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Introduction

With the advent of free trade or trade liberalization and the pending removal of all preferential treatment from world trade by the year 2008, Jamaica is faced with the on-going task of improving and sustaining the competitiveness of the agricultural sector.

The country must re-focus its trade strategies and strengthen its support systems in order to survive in this fiercely competitive global market. With this in mind, the agricultural sector along with other partner institutions have carried out various studies on the competitiveness of the traditional export commodities. Most if not all the studies have reported the non- competitiveness of the traditional trade if preferential trading arrangements were to be abolished.

In an effort to re-focus the trade strategies of the sector, the government through the Ministry of Agriculture has accelerated the development of the non-traditional export sector. The commodities that are defined by this group are not indigenous to the country as such this sector must be properly organized before it can become competitive both in the external and internal markets.

One such commodity that has being encouraged under this initiative is the hot pepper (*Capsicum spp.*). Jamaica trades in two main varieties of hot pepper:
1. West Indian Red
2. Scotch Bonnet

Hot pepper is been identified as a priority commodity for the Caribbean. [1]In 1998, an assessment of the export competitiveness of non-traditional crops and livestock activities in the Caribbean showed that hot pepper had significant potential for successful and competitive production in the region. Hot pepper is also among the seven commodities identified under the Regional Transformation Programme coordinated by CARICOM Secretariat

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[1] FAO/IICA Trade liberalization of the Agricultural Sector of CARICOM, 1998.

Purpose of this Study

Given the volatile or erratic nature of the international market, it is imperative that the competitiveness of agricultural commodities be determined on a continual basis to ensure sustainability of competitive potential.

Competitiveness is the ability of enterprise, industries, regions or geographic areas to generate in the context of international competition, relatively high levels of incomes and employment of factors of production on a sustainable basis. In other words competitiveness is a dynamic process that plays itself out over time. As a consequence, concepts and measures of competitiveness must extend through time.

By utilizing the Porter's Diamond framework, the competitiveness of hot pepper production and marketing will be investigated in comparison to that of its major competitors. According to Porter (1990), there are four attributes of a nation that shape the environment in which domestic firm or industry can compete thus promoting the creation of competitive advantage. They are as follows:

1. Competitiveness of related and supporting industries
2. Factor conditions
3. Demand conditions
4. Local firms strategy, structure and rivalry

In addition Porter argues that the drivers of these determinants are:

1. Government
2. Randomness

In addition, a policy analysis matrix approach will be used to determine the competitive advantage and social profitability of pepper production in Jamaica.

Application of the Diamond Framework

Factor Conditions

Porter states that traditional factor endowment argument of standard trade theory is too simplistic a base for national competitive advantage arguments. He argues that sustainable competitive advantage exists when a nation state possesses the factors necessary to compete in a particular industry, which are both advanced and specialized. Advanced factors are those factors whose development demands large and substantial investment in human and physical capital. The distinction of generalized versus specialized is however based on their ability to perform tasks. Specialized factors are developed with considerable investments from generalized factors.

Based on information from the USDA website the major external suppliers of hot pepper to the USA are Mexico, Trinidad and Tobago, Canada and Jamaica. Mexico and Canada enjoy both geopolitical and geographical comparative advantages while Mexico further enjoys ecological comparative advantages in the production of hot pepper in comparison to Jamaica.

Ecological Advantage

While Mexico may be noted for its hot chile pepper, both hot and sweet peppers were originated and domesticated in Mexico giving that country an ecological advantage in pepper production. The West Indian red was developed by CARDI for the region and Jamaica is home to the scotch bonnet type giving Jamaica an ecological advantage in the production of both cultivars.

[2]Researchers at the George Washington Carver Agricultural Experiment Station at Tuskegee University in Alabama experimented with five different mulching media to determine the most suitable one for growing scotch bonnet pepper (Jamaican variety).

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[2] National Pepper Conference 2002

The media were: black plastic, hay, black paper, bare soil-hoe check and bare soil. The best medium in terms of productivity turned out to be hay, with a yield of 4491 kilograms per hectare. This suggests that the USA has not been able to profitably domesticate the Jamaican scotch bonnet variety as they do most of the Mexican varieties and as a result are not able to make inroads into Jamaica's ecological advantage in growing scotch bonnet pepper.

Geographical Advantage

The major advantage here lies in the transportation of the commodity from Mexico to USA because of the close proximity of the two trading partners. Transportation of fresh produce to the external market represents a substantial percentage of the total cost. The close proximity of Mexico to its US market reduces this cost drastically as a result the commodity reaches the final consumer at a much cheaper price.

Geo-political Advantage

Trading regime plays a critical role in agricultural development. Mexico is a signatory to the Free Trade Area of the Americas (FTAA) formerly NAFTA (North American Free Trade Area) agreement and this has resulted in increase trade among the major partners in USA and Canada. In fact Mexico agricultural trade with USA since NAFTA has grown over 75%.

A trade agreement such as NAFTA holds the following advantage for its partners:
1. Facilitates international trade growth and by extension economic growth
2. Improves socio-economic conditions
3. Increases resource endowment through complementary partnerships

The pattern of agricultural trade among NAFTA/FTAA members reflects production advantages in the three NAFTA/FTAA partners arising from differences in cost of resources, demand factors and policies that impact farm production and trade.

A Comparison of Jamaica's Profitability to its Competitors

Particulars	Jamaica	T&T	Mexico
Total Acreage	1 ha	1 ha	1 ha
Quantity	14673 kg	9000 kg	[3]12500 kg
Variety	Scotch bonnet	W.I. Yellow	Chile
Total Cost	$324,553.34	$138,600.00	
Gross Revenue	$660,285.00	369,000.00	
Gross profit	$335,731.66	230,400.00	
Gross margin Ratio	0.51	0.62	
Average cost/kg	22.12	15.40	

All figures in Jamaican dollar, T&T $ 1.00 = J $7.50, US $1.00 = J $ 50.00

According to CARDI, the highest yield per acre in CARICOM has been recorded in Trinidad and Tobago. The actual reason for this is unknown. The average national yield for this country is nine (9) tonnes to the hectare. Average national cost of production per kilogram is approximately US $0.14 per pound. The conclusion may be drawn here that Trinidad's average national yield is comparable to Jamaica's average national yield, however, Trinidad may be considered a lower cost producer than Jamaica as that country is producing hot pepper at approximately 30% lower than Jamaica. A possible explanation for this difference is that the West Indian yellow is a hardier pepper than the scotch bonnet and as such disease control is much less. In addition, in 2001 a hot pepper seedling cost a T&T farmer only T&T $0.13 cents which is less than Jam. $ 1.00 while it is costing local farmers over seven times that.

National production of hot pepper in Trinidad has increased from 360 tonnes in 1990 to 754 tonnes in 1999; this represents an increase of 210%. Over this period Jamaica's production while much more (over three times that of Trinidad in 1999 alone) has declined steadily. Based on the available statistics Trinidad is earning 17.7 % more than Jamaica to each dollar invested in hot pepper production.

The Mexican hot pepper varieties attract a far lower price than the Jamaican and Trinidadian hot pepper. However, the competition is very intense between the Jamaican scotch bonnet and the Trinidadian yellow pepper. Trinidad and Tobago supplies a yellow pepper to the market; this is known in the West Indies as the West Indian

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[3] FAO Statistics

yellow. However this pepper is positioned in the overseas market as having similar attributes as the Jamaican Scotch bonnet pepper and as such enjoys similar preferences and price.

| Exporting Country	Average Price in the USA Market
Jamaica	$4.50/kg
Mexico	$0. 45/kg
Trinidad & Tobago	$4.00/kg

Source: http://www.ams.usda.gov/mnreports/wa_fv400.txt

Demand Conditions

The competition for hot pepper in the external market is an unsympathetic one, with many countries supplying various varieties of the commodity to the major importing markets. A low cost producer in Mexico is the major supplier of hot peppers to the United States, which incidentally is the largest importer of Jamaican hot peppers. The other major suppliers of hot pepper to the USA are Trinidad and Tobago, and Canada.

During the period 1998-2002 export earnings and volumes fluctuate however a general declining trend was observed. [4]Mexico exports over 300 times more pepper to the United States than Jamaica does. It is obvious that the Mexican spicy cuisine famous all over the United States, high amount of processing or value added for its chile pepper and the cheap labour rate in Mexico are major factors shifting the competitive edge in Mexico's favour. In addition to the demand for value added products Mexico supplies approximately 80% of the USA fresh product market with the Caribbean and Canada, Costa Rica, Cuba etc. supplying the rest.

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[4]Source: http://www.ams.usda.gov/mnreports/wa_fv400.txt

DECLINING EXPORT REVENUE
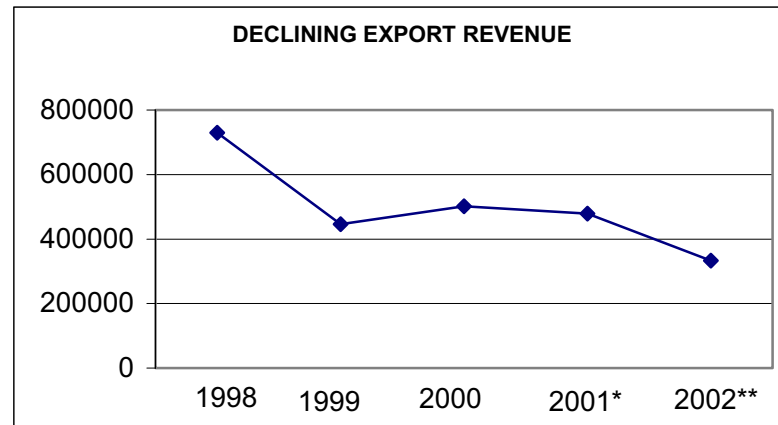
According to Porter, local demand is the root of a nation's competitive advantage. He states that this may be achieved through a number of channels e.g.:

➤ Pressure placed on producers by buyers to innovate and improve quality

➤ Sophisticated domestic buyer needs (e.g. buyers of processed pepper) which provide a window into more advanced buyer needs

➤ Through economies of scale

➤ By creating linkages with related industries such as fast food chains e.g. Island Grill, Boston Jerk etc.

The scotch bonnet pepper is popular among the local processors. Jamaica has the advantage of being able to grow pepper all year round of acceptable quality however not the required quantity. There are two major processors that have managed to innovate and develop award winning products to satisfy *the crave* for the great Jamaican jerk using local hot pepper as the main ingredient. There are other processors of various types of sauces involving hot pepper.

A recent demand survey among agro-processors carried out by the Mrs. Wright (ADO, ASSP), found that a total of 160,556 kg and 291,713 kg of scotch bonnet and West Indian

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[5] * Year 2001 data represents export for the period January to July & December.
** Year 2002 data represents export for the period January to September.

red respectively is needed annually. These figures represent the demand of 17 out of a total 26 respondents who expressed a willingness to set up contract farming in order to alleviate the inconsistency in supply.

There is a clear demand for the West Indian red variety for the export market; the large Trinidadian grown red type pepper is preferred in the USA market. According to CARDI, this variety is a higher yielding variety and is more tolerant to the major pest and diseases of hot pepper. There is also a clear market opportunity for local red peppers for the local processing industry.

Jamaica enjoys a niche in the external market and an excellent local demand for the primary product and also the value added commodities. However, as Porter argues competitive advantages are not innate, they must be built and sustained The proper policy must be put in place to alleviate the problem of inadequate and inconsistent supply and improve our competitive position. This issue is critical to the development of the non-traditional export sector. If this is not addressed with utmost urgency, the declining trend in export volume may send a negative signal to our buyers that we are not capable of supplying our market and as such stand the chance of losing our position in the market.

Constraints to the Hot Pepper Export Industry

[6]Constraints of the export trade as identified by CARDI are

> ➢ Lack of market presence
> ➢ Non and slow payments
> ➢ Ad hoc and weak distribution system and logistics
> ➢ No firm system of sales and merchandising

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[6] McDonald et al (2001), Marketing issues affecting the hot pepper industry in Jamaica and the Caribbean, CARDI, UWI (Mona), Kingston, Jamaica.

In addition to the constraints identified above Jamaica is unable to supply consistently true bonnet type peppers to the market. [7]Mr. McGlashan of the Ministry of Agriculture, Plant Breeding Division, Bodles, explained that the Tobacco Etch Virus (TEV) and the Potato Virus Y (PVY) are responsible. He states that early harvest reduces the problem but as the season is prolonged the size, shape and quality of the pepper is reduced when the virus is more prevalent. According to the source cited above, the major constraint to increasing productivity is that most farmers grow their pepper in rain fed zones where they depend solely on the rain. This water supply is inadequate for the crop to yield ideal productivity. In Mexico for example, they utilize the drip irrigation system and found that this not only reduces the presence of virues but improve productivity.

Related and Supporting Industries

Harmonious relationships between a primary industry and related industries can and will improve the competitive position of the primary industry. Jamaica Promotions, Bureau of Standards, Jamaica Exporters Association are only few of the support organisations in place to enhance the promotion of the Jamaican commodities, identifying market opportunities and supporting the marketing process of the export sector.

According to [8]Ali (1998), micro marketing involves management of physical, logistical, financial and informational resources. The coordination of production and distribution, including activities such as processing, storage and transportation, product development and market research, is important for a dynamically competitive market. The Ministry of Agriculture through its Marketing and Credit department regulates, standardizes and provides the market intelligence to producers and exporters, however, the breakdown in Jamaica's marketing system occurs at the very root of the marketing process. The problem of very poor linkages between production and distribution and the rest of the marketing logistics accounts for the inability in sustaining competitiveness.

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[7] Mc.Glashan, D. (1993). Identification of viruses affecting Scotch Bonnet Pepper *Capsicum Chinese* (Jacq) and implications for control. M.Sc. Thesis University of Florida, Gainesville, USA.
[8] Competitive advantage of the Caribbean Economies on Selected Export Commodities, Proceedings of UWI Ag. 50, 19-21 August 1998.

Firm Structure, Strategy and Rivalry
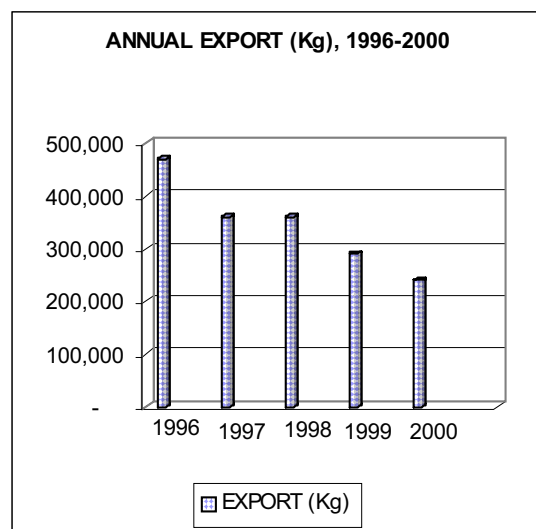
According to Porter (1990), vigorous domestic rivalry is strongly associated with competitive advantage in an industry and that success does not grow from one or two firms (farmers) experiencing economies of scale due to their dominance of the market (this practice is only profitable in a closed economy). In addition he states that domestic rivalry creates pressure to innovate and upgrade (improves or adapts new farm practices that will ultimately impact on quality and quantity).

Graph 1 — A Comparison of Annual Demand and Annual Production 1996-2000

Graph 2 — ANNUAL EXPORT (Kg), 1996-2000
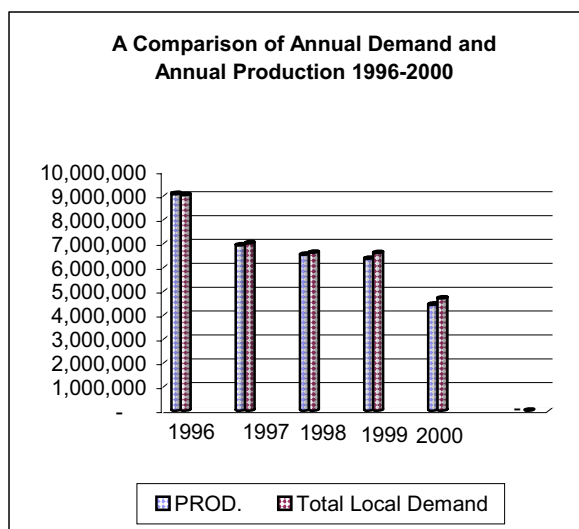
The local demand for hot pepper was taken as annual local production plus annual imports less annual exports. Additional graph attached, as appendix 1 will show that annual imports was more or less constant over the period, however from the graphs above, local production and export declined. This underscores the fact that there is no domestic rivalry among local hot pepper producers. An additional conclusion arrived at from the graphs is that local production drives the demand for Jamaican varieties of hot pepper both in the domestic and external markets. In 1996 when production was twice what it was in 2000 both export and local demand were highest.

A possible explanation for the trends observed above is that the local producers are not the ones who suffer repercussions for their actions it is obviously processors, consumers and exporters. As a result local producers are not forced to do anything about the current trends in production. For example when the local production is low, then there is a hike in the price of the commodity.

The situation also dictates the need for the streamlining or more so the instituting of a local hot pepper industry. Such an industry should involve coordinating, collaborating and providing the linkages and cohesion among stakeholders, (producers, researchers, facilitators of the transfer of technologies, agro-processors and marketers etc.).

Market Penetration

The findings also show that Jamaica is a net importer of hot pepper. Importation was highest in the years of low production. Imports remained reasonably stable over the period under review, however exports declined. (see appendix 1).

Government

The government through the Ministry of Agriculture and other regulatory arms of the government influence agricultural trade, investments and research and development. For example the fiscal policies of a government make or break development at the sector level. Macroeconomic policies must be facilitative to sector development in order to spur investments and growth of the sector.

The macroeconomic policies pursued in the late 1990s have been satisfactorily facilitative to agricultural development. The Agricultural Support Services Project (ASSP) is one such initiative. The ASSP is a partnership between the International Development Bank (IDB) and the government of Jamaica. The purpose of the program is to enhance the competitiveness of Jamaican agriculture in domestic and global markets. The program should achieve its objectives through:

➢ Strengthening the delivery of agricultural support services

➢ Strengthening and consolidating agricultural food safety services

➢ Financing selected activities in high payoff productive projects

In addition to the ASSP project, the Ministry of Agriculture has taken steps to regulate the quality seeds or seedlings that farmers use in production. The Ministry along with other partner institutions have been conducting research to include plant breeding, agronomic practices and improved technology in an effort to improve productivity and product quality.

Also the Ministry of Finance through the central bank has been encouraging lowered interest rate in a view to spur investments. Even though the rates are not been lowered fast enough the initiative indicates that the government is serious about facilitating investments and development.

Chances or the Incidence of Unforeseen Events

Jamaica in the last three years has been experiencing drastic changes in its weather and climatic conditions. These events have impacted negatively on agricultural production and exports and if not remedied can erode the competitive position of Jamaica's agriculture. For example the recent flood rains of September / October caused infrastructural damages to the agricultural sector, valuing approximately 12.6 million dollars. Loss in condiments (escallion, thyme, hot pepper, etc) amounted to a total of 184 hectares. These statistics underscore the magnitude of loss in production and infrastructural damages to the agricultural sector. This event impacted negatively on the supply of hot peppers available for exporters and processors.

Competitive Position of Jamaican Hot Pepper

Factors	Mexico	Jamaica	Trinidad & Tobago
Market Environment ➢ Size ➢ Price ➢ Competitive Strength ➢ Vertical Linkages	Very Strong Weak Very Strong Very Strong	Strong Strong Strong Very Strong	Strong Strong Strong Strong
Macro Economic Environment ➢ Sector Policy ➢ Investments ➢ Accessibility to loans	- Very Strong -	Strong Average Average	Average Average -
Related and Supporting Industries ➢ Quality Control ➢ R & D ➢ Linkages between Production and Marketing	Strong Very Strong Very Strong	Strong Average Weak	Strong Average -
Infrastructural Support ➢ Communication ➢ Transportation ➢ Extension	Strong Strong -	Strong Strong Average	Strong Strong Weak

CODE: Very Strong, Strong, Average, and Weak

Determining Social Profitability and Comparative Advantage using the Policy Analysis Matrix Approach

The PAM is a computational framework developed by Monke and Pearson (1989) for measuring input use efficiency in production, competitive or comparative advantage and the degree of government interventions. The basis of the PAM is a set of profit and loss identities (Nelson and Panggabean, 1991).

POLICY ANALYSIS MATRIX FORMAT

	Value of output	Value of input Tradable	Domestic Factors	Profit
Private Prices	A	B	C	D
Social Prices	E	F	G	H
Policy Transfer	I	J	K	L

Source: Monke and Pearson 1989.
Private profit A = (B+C), Social profit H = E- (F+G), Output transfer I = (A-E), Input transfer J = (B-F), Factor transfer K = (C-G), Net policy transfer L= (D-O)

The data in the first row provide a measure of private profitability defined as the difference between observed revenue and costs. Private profitability demonstrates the competitiveness of the agricultural system, given current technologies, prices for inputs in addition to output and policy transfers.

The second row of the matrix provides a measure of social profitability that reflects social opportunity costs. Social profits measure efficiency and competitive advantage. In addition a comparison of private and social profits provides a measure of efficiency. A positive social profit indicates that the country use scarce resources efficiently and has a static competitive advantage in the production of that commodity. A negative social profit indicates that the sector is wasting resources in the production of the commodity and such resources could be utilized more efficiently in other sectors. In other words the

cost of domestic production exceeds the costs of imports, suggesting that the sector cannot survive without government support.

The third row of the matrix estimates the difference between private and social values of revenue, costs and profits and reflects policy interventions.

In addition to computing profitability, the PAM may be used to compute protection coefficients such as DRC, EPC, ERP, NPC and NRP of which DRC is the most important. For this study DRC will be computed to determine the comparative advantage of the pepper industry.

DRC is the most popular measure of competitiveness because it gives a single number that reflects competitive advantage. DRC is a summary measure of the efficiency of domestic production and can be interpreted as the costs required for earning a unit of foreign exchange. DRC may also be used in comparing relative efficiency or competitive advantage among agricultural commodities and is defined as the shadow value of non-tradable factor input used in an activity per unit of tradable value added. In other words DRC indicates whether the use of domestic factors is socially profitable.

Commodities can be ranked according to DRC value, and this ranking can then be taken as an indication of competitive advantage or disadvantage.

DRC = Value of domestic factors at economic prices per unit of output / Value added at economic prices per unit of output

OR   G/ E-F

Methodology

1. An inventory budget will be built using information from the production cost database of the Ministry of Agriculture, which provides data on the physical input and output involved in hot pepper production.

2. From the inventory budget an input-disaggregating table will be created. This table classifies all the inputs into tradable, non- tradable (domestic resources) and transfers.

3. A system budget table will be created next which, by definition, is a combination of the above two tables.

4. From the system budget table a PAM will then be computed using the format above.

The major limitation is that it is a static measure while competitiveness suggest dynamism, as a result sensitivity analysis will be done to account for potential increases or decreases in yield and cost of production.

INVENTORY BUDGET TABLE/ SCOTCH BONNET

PARTICULARS	UNITS	# UNITS USED	PRIVATE PRICES	SOCIAL PRICES
Average yield	Kg	14,673	-	-
Total Revenue	-	-	660,285.00	836,361.00
TRADABLES				
Fertilizer 1	50 kg	5	3550.00	3550.00
Fertilizer 2	55 kg	2	4669.29	4669.29
Fertilizer 3	50 kg	7	4303.81	4303.81
Fertilizer 4	50 kg	7	4143.30	4143.30
Fertilizer 5	5o kg	3	1812.10	1812.10
Fertilizer 6	5 kg	5	3946.25	3946.25
Pesticide	-	-	7,772.00	7,772.00
Herbicide	-	-	8000.00	8000.00
Electrical water pump	-	-	0.00	0.00
Pipes (hoes) & fittings			5,000.00	5,000.00
Metal Drums	Each	2	1000.00	1000.00
Transportation	-	-	10,000.00	10,000.00
Fuel	-	-	10,000.00	10,000.00
Tools	-	-	8,000.00	8,000.00
DOMESTIC RESOURCES				
Planting Material	-	28g	2000.00	2000.00
Labour				
➢ Unskilled	-	-	217,490.00	126,144.20
➢ Skilled		-	15000.00	15,000.00
Land Charges	1 ha.	-	2500.00	209,017.00
Contingencies		-	15,334.34	10,868.56

ASSUMPTIONS IN THE COMPUTATION OF THE PAM

➢ Multiplying the average yield by the [9]f.o.b. price per kg yields the social revenue.

➢ The [10]c.i.f. price was used to determine the border price of most traded items and where the c.i.f. price could not be ascertained 60% of the private prices was taken as tradable and the other 40% as domestic resources.

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[9] Statistical Institute of Jamaica (STATIN), 2000
[10] Statistical Institute of Jamaica (STATIN), 2000

- All prices were taken as given as the Jamaican dollar is allowed to float on the market thus reflecting its real value. There was no need to account for real value of the Jamaican dollar.

- In a previous study by Antoine and Taylor, *competitiveness of the OECS agriculture* found that the true unskilled labour rate for Caribbean is 0.58 of the market rate paid. In addition because the market for skilled labour is a fairly competitive one the market rate reflects opportunity cost.

- The market value for land as represented in the private prices column is the previous annual tax that was paid on the property and as such does not reflect the real economic cost for land. With this in mind adjustments were made to ensure that the value derived for the social prices reflects [11]opportunity cost. [12]The procedure used was as follows: - The gross value of the land's output at border prices had the land been used for pumpkin production (the next best alternative use of the land) and from this all the cost of production (valued at border prices) was deducted. The residual value was then taken as the contribution from land and reflects the opportunity cost of the land. All figures for this calculation are 2000 data as presented by RADA and processed by the Ministry's Databank. The cost of production model for the pumpkin represents the St Thomas existing farmers under rain fed conditions.

- The social price for contingencies was taken as 5% of labour and material valued in social prices.

- Of a figure for $35,000.00 for land preparation $5000.00, $10,000.00 and $20,000.00 were taken as fuel cost, tractor maintenance/transportation and labour respectively.

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[11] The opportunity cost of land is the net value of production foregone when the land is not used for its next best alternative purpose.
[12] Gittinger, Price J. Economic Analysis of Agricultural Projects, EDI Series in Economic Development.

INPUT DISAGGREGATING TABLE/SCOTCH BONNET

PARTICULARS	PRIVATE PRICES	SOCIAL PRICES
TRADABLES		
Fertilizer Total Cost	**22455.00**	**22455.00**
Of which:		
Tradable	13181.70	13181.70
Domestic Resources	9273.3	9273.3
Transfers	0.00	0.00
Pesticide Total Cost	**7,772.00**	**7,772.00**
Of which:		
Tradable	1746.25	1746.25
Domestic Resources	6025.75	6025.75
Transfers	0.00	0.00
Herbicide Total Cost	**8000.00**	**8000.00**
Of which:		
Tradable	2782.10	2782.10
Domestic Resources	5217.9	5217.9
Transfers	0.00	0.00
Pipes & Fittings Total Cost	**5000.00**	**5000.00**
Of which		
Tradable	2400.00	2400.00
Domestic Resources	1600.00	1600.00
Transfers	1000.00	1000.00
Metal Drums Total Cost	**1000.00**	**1000.00**
Of which:		
Tradable	0.00	0.00
Domestic Resources	1000.00	1000.00
Transfers	0.00	0.00
Transportation Total Cost	**10000.00**	**10000.00**
Of which:		
Tradable	4800.00	4800.00
Domestic Resources	3200.00	3200.00
Transfers	2000.00	2000.00
Fuel Total Cost	**10000.00**	**10000.00**
Of which:		
Tradable	6000.00	6000.00
Domestic Resources	4000.00	4000.00
Transfers	0.00	0.00
Tools Total Cost	**8000.00**	**8000.00**
Of which:		
Tradable	4800.00	4800.00
Domestic Resources	2200.00	2200.00
Transfers	0.00	0.00

DOMESTIC RESOURCES		
Planting Material	2000.00	2000.00
Labour		
➢ Unskilled	217,490.00	126,144.2
➢ Skilled	15,000.00	15,000.00
Land Charges	2500.00	209,017.00
Contingencies	15,334.34	10,868.56

SYSTEM BUDGET TABLE/SCOTCH BONNET

PARTICULARS	PRIVATE PRICES	SOCIAL PRICES
TOTAL REVENUE	660,285.00	836,361.00
TOTAL TRADABLE COST	38710.05	35,710.05
Fertiliser	13,181.70	13,181.70
Pesticide	1746.25	1746.25
Herbicide	2782.10	2782.10
Pipes & Fittings	3400.00	2400.00
Metal Drums	0.00	0.00
Transportation	6800.00	4800.00
Fuel	6000.00	6000.00
Tools & Equipment	4800.00	4800.00
TOTAL DOMESTIC RESOURCES COST	285,843.29	396,600.71
In Fertiliser	9273.30	9273.30
In Pesticide	6025.75	6025.75
In Herbicide	5217.90	5217.90
In Pipes and Fittings	1600.00	1600.00
In Metal drums	1000.00	1000.00
In Transportation	3200.00	3200.00
In Fuel	4000.00	4000.00
In Tools & Equipment	3200.00	3200.00
Planting Material	2000.00	2000.00
Labour		
➢ Unskilled	217,490.00	126,144.20
➢ Skilled	15000.00	15000.00
Land Charges	2500.00	209,017.00
Contingencies	15334.34	10,868.56

Policy Analysis Matrix for Scotch Bonnet Pepper

| | | Value of input | | |
	Value of output	Tradable	Domestic Factors	Profit
Private Prices	660,285.00	38,710.05	285,843.29	**335,731.61**
Social Prices	836,361.00	35,710.05	396,600.71	**404,050.24**
Policy Transfer	(176,076.00)	3000.00	(110,757.42)	(68,318.63)

$$DRC = \frac{G}{E\text{-}F}$$

$$= \frac{\$396,600.71}{\$836361.00 \text{ - } \$35710.050.}$$

$$= 0.495$$

Private Profitability, Social Profitability and Comparative Advantage

A positive private profit indicates that the producers are earning an above normal rate of return. A positive social profit indicates that the resources used in the production of hot pepper are been efficiently used and to improve hot pepper production at this time will be beneficial to the country. In other words the cost of domestic production is less than the cost of importing the commodity and the country would be better off producing rather than importing the commodity. A DRC of less than 1 indicates that the use of domestic resources in the production of hot pepper is socially profitable at this time given current prices for physical input and output, technologies and policy transfer.

Effect of Divergences or Policy Transfers

This concerns the differences between private and social valuations of revenues, costs and profits. Any divergence between the observed price and the estimated efficiency price must be explained by the effects of policy or by the existence of market failures. Social prices correct for existence of distorting policies that lead to an efficient use of resources. It must be noted that not all policies distort the allocation of resources, some policies however, endorse to improve efficiency by correcting for failure of product or factor markets to operate properly.

A negative transfer in the total revenue column indicates that the producers are receiving less than the border parity price for the commodity. In the case of the two cost columns, a negative transfer in the domestic factors represents a positive transfer to the producers of the commodity as this contributes to an increase in profit while a positive transfer in the tradable column indicates that producers are paying more than they would if distortions were not present.

Conclusion

Before concluding, a distinction between market opportunity and competitiveness must be clearly established. Market opportunity can be defined as an evident demand for a commodity. It should never be confused that once there is a market opportunity for the commodity, the commodity is competitive. A commodity is competitive base on some merit of the commodity itself, for e.g.

- ➤ The local commodity was produced at a lower price than what the competitor is producing the same commodity at.
- ➤ The local commodity is been supplied to consumers at a cheaper price than what the competitor is supplying the same commodity at.
- ➤ The quality of the local commodity is better than the quality of a same commodity supplied by the competitor.
- ➤ The local producer is using less of its resources to produce at the same level or better than the competitor

Competitiveness measures the performance of a commodity in a competitive market. It reflecst the use of strategies (cost effectiveness, efficiency, productivity or quality) that allow a local industry to sell its commodity without any form of interferences such as subsidies, duties or over valued exchange rate in both international and domestic markets alongside commodities of the same nature from competing suppliers.

There is a relatively good demand for hot pepper in the markets and it is being competitively produced in the country at this time. There is also the opportunity to develop a hot pepper industry that can competitively participate in the global market.

Recommendations

The following recommendations are critical to ensuring that Jamaican hot pepper varieties competitively penetrate and supply an increase market share of the US fresh produce market.

➢ Strengthening of linkages between the demand and supply side of the hot pepper industry. Production must meet demand on a continuous basis minimising the impact of seasonality.

➢ Strengthen the support service arm of the Ministry of Agriculture (RADA) to play a pivotal role to ensure that technologies to improve productivity and quality are adopted by farmers, and to ensure that the farmers cooperate fully in the drive to develop and strengthen the local hot pepper industry.

➢ Strengthen the coordination or logistics among the stakeholders of the industry in an effort to satisfy the consistency and reliability expectations of our buyers.

➢ Much focus have been given to the USA market, but according to literature reviewed for this paper, there is an increase in the demand for spicy food in Europe and as such the necessary step should be taken to determine if there is an opportunity to increase the market share for Jamaican hot pepper varieties and value added products.

Marketing Issues

Hot pepper is a substitutable commodity. The country needs to maintain its presence in the overseas market. Scovill rating (the heat rating of the pepper) of the scotch bonnet pepper is approximately 200,000, which makes it the premium pepper on the market. The variety is used as the bench mark for determining the heat of the hot pepper. Dynamic marketing practices are required; however the commodity must be available. There are different types of consumers and we must be able to identify our consumers and satisfy them.

  ➢ There are those consumers who just need the hot pepper flavour
  ➢ There are those consumers that need a specific variety of the commodity.

Our market is predominantly made up of consumers from the second group, had it not been so, we would not have been able to sell in the market at such a high price. We must keep this market segment satisfied by always being present. We are responsible for loss in market share by not having the commodity to supply to the market consistently.

In marketing our commodity to the other group we need to communicate the attributes of the commodity to the target group. The scovill rating and the fact that it is the major ingredient in our famous jerk etc.

Without the proper logistics, the problem of non-payment or late payment will continue. We need to communicate with our agents or distributors

  ➢ That we have a good commodity
  ➢ We can supply a certain quantity on a continual basis
  ➢ And keep our side of the agreement

Without this level of commitment, we will not get rid of the problem. Export commitment is a vital ingredient in achieving export success. We also need to pursue international market entry strategies suitable to us. Direct export strategies as are currently practiced has one major drawback in that sometimes we are at the "*mercy*" of

these agents. Our pre-export support system is needed to do background checks on these agents and use only those certified by exporters or importers association

Research Issues

We must recognise that researches is often done on control plots, sometimes small lots and then the data is projected or extrapolated to reflect 1 ha etc. This kind of practice limits the use of the results, as extrapolation is prone to errors. Researchers must take the research to the different agricultural regions and make observations under similar conditions to those of the farmers before asking the farmers to adopt the new principles.

Appendices