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**CARIBBEAN FOOD
CROPS SOCIETY**

45

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**Frigate Bay
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Frigate Bay, St. Kitts and Nevis

**“Reality and Potential of Food Security and Agricultural Diversification in Small Island
Developing States”**

**“Realidad y Potencial de la Seguridad Alimentaria y la Diversificación Agrícola en
Pequeños Estados Insulares en Desarrollo”**

**"Sécurité alimentaire et diversification agricole dans les petits états insulaires en
développement: réalisations et perspectives".**

**United States Department of Agriculture,
T-STAR Sponsored Invasive Species Symposium**

**INVASIVE SPECIES SAFEGUARDING: IMPERATIVE FOR CARIBBEAN
REGIONAL AGRICULTURAL DIVERSIFICATION AND FOOD SECURITY**

**Special Symposium Edition
Edited by
Waldemar Klassen, Carlton G. Davis, Edward A. Evans, Sikavas Na-Lampang
and Wanda Lugo**

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SESSION I: FOOD SECURITY AND INVASIVE SPECIES

THE NEXUS OF AGRICULTURAL DIVERSIFICATION, FOOD SECURITY AND SAFEGUARDING AGAINST INVASIVE ALIEN SPECIES

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INTRODUCTION

The impact of Invasive Alien Species on agriculture and, by extension, food security is arguably one of the most important challenges facing countries globally and in particular in the Caribbean Region. The ability to increase production or maintain current levels of production has been threatened by outbreaks of pests and diseases. The Red Palm Mite has had significant effect on the coconut industry in St. Lucia, Trinidad and Tobago and Jamaica. The Lethal Yellowing disease of coconut has affected Nevis and Jamaica. Moko disease and Black Sigatoka disease have affected bananas in Jamaica and Trinidad and Tobago. The Giant African Snail has attacked crops in several islands including Barbados, St. Lucia and Antigua and Barbuda. Classical Swine Fever and Low Pathogenic Avian Influenza have been detected in the Dominican Republic and Haiti.

The importance of invasive alien species was emphasized in the recent observation of the International Day on Biological Diversity (IDB) in 2009 which had the theme: *Invasive alien species (IAS) - one of the greatest threats to biodiversity, and to the ecological and economic well-being of society and the planet.*

The structure of agricultural production in the Region has remained basically unchanged with traditional exports of banana, rice and sugar dominating. Recent erosion of preferential treatment, resulting from WTO rulings has forced the Region to consider more seriously the issue of agricultural diversification. This concept is not new. In 1987 the then president of the Caribbean Development Bank, Dr. William Demas, addressed the Board of Governors of the Bank at its 7th annual meeting in May 1987 on the topic of *Agricultural Diversification in the Caribbean Community: Some Issues*. In his address Dr. Demas put forward a case for agricultural diversification and discussed the costs and benefits. In the over twenty years since Dr. Demas' address, the concept of agricultural diversification has gained more relevance as the Region seeks to address issues such as food security and the impact of invasive alien species.

The Caribbean has become increasingly dependent on imported foods (estimated at EC\$3.5 billion in 2008) for both domestic use and for use in its growing tourism industry. As net food importer, the Region has become more vulnerable to escalations in world food prices. In 2008 in particular, Caribbean countries were confronted with the urgent need to secure additional financial resources and foreign exchange to finance their growing food import bills. The food crisis has led to heightened emphasis on increasing local food production.

On the eve of 2008, a World Bank expert was quoted as saying that ‘*developing island nations in the Caribbean should de-emphasize food production to focus more attention on reducing poverty, and small island nations should import food*’. This remark sparked a heated debate in the Caribbean about the Region’s deteriorating capacity to feed itself and by extension, the causes and effects of food import dependency, including the future of agriculture. There was a general consensus of the inadequacy of the national and regional policy framework, over time, to treat this issue with the level of importance that it deserves.

This paper will discuss the issue of food security within the context of agricultural diversification and the impact of invasive alien species with specific reference to the Caribbean Region.

<h2>Agricultural Diversification</h2>		
AGRICULTURE IN THE CARIBBEAN	FOCUS OF AGRICULTURE	EROSION OF PREFERENTIAL ARRANGEMENTS AND GLOBALIZATION
<ul style="list-style-type: none"> • Dominated in the past by traditional export crops • Banana, sugar cane, rice, coffee, cocoa 	<ul style="list-style-type: none"> • Production of export crops • Focus not on producing to meet the food needs of the nation. 	<ul style="list-style-type: none"> • Changed of focus to production for national & regional food security • Agricultural diversification now seen as important

Figure 1. Transformation of Caribbean agricultural policy from production for export to agricultural diversification for production to meet national & regional food security.

FOOD SECURITY

OAS Assistant Secretary General calls for recognition of food security as a political issue: During a visit to the headquarters of the Inter-American Institute for Cooperation on Agriculture (IICA), Assistant Secretary General of the Organization of American States (OAS), Ambassador Albert Ramdin, said that “food security had become a political rather than a technical issue. When people do not have enough food, trouble starts, there are protests and sometimes governments even fall.”

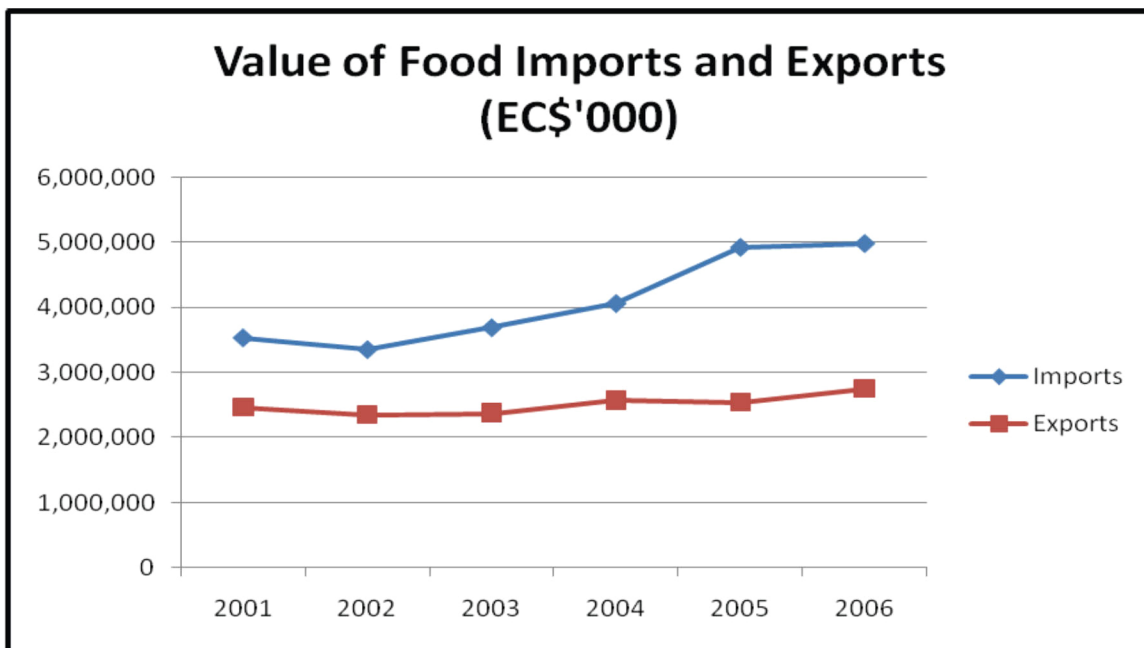
Food security is a flexible concept as reflected in the many attempts at definition in research and policy usage. Even a decade ago, there were about 200 definitions in published writings. The World Food Summit of 1996 defined food security as existing “*when all people at all times have access to sufficient, safe, nutritious food to maintain a healthy and active life*”. Commonly, the concept of food security is defined as including both physical and economic access to food that meets people's dietary needs as well as their food preferences. Food security is built on three pillars:

- Food availability: sufficient quantities of food available on a consistent basis.
- Food access: having sufficient resources to obtain appropriate foods for a nutritious diet.
- Food use: appropriate use based on knowledge of basic nutrition and care, as well as adequate water and sanitation.

The concept of food security incorporates valid economic arguments about the need to ensure that every household has adequate food of adequate nutritional value available and the equally valid political notion that no country could be considered truly independent if it must depend on imports for meeting the vast bulk of its food requirements. The goal of food security is thus closely related to the agricultural development objectives of:

- growth in output and productivity, to meet growing demands of the domestic market;
- sustainability, to maintain adequate levels of production in the future; and
- stability, to reduce the adverse effects of both the inherent instability of agricultural output and the periodic swings associated with cyclical changes in the economic environment, including the effect of such changes on prices and supplies of imported food.

Graph 1. The increasing annual costs of food imports and the static annual earnings from food exports in the CARICOM States.



The Caribbean has increasingly become dependent on imported food to feed both its local population and for use in the growing tourism industry. It is estimated that EC\$3.5 billion was spent on imported food in 2008. Table 1 shows the value of selected CARICOM total imports and exports for the period 2001-2006, and Graph 1 shows the trend over the same period.

Table 1: Value of selected CARICOM total imports and exports by Standard International Trade Classification (SITC) Group: 2001-2006.

Source: CARICOM'S TRADE A Quick Reference to Some Summary Data 2001-2006

	2001	2002	2003	2004	2005	2006
	IMPORTS (EC\$'000).					
Food & Live Animals	3,536,411	3,356,345	3,691,606	4,062,117	4,924,094	4,981,793
Mineral fuels, lubricants & related materials	5,498,979	5,169,974	6,574,141	7,708,900	12,321,212	1,3029,756
	EXPORTS (EC\$'000).					
Food & Live Animals	2,460,132	2,351,504	2,375,717	2,573,338	2,535,492	2,750,685
Mineral fuels, lubricants & related materials	7,393,482	5,448,958	9,711,953	11,216,536	19,311,157	30,755,794

The main problem facing the Region as it focuses on food security is how to be less dependent on imports and become more self reliant. We are not at the point where we can satisfy our minimum food requirements. The mantra now being heard across the Region is “*eat what we grow and grow what we eat.*”

INVASIVE ALIEN SPECIES

Invasive alien species have been described as plants, animals, pathogens and other organisms that are non-native to an ecosystem, and which may cause economic or environmental harm or adversely affect human health. In particular, they impact adversely upon biodiversity, including decline or elimination of native species, through competition, predation, or transmission of pathogens, and the disruption of local ecosystems and ecosystem functions.

Invasive alien species, introduced and/or spread outside their natural habitats, have affected native biodiversity in almost every ecosystem type on earth and are one of the greatest threats to biodiversity. Since the 17th century, invasive alien species have contributed to nearly 40% of all

animal extinctions for which the cause is known (Convention on Biological Diversity, 2006).

The problem continues to grow at great socio-economic, health and ecological cost around the world. Invasive alien species exacerbate poverty and threaten development through their impact on agriculture, forestry, fisheries and natural systems, which are an important basis of peoples' livelihoods in developing countries. This damage is aggravated by climate change, pollution, habitat loss and human-induced disturbance.

Globalization has resulted in greater trade, transport, travel and tourism, all of which can facilitate the introduction and spread of species that are not native to an area. Most countries are grappling with complex and costly invasive species problems. For example, the annual environmental losses caused by introduced pests in the United States, United Kingdom, Australia, South Africa, India and Brazil have been calculated at over US\$ 100 billion (CBD, 2006). Addressing the problem of invasive alien species is urgent because the threat is growing daily, and the economic and environmental impacts are severe.

Islands are especially vulnerable to invasive alien species because they are naturally isolated from strong competitors and predators. Islands often have ecological niches that have not been filled because of the distance from colonizing populations, increasing the probability of successful invasions.

Biodiversity loss is a particular concern on islands. The Report of the Global Conference on the Sustainable Development of Small Island Developing States (also known as The Barbados Programme of Action for the Sustainable Development of Small Island Developing States, BPoA, referred to the biological diversity of island ecosystems as “among the most threatened in the world”, due to their small size, isolation and fragility (Bridgetown, Barbados, 25 April-6 May 1994, Annex II, preamble, paragraph 6).

More recently, the Millennium Ecosystem Assessment concluded that the main drivers of island biodiversity loss would either continue or increase rapidly. It projected that the impacts of climate change and pollution from nutrient loading will become increasingly severe and that the impacts associated with habitat change, over-exploitation and, particularly, invasive species will continue to be high or, in the latter case, very high. (Convention on Biological Diversity)

The Caribbean Region largely consists of Small Island Developing States (SIDS) which depend on the conservation and sustainable use of island biodiversity for their sustainable development and as a result are among the most vulnerable of the developing countries, considering the relative lack of economic alternatives available and such factors as:

- Small populations and economies
- Relatively weak institutional capacity in both the public and the private sector
- Susceptibility to natural disasters and climate change
- Fragility of land and marine ecosystems
- Limited diversification in production and exports

- Dependence on international markets, export concentration, and income volatility
- Vulnerability to exogenous economic shocks.

These challenges and vulnerabilities prompted Agenda 21 (chapter 17, section G; 1992), followed by the Barbados Programme of Action (1994) and the Plan of Implementation of the World Summit on Sustainable Development (2002), to call small island developing States and islands supporting small communities “*a special case both for environment and development.*”

In recent years several invasive alien species detected in the Region have, to varying degrees, negatively affected the agricultural sector and have impacted society adversely. Invasive alien species such as the Red Palm Mite, the Giant African Snail, Citrus Greening, Black Sigatoka, Moko Disease, the Pink Hibiscus Mealybug, Lime Swallow Tail Butterfly, the Lionfish, are just a few examples that have had serious effect on agriculture and, by extension, on the prospect of food security.

AGRICULTURAL DIVERSIFICATION

POTENTIAL BENEFITS OF DIVERSIFICATION
 Food security and Employment Generation result in Foreign
 Exchange Savings and Earnings as well as
 Production Linkages and Utilization of Under-Utilized
 Resources (Demas, 1987).

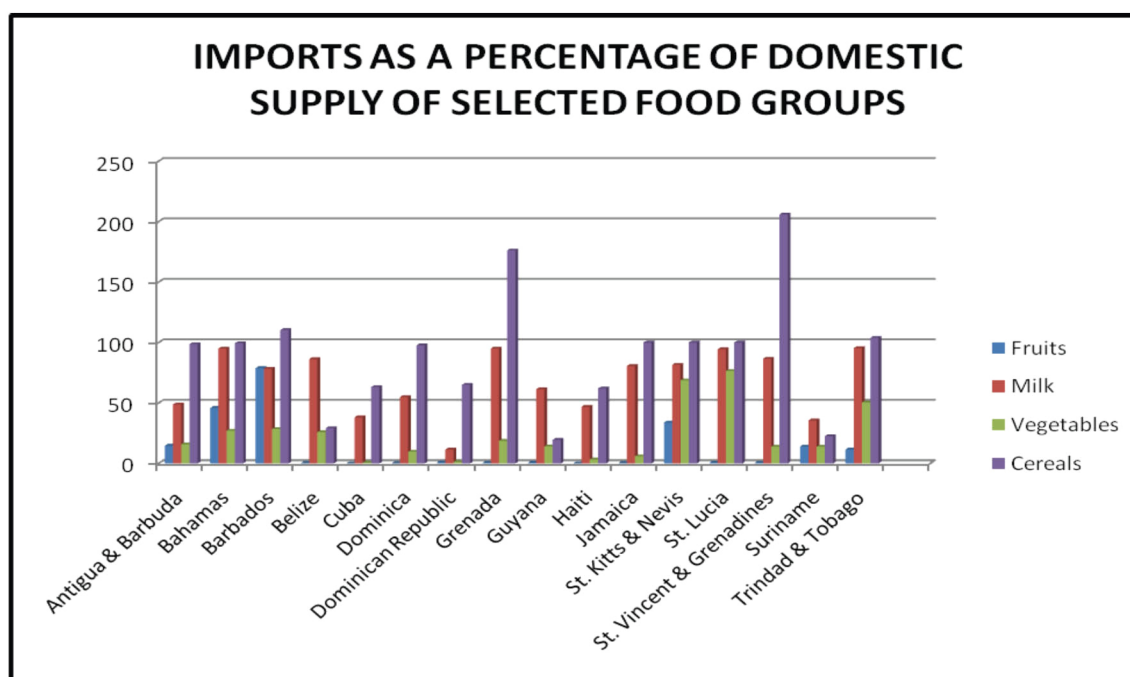
Agriculture in the Caribbean has been dominated over the years by the so-called traditional export crops, mainly banana, sugar cane, rice, coffee and cocoa. The focus of agriculture is on the production of these export crops, not on mass production for local consumption. Much of the food consumed in the region is imported as shown in Table 2 and Graph 2. However, recent events, including the removal of preferential arrangements for export to Europe, and the effects of globalization, have forced countries to take agricultural diversification seriously and to change the focus from production mainly for export to production for national and regional food security and import substitution.

A key component of the agricultural diversification strategy of St. Lucia is the reduction of the country's food import bill. St. Lucia's food import bill has averaged a 10% increase each year, and has risen from EC\$97 million in 1987 to \$189 million in 1999. Statistics demonstrate that St. Lucia's trade balance on food has moved from a surplus of EC\$82 million in 1987 to a deficit of EC\$90 million in 1999. Consequently, one of the expected outcomes of the agricultural diversification programme is the reduction of the levels of foreign exchange spent on food imports, and an increase in the generation of foreign exchange. Excerpt from Saint Lucia's Agricultural Diversification Strategy , Jan 1, 2001 / Dec 31, 2005

Table 2: Imports as a percentage of domestic supply of selected food groups.

	Fruits	Milk	Vegetables	Cereals
Antigua and Barbuda	14.7	48.9	15.9	98.7
Bahamas	45.9	95.1	27.1	99.5
Barbados	78.9	78.4	28.5	110.4
Belize	0.3	86.3	25.9	29.2
Cuba	0.0	38.1	0.7	63.2
Dominica	0.1	54.9	9.7	97.7
Dominican Republic	0.9	11.5	1.2	65.0
Grenada	0.4	95.0	18.7	176.2
Guyana	0.5	61.4	14.1	19.5
Haiti	0.0	46.8	3.3	62.0
Jamaica	0.3	80.6	5.9	100.0
Saint Kitts and Nevis	33.8	81.5	68.7	100.0
Saint Lucia	0.6	94.5	76.4	100.0
Saint Vincent and the Grenadines	0.4	86.6	13.8	205.9
Suriname	1.4	35.6	13.8	22.5
Trinidad and Tobago	11.6	95.5	50.4	103.9

Source: Trade Policy, Trade and Food Security in the Caribbean; J.R. Deep Ford and Gregg Rawlins (data from FAOSTAT, 2006)



Graph 2. Shortfalls in the domestic production of fruits, milk, vegetables and cereals in each of the CARICOM Full Member and Associate Member States.

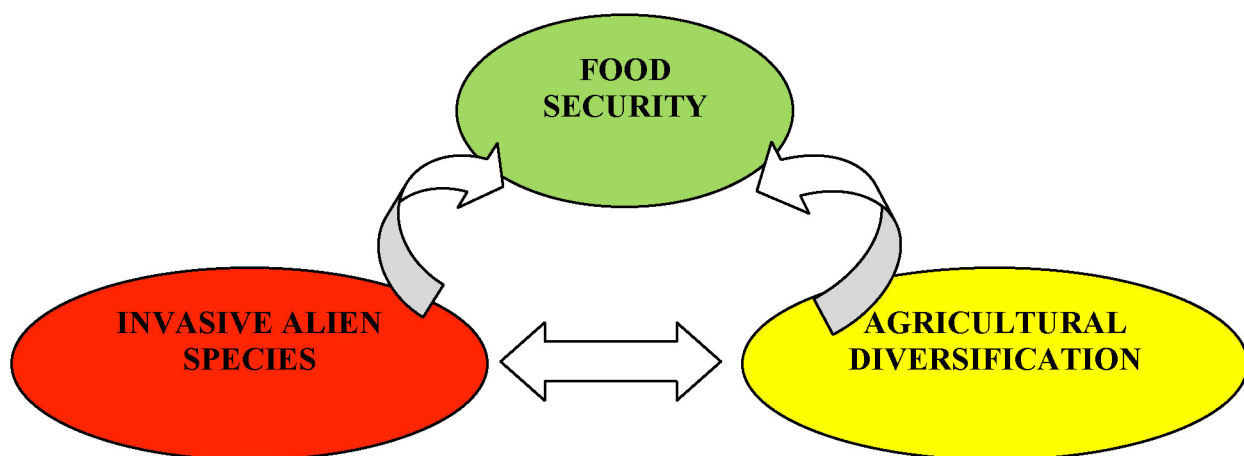
The St. Vincent and the Grenadines Ministry of Agriculture, Forestry and Fisheries Strategic Plan for Agricultural Diversification and Development 1997-2006 is being revised to chart the development of agriculture and agri-business over the long term. The new agriculture will be developed on a policy platform of agriculture diversification around bananas. The policy points towards the modernization and enhanced competitiveness of the agricultural sector to achieve the following policy objectives:

- Export development based on selected commodities including fisheries and other bio-products to generate foreign exchange earnings.
- Food and Nutrition security through the production of selected commodities including fish and livestock production.
- Import substitution which involves the production of special commodities and products for import replacement, saving foreign exchange, increasing linkages with the tourism sector, creating employment and the development of export base agro-industries.

(Extracted from the National Medium Term Priority Framework for FAO Assistance - St. Vincent and the Grenadines Draft document, 2006)

The potential benefits of diversification to the Caribbean Community can be considered under five related headings: Food Security; Foreign Exchange Savings and Earnings; Employment Generation; Creation of Production Linkages; and Utilization of Underutilized Resources. (Demas, 1987).

THE NEXUS



The above diagram illustrates the inter-connectivity of food security, agricultural diversity and invasive alien species. The basic premise is that the food safety goals of a country can be attained through agricultural diversification while safeguarding against the adverse effects of invasive alien species.

The achievement of food security in the Region is inextricably linked to diversification in agriculture in relation to the traditional crops such as banana, sugar cane and rice. Agricultural diversification systems and practices should include:

- Increased value-added use of the traditional crops
- Increased production of the ‘non-traditional’ crops such as root crops (yam, cassava, sweet potato) and vegetables and fruits.
- Introduction of new crops and varieties
- Home gardens
- Seed banks
- Fodder production
- Crop-Livestock association
- Crop genetic diversity management
- Cultivation of hillsides
- Cultivation of trees and orchards
- Optimization of land use
- Conservation of the natural resource base; sustainable land use
- Good agricultural practices and food safety
- Integrated pest and crop management
- Agro-tourism linkages
- Organic farming

But how do we safeguard against the adverse effects of invasive alien species? There are numerous examples, both within the Region and also worldwide, of the devastating effects invasive alien species can have on agriculture and the significant costs resulting from their introduction into a country. The loss due to the Citrus Tristeza Virus in Jamaica in 2001 was estimated at approximately US\$4.5 million (Lee et al., 2002), and the estimated cost to eradicate the New World Screwworm in Jamaica is US\$62.5 million. Although figures are not readily available there have been significant losses resulting from the presence of invasive alien species such as the Red Palm Mite, Lethal Yellowing Disease of coconuts, the Pink Hibiscus Mealybug, and Classical Swine Fever.

Again the question is how do we safeguard against the adverse effects of invasive alien species as we move towards agricultural diversity and food security? There are several factors that must be taken into consideration at both the national and the regional levels. These include:

- Agricultural Policy
 - There is need for comprehensive agricultural policies that address the issue of food security within the context of agricultural diversification and invasive alien species both at the national level and the Regional level. It was Guyana’s President Jagdeo who in 2003 called for a common agricultural policy for the Region.
- Legislative Framework
 - Adequate legislative framework is necessary. Many countries in the Region have outdated legislation or legislation which does not address adequately the issues of agricultural health and invasive alien species.

- Plant and Animal Health and Food Safety Systems
 - Plant, animal health and food safety systems must be improved and modernized in order to provide the necessary support services and regulatory framework.
- Human and financial resources
- Infrastructure

This list is by no means an exhaustive one. There are many factors that must be considered.

CONCLUSION

Five years ago, in July 2004 at the CARICOM Heads of Government Conference in Grande Anse, Grenada, Guyana's President Bharrat Jagdeo (current Chairman of CARICOM) presented a paper entitled '*A Framework for Repositioning of Caribbean Agriculture.*' In the framework, he stressed the need for a Regional policy and strategy for strengthening food security and alleviating poverty.

In January 2005, the Guyanese President's proposal was formally dubbed the '*Jagdeo Initiative*' with a theme '*Strengthening Agriculture for Sustainable Development.*' It was described as a practical instrument to move forward the Regional Transformation Programme on Agriculture or its successor, the CARICOM Common Agricultural Policy. The CARICOM Secretariat noted '*The policies and programmes for the agriculture sector in the Caribbean Community (CARICOM), as set out in the Jagdeo Initiative will ensure that the Region's agriculture sector is given priority in order for it to become sustainable.*'

Under the Jagdeo Initiative several key binding constraints were identified:

1. Limited Financing and Inadequate Levels of New Investments.
2. Outdated and Inefficient Agricultural Health and Food Safety (AHFS) Systems.
3. Inadequate Research and Development.
4. A Fragmented and Disorganized Private Sector.
5. Weak Land and Water Distribution and Management Systems.
6. Deficient and Uncoordinated Risk Management Measures.
7. Inadequate Transportation Systems, Particularly for Perishables.
8. Weak and Non-Integrated Information and Intelligence Systems.
9. Inadequate Marketing Arrangement.
10. Lack of Skilled and Quality Human Resources.

Several of the key binding constraints speak directly to our topic, and addressing these constraints both at a national and regional level is important if there is to be any real advancement for food security in the Region. But, four years hence and we are still faced with these constraints. If we as a Region are really serious about food security, we must take the necessary steps to do what needs to be done.

It is imperative that as a Region we work collectively at addressing these and other constraints if we are to attain our goal of food security.

It is now time for action... We have the answers; now let's put them into practice employing the four P's that Senator The Honourable Arnold Piggot, Minister of Agriculture, Land and Marine Resources, Trinidad and Tobago, outlined in his address to this meeting of the CFCS:

- Political will
- Programmes that are sustainable
- Partnerships that are strategic
- Private sector participation

REFERENCES

CARICOM'S TRADE A Quick Reference to Some Summary Data 2001-2006.

Convention on Biological Diversity. 2006. Invasive Alien Species, retrieved from July 9, 2009 from the World Wide Web: <http://www.cbd.int/invasive/>

Demas, William D., (May 13, 14, 1987). Agricultural Diversification in the Caribbean Community: Some Issues, Statement by the President, CDB to the Board of Governors at the 7th Annual Meeting, Grenada.

FAO Economic and Social Development Department, Trade Reforms and Food Security

Ford, J.R. Deep and G. Rawlins. 2002. Trade Policy, Trade and Food Security in the Caribbean. <ftp://ftp.fao.org/docrep/fao/010/a1146e/a1146e02.pdf>. 70 pages.

Gari, J. A. 2003. Agrobiodiversity strategies to combat food insecurity and HIV/AIDS impact in rural Africa. Population and Development Service (SDWP), FAO.

Lee, R. F., P. McConnell, K.L. Majunath, B. Cevik, O. V. Nikolaeva, M.G.H. Dekkers, & C.L. Niblett, (2002). The Citrus Tristeza Virus Epidemic in Bog Walk Valley, Jamaica

UNEP-Caribbean Environment Programme, retrieved July 9, 2009 from the World Wide Web: <http://www.cep.unep.org>

World Health Organization, Food Security, retrieved July 9, 2009 from the World Wide Web: <http://www.who.int/trade/glossary/story028/en/>