ANNUAL TECHNICAL REPORT 2024-25

Ministry of Agriculture, Food Security and Enterprise

Contents

A Message from the Minister

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Minister of Agriculture, Food Security and Enterprise

When people think of agriculture, they often think of crop farming: soil and land preparation and sowing, fertilizing, irrigating, and harvesting different types of plants and vegetation.

These are just one component of the agriculture sector, however. Agriculture also encompasses raising livestock, industrial forestry and fishing, and agricultural support services, such as agricultural equipment repair and trucking operations.

Why is agriculture so important to the success of our civilization? It helps sustain life by providing the food we need to survive. In Belize, it contributes some 842 million Belize dollars to our economy.

In Belize we grow crops on 5% of the total available land; that is, about 5% of our total land is arable. According to our Policy Unit, some 16,500 farmers are registered officially, farming on this 5% of arable land, with perhaps many more doing smallholder work throughout the country. They practice agriculture because it provides opportunities for economic equity and helps people prosper. Of course, we also improve food security and access to nutritious food, ensure greater efficiency and effectiveness in the management of the agriculture and food sector, and enhance collaboration among key stakeholders. Farmers provide better nutrition choices for Belizeans and ensure the cornucopia of vegetables, fruit and meat, is always available.

The Ministry of Agriculture, Food Security and Enterprise (MAFSE) has had its hands full over the past four and a half years, with the task of ensuring the agriculture sector is current, well guided and successful. The activities of national impact that we in agriculture can speak about with pride include stimulating the cattle industry by facilitation of formal and informal trade; agricultural partnerships with Mexico and Guatemala which have resulted in projects such as Sembrando Vida brought to Belize, trade agreements with Mexico that benefit Belizean producers, and agreements with Guatemalan counterparts in the Ministerio de Agricultura, Ganadería y Alimentación. We are still working on ensuring we have international trade markets for Belizean products in El Salvador and the Caribbean, and surely, we will soon achieve these goals. MAFSE has also increased visibility via digital and social media outreach, improving transparency and accountability, so that the agriculture sector has renewed confidence in the work of the ministry as seen through the participation of farmers in training sessions and involvement in projects. Our marketing arm, the Belize Marketing and Development Corporation has strengthened and re-focussed to support farmers, with tremendous success in areas like rice, honey and fruit pulp.

This ministry has also increased training opportunities at home and for cultivation of non-traditional crops, and we have seen increased farmer organization and capacity building through cooperatives and training. There are more achievements; as we reflect and analyse more, the more we realize that our progress has been steady.

We have many more ideas to improve livelihoods, export earnings, and general quality of life. We must venture aggressively into value adding and agro processing for example. This is where the large companies make money, and our farmers and producers can make that same money. We have the raw product, and we can improve our capacity for secondary production. We also need to continue the processes that we have started on exports in potential markets like Central America and the Caribbean. Once we get our act together, we will have put our 5% of arable land to good use and extract greater value from it.

A Message from the Chief Executive Officer

Sèrvulo Baeza

A close look at agriculture in Belize over the past four years will show without any doubt that agriculture has changed for the better. The Ministry has been able to provide transparent and clear communication with farmers, both at the small holder level and at the large-scale commercial farmer level; this has transmitted into greater trust in the sector between producers and Ministry. Extension officers are held to task for their relationship with clients; contact with farmers through visits and monitoring of crops, soil and livestock has been emphasized. This different approach has transmitted into a 'withitness' that had been languishing at the Ministry priorly. It is the reason why the public sees what is happening via our social media accounts and other means of communicating with the public. The Ministry is no longer hiding in the background, but out present and in the face of all actors involved.

With all this said, clearly the agriculture industry in Belize has done well in 2023-24. Despite challenges such as the presence in Central America of the New World Screwworm, Belizean Agriculture stands as a testament to the hard work of the agriculture sector. Climate change has only exacerbated the impact and increased uncertainty in food production, including on plant and animal pests and diseases, some of which we have been battling - HLB in citrus, AHPND in shrimp, and more recently, Fusarium in sugar cane and screwworm in livestock. But we have been able to ably stay the course and continue making our sector the strong pillar to our economy that it needs to be.

It is important to remember that agriculture is crucial for feeding the world, supporting livelihoods, and boosting economies, especially in developing countries like Belize. Agriculture is a multifaceted sector encompassing crop cultivation, animal husbandry, and related activities, playing a vital role in food security and poverty reduction. Growth in the agricultural sector can be more effective at reducing poverty than growth in other sectors. Regulations play a crucial role in supporting and safeguarding the agricultural sector. Providing farmers with access to education and training can help them adopt new technologies and good practices.

In Belize we must always keep our eyes forward and ensure the sector retains its resilience and elasticity. When farmers prosper and thrive, the nation also prospers. Let's look forward in 2025-26 to steering our sector on the right path and rise above the challenges that are always present.

List of Abbreviations	
ASR----------	American Sugar Refineries
BAIMS----------	Belize Agriculture Information Management System
BGA----------	Banana Growers Association
BAHA----------	Belize Agricultural Health Authority
BAPIS----------	Belize Agriculture Price Information System
BBS----------	Belize Bureau of Standards
BLR----------	Belize Livestock Registry
BLPA ----------	Belize Livestock Producers Association
BMDC----------	Belize Marketing and Development Corporation
BNSS----------	Belize National Statistical System
BSCFA----------	Belize Sugar Cane Farmers Association
BSI----------	Belize Sugar Industries
CARICOM----------	Caribbean Community
CARDI----------	Caribbean Research and Development Institute
CARSOLAN----------	Caribbean Soil Laboratory Network
CDF----------	Caricom Development Fund
CFZ----------	Corozal Free Zone
CIAT----------	International Centre for Tropical Agriculture (based in Colombia)
CGA----------	Citrus Growers Association
COP----------	Conference of the Parties
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
EDF----------	European Defence Fund
EU----------	European Union
FAO----------	Food and Agriculture Organization
FOC TR4----------	Fusarium Oxysporum Cubense Tropical Race 4
FY----------	Financial Year
GEF----------	Global Environment Facility
GIS----------	Geographic Information System
GoB----------	Government of Belize
HACCP----------	Hazard Analysis Critical Control Point
HLB----------	Hydrophilic-Lipophilic Balance
HPAI----------	Highly Pathogenic Avian Influenza
ICDF----------	International Cooperation and Development Fund
IDB----------	Inter- American Development Bank

IAEA----------	International Atomic Energy Agency
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
Lbs----------	Pounds
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
NEMO----------	National Emergency Management Organization
NGC----------	National Grains Committee
NQI----------	National Quality Infrastructure
NWS----------	New World Screwworm
PCR----------	Polymerase Chain Reaction
PHF----------	Pesticides Handling Facility
PCB ----------	Pesticides Control Board
PDNA----------	Post Disaster Needs Assessment
OIRSA----------	International Regional Organization for Agricultural Health
OHC----------	One Health Commission
RBA----------	Responsible Business Alliance
RC	Roman Catholic
RCF----------	Revolving Credit Facility
RDIC----------	Research, Development and Innovation Center (Central Farm)
SAIB----------	Sustainable and Inclusive Belize
SENASICA----------	National Agro-Alimentary Health, Safety and Quality Service (Mexico)
SDG----------	Sustainable Development Goal
SIA----------	Sugar Industry Act
SIB----------	Statistical Institute of Belize
SICB----------	Sugar Industry Control Board
SIRDI----------	Sugar Industry Research and Development Institute
SOP----------	Standard Operating Procedure
TA----------	Technical Assistance
TCP----------	Technical Cooperation Program
TTC----------	Triphenyl Tetrazolium Chloride
WB----------	World Bank
WOAH----------	World Organization for Animal Health (formerly OIE)
YMD----------	Yellow Malaysian Dwarf

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

Production and consumption data are key in any country for understanding global food systems, monitoring food security, and informing agricultural policies. The more data we have that tells us about food availability, dietary patterns, waste and loss, the better we are able to address issues like food security and sustainability. The Ministry endeavours each year to ensure this data is available to all stakeholders as we try to create an environment where data transparency and dependability are the rule of the day.

The production data for 'traditional' export crops in Belize for 2024 shows remarkable resilience in the productive sector for 2024. Sugar, particularly, had a banner year, rising to an all-time high in value of $182.25 million dollars from 1.03 million metric tonnes of sugar produced. While the production figure itself is not the highest it has been in the past ten years, the export value has risen in comparison to other years, since for the moment sugar is fetching excellent prices on the world market; in fact, much better in comparison to the whole decade before.

While citrus continues its uphill battle as a significant contributor to GDP and foreign exchange, the trending that has been observed from last year is for slow but sure improvement. The value of citrus products rose from $5 million dollars in 2023 to $5.3 million dollars in 2024, while yield in boxes from acreage of oranges planted also showed an increase of 15%. While limited labour availability continues affecting harvesting, the increase in yield

from the same acreage planted last year is heartening for an industry that in its best years has helped pump lifeblood into the villages of the South of Belize. It is also notable that producers continue to have faith in the recovery of the industry as new varieties are taking hold and seem to indicate better days ahead for this industry.

Bananas, meanwhile, improved, from a value of $64 million in 2023 to a value of $82.5 million in 2024. Acreage under cultivation increased by four-point zero three percent (4.03%) from 7,077 acres in 2023 to 7,283 acres in 2024, perhaps a small increase but an increase, nonetheless. Yields recovered due to improved fertilization, disease management and irrigation as well as better weather conditions. Input availability and application as well as credit availability were important for the recovery of the industry, another essential income earner for the areas of the south of the country.

While some things have improved for the 2023-24 production year, some forecasts remain bleak in their outlook. The forecast for next year's sugar exports is for things to be different than this year, for example. The industry is at present battling the fusarium infection that has spread quickly across the Northern sugar belt and is going to decimate the sugar crop this year. It is also important to keep in mind that citrus has faced some bleak years in the past 5 years or so, and government is working hard with the private sector to turn things around for this vital export subsector. Efforts to improve financing and therefore the resilience of farmers to be able to battle the effects of greening on production continue and seem to be producing very positive results so far. Bananas have also had a shot in the arm from financing efforts that government has arranged to ensure viability of these essential industries.

On other fronts, the MAFSE continues to see improvements. Aggregated production of the grains sub-sector indicates strong growth and stability. The local rice industry in Toledo, for example, shows very positive signs of growth as this year a high of almost 3 million pounds of rice paddy were harvested; the outlook is for even greater harvests this year as technology catches up to this sector. The cattle trade is another area the Ministry is proud of, with value of cattle trade hovering around 90 million dollars. Both the formal export market with Mexico and the informal market with Guatemala show strong signs of stability and growth, bringing much needed higher prices for livestock farmers. The onset of the screwworm epidemic sweeping through Central America has not had an adverse effect on the cattle trade, as we have been able to leverage agreements with Mexico to continue our export of cattle to that market.

Meanwhile, in non-traditional crops, focus has been emphasized on commodities such as coconut, soursop and pitahaya, each of which has excellent potential on the export front and also does well in Belize. Coconuts, particularly, show much promise as a potential export crop, especially with the Mexican market looming close as trade agreements get established with our neighbours.

In other areas of the MAFSE's work and commitment to agriculture, such as support for school gardening, much good effort has been made to include as many primary and

secondary schools and ensure participation in the School Gardening Competition in connection with the National Agriculture and Trade Show. The MAFSE firmly believes every Belizean child should be exposed to agriculture, and we relentlessly pursue this objective in primary and secondary schools throughout the country.

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 16,500 farmers and countless Belizean citizens, agriculture affects the entire country's economy.

2024 has been a year with much to celebrate in agriculture. The traditional exports, banana, citrus and sugar, have done very well, with both increases in productivity and increases in the price per pound or ton for the raw products as compared to 2023. As a result, we have seen increases in the value of output for all the traditional commodities. Other commodity areas have shown adaptability and resilience; we have seen increases in some areas that leave no doubt about the capacity, ability and improvement in Belizean farming. While some things that the Ministry has been trying to implement since 2020 have not been so successful, 2024 saw some ideas bear good fruit. Sharing a crop calendar with farmers and discussing the importance of planting and harvesting in turn so all can have access to markets, for example, seems to finally be taking root, as for this year issues of conflict with crops such as onion were minimised.

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 that continues, 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. 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 continues 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.

#planBelize has been extremely successful in the agriculture sector for 2024. 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 sure 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 the 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. and
- 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 Agro- Processing Unit

The Agro-processing Unit and the National Food & Nutrition Security Commission of the Ministry of Agriculture, Food Security and Enterprises participated at the Health & Nutrition Expo for schools that was held at the Belize City Center on Wednesday February 7, 2024 as part of a government supported initiative entitled: “Healthy Habits, Healthy Schools, Healthy Belize”. The initiative is aimed at reducing unhealthy foods in schools, reinforce healthy eating, and promote healthy habits such as good hygiene and physical activity. The Agro-processing unit displayed its Baking Pot Foods products and prepared zucchini muffins, banana muffins, cucumber juice and banana porridge, which were distributed as healthy snacks.

The coconut hybridization program saw MAFSE Extension Officers Mr. Nabet and Mrs. Lilian, and Agro-processing Coordinator Mr. Earvin and Extension Officer Ms. Howe visit Tun & Associates Ltd in Monkey River Toledo District on Thursday February 1, 2024. Tun & Associates Ltd. consists of several agricultural productions, a few accommodation complexes, and smaller and bigger areas of uncultivated nature. Tun & Associates Ltd. was cultivated earlier with mango, lime, and other fruits and agricultural products. In 2018 its Management decided to invest in coconuts. Coconut palms as opposed to many other crops, are resistant to extreme weather events, which are happening more often in Belize. Furthermore, coconut and coconut-based products are healthy and in high demand. The Estate planted 1,500 acres of coconut trees between 2018 and 2023. Recently a facility for packing and processing increased production of coconut water and fresh coconuts was built. The coconuts are sold both for exports and for the local tourism industry. Other products are passion fruit and hardwood. Tun & Associates is transitioning to organic agricultural methods.

A part of the unit’s contribution to Central Farm is the value addition of the seasonal fruits and vegetables produced by the various units of Central Farm. The additional value to the fresh fruits and vegetables resulted in the production of several local safe, healthy, nutritious, shelf stable products. The products were marketed through the BMDC outlet in Orange Walk Town, and San Pedro, as well as at promotional events and events the unit was invited to.

3.2 Belize Agricultural Health Authority

BAHA maintained its key programs aimed at certifying commodities for export, regulating imports, conducting pest risk analysis, and monitoring and controlling pests and diseases of quarantine importance.

The **Plant Health Department** saw shifting production trends, pests' impacts, environmental shocks, and economic changes that had diverse effects on industries. The grain sector shifted from expanding acreages of black-eye peas, beans, and corn to the production of soybeans as the demand for animal feed increased. Citrus production has reached its lowest export levels due to diminishing acreages caused by the impact of Huanglongbing (HLB), papayas continue to struggle to consolidate a stable volume of exports due to pests, and coconut exports have not yet truly materialized.

There were several important positive developments related to exports. Conditions were established for the export of fresh green coconuts with husk to Mexico. After a 60-day comment and objection period that began in February 2025, Belize will have the option to export both de-husked and husked coconuts to Mexico. Additionally, Mexico has set conditions for exporting whole-grain soybeans, which include basic fumigation with methyl bromide and inspection by the Belize Agricultural Health Authority (BAHA).

Export dossiers for fresh pitahaya and de-husked coconuts have been sent to El Salvador, where officials will conduct a pest risk analysis to determine the admissibility of these commodities. Currently, there are 50 acres of pitahaya planted, with plans for further expansion.

The Plant Health Department has completed a pest risk analysis for importing fresh ripe mangos from Mexico and has shared the conditions and protocols for their importation.

The Department processed 3,626 import permits, of which 2,617 were for wooden products, cut flowers, seeds and fertilizer, 53 were for live plants, and 956 were for fresh fruits and vegetables. The Department certified approximately:

- 16,709 metric tons (MT) of processed sugar,
- 3,998,996 pounds (lbs) of corn in all modalities (whole, cracked, corn meal),
- 2,751,285 lbs of pulses (RK beans, black beans, small red beans, blackeye peas),
- 2,448,500 lbs of papayas,
- 1,006,120 lbs of oranges,
- 110,504 lbs of cacao,
- 254,700 units of coconuts, and
- 328,850 board feet of lumber.

The yearly outbreaks of the Mediterranean Fruit Fly began in July 2024 and were effectively controlled by early October through an aggressive eradication strategy and protocol.

In October, a significant development occurred when SIRDI notified the Authority about a possible pathological infection in sugarcane in the Corozal District. Observation indicated that wilting and yellowing of sugarcane were spreading, which suggested the presence of *Fusarium*. While the Plant Health Laboratory confirmed the presence of *Fusarium species*,

identification of the specific species was not possible. However, the National Centre for Biotechnology Information (NCBI) in Taiwan used the genomic sequencing provided by BAHA to detect *Fusarium sacchari,* which is associated with wilting, internal discolouration and necrosis, as well as *Fusarium incarnatum,* commonly known as Pokah Boeng, and linked to leaf spots.

Routine surveillance activities focused on seven (7) pests of economic and quarantine importance, ensuring continuous monitoring and timely interventions as per established control and eradication procedures. No new pests were detected during the monitoring period.

The **Animal Health Department** placed significant emphasis on the regional threat posed by the New World Screwworm (NWS) and developed strategies to address its impact on human health, animal health, the agricultural sector, and trade. As a result, they successfully negotiated updated International Veterinary Certificates (IVCs) with Mexico for cattle intended for slaughter and cattle for fattening for export to Mexico. In November 2025, BAHA requested conditions for the export of cattle to Mexico in the event of an NWS infestation. By November 10, 2025, these conditions were agreed upon, allowing the export process to continue despite the NWS threat and eventual introduction in January 2025. Over the reporting period, BAHA facilitated the export of 6,672 head of cattle to Mexico.

The Department processed a total of 2,815 permits, 53 pet passports, 124 IVCs, and 660 movement permits. Additionally, the Veterinary Drugs Control Unit registered 336 products and 115 establishments/importer/feed mills. They conducted inspections of 2 feed plants and issued 5 free sale certificates.

The Department completed active surveillance activities for 6 WOAH-listed terrestrial diseases and passive surveillance for 12 WOAH-listed terrestrial diseases, investigating 177 cases. Among these, 18 positive cases of rabies were confirmed. Furthermore, active and passive surveillance for 9 WOAH-listed aquatic diseases and one fish disease, Tilapia Lake Virus, was carried out, and 11 inspections were completed.

The Central Veterinary Diagnostic Laboratory (CDVL) tested 20,455 samples in bacteriology, haematology, parasitology, serology, and molecular biology (PCR). The PCR Laboratory completed an additional 83 sample tests. In total, the department issued 155 international veterinary certificates, 133 for terrestrial animals and 17 for aquatic animals.

Four (4) import risk analyses were conducted: three (3) required site visits to support the shrimp industry, while one (1) was a desktop analysis to support feed manufacturing.

During this reporting period, NWS was a major area of focus. BAHA officers completed numerous training and planning sessions both nationally and regionally to enhance prevention measures and optimize control strategies. Officers also actively campaigned and

disseminated information regarding prevention, notification, identification, and treatment with the productive sector and the public in general.

The **Food Safety Services Department** welcomed inspectors from the Taiwan Food and Drug Administration as part of an evaluation of the equivalency of Belize's control system for fish products by Taiwan. The inspection team visited five (5) seafood processing plants, five (5) aquaculture farms, and the BAHA food safety and PCR laboratories in Belize City and Central Farm. The final report on their findings is expected before the end of the first quarter of 2025. This evaluation aimed to secure market access and to establish import conditions for exporting Belize shrimp to Taiwan.

Additionally, a draft report was received from the General Directorate for Health and Safety of the European Commission (DG Sante) on the findings of a survey conducted in 2023 on the laws and controls governing the production of fish and fishery products. Key findings included that some regulations and official controls for chemical contaminants in wild-caught fishery products are outdated. The draft report was accompanied by a template for comments and an action plan to address deficiencies and required a response.

Furthermore, the questionnaire for renewing the list of Belize establishments authorized to export to Mexico in the SICPA (Sistema de Informacion de Consulta de Plantas Autorizadas) system has been completed and submitted in collaboration with the Animal Health Department.

BAHA maintained its key programs aimed at certifying commodities for export, regulating imports, conducting pest risk analysis, and monitoring and controlling pests and diseases of quarantine importance.

3.3 Belize Bureau of Standards

The Belize Bureau of Standards (BBS) is the national standards body of Belize, mandated to develop, adopt, and promote national standards in various sectors. BBS ensures accuracy and fairness in commercial transactions through its legal metrology services, including the verification of weighing and measuring instruments. The BBS is also tasked with the provision of industrial metrology services refer to the application of measurement science in manufacturing, production, and industrial settings to ensure the accuracy, reliability, and traceability of measurements used in daily operations. These services are critical for maintaining product quality, process control, and compliance with international standards. The mandate of the BBS is carried out within its three (3) technical units: the Standards Unit, the Industrial Metrology Unit, and the Consumer Protection Unit (Compliance Activities and Legal Metrology Services).

The following are the main achievements of the Belize Bureau of Standards for FY 2024-25.

1.1 National Quality Council (NQC)

A significant achievement during this reporting period is the Government of Belize's formal endorsement of the establishment of the Belize National Quality Council (NQC) in November 2024. This endorsement represents a major milestone in the country's ongoing efforts to embed a culture of quality across all sectors of national development. The NQC is poised to serve as a central governance body, providing strategic oversight and direction for the effective implementation of Belize's National Quality Policy (NQP). Through this Council, Belize will ensure that its quality infrastructure is not only aligned with national development goals but also harmonized with international standards, thereby enhancing the credibility and competitiveness of Belize's products and services.

The establishment of the NQC, coupled with the ongoing advancements in standards development, reflects the BBS's strong commitment to strengthening Belize quality infrastructure. This commitment is especially critical to the agricultural sector, which remains a cornerstone of the national economy. In support of Plan Belize 2.0, quality standards are essential for supporting the diversification of non-traditional crops, strengthening traditional industries, improving value-added processing, and facilitating the growth of agribusiness. The NQC will play a pivotal role in guiding the development and implementation of agricultural standards that improve product quality, increase access to international markets, and ensure compliance with sanitary and phytosanitary requirements.

By institutionalizing quality governance and promoting standards in agriculture, Belize is taking concrete steps to elevate its global trade capacity, enhance food security, and foster sustainable rural development. These efforts will not only support the successful implementation of trade agreements but will also contribute to long-term economic resilience and an improved quality of life for Belizeans, particularly those whose livelihoods depend on the agricultural sector.

1.2 National Standards Development

Belize has made remarkable strides in the development of national standards, reflecting its commitment to fostering a robust quality infrastructure. During the reporting period, the country successfully published one compulsory Belize National Standard and finalized five draft standards that are intended to be adopted as compulsory. Additionally, the current standards work program encompasses the development of several standards for agricultural commodities.

The advancement of standards directly contributes to national development by delivering tangible economic, governmental, and social benefits. Economically, standards help to facilitate trade, enhance competitiveness, and support innovation. From a governmental perspective, they contribute to improving the regulatory framework, enhancing public safety, and boosting economic performance. Socially, the development and implementation of

standards lead to an improved quality of life for citizens and greater environmental protection. These cumulative benefits reinforce the value of standards as a critical driver of national progress and sustainability. Below are the National Standards Projects for the fiscal year 2024/2025:

Table 1. National Standards Projects

National Standards Projects FY 2024/25

#	STANDARDS PROJECTS	STAGE	STATUS/COMMENT(S)
1	Draft Specification for Marking and Labelling of Gas Cylinders (DBZS 6:202X)	50	Final draft standard submitted to the Standards Advisory Council (SAC) for voting. The TC recommended that these standards be established as compulsory.
	Working Draft (WD) Specification for Filling, Handling, Storage, Transportation, and Location of LPG Cylinders	20	A working draft prepared to initiate revision by the TC for LPG.
2	Draft Specification for Compressed Air (DBZS 27:202X);	50	Final draft standard submitted to the Standards Advisory Council (SAC) for voting. The TC recommended that these standards be established as compulsory.
	Draft Specification for Carbon Dioxide (DBZS28:202X) and Draft Specification for Nitrous Oxide (DBZS 29: 202X)		
	Draft Code of Good Manufacturing Practices for Medical Gases (DBZ CP 7: 202X) and Draft Specification for Medical Gases – General Requirements (DBZS 30: 202X)	40	The public notice was published in the Gazette and Newspaper, with a deadline for comments on March 31, 2025. Sensitization sessions are scheduled for these standards.
3	Draft Specification for Energy Labelling and Requirements for Refrigerating Equipment (DBZS 34: 202X)	50	Draft standard under final review by the TC for Energy Efficiency to determine test control for supply voltage parameter (115±10% V). Note that Belize has aligned with updated Minimum Energy Performance Standards (MEPS) from Central America and Mexico (NOM-015-ENER-2018) and not the 2012 version to which CRS 57 is aligned with.

	Draft Specification for Energy Labelling and Requirements for Air Conditioners (DBZS 35: 202X)	50	Draft standard under final review by the TC for Energy Efficiency to determine test control for supply voltage parameter (110±10% V and 220±10% V).
4	Draft Specification for Labelling Part 3: Labelling of Prepackaged Foods (DBZS1: Part 3: 202X ((Revised))	50	Final draft standard submitted to the Standards Advisory Council (SAC) for voting.
	WD Nutritional Labelling	20	The working draft is being prepared to initiate the work of the TC.
5	Draft Belize Code of Practice for Recreational High Angle Activity Tours (Canopy, Canyoneering, Rappelling, and Zip Lining)	40	The High Angle Activity Standard remains pending due to a possible Memorandum of Understanding (MOU) with the Association of Challenge Course Technology (ACCT), USA and revision of national standard by ACCT experts.
6	WD Specification for Honey	20	Working draft under revision by the Honey Working Group.
	WD Specification for Potato		Working drafts for potato and onion currently under revision by the vegetables technical subcommittee.
	WD Specification for Onion		Preparation of working draft.
	WD Specification for Pineapple		Preparation of working draft.

1.3 Verification Services

The Compliance Unit continues to fulfil its critical mandate under the Metrology Act, Chapter 294 of the Substantive Laws of Belize, which centers on the verification, inspection, and stamping of weighing and measuring equipment used in commercial trade across the country. This mandate is not only integral to protecting the interests of consumers and businesses but also directly supports the economic goals outlined in Plan Belize 2.0, particularly the vision of "Expanding private enterprise profits." By ensuring the accuracy of measurement instruments used in trade, the Unit contributes meaningfully to building trust in commercial transactions, fostering fair competition, and enhancing the overall business environment.

To effectively execute its responsibilities and optimize the use of its limited resources, the Unit strategically prioritizes verification exercises at critical points of trade, specifically, where transactions occur directly between businesses and consumers or within industrial operations. This targeted approach allows the Unit to maximize its impact while ensuring that the standards of fairness and accuracy in trade are upheld.

During the 2024-2025 fiscal year, the Compliance Unit carried out five key types of verification exercises, each of which plays a pivotal role in safeguarding economic value at various levels of commerce. These included the verification of commercial scales used in retail trade, industrial scales utilized in large-scale operations, net content verification within commercial establishments to ensure proper product labelling and packaging, fuel pump verification to guarantee consumers receive the correct volume of fuel purchased, and the verification of flow meters at liquefied petroleum gas (LPG) depots to ensure accurate measurement during distribution.

These efforts have had a direct and measurable impact on both consumers and businesses. Consumers benefit from the confidence that they are receiving fair value for their money, while businesses are protected from financial losses that may arise from inaccurate measuring instruments. The Unit's ongoing work in this area not only strengthens consumer rights and business integrity but also contributes to the broader economic stability and credibility of Belize's trade ecosystem.

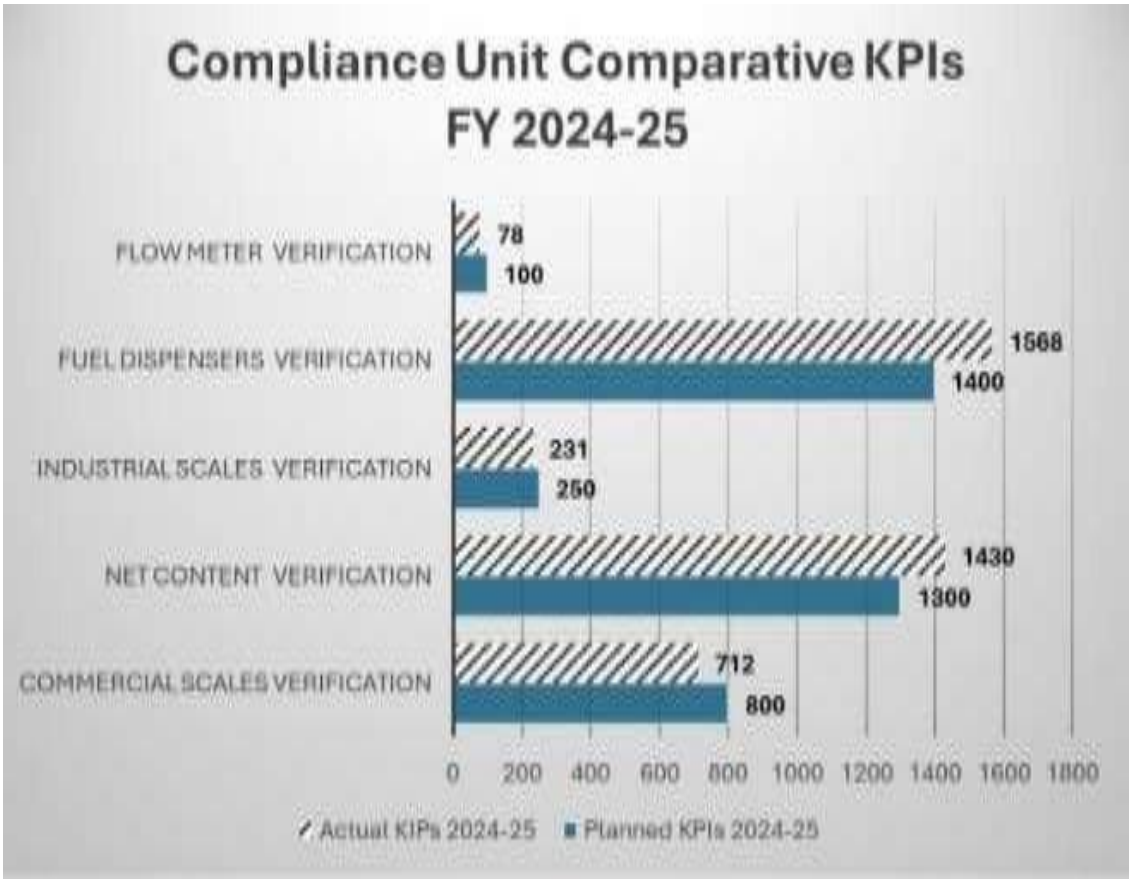

Figure 1: Compliance Unit FY 2024-2025 Comparative KPIs

Figure 2: KPIs Completion Rate

1.4 Calibration Services

The primary function of the Industrial Metrology Unit (IMU) is the provision of traceable calibration services to industry and other key stakeholders. This core function encompasses both the calibration of BBS's internal measurement systems and the calibration of stakeholders' equipment, thereby playing a critical role in ensuring the reliability, accuracy, and international comparability of measurements used in trade and industry. During the 2024-2025 fiscal year, the IMU achieved four major milestones with the support of the Caribbean Development Bank, marking a significant advancement in Belize's metrological capacity and its broader Quality Infrastructure.

The first achievement aligns with the guidelines of the International Organization of Legal Metrology (OIML) and Section 5 of Belize's National Metrology Act (Chapter 294). Funding was secured for the acquisition of five (5) 100 kg F2 mass standards and two (2) full sets of E1 mass standards ranging from 1 mg to 10 kg. These high-precision mass standards are essential for establishing and maintaining a robust national hierarchy of measurements in mass. Their acquisition significantly enhances Belize's ability to perform traceable and accurate calibrations, thereby strengthening national measurement capabilities and supporting the industrial and production sectors through improved quality assurance.

The second major achievement represents a historic milestone for Belize, marking the country's first-ever participation in an Interlaboratory Comparison (ILC), a critical step in demonstrating international metrological competence. In late 2024, BBS engaged in a bilateral ILC with the Laboratorio Costaricense de Metrología (LCM) of Costa Rica, a recognized regional authority in metrology. This exercise focused on the calibration of OIML R111-1 Class F1 mass standards and was aimed at evaluating the technical proficiency and procedural reliability of the BBS Fine Mass Laboratory. On January 24, 2025, the BBS received the official ILC report, which confirmed the positive comparability of results, a clear validation of the Bureau's capability to perform high-precision calibrations to international standards. This achievement is not only a significant step towards accreditation under ISO/IEC 17025:2017 but also elevates Belize's profile within the regional and international metrology community.

The third achievement was the successful internal calibration of the climate station, a vital piece of equipment used to monitor environmental conditions within the Fine Mass Laboratory. Accurate climate monitoring is essential for maintaining the integrity of precision measurements, especially in mass metrology, and is a key requirement for international accreditation.

IV. The fourth major accomplishment focused on capacity building. With funding from the same program, twenty stakeholders, comprising both public and private sector representatives, including five BBS staff members, were trained as Assessors for the

ISO/IEC 17025:2017 standard, which governs the competence of testing and calibration laboratories. This investment in human capital is instrumental in bolstering local expertise and readiness to meet international standards, reinforcing Belize's positioning within the global quality landscape.

Collectively, these milestones represent a strategic and substantial investment in Belize's Industrial Metrology capacity. By enabling the IMU to perform traceable calibrations directly linked to the International System of Units (SI), Belize is now closer than ever to offering metrology services that are globally recognized and accepted. This directly supports the objectives outlined in Plan Belize 2.0, particularly the goals of "Expanding private enterprise profits." This directly supports private sector growth by:

1. Reducing the cost and time associated with sourcing metrology services from abroad.
2. Enhancing product quality and process efficiency, which increases profitability.
3. Protecting companies from losses due to inaccurate measurements, especially in sectors like agriculture and manufacturing.

The Government's efforts to invest in the BBS calibration capabilities creates an enabling environment for local businesses to thrive, remain competitive, and expand their operations.

To further consolidate these achievements, the BBS is actively pursuing international accreditation of the Fine Mass Laboratory for the calibration of mass standards and non-automatic weighing instruments. This initiative, funded under the 11th European Development Fund (EDF), is scheduled for completion by June 2025. Achieving this accreditation will be a landmark achievement for Belize, symbolizing the country's entry into the global network of accredited metrology laboratories and upholding the principle of "One standard, one test, accepted worldwide." Such recognition will not only raise confidence in Belize's measurement capabilities but also reduce technical barriers to trade, improve competitiveness, and enhance trust in Belizean goods and services.

Importantly, investing in national metrology services delivers substantial cost savings for both public and private sector stakeholders. At present, many industries are forced to source calibration services from neighbouring countries, incurring significant expenses and delays. Industry partners such as BAHA, National Forensic Science traceability and fairness in trade.

These achievements not only boost economic performance and trade readiness but also delivers meaningful benefits Service (NFSS), Citrus Products of Belize Limited (CPBL), BSI-ASR Group, Caribbean Chicken Limited, TexBel Farms Belize, Silkgrass Farms, and Travellers Liquors Ltd all rely on timely, accurate, and cost-effective calibration services to ensure the integrity of their operations.

The IMU continues to set annual calibration targets, and by the third quarter of FY 2024/25, exceeded its performance expectations. A notable example is the BSI-ASR Group, which regularly requires verification of its weighbridges—critical infrastructure directly linked to the accurate payment of sugarcane farmers. These verification exercises are conducted by the Compliance Unit, with full technical support from the IMU to ensure measurement to consumers, businesses, and the broader society.

3.4 Belize Marketing and Development Corporation

BMDC's 2024 achievements are aligned with three strategic objectives:

Strategic Objective 1: Improve Livelihoods through Product Development & Market Access

Target: Enhance market access for three key product lines, impacting 300+ farmers and beekeepers countrywide.

2.1 Expansion of the Honey Industry

- For the fourth consecutive year, BMDC secured formal contracts with 21 beekeepers from northern Belize, ensuring consistent market access and enabling traceability.

- Beekeepers received equipment on credit to boost productivity.
- Investment in sachet packaging equipment enabled the launch of single-serve "Belize Jewels Honey" for the tourism market.

2.2 Upgrading the Big Falls Rice Facility

- BMDC purchased over 2.7 million pounds of paddy from southern farmers during the 2024–2025 harvest.
- Upgrades included colour sorters, semi-automated packaging lines (1lb, 2lb, 5lb sizes), and a new delivery truck, improving efficiency and reducing labour strain.

2.3 Belize Jewels Fruit Pulps Expansion

- Investments in 60 juicers and slush machines supported the introduction of healthy beverages in schools.
- Targeted both tourism and youth markets to expand reach and improve national nutrition.
- Diversification into value-added byproducts from fruit pulps is ongoing.

Strategic Objective 2: Reduce Food Losses & Enhance National Food Security

Target: Implement initiatives to reduce post-harvest losses and ensure consistent national supply.

2.4 Value-Addition from Surplus Carrots

- In collaboration with Silk Grass Farms Ltd., BMDC launched Belize's first 100% locally produced carrot juice.
- Addressed surplus caused by increased carrot production and prevented crop losses.

2.5 Coordinated Food Security Planning

- In collaboration with MAFSE, BMDC supported real-time transition planning from local production to imports.
- This responsive approach minimized disruptions in vegetable supply and ensured producers' concerns were addressed.

Strategic Objective 3: Strengthen Institutional Capacity & Service Delivery

Target: Identify investment opportunities that enhance value-added services for farmers.

2.6 Expansion of Cold Storage Infrastructure

- Two walk-in freezers (10'x10' and 10'x40') were commissioned, supplementing an existing 53' reefer.
- These facilities allow for greater fruit pulp storage capacity, benefitting non-traditional fruit producers.

2.7 Creation of a Packaging Department

- A new department was established to handle juices, slushies, and packaged grains.
- Five new staff were hired; the packaging of beans under the Belize Jewels brand now serves the San Pedro Market, creating youth employment.

2.8 Revamping of Agrilinks Platform

- In partnership with RRB, the Agrilinks platform was upgraded.
- Training sessions were conducted with farmer group leaders, and future sessions are planned to train buyers and institutional purchasers.

BMDC's 2025 achievements are aligned with three strategic objectives:

Strategic Objective 1: Improve Livelihoods through Product Development & Market Access

Target: Enhance market access for three key product lines, impacting 300+ farmers and beekeepers countrywide.

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3.5 Corozal Free Zone

In 2024, the Corozal Free Zone recorded total sales amounting to $257,267,637.84 USD, reflecting robust commercial activity across the Zone. The total value of imports into the Zone stood at $165,542,913.10 USD, supporting the continued availability of diverse products and services for regional consumers.

Revenue collection through the Social Fee reached $9,090,089.67 USD, which contributes to social welfare programs and education by the Government of Belize.

The business landscape within the Zone expanded with the registration of nine new companies, indicating sustained investor interest and confidence in the Corozal Free Zone as a viable commercial hub.

Movement and activity within the Zone also remained high. A total of 313,145 vehicles were recorded entering the Free Zone throughout the year, while the total number of visitors, or footfall, reached 1,029,070, underscoring the CFZ's strong draw for regional shoppers and tourists.

Infrastructure Development

- **External Road Works – Santa Elena Access Road to the Corozal Commercial Free Zone**:

Completion of major road upgrades on the approach to the CFZ with an investment of BZ$ 2,984,531.31. These works enhanced accessibility and logistical efficiency.

In addition to the grant provided by CABEI and the Government of Belize, the Corozal Free Zone also contributed $ 150,000 BZD to the cementing of the roundabout by the Customs & Excise Cargo area and the junction on the intersection of the Santa Elena Access Road and the Border Access.

- **Internal Road Rehabilitation**:

The Corozal Free Zone Management upgraded a 290-meter stretch of road inside the Zone to a 4-lane, 2-inch asphalted surface with clear demarcations and v-drains on both shoulders. Total Investment: US$ 455,364.77. Additional Oversight Engineering Costs: US$ 12,540.

- **Digital Infrastructure**

Free WiFi Project: Implemented 22 antennas providing 1.8 km of free WiFi coverage along Freedom Avenue, including the main boulevard and Charlie Gate—enhancing connectivity for businesses and visitors.

Waste Management & Equipment

- Procured a compactor truck for CFZ's waste management operations. Cost: US$ 43,687.81
- Upgraded IT Infrastructure with a new server, computers, access points, and additional hardware. Total IT Investment: US$ 25,243.27.

Social Contributions

- Continued our commitment to corporate social responsibility through donations and social outreach. Highlight: Rehabilitation of the Paediatric Ward at Corozal Community Hospital. Contribution: BZ$ 8,273

3.6 Cooperatives Department

- Registered two new co-operatives.
  - Placencia Taxi Co-operative of Placencia, Stann Creek on April 6, 2024
  - Hummingbird Agro-producers Co-operative of Hope Creek, Stann Creek on May 3, 2024
- Training programs for co-operatives were conducted countrywide as follows:
  - seven on the benefits of organization for small scale producers and service providers;
  - nine 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 three exchange and information sharing visits among co-operatives.
- Engaged in the joint implementation of the "Promoting Sustainable Livelihoods, Building Resilience-Investments in Cooperatives" project funded GEF-SGP UNDP. Departmental responsibilities included the provision of capacity building program for all thirteen (13) co-operatives in entrepreneurship, sustainable agriculture, leadership, organizational development and women empowerment along with monitoring and evaluation. The project provided a total of BZ$ 300,000 in grant funding across thirteen co-operatives as follows:

Table 2. Cooperatives Engaging in GEF Grant Funding

Co-operative	Location	Deliverable	Value, BZ$
Northern Sustainable Agro-producers Co-operative	Corozal	One carrot (produce) washer	22,000
Concepcion Vegetable Farmers Co-operative	Corozal	Construction of storage facility	20,000
Indian Church Farmers' Co-operative	Orange Walk	Two covered structures (greenhouses)	28,000
Prosperity Women's Co-operative	Orange Walk	Equipment and utensils for agro-processing	23,000
River Valley Livestock Co-operative	Belize	Refurbishing of marketing and office facility	21,000
El Progreso en Desarrollo Co-operative	Cayo	Construction of tilapia pond	21,621
Sayab Farmers' Co-operative	Cayo	Equipment and utensils for agro-processing& refurbishing of a cover structure	21,000

Western Mopan Farmers' Co-operative	Cayo	Packaging equipment and materials and river transport vessel	13,000
Hopkins Farmers' Co-operative	Stann Creek	One roto-tiller	17,000
Maya Mopan Beekeepers Co-operative	Stann Creek	Honey production equipment	20,000
Toledo Coconut Growers Co-operative	Toledo	Construction of nursery with seedlings	16,500
Hibiscus Mayan Arts Co-operative	Toledo	Refurbishing of building and installation of solar energy	13,521

- Audited seven co-operatives: New River Farmers, Orange Walk Beekeepers, Bomba United Farmers, LPAG Nago Bank, Valley of Peace Consumer, Placencia Producers, and Maya Line Taxi.
- Completed a viability assessment of Northern Fishermen Co-operative following solvency issues identified by the Central Bank.
- Under the FAO, IFAD, and EU funded Farmers Organization for Africa, Caribbean, and Pacific, engaged in the installation of QuickBooks® accounting software at the following co-operatives:

Table 3. Cooperatives with Quickbooks Software

Co-operative	**Location**
Concepcion Vegetable Farmers' Co-operative	Corozal
Northern Sustainable Agro-Producers Co-operative	Corozal
Orange Walk Beekeepers Co-operative	Orange Walk
Los Pequeños Agricultores y Ganaderos de Nago Bank Co-operative	Belize
Bomba United Farmers Co-operative	Belize
Valley of Peace Lagoon Farmers' Co-operative	Cayo
Maya Green Growers Co-operative	Cayo
Sayab Farmers' Co-operative	Cayo
Canaan Livestock and Farmers' Association	Cayo
Cayo Rural Farmers' Alliance	Cayo
Ta'nah Farmers Association	Cayo
Hibiscus Mayan Arts and Craft Co-operative	Toledo
San Pedro Columbia Honey Group	Toledo

3.7 Extension Service

The National Extension Service is the arm of the Ministry of Agriculture, Food Security and Enterprise that has the most visibility nationally. Each district office is equipped with both human and physical resources that ensure the timely and adequate delivery of services to the farmers of Belize. Extension Officers are trained in various disciplines that include but are not limited to crops, livestock, honey production and agro processing. This is coupled with advanced training in agriculture communications and technologies. Extension officers continue to provide training to farmers to build capacities to adjust to an ever-changing climate under which they produce and sustain their livelihoods. Training sessions are provided with the aim of building the farmer's resilience against climate variabilities and improving their production efficiencies. Agricultural extension has played a transformative role in empowering farmers, improving productivity, and fostering sustainable development in Belize. As a bridge between research and farmers, the extension service has significantly contributed to food security, improved rural livelihoods, and economic growth in Belize.

One of the most notable accomplishments is the dissemination of innovative agricultural technologies and practices. Extension officers of the MAFSE have effectively introduced modern farming techniques, such the introduction of biological control of pests and diseases; improved protective structure designs; effective use of pesticides and many more. These innovations have boosted agricultural productivity, ensured a stable food supply and reduced the risk of production loss.

Another significant achievement of the MAFSE extension program is capacity building through farmer education and training, which have empowered farmers with essential knowledge on pest management, soil fertility, and sustainable farming methods. Extension outreach was felt throughout the country with increased visibility and output. This will be shown in the report below.

Administration

The National Extension Service comprises of district offices in every district and these offices are staffed with highly qualified officers who are responsible to serve the Belizean farmers and the public in general. The extension service comprises of 33 Extension Officers, with 6 officers assigned to the Research and Development Center in Central Farm. The remaining 27 officers are spread across the country, tasked with transforming the lives of the farmers they serve. The extension service act as Agents of Change and are responsible for transforming technology, building the capacity of farmers, teachers, students and the wider Belizean populace. Each district is run independently with a District Agriculture Coordinator (DAC) in charge and is responsible for the day-to-day operation of the office. Each office is equipped

with support staff such as clerks, janitors and laborers. Each district office is also assigned vehicles for mobility purposes. The breakdown of the assigned vehicles is as follows:

Table 4. Vehicles in Extension Service Fleet

District	Model & type	Year	Type	Color	License Plate	VIN #	Status
Corozal	Hilux	2010	Toyota Pick-up	Silver	CY 3350	MROFR22G30558044	Working
	Mahindra	2014	Pick-up	Brown	BZ 2139	MAITZ4BKLD6661877	Working
	Honda	2014	Motorcycle 150X	Red	MC 2438	LTMJD2195E5202591	Working
Orange Walk	Hilux	2024	Toyota Pick-up	White	CY-B-3954	8AJDB3CD401344368	Working
	Hilux	2014	Toyota Pick-up	White	CYB-3351	MROFA8CD1K3900753	Working
	Hilux	2007	Toyota Pick-up	White	CYB-1802	8AJFR22G804513929	Working
	Hilux	2007	Toyota Pick-up	Black	BZB-1959	8AJFR22G504511393	Working
	D-Max	2014	IZUZU Pick-up	Blue	BZB-2113	MPATFS85JET000148	Working
	D-Max	2011	IZUZU Pick-up	Red	CYB-3904	MPATF585H8H505042	Working
	BT-50	2019	Mazda Pick-up	Tan	CYB-3386	MM7UR4DD2KW 878528	Serviceable
	Honda	2014	Motorcycle	Red	CYM-2437	LTMJD219XE5202618	Working
	Honda	2024	Motorcycle	Blue	CYM-3285	LTMKD1197R5200202	Working
Belize	Hilux	2008	Toyota Pick-up	Black	Bmp-B-0119	MR0FR22G000651944	Working
	BT-50	2019	Mazda Pick-up	White	CY-B-3390	MM7UR4DD6KIV932767	Working
	Honda	2024	Motorcycle XR 150L	Black	CYM-3284	LTMKD1193P5205149	Working
	Italika	2024	DM Motorcycle	Blue/ Grey	CYM-3312	3SCK4AKF7R1023258	Working
Cayo	Hilux	2024	Toyota Pick-up	White	CYB-3953	8AJDB3CD70136132	Working
	Hilux	2024	Toyota Pick-up	White	CYB-3955	8AJDB3CD801344700	Working
	D-Max	2008	IZUZU Pick-up	White	CYB:1347	MPATFS54H8H511237	Working

District	Model	Year	Type	Color	License Plate	VIN #	Status
	D - Max	2012	IZUZU Pick-up	Red	BZB-1905	MPATFS85HCT104668	Working
	Honda	2014	Motorcycle	Red	CYM-2433	LTMJD2194E5202582	Working
	Meilun	2013	Motorcycle	Blue	CYMB-0011	LF3YCM505DA000085	Working
Stann Creek	Hilux	2015	Toyota Pick-up	Silver	CZL-B-163	MROFR22G200737272	Working
	D-Max	2014	Pickup	Green	CZL-B-177	MPATFS85JET001001	Working
Toledo	BT-50	2019	Pickup	Gray	CYB-3389	MM7UR4DDXKW932769	Working
	D-Max	2012	Pickup	Red & Gray	BZB-1906	MPATFS85HCT104633	Working
	Mahindra	2013	Pickup	White	BZB-1963	MAITZ4BKLD6C61884	Serviceable

School Gardens

School gardening fosters hands-on learning, productivity potential, development awareness and student engagement. Students build technical skills by cultivating crops and livestock in schools which aids in building practical knowledge and promotes healthy eating habits by connecting children to fresh, healthy produce.

The Extension Officers of the MAFSE continue to create an enabling environment that encourages teamwork, as students collaborate on planting, weeding, and harvesting tasks. The MAFSE is currently working with a total of 60 schools which include:

Table 5. Schools Participating in School Gardening Program

District	High School	Primary School	Crop Grown
Corozal		Libertad Methodist Primary School	Tomatoes, sweet pepper, cilantro, cucumber, radish cabbage, lettuce
		San Victor Primary School	Assorted vegetables radish, cilantro, lettuce, cabbage, cucumber, corn, beans, hot peppers, chaya, watermelon etc cover structure- sweet peppers, lettuce, tomato, eggplant, cilantro
		Chan Chen Primary School	Assorted vegetables- cucumbers, cabbage, tomato, cilantro, carrots etc. Cover structure- sweet peppers. Broilers chickens
		San Antonio Primary School	Assorted vegetables-hot peppers, corn, cilantro, radish, tomato, sweet pepper, lettuce, cabbage, cucumbers, carrots etc.

District	High School	Primary School	Crop Grown
		San Joaquin Primary School	Cover structure- hot peppers, radish, tomato.
		Libertad Methodist Primary School	Tomatoes, sweet pepper, cilantro, cucumber, radish cabbage, lettuce
		San Victor Primary School	Assorted vegetables radish, cilantro, lettuce, cabbage, cucumber, corn, beans, hot peppers, chaya, watermelon etc cover structure- sweet peppers, lettuce, tomato, eggplant, cilantro
Orange Walk		San Juan RC School	Tomato, sweet pepper, cabbage, cilantro, Cucumber, Radish, Corn, Cabbage, Onion
		Carmelita Government School	Tomato, sweet pepper, cabbage, lettuce, Corn
		Santa Martha Government School	Tomato, sweet pepper, cabbage, lettuce, cilantro, Cucumbers
	New Hope High School		Sweet pepper, Cabbage, lettuce, Okra, Zucchini
	Bishop Martin High School		Cucumber, Watermelon, Melon Habanero, Lettuce, Tomato, Sweet peppers
	Belize High School of Agriculture		Tomato, Sweet pepper, Cabbage, Cayenne Pepper, Jalapeno, Corn, purple onion
Cayo		Victorious	Tomato, sweet pepper, cabbage, lettuce, cilantro, pak choy
		Succotz RC	Tomato, sweet pepper, cabbage, lettuce, cilantro, Pak Choy, celery
		Bullet Tree SDA	Tomato, sweet pepper, cabbage, lettuce, cilantro, corn, okra, pak choy
		Santa Elena Primary	Tomato, sweet pepper, cabbage, lettuce, cilantro, pak choy, papaya,
		San Antonio RC	Tomato, sweet pepper, cabbage, lettuce, cilantro, corn
Stann Creek		Light of The Valley	Tomato, sweet pepper, eggplant, jalapenos, habanero pepper, cantaloupe, cucumber, cabbage, cassava, sweet potato, cilantro
		Saint Matthews Anglican RC	Sweet pepper, habanero pepper, cucumber, cabbage, cilantro, lettuce
	ANRI		Broccoli, cilantro, tomato, sweet pepper, jalapenos, habanero pepper, cucumber, cabbage,
		Gulisi Community Primary School	Sweet pepper, jalapenos, habanero pepper, cabbage, cassava, tomato, lettuce
	George Town Technical High School		Tomato, sweet pepper, jalapenos, habanero pepper, cucumber, cabbage, cilantro
	Independence High School		Sweet pepper, jalapenos, habanero pepper, cucumber, corn, cabbage, cilantro
Toledo		Forest Home Methodist school	Cabbage, sweet pepper, cilantro, radish, cucumber, romaine lettuce
		Laguna Government School	Cabbage, sweet pepper, string beans, tomato
		Jalacte RC School	Cabbage, tomato, sweet pepper, watermelon, cucumber
		MAFREDI Methodist School	Romaine lettuce, sweet pepper, cilantro, cucumber

District	High School	Primary School	Crop Grown
		San Felipe Government School	Tomato, cucumber
		Luis Rey RC School	Tomato, sweet pepper, cucumber, lettuce, cilantro, radish
	Tumul Kin Center of Learning		Cucumber, hot pepper, cilantro, tomato
	Julian Cho Technical High School		Tomato, sweet pepper
	UB Toledo		Cabbage, sweet pepper, cucumber
		Forest Home Methodist School	Cabbage, sweet pepper, cilantro, radish, cucumber, romaine lettuce
		Laguna Government School	Cabbage, sweet pepper, string beans, tomato

Breeding Sheep and Goat Production and Guidance Enhancement Project

The Breeding Sheep and Goat Production and Guidance Enhancement Project (Sheep Project Phase II) was a four-year project funded by the ICDF Taiwan that included a budget of 2.5 million USD. The Extension Service collaborated with this project to execute training for farmers countrywide. These training sessions included thematic areas such as pasture establishment, sheep production and management, and culinary preparation of lamb and mutton. A total of 946 farmers, students and teachers were trained in 2024. These sessions were conducted using the hands-on approach since farmers learn better this way. The sheep industry stood at 17,800 and with a value of five million dollars in 2024.

Science Technology Engineering and Mathematics (STEM U) Foundation

During the latter part of the year the Extension Service collaborated with the STEM U Foundation to train students, farmers and teachers in Belize. The mission of STEM U Foundation is to inspire, educate, and empower students in Science, Technology, Engineering, and Mathematics (STEM). The training sessions, which were held in Orange Walk, Belize and Cayo Districts featured presentations from founder Mr. Jarrus Mitchel, consultants Dr. Ying-Tsu and Dr. Roger Thilmony, whose work in plant biotechnology and agriculture science has earned them the title of experts in their respective fields. The main objective of the training was to bridge the gap between agriculture and academia. A total of 75 farmers, 54 students and 23 teachers participated in the training.

Screwworm

The Ministry of Agriculture, Food Security and Enterprise (MAFSE) through its Extension Department joined BAHA in the fight to prevent and then control the spread of the New World Screwworm in Belize. A total of eight extension officers were deployed to Toledo on the 2nd of January 2025 after the first case was detected. The team conducted awareness and sensitization programs, treated wounds on animals, and injected with de-wormers, all to keep

the screw worm from spreading. The NSW is now in the Toledo, Cayo, Belize and Orange Walk Districts. The extensions officers have visited more than 10,000 homes and treated over 20,000 animals. The effort continues.

Public Sector Workers Trust

The Extension Service collaborated with the Public Sector Workers Trust on a project entitled "Sustainable Livelihood Project." The project's aim is to improve the lives of 546 of its members with seedlings of tomato, sweet pepper, cucumber, leaf lettuce, zucchini, cabbage and cilantro coupled with training in poultry management. The extension service was able to produce a total of 12,420 seedlings and assist with distribution to members from the Corozal, Orange Walk and Belize Districts. The other districts will be done later this year. This was coupled with the provision of three Home Gardening Training Sessions to the beneficiaries by trained extension officers. The main objective of the project is to empower PSWT members to become self-sufficient in vegetable production.

National Emergency Responses

The extension department actively assisted with relief efforts after both Hurricane Sara and wildfires that devasted the Cayo and Toledo Districts. In 2024 extension officers participated in damage assessments for the wildfires in the Cayo and Toledo Districts and Hurricane Sara and Tropical Storm Nadine that affected multiple districts. The officers visited more than 900 farmers in all districts to gather data on crops and livestock losses. This activity took time and resources from other important extension activities but was necessary to ensure that the damages farmers suffered during those devastating phenomenon.

SHEP Program

The Smallholder Horticulture Empowerment and Promotion approach is an initiative through the Japan International Cooperation Agency (JICA) in Belize. SHEP has been implemented in 57 countries and is geared towards creating a Market-Oriented Agriculture that aims to improve the efficiency of the extension service in Belize. The extension officers were able to conduct training with targeted groups in each district and among themselves. A total of 10 training sessions were conducted with farmers groups and eight among extension officers. These training sessions included baseline surveys, stakeholder's fora, market surveys and crop calendar etc.

IICA Project

The extension service also partnered with IICA on a project entitled "Adaptation Fund Project: Building Community Resilience via Transformative Adaptation: Component 3 - Creating Opportunities to Support Alternative Livelihoods" The project forms part of a larger project

that is being implemented by the Protected Areas Conservation Trust (PACT) and has a budget 1.3 million BZD. This project is expected to strengthen climate resilience in communities that are dependent on natural resources for their livelihoods. The extension service will be supporting IICA with the implementation of the project by assisting with the selection of the model farms and capacity building.

Bee Eradication

Bee eradication continues to be a major task of the extension service. This activity is continuous and requires a large portion of the human capital assigned within the districts. Bee eradication by numbers is captured in the table below:

Table 6. Bee Eradications per District

District	Number
Corozal	65
Orange Walk	34
Belize	68
Cayo	54
Stann Creek	35
Toledo	30

Vegetable Production

The extension services continue to monitor the vegetable production in Belize. This is especially important for sensitive commodities. Please find production statistics below:

Table 7. National Vegetable Production Statistics

National Vegetable Production			
Commodity		**2023**	**2023- 24**
Lettuce	Total production (lbs.)	531,535	745,500
	Acres harvested	39	44
Irish Potatoes	Total production (lbs.)	3,265,040	**3,074,750**
	Acres harvested	287	**385**
Onion	Total production (lbs.)	1,685,694	**3,189,025**

	Acres harvested	203	**201**
Carrots	Total production (lbs.)	887,177	1,349,720
	Acres harvested	83	129
Broccoli	Total production (lbs.)	146,627	70,922
	Acres harvested	13	9.9
Cauliflower	Total production (lbs.)	83,431	47,960
	Acres harvested	9.9	6.9
Celery	Total production (lbs.)	150,650	97,100
	Acres harvested	7.4	5.8

3.8 Grains

The grain and legume sub sector's objective were to improve the competitiveness of the commodities along the value chain to satisfy increasing domestic demand, national food security and to generate foreign exchange earnings. Red kidney beans was the commodity which experienced a reduction in acreage planted and production. Yellow corn, black beans, soybeans and sorghum experienced major growth in acreage planted and production. See Annex 1 and 2 for details.

In grains, **yellow corn** production saw a slight decrease of nine-point four one percent (9.41%) from 222.85 million pounds in 2023 to 201.86 in 2024. Acreage planted decreased by five-point two seven percent (5.27%) from 60,894 in 2023 to 57,683 in 2024. **White corn** production saw an increase of seventeen-point six two percent (17.62%) from 24.97 million pounds in 2023 to 29.37 in 2024. Further analysis indicated that the acreage under milpa production decreased while mechanized acreage production increased hence the overall increase in production. Total acreage decreased by thirteen-point nine eight percent (13.98%) from 11,789 in 2023 to 10,140 in 2024. **Rice** production decreased by five-point twenty-two percent (5.22%) from 39.02 million pounds in 2023 to 36.98 million pounds in 2024. Acreage planted increased nine-point five four percent (9.54%) from 7,803 in 2023 to 8,547 in 2024. **Sorghum** production decreased significantly by nineteen-point eight seven percent (19.87%) from 66.26 million pounds in 2023 to 53.09 million pounds in 2024. Acreage for the same period decreased by four-point nine six percent (4.96%) from 22,075 in 2023 to 20,979 in 2024.

In legumes, **red kidney beans** production increased by thirteen-point six one percent (13.61%) from 5.29 million pounds in 2023 to 6.01 million pounds in 2024. Acreage planted increased by seven-point four two percent (7.42%) from 6,951 in 2023 to 7,467 in 2024. Sluggish export sales to CARICOM prompted farmers to plant other grain crops which were

offering better market prospects. **Black bean** production decreased by seven point one five seven percent (7.57%) from 4.89 million pounds in 2023 to 4.52 in 2023 while the acreage decreased by four-point seven percent (4.7%) from 5,825 in 2023 to 6,097 in 2024. **Cowpea or black eye pea** production increased by sixty-two-point eighty three percent (62.83%) from 1.48 million pounds in 2023 to 2.41 million pounds in 2024. Acreage increased significantly by sixty five percent (65%) from 4,512 In 2022 to 1,579 in 2023. Better market prospects for crops such as sorghum and soybeans have contributed to placing less importance on cowpea production. **Soybean** production experienced a decrease of nine-point two eight percent (9.28%) from 64.16 million pounds in 2023 to 58.21 million pounds in 2024. Acreage planted saw a slight decrease of one-point seven percent (1.7%) from 40,979 in 2023 to 40,286 in 2024. Annex 2 illustrates production data.

Plan Belize contemplated an enabling environment for increased agricultural productivity, restoring confidence in the agriculture sector and increasing value addition. Challenges in the sector persist primarily due to climate change which impacts on the entire production chains and in particular planting and harvesting schedules. Producers must deal with new pest problems. Cost of production due to high input prices of fuel, pesticides and fertilisers contribute to the ability of farmers to remain competitive. Despite these challenges the grain and legume sub sector experienced growth, and the value of goods increased. The Ministry of Agriculture, Food Security and Enterprise (MAFSE) along with the Government of Belize (GOB) continued to address the challenges and remained engaged with the farming sector. Investments have continued in soybean processing facilities in Spanish Lookout and Blue Creek to produce soybean meal and oil for the domestic and export markets. Belize is now in a position to supply soybean crude to CARICOM for further processing. Mexico expressed interest in sourcing soybeans from Belize. Farmers are interested and will respond once the prices are attractive. MAFSE tested varieties in Belize from Mexico for suitability to Belize's agro climatic conditions. Technical assistance in soybean production was provided to Belizean farmers as well as to MAFSE technical personnel.

3.9 Livestock

Beef Cattle: The Ministry of Agriculture works closely with the Belize Livestock Producers Association (BLPA) to ensure the Belize Livestock Registry (BLR) registers every farm and livestock farmer in the entire country of Belize to maintain a sound and reliable traceability system of every animal from birth to death.

The BLR recorded a total of 7,503 active farmers in 2024, a significant increase of 10% more when compared to figures reported in 2023 of 6,808 registered farmers. In 2024, the BLR recorded a cumulative cattle herd at 202,697 an increase of approximately 6.5% when compared to 2023 cattle herd figures. The BLR also reported a total of 712 women who are cattle farmers meaning they represent approximately 10% of the total cattle farmer population.

Another breakthrough was in cattle exports. A total of 41,515 beef cattle were successfully exported in 2024, an increase of 3% when compared to figures reported in 2023. The total revenue or income generated due to cattle exports to Guatemala and Mexico accounted to approximately BZ$65 million. The Guatemalan and Mexican export markets in 2024 represented 85.2% and 14.8% consecutively.

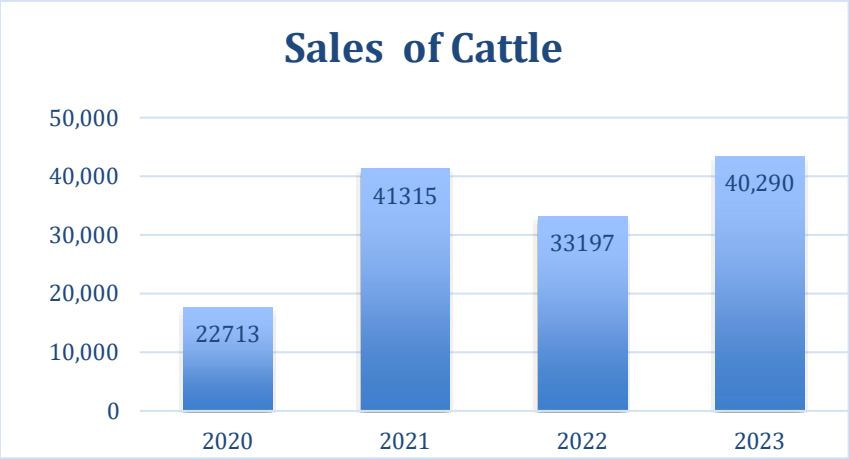

Figure 3. Sales of Cattle, 2020-23

Local consumption recorded a total of 10,800 animals slaughtered to meet domestic demand. This shows a significant increase of 11.8% when compared to slaughtered figures reported in 2023. The domestic value is estimated to be around BZ$35 million for 2024. The cumulative economic contribution of the export and domestic markets accounts to approximately BZ$100 million.

It is important to note that cattle farming in Belize is a small business income generating activity. It is estimated that 70% of the cattle farmers in Belize own between 51 to 100 head, making it an important farming activity that sustains the livelihoods of more than 35 thousand people, the vast majority living in rural areas.

The Bull Rental Program instituted in Central Farm, the Orange Walk and Toledo Districts by the Ministry of Agriculture was able to assist at least 30 small cattle producers to improve their genetics and a total of 35 small cattle farmers from the improved genetics program at Central Farm Livestock Breeding Unit. The livestock genetics development program objective is to increase productivity by at least 10% and improve meat quality that meets consumer preferences.

Another major achievement was the successful weaning of 74 new calves of superior genetics at the Central Farm breeding centre, of which 9 calves were weaned under the Artificial Insemination Reproductive Technology procedures. Considering the local demand of improved genetics by small cattle ranchers, the Ministry instituted a cattle breeding program with the Belize Livestock Producers Association. A total of 10 heifers of superior genetics were moved to the BLPA headquarters in Belmopan to be crossed with Brangus improved breeds. So far, this program has been successfully and to date this initiative has yielded 2

male purebred Brangus and 4 female Brangus. These are of superior pedigree and will contribute substantially to elevate overall reproductive and production performance in a significant way. This partnership is yielding great results for the cattle industry.

Networking and Strategic Alliances

Another major achievement was the technical cooperation between Belize and Mexico (AMEXCID) in the implementation of the Reproductive Technology in Cattle Production project for extension agents of the Ministry of Agriculture, BAHA and BLPA. The first training session was executed in Central Farm, Cayo District. The practical training in Artificial Insemination will be carried out in Mid-June 2025. The expectation is that at least 10 to 15 agents in modern reproductive technologies will be trained.

The Ministry of Agriculture is working closely with the Ministry of Economic Development on the development of a comprehensive sustainable cattle project. The objective of this partnership is to formulate a program for the enhancement of the Livestock sector and mobilize 50 million dollars to fund this major undertaking. The program under construction is also supported by BLPA. The name of the project is “Cattle-Livestock for Environmental Advancement, Resiliency and Sustainability (CLEARS).”

The other major collaborative initiative between BLPA and the Ministry of Agriculture, Food Security and Enterprise was to support the consultancy entitled "Value chain assessment and exploratory national market analysis for sustainable beef cattle products in Belize.” The report concluded with a Roadmap and Strategic Recommendations for Belize's Beef Value Chain. This project is being funded by the Scaling Up Climate Ambition on Land Use and Agriculture (SCALA) program in collaboration with UNDP and FAO, via its private sector engagement facility, collaborated with BLPA and the Government of Belize through the Ministry of Agriculture. The project document concluded by completing the following thematic areas: 1) A value chain assessment of the beef cattle value chain, 2) An exploratory national market analysis, 3) A financial analysis of the cost to transition from current practices to climate-resilience livestock production, and 4) A roadmap to enhance the climate resilience of livestock farmers.

A strategic partnership with BLPA, OIRSA, BAHA was formally established to better coordinate livestock development initiatives and collective resolved challenges of the cattle sector particular with climatic hazards, cattle export and pest and diseases. Strategic areas of collaboration include:

To maintain an updated and reliable Belize Livestock Registry and Traceability system.

- ✓ MAFSE and BAHA negotiated with SENASICA to reduce the 21 days quarantine to 7 days. This proposal was successfully approved.
- ✓ Despite having the presence of screwworm, Belize continues to export cattle on the hoof to Mexico under new and enhanced export protocols.
- ✓ A cattle export cost benefit analysis was completed. The conclusion of the study revealed that the cattle export is profitable primarily because of all logistics costs involved. On the other

hand, the export market to Mexico allows for cattle prices to remain high and stable with very limited fluctuations.

- ✓ Negotiations with BLPA have yielded very good results and now they have acquired the land where the export cattle corral will be permanently established.
- ✓ Negotiations with Mexico continue to expand the cattle trade.
- ✓ A collective effort among MAFSE, BAHA, OIRSA and IICA continues to focus on eradication of the New World Screw Worm. The NWS is currently the primary cattle health pest problem in Belize. A total of 2500 cattle farmers have been directly or indirectly sensitized in the prevention, control and eradication of the New World Screwworm.
- ✓ MAFSE successfully submitted a BZ$1 million screwworm prevention budget proposal to cabinet and was successfully approved.
- ✓ MAFSE and BLPA work on the financial support for cattle farmers affected by flooding in the Belize River Valley and Crooked Tree because of Tropical Storm Sara.
- ✓ Training in vampire bat trapping was successfully conducted by BAHA and MAFSE.
- ✓ Strategic Collaboration with IICA on project development of BZ$2.3 million in alternative livelihoods inclusive of livestock development initiatives.
- ✓ Active involvement in the trade negotiations in close collaboration with the Ministry of Foreign Trade. Trade negotiations with El Salvador, and Guyana among other Central American Countries as we seek to penetrate new markets and expand current market opportunities.
- ✓ The Ministry has collaborated closely with the private sector to facilitate innovation and technology transfer. Technologies that have been introduced include artificial insemination using imported bovine semen and embryos of superior pedigree.
- ✓ MAFSE strengthened its partnership with UB, TNC, and BLPA to promote sustainable and regenerative livestock farming. The tripartite livestock table among Belize, Guatemala and Mexico will be instituted to coordinate efforts in regenerative, sustainable livestock production.
- ✓ MAFSE supported BLPA in the culinary livestock competition, bovine genetics display and rodeo events.
- ✓ MAFSE actively participated in the National Agriculture and Trade Show, and other agricultural district fairs.
- ✓ The strategic partnership with the IDB resulted in training a total of 125 cattle farmers in the benefits of electric fencing in the Orange Walk District.
- ✓ 300 livestock farmers benefited from the following training: pasture management, silvopastoral systems, pasture establishment, supplemental feeding, animal health, silage and protein energy bank management.

Sheep and Goat:

The strategic partnership with ICDF Taiwan in the implementation of the Sheep and Goat breeding project has yielded positive results to grow and expand sheep production in Belize. The sheep and goat breeding centre objectives are to produce sheep and goats of superior genetics and make them available to livestock producers at very reasonable prices. The project also included a state-of-the-art sheep and goat breeding facility in the Orange Walk District. The Ministry of Agriculture has so assisted more than 100 small ruminant livestock

producers have benefitted from sheep with superior genetics. More than 150 producers have benefited from hands on training, workshops, field visits, value adding, feeding, breeding, management, sanitation, culinary and farmer exchange visits with the aim of increasing production, value adding and efficiencies. Currently we have almost 500 sheep farmers producing approximately 20,000 sheep.

Poultry:

MAFSE continues to play an active role in the legislative review of the poultry act and is very much engaged in the discussion as an active participant on the Poultry Health Committee. Under the FAO technical support program, the Newcastle poultry health protocol was updated. MAFSE works closely with BPA, and BAHA to maintain active and passive Avian Influenza surveillance.

In terms of production, a total of 12,971,193 birds (*61,910,085 lbs live weight*) were processed in 2024 yielding a total dress weight of 50,068,805 lbs. Total broiler output value stands at BZ$161,955,986.00. Total industry output (broiler, eggs, turkey, hens) for 2024 accounts for BZ$182,666,807., significantly higher than that reported for 2023, BZ$ 165,606,887.00. Belize is self-sufficient in broiler meat. The average per capita broiler meat consumption stands at 118 lbs per year.

Total eggs produced in 2024 stood at 59,888,172 eggs or 4,990,681 dozen. The average per capita consumption is estimated at 150 eggs. Total egg output stands at BZ$16,569,060.00.

Turkey production for 2024 stands at 712,267 lbs. The average per capita turkey consumption stands at 1.7 lbs per year. Turkey outputs alone account for BZ$3,119,729.00.

MAFSE continues to promote the white sex link and the Rhode Island Red to support backyard local production among the rural communities. Every local backyard chicken production farmer is advised to establish biosecurity protocols to mitigate entry of potential pests and diseases.

Total exports of live broilers, hens and eggs accounted for BZ$4,530,623.00.

Honey:

Beekeeping in Belize has been evolving significantly, with extensive training being conducted nationwide. Programs focusing on best beekeeping practices, manufacturing processes, and by-products have been implemented to ensure beekeepers produce high-quality honey. The production of honey considerably decreased in 2024 when compared to 2023. Two demonstration apiaries were established at the Belize High School in the Orange Walk District, while the other was at Kings College in the Belize District. This initiative provides an opportunity for 600 students and 70 beekeepers to engage directly in hands-on learning activities. Total demonstration plots now stand at six.

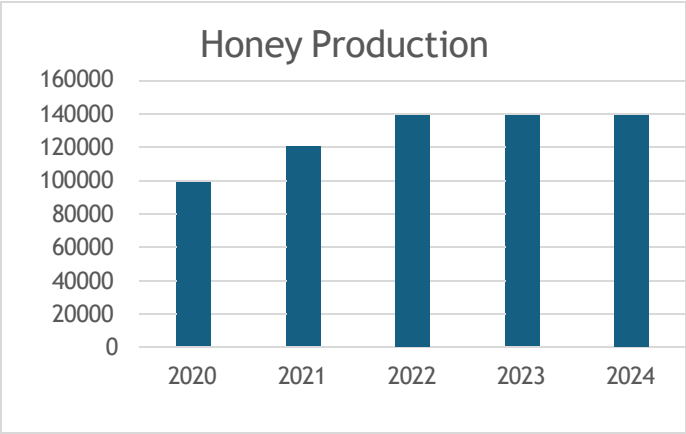

Figure 4. National Honey Production Statistics 2020-24

Aquaculture:

The objective of the Aquaculture Unit is to produce quality fingerlings and supply farmers to expand tilapia production.

In 2024 fingerling sales of 106,629 pieces were recorded. Biosecurity measures were instituted to prevent diseases. 3 completed fish farm training workshops were held at St. Viator High School, Julian Cho THS and the Tilapia Hatchery Center. Live fish displays were carried out at NATS and World Food Day 2024. One 4-inch diesel water pump and another 6-inch diesel water pump were installed with water lines for supply of water to the Tilapia Hatchery Center. Extension services were supplied to all six districts and 122 people practiced small scale and subsistence tilapia farming in Belize in 2024.

In 2024, the Aquaculture Unit continued inter-organizational cooperation with the UK government's Centre for Environmental, Fisheries and Aquaculture Science, CEFAS, in the Ocean Country Partnership Programme – Belize project. Through the OCPP, the Aquaculture unit lobbied for and obtained a donation of wetsuits, fish collecting nets, shade cloth rolls, and a microscope with a digital camera for examination of water samples for algae identification. This assisted the unit in its biosecurity and climate change adaptation efforts. In 2024, the Aquaculture Unit began inter-organizational cooperation with the Center for Sustainable Development Reform, which is a branch of the University of New South Wales, Australia. They have been hired by the OCPP to perform a financial feasibility assessment of the Aquaculture Unit and its Tilapia Hatchery Centre to formulate recommendations for its long-term feasibility. The Aquaculture Supervisor attended one workshop and received 2 field visits from CSDR in 2024. The assessment is expected to be completed in 2025. It will assist the unit in making sound management decisions in the future.

Dairy:

The goal: To transform the industry into one that is productive, competitive and sustainable.

Major achievements included MAFSE and the Dairy Association implementing the Dairy Strategy 2022-2026. MAFSE and the Dairy Association along with BAHA have facilitated the importation of improved dairy genetics. Now a cross- breed Holstein/Gyr is available to dairy farmers.

The work continues for dairy farmers to have greater ability to adapt to climate change; more adaptable and responsive dairy production systems to increase farm and processing performance to achieve greater efficiency, efficient and profitable use of land, water, and energy resources which contribute to enrich and support the environment with an emphasis on reducing global warming and greenhouse gas emissions, increasing milk production and quality, a platform for communication and coordination is established for favorable policy, regulatory environment development and facilitate access to domestic and regional markets, enhance the genetic progress in dairy breeding to achieve increase productivity and competitiveness in the sector, and greater implementation and integration of high-value technology at the production level.

Milk production for 2024 amounted to more than 12 million lbs. MAFSE works closely to improve the Shipyard milk processing facility into one that is more hygienic and meets food safety standards.

Swine:

The Ministry of Agriculture upgraded the swine breeding facilities in Orange Walk, Stann Creek and Toledo Agricultural Stations to facilitate the production of quality breeding piglets. A total of 105 pig producers benefited from improved swine pedigree. Swine breeds commonly introduced as part of the breeding program include Large White, Duroc, and Land Race. The new breeds introduced include Hampshire and Pietrain and the cross breeds of Land Race and Large White. The idea behind cross breeds is to maximize the hybrid vigor to maximize production and the quality of meat.

In reference to pig production, a total of 43,153 pigs were slaughtered to supply the domestic demand in 2024. This number of pigs yielded 5,178,000 lbs. in dress weight. The economic contribution generated was BZ$14,240,000.00

3.10 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:

a) Registration started October 2022

b) Official Launch: - July 2023

c) End date: December 2024

d) Funds approved: 1,539,442.74 pesos (approx. $3,516,539.58 - USD)

e) 98% of the project was implemented.

f) All 20 bio-factories have been built (4 additional built by interested farmers in their areas.

g) 2000 small farmers from all 6 districts benefitted from the project.

h) Approx. 2000 ATM cards were distributed (all disbursements of funds made).

i) Approx. 60,000 trees distributed to beneficiaries (assorted: vegetable seeds, fruit trees and timber trees).

j) More than 3000 agriculture packages distributed country wide.

More than 2000 individual or group training courses were done by the SV extension officers. Memorandum of Understanding on transparency between the Ministry of Foreign Affairs of the United Mexican States through the Mexican Agency for Cooperation and Development "AMEXCID" and the Government of Belize through the Ministry of Agriculture, Food Security and Enterprise was signed with the Legal Advice from the Attorney's General Office. The purpose of this Memorandum of Understanding was to establish the mechanisms of collaboration and coordination between the Ministry of Foreign Affairs of the United Mexican States, through the Mexican Agency for International Development Cooperation (AMEXCID) and the Government of Belize through the Ministry of Agriculture, Food Security and Enterprise, in order to assist and facilitate the practice of transparency regarding the use and access to information on personal data collected in the framework of the implementation of the "Sembrando Vida" project.

A Sembrando Vida "TOUR" of all 6 districts was done by the AMEXCID-SV Communications Unit from February 18-22, 2024. A Diagnostics of Results for the Sembrando Vida Project was also done from May 6th to 11th, 2024 by a UNDP consultant hired by AMEXCID.

Another relevant aspect of the bio factories is that, in addition to the 20 built by Sembrando Vida, the beneficiaries in Belize created 18 more on their own initiative distributed in the following districts: 6 in Corozal, 11 in Orange Walk and 1 in Stann Creek. This result demonstrates the great usefulness that bio factories have in the communities of smallholder farmers in these districts.

World Food Day-2024

World Food Day 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 18th, 2024, at the Central Farm Research & Development Center., Cayo District.

The theme of the 2024 WFD was: - **"Right to Food, For a Better Life, And a Better Future".** Keynote Address was delivered by Hon. Jose Mai, Minister of Agriculture, Food Security and Enterprise with the presence of H.E. Froyla Tzalam, Governor General of Belize. Approximately 15 primary schools, 5 high schools and tertiary institutions attended the event. Some 25 to 30 organizations attended, displaying agricultural products.

School Garden Program Support ("LEAVE NO ONE BEHIND")

The NFNSC continues with its school garden support program to primary and high schools across the country. Last year the Seventh Day Adventist Institution approached the Ministry for collaboration in support of their school garden programs. (see table below). The Education Officer, for SDA schools Mrs. Ellajean Gillett, 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. The 1st place winner of the Primary School Category went to San Victor RC from the Corozal district. The 1st place winner of the High School Category went to Valley of Peace-SDA high school.

Mesoamerica Hunger Free Project (Mesoamerica Sin Hambre)- AMEXCID/FAO/MAFSE

Project: "Improve Food and Nutrition Security and Encourage Healthy Eating Habits in Belize through Strengthening of the School Feeding Programme" GCP/SLM/001/MEX.

BACKGROUND

School feeding programs in the Caribbean, as elsewhere, have long been established and recognized as an important instrument in facilitating learning, especially for poor and vulnerable schoolchildren. More recently, in Latin America and the Caribbean (LAC), the goals of these programs, as well as the forms of delivery of assistance, have evolved and are now recognized as important tools for strategic intervention of social protection and for the fulfilment of the human right to adequate food, and are recommended as one of the key components of long-term sustainable development.

The Government of Brazil and FAO initiated the project *"Strengthening of School Feeding Programs in the framework of the Hunger Free Latin America and Caribbean 2025 Initiative-GCP/RLA/180/BRA"* in 2009, with the aim to promote and implement sustainable school feeding programs (SFP) in LAC countries. FAO has designed a framework to formulate technical and financial assistance to countries interested in improving their national SFP. The project has expanded to 17 countries, 13 of them currently active in Costa Rica, Belize, El Salvador, Grenada, Guatemala, Guyana, Honduras, Jamaica, Paraguay, Peru, Dominican Republic, Saint Lucia, and Saint Vincent and the Grenadines.

"Mesoamerica without Hunger", under the technical cooperation of FAO, is a program of cooperation between countries that contribute to the Sustainable Development Goals. 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, the Brazilian and Mexican Cooperation are working in cooperation and aligned to serve the interest 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 bases 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 were 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, and it was 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.

Under the Mesoamerica Hunger Free Project seedlings and garden material were donated to the schools in Belize, Corozal and Orange Walk districts.

Belize Food Systems Transformation Pathway

The Belize Food Systems Pathway continues with its ongoing workplan of activities. The opportunity with this pathway is that line Ministries like Agriculture, Education, Health, Sustainable Development, National Climate Change Office, NEMO, Rural Development and Economic Development and others will be able to have access to resources through our UN agencies in Belize, as well as from external sources.

A perfect example was when the World Food Program assisted approx. 717 farmers in hurricane relief, post Hurricane Lisa. The value of this grant was approx. $600,000 Bz. 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.

3.11 Project Execution Unit

In 2024-25, MAFSE executed annual work plans of 12 national projects with a value of $135,815,330, and two regional projects with a value of $42,800. These projects are funded by 6 agencies, which include the Taiwan International Cooperation and Development Fund,

the Caricom Development Fund, the World Bank, the Food and Agriculture Organization, the Government of Italy and the Church of the Latter-day Saints.

From the thirteen (13) projects a total of seven came to an end in 2024 with a value of $8, 512,146.11 of which $6,969,847.11 was funded externally and $1,542,299.00 was co-funded by the Government of Belize.

These projects included the AMEXCID project Sembrando Vida, which brought an awakening of agriculture with environmental practices to farmers of rural Belize; 2000 small farmers benefitted from this project and lasting impact in areas such as creation of bio-fertilizers and bio-pesticides remain with the client groups served.

Another project that brought much needed interventions to producers was the covered structure project funded by the CDF. This project ensured that in its lifespan covered structures were provided to small farmers, especially to grow vegetables and greens. Farmers across the country are now able to grow their products year round, without much fear of pests and disease affecting their production.

The MAFSE has also participated in the Sustainable and Inclusive Belize project funded by the Inter-American Development Bank, which has already benefitted producers in the agriculture sector inn its first year. Whilst it is administered from the Ministry of Economic Development, the agriculture component where farmers benefit has provided significant impetus to over 600 small farmers all over Belize. Similarly, MAFSE also collaborates in the CRESAP, or Climate Resilient Agriculture Project, which also aims to benefit small producers in the Orange Walk, Corozal, Cayo and Belize Districts. Producers of sugar cane, rice, maize, soybean, vegetables, livestock and fruit are being targeted by this project, which enters its second year of implementation. While the pace of implementation could perhaps be better, the $50 million dollars the project brings add much to the table and producers who register will stand to gain maximum benefits.

3.12 Policy Unit

The Policy and Statistics Unit of the Ministry of Agriculture, Food Security & Enterprise (MAFSE) is responsible for drafting, amending, and implementing the National Food and Agriculture Policy goals aligned with #planBelize. The unit manages the Belize Agriculture Information Management System (BAIMS) and the Belize Agriculture Price Information System (BAPIS), which are both used for planning, coordinating, and implementing various projects. The unit also coordinates with both the public and private sector to discuss matters affecting the agriculture sector through stakeholder meetings, sector/industry meetings, and liaise with stakeholders on issues related to market access, etc. The unit manages all statistics for MAFSE and all agriculture-related production, trade, and external data which are reported to the SIB and Central Bank.

In 2024, the Policy and Statistics Unit, along with the Extension Department, registered approximately 935 new farmers in 2024 on the Belize Agriculture Information Management

System (BAIMS), highlighting a 7-year registration trend. It is important to note that the annual number of newly registered farmers is decreasing as we approach full coverage. Based on the most recent census, which identified 20,291 individuals engaged in crop production, our current registry reflects approximately 80% coverage of the farming population.

An aggregated total of 16,427 Farmers were registered on BAIMS from 2018 – 2024 representative of 3,767 females, 12,574 Males, and 86 companies see *Figure 5* below.

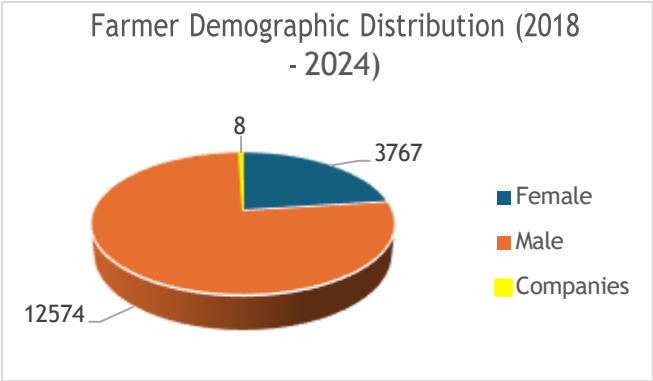

Figure 5. Farmer Demographic Distribution

Data is also highlighted by district, which illustrates that Corozal District remains the largest farming population, with the majority being sugarcane farmers. The district with least farmers is Stann Creek as seen in *Table 8* below.

Table 8. Number of Farmers Registered in BAIMS

District	# of Farmers
Belize	919
Cayo	3,345
Corozal	4,131
Orange Walk	3,884
Stann Creek	1,105
Toledo	3,043
Grand Total	**16,427**

The BAIMS, which is MAFSE's national agriculture registry is currently under strengthening support from the CRESAP, IADB, FAO, and KOICA projects. Support includes upgrading of

system software, hardware, data collection modules, price monitoring system, reporting system, survey tool upgrade, GIS integration, farmer's portal and training site creation. All these upgrades will help BAIMS to meet MAFSE's data needs, update the database, and ensure the sustainability of the information system.

Using BAIMS, many coordination activities are currently being engaged such as the vegetable planning sessions to coordinate planting, harvesting, and post-harvest activities. Likewise, the Policy Unit has coordinated the use of BAIMS to launch farmer support programs to address drought, forest fires, flooding from hurricanes, etc. The value of data also highlights where interventions are needed and aligned with the National Food and Agriculture Policy and Plan Belize. The BAIMS is also used as a list frame to launch other commodity-specific surveys, such as the coconut survey and livestock survey.

Through collaboration with the FAO, the unit has been coordinating and implementing Technical Assistance (TA) to support reporting on five key Sustainable Development Goal (SDG) indicators, aligned to "double the agricultural productivity and incomes of small-scale food producers by 2030." These include SDG 2.3.1, which measures the volume of production per labour unit by enterprise size (farming, pastoral, or forestry), and SDG 2.3.2, which assesses the average income of small-scale food producers, disaggregated by sex and indigenous status. SDG 2.4.1 monitors the proportion of agricultural area under productive and sustainable agriculture, while evaluates (a) the percentage of people with ownership or secure rights over agricultural land, by sex, and (b) the share of women among owners or rights-bearers of agricultural land, by type of tenure.

Lastly, SDG 12.3.1 focuses on the global food loss index. The unit has been reporting on four of these indicators through the Statistical Institute of Belize (SIB) and the Belize National Statistical System (BNSS) and plans to begin reporting on in the upcoming year; now, no data exists in Belize for these SDGs as the methodology for data collection and standardization of definitions need to be worked on. Through support from the FAO, a consultant will be in country in the latter part of 2025 to work on these. The policy unit also coordinates the National Grain Committee (NGC), chaired by the Chief Agriculture Officer and has representation from all stakeholders. All sessions are planned by the unit to update on stock availability (Food Security), production data, challenges being faced by producers, investment opportunities, and interventions by MAFSE at both technical and management levels. Likewise, the unit also coordinates data collection for the food stock availability for grains, wheat, sugar, and poultry.

The Unit also reports production statistics to the "CARICOM 25 by 2025" reduction of extra-regional food import bill by 25%. The policy unit of MAFSE provides statistics on a timely and reliable fashion to the Secretariat. Likewise, Belize is the only country besides Guyana to exceed its targets resulting in a reduction of its food import bill by 80%. This means that regionally, Belize is self-sufficient with its basic food needs, which include grains, livestock, and vegetables.

Other activities achieved with the unit include working in close collaboration with NEMO to assist cacao farmers affected by wildfires in 2024. The unit also worked with NEMO to assist farmers affected by flooding in 2024. Collaboration remains a top priority for the unit, as the entire data collection platform for DANA Agriculture was digitized by the statistics team. This digitization was also part of the ongoing effort by NEMO to centralize its database. The Policy

and Statistics unit is well versed in the use of data collection tools, analysis, and reporting, thus the need to continue collaboration. On the other hand, the unit has informed senior management, NEMO, and other partners on the need to update the 2008 evaluation sheet for crops and include livestock, small equipment, and housing materials. This sheet is over 15 years old and is no longer relevant for conducting evaluations. This needs to be given priority and deemed urgent.

Table 9. Primary agricultural output value for the years 2023 and 2024: Value in BZD

Sector	Value in 2023	Value in 2024	% Change
Sugarcane	120,174,377.44	137,770,695.48	15
Banana	72,269,474.00	92,905,762.00	29
Citrus	7,935,244.60	10,010,564.00	26
Marine Products	40,937,630.35	38,589,560.88	-6
Fruits	22,817,850.50	24,254,984.05	6
Grains/Legumes	248,710,981.80	223,908,761.00	-10
Vegetables, roots & tubers	25,954,703.90	28,342,425.25	9
Livestock	261,295,533.40	286,521,567.95	9.7
TOTAL OUTPUT	800,095,795.99	842,304,320.61	5.3

Source: Ministry of Agriculture, Policy & Statistics Unit, 2024

The Unit also gathers all agriculture production statistics and is proud to illustrate the economic output of agriculture to the economy of Belize. As such the overall output value of agriculture production increased by 5.3% from 800 million BZD in 2023 to 842 million BZD in 2025. This significant increase is testament to the hard work of farmers and food security for Belize. The sector that contributed the most to the economy was the livestock sector which grew by 9.7% from 261 million BZD in 2023 to 286 million BZD in 2024 as can be seen in Table 2. Above. All statistics gathered is shared with the Statistical Institute of Belize (SIB) and the Central Bank of Belize. This information then becomes the official statistics for the Government of Belize only after it has been revised, approved and published by the SIB.

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An aggregated total of 16,427 Farmers were registered on BAIMS from 2018 – 2024 representative of 3,767 females, 12,574 Males, and 86 companies see *Figure 6* below. Data are also highlighted by district, which illustrates that Corozal District remains the largest farming population, with the majority being sugarcane farmers.

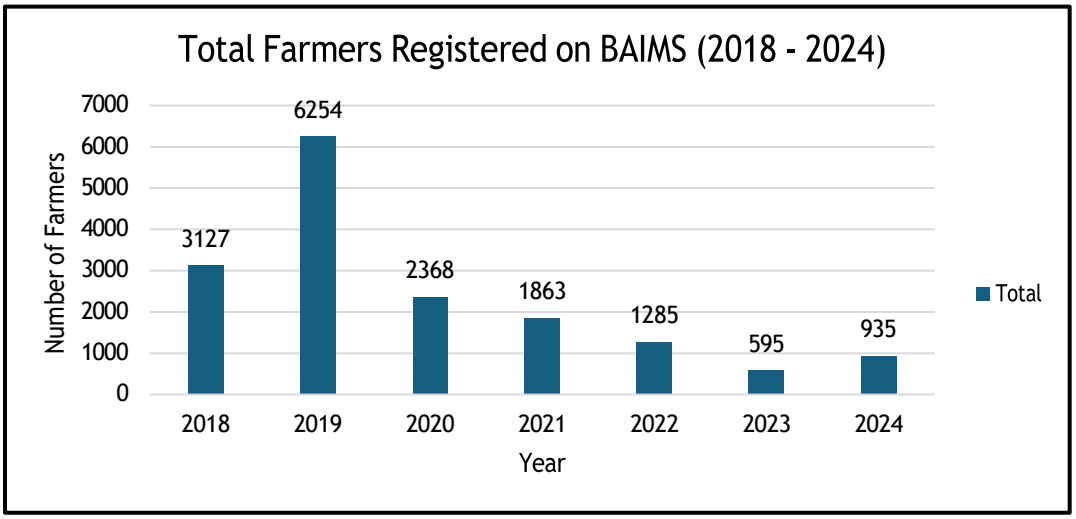

Figure 6. Number of Farmers Registered in BAIMS

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3.13 Research, Development and Innovation Center

The Agronomy Program is comprised of a team of eight (8) permanently established staff [including the Research and Innovation Program Coordinator and a Senior Secretary], and 17 support staff [Open Vote]. The RDIC program units are the horticulture open field, protective structures, organic section, germplasm banks, coconut hybridization program, and nurseries [fruit tree, coconut, and vegetable seedlings]. Outside of the program's work on station, the team is regularly called upon to provide technical support to the stations, Extension Department and the private sector. They are also responsible for the planning and implementation of out-district work on demand and requests by the MAFSE. These may include school garden design and construction, cover structure and irrigation design and construction, World Food Day (WFD), National Agriculture and Trade Show (NATS) and Priority Projects.

2.1. Evaluation of a Parthenocarpic Cucumber Variety- Central Farm

Cucumber (cucumis sativus L.,) is an important summer vegetable crop that is grown throughout the world for human consumption. In Belize, we have seen the adverse effects of production in the open field and poses a great challenge as it is a host to various pests and diseases. In addition, during the inclement weather, especially in the last quarter of the year, the protective structure can mitigate losses due to excess soil moisture and propagation of fungal and bacterial diseases. A lot of pesticides are being used resulting not only in higher cost of production but also contamination of fruits, of which affects us humans.

The present investigation entitled "Evaluation of a Parthenocarpic Cucumber Variety under protected structures" was conducted during the year 2024 (25th September to 3 December) under naturally ventilated polyhouse and shade net house conditions at the Research, Development and Innovation Centre, Central Farm. It is important to note that this type of cucumber seed was not readily available in the past, but suppliers are now importing and are

now accessible to farmers. The variety BRAGA F1 was the only variety available, hence it was utilized to carry out this project.

A total of 420 plants were transplanted under a Tropical Greenhouse using 2,520 square feet plot. During the evaluation four (4) harvests were completed at which fruits were randomly selected to record fruit characteristics. The objective of the project was to evaluate parthenocarpic cucumber varieties under a Tropical Greenhouse. The results of cucumbers had an average weight of 15.8 ounces, a length of 9.3 inches and a diameter of 2.2 inches. The yield per plant was averaged at 7.5 pounds, in total 2,145 pounds were harvested. The fruits were dark green and crisp, the skin was smooth, and this characteristic lasted for several days. The main diseases that affected the plants late in the production period were Cercospora, Mildew, and Corynespora. The high temperatures affected flower pollination and fruit set. No physiological disorders were seen such as blossom end rot or fruit cracking. The lowering and lean trellising method was utilized to grow the plants with a single stem, but it was labor intensive. A lot of information on crop management practices was gathered and will serve to improve on the implementation of another variety trial and to train farmers and technicians in this technology. Thes finding indicates that Parthenocarpic cucumber varieties can be grown under protective structures in Belize

The grape tomato is a small, oval-shaped variety of tomatoes that is known for its sweet flavor and firm texture. It is often confused with the cherry tomato, but grape tomatoes are typically smaller and have a more elongated shape. These tomatoes are popular in salads, snacks, and as a garnish due to their bite-sized nature and appealing appearance.

2.2. Production of Grape Variety Tomatoes under a Semi-Covered Tunnel Structure

The present investigation entitled “Production of Grape Variety Tomatoes under a Semi-Covered Tunnel Structure” used a prefabricated Taiwanese type of tunnel measuring 25 ft (W) x 60 ft (L) x 13 ft (H) with a total of 1500 square feet. This experimental trial was conducted from September to December 2024. The main objective of the project was to promote the use of protective structures to decrease crops losses due to the rain. It is in this period of the year that crop losses are experienced because of rainfall resulting in the excess of soil moisture and the propagation of fungal and bacterial diseases. The project also served to observe the performance of the cherry/grape varieties and record crop management practices. Observations made included days for flowering, fruiting and harvesting. Fruit characteristics were obtained by measuring fruit size and yield. Temperature and rainfall were recorded and obtained from the Central Farm Weather Station.

The three (3) varieties produced under the protective structure were Aria, Floridity and Tropical Ruby. There were no significant differences in days to flowering, fruiting and harvesting. The main harvest was completed on November 26, 2024. Plants grew vigorously reaching heights of over 6 feet. The varieties had similar average fruit weight (ounces), Aria .46, Floridity .48 and Tropical Ruby .41. The variety that had the longest fruit was Aria and Floridity had the widest fruits.

Tropical Ruby and Aria had a more elongated fruit shape as compared to Floridity. The variety with the highest plant yield in five harvests with 2.4 pounds was Tropical Ruby. This variety

also produced a high percentage of cracked fruits which decreased its total marketable weight harvested. The main pests encountered were mites and whiteflies, diseases such as Alternaria and Bacterial spots were also observed to affect all varieties.

During the trial, clinical observation indicated that no plants were lost due to the inclement weather experienced in the months of October and November of 2024. A total of 451.6 mm of rainfall was recorded in October and in November 249.1 mm, of which 56% of this rainfall was received in only three days. The amount of rainfall did not affect the plants under the protective structure. It was after the week of rainfall that farmers from all over the country experienced open field crop losses. The findings from this experience gathered in this project will be used to carry out other projects of similar objectives and a variety of trials.

2.3. Wheat Cultivation

On December 30, 2024, a wheat demonstration plot was established in Central Farm. Four beds were planted with wheat seeds provided by Mr. William Can, District Agriculture Coordinator, Cayo District. The seeds, a local variety, were sourced from Mr. Ben Friessen who is a wheat farmer from Lower Barton Creek. He shared two samples which had been harvested from the 2022/23 and 2023/24 cropping season. The wheat was planted in a field measuring 16 ft. wide by 90 ft. long (0.03 acres). The beds were constructed to be 3 ft. wide, 90 ft. long, and 1 ft. high, with 2 ft. spacing between them. Two rows per bed were manually planted, with seeds dribbled approximately 3 inches apart.

By January 3, 2025, wheat plants had begun to emerge. As this was the first instance of wheat cultivation in Central Farm and technical expertise on the crop was limited, crop nutrition, weed control, and pest management plans were developed based on information obtained online. Wheat nutrient requirements were identified as 155 lbs. N/acre, 62 lbs. P_2O_5/acre, and 36 lbs. K_2O/acre. A fertilization plan was created using granular fertilizers: 6 lbs. of 14-36-12, 10 lbs. of 46-0-0, and 1 lb. of 0-0-60 for the designated area. The thinning of seedlings was conducted on January 21, 2025, followed by the first application of 3 lbs. of 14-36-12 fertilizer on January 27, 2025. Crop growth and development as well as pests and diseases were closely monitored throughout the month.

2.4. Coconut Hybridization

The management of 10 acres of coconut gardens continued in 2024, which resulted in the production of >2000 MayPan seednuts (hybrids). To date the nursery has 959 hybrids seedlings that are ready for sales and 200 nuts in the germinating stage. In addition to hybrids nuts, Yellow Malayan dwarfs IYMD) and Panama Tall (PT) coconut were also produced. Replanting was done in Garden 6: 6 Brazilian Green. The team also fertilized Garden 2, of which consists of 576 plants of which were applied 3 lbs. to bearing trees and 2 lbs. to non-bearing trees and similar fertilizer regime to Garden 2, which consist of 135 trees.

An important activity also included the rehabilitation of the seed gardens, which entailed replanting and removal of overgrown and disease palm. Daily observations of the seed

gardens resulted in several trees tagged and removal due to pest and disease. Specifically, tree # 33, # 109, 68, and #125 YMD from seed garden 2.

In 2024, the RDIC conducted pollen viability using three different methods. These include the following:

- Conventional Oven (BAHA)
- Portable dryer (San Miguel)
- Air drying (C/Farm):

The test utilized 2% (2 grams) of 2,3,5-triphenyl tetrazolium chloride (TTC), with pollen grains placed on the substrate. After two hours, viable pollen was bright red, while non-viable pollen appeared white. Results indicated that the portable dryer at San Miguel Farm yielded the highest viability. A follow-up test will be conducted to validate findings and refine drying techniques at BAHA.

The Coconut Technical Team provided six (6) Panama Tall spathes for pollen extraction at San Miguel Farm, supporting one cycle of Maypan hybrid production, as requested by Manager Carlos Pinelo and approved by Mr. Hugh O'Brien.

2.5. Fruit Tree Section

The objective of this section is to support the cultivation of local and improved fruit tree varieties in Belize. The gene bank will play a key role in preserving genetic diversity, serving as a source of propagation material to produce and supply high-quality fruit trees. These will be grown under the best nursery management practices and offered at an affordable price. This section consists of the following:

a. Fruit Tree Nursery
b. Pitahaya Nursery
c. Pitahaya Germplasm

MAFSE has placed pitahaya as an important nontraditional fruit crop, thus the germplasm has been maintained with proper management for pests and disease and fertilization was conducted throughout the year. Below is the inventory of Pitahaya at the end of year 2024.

Variety	In Bags	Bareroot	Amount
Hawaiian Yellow (White pulp)	101	124	225
Local White (White pulp)	68	90	158
Purple Haze	74	129	203
Taiwanese Red	107	130	237

2.6. Soil Amendment Production

Approximately a total of 4,140 lbs. of compost, 383 lbs. vermi-compost and 200 lbs. of bokashi is available at the Organic Section. These nutrient rich soil amendments are mainly used for sales to the public and to support the mulching of fruit trees in the Agricultural Agrobiodiversity Plot and coconut palms in the germplasm bank. The compost produced was

used for the establishment of seedbeds, support to CDF project and for fertilization of pitahaya plants in the germplasm collection. The vermiculture system also produced Red California Earthworms that were sold to interested people (3lbs= $100.00).

The interest in organic soil amendment production has increased of late, which has resulted in several training courses being organized and facilitated both on station with 51 people being trained.

2.7. Agricultural Diversification Plot/Fruit Tree Germplasm Plot

The Instituto Nacional de Investigaciones Forestales y Agropecuarias (INIFAP) project aims to significantly improve sustainable farming practices in Belize, especially for coconut, soursop, and pitahaya (dragon fruit). By focusing on agroecological principles, these projects aim to integrate local resources, reduce chemical pesticide use, and enhance the overall health of the land, which can benefit both the environment and the community in the long term.

Key aspects include:

- Maximizing locally available resources: This ensures that the practices are adaptable and cost-effective for local farmers.
- Environmentally friendly practices: This involves techniques such as organic fertilization, mulching, and crop rotation, which promote healthy soils and reduce the environmental impact.
- Reducing synthetic pesticides: This is vital for consumer health and the biodiversity of surrounding ecosystems.
- Capacity-building and knowledge-sharing: Teaching farmers about agroecological methods will ensure that these practices are sustainable and scalable.

By improving soil health and encouraging natural pest control, these projects also aim to help farmers adapt to climate variability, something crucial in today's changing climate. Below are the following achievements by Mr. Ismael Garcia's Farm:

- Establishment of legumes to improve soil fertility and making of his own pesticides and bio-fertilizers.
- The pitahaya plants are in good health, indicating that the agronomic conditions (soil, climate, and management practices) are favorable. However, data collection has been delayed because not all plants designated for monitoring have reached the necessary maturity
- The demonstrative Soursop Plot is doing good so far with the good agronomic practices implemented despite irrigation being placed 6 months after.

2.8. Training and Workshops Conducted and Attended

The program was very active in 2024 in providing training to different beneficiaries' groups in a variety of training topics. A total of 495 people from different parts of the country participated in 10 training courses and these training benefited farmers, youngsters, school aged children, and extension officers. It is important to note that this does not include school

visits, which were exponential with an estimated 500 students and teachers who also benefited from RDIC.

2.9. Sales and Donations

The vegetable seedling nursery is a support to the Agronomy Section in Central Farm and to other projects. A total of 28,748 seedlings were produced to establish vegetable garden displays, for school projects and for sale. A total of 5,850 seedlings were sold at Central Farm producing and income of $2,261.55 this does not include the 7830 seedlings sold by the Ministry of Agriculture to the Public Service Union project. Donations of 6,065 seedlings were also made to schools, at fairs and support to the districts.

MAFSE also donated 150 white cassava cuttings and 50 Blue Bird cassava plants to Mr. Elsner Campos (DAC, Stann Creek District) and an additional 50 Blue Bird cassava plants to Mr. Lima, a farmer in the Cayo District. In addition, 1,300 Malayan Dwarf coconut seedlings were donated to the Northern Coconut Growers Cooperative of the Orange Walk District.

2.10. Free trees/Coconut/Seeds

In 2024 we saw an increase in sales of May-pan hybrid coconut in Central Farm. However, it is important to note that a larger number were donated to support the GEF6 project. This does not include donation to other organizations.

2.11. Out District Support

2.11.1. CDF and MAFSE

The Agronomy Program has completed the construction of an additional of six (6) Protective Cover Structures (17ft x 60ft), one in each district. These PS include 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 completed in 2024. The objective of the project is to enhance capacity building for farmers and extension officers in the management of crops under this system. Note that these beneficiaries of the project include women, youths, and men. A Technical Manual was also produced on the Management of Protected Structures.

A signing of the Memorandum of Understanding was a copy was kept by the beneficiary and the other by the Ministry of Agriculture. (Figure 1).

2.11.2. Capacity Building

A four-day training course from February 6th to 9 th. 2024, was conducted along with other Extension Officers of the MAFSE, of which include Mr. Harold Wesby, Mr. Amir Pulido & Mr. Alberto Gutierrez. Other facilitators included Mr. Gumercindo Mai from BAHA, Mr. Selvin Molina and Mr. Nonato Canto from the Pesticide Control Board (PCB), Mr. William Can DAC Cayo and Mr. Sergio Fuentes of the Sembrando Vida Project.

A total of 25 technicians from the MAFSE and other institutions such as the University of Belize, SIRDI, BAHA participated. The training included theoretical and practical sessions held at the Research Development & Innovation Center (RDIC). The technicians had the opportunity to learn many topics in vegetable production under protective structures such as selecting the location to build a protective structure, land

preparation, fertilization, irrigation, crop management practices, Integrated Pest Management, safe use and handling and application of pesticides and record keeping. At the end of the training the participants received a certificate of participation. A manual on the production of vegetables was also completed with the contributions of other technical authors.

2.12. World Food Day 2024

Research Development & Innovation Center (RDIC)
Preparations for the establishment of the World Food Day vegetable garden display began in the first week of August 2024. A plot design was completed and land and plot preparation initiated. The plot number 2 which measured 180 feet by 90 feet, was harrowed and prepared for planting. A total of 3,200 seeds of crops were sown to establish the garden (String beans, hot pepper, sweet pepper, cayenne, eggplant, tomato, cherry tomato, cabbage, cucumber, lettuce, Pak choy, zucchini, mesclun mix, Chinese cabbage, green onion). The establishment of the plot was a challenge as there were high temperatures along with limited water that affected the newly transplanted seedlings. The area where the leafy vegetables had to be covered with shade cloth. On World Food Day, the visitors to the garden were given seedlings of sweet pepper, tomato, cabbage, cucumber, leaf lettuce.

2.13. National Agriculture & Trade Show
The National Agriculture Trade Show was held on the last week of April 2024. Work started in late January of 2024, a plan was developed and submitted for funding. Land preparation of a 75 feet wide and 50 feet long plot was completed and transplanting of seedlings commenced in mid-February, the planting was completed in the first week of April 2024. The urban garden was also modified, and different crops were planted for display.

2.14. External Projects: Soil Care Project Phase I.
A total of 60,000.00 BZE is available for the intervention site in the northern belt (Patchakan and Libertad). These monies will be made available to SIRDI as the Managing Director. Mr. Osorio has experience with project funds. However, for disbursement of funds a concept paper will be required. Recommendations are to focus on the women and youth, thus focusing on existing fruit tree nurseries or new ones etc.

REPORT: SOIL LAB ASSESSMENT: This report stems from a visit to the Sugar Industry Research and Development Institute (SIRDI) in Corozal, Belize, by Dr. Gaius Eudoxie and Ms. Deneil Lara, from the 15 - 19th December 2024. The purpose of the visit was to assist SIRDI in identifying which tests can be conducted using equipment provided under the IAEA and SOILCARE projects and to advise on establishing a functional soil laboratory.

Key findings:
- SIRDI has the potential to conduct pH, EC, and bulk density analyses.
- Significant gaps exist in equipment and reagents for other essential tests and exchangeable cations/micronutrients.
- The current main building has sufficient space for a lab, but renovations are needed.

- Key concerns: Electrical requirements, lighting, and hard water supply.

Recommendations:

- Prioritize procurement of missing equipment and reagents.
- Address infrastructural concerns (renovations, electricity, water).
- Develop a capacity-building program for lab personnel.
- Seek technical support from regional or international institutions. (University of Belize and CARSOLAN etc).

Soil Sampling

The 355 soil samples have been processed and will be shipped to UWI for analysis. The Soil Care Project is seeking to integrate the Soil Doctor Program, this sensitization is currently being done across other countries. Mr. Trevor Thomson, Project Coordinator provided an update on the Draft lab SOPs, Belize Draft Land Policy, thus focusing on natural Agriculture Production and mapping.

Mr. David Fredrick of CARSOLAN also provided an update which includes establishing a soil laboratory network, SOPs in all laboratories and minimizing the use of pesticides. Lastly, FAO representatives were also present in the meeting, thus focusing on the role of Focal Points to the GSP and to Latin American and the Caribbean Soil Partnership (ASLAC). Nominations should be made by members countries.

2.15. IAEA- MAFSE

The International Energy Agency (IAEA) Project Number: BZE5012 “Use of Nuclear and Isotopic Technique for Optimizing Soil-Water-Nutrient Management in Rainfed Aquaculture Systems” contributed to the SDG 02- End hunger, achieve food security and improve nutrition and promote sustainable agriculture.

The project objective is to contribute to improved productivity of crops and reduce the impact of agro-contaminants on the environment. Below are the following activities that were accomplished:

1. A total of 35 technical people trained. This includes individuals from the Ministry of Agriculture, Sugar Industry Research and Development Institute (SIRDI), Caribbean Agricultural Research and Development Institute (CARDI), University of Belize and the Grain Producers. Expert mission on fusarium sugarcane was requested and is scheduled to take place in October 2025.

2. All laboratory equipment has been received, and an assessment of the facility has been completed. A total of 6 months is required to modify the infrastructure at SIRDI for it to be adequate to host the laboratory, provided resources are available. A total of three (3) technicians attended a scientific visit to an advanced laboratory to learn Soil and Nutrient Analysis. The team had the opportunity to conduct soil sampling with treatments and the

use of recommended sampling tools and techniques. Sampling analysis was conducted for EC, pH, Soil organic matter, soil organic carbon, secondary micronutrient and macro nutrient.

3. Procurement of 2 kg of N15 isotope fertilizers for field demonstration procured and delivered. MAFSE, SIRDI and CARDI have established field trials using the field protocols (sugarcane, corn and soybean) that were completed by the expert and the stakeholders. The weather delayed the implementation of the trial; however, all has been completed. The farm field days are still set to take place at the end of the project.

4. EVT2405343: Expert Mission to Assess and Provide Guidance in the Use of Nitrogen-15 Stable Isotope was implemented. The objective of the mission was to establish field protocols for the Sugarcane trail at SIRDI experimental station in Corozal District, Soybean trail at CARDI, Central Farm, Cayo District and for the Corn Trial at Central Farm, Cayo District. All experiments were established this month in January 2025. Data collection and sharing of information is done on a timely basis to ensure that reporting and knowledge transfer and capacity building are shared among stakeholders.

4. Once the research trial for 15N on Soybean, corn and sugarcane has been completed, it will provide useful information regarding N behavior and allow for improved management. Farmers will have the opportunity to maximize their production and at the same time safeguarding the environment (minimal contaminants). At the start of the project, the technology had not been implemented in Belize. By the end of the project, it is expected that at least 20% of fertilizers will be saved for 3 sugar cane farmers and one corn producer. This outcome will only be completed once the farm field days take place.

2.16. Peru Potato Project

The Governments of Peru and Belize established an International Technical Assistance Agreement on Agriculture for potato and vegetable. Within the framework of Belize's request for technical assistance to strengthen value chains for the above-mentioned agricultural products. The project name “titled "Fortalecimiento de la cadena de valor de la papa y hortalizas en Belice”. As per agreement the training modules included Harvesting, Post harvest, Marketing, Added Value and Consumption Promotion.

The exchange visit of the Peruvian team, led by Ing. Flavia Felix Huanca was from the 5th-10th May 2024. The targeted areas were Cayo, Orange Walk and Corozal District, of which training took place to enhance Belize’s Agriculture Practices. The collaboration focused on addressing technological demands and limitations in Belize's potato production sector. Below are some of the recommendations:

- Farmers with experience in potato production and integrate pest management.
- Organic fertilizers, analysis, soil management and nutrition, crop management and health.
- Requirements for extension, rural development and agricultural technology transfer methodologies.

- Production and storage technologies. In addition, must include Cost of Production.
- Soil fertility analysis, to identify what nutrient is missing, and which amendment needs to be incorporated.
- Practice crop rotation to break the biological cycle of pests and diseases.
- Produce seed. Identify areas and fields for seed production. Propose rules or policies that allow the production of seeds of new varieties that generate and need, with tolerance to climate change.

2.16.1. Potato Invitro Project

Fifteen (15) varieties imported on May 17, 2024, were P5PAD, P514, 13RHM8, V9NBC, 18X8H2, 18WOF7, 18WRIN, 18W5BQ, 18W5J, V9MPW, CIP, 18WRAY, 18WR3Q, VPMNV, and 18WQPA. These were taken to the UB Tissue Culture Laboratory on May 20, 2024. Below are the activities that took place thereafter:

- On July 11, 2024, at the Tissue Culture Lab, 14 invitro potato clones were moved from cold storage (19°C, 34% humidity) to a warmer room (23°C) for gradual acclimatization ahead of transplanting.
- On July 16, 2024, 13 clones were transplanted into pots filled with germinating mix and placed in the Vegetable Nursery. Fungicide (Python) was applied on July 17. These plants did not survive due to high heat temperatures, therefore; based on ROC expert advice, two jars (two clones) were moved to the banana multiplication nursery for observation. Weekly monitoring will determine if hardening protocol adjustments are needed.
- After two weeks of hardening, Mr. Miguel Wang demonstrated the application of Vandozeb fungicide as a preventative fungicide to protect hardened clones during the transplanting into soil medium.
- Transplanted plants were placed in a conditioning area in the banana nursery and adaptation results were successful and in early October, the transplanting of potato invitro plants into pots.
- On September 13, 2024, 14 in vitro potato varieties from the Tissue Culture Lab were moved to the banana nursery for hardening; one variety did not survive.
- On December 10, 2024, the potted invitro potato plants were relocated from the Banana Nursery to the Protected Structure and transplanted into larger planting pots on December 13, 2024. Prior to this, a soil medium was prepared using 900 lbs. of soil, 135 lbs. of compost, 40 lbs. of rice hull, and 25 lbs. of sawdust. Older plants were fertilizer with 1 oz of granular fertilizer 18-18-18.
- Mass multiplication continues for 14 out of 15 potato clones.

2.17. Global Environment Facility (GEF)

Project Title: “Integrated Management of Production Landscapes to deliver multiple global environmental benefits”. The project objectives are to mainstream biodiversity conservation and sustainable land/water management as well as the use of integrated landscape/ watershed approach that will allow combining sustainable production of key agricultural and forest products and conservation practices in productive landscapes in Belize. Below are following activities that were accomplished in 2024.

The technical team at Central Farm established a Nursery expansion 48 ft. x 48 ft., and three (3) germinating boxes. The purpose allows for an increase in the stocking of assorted trees and provides an adequate space for seed germinating and seedling establishments. In addition to that the nursery expansion also includes netting, synthetic mulch and irrigation. In addition to that the Team at Central Farm also constructed a shed expansion of 18 ft. x 20 ft with a chain link fencing, cement flooring and picnic table (2). The purpose serves as an area to conduct training in nursery management (fruit trees, coconut, pitahaya). Training areas include plant propagation techniques and management - crop nutrition, pest and disease control as well as orchard management of assorted fruit trees.

2.17.1. Distribution of Planting material:

A total of 3,606 assorted fruit trees, timber agroforestry and other tree species (Jan 25) and 180 coconut trees were distributed in Cayo and Belize District. In addition, to that a total 1,250 cassava and 1,440 sweet potato cuttings was provided for training in Belize District.

2.18. FOC TR4 Banana

From June 22–26, 2024, several activities were conducted in preparation for and during the FOC TR4 event. The Agronomy Team supported the preparation of the logistics for the Simulation in coordination with BAHA, OIRSA, ICDF, and MAFSE. The team also coordinated with the Agro-processing Unit for value addition of banana products (dehydrated, flour, chips) and prepared banana muffins and cakes. A final discussion was conducted at the Banana Growers Association (BGA), Stann Creek, to discuss the findings of the Taiwan Space Agency, which is currently being used to fight Banana Disease with Satellite Technology.

While this a milestone for Belize, it serves as a preventative measure in the event of an outbreak of TR4. The pilot study of TASA at BGA proved to be very effective to a certain extent as the system can alert the experts on certain parameters or suspects cases. In the future we are hoping to extend the coverage of monitoring not only to banana but to also include sugarcane.

2.19. JICA-MAFSE

The collaboration between The Japan International Cooperation Agency (JICA) and the Ministry of Agriculture in Belize is a great example of how international partnerships can directly support local farming communities. By focusing on dragon fruit (pitahaya) cultivation, JICA's initiative helps farmers improve both the quality and efficiency of their operations, ultimately increasing profitability. Here's how the project is structured:

1. Training Sessions for Farmers: 82 farmers benefited from these trainings. These farmers had the opportunity to learn about pruning, pest and disease management, and nutrient application, thus leading to higher yields and healthier crops.

2. Pitahaya Cuttings Donation: 996 high quality pitahaya cuttings were donated to farmers from Yo Creek, Orange Walk and Central Farm, which total to value of $2,988.00. This aligns with the larger goal of improving fruit quality and maximizing production.

3. Cost of Production Analysis: This analysis is a crucial component of the project, as it gives farmers and stakeholders a clear picture of the financial aspects of pitahaya farming. Understanding costs, labour requirements, and potential market returns helps farmers make informed decisions about their investments and operations. (see annex 1).

4. Market and Supply Chain Development: JICA's efforts in fostering discussions with stakeholders, farmers, and business partners around market opportunities and supply chain development are key to ensuring that farmers can access fair markets and achieve higher profitability. By positioning Belize as a competitive player in the regional and international dragon fruit markets, the project also contributes to the country's agricultural diversification. Recently, BMDC has been buying pitahaya from the farmers and adding value.

5. Coconut: On June 5, 2024, A visit was conducted by Ms. Teresita Balan, Agronomist I to Mr. Ismael Garcia's farm in Yalbac Village, Cayo District to discuss the continuation of the INIFAP Coconut Demo Plot. Due to fire containment efforts around the perimeter of the farm, the workers were unavailable, requiring a follow-up visit. Field observations revealed a significant decline in seed nut production and the spread of Red Ring Disease, caused by elevated temperatures and poor orchard management. Recommendations based on field observations include the following:

a. Replacing pheromone and molasses bait for coconut weevil control.
b. Implementing phytosanitary measures, including the burning of infected palms to limit disease spread.
c. Clearing dry coconut leaves and using them for mulching.
d. Harvesting leucaena pods and pruning trees before the rainy season.
e. Replanting missing areas with Mexican sunflower cuttings.
f. Removing four diseased palms from the field.
g. Conducting manual or mechanical cleaning of the orchard prior to the rainy season facilitate sunflower planting.

3.14 Supplies Control Unit

The rising cost of living and its effect of eroding buying power of consumers has been a key priority for SCU since 2022. The government of Belize decided to expand the list of goods subject to price regulation in late 2023. In addition, amendments were made to the Supplies Control Act to allow for violation to be resolved through ticketing. These amendments have resulted in a significant expansion in the number of violations addressed by the Unit. Between 2009 and 2023 only 14 matters had been addressed. Since the amendments were passed 153 violations have been dealt with by the Unit. In addition, 2024 saw the first intervention by the Unit at the wholesale segment of the supply chain. This has provided insights into the activities of this sector and has prompted the unit to expand monitoring to the importation sector as well. The SCU also developed a training package to train residents

of San Pedro and Caye Caulker. The municipal authorities have requested that residents be trained and empowered to do enforcement work in times of emergency (hurricane threats). The SCU plans to have people trained in May in preparation for the next hurricane season.

Providing space for local producers to compete remains a priority for the MAFSE. This is in line with efforts to encourage Belizeans to consume more of what they produce and produce more of what they consume. A major issue has been the fact that often, the items imported do not match the specifications or volumes approved by the unit. These violations have caused the unit to intervene at points of entry to carry out enforcement actions. The major product categories affected are grains, dairy, meat and processed meat products (frozen and processed), aerated beverages and brewery products.

3.15 Traditional Exports

The traditional export sub sector's main objective was to improve the competitiveness of the export commodities along the value chain to satisfy the domestic market, national food security and generate foreign exchange earnings and employment. The traditional export commodities included sugar, banana and citrus.

Sugar production experienced an increase of seven percent (7%) whereas sugar cane delivered to sugar mills experienced an increase of thirteen-point nine seven percent (13.97%) in 2024, compared with 2023. Sugarcane delivered increased from 1.488 million metric tonnes to 1.669 million metric tonnes and sugar production increased from 146,402 metric tonnes to 156,683 metric tonnes. The increase was attributed primarily to an increase in production in western Belize. Harvested acreage increased by six-point three percent (6.33%) from 96,630 acres to 102,751 acres.

Banana exports increased significantly by twenty-six-point three seven percent (26.37%) from 3.64 million boxes in 2023 to 4.60 million boxes in 2024. Acreage under cultivation increased by four-point zero three percent (4.03%) from 7,077 acres in 2023 to 7,283 acres in 2024. Yields recovered due to improved fertilization, disease management and irrigation as well as better weather conditions. Input availability and application as well as credit availability were important for the recovery of the industry.

Citrus production and fruit delivery to the main processing plant at Citrus Products of Belize Limited (CPBL) experienced a slight recovery due to new orchards increasing their productivity. Orange deliveries increased by fifteen-point three eight percent (15.38%) from 0.273 million boxes in 2023 to 0.315 million boxes in 2024. The harvested acreage remained at 15,000 acres. Grapefruit deliveries decreased by thirty-three-point five eight percent (33.58%) from 61,533 boxes in 2023 to 40,880 boxes in 2024. Grapefruit acreage that was harvested remained at 1,200. Limited labour availability to reap oranges and grapefruit contributed to fruit loss and a reduction of fruit harvested and delivered to the factory.

CPBL continues to maintain faith in the recovery of the industry and therefore continues to plant HLB tolerant varieties. The new HLB tolerant groves which were planted appear to be growing well and are expected to perform better than the traditional varieties. There are high expectations that these new varieties with sound management practices can increase production and assist with the revitalization of the citrus industry while diversifying into other crops such as coconut, soursop and pineapple continues. Annex 3 has detailed production information.

#planBelize contemplated providing support to the traditional export subsector to make them more competitive, viable and resilient to climate change. In the sugar cane industry, GOB approved a Commission of Inquiry into the sugar cane industry in 2024. An independent team comprised of experts from Mauritius, South Africa and England conducted the inquiry. All stakeholders involved in Belize's sugar cane industry participated. Citrus and sugar cane farmers benefited from 2 million dollars' worth of fertilizers granted by the Government of Belize to assist with recovery efforts.

4. Lessons Learnt

1. **Preparedness:** Planning and preparation are crucial to the proper management of pests and disease. A devastating pest can invade our agroecosystem when surveillance and diagnostic tools are not prepared. *Fusarium spp.* infestations in sugarcane did not raise the minimum alerts before invading the industry in the north, compromising the future of the sector. In contrast, the 48-year-old med-fly program has consistently succeeded at maintaining the country free. Likewise, our response to NWS continues to be highlighted by the region as effective, particularly since we lack access to the sole eradication method, sterile flies. These examples highlight the importance of planning, preparation and surveillance in managing biosecurity risks.

2. **Education, Sensitization, Partnerships:** The education, sensitization and partnerships we develop with stakeholders are important as we continue to mitigate threats of new, emerging and re-emerging pests and diseases. The lesson here is that when we arm our stakeholders and partners with education and information, the sector benefits from the intervention.

3. There is a need to **increase stakeholder engagement** in food safety and animal and plant health programs, provide training opportunities for the private sector and more tailored plans for the public sector. Some stakeholders are unaware of some portions of the mandate of BAHA and have unfair expectations of a small authority, with significant responsibilities and tight budgets.

4. **School Gardens**: There is a strong need to build capacity with teachers who are not trained in agriculture. Most teachers are just assigned this responsibility without any formal training in the subject area. Extension officers end up training the teachers while also conducting school gardening activities at the schools, which places a burden on the time they spend in the schools and constrains the delivery of services to the schools.

5. **Vegetable Production Calendar**: This activity continues to pose a major challenge for the extension service. The focal point (Mr. William Can) has introduced a calendarized system to provide planting and harvesting accuracy to meet demand, but some farmers are not adhering to the agreement. There are several reasons why some farmers plant before or after schedule with respect to weather conditions at the stipulated time for planting. This also creates havoc for harvesting time since it creates a bumper crop that floods the market. Farmers usually face losses with carrots and onions especially, since these commodities are planted within a small window of time. If one community plants in tandem with another community then the harvesting will be at the same time as well. The Belizean market is small and can only absorb a small amount of each commodity at a given time. The extension service will continue to work to improve the planting schedule.

6. **Screwworm Eradication Program**: Meticulous planning and community cooperation to deal with this epidemic are of vital importance. The screwworm, a parasitic larva, that infests warm-blooded animals, can cause severe damage to livestock and wildlife if left uncontrolled. Extension officers have been on the forefront in the fight to control and eradicate the NWS since its inception in Belize on the 26th of December 2024. Officers were deployed to the Toledo District on the 2nd of January and are still on the ground along with BAHA. This program has caused a strain on the limited human resources available at the district level. The livestock extension officers go for a whole month at a time which leaves their normal client farmers unattended for that period. This mandate continues to prove difficult and will remain difficult until officers are able to tackle NSW at their own district level.

7. **Workplan synchronization:** The establishment of a newly re-organized and dynamic team requires a detailed weekly work plan instead of a trimester work plan. There are too many activities happening within a short time, and this serves as a weekly guide to ensure that the Policy Units' activities are fully monitored and evaluated. Another area that has been identified is the establishment of a staff bi-monthly planning meeting to get updates on all project and internal activities. This would allow for better workflow and allow officers to discuss bottlenecks, which can be addressed more effectively. It is also important for extension officers to buy in to details in workplans as they usually end being the executing body.

8. **Project Implementation**: Prior procurement of materials needed for project implementation after consultation officers in the field is a must. This allows for faster returns on procurement and response time to certain technical queries. The CRESAP project has been keeping the unit behind over the past 3 years because it cannot procure phones and motorcycles for data collectors. These items and materials should be deemed important, especially when projects are being implemented. CRESAP should procure equipment and materials beforehand to avoid delays in data collection.

5. Future Priorities and Plans

1. **Governance:** Establishment of a governance structure for the climate-resilient beef value chain in Belize, led by MAFSE and BLPA, to ensure sector compliance with national commitments related to environmental, climate, and commercial objectives. This structure will support training, technical assistance, processing, market development, and domestic and international commercialization (breeding, development, and fattening policies). Additionally, it will facilitate the development of a genetic improvement program and a comprehensive animal health program.

2. **Financing:** Financial support and access to credit, providing financial facilities for farmers to adopt climate-resilient practices that intensify production, retain breeding females to grow the national herd, reduce the sale of young animals, acquire genetic material to enhance the herd, implement required sanitary management practices, and enable potential carbon credit sales to international organizations and companies.

3. **Incentives:** Tax reductions to lower costs of genetic improvement, easing the import costs of semen, embryos, and in vitro procedures, fostering genetic improvement of the national herd. Implementing a Responsible Business Alliance (RBA) mechanism should be considered, to recognize such investments as deductible from income tax or offering partial reimbursements upon verification of their implementation. Define an allowable expansion limit to meet a projected 10–20-year demand and thereafter limit agricultural expansion by restricting the expansion of agricultural lands and intensifying production within existing areas through climate-resilient practices and financial incentives for protecting designated areas. This involves assessing the effectiveness of current environmental and sustainability laws to prevent land-use change, curb expansion, and promote natural regeneration and reforestation through sustainable livestock systems.

4. **MRV and traceability:** Technological support and strengthening of the animal traceability system, enhancing BLPA's system to support herd growth strategies, market supply control, genetic improvement programs with quality animals adapted to climate variability and market demands, and comprehensive sanitary management practices. This

system would manage the national herd as a unified entity. In addition, creation of transparent market control mechanisms, and development of traceability tools to regulate market fluctuations, including transport permit quotas, differentiated tariffs based on animal weight, transport moratoriums, and public auction sales management.

5. **Trade agreements:** Review of trade agreements with Guatemala and Mexico to assess the benefits of Belize's trade agreements and define quotas, closed seasons, or control mechanisms that enable producers to participate in the fattening stages and generate higher weight gains.

6. **New World Screwworm**: Continued execution of the national control program for New World Screwworm, with an emphasis on eradication and surveillance for pets and humans. The southern areas of the country seem to be most affected by cases in both livestock and pets, so action plans to address pet infections and emphasizing the One Health approach are important.

8. **Communications materials/ communications campaigns on regional diseases and invasive species**: In collaboration with its international partners and stakeholders, such as OIRSA, IICA, and FAO, MAFSE will continue its efforts to prepare and distribute publicity and awareness materials for risks/diseases found in the region. Currently excellent communication lines exist with these agencies to address epidemics such as the New World Screwworm, and we will continue taking advantage of the collaboration with these agencies to protect our national borders. These diseases include TR4 in bananas and invasive species such as the Giant African Snail.
9.
10. **Re-accreditation of the Polymerase Chain Reaction (PCR) laboratory**: The viability of our terrestrial and aquatic species is of vital importance to our farmers and fisherfolk. Work will continue on the re-accreditation of the Polymerase Chain Reaction lab to ensure global standards in processing samples from aquatic species in Belize.

11. **Animal Health Department Restructuring**: Finalize the restructuring of the Animal Health Department for improved workload management, efficiency and effectiveness. This keeps in mind the demands placed specifically on animal health with the incursion of screwworm, for instance. Along with eradication campaigns for pests such as screwworm, surveillance of diseases such as avian influenza, which can lead to significant mortality in chickens, is of vital importance.

12. **Fusarium in sugar cane and Citrus replanting program**: Currently the sugar industry in the north faces tremendous challenges with the Fusarium disease that has spread over all areas of the northern sugar producing belt. MAFSE will aggressively seek to provide technical assistance and support to SIRDI to provide capacity building to address the problems of replanting fields and changing agricultural practices to ensure better species and new approaches to cane planting and harvesting.

6. Staffing and Budgeting Considerations

The current staff levels are inadequate if the Supplies Control Unit is to expand its operations. In this regard, the government has approved 6 additional staff for the Unit. At present, office space and equipment have been identified and secured for offices in Independence village (southern zone) and Orange Walk town (northern zone). This expanded presence will be key in allowing the unit to deliver services to the public.

The Standards Unit of BBS continues to experience a significant surge in workload due to rising demands for the development of new standards which requires technical committee coordination and stakeholder engagement to ensure transparency and openness in the standards development process. This increase necessitates the recruitment of additional Standards Officers to manage growing responsibilities effectively.

The Compliance Unit operates with only three field officers, one of whom is set to retire in the second quarter of FY 2025-2026. The Unit's mandate is vast and technical, requiring highly trained personnel. New staff must undergo specialized training, which is currently unavailable in Belize and must be sourced internationally, posing both logistical and financial challenges.

Given the training gap, there is a critical opportunity to expand technical and vocational education under the *Education, Culture, Science and Technology* priority of Plan Belize 2.0. Establishing in-country metrology training would reduce future government expenses and ensure a sustainable talent pipeline for the Bureau.

Despite continuous professional development and certification efforts by staff, there are currently no upward mobility or promotion pathways within the Department. This affects staff morale and long-term retention of trained personnel.

While provisions for the calibration and procurement of metrology equipment are included in the Bureau’s annual budget, the allocation granted annually remains significantly below the operational needs of the department. This financial shortfall directly impacts the Bureau’s ability to perform timely and traceable calibrations, an essential requirement for providing internationally recognized services to industry stakeholders across critical sectors such as agriculture, manufacturing, and health. Calibration is not a one-time expense, but a continuous process required to maintain the accuracy, reliability, and international recognition of the Bureau’s measurement standards. For example, specialized equipment such as Special Platinum Resistance Thermometers (SPRTs) and high-precision mass standards must be calibrated at internationally accredited laboratories, often at high cost. When budgets are limited, critical calibration activities are delayed or deferred, which compromises the Bureau’s capacity to meet stakeholder needs, weakens trade assurance,

and threatens the reliability of measurements used in commerce and regulatory enforcement.

In recent years, BBS has heavily depended on external funding from development partners such as the Caribbean Development Bank (CDB) and the European Union (via the 11th EDF) to bridge this gap. Through these partnerships, the Bureau has been able to procure key equipment and reference standards critical to the National Quality Infrastructure (NQI). However, such project-based support is not always timely, predictable, or sustainable, creating operational bottlenecks when urgent needs arise.

To reduce reliance on external sources and enhance the Bureau's long-term capacity, it is essential to increase the national budget allocation for calibration and procurement of equipment. So doing, would:

- Ensure timely calibration of metrology instruments, supporting uninterrupted and internationally accepted traceability chains.

- Strengthen Belize's industrial competitiveness by ensuring local stakeholders have access to cost-effective and credible metrology services.

- Improve service delivery across sectors, especially in agriculture, where reliable measurements are tied to fair trade and farmer payments (e.g., weighbridge calibrations in sugar production).

- Support Plan Belize 2.0 goals of expanding private enterprise profits, facilitating trade, and reducing technical barriers to export.

An increased and dedicated budgetary allocation would also allow the BBS to proactively plan for future services, diversify into new areas such as temperature and volume metrology, and build greater institutional resilience, ultimately positioning Belize as a regional leader in quality infrastructure.

The **Extension Service** is highly understaffed. After a clear analysis of the unit, it can clearly be concluded that each district should be staffed with a minimum of six officers instead of the four that is currently the case. The additional staff would complement all that is required from the extension service. This is especially important since Extension Officers (E. O.s) are directly engaged with and are mandated to assist farmers in improving their production practices with the goal of increasing yields and productivity, which contributes to food security and financial gains for small and medium-sized farmers. The extension service faces funding challenges daily since most outreach relies on the availability of both financial and material resources. This limitation has caused understaffing, inadequate mobility,

insufficient training, and most of all, a lack of technical development from the officers to deliver knowledge and technology to farmers. This can be reversed with a higher budgetary allocation to the extension service and an increase in staffing at each district office.

7. Conclusions and Recommendations

The extension service of the MAFSE has been in existence from the inception and has only improved with time. The details listed above are mainly to improve the extension service to better serve the farmers of Belize. The MAFSE has the human resources and technical capabilities but in limited quantities, given the huge mandate of the extension service, both financial and physical resources are deserving of an increase. The improvement and modernization of the extension service will have a trickle-down effect which can eventually benefit upward for 50,000 Belizeans which includes farmers and their families, students and teachers. The extension service is so important for farmers who are struggling to keep up with the ever-changing climate variabilities and new pests and diseases that they face on a regular basis thus the need to train officers to be able to deliver on the shortfall of the farmers.

Belize has many small cattle producers. This diversity leads to non-standardized practices across the country, making it difficult to foster efficiency and productivity. Countries with similar challenges have implemented Uruguay´s Cattle Farming Model, managing the national herd as “one big farm.”

Most farmers utilize at least one sustainable production practice, typically basic rotational pasture activities. However, these isolated practices do not guarantee full protection of soil nutrients, water sources, or forest protection. For example, while some farmers engage in reforestation, the introduced species do not always contribute to long-term ecological restoration or efficiency.

Farmers sell their cattle before the animals reach an optimal weight for slaughtering. By selling young animals, they lose the opportunity to maximize weight potential and contribute to herd growth. This happens because there is a market that offers readily available incentives (Guatemalan buyers) with low risk and easy short-term earnings to farmers but also because there is a financial need especially among small farmers.

Selling young animals hinders the growth of the national cattle inventory. This limits the development of new markets and opportunities to improve the herd's genetic material.

There is a cyclical issue between production and market demands. Young animals are sold to meet the needs of existing markets, but the national herd cannot grow fast enough to keep up with market demand.

Veterinarian support and adequate management of vaccination and preventive health programs are rare in Belize. Additionally, importing high-quality genetic material from South America is both complex and costly.

At the national level, BLPA should encourage the adoption of standard practices to implement the “one big farm” model to improve efficiency, integrate technology, CSA practices and provide extension technical services. This model could also support Belize in seeking an international certification to verify the quality and advancement of the country's cattle sector. Specific proposals would include the following:

- Develop agricultural extension models that provide producers with access to genetic resources and "leasing" arrangements for breeding animals, with the commitment to keeping young animals to grow the national herd.
- Implement policies and training programs that promote and support beef exports to Mexico, which requires heavier animals. This would require producers to keep their animals for longer, choose those that will be used for herd growth, and ultimately achieve a higher return on investment for each animal sold.

- Develop a comprehensive technical package and training programs, supported by systematic extension activities in CSA practices. For example, guiding farmers on which species to plant, protect the agricultural frontier, and adapt to climate change, focusing on using endemic varieties and promoting practices that strengthen intensive rotational pasture activities. This approach will allow for more animals to be raised on the same land, effectively increasing herd sizes. Moreover, farmers should implement a comprehensive package of sustainable practices tailored to their specific circumstances, considering factors like land extension, topography, soil condition, etc. A clear step-by-step guide should be provided, outlining what to implement first and how to progress with integrated practices over time. This strategy will enable more integrated smart agricultural practices that will contribute to climate adaptation, enhance environmental protection, and increase productivity. These guidelines should be developed collaboratively by BLPA jointly and the Ministry of Agriculture, with incentives to encourage farmers to adopt these practices.

- Provide educational programs for farmers and incentivize the enhancement of herd management practices according to technical guidelines. This program should include practices to help farmers to improve cow and heifer supplementation, improve the reproductive rate, keep the correct number of animals available for restocking and teach them how to raise them to an adequate weight before selling (including potential financial benefits). These programs must also be linked with appropriate sustainable practices to foster intensive management to gain weight more efficiently.

- Organize and provide veterinary control and extension services to farmers. BLPA should also work with government authorities to simplify the import process for high-quality genetic material to improve the national herd.

BLPA and local veterinary science universities should establish partnerships with institutions in Mexico, the U.S., and Canada to explore funding for scholarships and develop joint programs. These partnerships could include student and faculty exchanges and the

integration of "social service" requirements, where students provide supervised services to the industry as part of their academic programs and graduation requirements. For foreign students, the incentive would be not only the opportunity to spend time in Belize but also to gain direct industry experience while subsidizing their education.

The recommended effort to retain female cattle in the national herd, aimed at expanding the country's production capacity, should be complemented by the introduction of climate-resilient breeds. These breeds must align with potential markets to enhance producers' incomes effectively. Another recommendation in this effort could be to establish a financing support mechanism to: 1) on-lend the value of its intended sales of young heifers, and 2) allow BLPA to purchase heifers and sell them to farmers who can rear them and put them into production.

It is necessary to implement an MRV and traceability system that enables the Government and BLPA to monitor the implementation of CSA practices on farms, ensuring their impact on sustainable compliance and reducing potential risks.

BMDC continues to align its vision and operations with MAFSE's mission to develop resilient agri-food systems. The corporation has made significant strides in processing, packaging, and distribution while providing critical support to small producers. The BMDC intends to continue strategic investments in processing, packaging, and cold storage, expand training for both staff and farmer groups, prioritize development of export-ready products and strengthen value chains through digital tools like Agrilinks.

With continued leadership and investment, BMDC will further enhance its impact—reducing food losses, supporting rural livelihoods, and promoting Belize's agricultural products both locally and internationally.

The Policy and Statistics Unit is fully operational, and the team is motivated to ensure that all work related to the unit is achieved as stipulated in plan Belize and the National Food and Agriculture Policy. The Unit is also proud to highlight achievements of its reporting mechanisms to the CARICOM secretariat, SECAC secretariat and other regional partners such as the FAO. It is also expected that the unit will be more aligned with the completion of staffing including the return of the Policy Analyst and hiring of the Statistical Officer. The unit is also actively engaged in trying to get additional project support that can address the needs of the unit. Realizing that projects, policy and strategies of MAFSE need reliable data is also an opportunity to focus on prioritizing the Policy and Statistics unit by providing additional resources. The unit is optimistic that additional technical assistance, project support and GOB support will be provided to ensure that the unit remains relevant within MAFSE considering the importance of data and information.

The new plans of MAFSE for future activities are aligned with the goals of the Policy and Statistics Unit. The unit is also hopeful that it can be involved in the future development of the budget since it is only the unit that can determine where the priority needs are. In 2025 the unit will start planning its 2031 agriculture census and thus require all the support needed

from the PEU and management. This venture will be in close collaboration with Extension, the Statistics Institute of Belize and Enumerators.

The unit also plans to develop course materials for data analysis and reporting. Likewise, training materials in data collection and reporting. The unit is also in need of data analytics and statistics courses to build internal capacity. It is expected that through the CRESAP project the unit will receive support needed to address various components through training.

Annexes

Annex 1. MAFSE publications, 2024.

Ministry of Agriculture, Food Security and Enterprise. (2024). *Annual General Meeting Reports*. Government of Belize.

Ministry of Agriculture, Food Security and Enterprise Agronomy Unit. (2024) *Reports on Varietal Trials*. Government of Belize.

Ministry of Agriculture, Food Security and Enterprise Extension Unit. (2024). *Annual Technical Report.* Government of Belize.

Ministry of Agriculture, Food Security and Enterprise Policy Unit. (2024). *Agriculture Sector Report.* Government of Belize

Ministry of Agriculture, Food Security and Enterprise Policy Unit. (2024). *Belize Agriculture Price Information System Updates*. Government of Belize.

Ministry of Agriculture, Food Security and Enterprise Policy Unit. (2024). *Industry Performance Report*. Government of Belize.

Ministry of Agriculture, Food Security and Enterprise Policy Unit. (2024). *Food Stock Availability Report*. Government of Belize.

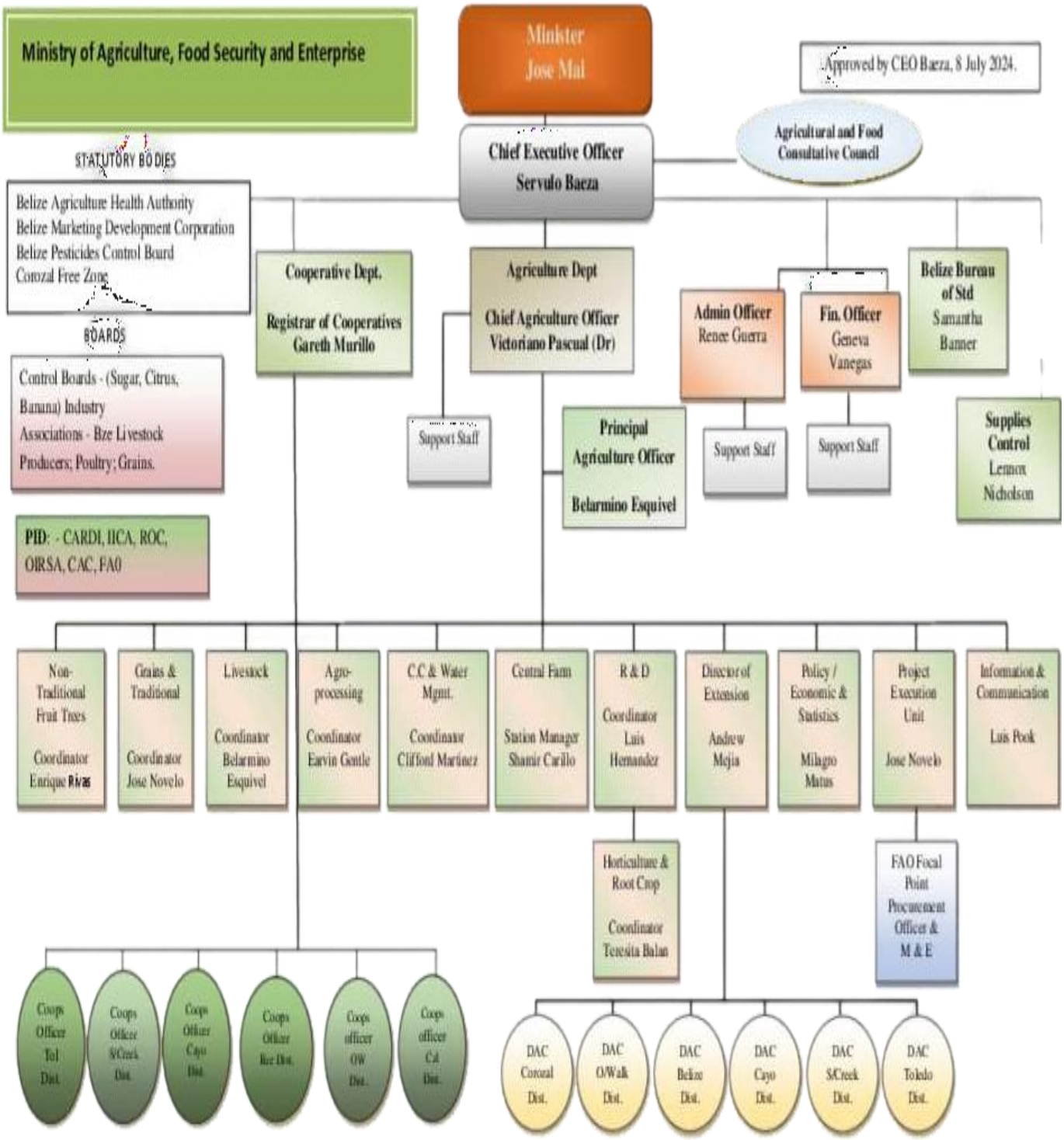
Ministry of Agriculture, Food Security and Enterprise Policy Unit. (2024). *TS Nadine and TS Sara Damage and Needs Assessment Report*. Government of Belize.

Ministry of Agriculture, Food Security and Enterprise Policy Unit (2024). *Market Analysis*. Government of Belize.

Ministry of Agriculture, Food Security and Enterprise Policy Unit. (2024). *National Economic Output*. Government of Belize.

Ministry of Agriculture, Food Security and Enterprise Project Execution Unit. (2024). *Project Execution Unit Annual Technical Report*. Government of Belize.

Annex 2. MAFSE Organogram 2025



Annex 3. MAFSE Staffing 2024-2025

Hon. Jose Abelardo Mai	Minister of Agriculture, Food Security and Enterprise
Hon. Alex Balona	Minister of State
Mr. Servulo Baeza	Chief Executive Officer
Mr. Digno Polanco	Senior Technical Advisor
Mr. Hugh O'Brien	Senior Technical Advisor
Dr. Victoriano Pascual	Chief Agriculture Officer
Mr. Gareth Murillo	Registrar of Cooperatives
Mr. Belarmino Esquivel	Principal Agriculture Officer/ Coordinator, Livestock
Mr. Andrew Mejia	Head of Extension Service
Mr. Jose Novelo	Coordinator, Projects Execution Unit/ Grains & Traditional Crops
Mr. Lennox Nicholson	Director, Supplies Control Unit
Mr. Clifford Martinez	Coordinator, Water and Climate Change
Mr. Greg Canto	Coordinator, Policy Unit
Mr. Luis Pook	Director, Information and Communications
Mr. Luis Hernandez	Coordinator, Research and Development
Ms Teresita Balan	Coordinator, Horticulture and Root Crops
Mr. Miguel Sosa	Coordinator, Aquaculture
Mr. Earvin Gentle	Coordinator, Agro-Processing
Mr. Enrique Rivas	Coordinator, Non-Traditional Crops and Fruit Trees
Mr. Emilio Montero	Coordinator, National Food and Nutrition Security Commission
Ms. Zoe Zetina	Managing Director, Belize Agricultural Health Authority
Mr. Valentin Carrillo	Managing Director, Belize Marketing and Development Corporation
Ms. Samantha Banner	Director, Belize Bureau of Standards
Ms Geneva Castillo,	Finance Officer
Ms Renee Guerra	Administrative Officer

<u>District Agricultural Coordinators:</u>

Mr. Fred Roches	Corozal
Mr. Sergio Hernandez	Orange Walk
Mr. Miguel Balan	Belize
Mr. William Can	Cayo
Mr. Elsner Campos	Stann Creek
Mr. Denzel Castillo	Toledo