

Agriculture Science Technology Innovation (ASTI) systems for the banana industry in St Vincent and the Grenadines

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ABSTRACT

The ability to create knowledge and innovate is essential for the realisation of improvements in productivity and global competitiveness. The agricultural sector in the Caribbean region and St. Vincent and the Grenadines by extension is no longer being insulated from the effects of changes occasioned by globalisation and trade liberalisation. Preferential trading arrangements have given way to free market competition consistent with the regulations of the World Trade Organisation (WTO). Within this context, the banana industry in St. Vincent and the Grenadines was examined using the CTA/UNU-INTECH/KIT Agriculture Science Technology and Innovation (ASTI) approach. The diverse factors that shape the interactions among actors and how they interact in the policy environment were also looked at. The science and research capacity to meet the challenges of the dynamic agricultural sector was also examined. Banana remains the major export crop of St Vincent and the Grenadines. Surveys and interactive workshops held with both farmers and organizations involved in the industry, revealed that there were several limitations to innovation. These included, lack of or weak collaboration among the major players, insecure land tenure arrangements, poor access to financing and a dearth of information on research and development in bananas in the Caribbean region. The organisations more inclined to innovate did so to a limited extent. The study made several recommendations for improving the incidence and sustainability of innovation and the innovation process in the banana industry. The system analysis identified areas where policy changes coincided with small surges in production. However, the industry performance has declined drastically

Key words: Innovation, banana, science, technology, interaction

INTRODUCTION

In St Vincent and the Grenadines, the agricultural sector is no longer insulated from globalisation and trade liberalisation. Preferential market access has given way to competition within the trading arrangements of the World Trade Organisation (WTO), as a consequence a steady decline in the banana industry and an overall decline in gross agricultural output have resulted.

The ability to create knowledge and innovate is essential for continued productivity and competitiveness. The CTA/UNU-INTECH/KIT Agricultural Science Technology and Innovation (ASTI) system provides such a framework to examine the interdisciplinary nature and the diversity of factors that shape the interactions among actors and how these impact on the actors' individual and collective abilities to learn, adapt and innovate.

Within this context, the banana industry in St Vincent and the Grenadines was evaluated within the framework of the ASTI. Specifically, a broad systemic analysis was conducted of the actors in the banana industry; their traditional habits, practices and linkages and the way these are shaped by different policies and reward structures. In addition, an assessment was made of how the various actors contribute to the overall performance of the ASTI system.

MATERIALS AND METHODS

The evaluation consisted of three components. (i) A review of secondary data that included national policies, strategic plans, production and marketing data from Ministry of Agriculture and Trade. (ii) Stakeholder meetings with private and public sector which included Growers Associations, Ministry of Agriculture, credit facilities. (iii) Surveys of banana farmers and organisations with which they interact.

Of the approximately seventeen hundred banana farmers in St Vincent and the Grenadines, 194 were interviewed from all the banana producing districts on the island. The survey instruments sought to gather information on general demographics; age, size of farm, ownership. Questions also addressed the level of training the farmer received, financing, collaboration and networking. Surveys were also conducted with 18 organizations, all of which were involved in agricultural based activities.

RESULTS

The agriculture sector

The role of agriculture in the economy of St Vincent and the Grenadines Agriculture was once the mainstay of the economy, contributing approximately 21% to the Gross Domestic Product (GDP) in 1990. Traditionally, banana was the main contributor to the sector (11%); however during the last decade with the decline in the banana industry there has been a downward trend in the performance of the sector (Table 1, 2).

The agricultural sector is dominated by small farmers with less than 5 acres (2ha) of land (Government of St. Vincent and the Grenadines, 2000). Increased competition from other sectors resulted in a 40% decrease in available land for agriculture between 1985 and 2000. Other contributing factors include: inadequate marketing arrangements, limited value addition, limited research and technology development, inadequate infrastructure, technical capacity and credit systems for sustainable production in non-banana agriculture.

Table 1 Percentage contribution of the agricultural sector to Real Gross Domestic Product (2002-2006)

	2002	2003	2004	2005	2006
Agriculture	11.66	11.09	9.87	9.09	9.28
Crops	8.68	7.79	6.80	6.27	6.50
Bananas	2.97	1.80	1.81	1.33	1.25
Other crops	5.71	5.99	4.99	4.94	5.25
Livestock	0.87	0.86	0.82	0.82	0.78

Source: Statistical Office, Ministry of Finance and Economic Planning, St Vincent and the Grenadines

Table 2 Rate of Growth in the Agricultural Sector (2002-2006)

	2002	2003	2004	2005	2006
Agriculture	7.77	-2.24	-4.86	-5.96	7.58
Crops	15.78	-7.80	-6.74	-5.68	8.28
Bananas	15.70	-37.89	7.80	-24.88	-10.05
Other crops	15.83	7.87	-11.10	1.30	13.79
Livestock	1.48	1.82	1.97	1.93	2.07

Source: Statistical Office, Ministry of Finance and Economic Planning, St Vincent and the Grenadines

The banana sub-sector

Banana is important to the economy because of its contribution to Gross Domestic Product, export earnings, employment, income distribution, social and gender equity and land use. In 1990, banana revenues accounted for 53.9% of merchandise exports. This has declined significantly but the contribution of banana export earnings to the economy remains crucial (Table 3). Total banana exports accounted for 42.9% of all merchandise exports from the country over the period 1991 – 2000 and 33.9% over 2001 to 2005. In 2006, banana exports accounted for 4.8% of exports. This is due in part to unfavourable market conditions and natural disasters. The robust growth rates in the 1990s were due to favourable trade arrangements. The buoyant economy also facilitated high levels of

public sector investment in infrastructure. Government provided support to the industry through subsidies, technical assistance, lobbying, diplomatic missions and income tax relief.

The decline in the value of the pound sterling relative to the eastern Caribbean Dollar in the early 1990s contributed to the start of the decline of the banana industry. This led to worsening of the terms of trade, prices fell sharply, farmers left the industry and banana cultivation was significantly reduced.

Additionally, more attractive wage sectors of the economy drew labour away from agriculture. The stringent quality requirements imposed by EUREPGAP also acted as a deterrent and farmers unable to comply, left the industry.

Table 3 Exports Earnings from Agricultural Exports versus Total Merchandise Exports (US\$ million)

	2002	2003	2004	2005	2006
A. Total Merchandise Exports	39.4	38.5	37.0	40.3	41.6
B. Food	32.0	26.5	28.0	28.6	28.0
Bananas	16.0	12.0	13.2	12.0	10.3
Other Food Exports	16.0	14.5	14.8	16.6	17.7

Source: Statistical Office, Ministry of Finance and Planning, St Vincent and the Grenadines

Review of policy framework

The important regulatory and developmental policies which impact on the banana industry in St Vincent & the Grenadines include: (i) Plant Protection Act (1941) which provides for the prevention, eradication and control of diseases and pests affecting plants; (ii) Banana Restructuring Act of 2001; (iii) National Irrigation Authority Act 2004; (iv) St Vincent and the Grenadines Development Plan 1991-1995 and (v) the St Vincent and the Grenadines Medium Term Economic Strategy Plans, 1998-2000, 2002-2004, 2006-2009 (ASTI 2007). These policies seek to assist the development of a more competitive banana industry by the implementation of strategies and programmes to reduce operational costs and improve production and productivity.

Initiatives arising from these policies included: the provision of tissue culture plantlets from high yielding varieties e.g. Williams, Grand Name and Robusta; establishment of major irrigation infrastructure; implementation of a feeder road rehabilitation programme and a subsidy on inputs

These initiatives had limited success for several reasons, the major factor being the non-adoption of farmers of all aspects of the production technologies recommended. Farmers readily adopted tissue culture plantlets, which are now the main means of crop establishment. The expected yields were however never achieved due to the non-adoption of other recommended production practices like irrigation and improved fertilisation. Government recognised the importance of linkages and recommended in its Medium Term Economic Plan 2006-2009: (1) Strengthening the linkage between the Tissue Culture Laboratory, the St Vincent and the Grenadines Banana Growers Association and the Agricultural Input Warehouse; (2) Improving the linkage between primary producers and consumers, especially supermarkets, restaurants and hotels. The entities in listed in (1) still operate

quite independently of each other and the restaurants, hotels and supermarkets are still not major outlets for farmers' produce.

The major functionaries in the banana industry are detailed in Appendix 1

Survey of banana farmers

A total of 194 banana farmers in St Vincent and the Grenadines were contacted during a survey to determine the profile of banana farmers.

The largest proportion of farmers interviewed was in age group 50-60 years (34.0%), and the smallest amount in the 20-30 years age group (1.5%). Of the sample of farmers interviewed, 68.4% were males and 31.6% were females. The majority of farmers (39.2%) established their enterprises in the 1980s, 20.6% in the 1970s, 18.0% in the 1990s, 10.8% in the 1960s and 3.6% in the 1950s. It was found that 4.1% of the farmers began their operations between 2000-2003. The number of years farmers were involved in banana production ranged from two to 56 years. Most of the farmers (37.1%) have been farming for 20 to 29 years, followed by 20.6% farming for 30 to 39 years, 19.1% for 10 to 19 years, 16.5% for 40-56 years and 6.7% for 2 to 9 years.

Most of the farms were small-sized, with 53.6% of the respondents having farms less than 5 acres (2ha) - small-sized, 38.7 % with farms 5 to 10 acres (2-4ha) - medium-sized while only 7.7% had farms more than ten acres (4ha) in size.

Of the farmers interviewed 91.2 % considered themselves fulltime farmers while 8.8% were part time. Farmers' enterprises were involved mainly in production and contract farming as expressed by all (100%).

Land is held under a variety of tenure arrangements. The distribution of tenure is illustrated in (Figure 1). Only 1.0% of respondents stated that the land is owned, while 12.9% had family land. The majority (85.1%) held land under various forms of insecure arrangements: rent or lease, freehold and sharecropping.

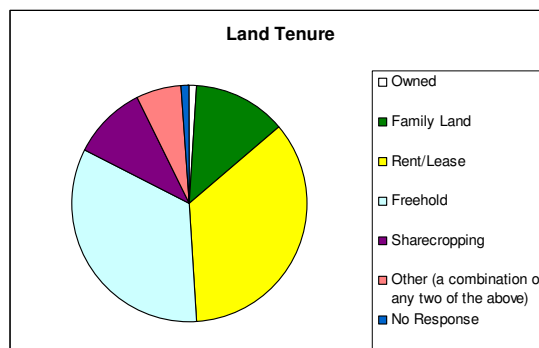


Figure 1 Ownership structure for farmers

When asked if affiliated with a national organization, network association, consortium or corporation, 97.9% of respondents answered in the affirmative. The organizations were mainly the St. Vincent

Banana Growers Association 4.8% and Fairtrade 93.1%. The majority (66.5%) of the sample only received primary level education, 20.1% received a secondary education while 8.8% received tertiary education.

In many cases the farmers had no collaboration with most of the actors listed in Appendix 1 except with the Windward Island National Farmers' Association and the Agricultural Input Warehouse. None of the respondents thought that they had an intense collaboration with the Tissue Culture Laboratory which is involved in producing the tissue culture plantlets. When questioned about their outlook for the banana industry, the response given by 45.5% of the farmers was negative. Of the total, 40.2% made positive comments and 12.8% of the respondents were indifferent (Figure 2).

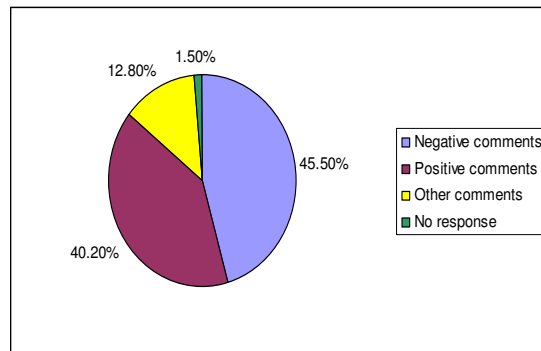


Figure 2 Farmers' outlook for the banana industry

Survey of farmer organisations

Eighteen organisations associated with banana farmers, e.g. (farmer associations, finance institutions and government agencies) were surveyed.

The oldest of the organisations surveyed was established in 1908 while the most recently established was in 2005. Nine (50%) were locally owned (private), six were public/government owned, two were foreign owned (private) and one was owned on the basis of local equity. Ten of the organizations are parts of larger groups while the remaining eight were not.

The highest level of academic qualification among members/staff of the organizations was a Masters degree (44.4%). The organisations involved in research said that their research work was directed towards local agriculture. Only three organisations claimed to have had a formal training and development programme in agriculture. Nine (50%) of the organisations interviewed claimed to have had overseas collaboration, with marketing and distribution being common among four organisations and financing common among six.

Local collaboration was common to 13 organisations, particularly in the areas of teaching, research, product development, marketing and distribution, financing and banking and extension services. The

organisations' assessment of the domestic science and technology infrastructure for supporting agricultural activities was favourable. Most thought they were adequate.

DISCUSSION

The findings revealed that farmer innovations were either not evident or not adopted in the banana industry. The farmers still for the most part operate as they did more than two decades ago. The need to innovate for sustainability of the industry is crucial.

The following recommendations are made to improve the incidence and sustainability of innovation in the banana industry:

- (1) Management of the industry could be greatly enhanced by the restructuring of the government appointed board to make it more farmer friendly
- (2) The aging farmer population threatens sustainability. Emphasising agricultural science in primary and secondary schools, is particularly desirable
- (3) The weak collaborative linkages between the various actors in the industry need to be strengthened. This shortcoming serves as a hindrance to innovation
- (4) Research, which is a vital part of the innovation process, has not been identified as a priority. The roles of CARDI as well as the UWI should be examined with a view to increasing their contribution to the industry
- (5) Banana extension needs to be strengthened to assist and advise farmers in the use of improved production practices for increased productivity
- (6) Financing should be made more accessible to farmers. The major commercial banks do not now have any special concession for farmers. Collateral free or low interest loans should be considered
- (7) The government should expand available subsidies. Farmers suggested 100% financing for farm vehicles
- (8) A land bank system should be instituted to make land available for landless farmers interested in expansion or youths interested in starting up.

CONCLUSION

The preceding recommendations can support a sustainable industry which despite the many challenges is still regarded as viable by many of the farmers interviewed. It is clear that the innovation process in the banana industry is limited. Industry decline did not spur the farmers to innovate. The "secure" market arrangements might have lured them into a false sense of security for which they are now paying a heavy price.

There is need to look at the industry in a global context. The fact that banana is still critical to the economy of St Vincent and the Grenadines, provides the avenue to explore other opportunities for e.g.; value addition, niche marketing and capitalising more on Fairtrade marketing.

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REFERENCES

ASTI. 2007. The Banana Industry of St Vincent and the Grenadines, Agricultural Science Technology Innovation System (ASTI)

Government of St Vincent and the Grenadines. 2000. Agricultural Census. Kingstown, St Vincent and the Grenadines: Ministry of Agriculture

APPENDIX 1 MAJOR FUNCTIONARIES IN THE BANANA INDUSTRY

Actors	Description
<p>• Management St Vincent Banana Growers Association (SVBGA)</p> <p>Windward Island Crop Insurance (1988) Limited (WINCROP)</p>	<p>The SVBGA was established by the Banana Restructuring Act 2001. It is responsible for controlling the cultivation of bananas, conducting research, promoting improvement in production techniques and acts as the agent for all registered growers.</p> <p>WINCROP 1988 membership consists of Banana Growers Associations in the Windward Islands. Banana is currently the only crop granted insurance coverage.</p>
<p>• Production Tissue Culture Laboratory</p> <p>Irrigation Management Unit (IMU)</p> <p>Agriculture Input Warehouse (AIW)</p> <p>Hadley Blooms</p>	<p>This facility is jointly operated by the Ministry of Agriculture, Forestry and Fisheries and the Mission Taiwan. It is responsible for producing clean planting material for farmers.</p> <p>The IMU is managed by a government appointed board which was set up in 2006 to ensure that banana growers had a reliable source of water for improved production. It conducts research in irrigation, fertigation and banana production.</p> <p>This is a government owned input supplier, which provides all banana inputs at a subsidised price. It is controlled by a board and prices are fixed by government.</p> <p>A private flower producer, who does second stage hardening for banana plantlets</p>
<p>• Marketing The Windward Islands Banana Development and Exporting Company (WIBDECO)</p> <p>Windward Island National Farmers' Association/Fair Trade (WINFA)</p>	<p>WIBDECO is a private company with responsibility for the marketing and distribution of Windward Island Bananas. The Shareholders are the Governments and the Banana Growers Association of the four Windward Islands.</p> <p>WINFA administers the Fairtrade label for banana growers in the Windward Islands. Growers under this label must undertake to reduce the use of pesticides and herbicides.</p>

Actors	Description
<p>Traffickers</p> <p>National Properties Ltd (NPL)</p>	<p>Primarily responsible for inter-island trade. They buy second grade bananas either directly from the growers or from the Banana Growers' Association.</p> <p>A government owned, private sector run organization. The board is cabinet appointed and deals primarily with the marketing of agricultural crops in St Vincent. It is responsible for marketing first grade bananas regionally.</p>
<p>• Research</p> <p>University of the West Indies (UWI)</p> <p>Caribbean Agricultural Research and Development Institute (CARDI)</p>	<p>The UWI with campuses located on three Caribbean Islands is not involved in banana research in St Vincent.</p> <p>The Caribbean Agriculture Research and Development Institute (CARDI) is a regional research institute operating in 12 Caribbean countries.</p>
<p>• Financial Institutions</p> <p>Banks</p> <p>Credit Unions</p>	<p>These comprise First Caribbean International Bank, Bank of Nova Scotia, Royal Bank of Trinidad and Tobago, National Commercial Bank and First St Vincent Bank.</p> <p>Credit Unions in St Vincent and the Grenadines are: Teachers Credit Union, Kingstown Cooperative Credit Union, Government Employees Cooperative Credit Union and the Marriaqua Cooperative Credit Union. Payment from the Banana Growers Association for produce sold is deposited into farmers' accounts at these institutions. Some growers also access the loan facilities.</p>