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IMPROVING THE PRODUCTIVITY OF BANANA FARMS AS A STRATEGY TO IMPROVE INTERNATIONAL COMPETITIVENESS -THE CASE OF IRRIGATION IN ST. VINCENT

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INTRODUCTION

The banana industry in St. Vincent is on the verge of making significant investments in irrigating banana farms. The planned investments in irrigation are intended to significantly improve the competitive position of the industry in an increasingly competitive and demanding international market. This paper considers why the use of irrigation in bananas is an important strategy for improving the international competitiveness of the industry in St Vincent.

History of Banana Irrigation in St. Vincent

It is a widespread perception in the St. Vincent Banana Growers' Association (SVBGA) that the industry will not survive without major improvements in production and productivity on banana farms. It is also felt that extensive use of irrigation in bananas is the most important initiative to achieve the required gains in production and productivity in St Vincent.

Little irrigation of bananas is done now, but during the sixties, seventies and mid-eighties, mainly estate owners irrigated banana farms on the drier coastal areas. The estates which irrigated bananas used infrastructure and waterways developed for processing sugar cane and arrowroot. These farms were mainly irrigated using overhead sprinklers and fuel driven pumps. Canals were often

used to channel water from rivers to the various farms. In some areas, remnants of the equipment and canals used can still be seen. These irrigation systems were allowed to deteriorate as the estate system of production became unprofitable and estate owners divested their lands.

Since the acquisition of the Orange Hill Estate by the Government in 1987, the only major investment in irrigating bananas was done by Mr. Victor Hadley in 1995. Unlike previous cases, Mr. Hadley used drip/trickle irrigation technology for his bananas. This investment was again facilitated by the presence on the site of a horticultural enterprise using a combination of drip and mini sprinklers. More recently, drip irrigation system have been installed on ten demonstration farms covering fifty acres, using funds provided under the STABEX-funded Banana Industry Development Programme (BIDP).

THE COMPETITIVE POSITION OF ST VINCENT AS A BANANA PRODUCER

Threats and Opportunities

The competitive position of St Vincent and other Windward Islands as banana producers is under threat for reasons discussed below.

Structure of production

Production occurs primarily on small farms of less than 5 acres. An estimated 80 percent of farms are less than 5 acres. The 20 percent of the farms above 5 acres account for an estimated 40 percent of exports. This 20 percent, however, accounts for about 80 percent of exports from St. Vincent.

Cost of production

St Vincent is considered to be a high cost producer compared to its Latin American

competitors (Table 1). The average Windward Island's cost of production is estimated to be US \$9.50 per 401b box compared to US \$5.50 for Latin American fruit (Cornibert 1997). It is also estimated that to achieve the required cost competitiveness the industry must aim for a reduction in average cost of 43 percent. Since low land productivity and low yields are two of the major reasons for the relatively high cost of production, long term improvements in cost of production can only be attained through major changes in production technologies.

Table 1: Costs of production for Selected Banana Producing Countries

Producing Country	FOB US\$ Tonne (1992-3)
Dominica	515
Grenada	503
Cote D'Ivoire	469
St Lucia	463
St Vincent	461
Cameroon	440
Jamaica	391
Colombia	200
Costa Rica	179
Ecuador	162

Source (FAO 1994)

The widespread use of irrigation on land subject to water stress is the only way that significant changes in the cost competitiveness of the St. Vincent industry can be achieved.

Rising input cost

The cost of major material inputs continues to rise. As shown in Table 2, between 1993 and 1996, increases in six key inputs have ranged from 1.5 to 13.0 percent.

Table 2 Changes in Input Costs 1993 and 1996 for Banana, St. Vincent

Input	Unit	1993 Units		1996 UNITS		% Increase In Cost Price
		Cost Price ECS	Sale Price ECS	Cost Price ECS	Sale Price ECS	
Fertiliser	Bags	39.98	40.00	44.24	48.00	10.7
Gramoxone	Gal	48.81	64.00	50.62	62.00	3.7
Primicid	Gal	117.25	140.00	132.50	140.00	13.0
Blue Diothene	Roll	71.60	95.00	77.35	83.00	8.0
Furadan	25 kg	167.77	175.00	170.33	183.00	1.5
Vydate	Gal	77.43	85.00	85.42	91.00	10.3

Declining farmer returns

Since 1992, there have been significant declines in returns to farmers. Table 3 shows

how farm gate prices have declined since 1992. With such low returns, farmers' investments in sustaining production and quality targets have suffered.

Table 3 Average Farmgate and Export Prices 1992 to 1997

Year	Farmgate Price Cents/lb	Export Price Cents/lb	Grower to Export Price Ratio
1997*	29.95	48.3	61
1996	33.9	53.8	63
1995	35.4	53.6	66
1994	31.6	59.9	53
1993	33.5	49.4	68
1992	43.8	59.2	74

* Up to May 1997

Continued Decline in SVBGA export volumes and earnings

Export volumes and earnings have declined by 41 and 47 percent respectively since 1992. The combination of low prices, low farmer confidence and natural disasters (drought and storms) have contributed to significant reduction in export volumes and earnings. Export earnings have also been hurt by price competition between the UK Multiples. Poor and inconsistent quality of

fruit has also contributed to a lowering of export earnings.

Quality of product and reputation in trade

Banana quality in the EU is judged by up to 60 different parameters. To be competitive, the industry must ensure that fruit exported from each of the thousands of farms meet these exacting quality criteria. The UK

multiples who control a dominant and are relentless and ruthless in demanding the perfect banana. The high variation in farm sizes, conditions and farming practices in St Vincent make it difficult to achieve the required cluster after cluster quality consistency demanded and largely supplied by competitors such as Chiquita. Because of a reputation for inconsistent fruit quality, Windward Island fruit has developed a poor reputation that encourages the multiples to seek other sources, further eroding the competitive position of fruits from St Vincent and other Windward Islands in the market place.

Market share

On a per capita consumption basis, banana is one of the most popular fruits traded on the world market. St Vincent and the Grenadines, however, have a very small share of the international market for bananas. St Vincent contributes, on average, 23 percent of Windward exports, but Windward Islands export only a small percentage of world exports. Windward Island fruit can be sold throughout the European Union, but for various reasons, most of the fruit exported from St Vincent and the Windward Islands is sold in the UK. The UK market represents about 4 percent of world market compared to Germany (13 percent), France (5 percent), Italy (7 percent) (IICA 1995). It is likely that the UK will remain in the short run, the major market for fruit from the Windward Islands.

St Vincent's fruit is marketed by WIBDECO through GEEST. Within the UK, the banana market is increasingly dominated by powerful multiples. These multiples are in intense competition with each other and they demand increasingly high standards and product requirements from banana suppliers.

increasing share of the market. As a result of these pressures and fierce competition from large suppliers such as Chiquita, St Vincent remains a weak player in the market. The last three years have seen continuous reductions in the Windward's market share as companies like Chiquita increase their share of the UK market.

Weakening of SVBGA's strategic partners

St Vincent and its strategic partners (St Lucia, Dominica, Grenada and WIBDECO) have not been able to produce sufficient volume of bananas in line with the new, highly demanding dictates of the marketplace. Our share of the major multiples that control the lion's share of the premium quality banana sector in the U.K. has continued to decline dramatically (Table 4). There has not only been a weakening of the Industry at the farm level but also a weakening of our strategic partners. The overall weakening of the competitive position of our strategic partners seriously undermines our abilities to remain serious players in the EU market.

Table 4: Sale of Windward Island Bananas to leading UK Multiples 1991 - 96

Year	Sales (Boxes/week)	Percentage Decline over 1991
1991	69000	--
1993	57000	17.4
1996	23000	66.7

Declining world banana prices

Since 1950, there has been a consistent decline in world banana prices. As shown in terms by 59 percent between 1950 and 1995.

Table 5 Real Decline in World Banana Prices 1950-95

Year	Price (US\$/tonne)
1950	1000
1953	825
1956	850
1959	750
1962	650
1965	750
1968	700
1971	600
1974	450
1977	560
1980	500
1983	550
1986	530
1989	500
1992	525
1995	410

Source (Hallam and Peston 1996)

Table 5, banana prices have declined in real. At the same time there, have been significant global increases in production, exports and consumption of bananas. This declining trend is expected to continue. To continue in this market of declining price levels, the industry in St Vincent must reduce its average cost of production in line with the international price levels.

Long term and cyclical price movements

The international demand and supply of bananas follow a cyclical pattern. Lengthening price troughs have become a feature of the industry (IICA 1995). There is now a high price window for bananas during February to April. This is the period when the industry in St Vincent must aim to make sufficient money to compensate for the increasingly long periods when the market price is below the breakeven level for the

islands. Unfortunately, because of the rain-fed nature of banana production, this is the period when our production is lowest because of drought. Our high production period coincides with the period of low market prices. This pattern of production and price has so weakened the financial standing of the Association that it has been unable to pay the farmer the kinds of prices that would encourage investments in production and technologies to guarantee consistently high quality fruit.

Threats of WTO and removal of preferences

The decision of the WTO panel and threatened removal of favorable trade arrangements for Windward Island fruit is probably the most important threat to the competitiveness of the industry in the Windward. The EU banana regime, with its system of quotas and licenses, was intended to provide ACP countries like St Vincent with breathing room to restructure their industries to compete in an era without preferences. The removal of the licensing system as a result of the WTO ruling will prevent the Islands from satisfactorily adjusting to the demands of a fully competitive non-preferential EU market.

Because of the various pressures elucidated above, there is little time in which to restructure the industry in St Vincent. The adoption of a strategy to rapidly improve the country's competitiveness is a top priority. Improved competitiveness must come from exporting more low cost bananas that meet all stringent quality requirements of the UK multiples. The planned investments in irrigation are a major element of the new strategic approach of the SVBGA to improve the international competitiveness of the industry.

WHY IRRIGATION

In addition to reasons cited above, there are other important reasons why irrigation of banana is an important strategic approach to improving the international competitiveness of the industry in St Vincent. St Vincent suffers from 6 months of drought every year from January through June. The lack of productivity, and reduced quality, due to the effects of this prolonged dry season has to be overcome if St. Vincent is to compete in the world banana market. The current yields without irrigation are estimated to average 6 to 8 tonnes per acre/year; whereas it has been proven that, with irrigation and correct farm management, yields of over 20 tonnes per acre are possible.

Fruit quality problems which occur as a result of drought stress also means a high rejection rate for fruit which does not meet the export quality standards demanded by the European banana market. So in order to survive in today's highly competitive market, St Vincent must irrigate the banana farms to achieve competitive yields, and maintain consistent quality standards throughout the year.

Losses from Drought

At present circumstances, without irrigation, field losses due to drought reduce production by as much as 50 percent during the dry season. In some of the more exposed coastal zones, farmers are forced to abandon their fields during the height of the dry season. It is estimated that up to 2000 acres of bananas are grown in drought prone areas. Drought affected plants have such weak pseudostems that they are highly susceptible to field losses due to "blow down", even from only moderate winds. Those plants which do survive are so weakened that the

bunches they bear are very small, and suffer from fruit quality problems.

The loss of income in these drought prone areas has been so severe in the last four years that many farmers have accumulated debts with the Association that they are unlikely to repay in the next five years. Because of the debt many farmers are unable to invest in water and activities to avoid the damaging effects of prolonged droughts.

The irony is that, apart from the lack of water, many of these farms are ideal for banana production. They are relatively flat, easily mechanised, with good road networks, higher insulation than in the valleys and excellent temperatures for growth and development of good bunches. When water is not limited, as in the rainy season, many of these farms, with good management, out-perform farms in the valleys and at higher elevations. If the water constraint can be removed, then St Vincent can provide consistently, the volume of fruits that would reduce dead freight losses, as well as meet its quota requirements. Because these farmers would also produce more fruit, they would be less tempted to pack sub-standard fruit in an effort to earn more income.

Benefits of Irrigation

It is anticipated that planned investments in irrigation would generate the following benefits for St Vincent.

1) Increased yields

With irrigation and correct farm practices, regular yields of over 20 ton per acre are being achieved, compared to only 6 - 8 ton on non-irrigated farms.

- 2) No loss of production during dry season

During the dry season in St Vincent, production is reduced by 30 percent and many of the coastal areas are farms abandoned altogether until the rains begin in July.

- 3) Production Gains From Increased Use Of High Yielding Tissue Culture Planting Materials

High yielding tissue culture varieties could be imported as a way of increasing the yield potential of banana farms. To benefit fully from these plants, they must have adequate water from the time of planting to avoid serious field losses, and achieve maximum potential.

- 4) Timing Of Production To Maximise Exports At The Time Of Year When Prices Are Traditionally Highest.

Irrigation makes possible year round production unaffected by drought, so it is then possible to adjust production to meet periods of high market prices.

- 5) Improved Quality Of Fruit Since Plants Are Not Subject To Drought Stress

Plants growing under stressed conditions are more susceptible to pest and disease attack and will produce small bunches of stressed fruit which have a high rejection rate during processing.

- 6) More Efficient Application And Use Of Fertiliser And Nematicide Through Irrigation Lines

More efficient use of chemicals, and fertiliser is an important consideration when farmers

are trying to keep down costs. Irrigation using drip systems could improve efficiency of application.

- 7) Fertilisers Applied Are Not Lost Due To Leaching.

Unlike granular fertiliser, liquid fertiliser applied through drip lines is more rapidly taken up by the root system, and loss due to leaching is reduced.

- 8) Drip Irrigation Helps With Weed Control

In the case of drip irrigation weed management is assisted as the drip lines only apply water immediately around the banana plants, so that there is no water applied to the weeds growing between the rows, and therefore less weed growth.

- 9) Increased Revenue to the Farmer from the Same Acreage.

Probably the most important reason for irrigation is that the farmer can more than double the revenue from the same area of land.

Improved Production, Productivity and Quality - The Case of Victor Hadley

During the last two years, one farmer has demonstrated that significant increases in production and productivity can be achieved in St Vincent using irrigation. The experiences of Mr. Victor Hadley are presented below as a case study.

Hadley took the initiative just over 2 years ago and using imported tissue cultured plants established 3.18 acres of bananas under drip irrigation. His drip irrigation system was established at a cost of EC\$ 5000 per acre.

He used a 10 Hp electric pump with a capacity to deliver 90 gallons of water per minute. Drip lines had emitters spaced at 80 cm. During peak periods, a total of 7000 gals per acre were applied to the farm using water pumped from a nearby river. The system was metered to deliver nine gallons of water per mat/day.

By any measure, the performance of this farm was excellent. The difference in plant growth, and the increased size of the pseudostem was quite startling when compared to non-irrigated farms. The average number of functional leaves on the plants was eighteen. The ratoon rate was 1.5 bunches per year. On average bunch size was also higher than on non-irrigated farms. Mr. Hadley was able to obtain an average of 65 lbs. per bunch. An average box per bunch ratio of 1:6 was attained, compared to an average of 0.75 on other farms. It was common to see bunches with 13, and 14 hands on this plantation. A yield of 281,261 lbs. was achieved to date. Of this amount, 256,338 lbs. were sold to the Association. His gross yield per acre was 20.93 metric tonnes while net sales were 19.08 metric tonnes per hectare. His Average rejection rate was 1.85 metric tonnes per acre (8.83 percent of gross production). The major quality defect was fresh bruises, largely resulting from damage at harvesting time because the size of bunches made handling difficult during harvest time.

Mr. Hadley also estimates that no replanting will be necessary for at least 5 years, and maybe more; whereas, farmers in the same eco-zone have had to replant either annually or within 3 years due to the fall off in yields from successive annual drought stress.

He further indicates that using drip irrigation required special staff had to be trained so

that the irrigation lines were not cut during pruning operations. The pruning itself required a different approach. Because of the position of the irrigation lines, the banana must be synchronized with the irrigation lines. Because of this, the selection of follower shoots for the next crop has to be made from only a "quarter moon of soil" on the same side of each plant, and on the side of the irrigation line. In this way, the field maintains a strict uniformity to allow the irrigation to remain effective throughout the life of the plantation.

According to Mr. Headley, his drip irrigation system paid for itself within two years. So it was demonstrated on this farm that, with irrigation and proper farm management, a banana farm could produce yields more than double that of the non-irrigated farms in the coastal areas of St Vincent.

PLANNED INVESTMENTS IN IRRIGATION

As demonstrated above, on one irrigated farm in St Vincent, average yields of 20 tonnes per acre can be achieved using drip irrigation and correct farm practices. The SVBGA has therefore embarked on a three-phase irrigation strategy. The first phase involves a pilot irrigation project on fifty acres using resources from Stabex 1993 fund allocations. The second phase involves the fast track irrigation of 800 acres of land at Rabacca Farms and Langley Park in order to boost production in 1998. The third phase is the irrigation of an additional 3200 acres by the year 2000. The second and third phases are also to be funded from the Stabex 1994 allocation.

Pilot Projects under Stabex 93 Concept

As conceived, the projects would include the following:

- (i) Installation of a number of representative farms, small, medium and large, in St Vincent, mainly for demonstration purposes.
- (ii) Financing of technical design studies, purchase materials and supplies and for the establishment of these demonstration units.
- (iii) Expansion of pilot project into a national irrigation programme, and
- (iv) Establishment and monitoring of demonstration plots by the Ministry of Agriculture and CARDI.

Current Status

Establishment of demonstration sites started in June 1997. Fourteen farms covering approximately fifty acres were provided with irrigation equipment under this project. Eleven of these sites are fully functional while final installation work is in progress on the other three sites. Although it was envisaged that sprinkler irrigation systems would also be tested, it was decided to only use drip irrigation systems. On most of these farms, tissue cultured plantlets of the Grande Naine variety were established. A total of EC\$ 930,825 was allocated for this project. It is still too early to gauge the impact of this demonstration project.

PLANNED PROJECTS UNDER STABEX 94 - ST VINCENT IRRIGATION PROJECT

St Vincent was allocated ECU 25,724,865 under Stabex '94, equivalent to more than EC \$80 million. The indicative allocations of

the Stabex are as follows: An allocation of 23.3 percent (EC \$18.6 million) for banana productivity improvement programmes, including irrigation and other production technologies, 23.33 percent (EC \$18.6 million) for agricultural diversification. The balance of the funds was allocated to programmes for Diversification of the Economy (31.1 percent), Social Safety Nets (3.9 percent), Consultancy Services (7.8 percent), Monitoring and Evaluation (3.9 percent) and 6.7 percent was to be held in Reserves. The irrigation of bananas was an idea whose time had come and there were widespread public appeals that significant proportions of the Stabex 94 allocation be used to establish a national irrigation programme in order to ensure the long-term viability of the industry and the agricultural sector in general. As a result it was decided that a substantial proportion of the funds allocated for banana productivity improvement and agricultural diversification be used for establishing a national irrigation programme with banana irrigation as the main focus.

According to the Framework of Mutual Obligations (FMO) which sets out the terms and conditions for use of Stabex resources, a Committee was established for administration of the Stabex 94 programme. A European Development Fund/Programme Management and Coordination Unit (EDF/PMCU) was established in

At a National Stabex Committee meeting in April 1997, it was proposed and accepted that ECU 11.7 million be allocated to a programme for irrigating 4000 acres of bananas as a strategy for achieving the desired production and productivity increases in the industry. A proposal was prepared and submitted to the EDF/PMCU Management Unit for presentation to the EU

Delegation in Barbados. This proposal was approved in principle by the EU delegation, subject to the completion of a feasibility study because of the size of the project.

The goal of the irrigation project is to help St Vincent and the Grenadines to improve banana productivity and quality through the use of irrigation and improved farming practices. The target is to move average yields in St Vincent from an estimated 7 tons per acre, to at least 16 tons per acre. It is also envisaged that when linked to a phased replanting of tissue cultured material further reduction in production costs can be achieved in the industry. The investment is considered essential to the future viability of the industry.

The overall target group was 1000 banana farmers who had access to adequate water sources, suitable land in terms of slope, soil type, together with the necessary production skills for the production of high quality bananas.

The basic plan was to install irrigation systems on suitable farms. It was estimated that capital investment of EC\$ 7,250/ acre would be required, as well as a further investment of EC\$ 3000/acre for tissue cultured plants. It was expected that fields would last about five years before replanting. This is much longer than what obtains now on most unirrigated farms.

It was initially intended that 1000 acres be developed per year over four years and that substantial acreages be irrigated by February 1998. Because of the time and process involved in conducting a feasibility study and in releasing of funds, it was decided that the Government should try to obtain approval for a first phase fast-track Emergency Banana Irrigation Project to irrigate 800

acres at Rabacca Farms, and Langley Park. These two areas have a large number of farms, and adequate water sources. This fast track approach received support.

Current Status

Implementation of the first phase of the national irrigation project has commenced. An Irrigation Design Engineer was mobilised and is in the process of designing irrigation systems and preparing tender dossiers for the purchase and installation of irrigation equipment for 800 acres at Orange Hill and Langley Park.

A tight timetable for project implementation is being followed. Detailed designs are expected to be completed by 6 September 1997. A study and recommendations on institutional and management aspects are to be completed by 23 September 1997. Procurement of equipment is expected to occur between August and December 1997. Installation of equipment is expected on Langley Park by 6 February 1998 and Rabacca by 8 March 1998, provided there are no significant delays. This will be a major step forward for St Vincent in maintaining production levels in the 1998 dry season. Once the feasibility study is completed, the remaining 3,200 acres of irrigated lands can be established over the next 3 years.

Anticipated Benefits of Irrigation Projects

The irrigation projects described above are expected to yield significant economic benefits to farmers, the banana industry and the wider economy of St Vincent and the Grenadines. One major benefit anticipated, is an increase in production, so that St Vincent can meet its annual assigned quota of 82,000 metric tonnes. The improvement in productivity envisaged would also free up

land for production of other crops, since less land could be required to meet the quota. The anticipated benefit flows are presented in Annex 1.

As shown on the 5-year plan, with the benefits from irrigation, St Vincent could reach 81,000 for year 2001, provided that the 4,000 acres of irrigation were installed, before the start of the dry season in year 2001. Correct farm practices are also necessary to ensure maximum benefit from the irrigation systems, and the Extension Service will play a major role in ensuring that this happens. We estimate an achievable target of 3 tons per acre through improved through improved extension work. The irrigation itself is expected to increase the present yields by 8 - 9 tons per acre, which, with improved farm practices, will bring the overall yield per acre to around 20 tons.

Earnings to the farmer at the minimum level of \$EC 572 / tonne could be as follows:

1998 EC\$ 31 million
 1999 EC\$ 36 million
 2000 EC\$ 41.3 million
 2001 EC\$ 46.4 million

IMPORTANT POLICY CONSIDERATIONS AND ISSUES TO BE RESOLVED

The implementation of a national irrigation programme is not without its problems and pitfalls. Many of the anticipated benefits depend on the maintenance of a favourable trading environment for Windward Islands bananas. Threats from the WTO ruling and sluggishness in making the required improvements to the quality of fruit exported could render these investments in banana irrigation meaningless, I since there may be no proper market in which to sell the fruit.

An adequate flow of benefits will also depend heavily on the institutional arrangements for managing the national irrigation system. Although the planned institutional study should address these issues, some of the thorny issues that must be resolved include:

- What management systems will be put in place? Would a separate irrigation management team be established to carry out maintenance and establish the timing of the irrigation?
- What will be the role of project beneficiaries in the management of the irrigation systems?
- What user fees will be charged?
- How much of the initial costs will be borne by the project and how much by project beneficiaries?
- What arrangements will be made for training of farmers and providing adequate extension staff support?
- How will project water sources and watersheds be protected so that there is sustainable flow of water during dry periods?
- What data collection system will be instituted to monitor evaporation rates, rainfall and water usage?

CONCLUSION

The IICA study identified five possible routes to competitive advantage for the Banana Industry in the Caribbean.

- Product differentiation - selling a product with unique characteristics

- Product diversification
- Cost leadership through cost reduction
- Speedy response to changing consumer needs
- Improving the service characteristics of the product

Many analysts agree with the study's conclusion that cost leadership is not an option open to St Vincent and the other Windward Islands. There are opportunities, however, for significant cost reduction in the industry in St Vincent through technological modernisation and investments in irrigation. Cornibert (1997) estimates that to be competitive, industry costs must fall by 43 percent. The major areas of costs at the macro level arise from quality claims and deadfreight charges arising from inadequate production and forecasting. There is also need to reduce on farm costs and the operational costs within the Association. The proposed irrigation investment can contribute to the required cost reduction by fostering:

- Increased production on farms, thereby reducing unit cost of production and shipping costs.
- Increased productivity of land - greater yields
- Improved productivity of labour. Since labour is 60 percent of variable production costs, then mechanisation of irrigable lands can contribute to greater labour efficiency. Any improvement in labour productivity would contribute to improved competitiveness of the industry.
- More efficient use of material inputs. The IICA study also found that cost efficiency in the Windwards banana industry was more related to the level of input usage and yields. Irrigation would

facilitate increased yields through more efficient use of inputs.

The second area of opportunity exists from product differentiation: establishing desirable features of fruit from St Vincent. The recent introduction of branding on fruit from certified growers is a first step towards establishing a more definitive product position for Windward Island fruit. Irrigation would facilitate this in St Vincent by providing higher volumes of certified top quality fruit that can be sold in the more lucrative end of the market. The quality performance of the industry in 1997 demonstrates that St Vincent can supply the quality of fruit required by the Multiples. Irrigation could therefore contribute to the stabilisation and maintenance of market share.

IICA also argues that the industry may differentiate itself on the basis of its service characteristics. WIBDECO's investment upstream provides some opportunity to establish a quality service image for Windward Islands fruit marketeers. This could be supported by likely gains in shipping efficiencies through reduced deadfreight and quality claims. The industry has already moved to establish strategic alliances with other marketeers. For example, marketing arrangements with Fyffes provides an opportunity to increase the volume of St Vincent fruit sold to the Multiples. At present, the strategic alliance with Fyffes is constrained by the low export production.

Irrigation would also facilitate agricultural diversification, thereby ensuring greater returns to the farmer per unit of land farmed. Irrigation may also allow SVG to expand production of tropical products, which may be marketed through WIBDECO's marketing

infrastructure as a part of its plan to market a mix of tropical products.

Reasonable and sustainable farm incomes is the best guarantee that the industry will remain competitive, since farmers will be better able to afford the investments necessary to reduce costs and achieve productivity gains.

Irrigation is not seen, however, as a total panacea for the woes of the St Vincent Banana Industry. Competitiveness and success in the long run also hinge on other factors. Farmers will be on a steep learning curve if they are to generate the production volumes and benefits with the speed required to improve competitiveness quickly. Farmers will need to learn the irrigation technology quickly and this is a major constraint to achieving the industry targets set.

One of the most important factors will be farmers' confidence in the future of the industry. This confidence is partly driven by

returns to the farmer, as well as public sentiments about the long run viability of the industry. Constraints of technology transfer and the quality of the extension services are also likely to be important determinants of the success of irrigation as a strategy for improving the competitiveness of the industry.

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Annex 1

St Vincent Production Forecast 5 Year plan

Sheet 1

	Month/No. weeks													Year Total	% Increase
	Year	Jan/4	Feb/4	Mar/4	Apr/4	May /4	Jun/4	July/4	Aug/4	Sep/5	Oct/4	Nov/4	Dec/4		
Worst case scenario	1997	3240	2776	2488	2997	2285	2110	2756	2054	2964	2897	3379	4623	34569	
Increase from improved farm practices 3 tonnes	1998	920	920	920	1150	920	920	1150	920	1150	920	920	1150	11960	24%
Increase 9 tonnes/acre from 1,000 acres irrig.	1998	0	0	692	865	692	692	865	692	865	692	692	865	7612	22%
Total Production	1998	4160	3696	4100	5012	3897	3722	4771	3666	4979	4509	4991	6638	54141	56%
Increase 9 tonnes/acre from 1,000 acres irrig.	1999	4852	4388	4792	5877	4589	4414	5636	4358	5844	5201	5683	7503	63137	82%
Increase 9 tonnes/acre from 1,000 acres irrig.	2000	5544	5080	5484	6742	5281	5106	6501	5050	6719	5893	6375	8368	72133	108%
Increase 9 tonnes/acre from 1,000 acres irrig.	2001	6236	5772	6176	7607	5973	5798	7366	5742	7584	6585	7067	9233	81129	135%

This takes St. Vincent to the Quota Limit by Year 2001

Earnings to the Farmer at 2 cents/lb or EC\$ 572 per tonne

YEAR	1998	1999	2000	2001
	EC\$ 31	EC\$ 36	EC\$ 41.3	EC\$ 46.4