

Agriculture and Environment

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Introduction

Sixty percent of Dominica's land surface is covered by natural vegetation ranging from scrub woodland on the drier western side to rich tropical rain forest on the mountain slopes. This diverse terrestrial flora and associated animal life is supported by climate which is described as humid tropical marine with average temperature of 27 degrees F and high rainfall. The island is interspersed with waterfalls, rivers and lakes, and with the marine environment and variable topography, Dominica has earned the name of "Nature Island of the Caribbean."

The high rainfall and its presence in the hurricane zone make the country susceptible to landslides and damage to its social and economic infrastructure from time to time.

Dominica is a volcanic island with many mountain ranges and rugged terrain. The topography makes it difficult to find arable land and was a major factor in helping the indigenous Carib Indians to escape capture by the Spanish, British and French Colonial powers.

Dominica possesses hydroelectric energy resources and its volcanic nature is now being explored for geothermal energy. There are eight active volcanoes and the only boiling lake in the Western Hemisphere. The use of wind energy on the Atlantic coast is also being investigated.

The extensive marine resources including impressive coral reefs, the vegetation and rugged topography, and limited urbanization has made the island an ideal location for ecotourism and it offers a range of activities such as adventure safaris, plant and animal research, hiking, river bathing, sightseeing, bird watching, whale watching, and scuba diving.

Much of the island is considered protected areas by law with a number of terrestrial and marine reserves and parks. Within these areas we find a diversity of flora and fauna. Besides the dense primary oceanic forests and woodlands, Dominica hosts the most diverse array of wildlife species in the eastern Caribbean including birds, mammals, reptiles, amphibians, fresh water and marine fish, several invertebrates and insects. The best known species are the two endemic parrots, the imperial "Sisserou" and the red-necked "Jacko"; blue-headed hummingbird; the agouti, a rodent, introduced from South America by the indigenous peoples; the manicou, an opossum; wild pig; the amphibious mountain chicken or crapaud; and "titiwi" and crayfish

Vision

Dominica's terrestrial and marine biodiversity is captured in the vision statement. "We, the people of Waitikubuli, recognize Dominica's unique and fragile ecosystems as the basis for the development and advancement of our people and nation. As custodians of

nature's biodiversity, we aspire to integrate the endowed gifts of our biotic wealth, with our cultural knowledge, to ensure economic, cultural and ecological integrity for the well-being of present and future generations".

In concert with this vision, the national coat of arms says in Creole "Après Bondie C'est La Ter" signifying that the fruits of that land come immediately after God for the benefit of all Dominican citizens. Dominica is blessed with rich volcanic soil and an abundance of water, both essentials for growth of all kinds of tropical crops.

In pursuit of this vision the United Nations Convention on Biological Diversity was signed by the Government of Dominica on July 5, 1994. The Convention represents a commitment to the conservation of biological diversity, the sustainable use of biological resources, and the fair and equitable sharing of the benefits arising from the use of the genetic resources. Dominica's Biodiversity Strategy and Action Plan is intended to implement the country's obligations under the Convention, to create public awareness of the need to protect the environment, and to establish policies and legal instruments to guide conservation and sustainable use. In conformity with the vision, Dominica's system of national parks includes two marine protected areas (the Cabrits National Park and the Soufriere/Scotts Head Marine Reserve). In 2000, the Morne Trois Piton National Park was declared by UNESCO as a World Heritage Site.

Economic Development

Economic activity in Dominica was always focused on the use of its land resources and the productive capacity of a reasonably well-educated and healthy work force within a relatively small population of about 71,000 citizens on the island and an estimated 100,000 in the Diaspora.

The domestic market is small and the tendency has been to focus on exports of mostly agricultural products. One of the recent mainstays of the economy has been the banana industry. In the period 1995 to the present, there has been progressive decline in the major productive sectors of agriculture and manufacturing and a fledgling ecotourism was not able to take up the slack.

Government services, the second largest sub-sector to economic activity, has been inadequate against the background of globalization and reduction in grants and aid inflows. The decline of the banana industry, fluctuation in non-banana exports, and limited growth in tourism has contributed to a slump in the islands economy.

Notwithstanding inflation has been moderate and the exchange rate has been stable especially against the US dollar against which the currency, the Eastern Caribbean dollar is pegged.

Agriculture in Dominica

Agriculture continues to play a major role in the economic and especially rural life of the people of the country. Within that sector, crop production has always led the way being the primary foreign exchange earner from as far back as colonial times. With livestock,

fisheries and forestry sub-sectors, these enterprises have provided employment among the rural communities, and made significant contributions to gainful employment and food security.

The mountainous terrain has favoured tree crops. A wide variety of crops have always been grown on the island, with particular crops gaining dominance at different times depending on changes especially in export markets. At one time sugar was king as it was throughout the Caribbean islands. There is still a vestige of that old industry in the manufacture of Soca and Macoucherie rum. Then it was lime. Dominica was the main producer of lime in the world with local companies like A.C Shillingford & Co and the English firm, L.Rose & Co being the main exporters of lime juice. Coffee was introduced by French settlers two centuries ago. Grown on hillsides it has a special bouquet. Bello Products processes as much of this coffee as it can get. Then came vanilla, cocoa, other citrus crops, and non-food crops such as essential oils, especially bay oil, the base materials for perfumes. Dominica's popular bay rum continues as a product of the essential oil industry and is managed by the Oils & Spices Cooperative. A recent company Blows has specialized in packaging teas from local herbs as well as spices such as nutmeg, cinnamon, and cloves

The banana industry gained dominance with a protected market in the UK, shipping via Geest Industries and the expansion of "feeder roads" into the interior of the country. Bananas were the vehicle for rural development. Its decline has increased rural poverty. The Industry is now managed by WIBDECO (Windward Islands Banana Development & Export Co).

Diversification in Dominica's Agriculture

To offset the decline in the older industries and more especially bananas several programmes were initiated to diversify agricultural production, to increase foreign exchange earnings, provide more employment, food security, import substitution and agro-biodiversity conservation in the context of environmental protection, preservation of the genetic pool and the Articles of the Convention on Biological Diversity.

Today Dominica is placing more emphasis on fruit production, root crops (dasheen, tannia, yams, sweet potato) vegetables, (cabbage, lettuce, tomatoes) chicken and egg production, fish, pork and other meats, to supply local demands and to encourage regional, small huckster trade in citrus and other fruit and cut flowers (anthuriums, ginger lily, orchids, bromeliads, ferns, and climbing and creeping and variegated leafy ornamentals) to the drier tourist islands. The cooler climate at the higher elevations supports the cultivation of cauliflower and broccoli, and certain flowers.

There is also a growing interest in supplying agricultural and agro-processed products to ethnic and Diaspora markets especially in the UK where there is a lingering sentiment for Creole cuisine. Exports to the US are growing through air cargo service of Amerijet. This demand is being managed by DEXIA (Dominica Export & Import Agency). The other important agency that has an interest in expanding investment and export

opportunities is NDC (National Development Corporation) through the tax incentive of pioneer industry status. . In the investment area financial institutions such as the Credit Unions and banks should do more.

Indigenous Knowledge

Present agro-biodiversity knowledge derives from the occurrence of the convergence of cultures composed of Caribs, Africans from the slave era, and European heritage that gave rise to a “Creole” culture based on the customs and use of diverse plants, animals and the agro-ecosystem. Hence the development of a special cuisine that includes crapaud, conch, fish, smoked meats, spiced with local herbs.

Land use

Loss of biodiversity is caused by human impact through unplanned conversion of land to agriculture, residential development and other losses through deforestation, over-exploitation of wildlife, pollution, natural disasters, and inadequate legal and institutional mechanisms. Without proper land use planning and environmental protection legislation there is a negative impact on the “Nature Island” image and thus on tourism, agricultural productivity, and the linkage to agro-processing as is conducted by companies like Bello, Blows, and Benjo’s Seamoss. The other major agro-processing enterprise is Dominica Coconut Products, now owned by Colgate Palmolive, manufacturers of soap under brands such as Dial, Imperial Leather, Palmolive; cooking oil, detergents and cosmetics.

With increasing home building steeper lands under forest are being cleared. Also, some farmers are still utilizing slash and burn during the dry season. These practices may get out of control and cause depletion of natural habitats, loss of biological resources and contribute to landslides and soil erosion.

Land distribution and Tenure

Through the Integrated Rural Development Project and other land distribution projects crown lands and several estates were divided into small plots and sold to farmers. Much of this land was cleared and in many cases was unsuitable for agriculture especially for bananas which was the main use. Attempts to farm on these steep slopes resulted in destruction of water catchment areas, and reduced flow in rivers around the island.

In the past, just a few individuals owned large portions of land. In a 1961 census, the wealthier 1.4% of farmers owned 56.4 % of the arable land. By 1995, through the distribution programmes, about 8400 farmers held all the farm lands with an average size of 6 acres. These small size farms have their own problems of capacity and economic scale of operations. Land tenure has other problems such as fragmentation within families, unclear land title, and default in payment of rent. The historical slave association with land, the hardship to work such land, the lack of improved technology, the tendency to look down on farmers, the unwillingness to invest in agricultural improvement, has had negative impact on agricultural productivity. Bello has to order

pepper paste from Costa Rica and there is not enough banana production to meet the island's export quota.

A Move to Modern Agriculture

The diversity of crops and varieties has traditionally strengthened the recovery of Dominica's agriculture. That is becoming more difficult as the effort to modernize to meet competition continues. New commercial high yielding varieties, irrigation, meristem plantlet production, and new farming practices have been introduced but not at a sufficiently quick pace to catch up. At the same time, protection should be provided to the indigenous genetic pool. More research is now being done by the Department of Agriculture, and regional institutions such as CARDI (Caribbean Agricultural Research & Development Institute), IICA (Inter-American Institute for Cooperation in Agriculture) and UWI. Concern has been expressed that as the environment changes nitrogen fixing bacteria, mycorrhizae, predators, pollinators, seed dispersers and other beneficial species that co-evolved over centuries with traditional agricultural species may decline with negative effect on productivity.

Another important development relative to the retention of traditional knowledge is the use of native plants for various uses including investigation of their phytomedicinal and nutraceutical value.

To date because of rapid movement through air and sea travel of people from different parts of the world invasive and sometimes harmful organisms are carried. These have caused periodic outbreaks of new pests and diseases. Quarantine procedures now need to be beefed up.

With the increasing dynamism and evolution of Dominica's agriculture and environment, a number of steps are now necessary:

- An inventory of biodiversity resources to complement and expand on the work done by the Smithsonian and other institutions
- Review agricultural policies and legislation to ensure that crops, and their ecosystems are protected and there is not excessive and improper use of pesticides
- Establish gene banks to preserve scarce or threatened biological species
- Promote research in biotechnology and other technologies to see how they might fit to improve agricultural diversity and productivity

Institutional Strengthening

In an effort to build system, institutional and individual capacity among the nationals of Dominica especially the youth who will, inherit this land a number of critical steps need to be undertaken:

- Build relationships between Dominica's institutions and those which have a regional or international resource that can be brought to bear on the island's development. In that regard, Clemson University, the Smithsonian Institution, Oceanographic Institute of Dominica (OID), Government agencies and the Dominica State College (DSC)

should develop collaborative relationships and greater involvement of Dominican students and the Government in the work of these institutions. Clemson University operates the Archbold Tropical Research & Education Consortium (ATREC) at Springfield. A distance learning project is in the works. The Oceanographic Institute of Dominica produces coral in tanks for export and sale to people with aquaria.

- Distribute relevant literature published by these external institutions and local groups to libraries, documentation centers and educational institutions in Dominica. Work with the Ministries of Agriculture & Environment, Education, Youth and Community Development and other institutions in the public and private sector to foster ongoing discussions at the DSC, High Schools and other relevant audiences.
- Establish an Agricultural Sector Plan within which these various activities can be prioritized. Farmers and the youth should be included in the planning process
- Revisit prior successful crops like vanilla which are now in high demand to seek new opportunities for economic growth
- Continue with a massive public awareness and education programme through all media and other outlets to stimulate citizen action for conservation and sustainable use of the island's biological resources.

Careers in Agriculture

There are a wide variety of careers in agriculture and environmental protection which span the range from cultivator, processing, distribution and marketing on the one hand and sustainable use and conservation of natural resources on the other hand. I will mention here some of the critical professions for the consideration of the youth who are considering taking up careers in agriculture or environmental protection.

- Agronomy- basic science of crop production
- Extension and Education- transmission of agricultural knowledge and research to the farm level
- Agricultural Communication-the art and practice of communicating information to farmers usually through the media.
- Plant Pathology-study and treatment of plant diseases caused by viruses, bacteria, fungi and adverse physiological conditions
- Plant Nematology—study and treatment of plant nematodes that are parasites mostly on roots of crops
- Entomology- deals with insect classification and behaviour and methods of control
- Soil science—deals with soil properties and chemistry and is the basis of plant nutrition
- Biochemistry-the chemical processes of plant and animal life
- Physiology- normal functions and vital processes of living plant and animal organisms or their organs
- Genetics-inherited features of living organisms as produced by the interaction of their genes. It is the basis of plant and animal breeding
- Animal husbandry-domestication, care and production of animals for human nutrition.
- Veterinary Science-prevention, diagnosis, treatment of animal diseases

- Taxonomy-classification and naming of plants and animals into established groups based on their natural relationships.
- Ecology-study of the relationship between plant and animal species and their total natural environment
- Forestry- sustaining, developing and cultivating forests
- Environmental Science-study of the physical, social and cultural factors and conditions that affect life
- Marine Biology—deals with the study of marine life and the marine environment
- Food technology- study of the preparation, biochemistry, nutritive value and safety of foods. An important skill in agro-processing.
- Biotechnology-use of living organisms to make new products and develop new processes, e.g. fermentation, genetic engineering to modify the genetic material of living cells, recombinant DNA techniques, cloning

Citizenship and Civic Responsibility

The first order of business is to inculcate in the youth and the citizenry the value of agriculture to their lives and to the social and economic life of the country and to encourage them to take up careers in agriculture. This can be achieved by making the connection between the past and current history of agriculture and their lives and that of their parents. Practical involvement through farm work and field visits will bring the value of agriculture and the environment nearer home.

Educational institutions such as the DSC should encourage students to undertake practical projects in agriculture to sharpen their appreciation for research as a vehicle to improve knowledge and solve problems. Laboratory facilities are necessary to enable hands on experience with plant and animal sciences and the various ways in which those are utilized to provide food, feed timber products, herbs, and fibre.

There are several books which should form a part of a proper civics education;

Dominica. Island of Adventure - Lennox Honychurch

The Dominica Story. A History of the Island – Lennox Honychurch

Aspects of Dominican History – Government of Dominica

Dominica. Nature Island of the Caribbean – Government of Dominica

Waitikubuli. A Collection of Papers. The Rosie Douglas Foundation & the Dominica Academy of Arts & Sciences. New York Symposium, December 8, 2001

Waitikubuli. A Collection of Papers. The Rosie Douglas Foundation & the Dominica Academy of Arts & Sciences. Roseau, Dominica Symposium, October 30, 2002

The Democratic System in the Eastern Caribbean – Donald C. Peters