MINISTRY OF AGRICULTURE, FISHERIES & COOPERATIVES

2002 ANNUAL REPORT

MINISTRY OF AGRICULTURE, FISHERIES AND COOPERATIVES (MAFC)	*ANNUAL REPORT 2002*
OUR CLIENTS and PARTNERS IN DEVELOPMENT	*Farmers* *Fishermen* *Producers and workers* *Processors and manufacturers* *Distributors and exporters* *Consumers and investors* *National and local government* *Civil society* *Local and external donors*

THEME of MAFC	Agriculture and Fisheries: Pillar of the Belizean Economy
VISION OF THE MAFC	A transformed/Modern sector that is fully competitive, diversified and sustainable.
MISSION Of MAFC	To continue as the economic pillar of Belize, ensuring food security, generating income and foreign exchange, creating employment, and conserving natural resources, in order to grow the economy, reduce poverty and empower the local populations for sustainable development.
STRATEGIC OBJECTIVES of MAFC	1. Increase the efficiency, profitability and competitiveness of the agriculture, fisheries and cooperative sectors 2. Accelerate the diversification in production, processing and exports 3. Improve and conserve the natural and productive resource base to ensure long-term sustainable productivity and viability 4. Improve access to productive resources and services and create economic opportunities for small farmers, women and young farmers, and indigenous people, particularly in poor, marginal areas 5. Strengthen the institutional capacities to provide effective support in marketing and trade, research and extension, as well as relevant education and training

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Foreword

We want to congratulate and recognize the achievement of the farmers and producers of Belize. We must recognize them for their hard work and also to those who made it possible: our collaborators and of course, the staff of our Ministry. We must acknowledge that this fulfills part of our government's manifesto to enhance the quality of life of all Belizeans, to create safe, caring communities and families so as to give our people the opportunity to lead creative and productive lives.

Only under a PUP administration has so much attention been focused on developing the productive agricultural sector as a means of providing food for our tables as the slogan says NO FARMERS=NO FOOD; as a means of improving the lives of rural people, and reducing the import/export imbalance. I would like to state for the record that I am proud of the achievement of the Ministry.

It is not by chance that every day more and more small farmers are beginning to view themselves for what they really are – agricultural entrepreneurs.

Hon. Daniel Silva
Minister of Agriculture, Fisheries and Cooperatives

Acknowledgement

The Ministry of Agriculture, Fisheries and Cooperatives is very grateful to the Ministries of Government, non-government organizations, international agencies and many other agencies or groups who provided valuable encouragement, support and/or collaboration. In particular, we wish to give special recognition and credit for our achievements, progress and learning in 2002 to those who made it possible, and therefore we dedicate this report to:

- Farmers, fishers, producers, distributors, exporters, investors and promoters
- Professionals, administrative and field staff of the Ministry and partner institutions
- Members of steering or advisory councils or boards for Agriculture, Fisheries, Credit Unions and Cooperatives, CZMA, CARD, BAHA, BMB
- National partners in development: BEST, SFBB, DFC, Credit Union League, BFCA, BTIA, BAS,
- International partners in development: CARDI, ROC, IICA, CFRAMP, FAO, CATIE
- International donors: CDB, IDB, IFAD, EU, UNDP-GEF,

We are grateful to all of them, who shared our vision and mission. They also provided timely support and cooperation that was essential to fulfill the Government's Manifesto. Growing the economy and creating wealth is the only way to enhance the quality of life of all Belizeans and to overcome poverty on a sustainable and equitable basis.

The Hon. Daniel Silva, Minister of Agriculture, Fisheries and Cooperatives, deserves special recognition for his leadership, vision, business acumen and commitment to transforming the Ministry into a dynamic and results-oriented organization, and for making the Ministry one of the best in the public service.

1.0 Executive Summary

Our record of achievement for the last five years is a glaring example of what can be accomplished with a responsible government. While Citrus, bananas and sugar have always been considered the bedrock of the agriculture sector we moved determinedly to build on the potential for non-traditional crops. This government remains committed to diversification, to ensure poverty alleviation and an improved quality of life for the Belizean people. It is these same new initiatives that saw a dramatic increase in new crops for export that contributed to the growth of our gross domestic product (GDP). Papayas, beans, peppers, onions, potatoes, milk and dairy products are but a few of these commodities that saw unbelievable growth.

For example in 1997 this country was producing a mere $742 worth of onions while in 2002 we produced almost $900,000, estimates for 2003 are for $1.5 million dollars worth of onions to be produced. This onion program is benefiting over 100 farmers in the Corozal, Orange Walk and Belize districts and is an example of the success of our diversification program. Bean production, including red kidney, black beans, black eye-pea and other beans, went from fifteen million pounds (15,000,000 million lbs) in 1997, valued around seven point five million dollars ($7.5 million), to twenty one million pounds (21,000,000 million lbs) in 2001, valued at almost eleven million dollars ($11.0 million). In 2002 there was a drop in the production due to an unfavorable dry in the north but estimates for 2003 is for production to surge again. Cabbage grew from a value of four hundred and twenty thousand dollars ($420,000) to a two point three million dollar ($2.3 million) economy for farmers. The value of Potato production climbed from three hundred and fifty thousand dollars ($350,000) to one point four million dollars ($1.4 million) during this period.

The stellar performance of papayas provided an unimagined boost to export earnings as production soared from eight million pounds (8,000,000) in 1997 to over twenty four million pounds in 2002, contributing over fifteen million dollars ($15 million) to the economy of Belize. In the next few weeks, the export of the large Cuban Maradol papaya is to commence from a new packing shed by Exotic Fruits Ltd. in the Corozal district. Building confidence in this industry is one of the hallmarks of the achievements of this Government.

Hot pepper exports on the other hand suffered in 2002 from hurricanes and floods in literally every district of Belize, but have rebounded during the last three months of 2002, and continue this upward trend into the early part of 2003. Most importantly fresh Belizean hot peppers which range in color from red, purple, orange, yellow and green is now considered the standard in the Florida market, resulting in increased demand for Belize's hot peppers. Hot pepper exports for 2003 are expected to reach 1.5 million pounds, thereby exceeding the one million pound mark for the first time in the history of Belize and contributing $3 million Belize dollars in foreign exchange revenues to Belize.

In the area of livestock, milk production has climbed steadily with our new focus on dairy products. Milk grew from 2.5 million pounds in 1997 to 7.6 million pounds in 2002. This has resulted in impressive diversification of locally produced milk products, which now includes fresh and flavored milk, fresh and sour cream, ice cream, cheddar and mozzarella cheese, and cheese pastes. A popular and well-known pizza house in Belize now spends more time producing high quality pizzas with Belizean cheese and less time looking for US dollars to import cheese as they are now fully on board our Buy-Belizean campaign.

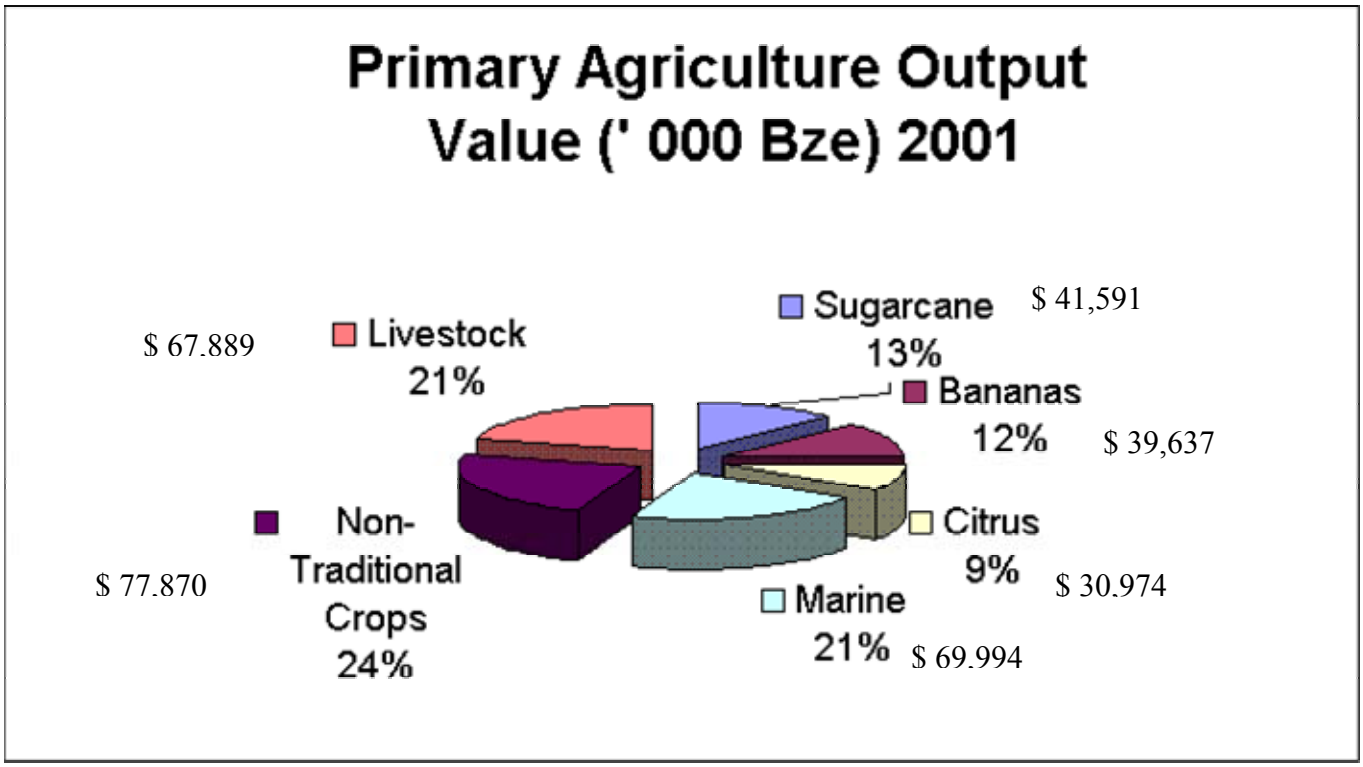
The government of Belize will continue investing in the productive sector and offering new incentives for farming entrepreneurs. Mature and visionary leadership from this government continues to funnel resources for the strengthening of the regionally acclaimed Belize Agricultural Health Authority (BAHA). Belizeans should be proud to know that BAHA passed the European Union test, and was recognized in March of 2002 by the European Union as the competent authority to certify Belize's agriculture and fisheries exports.

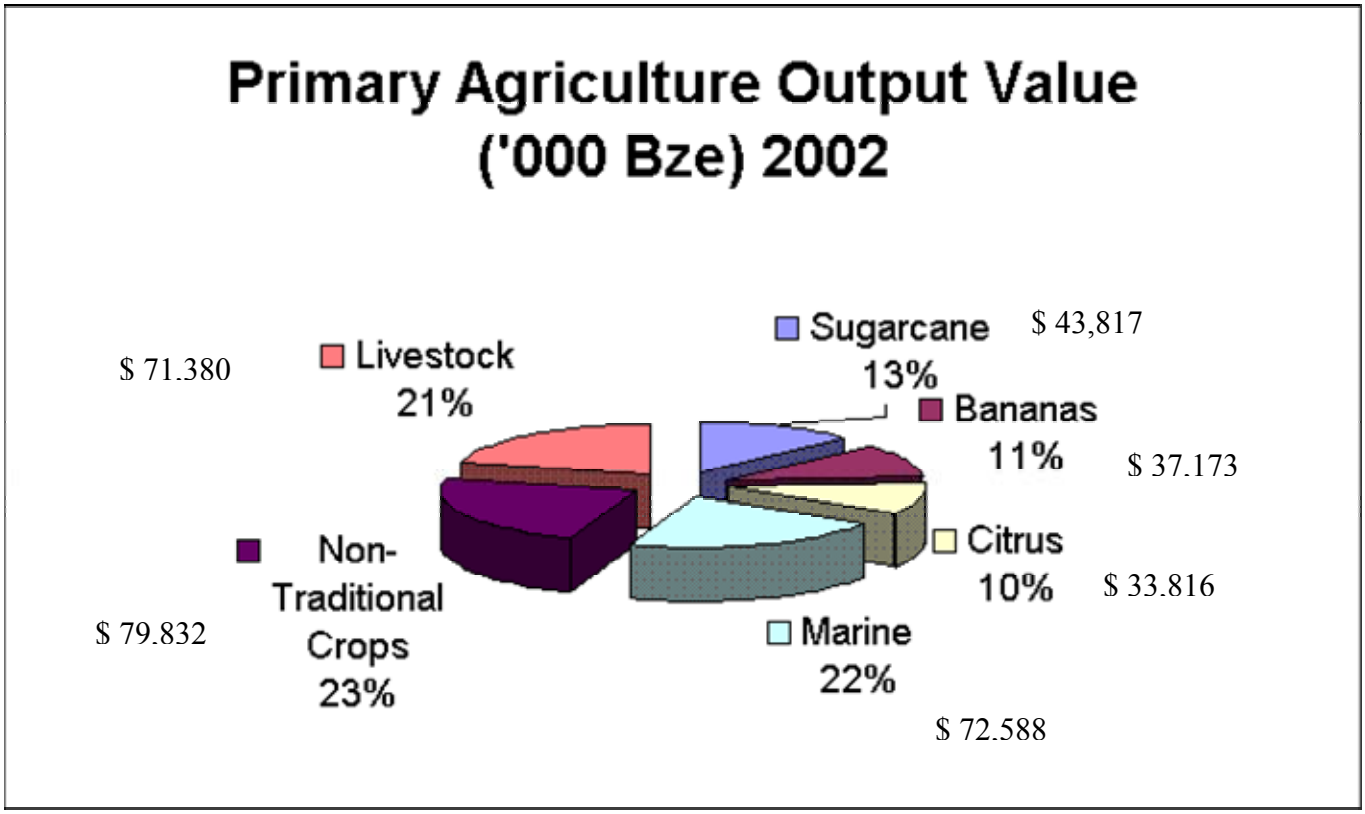
Central Farm was transformed from a dilapidated run down research and development station that had lost the confidence of Belizean farmers into an institution to be proud of, and one that has varietal trials and demonstration plots of onions, potatoes, carrots, celery, broccoli, cauliflower, guavas and other crops in every district of Belize. Most importantly, farmers are now using the varieties being promoted by Central Farm. Timber plantations are being established from seedlings produced at Central Farm, and coconut hybrids are being planted to rehabilitate an industry that was dying. Central Farm has led the way in the sale of over 300 improved bulls, 50 % of which were imported and 50 % produced by a highly motivated team working there.

We must highlight one more success story. The Belize Marketing Board has recovered from its worst financial crisis due to the past administration. At 31 July 1998, following several years of losses, the organization had accumulated debts of over $6.5 million and an operating deficit of over $3.7 million.

The Belize Marketing Board has seen impressive growth in the past three years. Yearly sales have increased from a record low of $1.35 million in 1998 to $9 million in 2002. From an institution that was operating at a loss of $ 1.7 million in 1998 and had accumulated debts of over $ 6.5 million, the BMB has turned things around to record a net operating profit of $173,142 for the financial year ending in July 2002. Total assets have increased from $1.49 million in 1998 to $2.6 in 2002, and administrative expenses have decreased from $1,127,245 to $778,213 during the same period. Indebtedness is under control with no increase over the past three years.

Strengthening Communities, Uniting Belize - that is what this Ministry seeks to do. Let it be known to all Belizeans that Agriculture remains the pillar of the Belizean economy.


Primary Agriculture Output Value (' 000 Bze) 2001
$ 67.889
Livestock 21%
Sugarcane 13%
$ 41,591
Bananas 12%
$ 39,637
Citrus 9%
$ 30.974
Marine 21%
$ 69.994
Non-Traditional Crops 24%
$ 77.870


Primary Agriculture Output Value ('000 Bze) 2002
$ 71.380
Livestock 21%
Sugarcane 13%
$ 43,817
Bananas 11%
$ 37.173
Citrus 10%
$ 33.816
Marine 22%
$ 72.588
Non-Traditional Crops 23%
$ 79.832

2.0 DEPARMENT OF AGRICULTURE

The Department of Agriculture was restructured in early 2001 into seven main programs identified as: Extension, Research and Development, Crop Development, Livestock Development, Marketing and Agro-processing, Information Management and Policy. For practical purposes, Information Management and Policy are programs shared with the Fisheries and Cooperative Departments, Extension and Agro-processing were combined, and Marketing was unassigned in 2002. The main objective of the Department of Agriculture is to enhance the productivity, profitability and competitiveness of the agriculture sector in Belize in order to increase income, improve the socio-economic standards of the farmers and create more opportunities for employment.

2.1 Extension Services

Agriculture Extension continues to serve as the critical link for the transfer of technology to farmers from the research and development program of the Department of Agriculture. The extension department is comprised of six district agriculture coordinators and 21 extension officers. This department accounts for approximately 30 % of the Agricultural staff.

Extension continued to be the main channel for information flow to the farmer, and was the vehicle for relaying immediate farmer problems and needs, which require national intervention. In effect the extension service was key to the agriculture sector maintaining a contribution of 80% of domestic exports.

2.1.1 Extension Staff and Program Assignments

In order to ensure better coverage of extension services in the different programmes, each extension officer was assigned to particular commodities within the work program. The use of this approach allowed for adequate time to be spent on the specific commodities, resulting in proper implementation and management, which lead to increased production of several non-traditional commodities.

2.1.2 Training Activities

A series of ‘farmer training school’ programs were carried out on guavas, hot peppers, onions and irrigated vegetables. In this program, farmers from one district spent one or more days working in the field and learning improved management practices from more innovative farmers in another district. In addition, a field trip was organized for farmers and technicians to the BEJO’s seed research station in Guatemala.

In livestock, trainings were held in beef management, artificial insemination, pasture management, apiary management and pig production. Prior to the dry

season, districts carried out several workshops on preparing molasses urea blocks and other alternative sources of supplementary feeding in preparation for the dry season. In addition to district training programs, livestock farmers and technicians traveled to Mexico on three different occasions to have a first hand look at the breeding lines of cattle and to expand their knowledge on pasture management and equipment use.

2.1.3 Land preparation

During 2002, 605 farmers benefited from the mechanization services managed and coordinated by the extension service. A total of 2085 acres were prepared for farmers countrywide. Most importantly, this program impacted farmers who were participating in the Ministry's diversification program.

2.2 Research and Development – Central Farm

During the past year Central Farm Research Station made great improvements in achieving its objectives set forth in its program of work. A number of agreements were signed to foster and improve activities on the farm, and much progress was made towards establishing a semi-autonomous institute. Despite its slow start, the programs set forth have impacted positively on the production, processing and the marketing systems of farmers and producers in Belize.

2.2.1 Agricultural Engineering Research and Development

The Agricultural Engineering Section focused on strengthening the section to carry out its various objectives namely by providing: Vehicle Maintenance and Repair, Farm Mechanization Services, and Soil and Water Technology Unit.

2.2.1.1 Vehicle Maintenance and Repair

A vigorous preventive maintenance program was pursued by the Mechanical Unit, insisting on timely maintenance and inspection of all vehicles of Central Farm and MAFC. A total of 204 vehicles were maintained and repaired during the year 2002. Twenty-two (22) participants benefited from a seminar/workshop on Maintenance and Use of Vehicles organized in collaboration with Bravo Motors Ltd. The Unit also received equipment, which included, a heavy-duty electric drill, one 5-hp powered washer, a vacuum cleaner and automatic controls for the hydraulic ramp. Personnel were also complemented with an additional mechanic/welder and a part-time electrician.

The overall annual operational cost for vehicle maintenance and repair was $44,446 in maintenance and repairs, and $88,764 in fuel and lubrication. The farm tractors incurred $13,391 in maintenance and repairs and a total cost of $33,120 in fuel and lubricants.

2.2.1.2 Farm Mechanization Services

The rubber wheel tractors provided custom work to 340 farmers and prepared 1,423 acres of land. The income derived from the machinery services program amounted to $37,072. The Agriculture Engineering Division of Central Farm also provided 185 hours of bulldozer work to 60 farmers and another 522 hours to community work. Gross income from bulldozer services to farmers was $ 26,174 and in the latter case only operational cost was paid. The bulldozer also provided an additional 3,500 hours of machinery work to Central Farm and 505 hours to the Ministry.

A one-day workshop was organized in collaboration with New Holland Ltd., for 30 operators and technicians. In addition, two small machinery demonstrations were done at Central Farm and at Stann Creek, in collaboration with the ROC Mission. The work of the unit was strengthened by the appointment of a mechanization coordinator and the acquisition of an additional disc plow, one offset harrow, one 83 hp MF tractor and one F350 Ford truck.

2.2.1.3 Soil and Water Technology Unit

At Central Farm, a nine-acre plot was surveyed and five acres were placed under pressure compensated drip irrigation, with fertigation at a cost of $3,901. Another eighty acres were surveyed to install drains, and in collaboration with the Ministry of Works and Forestry, drainage installations were initiated, but not completed due to inclement weather.

The agro-forestry nursery was fitted with sprinkler irrigation and Family-Drip-System (FDS) irrigation was also installed as a demonstration plot to monitor the water requirement of broccoli.

Additional irrigation equipment and water pump were procured for the Selena micro-dam project. Smaller reservoirs were installed to store water for irrigation and approximately four acres of vegetables were placed under irrigation. Erosion of the micro-dam's spillway continued to be a major challenge but with assistance from the Ministry of Works we were able to address the problem and reduce erosion.

MICRO-DAM AT SELENA

Funding was procured from the ROC Mission for the purchase of ten FDS irrigation units for small producers. They were installed for demonstration and training purposes at various points throughout the country. Assistance was also given to CREI in designing an irrigation system for greenhouses, and water samples were collected at Sarteneja in order to test the water and find a feasible solution to the problems of poor water quality for agriculture in the area.

2.2.2 Crop Research and Development

In 2002, research activities were concentrated principally on non-traditional crops such as carrot, onion, broccoli, cauliflower, potato, celery, garlic, cabbage, tomato and sweet pepper. A total of 21 research activities were conducted throughout the country. These included trials and demonstration plots on varieties, fertilizers, herbicides, planting densities and extended production season. Initial reports are indicating:

- that specific varieties of broccoli, cauliflower, onion and celery can be feasibly planted from November to January;
- Carrots, if grown under irrigation, can be grown viably all year-round in the Northern Districts;
- Research in garlic will need to be intensified to find a suitable variety adapted to tropical conditions.

Gross revenue generated from sales by the Crop Research and Development Unit was $60,120 of which the coconut hybridization program generated $40,481, agro-forestry $16,915 and the crop research trials and fruit tree program generated $2,724.

2.2.2.1 Coconut Hybridization Project

A total of 13,435 lethal yellowing resistant seedlings were produced of which 8,256 were Maypan and 5,179 were Malayan dwarfs. At the end of the year 3,000 cross-pollinated nuts were in the nursery inventory from which another 1,400 Maypans is expected after germination.

Contact was made with the INIFAP Research Institute in Mexico to access pollen from other lethal yellowing resistant Pacific type male parents to be used in the recently established 5 acre pure stand Malayan Dwarf seed garden.

The Coconut Project Unit also carried out several training courses in coconut production and management, and supplied information for the production of a coconut production manual, which was compiled by a consultant firm and made available to producers.

A performance assessment survey carried out in collaboration with BAHA indicated that Lethal Yellowing is affecting the entire country, and that the Maypan hybrids exhibit the expected 90% survival rate.

2.2.2.2 Vegetables (Research)

Celery & Garlic

Variety and fertilizer trials in celery were conducted at Central Farm to determine if quality parameters of stem rigidity and minimal pungency could be achieved under Belize's agro-climatic conditions. One variety, Bolivar, appears very promising. Variety and fertilizer trials for garlic were delayed due to difficulty in obtaining seeds of varieties required for research.

Broccoli & Cauliflower

Concurrent with the commercialization of varieties selected from the previous year's research, more broccoli and cauliflower varieties were tested using the selected varieties as controls.

Onion, potato, carrot

The research efforts on these three commodities is mainly geared towards the identification of better performing varieties than the ones currently in use. Research was conducted on variety, weed control and extended season of these commodities in the four districts that accounted for the bulk of the current commercial production. In addition a first time variety trial in onion was also done in the Toledo district to see if onions, which have a ready market, can be identified as a potential diversification alternative for Toledo farmers.

2.2.2.3 Vegetables (Outreach Demonstration Plots and Training)

Cho-cho, onion, carrot, tomato, sweet pepper, cabbage

Outreach vegetable demonstration plots were conducted in four districts to promote commodities identified as having an existing localized market, available production technology and interested farmers. Demonstration plots of onion in Stann Creek, tomato, sweet pepper and cabbage in Toledo and extended season carrot production in the Belize district were established. Additionally a

demonstration plot of cho-cho was established in the Orange Walk district in an effort to encourage the district to produce cho-cho for the local market as well as a possible future non-traditional export crop.

Over 200 crop producers, extension officers, high school and university students were trained in vegetable, root crop, coconut and fruit tree production. The Unit also continued to strengthen its collaboration with CARDI, BAHA, Multinational Seed and Agrochemical Companies, FAO, CATIE, Taiwanese Mission, VULSAC and IICA for the development of Crop Research in Belize.

2.3 Crop Development

During the year 2002 the crop development program conducted numerous training, research, demonstration, production, expansion and rehabilitation activities in the non-traditional vegetable, fruit and root crop sectors, including new initiatives for the export market.

2.3.1 Cashew

The year 2002 was very successful for the cashew development initiative, with fiscal support from the Department of Agriculture; construction of a processing facility was completed at the Sand Hill (Maxboro) site. The Belize Cashew Producers Cooperative expanded its membership to 93 persons, incorporating 20 villages in the Belize district. An agricultural officer was seconded from the Department of Agriculture to oversee and manage the cashew project under the guidance of the project steering committee.

The Cooperative was able to upgrade the processing plant site by accessing valuable support for road construction, electricity and water from the relevant government ministries. Cooperative members were also able to access loans from the Small Farmers & Business Bank to enable rehabilitation of existing orchards and to expand cashew field acreage by 86 acres. Ten products developed from the cashew nut and false fruit were successfully promoted at agricultural fairs by the cooperative. It is expected that the processing plant will fully be operational for the 2003-harvesting season.

2.3.2 Vegetables (Coordination of Production)

Potato, Onion, Carrot

Coordination of local production of onions, potatoes and carrots along with the Belize Marketing Board and the District Coordinators of the Corozal, Orange Walk, Belize and Cayo districts continued. Targeted acreages of 155 acres for onions, 250 acres for potato and 50 acres of carrots were met this year, with Belize district increasing its share in onion production over last year's schedule. Consequent to research conducted in 2001, another variety of carrot, Brasilia, was included in this year's commercial production along with the usual variety, Royal Cross.

Broccoli and Cauliflower

As a result of last year's successful research and demonstrations for broccoli and cauliflower, production of selected varieties was promoted in five districts. Farmers with the capacity for production were identified and production was coordinated so as to meet the weekly requirements of the local market for a four-month period. Cauliflower production was delayed due to unavailability of seed of the preferred variety until late in the year.

2.3.3 Export Promotion

2.3.3.0 Hot pepper

Hot pepper exports, which had seen a continuous unprecedented growth from 1998 to 2001, declined drastically to less than one half in 2002. This decline was attributed to several causes including withdrawal from the market of a major exporter due to effects of hurricane Iris, incidence of two new pests in the major producing areas, deterioration in seed quality of the major variety imported through the regional breeding program but, most importantly, escalating mistrust of exporters due to late payments to producers.

Viral damage on Scotch Bonnet

By the end of 2002, two traditional pepper exporters had withdrawn from the industry but two new companies had commenced exportation. A pepper forum convened at the end of the year discussed the issues of bridge financing, buyer/producer relationships and the re-organization of the industry in order to learn from the pitfalls of 2002 and prepare for rejuvenation of the industry in 2003.

2.3.3.1 Apple banana

Apple banana was promoted as a potential new non-traditional export crop after two exporters (Agro World and Exotic Fruits & Vegetables) expressed interest in one of the locally produced varieties for the export market. Efforts were made to collect and multiply planting material from this variety to distribute to interested farmers. The Corozal district led the initiative with the establishment of thirty acres of irrigated commercial production. Harvesting and exportation from this field is expected to commence in February 2003. A two-acre demonstration plot was established in the Orange Walk district to study cost of production and best practice in an effort to stimulate farmers in this district to get involved in this new export commodity. Smaller operations were also started in the Toledo district along with propagation of the selected planting material in three of the ministry's fruit tree nurseries in the Belize, Stann Creek and Toledo districts.

2.3.3.2 Okra

Mayan King from the Stann Creek district identified an export market in the USA for the okra variety Clemson Spineless and approached the Ministry for assistance to supply this market. Small farmers were organized in several villages of the Stann Creek District and a total of 40 acres of okra was planted with the seeds provided by the exporter. It is expected that the results of this first "experiment" will indicate the viability of a year round okra production industry in this district.

2.3.4 Other Fruit Trees

2.3.4.1 Pitahaya

Pitahaya was selected as a potential non-traditional fruit crop from which Belizean farmers can earn additional income. Four varieties (white, pink, red, yellow flesh) were accessed for propagation. These different varieties were planted in a field propagation nursery at Central Farm for later distribution to farmers. A demonstration plot of 600 plants was established in the Cayo district and a smaller plot in Orange Walk for interested farmers to gather relevant information as to the feasibility of this crop for local or export markets.

2.3.4.2 Guava

The programme to propagate and supply affordable planting material for the large fruited Taiwanese guava variety was successfully conducted. A total of 700 grafted plants were produced and sold at $5.00 for the round type and $10.00 for the long type, the latter being favored for the export market.

2.3.4.3 Grape

Efforts to grow grapes with farmers in the Cayo and Stann Creek districts were not successful. Despite interest in this crop by farmers countrywide, it was eventually recognized that the agro-climatic conditions of the northern districts are more suitable for commercialization of this crop. The program was, therefore, moved to the Orange Walk district, where an on farm demonstration/propagation plot was established. Participating farmer, along with other technical personnel, were also given a refresher-training course in grape production at the Teakettle site where a Taiwanese farmer is still pursuing commercialization.

2.3.4.4 Sour sop

There was renewed effort in the management of existing sour sop orchards through participatory training and on-farm demonstrations especially in the districts of Belize, Cayo and Toledo. Ten thousand “sour sop bags” were finally procured from Costa Rica, these will be used in the bagging of the fruit so that it can reach maturity and not be afflicted by the pest complex that is hampering our sour sop orchards in Belize.

2.3.4.5 Nutmeg

The crop program continued with the sale of nutmeg seedlings as part of an on-going initiative to increase nutmeg production in Belize, whilst effort continued to perfect the method of propagation of female plants. Approach grafting as an alternative to air layering was discovered as a means to speed up the process.

2.3.4.6 Fruit Tree Nurseries

An irrigated fruit tree propagation nursery was established in Central Farm for the supply of different varieties of fast growing species such as passion fruit, pitahaya, guava, carambola and other commodities that may be later prioritized for expansion. The Stann Creek nursery continued to supply a variety of seedlings, grafted plants and micro-propagated Curare plantain to farmers. Apart from the traditional grafted mango varieties, the station embarked on experimentation in the air-layering of ***Lychee, rambutan***, sour sop and the grafting of malay apple, velvet apple, carambola, mamey, breadfruit and mangos -teen in the hope of reducing the time to field maturity of these species. We were successful with propagation technique of the first six species.

2.3.5 Root Crops

2.3.5.1 Cassava

Cassava production expanded dramatically due to its processing use into various products as well as for livestock and shrimp feed. Using the five characterized varieties from the Stann Creek district nursery, demonstration plots were established in the Toledo and Belize districts. These demonstrations serve to (1) preserve the existing germplasm (2) determine suitability of varieties under different agro-climatic conditions and for different end uses and (3) make planting material of selected varieties more available to farmers.

2.4 Livestock Research & Development

The year 2002 was indeed a success for the entire livestock division at Central Farm. This success was also enjoyed countrywide as the national livestock industry benefited widely with improved genetics in dairy cattle, beef cattle and pigs. In order to improve management practices for livestock, farmers from throughout the country were exposed to technical training in swine production, beef cattle management and dairy production including milk quality, artificial insemination and disease prevention.

2.4.1 Livestock Development

The livestock program focused largely on training, production and processing, genetic improvement and market support to local producers/processors. There was no major animal health problem except for a classical swine fever scare in the Cayo district in the latter part of 2002. The Ministry's policy of supporting local production coupled with the 'Buy Belizean' campaign created the right environment for domestic production and the export of live cattle.

The dairy sector continued to experience an upturn in production and processing. Milk production went from 5.5 M to 7.8 M pounds, 90 % of this production came from the Cayo district.

The livestock extension officers conducted another livestock survey in 2002. According to the survey the only two species that suffered a decrease in population were swine and beef.

Value output for livestock production in 2002 was $ 71.4 M, of which beef accounted for $11.5 M, pork $5.4 M, sheep $0.1 M, poultry $46.5 M and eggs $3.2 M.

TABLE # 1: LIVESTOCK POPULATION BY DISTRICT AS INDICATED IN THE 2002 LIVESTOCK SURVEY.

SPECIE	BELIZE	CAYO	COROZAL	O/WALK	S/CREEK	TOLEDO	TOTAL (2002)	TOTAL (2001)	% INCREASE
Beef	4,310	16,250	1,237	28,890	1,178	1,524	53,389	55,973	(4.6)
Dairy	126	1,079	1,053	1,171	47	84	3,560	2,064	72
Swine	1,006	3,378	1,334	6,536	766	9,800	22,874	27,541	(17)
Sheep	279	1,776	1,942	1921	121	370	6,409	4,053	58

2.4.2 Dairy Production

The policies implemented by the Ministry surely had a positive effect on milk production and the processing into its by-products. Western Dairies has almost doubled its production of ice cream, mozzarella and cheddar cheese. The influx and settling of Central Americans in the rural areas has created a considerable demand for cottage white cheese. This can be appreciated in the volume of milk produced in the Belize, Stann Creek and Toledo districts. The production of milk in 2002 was 7.8 million pounds as compared to 5.5 million pounds in 2001. Milk processed by the two Cayo district processors increased by 20%, that is, 4,213,757 lbs versus 3,884,020 in 2001.

The dairy section at Central Farm produced 148,172 pounds of whole milk as compared to 137,448 pounds in 2001. Most of this milk was sold to Big-H Enterprise and about 30 % was used to feed the dairy calves. In order to generate more income for the section the decision to sell all male calves at one week of age was taken.

TABLE # 2: MILK PRODUCTION (IN LBS) BY DISTRICT

BELIZE	CAYO	COROZAL	O/WALK	ST. CREEK	TOLEDO	TOTAL	YEAR
327,600	3,884,022	733,824	582,624	-	14,400	5,542,470	2001
94,500	5,686,061	218,879	1,242,808	111,900	442,200	7,796,348	2002

SOURCE: MAFC AGRICULTURE PRODUCTION STATISTICS

Milk production for the Belize district went down as one producer sold his entire herd for slaughter and another producer got rid of his stock with the intention of getting better herds. In the Toledo district, milk production expanded from 14,500 lbs in 2001 to 442,200 pounds in 2002. This increase was mainly due to the inclusion of production that was previously not accounted for in past reports. Through the CARD project, funds were provided for the procurement of 19 Brown Swiss dairy heifers to be introduced to the district from the Orange Walk district. To further strengthen the dairy program of the Toledo district a Holstein bull was transferred to the district to offer bull rental services to milk producers.

Diary type bulls were also transferred to Orange Walk from Central Farm to further strengthen the milk programme in that district. Plans are underway to set up a processing facility in the Ship Yard area. In regards to infrastructure funds were made available for the renovation of one side of the dairy waiting parlor fence at Central Farm.

Mastitis continued to be the major production problem for milk producers. In conjunction with BAHA and Western Dairies a meeting was held with milk producers to discuss the escalating mastitis problem and to take the necessary control measures. The second disease of mention was the appearance of the Bovine Viral Diarrhea (BVD). Many herds in the Cayo district came down with this disease as early as December of 2001 but it was not verified until March of 2002. The disease does not cause deaths but can cause loss in milk production and abortions.

2.4.3 Beef Production

For the first time in years beef producers were satisfied with the farm gate price of cattle. The average price per pound went from $0.95 to $1.10. Although we did not report any cattle export to either Mexico or Guatemala in 2001, in 2002 information obtained from the Belize Livestock Producers Association indicated that 1,360 heads of cattle were exported to Guatemala and Mexico. This export created the vacuum necessary to trigger the increase of the price of beef on the hoof.

In 2002 the Ministry was responsible for the importation of 24 breeding bulls. Ninety percent of the animals were for beef and the remainder for dairy. As part of our genetic improvement program these animals were sold to small producers at half the price and medium to large producers paid 75% of the landed price of the animal. Most producers paid an average price of $1500 per animal. We also

assisted in facilitating the importation of breeding bulls for the private sector as a means of reducing the cost per animal to them.

Slaughter returns show that the number of animals slaughtered increased by 4% in 2002, 9,076 heads in 2002 versus 8,729 heads in 2001. With the demand remaining basically constant, export cattle was the factor responsible for increases in the farm gate price. The Orange Walk district accounted for 49 % of all slaughters and the Cayo district for 23%.

TABLE # 3: CATTLE INVENTORY AT THE GOVERNMENT STATIONS DECEMBER 31st 2002

CATEGORY	YO CREEK	TOLEDO	CENTRAL FARM	TOTAL
Cows	32	3	136	171
Bulls	5	4	3	12
Heifers	22	2	41	65
Calves	5	0	28	33
Young Bulls	6	2	28	36
Total	70	11	245	326

The Ministry coordinated two trips for producers and technicians to attend livestock fairs in Mexico. The first was the Nelore exposition in Chiapas and the other was the livestock fair in Merida, Yucatan. In the latter fair the participants participated in the judging and selection of beef breeds. They also did some on farms visits to learn new technologies that can be adopted in Belize.

In July the Orange Walk extension service organized a meeting with 100 producers to explore the possibility of organizing a local branch of the Belize Livestock Producers Association. It was concluded that the district was not ready for a local subsidiary of the BLPA.

A trial was conducted to evaluate the growth potential of steers at reduced stocking rate where the control group grazed on natural pasture and the test group grazed on *Brachiaria brizantha*. The eight animals in the test group were rotated every two weeks and were in pastures with electric fencing at a stocking rate of 0.8 acre per animal. There were four animals in the control group and they too were rotated every two weeks. The control group gained on average 1.5 pounds per day and the test group gained 2.02 pounds over a 12-week period. It was obvious that at lower stocking rates with improved pastures steers gained more weight than those on natural pastures. Another observation was the fact that the control group gained more weight than the other animals that grazed on natural pasture and not rotated. In conclusion, the trial demonstrated the potential of improved pastures and that of pasture rotation.

A decision was taken in the latter part of the year to get rid of the Red Brahman herd in an effort to reduce the number of breeds we are presently working with,

and concentrate in the production of one or two good beef breeds. As a result of this action a portion was sold to Chial farms and 9 cows, 1 mature bull and 2 calves were transferred to the Tumul Kin Center of Learning in Toledo for teaching purposes.

The only disease worthy of mention for beef was the outbreak of blackleg in the summer months; most of the cases were reported in the Cayo and Toledo districts. The Toledo district responded with an aggressive vaccination program.

At the Yo Creek station 15 cows were synchronized of which only 5 were actually inseminated with the semen of Brown Swiss and Black Angus.

In October an artificial insemination course was conducted to train producers and Ministry personnel in that technique. A total of 12 participants attended, including 5 producers, 4 of our technicians and 3 students from the Faculty of Agriculture and Natural Resources (FANR).

2.4.4 Pastures

A total of 140 acres of pasture were established at the three agriculture stations, 120 acres at Central Farm, 15 acres at Yo Creek and 5 acres at the Toledo Agriculture Station. Approximately 75% was planted out with ***Brachiaria brizantha*** and the rest with ***Brachiaria humidicola***. Four hundred and twenty five pounds of grass seeds were distributed to livestock producers, namely 60 pounds Yo Creek, 120 pounds for Belize, 25 pounds for Corozal, 100 pounds for Cayo and 120 pounds for the Toledo district. The 2002 livestock survey show that the country has 37,349 acres of natural pastures and 21,140 acres of improved pastures.

At Central Farm a protein bank demonstration plot was established to show producers the availability, benefits and potential of plant species that are excellent sources of feed for livestock herds. Among the species being promoted are: mulberry, nacedero, erythrina, luecaena and madre cacao. The Cayo district and the Belize districts were the two districts that promoted the use of the mulberry and madre cacao the most. The Cayo extension service distributed 1290 cutting of mulberry and the Belize district did 200 cuttings. A portion of live fence was also established to demonstrate to producers the potential of live fence as feed, support fencing and as a soil enrichment agent.

2.4.5 Pig Production

Slaughter returns show that approximately 18,000 heads of pigs were consumed on the domestic market in 2002; this figure was slightly higher than that of 2001 when 17,225 heads were slaughtered. The highest areas of production continue to be the Mennonite communities of Little Belize, Blue Creek, Spanish Lookout and Shipyard. Almost 50% of the animals slaughtered were in the Cayo district.

In April 15 gilts and 2 boars were imported from Mexico from the PIC bloodlines. All 15 gilts were bred in July; 6 to one line of PIC boar, 6 to the other line of PIC boar and 3 with a Central Farm boar. The purpose of crossing 3 of the gilts with the local boar was to demonstrate to producers the advantages of cross breeding and upgrading of a herd.

In August the Ministry sponsored a one-week training at Zamorano, Honduras for 6 meat processors. The participants were taught to produce green and cooked sausages, bacon, ham and emulsified sausages.

In December the piggery unit at Central Farm was leased to a Guatemalan company by the name of Progenitors Porcinos de Centro America S.A. for 10 years. This company will import grandparents of the PIC bloodline from Canada to produce breeding animals for export to Central America. The pigs from Central Farm were transferred to the piggery at the Yo Creek station, which will become the main breeding stock station for the Ministry.

TABLE # 4: PIG HERD AT GOVERNMENT STATIONS AT 31st DECEMBER 2002

CATEGORY	CENTRAL FARM	ST. CREEK	TOLEDO	YO CREEK	TOTAL
Sows	15	6	4	6	31
Boars	6	2	2	3	13
Gilts	28	1	2	4	35
Piglets	37	22	4	0	63
Barrow	10	0	0	4	14
Total	**96**	**31**	**12**	**17**	**156**

2.4.6 Poultry

Poultry production continued to expand on a yearly basis. Processors slaughtered 8.6 M birds as compared to 7.8 M in 2001. This reflects an increase of 9 percent. However, layer production took a dip in production. In 2002 layer producers marketed 2.0 M dozens of eggs as compared to 2.3 M in 2001, reflecting a decrease of 13 percent (See table below)

2.4.7 Poultry and Egg Production

TABLE # 5: POULTRY AND EGG PRODUCTION

ITEM	BELIZE	CAYO	COROZAL	O/WALK	TOLEDO	TOTAL
Birds Slaughtered	30,000	4,156,507	2,276,000	2,744,363	3,350	9,210,235
Eggs (doz)	90,000	1,540,567	186,840	321,660	14,255	2,153,322

SOURCE: MAFC AGRICULTURE PRODUCTION STATISTICS

The proposal prepared by the Ministry in June and submitted to CARICOM for the derogation of the CET on poultry parts was later approved for Trade and Economic Development (COTED). This safeguard will allow the local poultry industry to continue to expand and to establish itself as a strong and competitive institution.

Mr. Robert Best from the Caribbean Poultry Association, and the Department of Agriculture facilitated the preparation of a project proposal for the Belize Poultry Association (BPA), which was forwarded to the Caribbean Human Resource Development Program for Economic Competitiveness (CPEC) for funding. The proposal is for a total of CDN $385,376 with CPEC funding CDN$197,916. The project is for 3-5 years and will focus on the technical improvement of production systems, feed formulation and quality, HACCP, processing and marketing, institutional strengthening and human resource development. It is expected that this project will enhance the capabilities and competitiveness of the Belize Poultry Association

2.4.8 Sheep

Although sheep production has much potential as an activity for small producers and rural families, not much work was done by the Ministry to assist this sub-sector. However, plans are in the pipeline to focus on sheep production in 2003. This will include the importation of new and improved breeds to address the inbreeding problems faced by most producers. The breeds to be imported will include the Dorper, Katahdin and the Pelibuey.

The national herd at 31st December 2002 was 6,409 heads of sheep. The Orange Walk and Cayo district account for over 50 % of all sheep. Official slaughter return figures show that some 992 heads were slaughtered in 2002.

2.4.9 Breeding and Genetic Improvement

2.4.9.1 Livestock

During 2002, the Ministry facilitated the importation from Mexico of 45 Brown Swiss diary heifers to support small dairy farmers and 21 breeding bulls to improve breed and to promote and foster development in the dairy and beef industry. Most of the breeding bulls were sold in the Orange Walk District. In addition to that, three (3) Jersey registered bulls were also imported from Zamorano, Honduras of which two were rented out to dairy farmers mainly in the Cayo District, and the other was used in the dairy herd at Central Farm. In the last shipment of the year two Brahman embryo bulls were imported of which one will be incorporated to the Central Farm breeding program to continue producing breeding stock of good quality to sell to local cattle producers.

2.4.9.2 Swine

This year a total of 168 pigs were sold from Central Farm of which 47 % went as breeding stock. In addition some 102 pigs were transferred to the two Southern Districts to assist in the Hurricane Iris Rehabilitation project. A boar service for farmers, which was put in place later in the year, was successful, as 12 sows were bred through this program.

In 2002, Fifteen (15) gilts and 2 boars of the Pig Improvement Company (PIC) type were imported from Mexico to improve genetics at Central Farm and the industry on a whole. The first 22 PIC offspring (males and females) were sold to Cayo Producers just a few days before the transfer of the entire breeding herd to the Yo Creek Agricultural Station in Orange Walk.

2.4.9.3 Technical Support Services

The outreach program to the various collaborators and stakeholders saw great improvement, as the livestock section was able to cooperate and assist in the training for both farmers and Livestock Extension Officers (LEO's). The Livestock Officer visited all District Agricultural Stations at least twice during the year, except the Yo Creek Station, which was visited 4 times.

In 2002, the Corozal district was assisted with two seminars in cattle production (beef & dairy), Stann Creek got assistance with one seminar in beef and dairy management and Molasses Urea Blocks (MUB) and an intensive seminar in swine production. The Belize district got assistance with one seminar in swine management and diseases and one training in the fabrication of MUB. In the Cayo District at Central farm, training in dairy cattle management was a priority especially in Artificial Insemination and Mastitis control.

2.4.9.4 Livestock Production and Performance at Central Farm

Overall, the livestock section, which includes pigs, deer, beef and dairy cattle, saw tremendous improvements in most areas during the year 2002. The beef cow herd increased by 22.1 % while the dairy cowherd increased by 11.8 % over the previous year. The conception rate for the beef herd increased by 6 % and the weaning rate reached a high of 86.5 %. In regards to milk production, an increase of 7.2 % was achieved. Milk yield was 148,172 pounds of milk at an average rate of 23.3 lbs. per cow per day. In regards to total output from the dairy unit, which includes milk production, dairy cattle sales and bull rental services the year 2002 produced an increase sale of 26.9 % over the year 2001.

General sale of pigs (revenue) in 2002 went up by 21.4 % as well as an increase over the targeted amount for sale by 10.7 %. Pre-weaning mortality, however, increased to 8.1 % a slight increase over last year by 2.6 %.

The combined total value of goods, services and products that was obtained from sales, bull rentals and stock transfers from the livestock section in 2002 was $275,714.99, an increase of 11.8 % over the previous year.

2.4.9.5 Adaptive Research

Pasture rehabilitation and improvement was a major activity at the livestock section in 2002. However, of the 130 acres targeted, approximately 70 acres or 53.8 % was well established. The weather pattern was the main factor in pasture establishment. Besides the weather, weed infestations on the newly planted paddocks were also a detrimental concern.

As part of the research program, a three months steer feeding trial was designed and implemented with favorable results whereby it was shown that a group of steers on improved pastures gained 0.56 lbs. on average above that of the control group.

Electric fencing for the beef cattle heard at the livestock section was always a concern. This year the cost of production was investigated and resulted that the installation of electric fencing per foot was cheaper by $ 1.30 to install than conventional barbed wire. One acre fencing using electric fencing will cost $182.44 compared to $1,264.32 to fence the same area with bared wire**.**

2.5 VIFINEX

The VIFINEX project continued its surveillance and database on pests affecting the production of hot pepper. In accordance with the project work plan, two training courses were carried out, one on Food Safety and the other, on Good Manufacturing Practices. Field days, farmer-to-farmer exchanges, and the initiation of a pepper production project in the Toledo district were facilitated by

the project. The first general assembly for the incorporation of the Belize Hot Pepper Growers Association was held with the election of the first Executive Committee. VIFINEX's also developed a program to assist the citrus industry with phyto-sanitary surveillance of important quarantine pests.

2.6 CARTF Projects

The Agriculture Department coordinated a series of meetings and discussions in Orange Walk, Cayo and Stann Creek districts with Mr. Maurice Wilson of CARDI Trinidad, Extension Officers, CARTF (Caribbean Agriculture Research and Training Fund) and potential CARTF beneficiaries. With the assistance of CARDI Trinidad, special focus was given to the development of proposals for 7 CARTF projects, namely (i) technology development and marketing for organic production, (ii) pineapple processing and marketing, (iii) cassava product development for livestock feed, (iv) production and marketing of banana chips (v) labeling and market development for seasoning (vi) irrigation of vegetables for El Progresso Cooperative and (vii) cashew product standardization and marketing. Four (4) proposals were finalized and three (3) were in process of being finalized. The project on seasoning was submitted to CARTF and approved, the one on banana chips was rejected by the beneficiary and two, namely the cassava feed and pineapple projects, were in the process of being submitted to CARTF for funding.

2.7 Agro-Processing

The growth potential of the agro-processing sector became more evident with the launching of our coordinated agro-processing work program in 2002. Many processors displayed significant interest to produce new products and expand production.

Management of the work program for 2002 was facilitated by the assignment of one extension officer to coordinate district activities for agro-processing. In addition, Mr. Charles Bacab attended a 3-week training course in Taiwan and upon his return; he was assigned to the ROC food-processing lab at Central Farm as agro-processing technician.

2.7.1 Training

In collaboration with the ROC Technical Mission, the Department conducted 24 trainings sessions in 2002. The trainings were focused in two main areas, product development and food safety. They included fruit bottling, dried fruits, jams, hot pepper processing, potato chips, frozen French fries and other products. Additional trainings were also carried out at the district level under coordination of the extension officers, cooperative officers and the trained contact person. These district sessions focused on tomato products (such as salsa

casera and tomato ketchup), jalapeno products, peanut products, rice products, dairy products and cassava products.

A total of 264 individuals were trained during the course of the year and over 100 visitors visited the food processing facility at Central Farm. In addition, two participants from Dominica visited the ROC mission and were trained in dry fruits and vacuum frying for a week and an individual from Peten, Guatemala obtained training on corn snacks through the ROC mission in Belize.

2.7.2 Product Development and Commercialization

Product development and marketing support was given to various processors countrywide. Products receiving such support were milpa real Minsa, fufu flour, soybean meal, dried ground and whole hot peppers, turkey parts, turkey ham, chicken ham, pork ham, orchata, salsa casera, seasoning and others.

The agro-processing technician assisted in improving the shelf life, quality, acceptability and production efficiency in several other products throughout the country, such as seaweed in San Ignacio, peanut butter and a cheese processor in Corozal. Assistance in proper sterilization was also given to an Orchata producer in Corozal.

Jam makers in Orange Walk obtained specific assistance in learning methods to calculate the level of brix in their produce. The agro-processing work program has recently launched a special effort to promote the marketing of value added products, especially those produced by cottage level processors. In addition, new products, such as peeled and frozen cocoyams, plantains, yams, sweet potato and a combination of all five are currently being developed to test market acceptability.

3.0 DEPARMENT OF FISHERIES

The Belize Fisheries Department through its mission “to provide the country and the people of Belize with the best possible management of its aquatic and fisheries resources, with a view to optimize the present and future benefits through efficient and sustainable management”, continues to ensure the steady development of the sector and ensure the integrity, productivity and sustainability of our ecosystems.

The Fisheries Sector still continues to contribute significantly to Belize’s Economy with export earnings in 2002 valued at $72,587,810.34 and contributing approximately 7% to the GDP of Belize (See table 1).

TABLE # 1: TRENDS IN THE MARKET VALUE OF MARINE PRODUCTS FOR 2001 AND 2002

Commodities	2001	2002
Lobster	$ 12,777,400.00	$ 13,574,326.95
Conch	$ 4,615,960.04	$ 2,846,539.87
Conch trimming	$ 28,350.00	$ 197,331.68
Lobster meat	$ 195,760.00	$ 422,304.45
Live Conch	$ 2,269.69	
Whole fish	$ 11,875.00	$ 127,159.00
Stone crab	$ 706.13	
Shrimp	$ 48,933,285.07	$ 53,199,594.30
Shark		$ 12,500.00
Fish Fillet	$ 390.56	$ 127,159.00
Aquarium fish	$ 37,629.20	$ 30,300.98
Ground Conch	$ 57,306.40	$ 6,708.19
Total	$ 66,660,932.09	$ 72,587,810.34

To further strengthen the management of Belize's Fisheries Sector, the Belize High Seas Fishing Bill was drafted and has had its second reading in the House of Representatives. This bill will allow the Government of Belize through the Fisheries Department and the National Ship Registry to be able to more efficiently regulate and monitor its high seas fishing fleet, and to collect revenues through licenses and other fees.

3.1 Capture Fisheries

The marine capture fisheries sector was still recovering from the severe of hurricane Iris and tropical storm Chantal in 2001. In 2002, capture fisheries accounted for approximately 39% of the total earnings generated by the Fishing Industry. The earnings of Lobster and Conch remained relatively the same as 2001. Pink Sea shrimp earnings showed a marked 622% increase. This was due to the fact that 12 boats were allowed to trawl in Belize for the 2001-2002 season in order to provide the Fishing Cooperatives with a means to earn much needed revenues for their continued survival. The Fisheries Department found it necessary to carry out scientific studies with the cooperation of experts from the CARICOM Fisheries Units on the status of the wild shrimp stock in Belize. This study was completed in 2002 and the recommendation for management, is expected to be presented to the fishing community and the Ministry of Agriculture, Fisheries and Cooperatives in early 2003.

Capture Fisheries Unit Personnel Collecting Biological Data from Shrimp Trawler

3.2 Management of the Nassau Grouper Fishery

The year 2002 was historical because Belize for the first time has now passed into law regulations for the protection and conservation of the Nassau grouper. In November of 2002, the Minister of Agriculture, Fisheries and Cooperatives signed Statutory Instruments which declared a closed season for the Nassau grouper from December 1st to march 31st and the year round protection of 11 of the 13 documented spawning sites for this

3.3 Diversification of the Fishing Sector

In 2002, the pilot project to determine the feasibility of using fish aggregating devices (Fads) as an alternative fishing method was implemented. Two Fads were deployed in the Turneffe, a toll area in our Belizean Coastal waters and their performances are currently being monitored. It is projected that two more will be built and deployed in the year 2003.

3.4 Ecosystem Management

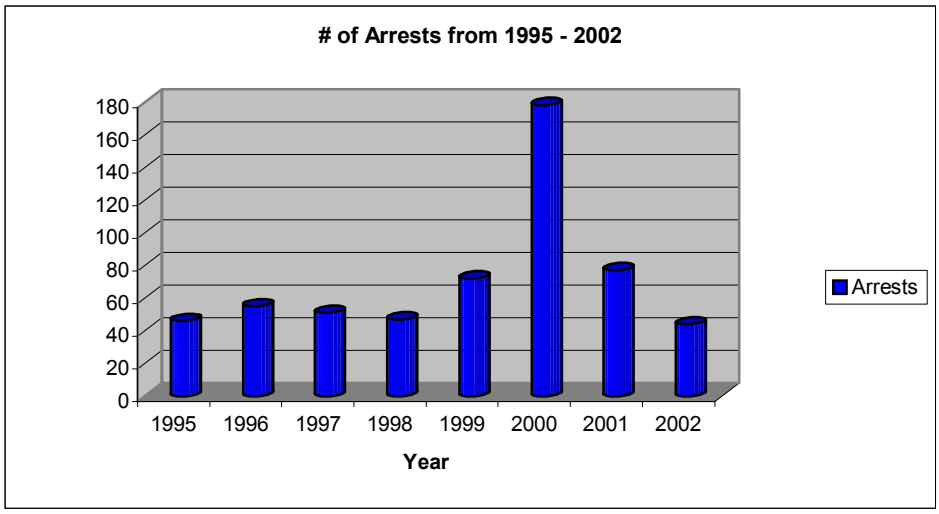
The Ecosystems Management Unit (EMU) of the Fisheries Department consists of the marine reserves and the Conservation Compliance Unit (CCU). The new management paradigm has shifted from specific species and site protection to

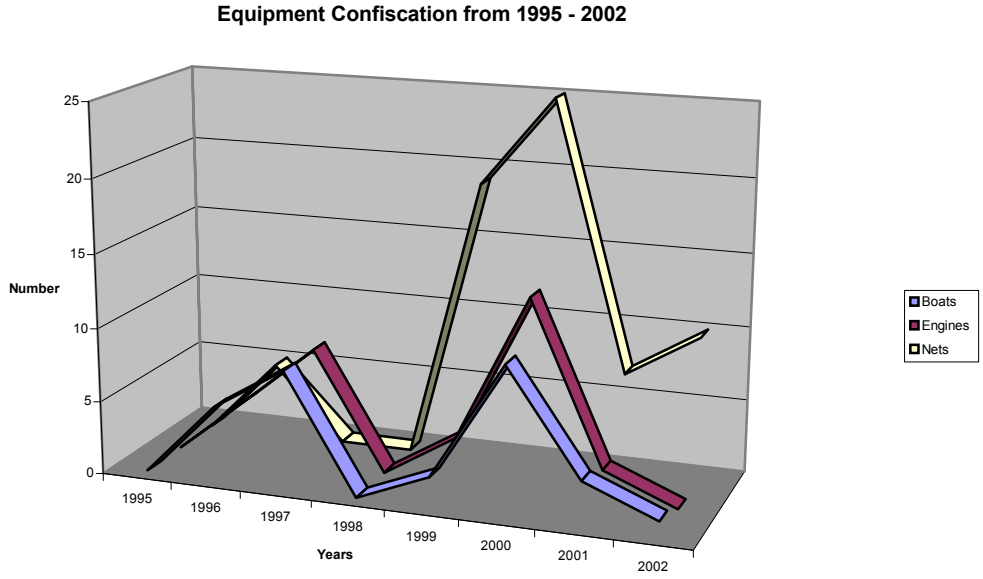
the protection of entire ecosystems and the regulation of the activities within those systems.

3.5 Enforcement

The Enforcement Unit conducted limited patrols and restaurant checks for 2002 due mainly to the financial constraints experienced by the Fisheries Department for the fiscal year 2001-2002. As a result, operations were scaled down to cover the basics. Fisheries Prosecutions resulted in thirty-one convictions with fines amounting to $70,070.00.

Enforcement in the marine reserves has been very regular and effective. There was more coordination with the reserves especially in enforcing the new grouper regulations recently brought into force.



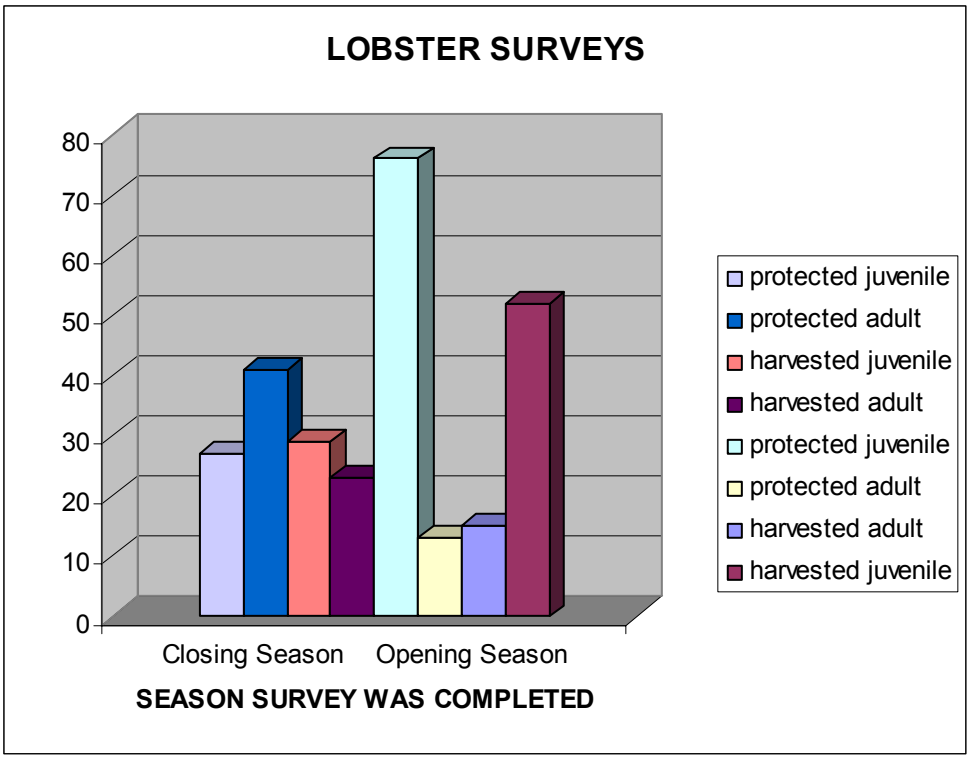


3.6 Monitoring

Monitoring for lobster, conch, finfish and other commercially important species continued at the reserves. Monitoring was standardized in 2002 and will be regularized with the implementation of the Mesoamerican Barrier Reef Systems project Synoptic Monitoring program in 2003.

In December 2002, the first Marine Protected Areas Forum was held in Belize. At this forum, for the first time in the history of the Fisheries department, each marine reserve had scientific results to share with the general public on the research being conducted. In general, the studies all confirmed the theory that the biodiversity and population size of important commercial species were much higher in the no take areas of reserves.

Graph Showing Changes in Number of Lobsters Found in Harvested Versus Protected Areas in the Bacalar Chico Marine Reserve



Data collection for the Caribbean Planning for Adaptation to Climate Change (CPACC) project continued in 2002. This data is submitted to the CPACC data analysis center at the University of the West Indies each year to monitor the changes in the status of the coral reefs in Belize due to climate change.

Biologist collecting beach trap data from caretaker

3.7 Carrying Capacity Study

The World Wildlife Fund provided a small grant to conduct the carrying capacity study at the Hol Chan Marine Reserve. This study was essential since visitations to the reserve have increased significantly. The results are still being analyzed from the study but preliminary findings are suggesting a number of corrective measures to prevent future negative impact on the integrity of the ecosystems in Hol Chan.

3.8 Co-Management Agreements

Co-management strengthened in 2002 for the Toledo Institute for Development and Environment (TIDE), Friends of Nature (FoN) and the Toledo Association for Sustainable Tourism and Empowerment. These institutions co-manage the Port Honduras Marine Reserve, Gladden Spit and Silk Cayes Marine Reserve and the Sapodilla Cayes Marine Reserve respectively.

3. 9 Environmental Impact Assessment

The Fisheries Department played an important role in the National Environmental Appraisal Committee (NEAC), which assesses and approves national developments and Environmental Impact Assessments (EIAs). The biggest contribution was made on coastal and marine developments.

3.9.1 Aquaculture and Inland Fisheries

The AQUIF Unit has made great strides in consolidating its programmes, and focusing them towards definitive ends. In this regard major emphasis has been placed on forward planning and accomplishing the various tasks within the context of a logical programmatic framework to address the development challenges of the Aquaculture and Inland Fisheries Sub-Sectors. In relation to this undertaking, five (5) program areas have been defined and this in effect, reflects the job description of the Officers within the Unit.

In 2002, the Aquaculture Sub-Sector continued to expand. This was evident from the increase in the number of farms and consequently the area under production, as well as the number of potential farming operations going through the EIA and/or the EPZ Approval process. This was relevant to both the shrimp-farming component of the industry, as well as the Inland Freshwater Farming component of the industry.

3.9.2 Marine Aquaculture Development

Paradise Shrimp Farm located on the Coastal Road

In regards to the area devoted for shrimp farming, there was an increase in land tenure-ship from 44,304 acres of land in 2001 to 55,112 acres of land in 2002 [See table 2].

TABLE # 2: PROFILE OF THE AQUACULTURE INDUSTRY – 2002

STATISTICAL FEATURES	**YEAR 2001**	**YEAR 2002**
TOTAL FARM LAND	*44,304 ACRES*	*55,112 ACRES*
AREA HARVESTED	*5,818 ACRES*	*6,588 ACRES*
PRODUCTION AREA	*5,818 ACRES*	*6,788 ACRES*
AREA NOT IN OPERATION	*68 ACRES*	*68 ACRES*
NEW FARMS	*490 ACRES*	*458 ACRES*
EXISTING FARM EXPANSION	-	*590 ACRES*

TOTAL ACREAGE	*6,356 ACRES*	*7,904 ACRES*
TOTAL PRELIMINARY PROJECTIONS FOR PRODUCTION (Heads-on)	*13,460,000 pounds*	*23,730,000 pounds*
TOTAL PRELIMINARY PROJECTIONS FOR EXPORT (Tails)	*8,614,400 pounds*	*15,187,200 pounds*
REALIZED PRODUCTION	*9,812,135 pounds*	*8,891,366 pounds*
TOTAL PRODUCTION ESTIMATES (Heads-on)	-	*10,111,940 pounds projected*
TOTAL EXPORT (Tails)	*7,127,374 pounds*	*5,406,857 pounds*
TOTAL EXPORT VALUE	*$48,738,671.25*	*$44,528,326*
AVERAGE MARKET PRICE/Lb. TAILS	*$6.84*	*$8.23*
TOTAL NUMBER OF FARMS CONSTRUCTED	*15*	*15*
TOTAL NUMBER OF FARMS OPERATIONAL	*11*	*13*
TOTAL NUMBER OF FARMS REALIZING HARVEST	*11*	*12*
TOTAL NUMBER OF FARMS ABANDONED/DECOMISSIONED	*1*	*2*
TOTAL NUMBER OF FARMS UNDER PERMITTING REVIEW	*3*	*3*

There was an increase in pond production area from 5,818 acres in 2001 to 6,788 acres in 2002. This represents an increase of 16%. It should be noted that only 6,588 acres of the 6,788 acres of land under production were harvested in 2002 - the remaining acreage was harvested by one farm in early 2003. Production pond acreage is expected to increase to 7,904 acres in 2003, of which 7,836 acres are expected to be in operation by the end of the year. The remaining acreage is relevant to farms that have been decommissioned or lying fallow.

The number of farms in operation increased from eleven (11) in 2001, to thirteen (13) in 2002, with an additional two (2) farms that have been abandoned or lying fallow. In addition to this overall number of fifteen farms, with the two (2) new farms in the early stages of development (Rio Mar and Melinda Mari culture Ltd) and one (1) farm pending approval by the NEAC, this should bring the total number of farms to eighteen (18) by late-2003.

Farm production for 2002 has been estimated to be 10.1 million pounds of heads-on shrimp, with an approximate of 6.47 million pounds of tails being processed for sale in the local market (10-15%) and most of the product being exported to the U.S. and the E.U. markets.

In relation to inland freshwater farming developments, this may be separated into two (2) levels of enterprise – these are the large-scale commercial operations and the small-scale subsistence and trial operations. In relation to the large-scale operations, one (1) farm exists. This is Fresh Catch Belize Limited with a proposed production area of 150 acres and a production capacity of 2.6 million pounds per year. As of December 2002, pond construction activities have been

completed and the initial stocking of brood stock commenced in October with additional stocking in the nursery system in December. This operation is based on the farming of red tilapia and the silver tilapia.

In relation to the small-scale farms, there are currently twenty-two (22) farms in operation, with a total acreage of 15.4 acres. There has been much interest in this area with twenty-seven (27) potential farmers that have approached the Fisheries Department. Most of the interests and participation thus far has been in relation to the Mennonite Community in the Orange Walk District.

The species being farmed in inland freshwater situations include a number of indigenous cichlid species such as the Crane (*Cichlasoma urophthalmus*), the Bay Snook (*Petenia splendida*) and the Tuba (*Cichlasoma synspilum*), as well as the Tilapia.

3.9.3 Support/Extension Services

The AQUIF Unit expends approximately 320 to 350 man-hours per month. In relation to the protection of species in the environment, the AQUIF Unit organized a public forum to solicit the views and opinions of stakeholders in regards to the draft "Freshwater Fisheries Legislation". A report of this forum has been completed and the "Draft Freshwater Fisheries Legislation" has been finalized and is ready for submission to the Solicitor's General Office.

In addition to the advisory and enforcement services, the AQUIF Unit is also involved with the production of seed stocks or fingerlings for fish farmers. In 2002 the AQUIF Unit produced and sold 6,000 fingerlings to small farmers with earnings of $1,500.

3.94 Institutional Strengthening

The AQUIF Unit embarked on a major initiative to train its officers in 2002. This was mainly in the form of short-term overseas training. In this regard the AQUIF Unit organized training for four of its officers in locations such as Egypt, Taiwan, China, Malaysia and Mexico [See table 3].

TABLE # 3: SHORT-TERM TRAINING (OVERSEAS)

NAME	TIME FRAME	DESTINATION	TRAINING PROGRAM
Rigoberto Quintana	27/05/02-02/06/02	Mazatlan-Mexico	Shrimp Disease and Diagnostic Methods
	12/07/02-22/08/02	Malaysia	Shrimp Hatchery Operation and Management
Normando Perez	8-21/07/02	Taiwan	Technology & Management of Aquaculture

Olive Hyde	28/09/02-13/12/02	Egypt	General Freshwater Fish Husbandry
Wilfredo Pott	25-29/09/02	China	International Water Conference

4.0 DEPARMENT OF COOPERATIVES AND CREDIT UNIONS

4.1 Introduction

The year 2002 will indeed go down as one of the most active years for the Department of Cooperatives and Credit Unions. This probably could be attributed to the increase in internal control audits and visits carried out by the Department, as the Department was successful in meeting with every Credit Union Manager and Board to improve operations and to improve the relations between the Department and the Staff.

The year 2002 will also go down as the end of an era of instrumental leadership by a Minister who was bold enough to allow the Department to achieve its goals. Under his leadership, during 1998 to 2002, credit unions membership grew from 60,180 to 73,740, number of loans issued increased from 23,628 to 35,711, amount of funds issued as loans increased from $57,620,608.27 to $90,010,421.68, savings grew from $101,260,357.15 to $180,418,308.21, and assets increased from $142,505,832.42 to $252,898,039.55.

4.2 Mission

"The Department of Cooperatives and Credit Unions is committed to the strategic management of human, technical, financial and other resources for the sustainable development of Cooperatives and Credit Unions as business-oriented units in the socio-economic development of Belize."

4.3 Objectives

- To deliver an effective, efficient and, above all, a courteous service by ensuring staff are trained in public relation

- To improve the quality and sensitivity of service by listening to the voices of the public and by setting targets and monitoring performances.

4.4 Staff

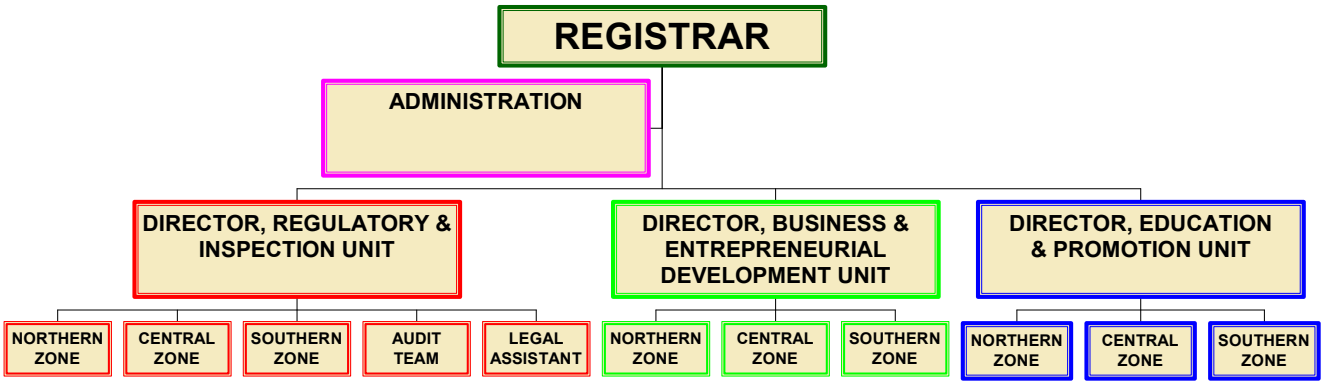
In 2002, a new Registrar of Cooperatives and Credit Unions, Ms. Zenaida Moya, was hired to head the Department. Ms. Moya then became the first female Registrar of Cooperatives & Credit Unions.

In an effort to offer effective technical support to credit unions and to have the Department serve in a more advisory capacity to credit unions and cooperatives,

several new officers were also recruited to join the existing staff during 2002. These officers included: Braulio Contreras, Armando Aban, Marian Castellanos, Dwayne Requena and Floridalia Quiroz. Also in December of 2002 the Assistant Registrar, Mr. Joseph Bradley, proceeded on retirement.

4.5 Structure

In September of 2002, the Department was restructured in order to better serve the increasing demands of credit unions and cooperatives. Three units were established, namely, Regulatory & Inspection Unit, Business and Entrepreneurial Development Unit and Education and Promotion Unit. Each unit was then split into zones (Northern, Central, and Southern Zone), to more effectively serve our members.



4.6 Education & Promotion Unit

The first of the Training Programs offered for 2002 by the Department and the League was the Capability Workshop entitled Roles and Responsibilities of Officers. The training was geared toward educating Boards of Directors, Supervisory Committees, and Credit Committees of their roles and responsibilities within their credit unions.

The movement also for the first time held a two-day Credit Union Conference on October 18 and 19 at the Princess Hotel and Casino under the theme “Credit Unions: Building a Better Tomorrow”. Highlights of the conference were training seminars, a Youth Forum, and a Banquet & Awards Ceremony to award credit unions and credit union leaders who exemplified the credit union spirit and philosophy of hard work and steadfast commitment.

The Registrar of Cooperatives and Credit Unions and a delegation from Belize represented the country at the 45th Annual International Convention held in Ocho Rios, Jamaica from July 18 to July 25, 2002. Honored at this Convention were Mrs. Jane Usher from Holy Redeemer Credit Union Limited and Mrs. Arcelia Leiva from La Inmaculada Credit Union Limited for their long service to the credit union movement. Belize was also honored as being one of the 10 pioneering countries of the Caribbean. Mr. Gilroy Graham was elected to serve on the

CCCU Board of Directors were, Ms. Zenaida Moya, was elected to serve on the Executive Committee of the Caribbean Association of Regulators of Cooperatives and Ms. Vanessa Johnston was elected to serve on the Youth Forum Committee.

Six hundred and sixty-three (663) Credit Union and cooperative members and two hundred and eight (208) pre-cooperative members received training on Institutional Strengthening to improve their managerial, technical and financial capabilities and skills. Three hundred and seventy-two (372) students also received cooperative education in an effort to promote the credit union and cooperative movement in the schools. In its continued effort to promote women, the Department's also provided similar training to thirty-one (31) women.

The Department also held for the first time a two-day Strategic Planning Workshop to look at the status of the different organizations and to decide what actions or remedial measures should be put in place to strengthen or improve those activities. Two regular staff meetings were called with staff from throughout the country. Monthly meetings with the Belize Credit Union League were also held to identify areas of joint efforts and to discuss problems facing the movement.

4.7 Regulatory & Inspection Unit

In 2002, the Credit Unions Act was revised to accommodate the changing technological and financial advances in the area of financial services to better serve members.

A Credit Union Technical Assistance Program and Board was established to provide technical support and to develop sound management practices and policies. Five persons were appointed to serve on the Board, namely, the Registrar of Cooperatives and Credit Unions, the Director of the Regulatory and Inspection Unit, a Representative of the Belize Credit Union League Limited, a Representative of Holy Redeemer Credit Union Limited* and a Representative of St. Francis Xavier Credit Union Limited*. (*Representation from credit unions not represented by the League)

4.7.1 Audits & Accounts

During the year under review the Department continued to assist Societies in the writing up of their books of accounts. They also assisted various Societies in the computerization of their accounts.

Credit Unions were given until December 31st to have their accounts updated and submitted on a monthly basis. The most common problem encountered was that of untrained staff and officers.

As part of the functions of the Regulatory & Inspection Unit 17 audits were undertaken for different Societies countrywide. These included seven Credit Unions, three Fishermen Cooperatives and seven agriculture and service cooperatives. Of the 17 audits, 13 have been completed and 4 are almost finished.

4.7.2 Inspection and Enquiry

The Unit carried out Monthly inspection and verifications for active societies in the Northern Zone (Corozal and Orange Walk District); two officers were assigned to the Unit and posted in the two districts. Regular cash inspections were also conducted. In most cases due to the lack of finance cash inspection were carried out at the same time as verifications.

4.7.3 St. Francis Xavier Credit Union Limited

One of the main issues the Department had to deal with early in the year was the irregularities at St. Francis Xavier Credit Union Ltd. An investigative team consisting of the Registrar, the Executive Director of the Belize Credit Union League, and the Corozal District Cooperative Officer was constituted to investigate the irregularities. At the end of the investigation measures were taken which included the suspension of the Manager, Accountant, and Field Officer/ Network Supervisor. Official charges were later brought against the Field Officer/ Network Supervisor. Policies were also recommended to provide for a more productive and work conducive environment in the Credit Union.

4.7.4 Mount Carmel Credit Union Limited

In April 2002, the Mount Carmel Credit Union Board of Directors employed Mr. Julio Perez as the new general manager for the credit union. One of the immediate changes made was the decrease in the amount of cash kept at the credit union limiting the amount to $10,000.00. Recommendations were made to acquire a computer system to improve the preparation of updated financial statements and the creation of a D base and other important information to assist the credit union to be competitive with the other financial institutions. A complete examination was also carried out by Accountant Ernest Castro to assess the exact amount of embezzlement that was discovered in September 2001 at the credit union.

4.7.5 Main Type of Societies

As of 31st December 2002 the register of Co-operatives maintained by the Department accounted for 265 Societies. These included 58 Credit Unions, 125 Agricultural Co-operatives, 15 Fishing Co-operatives, 19 Housing Co-operatives,

5 Tourism Co-operatives18 Transport Co-operatives, 4 Consumer Co-operatives, 6 Beekeeping Co-operatives and 15 Other types of societies.

4. 7.6 Liquidated Societies

The intention to liquidate ninety-one [91] Societies was published. These Societies include: 20 Credit Unions, 8 Housing Co-operatives, 48 Agriculture/Marketing Co-operatives, 8 Transport Co-operatives, 1 Craft Co-operative and 5 Fishing Co-operatives. The liquidation process for these societies has to date not resumed due to the lack of personnel and finance.

4.7.7 New Societies

During 2002 there was only one new cooperative society registered. The Northern Peseros Co-operative Society Ltd. was registered in March 2002

4.8 Business & Entrepreneurial Unit

The Business and Entrepreneurial Development is a newly created Unit in the Department of Co-operatives and Credit Unions. The overall purpose of this unit is to ensure the development of the productive sector, focusing on co-operatives as micro or medium enterprises within the socio-economic development plan of Belize. The Unit also supports the Department of Co-operatives and Credit Unions as well as the Ministry of Agriculture, Fisheries and Co-operatives in anyway possible to better uplift the lives of the Belizean people encouraging them to be more independent and in most cases business oriented.

This unit is comprised of three zones, namely the northern, central, and southern zones with each zone being administered by a Co-operative and Credit Union officer whose primary responsibility is to promote, develop and support market-driven and economically viable micro-enterprises within the context of co-operative philosophy and principles.

Despite the shortage in staff and other resources the department ‘s office managed to assist in achieving the following accomplishments during the period under review. Combined statistical information on credit unions from the Cayo District, show that assets decreased by 2.85 %, shares increased by a small margin of 1.37 % whiles the credit union movement still offered 2,543 loans amounting to $ 4,644,701.00 with a combined membership of an average of 6,456.

There was a mark increased in production for carrots, peanuts, citrus and pineapples. Hot pepper production on the other hand decreased by 66.5 % as compared to the 2001 production figure, whiles it only exported 52 % of the 28,000 lbs produced, potatoes decreased by 62.09%, The dairy producers marketed an average of 350,000 lbs through Big. H. Enterprises and an approximate 100,000 lbs of process product either through cheese yogurt and other milk derivatives.

A relatively new sector that did and continues to be doing excellent is the agro-processing (value adding) of products. The Department of Co-operatives and Credit Unions in close collaboration with its partners in development facilitated the training of approximately 88 proposed co-operative members in papaya, pine-apple, mango, tomato jams and jellies, jalapenos, sweet potatoes, bananas, plantain, cassava, coco yam chips, supa, plums, V 8 juices and mixed fruits.

The Cooperative Department assisted the northern zone with promotional activities such as: fiesta ramah, Corozal day, field visits and market assistance. It also provided training in the following topics: financial management, administration, cooperative act, processing and self-confidence building.

The various cooperatives of the northern zone have been involved among other things in the production of vegetables, cattle, honey and sewing. The cooperatives were successful in producing and selling a large quantity of vegetables such as onions, carrots, cabbages and cucumber. Honey production was also on the rise this year.

5.0 STATUTORY BODIES

5.1 BELIZE AGRICULTURAL HEALTH AUTHORITY (BAHA)

The Project – 1189/OC-BL Modernization of Agricultural Health was designed to upgrade Belize's capacity for the agricultural health services by establishing the Belize Agricultural Health Authority (BAHA), a quasi-government institution with joint governance by the Government of Belize and the Private Sector. BAHA is intended to provide enhanced sustainability of agricultural health and food safety services while meeting the improved quality of services demanded by trade globalization.

The Profit & Loss statement for the reported period shows a 60% increase in revenue collected as compared to the same period last year. It must be stated that Government subvention accounts for 54% of total revenues while BAHA generated funds of $812,670 or 46% of all revenue.

5.1.1 Food Safety Services

5.1.1.0 HACCP Unit

Sanitary Audits of Nova companies and corrective actions recommended by BAHA and instituted by Nova resulted in Nova shrimp processing facilities achieving HACCP certification.

Another Shrimp processing plant (Aqua-Mar) has also submitted its HACCP plans for evaluation by BAHA (Food Safety Service) and has undergone one official sanitary audit.

5.1.1.1 Inspections

Inspections of processing plants continued throughout the year. A total of 46 meat, fish, dairy and juices processing plants were inspected.

Except for one fish processing facility, the EU audit of the fish processing facilities was favorable. The Fishery User Group met to discuss the results of the EU audit report and a plan of action to achieve improvements in each of the processing facility was agreed upon and submitted to the Food Safety Services.

Monthly baseline microbiological testing of fish and fishery products from the various fish and fishery products processing facilities continued. A total of 470 official samples were tested and the financial returns were just over $20,000.

Inspection of meat and poultry processing industry including Running W in Central Farm, and Rio Azul in Orange walk was conducted on a weekly basis. Assistance was also provided to the Dairy industry in food safety matters and inspections. Two new food safety inspectors were hired in December 2002 to service the food processing industries (namely meat and poultry) in the Orange Walk district and the other in the Cayo district to service the milk, juice, fruits and vegetables processing industries.

A HACCP Principles and Prerequisites training Workshop for Public Health Inspectors, BAHA personnel and members of the Meat processing industry was held in Cayo in conjunction with PAHO resource personnel. Food Safety Services also teamed with the Food Safety Official from OIRSA to host a three-day workshop in Good Agricultural Practices in Juices, Fruits and Vegetables. A

follow up one-day seminar was also undertaken with the Belize Marketing Board to address processing problems that small-scale fruit and vegetable canners had.

Belize was the host of the Canada – CARICOM Alliance on Codex and Food Control Systems. The Food Safety Services of BAHA organized this international seminar, which was host to some 60 participants representing international organizations and institutions.

Belize was also the host of the OIRSA's XVII Extraordinary Technical Commission Meeting in October of 2002. This meeting was the first for the technical desk for food safety recently established in OIRSA. BAHA's Director of food safety chaired the technical desk for food safety. The resolutions adopted at the meeting, which included Animal Health, and Plant Health were endorsed by the Central American Ministers of Agriculture.

5.1.1.2 Fish Health Unit

The Taura Syndrome Virus (TSV) that has spread throughout the shrimp farms of Belize has showed its dramatic effects on harvesting. The harvest numbers have been much lower than expected and this has resulted in depleted stocks for export. Restocking took place much later in the year and thus the processing plants were inactive for a number of months.

A Risk Analysis of a hatchery and shrimp farm in Mexico was undertaken by Fish Health officer and Food Safety personnel to determine the health risk involved in the requested importation of Naupili and PL`s of Shrimp from Mexico. The risk analysis was favorable and imports were allowed from the visited site with the appropriate conditions being met. A Risk analysis and site visit for a sanitary audit of a Tilapia feed processing facility in Honduras was also conducted in conjunction with the Veterinary Medicine and Feed Registrar. The facility was provided with a written review of the result of the audit and conditions to be met in order to meet importation requirements. The Fish Health Unit also conducted Site visits to the Tilapia farm.

The Fish Health Officer and Food Safety Inspector conducted an investigation of increased fish mortality on Tilapia farm in December. Samples were submitted to CIL and fish dissections and microbiological testing revealed a common parasite and bacterial infection problem, which was rectified with antibiotic and anti coccidial treatments. Since then the farm has not experienced any abnormal or un-expected mortalities

The Fish Health Officer attended an FAO sponsored Fish Health training seminar in Mexico during this period. An outcome of this seminar was the formation of a fish health support group and contacts for the further development of fish health protocols for improved bio-security and sustainability.

A proposal to develop the fishery industry and to improve on fish health has been developed with Dr. Burns and submitted to the EU for possible funding. The project is a comprehensive one and would address such issues as residue testing of fishery products to assure our trading partners of the safety of fishery products in Belize.

5.1.1.3 Food Borne Disease Investigations Unit

The Food Safety Services was able to isolate *Staphylococcus aureus* intoxication as the probable cause of a food borne intoxication involving 3 people, two of whom were hospitalized. The suspect food commodity was fish fillet bought from a vendor off the streets and sold to a small restaurant. Food safety staff and the Public Health department did investigation and sample collection.

A Food Microbiology technician attended CAREC training workshop on Salmonella surveillance in Trinidad. The goal is to feed into a regional database for food borne disease surveillance network.

A Mycology laboratory has been established through the efforts of Food Microbiology Laboratory Supervisor at CIL. This unit will be used to test for yeast and moulds in foods as well as for investigations.

5.1.1.4 Quality Assurance Unit

The working group on egg standards at an international conference held in Trinidad in November 2002 on Table Eggs Production, Safety and Competitiveness has requested that BAHA assist in the drafting of regional quality standards for table eggs for Caricom.

Request for CIL food safety services to provide nutritional testing of commodities continues to come in. Residue laboratory technician and Laboratory Administrator have partnered with PAHO/INCAP to perform testing for iodine in salt for the country of Belize.

The Food Safety Director was appointed on the newly established Nutrition Commission of Belize. Plans are in place to develop the work program of the commission in order to fulfill the mandate of the Food and Nutrition Security policy of Belize.

5.1.1.5 Veterinary Public Health

The Food safety inspector was involved with rabies control in Cayo. Site visits to Guatemala and Nicaragua residue testing facilities helped to establish firm links and partnerships for reference testing for residues. Samples have been

submitted to Nicaragua in order to help fulfill our residue testing commitments in fish.

5.1.1.6 Food Import/Export Policy Unit

A total of 1,857 food permits were issued. In addition 29 sanitary certificates were issued. Combined, a total of $22,480 was earned in this unit.

5.1.2 Quarantine & Inspection Service

5.1.2.1 Regulatory Activities

The thirty-two (32) Med fly interceptions in the Southern Districts cost the Government of Belize over $200,000.00. A total of 311 permits, 1291 Phytosanitary Certificates, 5257 Landing permits were issued countrywide. A total of 506 violations were reported for the year 2002. The number of market inspections decreased by 21%, to 261 from last year's 329. Including Med fly, there were a total of 55 interceptions, an increase of 83% in comparison to last year. In terms of revenue collection for BAHA, the Quarantine cost recovery scheme generated $680,182.05, an increase of eighty percent (80%) compared to last year's income of approximately $378,748.93. Of the revenue collected: $436,599.05 was for Quarantine Inspection of imports; $68,234.00 for export certification; $69,784.00 for ship boarding; $28,860.00 for violations; $2,410.00 for inspection of goods in transit; and $520.00 for inspection of private aircrafts. A total of $32,280.00 was collected for the issuance of Plant Permits; $210.00 for Food Safety import permits; and $10,025.00 for the issuance of Animal Health import permits. An additional income of $5,390.00 was also generated for consultancy services offered to Suriname during attachment with Quarantine in Belize.

5.1.2.2 Legislation

The Quarantine Procedural manual was completed. The amendments to SI number 62 of 2001 were completed. Procedures and documents for major quarantine activities, such as: Inspection Procedures for imports, Export Certification Procedure, Procedure for conducting Market Inspection and Quarantine Investigations; Inspection Procedures at Terrestrial Ports of Entry; Inspection Procedures for the boarding of vessels and aircrafts were updated and/or developed.

5.1.2.3 Surveys and Surveillance

There were a total of 32 Med fly interceptions for this year, a one hundred percent increase in detections compared to the year 2001, when 16 Med fly interceptions were carried out. The areas of interceptions in 2002 were Punta Gorda, Seine Bight, Placencia, Hopkins and St. Nicholas Caye.

A total of 39 farmers involved in the propagation of med fly host commodities destined for the export market signed compliance agreements with BAHA. This included farmers involved in hot pepper and papaya production.

5.1.2.4 Administration

The boarding of aircrafts and cost recovery scheme for private planes was implemented at the Phillip Goldson International Airport and Big Creek. The BAHA headquarters in Placencia was completed. The employment of a Data Entry Clerk and the establishment of a Quarantine database greatly enhanced the accessibility and analysis of data for the Department. The feasibility study of establishing a Quarantine Station in San Pedro was also conducted.

5.1.2.5 Public Awareness

Other meetings were held with farmers, producers and importers in Belmopan and Orange Walk. Several meetings were also held with the Vegetable Importers Association. Through collaborative efforts with the Bureau of Standards, the Department became involved in transferring draft standards to producers and importers of carrots, potatoes and onions. The Ministry of Agriculture was also presented with copies for comments.

5.1.2.6 Networking

A meeting was held with Ministry of Agriculture personnel to address the issue of contraband and District Agricultural Coordinator's role in market inspection to curtail such an activity.

Discussions were held with the Pesticide Control Board, who donated an updated manual of pesticides registered in Belize to every Port of entry. All Officers were trained and the Pesticide Control Board made the decision to assist with gloves and masks for the safe inspection of imported pesticides at the respective ports.

Several meetings were held with the Assistant Comptroller of Customs to discuss how best the collaborative efforts of both Customs and Quarantine could be enhanced. The meeting was as a result of the repeated release of containers from the Belize Port Authority, with goods of Quarantine importance, without inspection from Quarantine. The result of such meetings proved beneficial.

A meeting was also held with Border Management at the Northern and Western Border to ensure that adequate working space is made available for BAHA's operation.

The Ministry of Agriculture, Petén, Guatemala was also facilitated with procedures that are in place with respect to the National Med fly Surveillance Programme.

5.1.2.7 Training

Three Quarantine Supervisors and Quarantine Inspectors participated in a workshop held in Belize on Citrus Canker and Citrus leprosies in the month of February. Pesticide Control Board conducted a training session for Quarantine Inspectors. Quarantine Supervisors also participated in a one-day seminar held at the Princess Hotel and Casino, on Management. A Quarantine Inspector also received training in Communication Skills, Public Relations and Front Desk Operations. Another Quarantine Inspector attended a simulation exercise for Foot and Mouth Disease in Panama.

The Director of Quarantine represented Belize at a seminar held on Dispute Settlement in Honduras. She also participated in the reunion of Plant Quarantine Directors held in Barbados and attended the OIRSA Reunion of all Directors Of Plant and Animal Health and Food Safety held in Belize, for the first time. The Director also gave a presentation on the role of the Quarantine and Inspection Service in the Processing Industry to a group of processors at Cahal Pech Resort, along with the Director of the Food Safety Department.

5.1.3 Plant Health Department

The Plant Health's Department goal is to provide efficient, reliable, cost effective solutions to clients in the plant health field and at the same time maintaining phytosanitary security.

5.1.3.1 Diagnostics and Surveillance

The department continued to lend support to the med fly Surveillance Programme in the identification of intercepted med flies. A first report was made of pepper gall midge on hot pepper. Likewise a new report was made of a mealy bug ***Dysmicoccus* sp**. on banana. The management recommendations provided by the department resulted in a 30% reduction in the amount of rejected fruit. Other pests detected at field level were: ***Fusarium*** on plantains, coconut weevil, whiteflies and lethal yellowing on coconut, lethal yellowing on Royal Palms, ***Helminthosporium*** and ***Mocis latipes*** on sugarcane, mites on hydroponically grown vegetables and ***Erynnis ello*** on cassava. Survey was conducted countrywide for gall midge on hot pepper. On a monthly basis surveillance was carried out for pink hibiscus mealy bug.

5.1.3.2 Training

The department conducted twelve training programs during the period under review to two hundred and thirty-one persons. These included pest and disease management in cabbage, onion, potato, carrots, hot pepper and papaya, exotic pest and disease awareness, as well as management of banana mealy bug and structural pests of wood. Training was also provided on sanitary and phytosanitary measures to technical agricultural personnel.

5.1.3.3 Legislation

A protocol was developed for the importation of plantain, papaya nurseries, importation of vanilla, the risk assessment for the importation of *Acacia magnum*, wood packaging standard, and the plant health regulations review was completed.

5.1.4 Animal Health

5.1.4.1 Notifiable Diseases

Two samples were submitted to Ladives Laboratory in Panama for Vesicular Stomatitis confirmation. Both samples were negative to ELISA. In 2002 an active surveillance programme on vesicular diseases was implemented with the assistance of USDA. The Med fly technicians assisted BAHA in weekly questioning of target farmers and the veterinary personnel did monthly visual inspection of animals in the target farms. A total of 298 farm visits were recorded. Thirty-two brain samples were submitted to MIDA Laboratory in Panama for Rabies diagnosis. Two of the samples were positive for rabies, one from a fox from Esperanza Village and the other from a bovine from Pilar, both in the Cayo District. The bovine sample was subsequently sent to Colombia by PAHO for characterization.

The tuberculosis and brucellosis programme was initiated in November 2002 with the dairy farmers delivering milk to the Western Dairies Plant in Spanish Lookout. A total of 77 farms were visited and 465 cattle were tested for tuberculosis and brucellosis; all the results were negative.

5.1.4.2 Disease outbreaks

In December 2001 an outbreak of diarrhea spread throughout the Cayo District affecting mostly dairy cattle and causing a dramatic fall in milk production. The samples submitted for laboratory analysis, all tested positive for Bovine Viral Diarrhea (BVD), type 1 and type 2. BVD, type 2 had previously caused problems in the USA and Canada.

In October 2002 the dairy farmers delivering milk to the Western Dairies experienced an outbreak of mastitis in their milking herds. This caused milk rejection at the Plant, laboratory results showed that the outbreak was due to environmental and udder pathogens.

Shipyard farmers reported mortality and high morbidity in broilers obtained from a particular hatchery. The birds were diagnosed with vitamin E/Selenium deficiency although the mortality in birds less than a week old was not diagnosed – Avian Encephalomyelitis due to poor vaccination of breeder flock was suspected.

Various poultry farms in Shipyard were affected with coughing and rales, given the age of the birds ***Mycoplasma gallisepticum*** was suspected. The test for Avian Influenza was negative. Cultures were positive for streptococcus isolate type A.

A farmer in the Orange Walk District lost 23 cattle due to Blackleg. After 2 series of vaccination no more animals were lost.

5.1.4.3 Disease Surveillance

The Avian Influenza Surveillance launched in January 2001 was maintained in 2002 through sentinel farms and investigation of suspect cases. All samples tested (650) were negative to Avian Influenza.

The ongoing surveillance for Classical swine Fever (CSF) continues to indicate that Belize is free of this infectious List A disease. Late in November, suspect CSF was investigated in a farm in the Cayo District. An emergency response was mounted and was only lifted when the Plum Island Laboratory confirmed that the results were negative. A total of 364 samples were tested for CSF at our Central Veterinary Laboratory; all with negative results.

5.1.4.4 Field Services and Veterinary Services

The Veterinary Clinics in the districts saw a total of 249 cases in 2002. Other veterinary services offered by the Animal Health department included pregnancy diagnosis, de-worming, and post mortem examination.

5.1.4.5 Permits, Quarantine and Health Certificates

A total of 5062 import permits were issued in 2002. A total of 17-health certificate were issued at Central Farm Veterinary Clinic for the export of 4,250 bovine hides to Guatemala. The Central Farm Office issued two International Veterinary certificates for the export of a parrot and tortoise. 23 on-farm quarantines were done for 410 animals, as compared to 10 and 259, respectively, for 2001.

5.1.4.6 Risk Analysis

A visit was made to Honduras to assess a plant for export of tilapia feed to Belize. Approval was given for tilapia feed manufactured at the Alcon Mill for Fresh Catch Farm. Breeder pigs from Guatemala were refused entry due to supporting documents from laboratory that had vague results for CSF and PRRS. A farm visit was conducted in Tizimin, Mexico to assess quarantine site and testing. Risk analysis was also done for a Mexican circus and West Nile Virus was studied to assess hazard of importing horses from the USA.

5.1.4.7 Laboratory

A total of 5,209 samples were processed at the Central Farm laboratory for the year 2002. 4,066 or 78% were submitted for Diagnostic Assays, (Parasitology, Bacteriology, Serology) and 1,143 samples or 22% were submitted for non-diagnostic assays (Hematology, Urine Analysis, Immunology and sample preparation). 1,014 samples were tested for List A diseases.

5.2 THE BELIZE MARKETING BOARD

Marketing has been identified as one of the key constraints to agricultural development in Belize. The Belize Marketing Board is a major player in marketing commodities, coordinating both domestic and export activities relative to some essential items. The commodities currently addressed by BMB are, red kidney beans, potatoes, carrots, onions and recently soybeans, and some small fresh and processed products with small farmers and entrepreneurs.

5.2.1 Product Purchases

During the fiscal year August 2001 to July 31 2002 the Board purchased products valued at $5,994,049 from rice farmers and other producers who have joined in the Department of Agriculture thrust of import substitution.

Table # 1: Purchase of Local Commodities (2001/02)

Commodity	Volume (lbs)	Value ($BZ)
Rice Paddy	4,762,251	1,036,886.41
Milled Rice	6,989,460	4,056,921.40
Potato	34,992	19,236.01
Carrots	37,543	20,983.30
RK Beans	260,996	192,669.70
Onions	458,650	272,381.50
Soybean	1,371,105	394,971.10
Total		$5,994,049.42

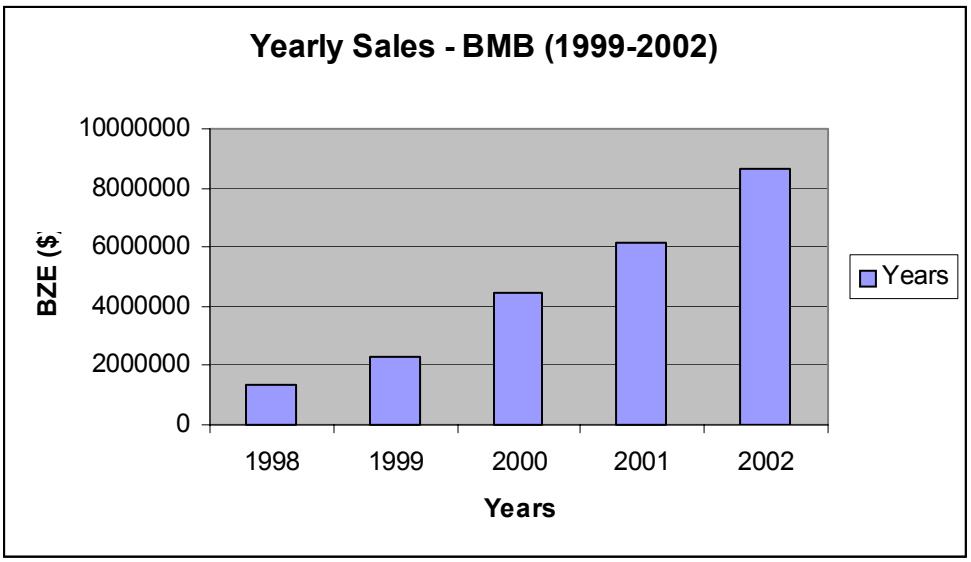
SOURCE: BMB, 2001

Imports of Commodities (2001/02)

Commodity	Volume	Value ($Bz)
Potato	189,000	64,715.20
Onion	1,259,400	475,493.92
Rice	1,640,000	819,842.40
Skimmed Milk	2880 cases	43,506.00

SOURCE: BMB, 2002.

The graph below depicts an increase in sales from $1,348,242 in 1999 to $8,675,675 at the end of July 2002.



5.2.2 Agro-processed Products

With the establishment of the Product Development Unit last year the Board is actively seeking and encouraging the value adding to agricultural products. Agro-processing provides for additional income generating opportunities for small income families. To this end we have bought various quantities of stewed suppa, stewed pumpkin, stewed papaya, pepper sauce, jalapeno pepper, and mixtures of may plum and mango. Maintaining quality remains a challenge for us and hence the Board will be documenting the quality and standards that need to be maintained by agro-processors. We also continue to design and print low cost labels for various agro-processed products around the country.

5.2.3 Soybean Production Project[1]

In June 2001, four hundred and forty five acres of soybeans were planted in the Orange Walk District of which 532,365 lbs was harvested. A second crop was planted in October/November and December of 2001, which involved 59 farmers in Cayo, Orange Walk and Corozal district with a total acreage of 2056 acres. A low production of 386,462 pounds was obtained, which is considered below average yields. Several factors contributed to the low yields namely little rainfall during the growing period and the untimely arrival of inputs.

In June 2002, thirty-one farmers planted 1700 acres of soybean of which 1088 acres was harvested yielding a record production of 1,649,294 pounds. The project was also successful in producing its own seed for June 2003 crop.

Construction for the storage/drying unit and the processing plant commenced in May 2002. The foundation for the storage/drying unit has been completed while that of the processing plant is under construction and should be finished by March 2003.

5.2.4 Belize Marketing and Development Corporation

In order to introduce new functions to the Marketing Board, legislation was drafted for the House of Representatives to change the name of the Belize Marketing Board to The Belize Marketing and Development Corporation. Its mission will focus on collaborating with all development partners to ensure food security through enhanced product development and marketing services. Our main services will focus on identifying markets locally, regionally and internationally for local agricultural products including marine products. The BMB will be tasked to link buyers, sellers and producers of local commodities to ensure the smooth flow in the marketing chain.

5.3 Coastal Zone Management Authority and Institute

The Coastal Zone Management Authority and Institute is a statutory body established in 1998 by the Coastal Zone Management Act Chapter 329 of the laws of Belize. The agency, as mandated by the Act is responsible for the development and implementation of programmes and projects that translate the marine and related policies of Government into activities that contribute to the sustainable development of coastal resources.

Towards the fulfillment of this mandate the agency accomplished and proposes to undertake the following:

5.3.1 Monitoring and Research

The Institute sustains three national monitoring and research programmes: The coral reef monitoring, water quality monitoring and the endangered species monitoring (Manatee was the focus for 2002).

5.3.2 Coral Reef Monitoring Programme

The institute on a routine basis conducts coral reef monitoring work at three sites, Caye Chapel, Gallows Point, and Goffs Caye. Caye Chapel displayed the largest increase in recent mortality, highest mean percentage increase of coral bleaching and highest disease diversity. Incidence of diseased corals at Goff's Caye was non-existent among tagged corals in mid 2001 but by mid 2002 it escalated by 12.9%. Monitoring work has been expanded to include the Marine Protected Areas (MPAs). CZMAI continues improving its collaboration efforts with other organizations through its Coral Reef Monitoring at Rendezvous Caye with WWF and Green Reef with its spawning aggregation monitoring at Robinson Point and Goff's Caye.

CZMAI received a grant from the National Fish and Wildlife Foundation (NFWF) for conservation of Goff's Caye and its surrounding reef habitats and will be implementing the project in 2003. The project should see the installation of marker buoys at the site, increase in education of the visitors visiting the site, sustained monitoring of activities at the site and determination of the carrying capacity of the site.

5.3.3 Manatee Research Programme

Two scientific manatee aerial surveys were conducted for the year 2002, dry and wet seasons. Dry season survey recorded a total sighting of 83 animals, 7 of which were calves (8.4%). The wet season aerial survey had a total of 340 animals, 38 of which were calves (11.17%), indicative of a healthy manatee population. The majority of the sightings occurred in the southern lagoons of Belize where there is a notable abundance of sea grass beds, other vegetation, freshwater from numerous, rivers and streams, and a relative stable water temperature (25-33^{0}C). It is important that these habitats be maintained as best as possible to support the manatee population.

The post release monitoring of orphaned Woody and Hercules are ongoing. Both animals are monitored on a daily basis via VHF tracking devices and this initiative is being financed partially by a grant from PACT.

CZMAI worked closely with the Wildlife Trust in their annual Manatee Capture and Tagging Programme and plans to work closely with Green Reef in the implementation of its Manatee Awareness project in 2003.

In 2002 there were a total of twelve reported cases of Manatee Stranding, three of which could be directly attributed to watercraft collisions.

5.3.4 Water Quality Monitoring Programme

The water quality programme benefited from the improvements to the laboratory facilities, which has been upgraded considerably. However the disruption due to the upgrade of the facilities affected the ability of the agency to systematically collect data throughout the year. Notwithstanding these limitations monitoring was sustained at Caye Chapel and in the Placencia lagoon. Caye Chapel Monitoring concluded that the suspended sediment level was not significant and the nutrient levels required further monitoring to determine if they were indeed significant. Findings from the Placencia Lagoon Study should be completed by mid 2003.

5.3.5 Coastal Planning Programme

In 2002 Draft Guidelines were completed for Caye Caulker, Turneffe and Placencia and plans are underway for the fast tracking of the preparation of plans for the completion of the remainder of the coastal region by midyear 2003. CZMAI projects the completion of the Coastal Zone Management Plan and submission to the House of Representative by end 2004. These plans are being prepared by Coastal Advisory Committees (CACs) comprising government officials, developers, fishers, town and village council representatives, tour operators, business persons etc.

5.3.6 Data Management

Notable accomplishments were made in this area further boosting the Institute's position as the primary data centre for coast resources information and as such much investments were made in terms of equipment purchases and capacity building. This hub as data centre will be reinforced in 2003 as MBRS has selected CZMAI as a node for its Regional Environmental Information System. Additionally, we have successfully installed the Coastal Resources Information Systems (CRIS) developed under the CPACC project.

Towards database development we have acquired ERDAS Imagine 8.5 and Landsat TM Satellite Imagery dated March 2002 for the Country of Belize. In addition the Institute has developed a cayes database on land tenure, land use and habitat. Information for Turneffe Island Atoll has been completed and information on the remainder of the country should be obtained by mid-year 2003.

5.3.7 Education and Public Awareness

CZMAI facilitated numerous consultations in order to address the ostensibly lack of support for the National Integrated Coastal Zone Management Strategy for Belize by key stakeholders including fishers and local government officials. The consultations were extremely successful and resulted in the endorsement of the Strategy by Cabinet in February 2003.

In order to ascertain the level of understanding of the Fishers on Marine Protected Areas (MPAs), a fisher's questionnaire was developed in 2001and a survey was conducted in 2002. The survey concluded that there is a need for MPA education program targeted at fishers, as only 43% had no understanding of the role of the MPAs at all.

As a part of our nation wide public education strategy, CZMAI hosted its first Open Day in September 2002 for a three-day period to create public awareness on the organizations role functions and activities. Over 300 persons attended the open house and comments regarding the usefulness of the information and quality of the displays were positive.

In building awareness of the beauty and benefit of Cayes in Belize, CZMAI in conjunction with World Wildlife Fund celebrated under the theme "Dive Into Earth Day 2002-Celebrating Belize's Cayes: Sergeants - Goff's - English Rendezvous.

Exploring the Sea We Know, a programme consisting of a mural painting of marine and coastal resources and a day trip to Goff's Caye, was held for inner city and rural youths to allow exposure to the importance of coastal and marine resources and the role of CZMAI.

In an effort to adequately inform the rapid growth in tourism CZMAI produced a Tourism and Best Practice for Coastal Areas of Belize booklet, which has been widely disseminated.

5.3.8 Training and Workshops

In an effort to build the capacity of the staff of CZMAI so as to ensure that we maintain the ability to advise technically and strengthen linkages technical staff participated in a range of regional initiatives of which noteworthy examples are the International Coral Reef Initiative's (ICRI) and OAS training on Ocean Governance, IDB/GEF Gulf of Honduras Project Meeting, and GIWA Scaling and Scoping Workshop for the Caribbean Region.

Towards the strengthening of Marine Protected Areas (MPAs) most staff members benefited from having received training in Multivariate Statistical Analysis, Reef Fish Spawning Monitoring, underwater camera use, coral identification, dive certification and dive safety, etc.

Conflict resolution and leadership training workshop for Marine Protected Areas Advisory Council 's and Coastal Advisory Council 's was conducted by CZMAI to strengthen the framework for protected areas and development planning and management.

Several other government departments, agencies, and community groups were supported financially in order to facilitate their participation in international forums and/or training sessions.

5.4 CARD PROJECT

The Government of Belize (GOB), the Caribbean Development Bank (CDB) and the International Fund for Agricultural Development (IFAD), finance the Community Initiated Agriculture and Resource Management/Rural Development Project (CARD), for Agriculture Development (IFAD). The CARD Project became operational in June 1999 (although it was officially launched in March 2000).

The objective of the CARD Project is to develop the productive potential of balanced sustainable land use systems and ensure accessible support services to low income families in the southern region of Belize. The Project area comprises Toledo district and those settlements in the Stann Creek district south of the Hummingbird Highway.

To achieve its objective, the project has two mechanisms: the Community Development Fund (CDF) and the Rural Financial Services (RFS). Both CDF and RFS are implemented by the co-execution modality, i.e. service providers are contracted by the project to provide the services to the beneficiaries in the target region.

In the 2002 Annual Work Plan and Budget (AWPB), 44 new subprojects were planned plus 27 small subprojects brought forward from 2001 AWPB, making a total of 71 intended subprojects (table 1), of this total 34 subprojects have been completed, three are under implementation and another three are in the procurement services or goods stage. The remaining 31 subprojects have not materialized, either because their proposals were not submitted or the CALO withdrew the application. Furthermore, another twenty-three subprojects were presented to the CARD Project during the year, of which twenty-one have been implemented and completed in a timely manner.

Table #1: Summary of CDF Subprojects for 2002

Status	Subprojects projected In 2002 AWPB	Subprojects not projected In 2002 AWPB	Total
Planned	71	0	71

Proposal Submitted	40	23	63
Completed	34	21	55
Under implementation	3	1	4
Process of procurement	3	1	4
Not materialized	31	0	31

During the period under review there were thirty communities that benefited from the CDF subprojects, 23 from Toledo and 7 from Stann Creek. Eight organizations also received assistance from CDF, including one school (Tumul Kin).

5.4.1 Rural Financial Services

The main objective of the Rural Financial Services (RFS) is to improve the access to small farmers, micro entrepreneurs, women and youth, individually or in groups, to financial services (savings and credit) in terms and conditions suitable to their needs (micro finance).

The year 2002 was to be considered a pilot phase for the RFS, where the main objective was to test the methodological approach and learn from the process. The work plan was centered in conducting a Market Demand Survey for Rural Financial Services, engaging of two Intermediary Financial Institutions (IFIs), providing institutional strengthening to the same, and training of the Rural Financial Expert who attended a Micro-finance Training Course in Boulder Colorado. The major RFS accomplishments are illustrated in table 2.

Table # 2: RFS Achievements 2002

Activity	Quarter			
	1st	2nd	3rd	4th
Contracting of Belize Enterprise for Sustainable Technology (BEST) for undertaking Market Demand Survey for RFS				
Conducted the Market Demand Survey				
Engagement of BEST as the first participating IFI				
Attend Training Course in “Effective Management of Micro-finance Institutions of Small and Micro-enterprise” at the International Training Center in Turin, Italy.				
Prepare a Proposal for changes in the implementation strategy of the RFS Component of the CARD Project				
IFAD Support Visit				
IFAD/CDB Joint Supervision Visit				
Amend the Credit By-Laws of the Subsidiary Loan Agreement				
Preparation of Institutional Diagnosis for the Second IFI, namely the Citrus Growers and Workers Credit Union Ltd. (CGWCU)				

Vacation				
Engagement of the CGWCU at a participating IFI				
Signing of First-Tier Subsidiary Loan Agreement between DFC & CGWCU				
Mid-Term Review				
Preparation & signing of Memorandum of Understanding between CARD & CGWCU				
Preparation of proposal to CDB & IFAD for reallocation grant funds for the CGWCU				
Preparation of Three-Year Business Plan for CGWCU				

5.4.2 Highlights from CARD Project Coordination Unit

The project headquarters, constructed over the building that houses the Toledo Department of agriculture, was completed by mid February 2002 and staff members moved to the new office in March.

2002 was a year of much turn over in staff: a) Mr. Alexander Perez was hired as Accountant/Coordinator for Administration in February, he resigned in October; b) The contract for the Project Director, Mr. Jorge Cawich, was not renewed in May, since then Mr. Javier Garcia has been acting as Project Director; c) Mr. Allen Genus resigned from his position effective March, this vacancy was filled by Ms Maria Edeso in July; d) the Community Gender Specialist, Ms Eva Middleton was engaged with the project in August; e) And in September, Mr. Mario Chavarria resigned his post.

Mr. Sylvan Roberts, Statistical Surveys and Data Analysis specialist, was contracted to carry out a Baseline Study. This study was finalized in August and provides information about the actual situation of 20 villages within the CARD project region with regards to their productive (agricultural and non-agricultural), social and economic sectors.

In October, a Mid-Term Review Mission was conducted to assess the progress of the CARD Project and a result of this assignment the project received a series of recommendations and a one-year trial period.

5.5 BELIZE LIVESTOCK PRODUCERS ASSOCIATION (BLPA)

5.5.1 Livestock Situation Update

The year 2002 saw further increases in beef cattle production. An informal survey carried out by the Ministry of Agriculture reflected an increase in cattle numbers, both beef and dairy, of about ten percent over the 1994 census. The importation of breeding bulls and registered breeding heifers were the highest ever, with over 100 bulls and over 220 heifers coming into the country, from Mexico and the USA. Sale prices have continued to climb, particularly for

finished slaughter stock and for breeding heifers. The Mexicans have assured that imports of Belizean beef to Mexico will resume, and are scheduled to do so in the first quarter of 2003. This will stimulate a further increase in prices for cattle on the hoof.

Cattle farmers in the Orange Walk, Cayo, Belize and Stann Creek Districts have continued to increase their pastures and their breeding herds. Breeding heifers as well as feeder steers are in short supply. Interest also increased in the Toledo and Corozal Districts, with new cattle producers entering the scene and established producers purchasing superior bulls and heifers and expanding and improving their pastures.

An increase in the use of breeding stock with European blood, both pure and composite, has been reflected in the importations and in the use of artificial insemination. This reflects an increase in concern about the quality of beef being produced, in response to consumer demands, particularly users in the tourist and hotel trade.

In the Dairy sector, dairy herds and dairy production have been increasing, with a heavy emphasis in the use of artificial insemination. Artificial insemination courses were held to improve the skills of technicians. Dairy production continues to be concentrated mostly in the Cayo District, but is expanding rapidly into the Orange Walk and Belize Districts. Western Dairies in Spanish Lookout continues to expand its product base as well as its production, with increasing market acceptance.

Pig production increased beyond self-sufficiency levels in the early part of the year, and export markets for pork products could not be found. Many small producers stopped producing or started to slaughter and retail their own pigs. Improved genetic stock, being pigs with lower fat and higher muscle to bone ratios, as well as higher feed conversion factors, have been imported into the country by the Government and private producers and their numbers are being multiplied for widespread distribution.

The BLPA is focusing on strengthening its individual producers, on sourcing lands or land arrangements for expansion, and on sourcing credit and financing for the expansion that needs to take place, principally in the beef production sector but also in the dairy, and sheep and goat, sectors. Of greatest importance is the drive to assist producer members to reach economies of scale and to implement the latest technology in pasture establishment and management, use of alternative feeds and feeding systems, particularly in the very dry or very rainy seasons of the year, proper but affordable handling and management facilities and equipment, improved breeding systems and use of superior genetics, and improved financial management systems. Assistance and encouragement is being given to new investors in the livestock sector, both local and foreign.

6.0 ASSOCIATED COOPERATION PROGRAMS

6.1 Caribbean Agriculture Research and Development Institute (CARDI)

The CARDI (Belize Unit) Annual Technical Report 2002 covers two cropping seasons, the November/December 2001 planted crop which was harvested in March/April 2002, and the June/July 2002 planted crop and harvested in September/October 2002. Additional trials planted in the November/December 2002 season are not covered in this report since harvesting would commence in March/April 2003. Over the reporting period the Belize Unit research efforts concentrated on chickpea, corn (yellow and white), cowpea, hot pepper, mung bean, peanut, rice, pigeon pea, sesame, soybean and vegetables (sweet corn, sweet pepper and tomatoes). Corn is usually planted as a rotation crop on the field station in the May/June season and in June 2002 a few International trials on corn were also planted. During the reporting period technical assistance was provided to the soybean project, which is being executed by the Ministry of Agriculture, Fisheries and Cooperatives. Also, during the reporting period a number of commercial acreages of cowpea, peanut, rice and soybean were monitored.

6.1.1 Soybean

Eighty-two Soybean entries were planted in November 2001 in an unreplicated preliminary evaluation trial. A large number of entries provided more yields than the control *CARDI S-15*, which had yield of 648 g kg plot^{-1}. Twenty-seven entries had yields more than 1.00 kg plot^{-1} while exhibiting an acceptable lowest pod height. The seeds of these entries were increased for further testing.

Twelve Selected Soybean entries were planted in November 2001 in a replicated variety evaluation trial. The control entry, *CARDI S-15***,** which had yield of 2,270 kg ha^{-1} out yielded all entries.

A contract between the Ministry of Agriculture, Fisheries and Cooperatives (MAFC) and CARDI was signed on 15th May 2002 to provide technical assistance to the Soybean Project and to develop appropriate soybean production and processing systems for Belize. Technical assistance was provided to the staff of the soybean project and participating farmers through site visits, discussions and recommendations. Assistance was given in the selection of appropriate varieties of soybean for planting in June/July and October/November planting seasons. Various varieties of soybean and application of four fertilizers combinations were demonstrated at two sites, New Hope and Blue Creek in the Orange Walk District. Variety *CARDI S-15* had provided highest yield at both locations. Application of higher potassium had advantage in yield at the New Hope site while there was not much advantage at the Blue Creek site. There was no advantage in productivity due to the

application of higher rate of fertilizers with two foliar applications as recommended by the Brazilian consultant. These two sites have two different soil types.

Two Soybean Field Days were organized jointly with the Soybean Project Staff. The first was held on 12th September 2002 in which over 60 farmers participated. It was aimed at providing interaction between soybean producers and other producers. CARDI assisted in technical presentations and discussions. The second Field Day was held on 4th December in which about thirteen farmers participated. The purpose of this Field Day was to demonstrate various soybean varieties planted at the demonstration site in Blue Creek and also to show a seed production plot of variety *CARDI S-15.*

"PRELIMINARY GRADING STANDARDS FOR SOYBEAN GRAIN IN BELIZE" was prepared and provided to the soybean project staff. Price schedule were set up by the project using the grading standards.

Seeds of Variety *CARDI S-15* were multiplied at three locations - Blue Creek, Orange Walk, Central Farm and Spanish Look Out in the Cayo District. The crop was harvested at the Blue Creek location and was dried by the farmer at Blue Creek. It will be further cleaned, graded and stored in the cold storage for planting in June/July and October/November planting seasons of 2003.

"SOYBEAN PRODUCTION GUIDE' was first prepared in June 2002 and was revised in October 2002. A detailed "Soybean Production Manual" is being prepared and will be completed in the first quarter of 2003.

6.1.2 Peanut

Forty-two entries were planted in June 2002 in an unreplicated preliminary evaluation trial. A number of entries were found to be resistant to rust disease. Entries *WS-1, ICGV-88258***,** and **-***87273A* were found to be resistant to rust disease and entries *WS-4, ICGV - 88258, -88273A,* **-** *88361 Red, - 88378, - 88395- 88407, -91001A,* and *-91007* were moderately resistant to leaf spot disease. A large number of entries had performed better than the control entry, *Tennessee Red.*

Twelve entries were planted in June 2002 in a replicated variety evaluation trial. Entries *ICGV-88273A* and *-88273B* were highly tolerant to leaf spot and rust diseases as compared to the control cultivar. All entries had higher percentage of leaf fall at harvest. There was no significant difference in yield among cultivars.

6.1.3 Cowpea

Ten entries were planted in the November 2001 planting season in a replicated variety evaluation trial. Although there was no significant difference in yield

among varieties the commercial variety, *California #5*, had provided highest yield (1,380 kg ha^{-1}).

Technical assistance was provided to a large number of farmers in cowpea production technologies, particularly in the areas of weed, insect pest and disease management.

6.1.4 Corn

In 2002 project activities were concentrated on evaluating both yellow and white grain corn hybrids in three variety trials, including the 2002 International Yellow hybrid Corn trial accessed from the International Maize and Wheat Improvement Center (CIMMYT), to assess the potential of currently recommended hybrids and identify other suitable high yielding hybrids for medium sized and large scale producers.

Two sets were comprised yellow hybrid trials (11 and 10 entries) and one set was comprised of white hybrids trial (9 entries). Observations and data from the CARDI 2002 Yellow Hybrid Corn Trial indicate that, in terms of overall performance in the June 2002 cropping season, the hybrid *DK C – 805* performed better than the other ten hybrids that were included in the trial. Observation and data from the PCCMCA 2002 International Yellow Hybrid Corn Trial indicate that, in terms of overall performance in the June 2002 cropping season, the hybrid *MTC – 13203* performed better than the other nine hybrids that were included in the trial. Observation and data from the CARDI 2002 White Hybrid Corn Trial indicate that, in terms of overall performance in the June 2002 cropping season, the hybrids *HS 5* and *Asgro Nutria* performed better than the other eight hybrids that were included in the trial although *HS 5* found to have had more root-lodged plants than *Asgro Nutria*. Other entries that produced high shelled grain yields were *HS 7, DK C – 343, Z – 31 – BM,* and *Z – 31 – PG.*

6.1.5 Hot Pepper

In 2002 the project concentrated its efforts on producing seed of Yellow Scotch Bonnet to satisfy a request made by one of the local fresh fruit exporters.

6.1.6 Vegetables

The CARDI 2002 Vegetable Crop Observation Trial was established with nine varieties of sweet pepper and twelve varieties of tomatoes marketed by Prosser Fertilizer and Agrotech. One variety of processing tomato supplied by Cool Delite, a local processing company, was also included in the trial. Both Prosser and Cool Delite sponsored successful field days at the CARDI Field Station, which were attended by vegetable producers, District Agricultural Coordinators, Extension Officers and senior personnel of the Ministry of Agriculture, Fisheries and Cooperatives.

The CARDI 2002 Hybrid Sweet Corn Trial was established with seed provided by two local seed suppliers, Prosser Fertilizer and Agrotec Co. Ltd. and Universal Hardware, in an effort to identify high yielding sweet corn varieties/hybrids that are also adapted to local conditions. None of the entries provided fresh cobs of marketable quality due to extensive earworm damage. Based on the data and observations from the CARDI 2002 Hybrid Sweet Corn Trial it is concluded that none of the six entries evaluated could be recommended for commercial production at this time.

6.1.7 Other Crops

6.1.7.1 Chickpea Variety Observational Trial and Nucleus seed Multiplication:

Based on earlier evaluations 11 cultivars of Kabuli type chickpea were selected. In late 2001 four new cultivars of Desi type chickpea were acquired from Canada. A total of 15 cultivars were planted on 15 December 2001 at the CARDI Field Station. The purpose of the trial was to take observations on the performances of various cultivars and also to have nucleus seed. Among 'Kabuli' Type *FLIP 93-69C* had bigger seed size and also higher yield except *FLIP 91-112C*. Among 'Desi' Type *CP97-168D* had higher yield.

6.1.7.2 Mungbean Variety Observational Trial and Seed Multiplication:

Five new cultivars were acquired from the Asian Vegetable Research and Development Center, Taiwan. These cultivars along with a CARDI's selected variety, *CARDI Green* were planted on December 17, 2001 at the CARDI Field Station. The trial was planted to compare new cultivars with already selected cultivars. Two cultivars, *VC 6372-45-8-1* and *NM 94* matured in 66 days after planting while *CARDI Green* matured in 78 days. Cultivars *KPS-1* and *KPS-2* had 100-grain weight of 6.0 and 5.8 g, while *CARDI Green* had 4.1 g. Consumer preference is for larger seed size.

6.1.7.3 Chaya

Based on discussion with MAFC Senior Management it was decided that Chaya (*Cnidoscolus chayamansa)* would be included in its portfolio for introduction. Literatures have been collected and reviewed. Chaya foliage is very rich in protein and some minerals and vitamins. An informative publication has been prepared for distribution.

Chaya is being grown in Belize by Maya Indians as a source of protein. A few sticks of local types have been collected and planted in nursery bags and it has been transplanted in field for further multiplication.

6.1.8 Seed Production

Nucleus seed of selected crop types and varieties was produced on CARDI Field Station in Belmopan. Basic seed production involved selected varieties of ten-crop types - Chickpea, Cowpea, Mungbean, Peanut, pigeon pea, rapeseed, rice, sesame, soybean and Urid Bean. Certified seeds of Corn, Cowpea, Mungbean, Peanut, Rice, and Soybean were produced, cleaned and distributed to farmers.

6.1.9 Technical Assistance/Training

Technical services were routinely provided to researchers, extension agents, farmers and various local and international consultants. The technical services covered wide areas of agriculture including production technologies, processing, farming systems, and agricultural research and extension management.

Under a Memorandum of Understanding between CARDI and Agriculture Environmental Renewal Canada Inc. (AERC), CARDI in Belize produced seeds of selected hybrids of sorghum (grain and forage) and millet. Seeds were exported to AERC in Canada

An Extension Officer from the MAFC is serving an attachment at the Unit. Training involves exposure to research methodologies including data recording and management, and various aspects of crop production and post-production technologies.

The CARDI Representative continued to serve as a member of the Pesticide Control Board and also as a member of the Citrus Research and Education Institute (CREI). The CARDI representative was also requested to provide technical assistance to the Commodity Secretariat in organizing Research and Development Committee of three major export crops (Sugar, Citrus and Banana). MAFC appointed Mr. Anil Sinha to serve as a member of a Task Force for restructuring of Research and Development Section of the Ministry into a possible semi-autonomous institute. Mr. Anil Sinha was also invited to serve in the Advisory Committee of the Sugar Industry Research and Development.

6.2 THE TECHNICAL MISSION OF THE REPUBLIC OF CHINA TO BELIZE

The Mission was sent in early 1991 to work with Government and people of Belize in agricultural development. The Mission is comprised of eight members, including a Chief, two Agronomists, a Horticulturist, a Food Processing Specialist, a Mechanic and two Assistants. Presently the mission is carrying out three projects, namely, rice and other agronomic crops, vegetables and fruits, and food processing.

6.2.1 The Rice Project aims to produce high quality seeds, transfer seed multiplication technology, and assist in improving production systems. The major achievements during 2002 are the following:

1. Production of high quality rice seeds:

    a. 'CARDI 70': 80,000 pounds (4,671 lb/acre).
    b. 'Jasmine': 20,000 pounds (4,588 lb/acre).
    c. 'Taichung Sen 10': 46,000 pounds (4,988lb/acre).

2. Trials of new varieties: Two trials of 22 new varieties have been carried out in Pappy Show, Toledo. Six varieties are found promising, and will join the further trial.

3. Testing of production and marketing potential of 'Jasmine Rice': A Jasmine rice variety from Texas, USA was grown in Central Farm, Cayo and in Pappy Show, Toledo. A total of 20,000 pounds (4,588 lb/acre) was produced. 9,050 pounds of white rice milled from 17,000 pound of rice paddy was sold to market with a wholesale price of BZ$1.00/lb. It is shown that this variety has a promising market potential in Belize.

4. Technical assistance in rice production (580 acres) in Toledo.

5. Training of students from FANR and Tumul Kin School on rice production.

6. Depositing BZ$41,976.60 from rice sales into the Rice Project Account, the accumulated total was BZ$64,773.80 by end of 2002.

Rice Field in poppy Show

Training of FANR students

6.2.2 The Vegetables, Fruits and other Agronomic Crops Project major achievements during 2002 are as follows:

1. Propagation of planting material of promising crops:

    a. Soybean: 2,600 pounds.

b. Vegetable soybean: 330 pounds.
c. Soybean (for sprouts): 570 pounds.
d. Azukibean: 1,200 pounds.
e. Peanut: 1,300 pounds.
f. Mungbean: 165 pounds.
g. Cherry tomato (seeds): 0.88 pounds.
h. Guava: 500 plants.
i. Carambola: 48 plants.
j. Wax apple: 24 plants.
k. Jujube: 3 plants.

2. Production of crops for processing:
   a. Dasheen: 5,500 pounds.
   b. Sweet potato: 4,400 pounds.
   c. Carambola: 1,000 pounds.

3. Vegetable demonstration plots at Central Farm, including Cabbage, Cauliflower, Broccoli, Chinese cabbage, Cucumber, Chive, Radish, Carrot, lettuce, Eggplant, Melon, and Mungbean.

4. Promotion of new 'Guavamelon'.

5. Technical assistance to 'Production and Marketing Team' in vegetables (including Cherry tomato, Sweet pepper, Tomato, Cabbage, Cauliflower, Water melon, Cantaloupe, and wax gourd) production.

6. Training of students from FANR and '4H' on vegetable production.

7. BZ$13,629.34 from vegetable sales was deposited into Horticultural Crops Project Account, BZ$4,342.40 was spent in assisting in the setting up of a 'Family Irrigation systems. The remaining balance at the end of 2002 was BZ$19,520.28.

Harvesting Carambola

Technical assistance in vegetable production

6.2.3 The Food Processing Project major achievements during 2002 are as follows:

1. Completing the producing line for potato chips: new food processing machines introduced, including washer (for root and tuber crops), peeler (for root and tuber crops), sticker slicer, chips slicer, dice slicer, general slicer, vibrate sieve, fryer & cooker, cooker, mixer, and sealer, total cost US$35,000.

2. Developing new promising processed products from material available in Belize, including dehydrated pineapple, and wax gourd; vacuum fried peanut, dasheen, plantain and banana; fried corn, potato chips, sweet potato chips, dasheen chips; and hot pepper powder.

3. Supplying various dried fruits to BDF (1,000 packs/month).

4. Assisting in production and marketing of 3,100 packs of dried papaya.

5. Assisting in processing 2,200 pounds of hot pepper powder to export to USA.

6. Training of students from FANR on production and marketing of dried papaya.

7. In cooperation with PAHO, training of 26 farmers from Toledo on production of dried pineapple and papaya.

8. Carrying out 16 training courses, totally 190 participants.

9. Assisting the 'Train the trainers program' organized by ICDF and BELTRAIDE.

10. Deposited BZ$8,102.15 into Food processing Project Account, the accumulated total by end of 2002 is BZ$14,355.45.

6.3 INTER–AMERICAN INSTITUTE OF COOPERATION FOR AGRICULTURE (IICA).

6.3.1 Trade and Agribusiness Development

IICA has provided technical assistance to the sugar industry: 1) A Policy Document on the Sugar Industry has been presented to all the public and private institutions related to the sugar industry; 2) Technical assistance was also provided to identify priority areas of intervention for increasing productivity and efficiency at the field and at the factory level; 3) Field trips to Guatemala were also programmed and coordinated by IICA in favor of public and private parties within the sugar industry.

IICA provided support for the participation of the Minister or C.E.O of Agriculture to participate at five ministerial meetings in the Central American Region having to do with trade and integration initiatives. The Central American Agricultural Council (CORECA) convened some of these meetings.

6.3.2 Agricultural Health and Food Safety

Emergency funds from IICA were approved for rebuilding the phytosanitary surveillance capability after Hurricane Iris. The construction of a quarantine facility was made in order to restore and strengthen the agricultural health surveillance capability, especially on the Peninsula in Placencia, a place with past history of Med Fly infestations.

The Canadian Food Safety Agency and IICA collaborated in the planning and execution of the CANADA-CARICOM Alliance on Food Control Systems and Codex Alimentarius Workshop. This regional event was hosted in Belize.

IICA provided support to the Ministers of Agriculture and Trade in Belize for public officials participation in workshops and Committee meetings related to world trade and to International Sanitary and Phytosanitary Measures. These were joint cooperation activities with the USDA in Geneva and with FAO in Trinidad and Tobago.

6.3.3 Sustainable Rural Development

IICA, in collaboration with the Ministry of Agriculture, private institutions and the German Cooperation Agency (GTZ), provided technical assistance in support of organic agriculture development for: 1) The legal constitution of the Belize Organic Producers Association (BOPA); and 2) Development of the National Legislation for organic agriculture;

The Registrar of Cooperatives in the Ministry of Agriculture, Fisheries, and Cooperatives has duly registered the Belize Cashew Producers Cooperative Society Limited, consisting of 92 small producers. IICA provides technical assistance through the Fruit and Root Crops Project in close collaboration with the Ministry of Agriculture, the Belize Audubon Society, public rural financing agencies, and other non-government organizations.

6.3.4 Technology and Innovation

IICA, as a member of the Ministerial task force for institutional development, provided technical cooperation for conversion of Central Farm (the Research Department of the Ministry of Agriculture) into an autonomous institution, the Belize Institute for Agricultural Research and Development (BIARD). Draft

legislation has been produced and passed by the House of Representative for this institutional transformation.

IICA participates as member of the Advisory Committee for the development of the Sugar Industry Research and Development Institute, a new institution contemplated in the new Sugar Industry Control Act. IICA produced a proposal document for the creation of this new institution in 2000.

6.3.5 Information and Communication

IICA Belize has purchased equipment for the installation and operation of its Information and Documentation Center to be inaugurated during the first trimester of 2003.

6.3.6 Education and Training

IICA assisted in the coordination of training activities related to organic Agriculture and diversification: 1) Hosted a workshop on Certification and Marketing Procedures for Organic Products in collaboration with the Ministry of Agriculture, the Meso-American Biological Corridor and CATIE; 2) Assisted with the coordination of Working Tour of Organic Cacao Producing areas in Costa Rica and Panama for the extension personnel and the Toledo Cacao Growers Association (TCGA) members; 3) Facilitated training for one of IICA technicians on Inspection Procedures for Organic Agriculture. IICA Office in Belize now has a fully trained inspector capable of providing improved technical assistance to farmers in the process of compliance with the requirements for organic inspection and certification; and 4) A series of training workshops for extension workers and producers on crop management and marketing under the diversification project.

6.3.7 Other Technical Programs

IICA participated as member of different committees and task forces on technical issues: 1) Technical committee for the Citrus Research and Extension Institute; 2) The task force for Agricultural Health National Emergencies; 3) The committee for the creation of the National Commodities Research and Development Council; 4) The Ministerial task force for Institutional Development; 5) National coordinator for the promotion of organic agriculture; and 6) Chair of the steering committee for the Belize Cashew Growers Cooperative.

IICA prepared document proposals for: 1) conducting market research between indigenous Belizean Maya farmers and neighboring Guatemala communities along the southern border; 2) promotion of sustainable and organic agriculture to be funded by OAS through the Ministry for Economic Development; and 3) Organic Cacao Production.

6.3.8 Publications

IICA has produced the following publications: Black Pepper (***Piper_nigrum)***. Production and International Trade and Outlook for other Important Spices, Potential of Ornamental Species of Belize for Export and Sugar Policy and Strategy: Strategic Actions for the Belize Sugar Industry.

6.3.9 Other Topics

IICA participated in national consultations convened by the Ministry of Foreign Affairs on: The Medium Term Economic Strategy Paper 2003-2005,the National Poverty Elimination Strategy and Action Plan 1998-2003 and on the Strategic Approach for Strengthening International Cooperation.

A technical review was conducted on the progress and future of the Fruit and Root Crops Project since this project is scheduled to close at the end of 2003.

6.4 INTERNATIONAL REGIONAL ORGANIZATION FOR AGRICULTURAL HEALTH (OIRSA)

The International Regional Organization for Health in Agriculture (OIRSA) was formed in October 1953 with the mission to "facilitate the social and economic development of the region through a sound and healthy agricultural production which is environmentally acceptable to satisfy the human population requirements". Belize became a member of OIRSA in 1996.

The objective of OIRSA is to support member countries in the development of their animal and plant health systems by assessing the execution of services in the control against plant and animal diseases, pests and plagues that affect agricultural patrimony.

6.4.1 Achievements of OIRSA-Belize for 2002

6.4.2 OIRSA continued financing projects for Plant and Animal Health, which are as follows:

a). VIFINEX Project: Strengthening the Surveillance of Sanitary and Phytosanitary in Non Traditional Export Crops specifically the Pepper Production. This Project is ongoing and is administered by OIRSA with funds from the Republic of China and is executed by the Ministry of Agriculture, Fisheries and Cooperatives on behalf of the Government of Belize. The total funds approved were $450,000. U.S.

b). Control of the Pink Hibiscus Mealy Bug Project: This project is ongoing and is being implemented by the Belize Agricultural Health Authority with funds from OIRSA. The total funds approved were $425,000. US for the period 2001-2005. The main objective of this

project is to biologically control the Pink Hibiscus Mealy Bug. In addition, the project has financed the construction of a Regional Insect Laboratory for the Control of the Hibiscus Mealy bug. This laboratory was recently inaugurated on January 13th, 2003.

c). Assisted in the Avian Influenza Programme for the Belize Agricultural Health Authority in declaring Belize as a Country free of this disease ($30,000.U.S)

6.4.3 Among other activities are the following:

- Ms. Emelda Lizarraga was appointed as the new OIRSA Representative for Belize in October 2002.

- The Representation of OIRSA-Belize with the support of BAHA and the Ministry of Agriculture, Fisheries and Cooperatives hosted the 30th Board of Director meeting (HCIRSA) in San Pedro, Cayo Ambergris in October 2002. The Board members are comprised of Ministers of Agriculture of the Central American Region.

- Continued the provision of financial support to three Belizeans for a Technical Masters Degree in Sanitary and Phytosanitary Measures (40,000).

- Provided capacity building to personnel of the following organizations:

    1. Pesticide Control Board on ¨Monitoring and Inspection Workshop on Fiscalization of Pesticide Control, which was held in Guatemala from 4-8 November 2002.
    2. Belize Agricultural Health Authority on the Identification of Scale Insects in Trinidad from November 24th -4th of December 2002.
    3. Ministry of Agriculture, Fisheries and Cooperatives on the Control, Assurance and Quality Control of Food Safety for Fresh and Processed Vegetables in Panama City on November 27th to 29th, 2002.

6.5 USDA/AGRICULTURE PLANT HEALTH INSPECTION SERVICE (APHIS)

The United States Department of Agriculture, Animal and Plant Inspection Service USDA/APHIS presence in Belize is to assist in Maintaining Foreign Animal and Plant pest and diseases out of Belize. With this main focus the USDA assists in the surveillance and eradication of the Medfly. In Animal Health we try to assist in the promotion of active surveillance in Foreign Animal Diseases with

emphasis on the Vesicular diseases due to its similarity with Foot and Mouth Disease.

6.5.1 Med fly Program:

During the year 2002, a total of 31 med fly specimens were detected in traps located in Southern Belize. Of these captures, five sites were considered as detection sites, since some of the detections occurred repeatedly on these sites. They included Punta Gorda Town, Maya Beach in the Placencia Peninsula, Placencia village itself, Hopkins village and Nicholas Caye in the Sapodilla Caye ranges of Belize's Southern waters.

USDA provided BAHA with Six Drums of Success 0.02cb for Ground Applications. This is a biological insecticide produced by a new species of Actinomycetes bacteria, *Saccharopolyspora spinosa.* The product also contains Ammonium Acetate, which serves as an attractant to fruit flies and as a repellant to bees and other insects. This is one of the ways USDA is assisting Belize in using environmentally friendly biological insecticides for the control of the Mediterranean fruit fly. USDA also assisted with the calibration of motorized sprayers for low volume applications and a boom ULV sprayer for orchard applications.

During 2002 USDA also assisted BAHA in the preparation of a technical document presented at the OIRSA regional meeting held in Belize. The document made the motion to consider Belize a med fly free country by OIRSA member countries.

6.5.2 Animal Health

USDA provided funding for the participation of one veterinarian from BAHA to participate in the foreign Animal Disease training in Plum Island New York. This is a high security laboratory where the virus that causes Foot and Mouth disease, Avian Influenza and other exotic disease agent are handled for training and experimental purposes.

At the beginning of the year the USDA office in Belize worked very closely with Dr. Victor Gongora, the Animal Health Director for BAHA in establishing an active surveillance program for vesicular disease. Six sentinel farms were selected in each district to be visited by the Med fly technician once a week and by a BAHA veterinarian once a month. Toolboxes, cover-alls and rubber boots were provided to the technicians participating in the programme.

USDA also assisted BAHA with reference diagnostic services for the Classical Swine Fever scare that occurred in early December. After the reference laboratory in Nicaragua had tested positive for samples submitted for classical

swine fever, the USDA Foreign Animal Disease Laboratory in Plum Island confirmed that the same half of the samples submitted to them for diagnosis tested negative. This brought a sigh of relief since BAHA authorities were getting ready to slaughter and destroy all the animals from the suspect farm.

6.5.3 Certification Program

The pepper and papaya certification program is closely linked to the med fly surveillance program. Because Belize has an ongoing med fly surveillance program and is now officially recognized by the USDA as a med fly free country, peppers and papayas can be exported from Belize to United States of America. USDA experts Dr. David Reeves responsible for Plant Protection and Quarantine and Pre-clearance and Port Operations program, and Dr. Pete Witherell from PPQ visited Belize to review the papaya and pepper certification program. Their consensus was that Belize was free of med fly and that it was complying with the field and packing requirements from USDA.

6.5.4 Other Issues:

Early in the year the Ministry of Agriculture invited the Foreign Agriculture Service of USDA for an exploratory visit, with the aim of signing an agreement for collaboration between the two agencies. The aim of the Ministry of Agriculture was to seek the assistance of USDA for the transfer of technology for the newly formed Belize Agricultural Health Authority. Andres Delgado and Howard Anderson from USDA/FAS, and Dough Barnett from APHIS visited Belize for the exploratory mission. As a result of this visit an agreement for technical cooperation was signed between the Ministry of Agriculture and FAS. A training package was prepared by USDA and submitted to BAHA for consideration. To date no response has been forthcoming.

At the request of the Ministry of Agriculture, USDA and the US Embassy in Belize were instrumental in providing the services of world renowned Dr. C. Prakask from the University of Tuskegee. Dr. Prakash visit to Belize was to conscientisize the government policy makers on the topic of Genetically Modified Organisms. The one-day training activity was held at the Belmopan Convention Hotel and was followed by radio talk show on Love FM.

7.0 SENIOR MANAGEMENT STAFF

(31ST DEC. 2002)

MINISTRY:

Hon. Daniel Silva, Minister and Representative of Cayo Central
Mr. Sergio Garcia, Chief Executive Officer
Mr. Horace Grant, Finance Officer
Mr. Jose Castellanos, Policy Analyst

DEPARTMENTS:

Mr. Hugh O'Brien, Chief Agricultural Officer
Ms. Beverly Wade, Fisheries Administrator
Ms. Zeniada Moya, Registrar of Cooperatives & Credit Unions

STATUTORY BODIES:

Mr. Carlos Moreno, General Manager, BMB
Ms. Pamela Scott, Managing Director, BAHA
Mr. Javier Garcia, Acting Managing Director, CARD
Mr. Fred Hunter Jr. Managing Director, BLPA
Mrs. Imani Fairweather, Managing Director, CZMA

ASSOCIATED REGIONAL/INTERNATIONAL ORGANIZATIONS:

Mr. Anil Sinha, Representative, CARDI
Dr. Jaime Salazar, Representative, IICA
Dr. James Tsai, Head of Technical Mission, ROC Taiwan
Mrs. Emelda Lizarraga, Representative, OIRSA
Mr. Crispin Blanco, Representative, USDA/APHIS

Appendix I: Agriculture Production Output Value 2002 at Producer's Price

Economic Value of Agriculture Output 2002			
Commodities	**Quantity (lbs.)**	**Price (BZ$)**	**Value (BZ$)**
Sugarcane *(tonne)*	1,150,656	$ 38.08	**$ 43,816,980.48**
Banana Export			
(40 lb boxes)	1,281,169	$ 15.20	**$ 19,473,768.80**
(28 lb boxes)	364,952	$ 10.64	**$ 3,883,089.28**
(33 lb boxes)	976,826	$ 12.54	**$ 12,249,398.04**
(26 lbs boxes)	37,162	$ 9.83	**$ 365,302.46**
Domestic consumption (40 lbs/box)	394,755	$ 3.00	**$ 1,184,265.00**
Apple Banana (Bunches)(domestic)	5,700	$ 3.00	**$ 17,100.00**
Total Banana Products			***$ 37,172,923.58***
Citrus Export			
Grapefruit (80lb box)	1,230,942	$ 4.74	**$ 5,834,665.08**
Orange (90 lb box)	4,122,594	$ 5.88	**$ 24,240,852.72**
Fresh Lime Export (lbs)	126,905	$ 0.06	**$ 7,614.30**
Fresh Orange Export (lbs)	13,364,902	$ 0.15	**$ 2,004,735.30**
Fresh Grapefruit Export (lbs)	227,294	$ 0.25	**$ 56,823.50**
Domestic Lime Consumption (lbs)	309,500	$ 0.50	**$ 154,750.00**
Domestic Grapefruit Consumption (80 lbs/bx)	12,309	$ 6.00	**$ 73,854.00**
Domestic Orange Consumption (90 lbs/bx)	206,129	$ 7.00	**$ 1,442,903.00**
Total Citrus Products			**$ 33,816,197.90**
Marine Export			
Lobster			**$ 13,574,326.95**
Conch			**$ 2,846,539.87**
Shrimp			**$ 53,199,594.30**
Whole Fish			**$ 127,159.00**
Other			**$ 48,351.37**
Domestic Consumption			**$ 2,791,838.85**
Total Marine Products			**$ 72,587,810.34**
Papayas **(Export)**	23,783,560	$ 0.35	$ 8,324,246.00
Papayas **(Local)**	435,780	$ 0.53	$ 230,963.40
Total Papaya Products			***$ 8,555,209.40***
Hot Pepper Export	217,906	$ 0.80	$ 174,324.80
Domestic Consumption	228,532	$ 1.11	$ 253,670.52
Total Hot Pepper Products			**$ 427,995.32**
Total Cocoa Products	56,131	$ 2.00	**$ 112,262.00**
Cowpeas	8,225,356	$ 0.48	$ 3,948,170.88

RK beans	4,939,496	$	0.80	$	3,951,596.80
Black Beans	3,283,920	$	0.90	$	2,955,528.00
Other Beans	831,690	$	0.80	$	665,352.00
Corn	73,610,658	$	0.20	$	14,722,131.60
Rice paddy	24,139,125	$	0.22	$	5,310,607.50
Sorghum	26,651,225	$	0.17	$	4,530,708.25
Soybean	2,058,225	$	0.36	$	740,961.00
Cabbage	4,221,693	$	0.59	$	2,490,798.87
Cucumber	416,600	$	0.50	$	208,300.00
Okra	549,680	$	0.65	$	357,292.00
Squash	197,748	$	0.30	$	59,324.40
Pumpkin	733,692	$	0.25	$	183,423.00
Sweet Pepper	1,183,190	$	2.48	$	2,934,311.20
Tomatoes	3,154,500	$	1.14	$	3,596,130.00
Irish Potato	1,387,440	$	0.73	$	1,012,831.20
Onion	1,181,010	$	0.67	$	791,276.70
Carrots	231,584	$	0.71	$	164,424.64
Cassava	12,686,800	$	0.30	$	3,806,040.00
String Beans	20,000	$	0.75	$	15,000.00
Lettuce	9,000	$	1.50	$	13,500.00
Chinese Cabbages	229,000	$	0.70	$	160,300.00
Broccoli	13,675	$	2.50	$	34,187.50
Celery	20,000	$	2.50	$	50,000.00
Cho-cho	137,000	$	0.85	$	116,450.00
Sweet Corn (ears)	480,000	$	0.70	$	336,000.00
Cauliflower	1,900	$	2.50	$	4,750.00
Cocoyam	1,882,225	$	0.60	$	1,129,335.00
Sweet Potato	335,399	$	0.56	$	187,823.44
Yam	42,600	$	0.56	$	23,856.00
Yampi	30,800	$	0.85	$	26,180.00
Jicama	92,600	$	0.45	$	41,670.00
Mangoes	2,431,000	$	1.00	$	2,431,000.00
Peanuts	306,950	$	1.11	$	340,714.50
Pineapple	4,208,727	$	0.63	$	2,651,498.01
Pitahaya	29,000	$	2.00	$	58,000.00
Plantain (bunches)	879,770	$	5.00	$	4,398,850.00
Watermelon	4,564,760	$	0.30	$	1,369,428.00
Coconuts	3,746,522	$	0.44	$	1,648,469.68

Cotton	131,985	$	8.00	$	1,055,880.00
Canteloupe	799,300	$	0.78	$	623,454.00
Annato	21,300	$	1.00	$	21,300.00
Coffee*	500,000	$	1.35	$	675,000.00
Avocado	410,000	$	0.85	$	348,500.00
Cashew *	300,500	$	1.00	$	300,500.00
Soursop	22,800	$	1.00	$	22,800.00
Ginger	154,000	$	0.75	$	115,500.00
Nutmeg	400	$	10.00	$	4,000.00
Grapes	2,400	$	3.00	$	7,200.00
Craboo	161,000	$	0.40	$	64,400.00
Guava	102,000	$	2.00	$	204,000.00
Other Fruit (sapodilla, mamey, etc)				$	125,000.00
Other Vegetables (radish, cilantro, etc)				$	100,000.00
Total				**$**	**71,133,754.17**
Livestock					
Beef (Dress weight)	4,066,048	$	2.50	$	10,165,120.00
Beef Export(on the hoof) (lbs)	1,278,700	$	1.05	$	1,342,635.00
Pigs (Dress weight)	2,148,600	$	2.50	$	5,371,500.00
Sheep (Dress weight)	37,200	$	3.00	$	111,600.00
Poultry (Dress weight)	28,755,288	$	1.58	$	45,433,355.04
Turkey	396,990	$	3.00	$	1,190,970.00
Milk	7,796,348	$	0.33	$	2,572,794.84
Eggs (Dozen)	2,153,322	$	1.50	$	3,229,983.00
Spent hens(No.Heads)	139,500	$	3.00	$	418,500.00
Honey	104,500	$	4.50	$	470,250.00
Total				**$**	**70,306,707.88**
Total Agriculture Output				***$***	***337,929,841.07***
Citrus/sugarcane/Bananas/Fisheries (export and domestic)				**$**	**187,393,912.30**
Non-Traditional				**$**	**150,535,928.77**

*Raw nut

Domestic Banana Consumption is estimated 12.5% of total production

Domestic Orange Consumption is estimated 5% of total export

Domestic Grapefruit Consumption is estimated 1% of total export

Domestic Marine Consumption is estimated 4% of total export

Beef Export (on hoof) is estimated 950 lbs/head

Source: MAFC, District Agriculture Offices Reports

Appendix II: Primary Agriculture Output Value 2002 at Producer's Price

Economic Value of Agriculture Output 2002						
Commodities	**Quantity (lbs.)**	**Quantity (lbs.)**	**Price* (BZ$)**	**Price** (BZ$)**	**Value (BZ$)**	**Value (BZ$)**
	2001	**2002**	**2001**	**2002**	**2001**	**2002**
Sugarcane	1,011,214	1,150,656	$ 41.13	$ 38.08	**$41,591,231.82**	**$ 43,816,980.48**
Bananas						
(40 lb boxes)	665,065	1,281,169	$ 15.20	$ 15.20	$10,108,988.00	$ 19,473,768.80
(28 lb boxes)	352,894	364,952	$ 10.63	$ 10.64	$ 3,751,263.22	$ 3,883,089.28
(33 lb boxes)	2,040,958	976,826	$ 12.54	$ 12.54	$25,593,613.32	$ 12,249,398.04
(35.26 lbs boxes)	13,650	37,162	$ 13.40	$ 9.83	$ 182,910.00	$ 365,302.46
Domestic consumpt. (40 lbs/box)		394,755		$ 3.00		$ 1,184,265.00
Apple Banana (Bunches)(domestic)		5,700		$ 3.00		$ 17,100.00
Banana Products	*3,072,567*				***$39,636,774.54***	***$ 37,172,923.58***
Citrus						
Grapefruit **(80lb box)**	1,460,574	1,230,942	$ 4.05	$ 4.74	$ 5,915,324.70	$ 5,834,665.08
Orange **(90 lb box)**	5,734,330	4,122,594	$ 4.37	$ 5.88	$25,059,022.10	$ 24,240,852.72
Fresh Lime Export (lbs)		126,905		$ 0.06		$ 7,614.30
Fresh Orange Export (lbs)		13,364,902		$ 0.15		$ 2,004,735.30
Fresh Grapefruit Export (lbs)		227,294		$ 0.25		$ 56,823.50
Domestic Lime Consumpt. (lbs)		309,500		$ 0.50		$ 154,750.00
Domestic Grapefruit Consumpt. (80 lbs/bx)		12,309		$ 6.00		$ 73,854.00
Domestic Orange Consumpt. (90 lbs/bx)		206,129		$ 7.00		$ 1,442,903.00
Citrus Products					**$30,974,346.80**	**$ 33,816,197.90**
Marine Products **					**$69,993,979.00**	**$ 72,587,810.34**
Other						
Papayas	11,872,722	23,783,560	$ 0.50	$ 0.35	$ 5,936,361.00	$ 8,324,246.00
Cowpeas	7,198,492	8,225,356	$ 0.58	$ 0.48	$ 4,175,125.36	$ 3,948,170.88
Hot peppers	817,591	446,438	$ 1.11	$ 1.11	$ 907,526.01	$ 427,995.32
Cocoa	65,536	56,131	$ 1.38	$ 2.00	$ 90,439.68	$ 112,262.00
RK beans	12,796,125	4,939,496	$ 0.80	$ 0.80	$10,236,900.00	$ 3,951,596.80
Black Beans	1,240,600	3,283,920	$ 0.83	$ 0.90	$ 1,029,698.00	$ 2,955,528.00
Other Beans		831,690		$ 0.80		$ 665,352.00
Corn	80,986,720	73,610,658	$ 0.23	$ 0.20	$18,626,945.60	$ 14,722,131.60
Rice paddy	26,721,777	24,139,125	$ 0.22	$ 0.22	$ 5,878,790.94	$ 5,310,607.50
Sorghum	18,542,500	26,651,225	$ 0.14	$ 0.17	$ 2,595,950.00	$ 4,530,708.25
Soybean	1,159,513	2,058,225	$ 0.30	$ 0.36	$ 347,853.90	$ 740,961.00

***Price refers to Producer Price for year 2001**

**** Value of Domestic Consumption is estimated at 5% of total exports**

Agriculture Production Output Value 2002

Commodities	Quantity (lbs.)	Quantity (lbs.)	Price* (BZ$)	Price** (BZ$)	Value (BZ$)	Value (BZ$)
	2001	2002	2001	2002	2001	2002
Cabbage	3,855,042	4,221,693	$ 0.59	$ 0.59	$ 2,274,474.78	$ 2,490,798.87
Cucumber	432,500	416,600	$ 0.50	$ 0.50	$ 216,250.00	$ 208,300.00
Okra	423,800	549,680	$ 0.65	$ 0.65	$ 275,470.00	$ 357,292.00
Squash	304,250	197,748	$ 0.30	$ 0.30	$ 91,275.00	$ 59,324.40
Pumpkin	771,600	733,692	$ 0.25	$ 0.25	$ 192,900.00	$ 183,423.00
Sweet Pepper	884,500	1,183,190	$ 2.48	$ 2.48	$ 2,193,560.00	$ 2,934,311.20
Tomatoes	3,112,746	3,154,500	$ 1.14	$ 1.14	$ 3,548,530.44	$ 3,596,130.00
Irish Potato	2,384,000	1,387,440	$ 0.73	$ 0.73	$ 1,740,320.00	$ 1,012,831.20
Onion	745,749	1,181,010	$ 0.67	$ 0.67	$ 499,651.83	$ 791,276.70
Carrots	294,000	231,584	$ 0.71	$ 0.71	$ 208,740.00	$ 164,424.64
Cassava	3,557,400	12,686,800	$ 0.40	$ 0.30	$ 1,422,960.00	$ 3,806,040.00
String Beans		20,000		$ 0.75		$ 15,000.00
Lettuce		9,000		$ 1.50		$ 13,500.00
Chinese Cabbages		229,000		$ 0.70		$ 160,300.00
Broccoli		13,675		$ 2.50		$ 34,187.50
Celery		20,000		$ 2.50		$ 50,000.00
Cho-cho		137,000		$ 0.85		$ 116,450.00
Sweet Corn		480,000		$ 0.70		$ 336,000.00
Cauliflower		1,900		$ 2.50		$ 4,750.00
Cocoyam	2,841,770	1,882,225	$ 0.60	$ 0.60	$ 1,705,062.00	$ 1,129,335.00
Sweet Potato	649,400	335,399	$ 0.56	$ 0.56	$ 363,664.00	$ 187,823.44
Yam	29,250	42,600	$ 0.56	$ 0.56	$ 16,380.00	$ 23,856.00
Yampi	34,000	30,800	$ 0.85	$ 0.85	$ 28,900.00	$ 26,180.00
Jicama		92,600		$ 0.45		$ 41,670.00
Mangoes	113,000	2,431,000	$ 1.00	$ 1.00	$ 113,000.00	$ 2,431,000.00
Local Papaya	448,400	435,780	$ 0.53	$ 0.53	$ 237,652.00	$ 230,963.40
Peanuts	263,300	306,950	$ 1.11	$ 1.11	$ 292,263.00	$ 340,714.50
Pineapple	4,472,000	4,208,727	$ 0.63	$ 0.63	$ 2,817,360.00	$ 2,651,498.01
Pitahaya		29,000		$ 2.00		$ 58,000.00
Plantain (bunches)	1,158,189	879,770	$ 5.00	$ 5.00	$ 5,790,945.00	$ 4,398,850.00
Watermelon	4,500,994	4,564,760	$ 0.30	$ 0.30	$ 1,350,298.20	$ 1,369,428.00
Coconuts	2,012,000	3,746,522	$ 0.44	$ 0.44	$ 885,280.00	$ 1,648,469.68
Cotton		131,985		$ 8.00		$ 1,055,880.00
Canteloupe	697,500	799,300	$ 0.78	$ 0.78	$ 544,050.00	$ 623,454.00
Annato		21,300		$ 1.00		$ 21,300.00

Coffee	503,750	500,000	$ 1.35	$ 1.35	$ 680,062.50	$ 675,000.00
Avocado	20,000	410,000	$ 0.85	$ 0.85	$ 17,000.00	$ 348,500.00
Cashew[a]	509,200	300,500	$ 1.00	$ 1.00	$ 509,200.00	$ 300,500.00
Ginger		154,000		$ 0.75		$ 115,500.00
Nutmeg		400		$ 10.00		$ 4,000.00
Grapes		2,400		$ 3.00		$ 7,200.00
Craboo		161,000		$ 0.40		$ 64,400.00
Guava		102,000		$ 2.00		$ 204,000.00
Other Fruit (sapodilla,mamey,etc.)						$ 125,000.00
Other Vegetables (radish, cilantro, etc.)						$ 100,000.00
Soursop	29,640	22,800	$ 1.00	$ 1.00	$ 29,640.00	$ 22,800.00
Total					**$77,870,479.24**	**$ 80,229,220.89**

[a] **Raw Nut**

Agriculture Production Output Value 2002

Commodities	Quantity (lbs.)	Quantity (lbs.)	Price* (BZ$)	Price** (BZ$)	Value (BZ$)	Value (BZ$)
	2001	2002	2001	2002	2001	2002
Livestock						
Dressweight:						
Beef	3,233,231	4,066,048	$ 2.48	$ 2.50	$ 8,018,412.88	$ 10,165,120.00
Beef Export (on the hoof) (lbs)		1,278,700		$ 1.05		$ 1,342,635.00
Pigs	2,402,613	2,148,600	$ 2.35	$ 2.50	$ 5,646,140.55	$ 5,371,500.00
Sheep (Dress weight)		37,200		$ 3.00		$ 111,600.00
Poultry	29,965,666	28,755,288	$ 1.56	$ 1.58	$46,746,438.96	$ 45,433,355.04
Turkey	368,696	396,990	$ 3.00	$ 3.00	$ 1,106,088.00	$ 1,190,970.00
Milk	5,580,268	7,796,348	$ 0.33	$ 0.33	$ 1,841,488.44	$ 2,572,794.84
Spent hens (No. Heads)		139,500		$ 3.00		$ 418,500.00
Eggs (Dozen)	2,263,463	2,153,322	$ 1.80	$ 1.50	$ 4,074,233.40	$ 3,229,983.00
Honey	95,815	104,500	$ 4.76	$ 4.50	$ 456,079.40	$ 470,250.00
					$67,888,881.63	**$ 70,306,707.88**
All Non-traditional products					**$ 145,759,360.87**	**$150,535,928.77**
Citrus/Sugarcane/						
Bananas/Fisheries					**$ 182,196,322.16**	**$187,393,912.30**
Total Agri. Output					**$ 327,955,693.03**	**$337,929,841.07**

Source: MAFC, District Agriculture Offices Reports

***Price refers to Producer Price for year 2001**

****Price refers to Producer Price for year 2002**

Appendix: III: Production Forecast For 2003

						Projected	
Commodities	**Units**	**Production 2002**	**2003 Estimate**	**Unit prize**	**Economic Output Value 2002**	**Economic Output Value 2003**	**Increase/ Decrease %**
Banana	boxes/40lbs	2,368,531.00	3,200,000.00	15.20	36,001,671.20	48,640,000.00	35
Oranges	boxes/90lbs	4,122,594.00	4,500,000.00	5.88	24,240,852.72	26,460,000.00	9
Grapefruit	boxes/80lbs	1,230,942.00	1,250,000.00	4.74	5,834,665.08	5,925,000.00	1.5
Soybean	lbs	2,058,225.00	5,400,000.00	0.36	740,961.00	1,944,000.00	162
Sugar cane	tonne	1,150,656.04	1,150,000.00	38.08	43,816,982.00	43,792,000.00	-0.06
R K Beans	lbs	4,939,496.00	11,500,000.00	0.80	3,951,596.80	9,200,000.00	133
Black Beans	lbs	3,283,920.00	2,330,800.00	0.90	2,955,528.00	2,097,720.00	-29.02
Black Eye Peas	lbs	8,225,356.00	6,270,000.00	0.48	3,948,170.88	3,009,600.00	-23.8
Other Beans	lbs	831,690.00	993,200.00	0.80	665,352.00	794,560.00	19.4
Rice (paddy)	lbs	24,139,125.00	24,199,000.00	0.22	5,310,607.50	5,323,780.00	0.25
Papaya (Export)	lbs	23,783,560.00	30,000,000.00	0.35	8,324,246.00	10,500,000.00	26.1
Corn	lbs	73,610,658.00	78,000,000.00	0.20	14,722,131.60	15,600,000.00	5.96
Beef (dress weight)	lbs	4,066,048.00	4,472,652.80	2.50	10,165,120.00	11,181,632.00	10
Chicken (broiler dressed)	lbs	28,755,288.00	30,590,488.00	1.58	45,433,355.04	48,332,971.04	6.38
Pig (dress weight)	lbs	2,148,600.00	2,598,000.00	2.50	5,371,500.00	6,495,000.00	20.9
Milk	lbs	7,796,348.00	8,165,722.40	0.33	2,572,794.84	2,694,688.39	4.7
Egg	dz	2,153,322.00	2,254,603.00	1.50	3,229,983.00	3,381,904.50	4.7
Sheep	lbs	37,200.00	40,920.00	3.00	111,600.00	122,760.00	10
Sorghum	lbs	26,651,225.00	22,000,000.00	0.17	4,530,708.25	3,740,000.00	-17
Carrots	lbs	231,584.00	400,000.00	0.71	164,424.64	284,000.00	72
Potatoes	lbs	1,387,440.00	2,242,000.00	0.73	1,012,831.20	1,636,660.00	61
Hot Peppers	lbs	446,438.00	544,000.00	0.80	357,150.40	435,200.00	22
Onions	lbs	1,181,010.00	1,550,000.00	0.67	791,276.70	1,038,500.00	31
Fisheries							
Lobster	lbs/tail	590,000.00	625,000.00	12.00	7,080,000.00	7,500,000.00	6
	lbs/head	46,500.00	50,000	5	232,500.00	250,000.00	7.5
Conch	lbs	412,542.00	500,000.00	5.00	2,062,710.00	2,500,000.00	21
Marine Shrimp	lbs	181,857.00	220,000	9	1,636,713.00	1,980,000.00	21
Farm shrimp	lbs	9,400,895.00	22,700,000.00	8.50	79,907,607.50	192,950,000.00	141
Total					***$ 315,173,039.35***	***$ 457,809,975.93***	46