good relations with our neighbours to the North, who opened their borders to our exports. The success of the cattle export trade with Mexico is key to the success of our farmers, as the trickle-down effects of foreign trade benefit a wide range of households throughout the country.

I am happy to see that vegetable production has improved, in some areas marginally, in some areas significantly. Our vegetable production so far is for the local market, and as vegetable producers improve the yield and quality of their product, the Belizean public can be reassured of our country's food security, and export-level quality of commodities.

Huge strides have been made by the Belize Marketing and Development Corporation as they now have available for the local market value-added products such as fruit pulp; they continue to actively market honey and have provided Toledo rice farmers with a heaven-sent alternative income earner in rice, an industry they were once famous for but which the previous administration allowed to die.

Units within the Ministry, whose mandate exists within the parameters of ensuring public safety measures in price gouging are followed, have risen to the challenge. New legislation has expanded the list of controlled goods and allows for ticket issuance. Just imagine, now 124 tickets have been issued to date in the span of 6 months, when for the past 13 years only 14 tickets were issued.

The Ministry continues to modernize its policies as we face new challenges in a changing world. A new Agriculture Policy is currently being crafted with the support of the FAO. We are also making inroads in upgrading our software that deals with farmers; and the Belize Agriculture Information System is due an upgrade to reflect new parameters for professional operation. A recent acquisition of vehicles through the CRESAP project will certainly help to carry out some of the work of this Ministry. The vehicles have been distributed throughout the Ministry as needs dictate and policy indicates.

While traditional exports are lagging in production and contribution to GDP for this past year, we should note that in all cases our Ministry has made recommendations or is instituting changes to assist producers. The Commission of Inquiry into sugar production has been legislated and been put into effect. Citrus producers are slowly regaining ground against disease and confidence in the industry; production in citrus is expected to rise this year, while their facility to finance rehabilitation remains active. The banana industry shows signs of recovery as well, with improvements after the Hurricane Lisa disaster in the fields and projects underway to provide resilience in the face of diseases like Sigatoka and Tropical Race 4. Our traditional industries are recovering, albeit not at the pace we would like, but they are improving.

Our work continues for this year as we support, guide and ensure that progress continues in agriculture. Join us as we lay down the groundwork now for success later and prosperity for our jewel.

List of Abbreviations

ASR-----	American Sugar Refineries
BAIMS-----	Belize Agriculture Information Management System
BGA-----	Banana Growers Association
BAHA-----	Belize Agricultural Health Authority
BBS-----	Belize Bureau of Standards
BLR-----	Belize Livestock Registry
BLPA -----	Belize Livestock Producers Association
BMDC-----	Belize Marketing and Development Corporation
BPA-----	Belize Poultry Association
BSCFA-----	Belize Sugar Cane Farmers Association
BSE-----	Bovine Spongiform Encephalopathy
BSI-----	Belize Sugar Industries
CARICOM-----	Caribbean Community
CARDI-----	Caribbean Research and Development Institute
CDF-----	Caricom Development Fund
CERC-----	Contingent Emergency Response Component
CFZ-----	Corozal Free Zone
CIAT-----	International Centre for Tropical Agriculture (based in Colombia)
CGA-----	Citrus Growers Association
CPA-----	Certified Pesticide Applicator
CPBL-----	Citrus Products of Belize, Limited
CRESAP-----	Climate Resilient and Sustainable Agriculture Project
CRIP-----	Climate Resilient Infrastructure Project
DANA-----	Damage and Needs Assessment
DFC-----	Development Finance Corporation
FAO-----	Food and Agriculture Organization
GoB-----	Government of Belize
HACCP-----	Hazard Analysis Critical Control Point
HPAI-----	Highly Pathogenic Avian Influenza
ICDF-----	International Cooperation and Development Fund
IICA-----	Inter-American Institute for Cooperation on Agriculture
INIFAP-----	National Institute for Forestry and Agriculture Research (Mexico)
IPDM-----	Integrated Pest and Disease Management
ITC-----	International Trade Centre
JICA-----	Japan International Cooperation Agency
MAFSE-----	Ministry of Agriculture, Food Security and Enterprise

MAGA-----	Ministry of Agriculture, Livestock and Food (Guatemala)
MTDS-----	Medium Term Development Strategy
NATS-----	National Agriculture and Trade Show
NDV-----	Newcastle Disease Virus
PHF-----	Pesticides Handling Facility
PCB-----	Pesticides Control Board
PDNA-----	Post Disaster Needs Assessment
OIRSA-----	International Regional Organization for Agricultural Health
OHC-----	One Health Commission
RCF-----	Revolving Credit Facility
CRDI-----	Centre for Research, Development and Innovation
SENASICA-----	National Agro-Alimentary Health, Safety and Quality Service (Mexico)
SIA-----	Sugar Industry Act
SIB-----	Statistical Institute of Belize
SICB-----	Sugar Industry Control Board
SIMIS-----	Sugar Industry Management Information System
SIRDI-----	Sugar Industry Research and Development Institute
TCP-----	Technical Cooperation Program
WB-----	World Bank
WOAH-----	World Organization for Animal Health (formerly OIE)

Executive Summary

The Vision of the Ministry of Agriculture, Food Security and Enterprise (MAFSE) is to have an industry that is competitive, innovative, diversified, and sustainable. Its mission is to grow and to continue as an economic pillar, ensuring food and nutrition security, diversifying business opportunities, reducing poverty and enhancing human resources capacity in a sustainable and competitive environment. Broad objectives include ensuring greater efficiency and effectiveness in the structure and institutional management systems of the agriculture and food sectors in Belize. This will be achieved through well-defined roles of regulatory and promotional bodies, enhancing greater collaboration among key stakeholders, and the establishment of clear policy incentive frameworks for the production, utilization, climate-smart adaptation and marketing of agriculture and food products. This is expected to enhance the sustainable growth of the sector, to ensure food and nutrition security, to improve farmer/processor income, to create employment, and to attract private sector investment and participation in the sector. The Ministry recognizes five pillars needed for success in agriculture:

- Production, Productivity, and Competitiveness.
- Market Development, Access, and Penetration.
- National Food and Nutrition Security and Rural Livelihoods.
- Sustainable Agriculture and Risk Management; and
- Governance

1. Introduction

The Ministry of Agriculture has existed since 1961 when a Ministerial system was introduced to the country's legislature. From the days of mahogany cutting to chicle export, to sugar and now newer export commodities like livestock and grains, agriculture has always been a strong foreign exchange earner that has underpinned the economy of Belize. Currently directly impacting approximately 13,000 farmers and countless Belizean citizens, agriculture affects the entire country's economy.

2023 has been a year with much to celebrate in agriculture. Despite the anticipated volatility for the traditional commodities- something which we could have seen coming because of the conditions in the banana, citrus and sugar industry, other commodity areas have shown that our agriculture sector has been resilient, adaptive and strong; we have seen bumper crops in some areas that leave no doubt about the capacity, ability and improvement in Belizean farming. The new direction towards diversification that the Ministry of Agriculture, Food Security and Enterprise has taken has been shown to be brilliantly successful as *#planBelize* has been put to work and has passed with flying colours. Perhaps no better proof of this is the report card for Belizean agriculture at the recently held CARICOM summit where the 20x25 goals were put on table for all Caribbean nations, and Belize's agriculture sector passed the self- sufficiency test with flying colours. We are on the right path, the strong steady support of this pillar of the Belizean economy is firm, and our farmers are winning. This is the execution of a plan that shows how we can, as a nation, adapt, persevere, and pull ahead.

On the front of traditional exports, both bananas and citrus particularly are still in a cycle of recovery. Finances and conditions in these industries have left farmers battling with issues such as disease, labour and access to financing, all situations that GoB is aware of and is actively trying to improve for these industries. Sugar has its own unique situations that affect production, such as droughts and fertilizer issues, but the good news here is that the international market prices for cane sugar are excellent, and so despite the drop in production for this year, the value of the contribution of the sugarcane crop to GDP and foreign exchange has been on par with previous years.

Other areas such as onion, red kidney beans and black bean productivity have been lower than last year, but not alarmingly so, as conditions that have by now stabilized had negative effects, as is the case with black beans with weather and pests affecting the crop this year, and sluggish market conditions for red kidney beans affecting the confidence of farmers for that commodity.

Once looking beyond the traditional exports, the news starts getting better. Industries such as shrimp are on the rise in both recovery and productivity. No longer affected by disease and

on the rebound with their ability to produce, a renewed confidence permeates this once thriving industry and their future looks bright, as injections of financing and technology have stabilized their productivity. The cattle industry is another success story, as this year's productivity figures and resultant contributions to GDP/ foreign exchange earnings have both surpassed last year's. Even the sheep sub-sector shows upward mobility in productivity, a sure sign that both the efforts of the Taiwanese funded genetic breeding center to improve our national herd in sheep and goat capacity, and market conditions for these commodities are improving. Coconuts, an emerging crop, are steadily rising in terms of acreage planted, as large, medium and smaller scale farmers are planting to ensure the water and copra bearing fruit will be available in export quantities in coming years. Production of crops such as soybean is on the rise as two factories, one in Blue Creek and one in Spanish Lookout, have had ground broken for their construction, with the Blue Creek factory already operational. With these industries on the rise, we are set to tap into the burgeoning regional markets for these commodities.

Perhaps the success of the *#planBelize* approach to diversification is best shown by this year's crop productivity figures of non-traditional commodities such as avocado, pitahaya, soursop, cucumber, tomatoes, potatoes, rice and corn (both white and yellow taken together), just to name a few, all show healthy spikes upward. The beautiful thing about this is that it is mostly small farmers that are contributing to the increased productivity figures, as both the Ministry of Agriculture's message of trying new crops and the renewed confidence in the stability of the local economy show clear signs of our ability to feed ourselves, to generate income for farmers, to provide for our domestic needs and to improve both the local cornucopia and satisfy demands of the tourism sector.

On the front of enterprise, another responsibility for this ministry, resounding success has been met with the Belize Marketing and Development Corporation and Corozal Free Zone, both largely thriving entities that have injected millions into local economy, provided jobs for thousands of Belizeans and stabilized markets for hundreds of farmers and producers. Belizeans now depend on the ability of these business entities that with renewed leadership, show the way forward in planning, development and improvement of Belize.

On all fronts *#planBelize* has been extremely successful in the agriculture sector. The goals of this ambitious plan included import replacement and substitution, export expansion and strengthening the linkages of tourism with our local productive sectors, affordable financing for farmers, diversification and innovative climate-smart systems, research and development partnerships with renowned universities, work with the associations of the four traditional exports, i.e. sugar, citrus, banana and shrimp, growing and producing more of what we eat and promoting more consumption of what we grow, improving storage and logistic facilities, improving our trade and market intelligence for international access and finding niche

markets for the export of non-traditional products, as well as teaching of agriculture and agri-business in schools. Every single goal and target of #planBelize has been addressed successfully, as the MAFSE has nurtured traditional and non-traditional crops successfully, has responded to issues such as storage and research in commodity areas, has ensured stability of local markets and production, and is actively seeking export markets for our commodities within our region, such as to CARICOM, Mexico and El Salvador. Linkages have been made with institutions such as Zamorano University to ensure research is continuous and agriculture is now active in dozens of schools around the country as the message of growing what we eat has resonated in primary schools, with so many gardening activities in place at schools that we now have trouble keeping up with all of them. Agriculture, as it is said, is everyone's business, and this ministry is happy to note that everyone takes this business seriously. Belize is poised at a threshold that, barring catastrophic natural events, will surely propel the sector and to a larger degree the Belizean economy forward.

2. Mission Statement and Priorities of the Ministry

The MAFSE mission is to continue as a key economic pillar, ensuring food and nutrition security, diversifying business opportunities, reducing poverty and enhancing human resource capacity in a sustainable and competitive environment. This is in keeping with the Ministry's profile as a partner with regional and international organizations such as the FAO, CARDI, OIRSA, and IICA; it is in keeping with the mandate of #planBelize, where 11 points are declared for the #planBelize Agriculture Policy as 11 outputs to be achieved in the next 5 years.

1. Food security- Encourage import replacement and substitution, support export expansion and strengthen the linkages of tourism with our local productive sectors.
2. Tax cuts- Review the entire tax system and enact reforms to have a simplified, fair, efficient, and development-driven system.
3. Trade- review, improve and aggressively implement our trade policy agreements in our region.
4. Exports- Work with the associations of the four traditional exports, i.e., sugar, citrus, banana, and shrimp to develop a strategy for development.
5. Financing- Support farmers in accessing affordable financing.
6. Diversification- Diversify production and support the adaptation innovative climate-smart systems.
7. Research- Increase the collaboration of Research and Development with partners and renowned universities.

8. Grow more- Encourage rural and urban communities to grow and produce more of what we eat and promote implement a Buy Local Campaign.
9. Teach- Lobby for agriculture and agri-business to be taught in schools.
10. Storage- Improve storage and logistics facilities for farmers.
11. New markets- Improve trade and market intelligence for international access and find niche markets for the export of the non- traditional commodities.

The overall goal of this policy is to increase, diversify and sustain agricultural production, food security, income, and employment generation in Belize. To achieve this goal, the Ministry has designed programs and projects, as presented in the Medium Term Development Strategy (MTDS) actions, with specific targeted outcomes related to:

- Increased Production, Productivity, and Competitiveness.
- Development of Market Access and Penetration.
- Achievement of National Food and Nutrition Security.
- Implementation of Sustainable Agriculture practices and implement Risk Management measures.
- Improved Governance of the Ministry

The Mission of the Ministry aligns well with *#planBelize's* stated goals “to increase, diversify and sustain agricultural production, food security, income, and employment generation in Belize. This goal will require increasing farm-level capacity, improving technology and innovation, raising labour productivity, and being regionally competitive. Achieving this goal will enable Belize to increase exports, reduce food imports and improve the livelihood and well-being of rural communities.” Point for point, the goals mirror each other and provide for easy synthesis of the present policy framework currently employed by the MAFSE.

The Ministry has also placed high priority on completing various specific actions as reflected in the *#planBelize* Medium Term Development Strategy. These include:

- revision and updating of national sector policies, laws, and regulations for key sectors, such as sugar.
- rebuilding of the agriculture sector through teaching agriculture in schools and advocating the importance of agriculture, promoting the growth of crops in school and at home, producing their food snacks, and explaining why as a society, Belize must invest, be productive, and apply more business principles in agriculture.
- support and facilitation of farmers in accessing credit from financial institutions.
- Implementation of the Climate Resilient and Sustainable Agriculture Project to increase food production capacity and the adoption of climate-smart, green agriculture.

- implementation of projects enhancing food security and job creation, conserving natural resources and mitigating vulnerabilities to climate change by providing technology, inputs, and financing to some 2,000 farmers for the establishment of agro/silvo/pastoral systems across Belize.
- forging partnerships with renowned universities, regional and international institutions to mobilize investment for research and development to adapt technology
- Belizean farmers and processors should be able to replace or substitute at least 50% of food imports within 5 years.
- duty exemptions for the agriculture sector

These specific actions are directly aligned with the *#planBelize* objectives set out in the present Government's manifesto. They are explicit actions intended to be completed within the coming one to two years. As such they are an action plan for the Ministry in the medium term.

3. Main Achievements of the Ministry

3.1 Traditional Exports

2023 was not a very good year for the traditional agriculture exports which fell from a high of \$462.5 million in 2022 to \$390.3 million dollars in 2023. This 72.5 plus million dollar fall in agricultural exports was primarily due to a struggling citrus industry whose export revenues fell below \$25 million for the first time since the 1980s, a \$17.7 million fall in banana exports from \$81.7 million in 2022 to \$64 million in 2023, and a \$27.8 million fall in official exports of animal feed mostly to Caricom. Hurricane Lisa in the north hit sugar production the hardest, while bananas in South Stann Creek suffered from the residual effect of the 2021 flooding.

It is important to note that while the export agriculture sector struggled in 2023, every single one of our struggling traditional exports, including citrus, is undergoing a revival.

Sugar

Despite the challenges that the sugar industry faces with the distribution of revenues, the industry is still on a trajectory of growth nationally and with world sugar prices being the highest they have ever been in 40 years, our country is expected to reap considerable benefits from this industry.

In 2021, sugarcane production in Belize peaked at 1.89 million tons but production in the north has been falling and in 2023, the total country production fell to 1.49 million tons. Of this, farmers in the north produced 977,672 tons of sugarcane that was delivered to BSI, and in the west 511,288 tons of cane was delivered to Santander. However, due to higher sugar

prices, revenues from the export of sugar recorded only a small fall from \$162.4 million to \$157.9 million.

While production in the north has stagnated and is estimated to be just under 1 million tons of cane in 2024, production in the west is expected to balloon to 850,000 tons. This, combined with higher sugar prices, means that in 2024, Belize is projected to earn a record \$190 million dollars from sugar exports.

Banana

Banana production and exports for January and February show signs of full industry recovery. Production for the first 2 months of 2024 is 2.5 times higher than the first 2 months of 2023 and is higher than both 2022 and 2021 when the industry was booming. For the first 2 months of 2024, we have exported \$13.9 million versus \$5.9 million that was exported last year.

The primary reason for the rebound of the banana industry is the recovery of the fields from flooding, programming of crop to meet best price period of January to June in the EU market, the approval of \$5 Million for crop recovery via the DFC, and also approval of some \$2 Million plus as a revolving crop input loan fund that effectively replaced the revolving fund that Fyffes had in place for the Banana Growers Association. Better sigatoka disease control and more favourable weather also helps the recovery of this sub-sector.

To support the banana industry, BAHA in collaboration with Taiwan-ICDF and the OIRSA, continued with the implementation of the Taiwanese-supported project for the prevention of the introduction of *Fusarium oxysporum* f.s. *cubense* Tropical Race 4. The project consists of several components including capacity building for diagnostic capacity for banana diseases using PCR techniques for BAHA, a surveillance pilot project using Tele-detection with the use of satellites, an educational campaign for farmers and technicians and the introduction of a variety of bananas (Formosana) with a high level of tolerance to the disease, which is not present in Belize. Two trial plots, one in Central Farm and the other in Big Creek, Independence, of this new variety of banana have been established for experimental purposes and data is currently being collected to determine the various attributes of this variety when grown under Belize's conditions.

Citrus

Revival of the citrus industry has proven to be a challenge. Things are not happening as fast as anyone would like. Of the \$15 million dollars allocated by the Government specifically to facilitate rehabilitation of groves and encourage new plantings, less than \$1 million has been taken up. Clearly confidence in the industry has not been high and many farmers seem to be sceptical of the future.

Recently a small special committee was appointed to revisit interventions implemented in 2023 with a view to try and salvage the industry. It is yet too early to say if the industry will rebound to its glory days of 2005 when 8 million boxes of fruit were produced by 60,000 acres of citrus.

The 2022/23 citrus crop was the worst crop in the recent history of the industry. Deliveries of oranges and grapefruit to CPBL fell to 335,500 boxes, while deliveries to other processing plants along with local sales and informal exports to Guatemala accounted for another 170,000 boxes to give a total crop of just over half a million boxes.

The 2023/24 Crop is looking much better, and production is expected to rise by about 60%. To date CPBL is approaching 200,000 boxes and the second crop is estimated to be double the first crop. As a result, CPBL is expected to process over 650,000 boxes of fruit while other local processing, the local market and informal exports to Guatemala are also expected to approach 200,000 boxes, bringing total industry production to around 850,000 boxes of fruit.

Orange and grapefruit concentrate prices are also the highest they have been for a while, and performance of 4-year-old trees continues to look very good, with average yield approaching 0.5 box per tree and some individual 4-year-old trees having up to 1 box per tree. Two-year-old grapefruit tolerant varieties (2 varieties being observed) are also doing well vegetatively.

There is also growing interest in replanting by several existing farmers and new individuals but it is too early to make predictions on this.

Papaya

Since 2015 the papaya industry has looked pessimistic, but in 2024 the support given to revive the papaya industry is bearing fruit. In January and February 2023, we only exported two containers of papaya, but for the first two months of 2024, we have exported 13 containers of papaya totalling 523,000 pounds of papayas. It took us from January to mid-August in 2023 to export 13 containers of papaya and for the whole of 2023, we exported only 24 containers of papaya, totalling 982,000 pounds. In two months, we have already surpassed 50% of last year's exports. Pending no major issues, the rest of 2024 is looking very good for papaya exports.

Shrimp

The collapse of the shrimp industry began in 2015 and by 2020 and 2021 Belize produced just enough shrimp to supply the local market and had only miniscule exports. However, in 2022 and 2023 the industry entered full force recovery. The first thing was to halt the collapse of the industry, and this was achieved in 2021. In 2022, the technology for industry recovery was fine-tuned and in 2023 a government-appointed task force was set up and began working closely with the shrimp growers and their association. An action plan was put in place and shrimp production and exports began an upward trend. Belize's export of shrimp has increased in 2023 and production is expected to rise in 2024.

3.2 Livestock

Cattle

One of the major achievements for 2023 of the beef cattle sector was the significant quantity of cattle successfully exported to Mexico and Guatemala. Beef cattle exports for 2023 accounted for 40,315 head and generated approximately 70 million dollars in revenue for livestock farmers. This is a remarkable increase in cattle exports, approximately 21% when compared to 2022 figures, when a total of 33,197 head of cattle were sold, generating a total revenue of approximately 58 million Belize Dollars.

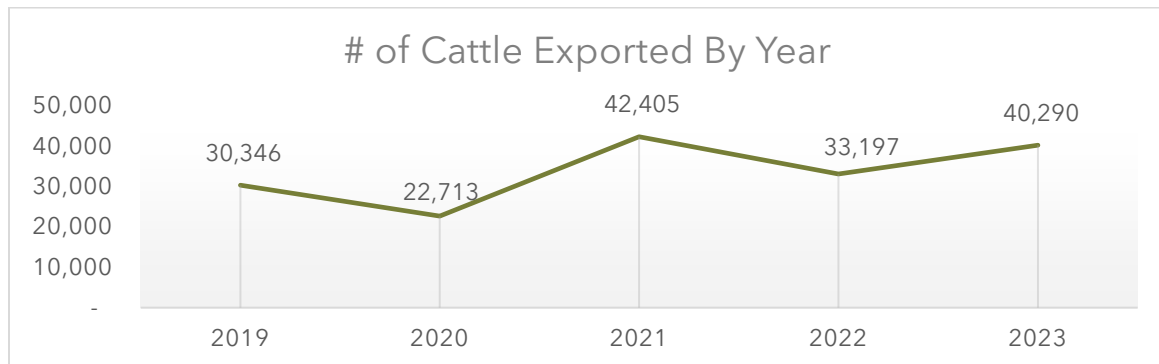


Fig. 1 Cattle export figures for 2019-2023

Additionally local sales for 2023 accounted for between 7,500 to 9000 head of animals slaughtered to meet domestic demand. This represents an additional 24.42 million Belize dollars in revenue. This is similar to what was generated for 2022.

In summary, total cattle exports and local sales for 2023 cumulatively generated a grand total of approximately 94.0 million Belize dollars. This is extraordinary performance of the cattle industry's social and economic contribution. In simple terms, the cattle industry in the current agricultural landscape is at the forefront as the agricultural commodity most contributing directly to food and nutritional security, increasing family income, employment generation, and positively adding up for a better quality of life for all cattle producers. It is estimated that more than 25,000 to 30,000 Belizeans are directly impacted because of cattle farming. Currently the national cattle herd stands at almost 200,000 head of cattle, guaranteeing local and export supplies for the coming year at least.

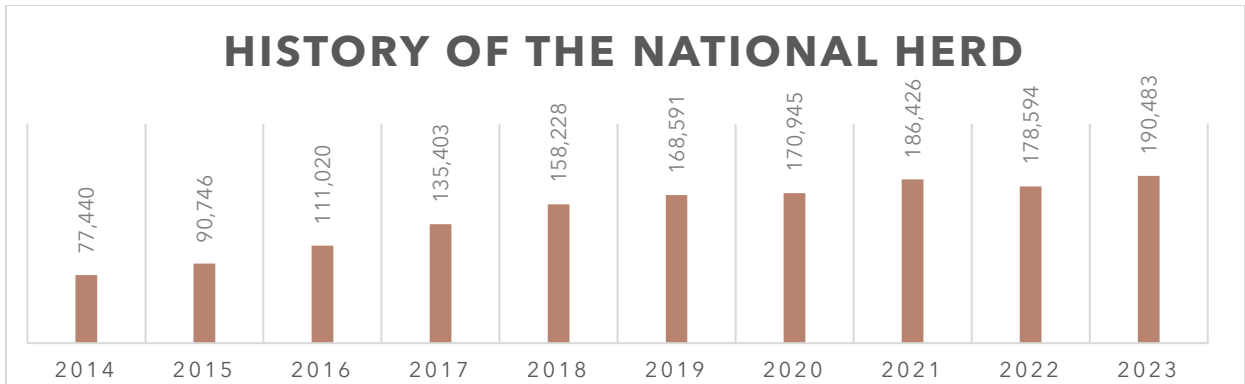


Fig 2. Historical tracking of the national herd

The livestock sections in Central Farm, Yo Creek and Toledo continue to function as a hub for farmers seeking to improve their genetics, breeding management, pasture production and overall animal husbandry. The three substations were able to deliver quality breeding stock of cattle, swine, poultry, Tilapia fingerlings, sheep, and goat to approximately 400 livestock producers countrywide. Added to the cattle development program is the bull rental program that benefited at least 23 cattle producers. Additionally, the livestock unit at Central Farm has invested in artificially inseminating 31 cows, of which we expect approximately 5 bulls and 5 heifers of superior genetics to further enhance the genetic development program to assist livestock farmers with the best genetics to increase productivity and resiliency.

Another major success is the continuous improvement successfully institutionalized in the Belize Livestock Traceability System to meet the OIRSA TRAZAR AGRO traceability standards. Maintaining an updated traceability tool has paved the way for Belize to access cattle export markets in both Mexico and Guatemala, fostering price competition and enabling farmers to secure competitive and preferred prices for their animals from \$0.90/lb when there was no traceability to average price on the hoof of \$2.50/lb now that we have a solid and robust traceability system. This major improvement has translated into putting more monies into the farmer's pocket. The Ministry will continue to make the necessary adjustments to ensure that our livestock traceability systems is relevant while meeting new standards of cattle registration, movement controls and overall traceability requirements.

Another major element of success was the educational training successfully carried out for sustainable livestock development provided to at least 600 livestock producers in the areas of climate smart agriculture practices including forage banks, protein banks, agroforestry, animal health, animal nutrition with focus on the VOISIN system, pasture management, rotational grazing, and agro-silvo-pastoral systems. The training's main objective is to enhance resiliency and sustainable growth of livestock farmers.

Our goal is to promote a green livestock industry that is not only productive and competitive but also climate resilient. The Ministry of Agriculture policy is to transform cattle ranching from the traditional modality of slash and burnt to one that looks at protecting the

environment by incorporating animal rearing with trees that will contribute to improve soil fertility, animal nutrition, and in so doing simulating the diversity that is required to maintain ecosystems while at the same time generating profitable margins for livestock farmers. Because of this policy the Ministry has hired an expert in this field so that technical officers and by extension livestock farmers are properly trained to know and adopt climate resilient and climate smart technologies and innovations to mitigate the effects of climate variability.

During the year, farmers were also provided with additional services and strategic training in breeding stock recording, molasses urea blocks, export requirements, quarantine protocols, vaccination, pest and diseases surveillance, diseases of quarantine and economic importance, and silage production. Capacity building is crucial for farmers' development, and they deserve to be provided the services as mandated by the Government of Belize.

The section also conducted a much needed and highly demanded sale of cattle that allowed farmers to purchase 50 breeding stock with pedigree records. The livestock database continues to function at a high capacity providing necessary information that is required for decision making. The database has eliminated the guessing game and solidified the quality of information needed to conduct culling, selection, and replacement of breeding stock.

Regarding further expanding the genetic development program, the Ministry of Agriculture and the Belize Livestock Producers Association signed a Memorandum of Agreement where 10 quality pedigree heifers was provided to support their natural cattle breeding program. The calves produced will be shared equally to expand the number of quality breeding stock at both organizations.

Dairy

The dairy sector also reported a major development in establishing the Ultra high Pasteurization processing facility with the goal of prolonging the shelf life of dairy milk from an average of 14 day to 90 days. Additionally, policies that were instituted to support local processed products allowed for all cheeses in stock to be sold domestically to the extent that what it is now being produced is being locally sold without any need to stockpile. The policies and strategies regarding import duty waiver for technologies to increase the shelf life of milk and improve milk quality has resulted in a major cut on dairy milk imports which resulted in more revenue generated by the local dairy industry. The Ministry will continue to support the importation of superior dairy genetics to increase milk productivity and the competitiveness of the sector.

The Ministry of Agriculture actively participated in close collaboration with IICA, SICA, FECALAC, and CAC to review and update two major regional documents namely the *Technical guidelines for the design and implementation of national risk-based programs for the surveillance of residue and contamination in cow milk and good practices in milk production*. This has been shared with stakeholders in the dairy industry to serve as a major tool for informed decisions pertaining to the surveillance of residue and contaminants for dairy milk.

In June 2023, BLPA, the Ministry of Agriculture and the Dairy Producers of Shipyard initiated discussions to sustainably increase production and improve the quality of milk and milk dairy processed products for the community of Shipyard. Another main topic of discussion was the identification of possible funding sources to achieve the level of development required by the shipyard dairy farmers. A follow up meeting was thereafter conducted by the Ministry of Agriculture in December 2023, and a private consultant agreed to develop the institutional framework to move the new dairy processing facility in Shipyard to achieve higher volumes of milk production and dairy processed products that meet high food safety standards.

The preliminary agreements by the Shipyard Producers included to buy over the current processing facility and build one that meets BAHA food safety standards. By the end of December 2023, the Shipyard interested members agreed to hire another consultant to develop an assessment of the current Shipyard dairy industry to develop a comprehensive strategic and implementation plan to monitor progress of development, an accounting system, a concept note, and project proposal to seek funding to transform the dairy industry into one that is productive, competitive, and sustainable. It was also a consensus agreement to officially register their dairy farmers into an association.

The national dairy herd stands at more than 10,000 head of animals with approximately 300 dairy farmers. The 2023 milk production figures account for 9,940,933 lbs. This is 17,5% less when compared to 2022 milk production statistics when 12,048,847 lbs of milk was produced. This major dip in production has been attributed mainly to the drought.

Poultry

The poultry sector also showed significant growth in the year 2023. The poultry sub-sector is a major contributor to food security, income generation, and employment. Belize is fortunate to be self-sufficient in broilers, meat, and eggs. Total number of birds slaughtered for 2023 amounted to 12,678,429 or 60,412,971 lbs of liveweight yielding a total of 48,617,695 lbs of dress weight. It estimated that Belizeans consume an average of 110 lbs of chicken per year and approximately 170 eggs per capita per year. A breakthrough in the poultry industry was the passing into law of the new poultry regulations that will enable the appropriate regulatory environment for proper accountability, control, and management of the entire poultry value chain. The regulation will provide the necessary tools to regulate the industry for the registration, pest and disease prevention and control including the adoption of biosecurity measures among others.

Another major development in the poultry sector was the development and approval of the backyard poultry emergency preparedness and response plan funded by the FAO and with complementary funding of OIRSA. The outputs of the project include:

1. A passive surveillance protocol for New Castle and avian influenza,
2. Report of the implementation of the pilot passive surveillance protocol including the training of at least 80 stakeholders, vaccination program, and communications plan, and

3. A strategic and financial plan for the implantation of the passive surveillance protocol country wide.

So far, a major success has been the prevention of the Highly Pathogenic Avian Influenza to enter Belize. The Ministry has worked closely with the Belize Agriculture Health Authority, OIRSA, and the Poultry Association to devise a plan of action that includes a dynamic active and passive surveillance to ensure we are constantly on the alert for any potential threat that can potentially impact the poultry industry. The Ministry of Agriculture, therefore, has worked closely with the Food and Agriculture Organization to support the industry with funds needed for public awareness, laboratory support and updated protocols for New Castle and Avian Influenza.

The archaic poultry legislation was reviewed and updated and passed into law in 2024. The regulation primarily makes provisions to create an appropriate legal environment to regulate the industry so that there is sustained growth, control, and management of important diseases.

Another important collaboration between the Ministry of Agriculture and FAO was the successful completion of a poultry sector assessment report conducted by the Food and Agriculture Organization in December 2023. The assessment provided guidance for policy development, poultry expansion and market access.

Layers and egg production also showed significant increases; a total of 5,187,872 dozen or 62,254,464 eggs were produced in 2023. On average total egg consumption per capita was 170 eggs.

Swine

The swine sub-sector continues to play a major role in the contribution to food security. The Ministry of Agriculture continues to sustain active dialogue to control and regulate ham importation every year. Efforts are continuous to set up a ham production plan to consistently reduce ham imports. Toledo, Stann Creek and Orange Walk continues to produce quality piglets with good genetics to supply local demand. Also, the Ministry supports the private sector in any importation of superior purebred pigs that will contribute to increase productivity and meat quality. This same support is applied to all other livestock subsectors. We can safely say that we are self-sufficient in pig swine meat, but broilers continue to be the number one preferred source of protein for Belizeans primarily because it is more affordable.

Sheep

Another initiative of the MAFSE to diversify the agriculture sector and provide livestock farmers with another income generating opportunity to provide much needed income to their families is the improvement of genetics in the sheep sub-sector. The total number of sheep recorded in 2021-2022 was 17,323 head with a total of 461 sheep farmers. The 2022-2023 sheep production statistics showed a progressive increase of 18,007 sheep and a total

number of sheep farmers of 497 representing a 3.9 increase in total sheep production and 7.6% increase in number of farmers.

To expand production, productivity and more in particular to improve the quality of Lamb and mutton, the Ministry of Agriculture has collaborated in institutionalizing a state-of-the-art National Sheep and Goat Breeding Center in Central Farm. The objective is to provide quality breeding stock to increase productivity and improve quality of meat among sheep producers. At least 50 sheep farmers benefited from improved sheep and goat genetics. To expand traceability in livestock, provisions have been made in the BLR Tazar-AGRO platform for sheep traceability. At least 20 training courses were imparted to sheep farmers in reproduction, nutrition, animal health, management, culinary, and traceability, butchering and meat cuts.

Aquaculture

The main objective of the Aquaculture Unit is to produce quality tilapia fingerlings to supply local tilapia producers. In 2023, however, the Tilapia Hatchery Centre experienced many challenges. Operations were normal from January to mid-March. Then from mid-March to mid-May we experienced a disease outbreak from suspected Streptococcus bacteria. To solve the disease problem a task force was instituted comprising of Ministry of Agriculture as the lead, DOE, BAHA and Fisheries. The collective efforts and committed collaboration resulted in the development and implementation of a comprehensive plan to successfully address the disease outbreak. The prolonged drought continues to pose major challenges primarily with increase water temperatures which negatively impacts reproduction and tilapia growth. The task force continues to remain active to monitor progress until we get back to average production of 200,000 fingerlings produced annually.

Beekeeping

The MAFSE(MAFSE) has embarked on a beekeeping development initiative to further support the rehabilitation of the beekeeping sub-sector in Belize. Through collaboration with the CARICOM Development Fund (CDF) and AMEXCID several training courses were executed in areas such as introduction to beekeeping for beginners, group dynamics, record keeping, good manufacturing practices and food safety standards. This was done with the collaboration of institutions such as the Cooperative Department and the Belize Marketing and Development Cooperation (BMDC). Capacity building aimed at enhancing entrepreneurial skills, organization, value addition and marketing.

At present, many beekeepers individually market their honey at the local stores, through their cooperative or to the BMDC. The local markets demand high-quality honey in bottles with proper labelling and presentation. Marketing high-quality and wholesome honey and honey products is a major undertaking. While the beekeeper's knowledge was enhanced beekeepers are still lacking some technical skills that require a more hands on and practical

approach. Another collaboration carried out was our strong partnership with AMEXCID in the area of hands-on and interactive learning process. Through AMEXCID a comprehensive assessment of the northern apiculture was carried out. The assessment was critical as it provided recommendations with specific training to address areas of production concerns.

Currently we have more than 200 beekeepers with a total amount of hives of 3,119 producing a total annual production of approximately 132,000 lbs. among other major accomplishments in the beekeeping industry include: The platform that was formally open at Trazar AGro to initiate beekeeping traceability, National Beekeeping Training, Hive Expansion, Supplemental Feeding, and Pre-harvest, Productive Diversification, Preparation of By-products with Honey, Graduation Ceremony for 45 New Beekeepers, Beeswax Stamping training, Handing over of Beekeeping Harvesting Equipment, RRB workplan meeting session, “Diagnosis of the beekeeping subsector and building capacities for new and existing beekeepers in Belize.”

A major event was the National Beekeeping Symposium 2023. The objective of the beekeeping symposium and expo was to disseminate relevant information, knowledge, technologies, and innovation and by extension to bring together a diverse gathering of experts, practitioners, and enthusiasts in the dynamic field of beekeeping to update beekeepers on relevant and promising modern research and technologies. A total of 600 people actively participated.

3.3 Agro-Processing Unit

The unit in collaboration with Fyffes Banana Company, the Ministry of Health, Ministry of Education, and the Ministry of Agriculture signed an MOU which focused on value addition of green bananas generated. Fyffes in partnership with the Government of Belize developed a plan for the formulation of a porridge mixed manufactured from the green banana after dehydration and milling into flour was then added to powder milk, cinnamon, nutmeg, and honey. This porridge was then incorporated into the school feeding program at the schools within the banana belt, particularly Bella Vista. The Ministry of Education was responsible for adoption of the porridge within the school, the ministry of health was responsible for data collection of students to determine if there is any significant change in the growth of the student population and the ministry of agriculture is responsible for the production of the green banana flour, and the subsequent mixing of the porridge. The unit manufactured a total of 350 pounds of green banana flour which after mixing with other ingredients resulted in the production of 250lbs of porridge mix which fed 200 primary school students at the Bella Vista Primary School three times a week for 6 weeks total. Fyffes and the students were very appreciative of the unit’s work in preparing the porridge in a timely and professional manner.

The unit provided technical expertise to Sayab Women’s Cooperative of San Antonio Village, Cayo District with the support of JICA that provided the resources for the execution of a series of trainings. The technical expertise provided focused on food safety, proper food handling,

production development, and labelling. A total of 8 visits were done by the Extension Officer of the unit with a total of 67 hours of training was provided to the 8 member women's cooperative. Products development training focused on the manufacturing of Cucumber pickles, mango spicy sauce, papaya jam, pasta sauce, salsa casera, while theoretical training focused on process flow in the facility, labelling standards session, and basic food handling provided over 3 weeks with a total of 18 hours of theory.

In March 2023, the unit with the support of the ICDF Taiwan Technical Mission developed and executed a 2-week training session for 29 women and youth from across the country of Belize. The 2-week session covered Food Handling by the Public Health department of the ministry of Health, food safety covered by the Food Safety Department of BAHA, labelling standards covered by the Bureau of standards, marketing covered by BMDC, and product development executed by the staff of the processing unit. The participants received their food handlers' certificate, certification for the introduction to HACCP done by BAHA and the product developed with the processing unit. The total cost for the activity estimated at \$27,500.00 BZD of which the ROC Taiwan provided the funds for the resources needed for the execution of the trainings and logistics, whilst the other partners such as BAHA, BMDC, Public Health, and the Agro-Processing Unit provided in-kind contribution.

3.4 Policy Unit

The Policy and Statistics Unit of the Ministry of Agriculture, Food Security and Agriculture is responsible to support line ministries and private sector with providing support with market development, access to agricultural commodities, and agriculture data to develop and improve policy. The unit performs an essential role in enhancing accountability, transparency and coordination within the Ministry. Throughout 2023 the unit has been involved in various sessions, workshops, trainings, and project implementation. Some of the biggest achievements reported include collaboration with the World Food Program (WFP) with the implementation of the Hurricane Lisa Relief Assistance Program (HLRAP) in June 2023.

Through this initiative the WFP and the Government of Belize partnered to strengthen Belize's social protection system in response to shocks. Through the HLRAP an emergency cash assistance programme was launched to support farmers directly impacted by hurricane Lisa in November 2022. The key dataset used to extract beneficiary farmers was from the Belize Agriculture Information Management System (BAIMS). There were 717 farmers who received support directly benefitting 704 farming households within Corozal, Orange Walk, Belize, Cayo and Stann Creek Districts. Each household benefitted with approximately BZD 1,000/USD 500 through DigiWallet in June 2023. Below is a breakdown of impact assessment (figure 3) and overview of beneficiaries (figure 4).

SURVEY OVERVIEW

230	HHs interviewed (33% of HHs assisted)
6	Margin of error
94	Confidence level

RESPONDENTS' DEMOGRAPHICS






	88% male 12% female
	Average HH size: 4
	Average age: 49
	28% of HHs with disabilities/vulnerable members
	25 HHs with Pregnant or Breastfeeding women

Figure 3. 717 Beneficiary Farmers Impact Assessment Overview of HLRAP

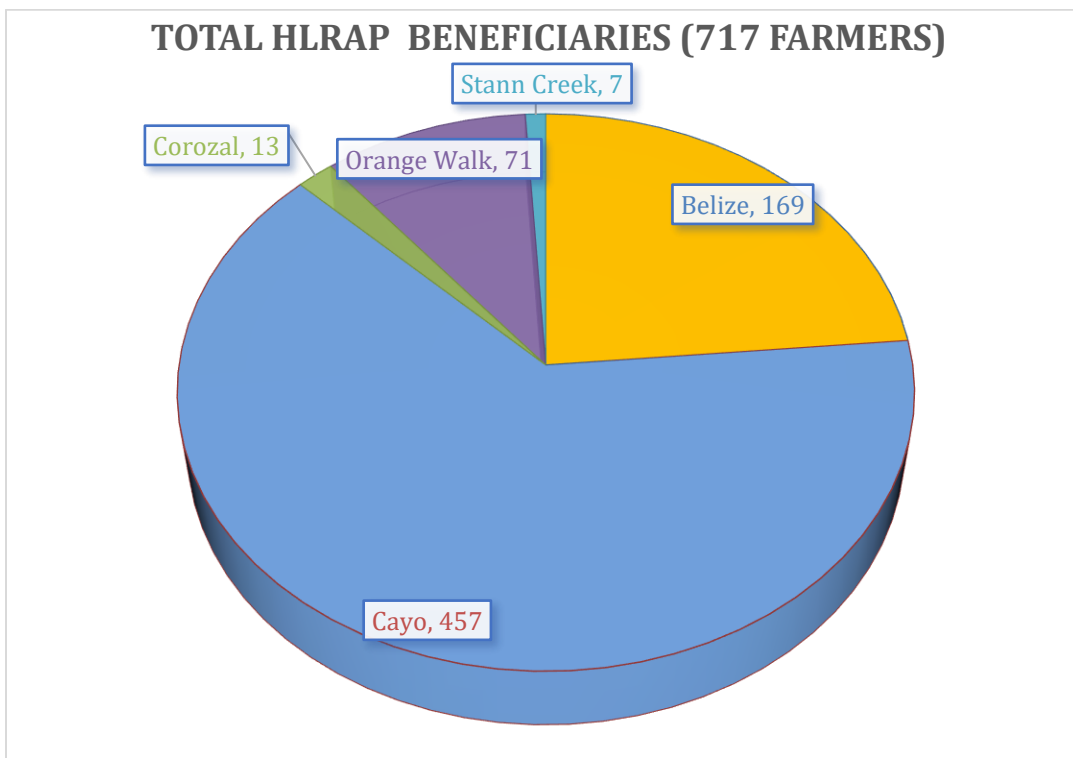


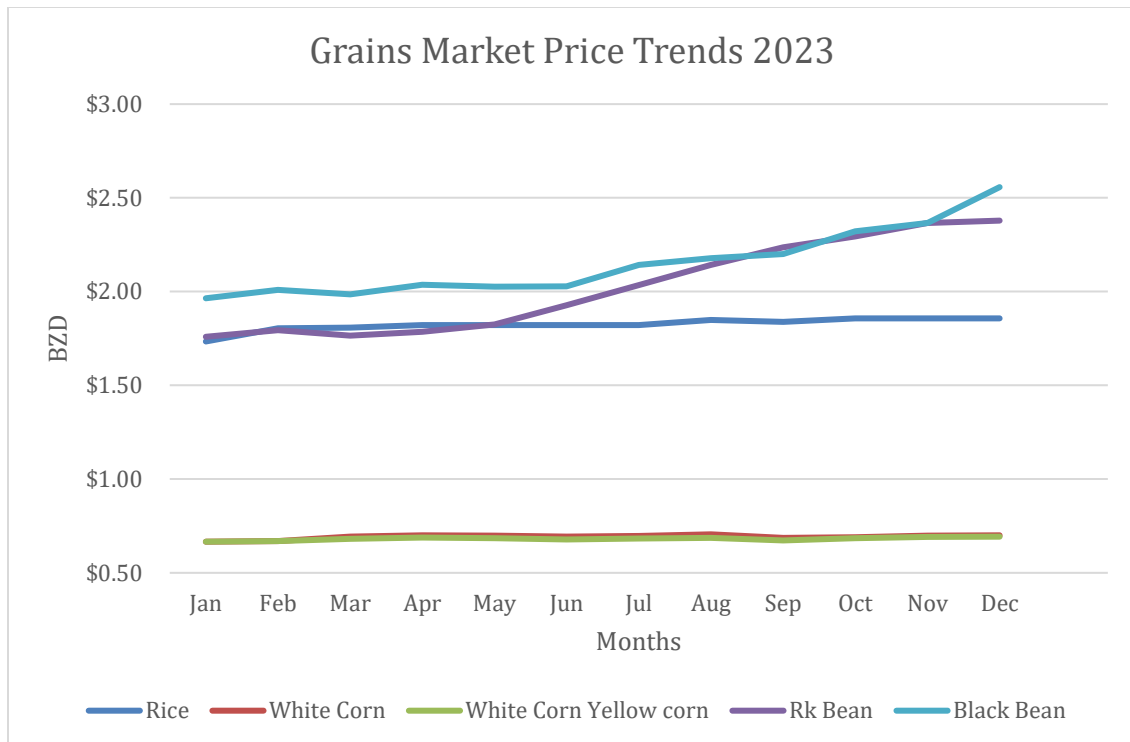
Figure 4. 717 Beneficiary Farmers HLRAP Distribution

Another key achievement of the Policy and Statistics Unit was the successful completion of 2023 production report. This report is vital to the national reporting schema of the Statistical Institute of Belize (SIB), Ministry of Foreign Trade (MFT) and the Central Bank of Belize. The

reporting mechanism collects data from key players in both the public and private sectors. Data is obtained using a template prepared by the statistics unit of MAFSE and reports are collected on a bi-annual basis. During these sessions a national validation exercise is carried out by the technical team to verify and validate all data before being published. The monitoring mechanism for reporting production is based on commodities of national importance categorized as Grains, Tradition Crops, Aquaculture, Vegetables, Root Crops, Tree Crops and Livestock. The type of data gathered include acreage under production, yield per acre, # of heads (livestock) and projections which yield the economic outputs in Belize Dollar, historical data trends and provision of projections. In 2023 the key sectors that saw increases where the Livestock Industry specifically the cattle industry, the grains sector which saw aggregated increases within the corn, sorghum and soy sectors. The shrimp industry also saw a small increase which indicates that the industry is rebounding from the effects of early mortality syndrome. Another sharp increase was seen within the coconut sector accounting for 18,000 acres and estimated to increase over 20,000 acres in 2024. The Policy Unit keeps monitoring key commodities that have direct import on the food basket and as such policy decisions are taken based on statistical data and analysis.

The unit also plays key roles in various bodies such as active participation in providing data and analysis to the Belize-Salvador Partial Scope Agreement (PSA) Trade Negotiating Team (TNT). The role of providing scientific and reliable data to the TNT is one of great pride for the policy and statistics unit which directly benefits trade for Belize. The unit also provides other trade data such as stock availability which is actively monitored by the unit ensuring self-sufficiency and reporting to the 25 by 25 Special Ministerial Task Force on a quarterly basis. The unit also provides data to the MFT ensuring that CET remains protected within the CARICOM region and ensures that Belize is self-sufficient. Key trade negotiations with Mexico, Salvador, Guatemala, CARICOM, Taiwan are a direct result of data originating from the unit. The unit takes pride in having historical data that dates to 1990.

Likewise, the unit also monitors market prices on a weekly basis through the Belize Agriculture Price Information System (BAPIS). The BAPIS is a component of BAIMS and data is collected at 7 markets throughout the country on market days which is compiled and published by the unit on a weekly basis. A sample of grains production trends for 2023 can be seen in Graph 1 below.



Graph 1: Grains Market Trend 2023

3.5 Centre for Research, Development and Innovation

A total of eight (8) coloured sweet pepper varieties from various local suppliers were evaluated under a Tropical Greenhouse in Central Farm during the months of October 2022 to March 2023. The objective of the trial was to evaluate the agronomic potential of selected sweet pepper varieties available in Belize. The results of this project familiarized local producers with varieties suitable for production under protective structures. Eight varieties (Var. 0125, Var. 2247, Var. 7870, Anaconda, Garfield, Nirmada, Thames, Zircon) were evaluated and data was gathered on plant and fruit characteristics of all varieties as there is limited information and most important heat tolerance. Whiteflies and mites were the main pests that affected all the varieties. The main diseases were bacterial wilt and anthracnose. In conclusion the varieties that flowered at 26 days after transplanting, fruiting began at 10 to 12 days after flowering. There was no significant difference in flowering and fruiting among all varieties. Harvesting of well mature fruits from all varieties was conducted 80 days after transplanting. Randomly selected fruits from several harvests were measured and weighed. The three varieties that produced the largest fruits were varieties 7870, Thames and Anaconda, however the largest fruit width, length and weight was the variety Thames. Lastly, the coloured sweet pepper variety trial needs to be conducted under a Bel-tunnel structure as this structure is mostly used by small famers, as well as the necessary equipment to record temperature and during the highest temperature in April and May.

Fruit Tree Program

The Crops Section is comprised of the Coconut and Fruit Tree Program and under these programs it administrates the Coconut Hybridization Program, Germplasms of Coconut, and Fruit Trees, Nurseries, and Infrastructures (4 storerooms and 2 workers shed). Additionally, it oversees the Organic Program which consists of the Vermiculture and Organic Amendment Production Unit and the Cold Storage Seed Room. In human resource staffing, there are five technical staff and eleven field laborers who are distributed across each of the established programs.

MAFSE has fruit tree germplasm banks and nurseries situated at the Research, Development and Innovation Center, Central Farm. The main purpose of a fruit tree germplasm bank program is to:

- Introduce, maintain, and conserve native and exotic species of fruit trees adaptable to Belize's agroecological conditions.
- Collect healthy and quality planting material to be used for propagation purposes and stocking of nurseries in Central Farm and District Stations.
- Supply farmers and other agriculturists with quality and healthy fruits trees at affordable prices.
- Promote the best nursery management practices in the field and nursery level.

The program consists of:

1. A five- acre germplasm bank of diverse types of fruit trees. This plot is located along the George Price Highway.
2. The fruit tree germplasm in the fruit tree and coconut nursery compound (dwarf golden plums, pitahaya, coconut, wax apple, and soursop).
3. A Horticulture Demo Center which consists of wax apple, local plums, guava, and starfruit. This plot was established in 1999 by Taiwan Technical Mission (TTM).
4. A 2-acre plot at the Agriculture Diversified Plot which consists of assorted fruit trees (local plum, bread fruit, citrus, jack fruit, coconut, avocado, kinap, sapodilla, timber, and flowering trees etc.). The field was established in the year 2020 -2021 during the COVID 19 Pandemic with the main objective to have fruit bearing trees and a source of pollen for the bee project established in Central Farm.
5. A 1.9-acre cacao plot – consisting of different varieties of cacao trees. This plot was established in 1986 by Mr. Joe Smith (Agronomist) and Dr. Marla Holder (Soil Scientist). This is an aged field which needs rehabilitation.
6. A pitahaya and soursop germplasm bank consisting of new varieties. These varieties were introduced in Belize in the year 2023. This initiative was made through the Belize – Mexico Bilateral Cooperation with the Government of Belize. The leading institution was the National Institute for Forestry, Agriculture, and Livestock Research (INIFAP).
7. Nurseries (3): Coconut, Fruit Tree, and Pitahaya

Coconut Hybridization

In 2023, a six-day work week from Monday to Saturday was implemented to increase the production of cross-pollinated nuts. Collaboration with BAHA was sought to dry Panama Tall

male flowers in their oven to enhance pollen grain viability. In addition, the number of weevil traps was raised from 8 to 12 due to high infestation of the South American Pan Weevil. Key activities included training for students and farmers, as well as management practices such as emasculation, pollination, replanting, weed, and pest control, especially using weevil traps. Transportation challenges persisted, hindering the collection of male flowers for pollen production. On another note, fertilization was not carried out due to approval of fertilizer approval by Headquarters, leading to deficiencies in plantation and production.

Coconut Germplasm Bank

The coconut germplasm bank currently has 7 entries, namely 2 hybrids (Chactemal and Maypan), 2 dwarfs (Yellow Malayan and Bronze Malayan), and 3 tall (Panama, Michoacan and Colima). The Michoacan tall was planted in 2022. Thus far, the YMD and Chactemal hybrid have started flowering and data is being collected on no. of spathe produced.

Fruit tree germplasm and production models

In 2023 significant works were undertaken to enhance the soursop and pitahaya in Central Farm. A demonstration plot was established on the 11th of July 2023 using two pitahaya varieties (Tanith & Andrea) recommended by the INIFAP team. Note that these findings were based on technological packages that were developed based on results in Chiapas, Mexico. This package was also shared with pitahaya producers and technical personnel of Belize to adopt develop a more environmentally friendly agricultural practices capable of optimizing and stabilizing Pitahaya production with the least possible impact on the environment and at the same time have good production results.

The Agronomy Section has developed four tables that will be used for the characterization of Pitahaya Varieties in Belize using the (INTERNATIONAL UNION FOR THE PROTECTION OF NEW VARIETIES OF PLANTS, GENEVA DRAFTED 2010). The First table is specific for the collection of data of Pitahaya stem or segment, the second table is for flower buds, the third table is for flowers and the fourth table is for fruits. The data collected needs to be evaluated and then registered as a new variety by the experts of the International Union.

Soursop production model

The MAFSE has benefited from a series of training courses on improved management practices in soursop production, and as such a demonstration plot has been established on 12th July 2023. The three (3) varieties developed and investigated by the INIFAP team include Clone 1, 2 and 8. The objective of the projects is to investigate how they will adopt to Belize and compared to production levels in Mexico.

All in all, the general objective of this projects is to transfer Agroecological components to optimize production in Belize.

CDF Project

The Agronomy Program has completed the construction of the thirty (30) Protective Cover Structures (17ft x 60ft) with installation of tank stand, drip irrigation and fertigation systems.

This project was funded by the CARICOM Development Fund (CDF) and the Government of Belize (GOB) and was initiated in November 2022 and is still ongoing.

Recently, funding has been allocated for the construction of six (6) additional structures countrywide. The objective of the project is to enhance capacity building for farmers and extension officers on the management of crops under this system. Note that these beneficiaries of the project include women, youths, and men. It is important to note that these farmers were identified by the respective agriculture departments in each district and a list was submitted to a panel for vetting based on respective criteria.

In the Cayo District a total of four structures were built. These areas include, Seven Miles, San Antonio, Agua Vivas, Waterhole. In Stann Creek five structures were built at Hope Creek, Hopkins and Dangriga. In Toledo a total of five structures were built at Cerro, Corazon, and San Jose. In the Belize District a total of five structures were built in Lucky Strike, Bomba, Santana, George Price Highway and Freetown Sibun. As for Corozal District a total of four structure were constructed in Chunox, San Narciso, Xaibe and Ranchito. Lastly, in the Orange Walk District a total of seven structures were constructed in San Carlos, Trinidad, Yo Creek, San Pablo, San Estevan and Mamayal.

Farmers, extension officers and relevant stakeholders were trained for an intensive one-week training on production management, plant nutrition, plant health, irrigation and pests and diseases, and fertigation system and crop production under the Protective Cover Structures.

FAO School Garden Project

In February 2023 the FAO personnel and the Ministry team met and agreed that the Research Department Technical team conduct site inspections at six schools, namely, two in the Belize District, two in the Orange Walk and two in the Corozal District. The schools selected in the Belize District were Lucky Strike Government School and Biscayne Government School. While in the Orange Walk District were Guinea Grass R.C. School and Santa Martha Government School, in Corozal District Chan Chen Government School and San Joaquin Government Schools were selected. The design agreed by the team was to build a semi-open prefabricated metal pipe tunnel of the size 17 ft. X 20 ft. at the identified schools. The structures were later enclosed with anti-insect screens to avoid interference by small animals such as chickens, dogs etc. The semi-open tunnels entail three raised beds filled with topsoil where the vegetable crops are to be planted by the designated individuals of the said schools. Therefore, there was an established time frame to gather and transport materials to the designated school sites. After materials were transported, the Horticulture team commenced with the pre-assembling of frames for the construction of raised bed frames.

World Food Day 2023

World Food Day 2023 was celebrated on October 20 at the Orange Walk Technical High School. This year's activities were celebrated under the theme, "Water is Life, Water is Food-

Leave No One Behind". In July 2023 preparations for the World Food Day started on July 2024. A visit was made to the Orange Walk Technical High School along with Mr. Alberto Gutierrez, E.O. An open field garden was selected, and inspections of protective structures was conducted. A plan was developed to establish an open field garden complete with an irrigation and fertigation systems, construction of two tunnel type protective structures, and a fully protected nursery. The gardens were established by Mr. Amir Pulido, Mr. Harold Wesby, and Mr. Alberto Gutierrez.

On the 20 of October 2023 on World Food Day a total of 2,232 seedlings were distributed amongst students, teachers, farmers, and other people that visited the booth. It is estimated that a total of 348 persons and 1 school (Trinidad Gov. School) received seedlings. The seedlings included cabbage, tomato, hot pepper, lettuce, eggplant, cucumber, zucchini, sweet peppers, and string beans.

National Agriculture and Trade Show

Preparations for the establishment of two open field vegetable garden plots including the urban garden and under the Bel and Tai Tunnels initiated in mid-January of 2023. A vegetable garden design was completed, and a budget was prepared to acquire the necessary materials and inputs for its establishment. Two open field plots were established with over 13 different crops, two tunnels and the Urban Garden were completed two weeks before NATS 2023 which was held from the 28-30 of April. Over 2,200 seedlings were also prepared and were sold, and part donated to teachers and schools who visited the booth.

3.6 Project Execution Unit

19 Projects executed in 2023

In 2023, MAFSE executed annual work plans of nineteen (19) national projects with a value of one hundred and ten million, one hundred and four thousand, one hundred and sixteen dollars (\$110,104,116), and three (3) regional projects with a value of nine million, three hundred and thirty-two thousand dollars (\$9,332,000). These projects are funded by eight (8) agencies.

From the nineteen (19) projects a total of twelve (12) came to an end in 2023 with a value of eleven million, ninety five thousand, five hundred and twenty eight dollars (\$11,095,528) of which nine million, three hundred and forty seven thousand, four hundred and forty-six dollars (\$9,347,446) was funded externally and one million, seven hundred and forty eight thousand, eighty-two dollars (\$1,748,082) was co-funded by the Government of Belize.

There are 6 projects in the pipeline that will come online in 2024 with a combined value of one million, three hundred and seventy-four thousand dollars (\$1,374,000).

Sembrando Vida Project

The Sembrando Vida Project has helped improve the quality of life for our rural population through the generation of employment with the contribution of agricultural products, technical as well as economic support. This incentivizes production of foods and the commercialization of the surplus of the foods produced. Registration started October 2022 with USD \$3.5 million dollars distributed. 2,000 small farmers from all six districts are benefitting from the project; 1,970 automatic teller machine cards have been distributed, 60,000 assorted fruit and timber trees have been distributed to beneficiaries and 20 bio-factories have been built. Did you collect any info on the results, e.g. survival of tree, growth, any products to use or sell?

3.7 Cooperatives Department

ACHIEVEMENTS

- Registered two new co-operatives.
 - Northern Coconut Growers Co-operative Society Ltd. of San Estevan, Orange Walk
 - Indian Church Farmers Co-operative Society Ltd. of Indian Church, Orange Walk
- Training programs for co-operatives were conducted countrywide as follows:
 - five on the benefits of organization for small scale producers and service providers;
 - twelve on co-operative administration and management;
 - six on the conduct of meetings and minutes taking; and,
 - four on introduction to finance and accounting procedures in a co-operative enterprise.
- Facilitated six exchange and information sharing visits among farmer co-operatives.
- Drafted and successfully presented and defended the “Promoting Sustainable Livelihoods, Building Resilience-Investments in Cooperatives” project before GEF-SGP UNDP. The project is providing a total of BZ\$300,000 in grant funding across thirteen co-operatives.
- Audited seven co-operatives: Savannah Taxi, Green Creek Farmers, First Stop Taxi, Valley of Peace Consumer, Placencia Producers, Placencia Tour Guides, and Maya Freshwater.
- Furthered development and enhancement of the staff manual and undertook a comprehensive revision and remake of the co-operative registration and capacity building curriculum.

3.8 Belize Marketing and Development Corporation

Expansion of the Honey Industry

For 3 years in a row, beekeepers in the northern districts of Belize have been assured a secure market for all the honey they produce. They are all assured 100% payment for their produce. Presently, 23 beekeepers are in this program and with the efforts of the Corporation, this program will be extended to incorporate even more beekeepers in other districts of our nation by 2025. The beneficiaries are women, men and youth that are engaged in this industry.

This year, BMDC has acquired export ready packaging for the Belize Jewels Brand of Honey. There have also been improvements to the Honey Buy-In Center of our facility to get BAHA Certification. The aim for these improvements is to finally meet the export standards set by the Bahamian Market. This in turn will provide more opportunities for our local beekeepers – both in volume and in income to be generated from better prices.

Revitalization of the Rice Industry

The 2023-24 Rice Crop was a successful one for the Corporation and for the rice farmers in the south. BMDC boasts of an over 200% increase in rice milled vs. the production of 2020-21 crop. With the investments in harvesting equipment and assistance in land preparation spearheaded by the Corporation, the farmers harvested over 1.9 million pounds of rice paddy. This translates to an increase of 1.1 million pounds produced over the amount produced in the previous year. All these changes have made the mechanized farmers more productive. However, to assist the milpa farmers, the corporation has an aggressive program to be instituted for the 2024-25 rice crop. This will in turn benefit over 150 milpa farmers from over 40 communities in the Toledo District. The corporation aims to increase the production but at the same time ensure that the small farmers also benefit from this program. The BMDC has also invested in improvements within the milling facility. State of the art packaging equipment, the introduction of new color-sorters and even modern sealing equipment has made the facility more apt to mill the amount of rice paddy delivered in a timely manner.

Introduction of the Belize Jewels Fruit Pulp

In the latter part of 2023 and first quarter of 2024, the BMDC has invested heavily in the Belize Jewels Fruit Pulps product line. This new product has assisted farmers from three districts – farmers that otherwise would not have a secure income from the fruits that they have lovingly cultivated. There are four types of fruit pulps being marketed by the BMDC in diverse parts of the country – mainly the tourist areas.

Investments have been made in equipment and in the right packaging for these pulps. The new presentation for these products was introduced in March of this year and since then, there has been an increase in the sales of these. The aim at the end of the day is to start to export these pulps and in turn assure our farmers a secure income from their fruits.

Export Programs being established.

Each year farmers have been getting training in improving the quality of the commodities they deal with. The BMDC in turn is increasing its efforts on the marketing side for these commodities. One such success is the completion of the PRA process for the export of four commodities to El Salvador. In addition to this, earlier this year, the corporation engaged in negotiations with its counterparts in that same republic to establish a market for fruit pulps and honey. This is still in process and the Corporation is aiming to finalize these negotiations by the end of 2024.

Another export project that the BMDC has been engaging with, is the Bahamas. Communications have been established with entities from that nation. The improvements in our packaging facility are being made to meet the standards established by that nation to start exporting. This is an ambitious project that the BMDC aims to accomplish by the end of this year.

Food security program

The MAFSE provides effective food security services for the entire country of Belize through a production information for the major fruits and vegetables in Belize and provides national production forecasts to all its stakeholders which assist in the food availability of these goods. Based on data provided by MAFSE Officials, the BMDC carried out several data validation visits to different producing areas in our nation. This directly influenced the supply of potatoes, onions, lettuce, broccoli and even cauliflower for the national supply.

Establishment of storage facility

Another proud accomplishment of the BMDC is that this year the corporation commissioned a 53' Sub-zero reefer – this is mainly for the storage of pulps that will prolong the shelf life of the processed fruits. In this manner, and once the proper markets have been established, the BMDC will be able to better assist other farmers apart from those that have already been selling to the corporation.

Earlier this year, the completion of the loading/offloading shed marked yet another milestone in the corporation's history. For some time, the Administration of the Corporation had seen the need for such a facility and after some deliberation, the project was initiated.

The objectives for establishing storage are to neutralize the production glut, extend perishable goods shelf life and remove excessive competition within the domestic market. This freezing reefer along with the two cold storage containers that were commissioned last year will ultimately assist in the national supply of several commodities of importance for our nation.

Acquisition of Vegetable Washers

In the early part of this year, the BMDC acquired an industrial vegetable washer. This investment will directly assist local farmers to improve the presentation of their vegetables to meet market demands. Along with this investment, two other small vegetable washers were acquired to help some organized farmer groups. This is in conjunction with other financing entities.

3.9 Belize Bureau of Standards

The BBS has been actively engaged in a series of national, regional, and international activities aimed at enhancing the Quality Infrastructure (QI) across various sectors in Belize. These activities include training and capacity-building activities, national standards development, enhancement of calibration capabilities, digital transformation, etc.

Accreditation of BBS Fine Mass Laboratory:

One of the biggest achievements for the BBS is securing funding for the accreditation of its Fine Mass Laboratory. Under the Metrology component of the 11th European Development Fund (EDF) Economic Partnership Agreement (EPA) Technical Barriers to Trade (TBT) program, the BBS seeks to achieve accreditation for calibration of OIML F2 class mass standards ranging from 1mg to 10 kg by 2024. Through the CARICOM Regional Organization for Standards and Quality (CROSQ), the implementation body of this project, the Jamaican National Agency for Accreditation (JANAAC) was contracted to conduct an assessment of the BBS ISO/IEC 17025:2017 Quality Management System (QMS) in November 2023. During this period, support was also received by the National Metrology Institute (NMI) of Mexico, Centro Nacional de Metrologia (CENAM) to perform an internal audit of the BBS ISO/IEC 17025:2017 QMS. Integral to the accreditation process is the calibration of BBS E2 mass standards for which the project also provided funding to be calibrated at the Trinidad and Tobago Laboratory Accreditation Services (TTLABS). To assess the competence, accuracy, and reliability of BBS laboratory in performing the calibration activities, funding has also been received to conduct interlaboratory comparisons (ILCs). Interlaboratory comparisons involve the comparison of measurement results obtained by different laboratories, typically using the same or similar measurement methods, instruments, and standards. BBS will be conducting its ILC with Laboratorio Costarricense de Metrología (LCM) of Costa Rica during May 2024. These initiatives mark a pivotal milestone for the BBS as it enables the department to ensure the utmost accuracy and reliability of its calibration services.

Metrology for Digital Transformation:

The BBS participated in a regional initiative to digitally transform metrology services through digital process management and lab automation utilizing the Capacity Building Using Regional Experience and Knowledge (CABUREK) Methodology. As a result of the collaborative efforts and regional exchange of expertise, experiences, and best practices, the Bureau was able to design and develop a web-based site for the management of the Industrial Metrology Unit’s (IMU) calibration data. With the development of this web-based site, the Unit has digitalized its Quality Management System, reduced the use of paper-based documents, improved the organization, accessibility, protection, and accuracy of information, and enhanced the efficiency of the calibration process through automation. The lab automation process allows the Unit to reduce the time it takes to conduct calibration and diminish transcription errors when inputting measurement results. This methodology is expected to be adopted across the Bureau to enhance its services.

National Standards Development:

#	STANDARDS PROJECTS	STAGE	STATUS/COMMENT(S)
1	Final Draft Standard Specification for Marking & Labelling of Medical Gas cylinders	60	<ul style="list-style-type: none"> Standard was published in October 2023.
2	Draft Belize Standard Specification for Nitrogen	50	<ul style="list-style-type: none"> Gazettal of notice to establish Standard as compulsory and memo requesting for the preparation of SI orders by the Sol Gen.
3	Draft Belize Standard Specification for Oxygen	50	<ul style="list-style-type: none"> Gazettal of notice to establish Standard as compulsory and memo requesting for the preparation of SI orders by the Sol Gen.
4	Draft Belize Standard Specification for Liquefied Petroleum Gas (LPG)	90	<ul style="list-style-type: none"> The technical committee is disposing of comments received during the enquiry stage.
5	Draft Belize Code of Practice for Recreational High Angle Activity Tours (Canopy, Canyoneering,	90	<ul style="list-style-type: none"> The technical committee is disposing of comments received during the enquiry stage.

#	STANDARDS PROJECTS	STAG E	STATUS/COMMENT(S)								
	Rappelling, and Ziplining)										
6	Draft Belize Standard Specification for Potatoes	30	<ul style="list-style-type: none"> Working Draft (WD) formatted and edited and will be disseminated among key farmers from the various cluster groups. 								
7	Outdated Standards for Brewery Products; Rum; Carbonated Beverages; and Poultry	90	<ul style="list-style-type: none"> Finalized stakeholder mapping in relation to the technical review process for outdated standards, which includes the following categories: Brewery Products, Rum, Carbonated Beverages, and Poultry. The stakeholders will be engaged to review the standards and determine the need to initiate the revision process. Key stakeholders in the technical review process includes the following: <table border="1"> <tbody> <tr> <td>Brewery Products</td> <td>Belize Brewing Company; Caribbean International Brewery; Hobbs Brewing Company; Two-5 Brewing Company</td> </tr> <tr> <td>Rum</td> <td>Copali Rum; Big Titty Rum; Cuello's Distillery; Tiburon Rum; Travellers Liquors; L&R Liquors</td> </tr> <tr> <td>Poultry</td> <td>Belize Poultry Association; Quality Poultry Products; Caribbean Chicken; Three Star Chicken; Fiesta Chicken; Country Foods</td> </tr> <tr> <td>Carbonated Beverages</td> <td>Bowen & Bowen</td> </tr> </tbody> </table>	Brewery Products	Belize Brewing Company; Caribbean International Brewery; Hobbs Brewing Company; Two-5 Brewing Company	Rum	Copali Rum; Big Titty Rum; Cuello's Distillery; Tiburon Rum; Travellers Liquors; L&R Liquors	Poultry	Belize Poultry Association; Quality Poultry Products; Caribbean Chicken; Three Star Chicken; Fiesta Chicken; Country Foods	Carbonated Beverages	Bowen & Bowen
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Carbonated Beverages	Bowen & Bowen										

Standards for Agriculture and Agriculture Products (AAP)

In a collaborative effort to address issues relating to quality and climate change, among other issues in agriculture, the Belize Bureau of Standards is working with MAFSE to establish national priorities for Standardization in the Agriculture Sector. In this effort, the BBS commenced a value chain exercise to assess standards and quality issues across cluster groups, seeking the involvement of farmers and other key organizations to identify priority areas in Belize's agricultural value chains.

Below are some quality issues arising in the cluster group assessments:

#	Specific Area	Identification of Quality Issues	Recommendation(s)	Priority (High/Medium/Low)
1	Water source	Lack of constant water source	Option 1: run adequate water lines from a river source nearby. Option 2: Invest BZ \$50,000 to drill and install a water well.	High
2	Climate Change	Increasing temperatures affecting potato plant and growth	Research on heat resistant potato variants from countries with similar climatic conditions (Honduras).	High
3	Irrigation System	Inadequate irrigation system	Replace sprinklers for adequate irrigation system and apply fertilizers and pesticides more effectively.	Medium

Belize Energy Efficiency Labelling Scheme:

In November 2022, the BBS hosted a soft launch of its Energy Efficiency Labelling Scheme (EELS) as one of the piloting countries for the CARICOM Energy Efficiency (CEE) Labels. To date, the BBS has been working on activities to develop its capabilities to implement its national scheme. In collaboration with the Lait Up Belize project through funding from the European Union, BBS is continuously supported in its communication and visibility and in capacity-building initiatives to strengthen the department's capabilities to implement this scheme effectively.

In this regard, the Quality Institute Bureau of Standards Jamaica (QI BSI) conducted training for BBS and the Energy Unit Officers from 18 to 22nd March 2024 in Jamaica. This initiative is part of Lait Up Belize's commitment to support the successful implementation of the Energy Efficiency Labelling Scheme (EELS) pilot program in Belize, aimed at promoting energy conservation and sustainability.

This training was designed to enhance the Officers' understanding and application of standard requirements critical for the effective testing and certification of energy-efficient air conditioning and refrigeration appliances. Coming out of this training, the Officers are now capable of assessing the test reports and certificates submitted by participating importers of

refrigerators and air conditioners. Thereafter, once products comply with the standards, they will be registered into the BBS database and, once imported can be affixed with a CEE label.

Metrology Services:

Legal Metrology - Legal metrology market surveillance activities aim to ensure accuracy and fairness in measurements across various sectors. This includes the verification of fuel pumps, net content, and industrial and commercial scales. By verifying the accuracy of measurements in these critical areas, legal metrology services play a key role in maintaining integrity and fairness in the marketplace, ultimately contributing to the overall well-being of both consumers and businesses alike.

The table below shows the number of verification services performed by the BBS during this period:

Activity	KPI
Verification of Fuel Pumps	1,547 fuel pumps
Net Content	1,171 prepackaged goods
Industrial Scales	190 industrial scales
Commercial Scales	551 commercial scales

Industrial Metrology - Calibration guarantees consistency and reliability in measurements, enabling businesses to meet regulatory requirements, maintain product quality, and ensure customer satisfaction. It serves as the cornerstone for confidence in measurements, facilitating fair trade practices and promoting trust between stakeholders. During the Fiscal Year 2023/2024, the BBS performed 204 calibrations in the fine and grand mass, volume, and non-automatic weighing instruments (NAWI). Industries such as airline transportation, agro-processing, cement manufacturing, forensics, the compliance unit of the BBS, etc., rely on precise measurements to ensure safety, quality, and compliance with regulatory standards.

The table below shows the number of calibrations performed by the BBS during this period:

Calibration	Quantity	Sector
Fine Mass (FM: 1 mg to 10 kg)	115	Airline Transportation, Agro-Processing, Cement manufacturing, Compliance, Forensics
Grand Mass (GM: 20 kg to 1000 kg)	50	Compliance, Agro-Processing
Volume Calibrations	5	Compliance
Non-Automatic Weighing Instruments (NAWI)	34	Airline Transportation, Agro-Processing, Distilleries
Total:	204	Total unique sectors: 6

Public Awareness Activities:

- Training in the Auditing and Implementation of ISO 9001:2015 Standards-Based Quality Management System (QMS) Standard: As part of the “Enhancing Belize’s National Quality Infrastructure” grant received through the Caribbean Development Bank (CDB), the BBS was able to secure consultancy to provide training for both public and private sector stakeholders in the implementation and auditing of the requirements of the ISO 9001:2015 QMS standard. This consultancy included five modules, three of which were conducted virtually and saw the participation of eighty-two stakeholders, and twenty-three stakeholders were chosen to participate in face-to-face sessions on procedure writing and design of forms and internal auditing.

While these trainings were a part of a grant, BBS continues to provide this support to stakeholders upon request given its certification to the ISO standard and having certified lead auditors on staff. On 24th October 2024, BBS Officers provided training to the Ministry of Tourism & Diaspora on Internal Audit to enhance the Ministry’s competency and propel their QMS.

- World Metrology Day 2023: World Metrology Day 2023, celebrated annually on 20th May, was observed under the theme "Measurements supporting the global food system." This occasion provided the BBS with a unique opportunity to engage closely with stakeholders in the agro-processing industry, illustrating the role that accurate measurements play in both local and international trade.

In pursuit of this initiative, three prominent entities were chosen: the Belize Sugar Industry (BSI-ASR Group) for sugar processing, Citrus Products of Belize Limited (CPBL) for citrus-related products, and Rainforest Seafoods for seafood processing and packaging. Each of these companies was visited, allowing BBS to capture video footage of their meticulous preparation and packaging processes for their respective products, destined for either local or international markets.

Subsequently, these videos were shared with three selected high schools in the Belmopan area, enriching students' educational experiences by offering a firsthand glimpse into the intricate world of measurements in the agro-processing sector. Moreover, these videos were also made available on BBS's social media platforms, ensuring a wider audience could benefit from this enlightening endeavor. This outreach not only fostered a deeper understanding of the role of metrology but also highlighted the practical applications of precise measurements in shaping the global food system.

- Cooperatives Rapid Response Project Workshop: On 30th June 2023, commemorating International Co-operatives Day 2023, the Department of Co-operatives invited the BBS to present on the importance of Standards and Quality in the Agriculture Sector for eleven (11) beneficiary co-operatives from across Belize. The presentation encompassed an overview of BBS, emphasizing the standards development process and the importance of properly labeling products. This informative session proved instrumental in equipping co-operatives with a deeper understanding of the significance of standards and quality in their agricultural pursuits.
- Introduction to Standards and Quality for Micro, Small, and Medium Size Enterprises (MSMEs): On 6th July 2023, BBS had the opportunity to introduce MSMEs to standards and quality. This session provided MSMEs with a comprehensive overview of the BBS mandate as it relates to standardization, legal and industrial metrology, and consumer protection. The presentation underscored the importance of a robust National Quality Infrastructure (NQI), emphasizing how it contributes positively to the export of high-quality goods, thereby boosting the competitiveness of local enterprises on a global scale.
- National Vegetable Stakeholder Consultation: Standards and quality in agriculture are pivotal for ensuring safe, sustainable, and consistent production while fostering market access, consumer trust, and environmental stewardship. On 17th August 2023, BBS participated in the National Vegetable Stakeholder Consultation organized by the Ministry of Agriculture, Food Security, and Enterprise (MAFSE) to sensitize farmers on the benefits of implementing standards within their production process.
- Caribbean Statistics Day: On October 13th, the Belize Bureau of Standards (BBS) participated in a commemorative statistical exhibition at the George Price Centre in Belmopan, hosted by the Statistical Institute of Belize (SIB) in observance of Caribbean Statistics Day. The event, held under the theme "One Voice, One CARICOM, Everyone Counts," served as a vibrant platform for celebrating the profound importance of statistical data in shaping policy and decision-making processes across the region.

The BBS, along with several other private and public institutions, were invited to showcase the myriad ways in which statistics empower and inform various facets of societal progress. The Industrial Metrology Unit (IMU) presented its innovative application of statistical techniques to estimate the uncertainty of measurement, an important aspect of ensuring precision and reliability in metrological practices. Furthermore, the IMU seized the opportunity to demonstrate the practical utility of statistical methodologies in other realms, namely, Control Charts. These dynamic tools are used to depict the dispersion and variability of repeated measurements visually. This exhibition provided a platform for the IMU to

demonstrate the Bureau's unwavering commitment to fostering a culture of excellence and precision in measurement standards.

- **Belize Chamber of Commerce and Industry (BCCI) Information Session:** On 17th October 2023, the BBS facilitated a presentation to private sector stakeholders under the BCCI membership to educate and sensitize them on the roles and responsibilities of the Bureau. In this session, participants were able to identify quality infrastructure services provided by the BBS to address organizational needs. Such engagements are integral for the Bureau as they provide the department with an avenue for the dissemination of information to foster a deeper comprehension of Quality Infrastructure among businesses and furnish indispensable guidance on trade and market access requirements.
- **World Food Day 2023:** On 20th October, BBS participated in the MAFSE World Food Day Fair, celebrated under the theme, "Water is Life, Water is Food. Leave No One Behind." It highlights the basic role of water in guaranteeing food security and focuses on the need for water resources in our attempts to battle hunger and malnutrition. The BBS display captured the importance of accurate and reliable measurement through the provision of its verification and calibration services and the benefits of standards in ensuring that the minimum requirements are in place to ensure clean and safe water in food production processes.
- **MPUELE - Energy Fair:** The Belize Bureau of Standards (BBS) participated in the Ministry of Public Utilities, Energy, Logistics and E-Governance (MPUELE) Energy Fair on 16th November 2023 at the Roaring River Golf Course in the Village of Roaring Creek. The BBS showcased its strategic roadmap towards the implementation of a National Energy Efficiency Labelling Scheme for Belize, focusing on essential household appliances such as refrigerators, air conditioners, and light bulbs, all harmonized with the CARICOM Energy Efficiency (CEE) Labels.

The significance of promoting energy-efficient appliances cannot be overstated: they inherently consume less energy, thereby significantly reducing greenhouse gas emissions and mitigating the environmental footprint associated with energy production and consumption. Through informed consumer choices, individuals play a key role in contributing to broader environmental conservation efforts, fostering a greener and more sustainable future for all.

Anticipation at this event buzzed as attendees learned of the imminent commencement of this scheme, slated to roll out starting April 2024, initially targeting refrigerators and air conditioners. This initiative marks a decisive stride towards enhancing energy efficiency and environmental stewardship across Belize, and the BBS's steadfast dedication to fostering a culture of sustainability and responsible consumption through the implementation of standards.

- University of Belize (UB) Faculty of Science and Technology (FST) Science Open Day and Expo: Annually, the UB hosts its Annual Science Open Day and Expo to promote science education within the community. This year's event was celebrated under the theme "Advancing Belize Vision through Science and Technology" on 16th November 2023, showcasing both the work of the University's students and exposing the students to the existing opportunities in the field of science. To support this initiative, the BBS promoted its work in legal and industrial metrology by highlighting the importance of verification and calibration in different fields of science and showcasing the measuring instruments used and mathematical calculations utilized in the execution of this responsibility.
- National Beekeeping Symposium: The MAFSE hosted a National Beekeeping Symposium at Centro Escolar Mexico in the Corozal District on the 30th of November. The symposium served as a platform to sensitize policymakers, beekeepers, and private and public sectors on the vital role bees and honey production play in maintaining a balance of ecosystems & biodiversity and the socio-economic benefits it has in the livelihoods of rural honey producers. BBS's presentation revolved around the Belize National Standard: Specification for Honey, which applies to all honey products and covers all styles of packaged honey that have been processed and are ultimately intended for direct consumption. The presentation reinforced the significance of quality assurance and sustainable practices within the honey industry. Utilization of this standard would ensure that the honey being produced meets specific quality criteria, bolstering consumer confidence and market access for honey producers.
- Belize Draft Specification for Liquefied Petroleum Gas (LPG): On 28th December, a virtual sensitization session was held with a representation of thirteen LPG stakeholders on the draft specification. This session aimed to engage relevant stakeholders, including government agencies, industry representatives, consumers, and other interested parties, with information on the proposed standards. This session facilitated discussion, feedback, and input from various perspectives to ensure that the final specifications are comprehensive, practical, and reflective of the needs and priorities of the industry. Ultimately promoting transparency, inclusivity, and stakeholder buy-in in the standard development process.
- Belize Draft Code of Practice for Recreational High Angle Activity Tours (Canopy, Canyoneering, Rappelling, and Zip Lining): The High Angle Activity Standard consultation/sensitization session was held virtually on December 15, 2023. Thirteen stakeholders/public representatives joined the session to review the draft code of practice and provide their feedback where relevant to the document. The High Angle Technical Committee is reviewing comments received during this consultation for disposition.

- **World Consumer Rights Day 2024 Fair and Responsible AI for Consumers:** In a market where the use of Artificial Intelligence has grown exponentially, from chatbots to delivery services, to self-driving cars, etc... this technology is set to have an enormous impact in the way we work, create, communicate, gather information and much more. Artificial Intelligence can be applied to every aspect of human survival – government, healthcare business, education, finance, automobiles, manufacturing, and gaming. While in the international market, AI has taken a larger role in how consumers access goods and services - from online shopping to chatbots, locally, it plays a smaller role.

The Belize Bureau of Standards chose to focus this year's theme on the role AI plays in consumerism and what those potential impacts are. During the weeks of March 12th through 22nd, 2024, the department, along with DigiWallet, visited several High Schools, delivering presentations on "AI & Consumerism – How AI Impacts Consumers' Access to Goods or Services in Belize." The aim was to highlight this growing trend and showcase one avenue of its practical application in Belize. Students enthusiastically received the information seeing the practical application of what they are learning in class and how it is applied in a real-world setting.

3.10 Belize Agricultural Health Authority

BAHA is led by a diversified Board of Directors and the management of the institution includes a very qualified team of professionals. BAHA is leading the way to facilitate the expansion of agriculture exports, protecting the country from debilitating pest and diseases and improving on its food safety mandate.

Our agricultural exports such as sugar, corn, beans, coconuts, papaya etc. are all certified by BAHA and the BAHA seal is well respected in Central America, the Caribbean, the European Union and the rest of the world.

In 2023, BAHA completed the following risk assessment to facilitate market access for new products to new markets:

Market access for fruits and vegetables in El Salvador

Prepared and submitted market access dossiers to our counterparts in El Salvador to conduct risk analyses for pineapples, oranges, carrots and onions. Conditions of importation were received from El Salvador but trade has not happened yet.

Market access for coconuts in Mexico and USA

Finalized market access for de-husked green coconuts to Mexico after a lengthy process of dialogue. However, no shipments have materialized due to stringent TBT requirements that make trade prohibitive. Market access for green coconuts with husk is being pursued in the

USA with a preliminary positive ruling already made but awaiting publishing of the results in the Federal Registry of USDA, for total clearance.

Market access for soybeans to Jamaica and Mexico

Prepared and submitted respective market access dossiers to the Plant Health Authorities of Jamaica and Mexico for conducting pest risk analyses for the said product. The first comes as a result of a request by an individual expressing interest in exporting to Jamaica and the latter is the outcome of bilateral discussions between Belize and Mexico.

BAHA has played an important role in facilitating market access for shrimp to Mexico and Taiwan, ice cream to Grenada, craboo puree to Guatemala, and yellow ginger products among others. In addition, BAHA has passive and active surveillance for such pests and diseases as the mediterranean fruit fly, the screw worm, poultry diseases, cattle diseases, shrimp diseases and more, so that Belize can continue to maintain exports to well established and new markets.

3.11 Supplies Control Unit

The Supplies Control Unit continues to lead the way in ensuring that the food produced by our farmers has a space in the local market, and that consumers are protected as much as possible from unscrupulous merchants and their price gouging tactics. The Unit has seen regulatory reform enacted into laws, providing for expansion to the list of goods subject to regulation, and legislation has been passed amending the Supplies Control Act to allow issuance of violation tickets. As a result of the modified consumer protection legislation to penalize price gougers, 124 tickets have been issued since September 2023 when over a span of 13 years, most of which was under the past government, only 14 tickets were issued. The Unit has also collaborated with the retail sector to sensitize business owners on requirements of new regulations.

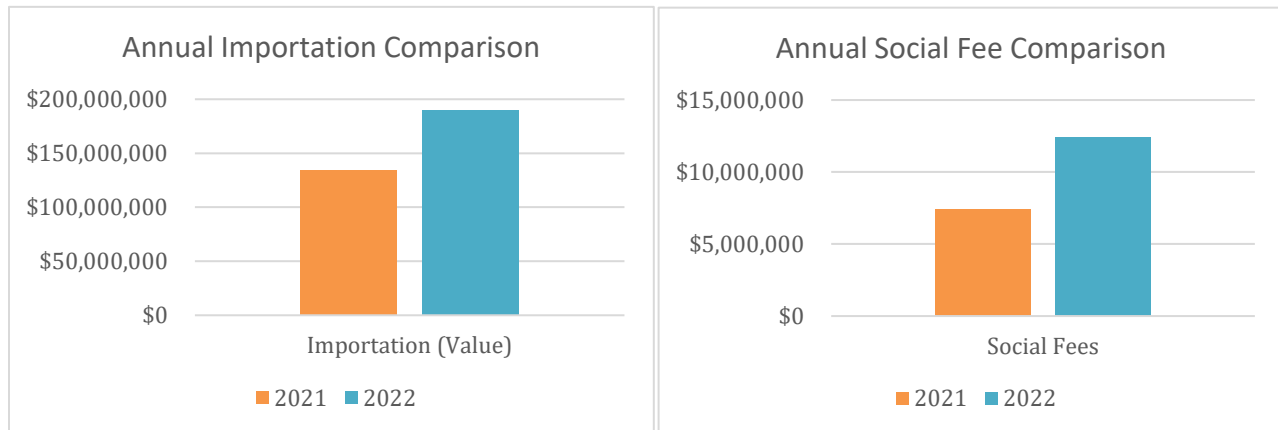
3.12 Corozal Free Zone

The Ministry of Agriculture, Food Security, and Enterprise successfully navigated the challenges posed by the pandemic to reopen the Corozal Free Zone, which had been closed on March 21st, 2020. The zone was successfully reopened on February 1st, 2021, marking a significant achievement amidst all the controversy. Since then, the Ministry has overseen remarkable growth and revitalization in the zone.

In February 2021, 108 businesses reopened their doors within the Corozal Free Zone. This number has substantially increased over time, with the latest data indicating that 308 businesses are now fully operational as of 2023. This growth reflects a positive trend in economic activity within the zone. The impact on employment has been equally impressive. At the reopening in February 2021, 560 individuals started working within the Corozal Free Zone. Currently, there are 1500 employees directly employed, indicating a significant increase in job opportunities. Additionally, the Ministry's efforts have led to the indirect employment of 1500 individuals through various services and contract work

associated with the operational businesses. This demonstrates a comprehensive approach to fostering employment and economic development within the region.

Importations in 2022 were valued at US \$190,030,340.83, an increase of 34.3% compared to 2021 (US\$ 133,784,978.18). As a result, social fees paid to the Government of Belize summed up to US \$12,377,715.26 USD, an increase of 66.4% compared to 2021 (US\$ 7,436,855.39).



In 2021, the Corozal Free Zone generated \$258,774,006.29 USD in revenue, while in 2022, the revenue increased to \$266,042,753.64 USD.

The Corozal Free Zone received approximately 1.1 million visitors in 2022. This represents a 20% increase in footfall compared to the previous year. The increase in footfall can be attributed to the opening of new stores and an increase in promotional activities. The CFZ also saw an increase in the number of vehicles from 242,481 in 2021 to 296,635 in 2022 which represents a 22% increase and contributed to the growth of the zone.

On December 8th, 2023, CFZ signed a contract with RJB Construction Limited to pave the Santa Elena Road Access to Corozal Free Zone valued at 2.9 million BZD. This was made possible through a loan from CABEL and funds from the GoB.

In addition to the quantitative achievements, the successful reopening of the Corozal Free Zone demonstrates effective government policies and strategic decision-making. The Ministry's ability to adapt to the evolving circumstances of the pandemic, facilitate the reopening process, and stimulate economic activity reflects sound governance and proactive measures.

As the Corozal Free Zone continues to thrive under the Ministry's guidance, it serves as a testament to the resilience of the Agriculture, Food Security, and Enterprise sectors. The achievements outlined not only mark a successful recovery from the challenges posed by the pandemic but also lay a foundation for sustained economic development and prosperity in the region.

3.13 National Food and Nutrition Security Commission

Sembrando Vida

The Project of SV had as its objective to improve the quality of life for the rural population through the generation of employment with the contribution of agricultural products, technical as well as economic support. This should incentivize production of foods and the commercialization of the surplus of the foods produced.

Chronology of Events

- Registration started October 2022
- Official Launch: - July 2023
- Proposed end date: April – May 2024
- Funds approved: - 61,539,442.74 pesos (at USD = 17.50 pesos, approx. US\$ 3,516,539.58)
- 90% to 95% of the project has been implemented.
- All 20 bio-factories have been built (4 additional built by interested farmers in their areas.
- 2000 small farmers from all 6 districts benefitted from the project.
- Approx. 1970 atm cards have been distributed (at least 2 disbursements of funds made, since not all atm cards have been distributed).
- Approx. 60,000 trees distributed to beneficiaries (assorted: vegetable seeds, fruit trees and timber trees). How many survived?
- More than 3,000 agriculture packages distributed country wide.
- More than 2,000 individual or group trainings done by the SV extension officers. Which districts?

World Food Day-2023

World Food Day (WFD) is celebrated annually on October 16th by 150 countries across the world in support of the FAO's mission to raise awareness and to gather greater support and understanding to the approaches that can help to end world hunger. In Belize the annual World Food Day event was held on Friday October 20th, 2023, at the Orange Walk Technical High School (OWTHS), Orange Walk District, with the opening ceremonies commencing at 10:00 a.m.

- The theme of the 2023 WFD was: - "Water is Food, Water is Life, LEAVE NO ONE BEHIND".
- Keynote Address: Hon Jose Mai, Minister of Agriculture, Food Security and Enterprise.
- Special Guest: Her Excellency Dame Froyla Tzalam, Governor General of Belize.
- Memorandum of Understanding signed by Minister, Principal and Chair of the Board of OWTHS.
- Ministry of Agriculture Contributed: Construction of covered structure, seedling nursery, fruit tree nursery, open garden, chicken coup, pitahaya orchard and the refurbishing of another cover structure.
- Approximately 15 primary schools and 5 high schools attended the event.
- 30 booths displayed agricultural products.

School Garden Program Support

The NFNSC continues with its school garden support program to primary and high schools across the country. Last year the Seventh Day Adventist Institutions approached the Ministry for collaboration in support of their school garden programs. The Education Officer for SDA schools Mrs. Ellajean Gillett, declared, and I quote, “With respect to the nature of the assistance this is what I am thinking: a few gardening implements, seeds, seedlings, fertilizer, and advice on what should be done to get the best outcomes would be appreciated. At this point, the thinking is that they would plant in buckets so that during the holiday period, the children can take home the plants for proper care, but I am open to your advice. Thanks for your willingness to assist!”.

This activity will start to be implemented in 2024.

Mesoamerica Hunger Free Project (Mesoamerica Sin Hambre)

“Mesoamerica without Hunger”, under the technical cooperation of FAO, is a program of cooperation between countries that contributes to the Sustainable Development Goals proclaimed by the United Nations. With aid from the Mexican Government through the Mexican International Development Cooperation Agency (AMEXCID), and with technical support from the FAO, “Mesoamerica without Hunger” also seeks to strengthen institutional plans for achieving food and nutrition security and providing support for individual family farming.

Today, Brazilian and Mexican Cooperation are working in cooperation and aligned to serve the interests of Belize in improving its SFP. In the first week of April 2016, FAO, together with the Governments of Belize, Mexico, and Brazil, launched a project which under the Mesoamerica without Hunger framework was providing financial and technical assistance to improve the program at 4 selected schools in the Toledo District; namely San Antonio, Santa Cruz, Santa Elena & Pueblo Viejo and to contribute to create the basis for developing a National SFP Policy.

The SFP model that is being promoted within the region goes beyond conception where the role of the program is limited to just providing meals to poor and vulnerable children. The new model is strongly based on the human right to adequate food approach, also considering the environment, cultural, social and economic sustainability. It is linked to school gardens and nutrition education, to promote lifelong healthy eating habits for school children and by extension, for their families. It also focuses on the utilization of local products, especially from family farming, promoting the consumption of fresh, local, and healthy foods and, at the same time, boosting local production and local job creation and reducing the food import bill.

The pilots are currently being implemented in four schools in the Toledo District. Brazilian and Mexican cooperation continue to support Belize in the implementation of its sustainable school feeding pilots, strengthening these six components which are:

- Inter-institutional and Inter-sectorial coordination.
- Social participation that stresses for community involvement and monitoring.
- Adoption of adequate and healthy menus that respect local culture.
- Food and nutrition education using school gardens as a pedagogical tool.
- Improvement of school infrastructure, including kitchens, dining halls and storage rooms in schools.
- Direct purchasing of food items from small scale and family farmers from the communities where the schools are located.

A Letter of Agreement (LOA) was signed to support the sustainable school feeding approach being piloted in those four schools in Pueblo Viejo, Santa Elena, Santa Cruz, and San Antonio of the Toledo District, with the FAO-Brazil technical assistance and funding from the Mexican Cooperation.

A sustainable SFP should seek to offer meals that are healthy, quantitatively, and qualitatively adequate, and culturally appropriate, therefore optimizing adequate growth, development, and the health of the students. Accordingly, the development of appropriate menus is fundamental. To plan and implement an appropriate menu for school feeding, the development of a Nutritional Plan was recommended, as it contains useful information for the various actors that support the implementation of the Sustainable Schools, such as the stakeholders from Education, Agriculture and Health sectors, at national and local levels, as well as school principals, teachers and cooks, family farmers and extension workers. A workplan for 2024 is currently being developed for further support of this project to Belize.

Belize Food Systems Transformation Pathway

The opportunity with this pathway is that line Ministries like Agriculture, Education Health, Sustainable Development, NEMO, and Rural Development and others will be able to have access to resources through our UN agencies in Belize. A perfect example was when the World Food Program assisted approximately 717 farmers in hurricane relief, post Hurricane Lisa. The value of this grant was approx. \$600,000 Belize dollars. This was in partnership with the Ministry of Agriculture.

Currently, our Ministry is working on an “Anticipatory Action for Droughts in Belize. An opportunity to access more resources to support the agriculture sector. The Ministry of Agriculture is the lead Ministry in this Food Systems Pathway.

4. Lessons Learnt

The battle at the MAFSE is always about resources, human and material, and their availability, so quite a few of the lessons learnt focus on that issue. It should be recognized that with the improvement of some conditions, such as a centralized location at the Show Grounds, with new office space available at the Carlos G. Santos Building, and a fresh influx of vehicles from the CRESAP project, limitations to administration, monitoring and effecting projects is lifted somewhat. The hope is that the playing field gets levelled sufficiently to allow efficiency to improve.

Research projects require a significant assignment of both human and financial resources; although planning for research projects is consulted on and are agreed upon based on priority, work is disrupted due to commitments that arise during the year. Therefore, the research plan needs to be as flexible as possible. This requires greater emphasis on collaboration with support partners such as CARDI, IICA, and OIRSA. Review of Ministry-wide priorities is essential to maximize limited human and financial resources. All this can only be impactful if MAFSE departments are fully involved.

Task delegation needs to be appropriately enforced with realistic deadlines. This fosters an environment that encourages collaboration. Clear communication is important; checking in often with the team and keeping communication lines open helps clear up expectations. The creation of a WhatsApp group for Units to assist with information sharing certainly assists greatly with this. Effective communication with all levels of the ministry and updating manager(s) at regular intervals through the submission of weekly report, monthly reports has also helped this year. Taking feedback and using it to improve helped by learning from missteps and growing successes.

Alternative funding sources, such as grants, public-private partnerships, and participation in regional and international projects to supplement budget and support critical initiatives, are important and units and departments need to explore these options more critically. Collaborating with donor agencies, development partners, and philanthropic organizations enables the provision of additional resources to expand reach and impact. Exploring opportunities for cost-sharing initiatives with stakeholders, such as other ministries, industry associations, and academic institutions, to fund specific projects or activities can help to alleviate this challenge. This approach not only helps alleviate financial constraints but also fosters a sense of ownership and shared responsibility among stakeholders.

Proper training of new recruits recently hired in departments and units needs to be done. This strengthening will help accomplish goals and objectives, as well as make transition easier for new employees.

Interest in and comprehension of capacity building programs to stakeholders may be higher than anticipated. For the coming year, this must be taken into consideration when

preparations for budgeting to reflect assignment of staff and resources are made. The utilization of project management methodology would have minimized delays and possibly made more efficient use of resources (material and human).

Timely collection, collation, analysis and reporting of statistics facilitates and influences policy recommendations and positively contributes to proper planning and resource mobilization.

5. Future Priorities and Plans

While individual units and departments or programs might have particular needs, across the Ministry the focus is on better efficiency and transforming our food and agriculture systems into one that is highly productive, competitive, and sustainable, which will require MAFSE to focus on these important priorities:

To improve the enabling environment by:

- Reviewing policy and legislation affecting agriculture, i.e. ongoing revision of the Ministry's Agriculture Policy, Seed Policy, Metrology Legislation, the Sugar Act and others.
- Updating legislation where needed goes a long way to ensure equity and fairness in different subsectors.
- Enacting relevant regulations that entail removal of tariffs and barriers to trade, and revising agreements to make them more effective and efficient.
- Improving the enabling legal and business environment to support the development of the agriculture industry.
- Validating the adaptability of climate resilient technologies. Research tools have been submitted to MAFSE headquarters for procurement purposes.
- Producing quality vegetable seedlings for farmers, schools' projects etc.
- Managing germplasm banks for traditional and non-traditional crops.
- Management of coconut hybridization programs.
- Strengthening the epidemiological surveillance of Tuberculosis, Brucellosis, Bovine Spongiform encephalopathy, among other important cattle diseases of socio-economic & quarantine importance to maintain the integrity of the Belize Cattle Herd Status.
- Intensifying livestock production through improved management, genetic breeding, and feeding, and by adopting environmentally sound technologies such as silvo-pastoral systems to mitigate the effects of climate change.
- Engaging in market research to understand new market perspectives in the region. MAFSE will support any initiative that moves towards processing and value- addition of beef cattle to further develop the industry.
- Continuing to improve the BAIMS, BLR, and other data gathering tools to support MAFSE in its policy making, project cycle management, research and development planning, and

demonstration and communication of its results and outcomes, with objective, measurable, reliable and timely data indicators.

To collaborate with and assist farmers:

- Disseminating research and development results.
- Continuing to collaborate with national and international agencies to strengthen research and development.
- Consolidating partnerships to assist informal farmer groups, farmer organizations and farmers cooperatives to access benefits and manage their projects successfully.
- Maintaining the Cattle Industry Committee to enhance communication and coordination for the sustainable development of the cattle industry (Ministry, BLPA, OIRSA, & BAHA)
- Institutionalize mechanisms for small producers to access affordable technologies and financing to increase efficiency, profitability and resilience.

To build capacity:

- Capacity building and institutional strengthening for increased effectiveness and impact of programs. Out-district outreach must also continue for extension officers and farmers.
- Facilitating the importation of superior genetics to improve meat quality to supply the local demand primarily the tourism sector. This will provide a great opportunity to reduce importation and support the local beef production.
- Continued infrastructural improvement of facilities across MAFSE.

To mobilize resources:

- Developing proposals to acquire funding for projects and research and development trials, as this is key in keeping the planned activities on track.
- Sourcing funds to invest in general infrastructure for facilities across the Ministry.

6. Staffing and Budgeting Considerations

One of the major constraints of the livestock program is the limited budgetary allocation to properly address the needs of the cattle, dairy, swine, poultry, apiculture, aquaculture, sheep and goat subsectors. In 2022 a total of \$30,000 BZE was allotted to the program. In 2023 the budget allocation was approximately \$20,000, meaning that it was reduced by \$10,000. It is very difficult to achieve all the desired performance livestock indicators for all seven subsectors with this minimal financial budget support. Another major challenge is the limited availability of fuel and transportation to the livestock program. The unit requires additional support with veterinarians primarily because BAHA vets are already overcommitted with their day-to-day activities and mandate to comply with their veterinary obligations.

The staffing and financial considerations of the Bureau of Standards pose significant challenges, particularly given the limited resources available. With only two standards officers and three consumer protection inspectors responsible for compliance activities, the Bureau faces a considerable workload overseeing standards development, enforcement, and compliance activities across various sectors. This shortage of personnel not only strains the Bureau's capacity to fulfil its mandate effectively but also hampers its ability to provide timely assistance and support to stakeholders.

The Bureau also operates within the constraints of a limited budget, which restricts its ability to invest in the required equipment to enhance its services, training programs, and capacity-building initiatives. This financial limitation impedes the Bureau's efforts to operationalize its calibration services fully, provide full regulatory coverage as it relates to legal metrology services, provide adequate redress to consumers, modernize operations, enhance service delivery, and stay abreast of emerging trends and technologies in metrology and standardization.

However, despite these challenges, the Bureau remains committed to fulfilling its responsibilities to the best of its ability. The department continues to seek innovative solutions to optimize resource utilization, streamline processes, and prioritize activities that yield the greatest impact. Collaboration with external partners, leveraging available technical expertise in the region, and advocating for increased funding and staffing are essential strategies for overcoming these obstacles and advancing the Bureau's mission of promoting quality infrastructure, consumer protection, and economic development.

7. Conclusions and Recommendations

A comprehensive workplan from all MAFSE departments should be shared with all staff members to avoid duplication of activities and to share financial and other administrative resources. The MAFSE Budget needs to take into account that expected deliverables are attained.

MAFSE should consider the limitations that exist prior to committing to projects. A project-based approach should be implemented. Consultation is key when opportunities arise and as such the recommendations of those that will participate in the implementation process should be heeded.

There is limited technical staff to carry out all that the MAFSE is requesting to accomplish. More technical personnel/agronomists are needed to implement projects and other responsibilities. A strain on available personnel is created when tasks are assigned inequitably, and the load accumulates.

New and innovative technologies in agriculture create opportunities; however, this requires investments by the Agriculture Sector, both public and private. Artificial Intelligence, for example, is already in use in many scenarios related to and in agriculture; we will need to adopt some of its cost-saving benefits to attain better efficiency with resources.

Financial resources should be available in a timely manner so as not to delay the purchasing of materials or inputs needed to carry out activities.

Administration needs to work hand in hand with the different sections and/ or programs for the ministry to achieve its objectives.

The Department of Agriculture in the district hosting World Food Day should take the lead in identifying and implementing the projects connected to World Food Day. Follow-up from the Agriculture Department in the form of technical assistance is vital to ensure that there is continuity with all activities left at the host school.

With regards to the National Agriculture and Trade Show, persons should be hired for the period leading up to the show to decrease the reliance on Ministry staff; Ministry staff often already have work routines focusing on productivity related to programs, which is interrupted because of the National Agriculture and Trade Show. Fuel allocation should be adjusted as well since there is daily commuting to the grounds in the months/weeks prior to the show.

Proper allocation should be made for payment of subsistence and overtime of workers. Several of them make very little money; this makes it difficult for them to have to leave money at home and set aside extra to take out district. All of them depend on subsistence and overtime and having to wait three months to get paid is not a good incentive.

The Agronomy Program carries out a wide range of field activities on station. Timely management of all the fields is hindered by the following: limited human and financial resources, unavailability of labourers due to uncertified, sick and vacation leave; outreach projects, lack of working machineries, and unavailability of tractor services and transportation upon request. At the RDIC, support services sometimes depend on station priorities.

Additional vehicles to support market surveillance activities, adequate allocation of fuel to support the continuous flow of work, adequate allocation of funds to support travel and subsistence for Officers, and the procurement of additional equipment to support the growing demand for services is needed.

Vacant and critical technical positions need to be filled out as quickly as possible to consistently continue with proper coordination to implement the mandate of the Ministry that requires the support of that vacant post. It is imperative that the budget for the livestock program be increased to at least \$150,000.00 annually to achieve most of the desired outcomes.

MAFSE should continue supporting import duty exemption particularly for technologies that are imported that will make the industry more productive, more resilient, and more competitive primarily because most of the challenges of the livestock industry can be highlighted as high cost of inputs, climate variability and climate change, unfair competition and taxation, eminent threats of pests and diseases, more rigorous and rigid sanitary measures, and the dynamics of a fragile global economy and dynamics changes of geopolitics affecting trade of products and services and high cost of technologies.

The MAFSE should maintain access to three main livestock markets – local, Guatemala, Mexico and others. We need to support transit and accounting/traceability of cattle exported informally to Guatemala, increase number of head exported to Mexico from 4-5,000 per year to 24,000 per year to maintain the Mexican market. The price of the Mexican market is key to maintain good prices in Belize - \$2.65/lb for up to 850 lbs versus \$2.50 for 500 lbs or less (also 600 lbs or less) animals. More cattle need to be exported at a higher per pound price to Mexico, maintaining a healthy ratio of 2:1 or 1:1 (Guatemala: Mexico) as this is very important for diversity, maintaining prices, and supporting BLPA revenues and/or supporting Mexican exports with revenues from Guatemala.

The strategic process for the future of livestock being recommended is as follows: ensure economic feasibility of exports to Mexico, particularly in comparison to Guatemala. The following may be considered:

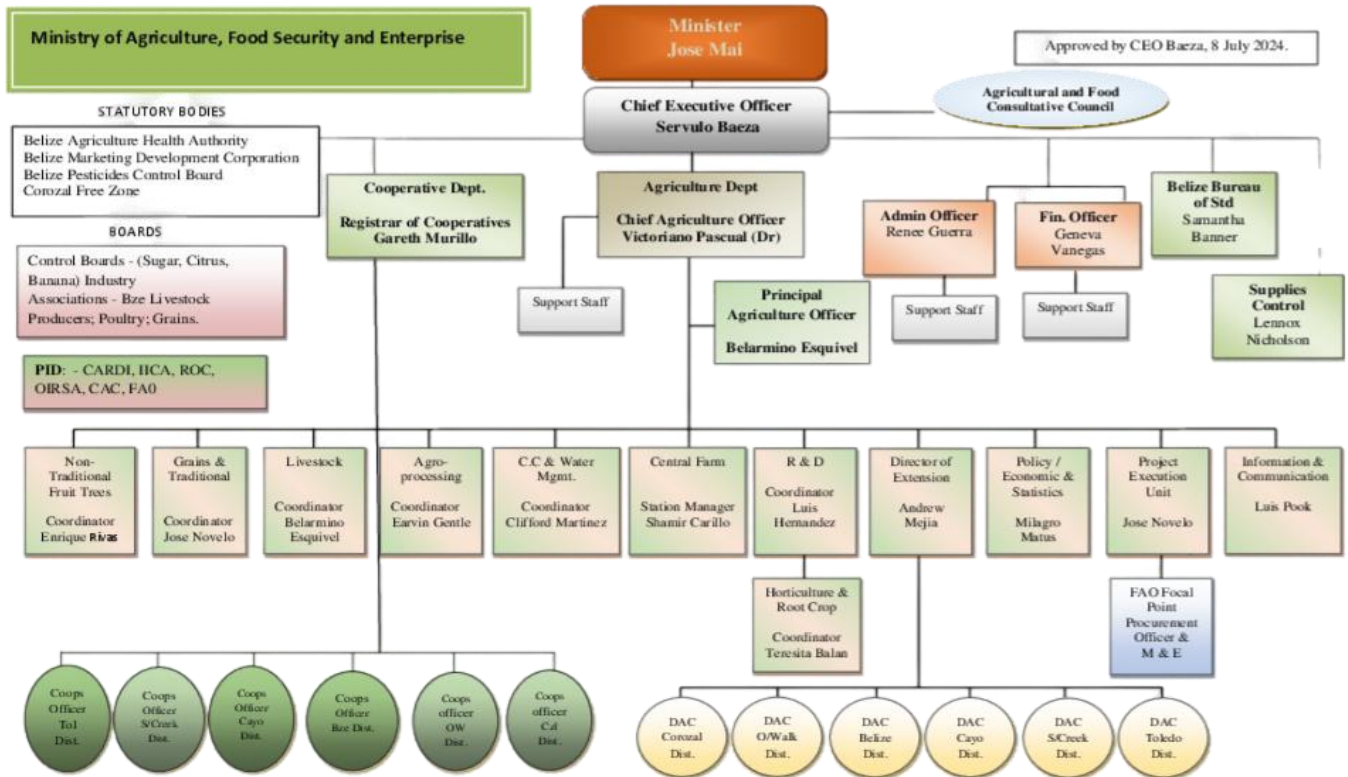
- i. Manage/reduce quarantine costs;
- ii. Reduce quarantine time and over-runs;

- iii. Avoid weight loss/feed inefficiency during quarantine;
- iv. Reduce price paid to farmers for Mexico sales;
- v. Guatemala sale to help subsidize Mexico sale via BLPA or taxation on all cattle exports;
- vi. Realistic assessment of BAHA and other costs.

Collaboration and Networking should continue actively. It is imperative that the Ministry actively continue to collaborate and galvanize our working relationship with our partners in development IICA and OIRSA. We should continue to cement our partnership with BLPA, the Pig Council, the Sheep and Goat Steering Committee, the Belize Poultry Association, particularly with the Poultry Health Committee, Livestock cooperative groups, One Health, the Cattle Stakeholders Think Thank Group, the Dairy Association and BAHA, primarily in quarantine, food safety, and animal health. We should also continue to play an active role in the partial scope negotiations and the Ministerial task force. Along with this we need annual production statistics to become more robust and reliable for decision making.

Annexes

Annex 1. Organigram of MAFSE



Annex 2. MAFSE Staffing 2022-23

Hon. Jose Abelardo Mai, Minister of Agriculture, Food Security and Enterprise

Servulo Baeza, Chief Executive Officer

Digno Polanco, Senior Technical Advisor

Hugh O'Brien, Technical Advisor

Dr. Victoriano Pascual, Chief Agriculture Officer

Gareth Murillo, Registrar of Cooperatives

Belarmino Esquivel, Principal Agriculture Officer/ Livestock Coordinator

Andrew Mejia, Head of Extension Service

Jose Novelo, Projects Execution Unit/ Grains and Traditional Crops Coordinator

Lennox Nicholson, Supplies Control Unit Director

Clifford Martinez, Water and Climate Change Coordinator

Greg Canto, Policy Unit Coordinator

Luis Pook, Information and Communications Coordinator

Luis Hernandez, Research and Development Coordinator

Teresita Balan, Horticulture and Root Crops Coordinator

Miguel Sosa, Aquaculture Coordinator

Earvin Gentle, Agro-Processing Coordinator

Enrique Rivas, Non-Traditional Crops and Fruit Trees Coordinator

Emilio Montero, National Food and Nutrition Security Commission Coordinator

Zoe Zetina, Belize Agricultural Health Authority Managing Director

Valentin Carrillo, Belize Marketing and Development Corporation Managing Director

Samantha Banner, Belize Bureau of Standards Director

Geneva Castillo, Finance Officer

Renee Guerra, Administrative Officer

Fred Roches, District Agriculture Coordinator, Corozal

Sergio Hernandez, District Agriculture Coordinator, Orange Walk

Miguel Balan, District Agriculture Coordinator, Belize

William Can, District Agriculture Coordinator, Cayo

Elsner Campos, District Agriculture Coordinator, Stann Creek

Denzel Castillo, District Agriculture Coordinator, Toledo

Annex 3. Publications by MAFSE, 2023

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