

The Nicaraguan Coffee Cluster

History, Challenges and Recommendations for Improving Competitiveness



**Microeconomics of Competitiveness
Spring 2006**

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INTRODUCTION

Nicaragua's volatile political history has stunted its economic growth and placed it among the poorest countries in Latin America. The country remains heavily reliant on its inherited resources. Agriculture is its largest economic sector and coffee its most important crop. This paper examines the potential for Nicaragua's coffee cluster to contribute to the development of the country and to become a distinctive world competitor. It uses the diamond models for analyzing the country's current economic strategy and the role of government in positioning the coffee cluster as a competitive enterprise both domestically and internationally. These analyses provide the foundation for recommendations on how to establish Nicaraguan coffee as an efficiently produced, high quality, high value, world class product.

I. HISTORY AS THE BACKDROP FOR NICARAGUA'S DEVELOPMENT

Nicaraguan history is a story of social, political and economic instability in a setting of exceptional biodiversity and natural beauty. A recent visitor described the country as "...a place of dramatic landscapes, large open lakes and ominous volcanoes, a place disfigured by destructive earthquakes and vicious tropical hurricanes. . . . Nicaragua's distant past is a portrait of conquest, subjugation, plundered resources and oppression by both internal and external forces." (Papanastasiouis, 2002).

Nicaragua is the largest country in Central America; with an area of 129,494 sq km, it is about the size of New York State.¹ Bordered by the Caribbean Sea and the North Pacific Ocean,

¹ Nicaragua's Bosawas Biosphere Reserve protects 1.8 million acres of Mosquitia forest (almost seven percent of the country's land mass) making it the largest natural reserve to the north of the Amazon. An additional eight percent of the country is covered by water, including Lake Nicaragua, one of the largest freshwater bodies in the Americas containing the world's only freshwater sharks.

Costa Rica and Honduras Nicaragua is geographically divided into three major zones: extensive Caribbean coastal plains, Pacific lowlands and central interior highlands.

Nicaragua's history of conflict began in 1502 when Columbus first encountered the indigenous "caribisi" people in Cape *Gracias a Dios* along Nicaragua's coast, thus opening the country to Spanish exploration. Two decades later, the Spaniards established their first settlements along the narrow strip of land between the Lake Nicaragua and the Pacific Ocean. This was the territory of the *Nicarao* or "*Nicarahuac*" people, from which the entire territory drew its name Nicaragua.

Within a few years, the indigenous population was decimated by new diseases, forced labor, slave trade to Peru and Panama and violent struggle against the colonizers. European nations and pirates coveted and fought over the attractive land. In addition to these often bloody struggles, the province suffered from Spanish trade restrictions and natural disasters. Between 1856 and 1990, Nicaragua experienced more than 70 violent political upheavals between 1856 and 1990. (Montalvan, 2002)

In February 1990 Nicaraguan opened a new chapter in its history with the first democratic election, in which Violeta Barrios de Chamorro was elected president. With the return of democracy, the country witnessed a robust post-conflict reconstruction process and three consecutive free elections.

II. NICARAGUA'S POLITICAL ECONOMY

II.1 From Somozas to Sandinistas

Between 1936 and 1979 Anastasio Somoza followed by his sons ruled Nicaragua as dictators. From 1960 until 1977 Nicaragua experienced its most significant economic growth, averaging an annual rate of 5%, due primarily to record international prices of coffee and cotton.

This agricultural boom allowed unparalleled exports and among the highest per capita income levels in the region resulting in the growth of an urban middle class. (Gilbert 1994)

Somoza's populism also entailed increased investments in infrastructure, public education, rural development and industrial expansion. Adopting the prevailing import substitution model and working through the Central American Common Market (CACM) enabled Nicaragua to establish specialization in processed foods, chemicals, and metal manufacturing. (HBS Case on Central America)

The Somoza's' dictatorship, however, was also a period of corruption, repression, and enormous accumulation of wealth of the elites, which increased income inequality and resentments between rich and poor. Military efforts to suppress student protests coincided with the development of a new political movement, the Sandinista Front of National Liberation (FSLN), founded in 1961. Political turmoil intensified after 1972 mainly as a result of the government's incapacity to manage the crisis after an earthquake destroyed the center of Nicaragua's capital city and killed nearly 20% of the population. Despite civil unrest, economic performance remained relatively stable while net inflows of foreign direct investment averaged 1.1% of annual GDP. (World Bank Indicators)

When Jimmy Carter assumed the presidency in 1977, the U.S. government adopted a rigorous human rights stance and withdrew all support for the Somoza regime. The Sandinista movement, which had existed for 20 years as a relatively modest movement, stepped into the leadership vacuum. This positioned it to usurp power when Somoza was forced to leave the country. Initially most Nicaraguans hailed the arrival of the Sandinistas as a source of peace and reconciliation. The Sandinistas soon dashed those hopes by seizing full control of the multiparty "Junta" (Government Board), which had assumed interim power after Somoza's resignation.

Under the FSLN, between 1979-1984, the Junta committed the country to a path of “international socialism.” In 1984 Daniel Ortega assumed the presidency.

Under Ortega’s leadership, the FSLN implemented a string of socialist “reforms,” including land distribution through the Agrarian Reform Institute, bank nationalization, and establishment of cooperative societies, media censorship, and establishment of the largest military force in Nicaraguan history. The Sandinistas developed close ties with Cuba, and the Soviet bloc, which led the United States to impose a total trade embargo and offer covert assistance to military resistance groups, which became known as the “Contras.”

The economic performance of the country was severely hampered during Ortega’s administration. The centrally planned economy produced record levels of debt, reaching 1,100% of GDP. The government committed to historically high levels of agricultural subsidies and the state became the sole intermediary buyer and exporter of agricultural products.² By the end of the Ortega’s presidency GDP dropped to 1942 levels and agricultural production fell to its lowest point in 30 years. (Nicaraguan Central Bank)

II.2 Democratic Transition and Post-Conflict Reconstruction: The administration of Violeta Barrios de Chamorro, which began in 1990, initiated a radical reversal of the Sandinista reforms and a complex post-conflict reconstruction process focused on combatant disarmament and open market reforms. The government controlled inflation and implemented economic stabilization policies following IMF recommendations, providing a more suitable environment for business. In 1966, the country attracted as much as \$120 million of FDI.

The administration of President Arnoldo Alemán, which followed in 1996, embraced an export promotion model adopting the Washington Consensus reform policies. Unfortunately

² As the civil war continued, 50% of the budget went to military expenses. The war accounted for 50,000 lives and created 80,000 orphans. The fighting destroyed about 80% of rural infrastructure, mainly rural roads.

Hurricane Mitch represented a major disruption of the country's economic progress and destroyed 15% of the country's coffee plantations. This natural disaster was followed by a "the coffee crisis," resulting from the sharp decline in the world market price which caused the loss of 85,000 jobs. (Emergency Plan 20002)

President Enrique Bolaños took office in 2002 and adopted a new economic strategy based on "clusters," overseen by a presidential-appointed competitiveness commission. He also made anti-corruption a top government priority. Unfortunately, his efforts were blocked by the collapse of several private banks and the loss of considerable political capital, which led to his expulsion from his political party. This political turmoil continues to negatively impact the country's efforts to improve competitiveness. Between 2002 and 2005, both the economy's and the agricultural average annual growth rates slowed to 2.5% and 1.8%, respectively. (World Bank Economic Indicators)

II.3 Dimensions of Nicaraguan Poverty: Nicaragua's poverty is rooted in large part in its legacy of political turmoil, lack of investment in human resources, including a "brain drain," and a culture of reliance on natural resources that inhibits innovation and differentiation. The country is anchored near the bottom of Latin American countries on most key social and economic indicator but the country's history also reveals the capacity for improvement. In particular, since 1993 the data suggest that (1) agriculture is contributing less to the growth of Nicaragua's economy; (2) diversification has fueled growth in the nontraditional sector; (3) there has been an increase in foreign direct investment and foreign aid.³

³ Nicaragua faces presidential elections in November 2006 in which the Sandinistas are making a bid to return to power. Despite their record of negatively impacting Nicaragua's economic growth, the unpredictability of the country's politics do not allow dismissal of Ortega's prospects of success. Similarly, it is difficult to predict what economic policies the Sandinistas might adopt or advocate were they to prevail in gaining ruling or influential power. Based upon recent history, however, two developments are likely. First, foreign investment would markedly decline unless or until the government can assure investors of the soundness of its economic policies and the safety of their investments. Second, the economy would suffer some disruption as the Sandinistas have traditionally based their power on an expanded public sector at the expense of promoting private enterprise.

In 2004, the World Bank estimated that 48% of the population lived below the poverty line.⁴ The impact of this poverty is especially evident in the country's lagging health indicators and weak infrastructure.

Nicaragua's Social Indicators (World Bank)

Indicator	Belize	Costa Rica	El Salvador	Guatemala	Honduras	Panama	Nicaragua
Population (millions) 2004	.0283	4.1	6.7	12.6	7.1	3.0	5.6
GNI per capita (Atlas method US\$) 2004 est.	3,940	4,670	2,350	2,130	1,030	4,450	790
Literacy (15+years)	77%	96	80	69	80	92	67%
Average Years of schooling	n/a	6.05	5.15	3.49	4.80	n/a	4.58
Life expectancy (years), 2003	71.2	78.6	70.4	66.1	66.1	75	68.8
Infant mortality (deaths/1,000), 2003	33	8	32	35	32	18	30
Access to improved water (% pop)	91%	97%	82%	95%	90%	91%	81%
Telephone lines: fixed & mobile (per 1000) 2003	317.3	274.4	292.0	134.7 (2000)	72.4	389.5	122.5

Nicaragua also has a weak record of investment in primary and secondary education, resulting in one of the lowest adult literacy rates in Latin America. Since an educated workforce is the foundation of a country's innovative capacity for productivity growth and sustained prosperity, Nicaragua faces the dual problem of increasing the educational opportunities for its citizens while keeping its educated citizens from emigrating. With the exception of INCAE, the top business school in Latin America, the country has yet to commit significant resources to higher education. In 2004, Nicaragua's total public expenditure on education was 3.1% of GDP down from 3.9% four years earlier. (World Bank edstats) Approximately 800,000 children

⁴ In 2001 45.1% of the population was living below \$1 a day. (World Bank)

cannot attend elementary school due to inadequate school funding. More than half million professionals who left during the Sandinista years have yet to return home.⁵

The country's productivity data reflect the low educational investment coupled with the brain drain. According to the International Cluster Competitiveness Project, the compounded annual average growth rate of GDP per employee (PPP adjusted) from 1999 to 2004 was -2%, which indicates that even among developing countries Nicaragua's productivity is relatively low. In 2004 services accounted for 58% of GDP, while industry was 24.7%, of which 13.8% is manufacturing. The latter represented a decline in manufacturing from 25.4% in 1984. While agriculture amounts to 17.1% of the GDP, agricultural products account for the largest share of Nicaragua's exports at 40%. Hospitality and tourism is a distant second at 18%. When fishing and fishing products are added to agriculture, the percentage of total exports from inherited resources rises to more than 50%. (World Bank 2005) This leaves Nicaragua highly vulnerable to external shocks including fluctuations in international commodity prices and natural disasters.

Investment in research and development is also lagging, amounting to a mere .05% of GDP, while the number of researchers and the amount of investment in R & D puts Nicaragua in the bottom 10% of its Latin American cohort. Nicaraguans registered no patent applications with the United States Patent and Trade Office in 2003-2004 (World Bank, KAM, 2005).

Nicaragua's current economic indicators, therefore, present a mixed picture, while recent developments provide reason for optimism. The government has also revived its commitment to the IMF poverty reduction and growth facility (PRGF) initiative, thus paving the way for further debt forgiveness and new foreign aid commitments. Nicaragua's 5.1% GDP growth rate in 2004 was the highest in Latin America, but inflation appears to be increasing and consumer demand is

⁵ One estimate noted that in 1990 as many as 70% of Nicaraguans with a masters degree in business administration were living outside the country. (U.S. Library of Congress) In 2003-2004 the World Bank placed Nicaragua in the bottom 10% of Latin American countries in the "brain drain" category of its Knowledge for Development Index.

expected to weaken, thus slowing growth (EIU, January 2006). The ratification of the Dominican Republic-Central American Trade Agreement with United States (DR-CAFTA) also promises to increase the country's exports. In sum, the strength of Nicaragua's economy and its ability to raise the living standards of its citizens remains subject both to external forces, especially commodity prices for coffee and oil, as well as to natural disasters, and domestic politics, notably demands for increases in municipal transfers or transportation and energy subsidies that can significantly undermine the government's fiscal discipline.

Economic Indicators

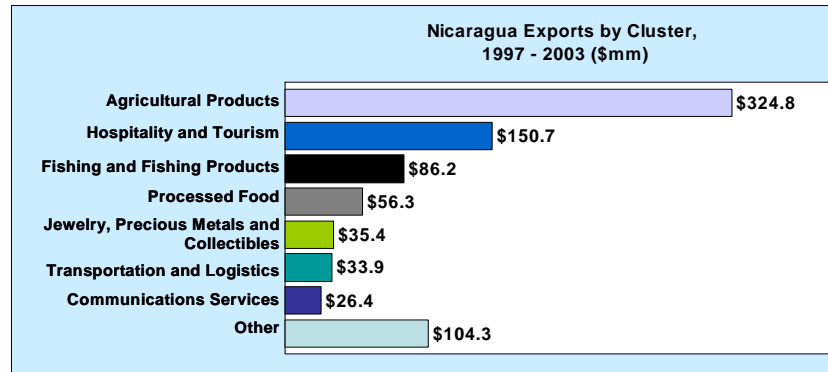
Indicator	2001	2002	2003	2004	2005 ^a
GDP (US\$ bn)	4.1	4.0	4.1	4.6	4.9
Real GDP growth (%)	3.0	0.8	2.3	5.1	4.0
Consumer price inflation (av;%)	7.3	3.7	5.3	8.5	9.7
Exports of goods fob (US\$ m)	895	917	1,050	1,363	1,499
Imports of goods fob (US\$ m)	-1,804	-1,834	-2,021	-2,452	-2,838
Current-account balance (US\$ m)	-796	-767	-749	-772	-939
Total external debt (US\$ bn)	6.4	6.5	6.9	5.0	3.1
Debt-service ratio, paid (%)	22.9	9.9	11.7	7.9	5.5
Exchange rate (av) C:US\$	13.4	14.3	15.1	15.9	16.7

Source: EIU (January 2006)

II.4 The Present and Future Nicaraguan Economy and the National Diamond: According to the International Monetary Fund (IMF), Nicaragua has achieved “satisfactory” recent economic performance and now qualifies for further debt relief. After protracted political struggles, the government has adopted a 2006 budget and budgetary reforms to continue macroeconomic stability in the run-up to the fall 2006 elections (IMF, 2005).

At the same time, however, Nicaragua continues to face several challenges, including a relatively high level of debt due to a widening current account deficit (IMF, 2006). Given the potential for political impasse and the political environment, there is considerable uncertainty whether the government can continue to strengthen its fiscal framework and maintain budgetary

discipline. Uncertainties undermine the investment climate that will enable Nicaragua to take full advantage of DR-CAFTA. Given the treaty's elimination of tariffs for 90% of Nicaraguan agricultural products and 100% of industrial and textile products, the country should be poised to attract increasing amounts of FDI that will contribute both to the growth of its exports and overall economy (Government of El Salvador, 2004).



Source: Institute for Strategy and Competitiveness

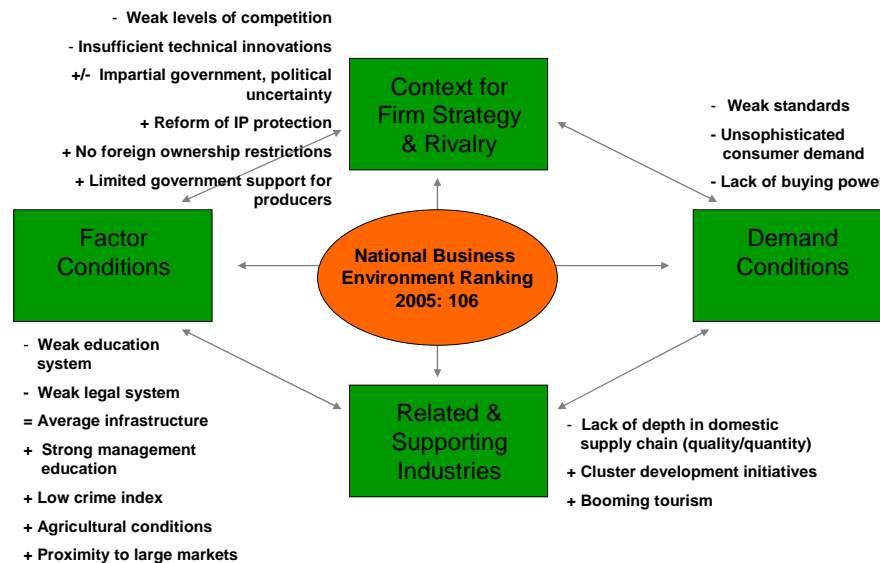
III. NICARAGUA'S NATIONAL DIAMOND

Nicaragua's national diamond represents the typical story of a developing economy. The economy is characterized by significant infrastructure challenges, unsophisticated local demand, and opportunities for improving competitiveness through technical innovation within the supply chain and across its main and related industries.

Factor Input Conditions: Nicaragua has a favorable geographic location close to markets in Central America and relatively close to Northern American markets. As noted above, however, Nicaragua's competitive disadvantages include an inadequate physical infrastructure, particularly its roads and deep sea ports, which obliges exporters to ship most of their products to Honduras where sea ports are better developed. The public education system and the quality of scientific research institutions can also be improved. Other weaknesses are the inefficiency of the legal framework and insufficient venture capital. While Nicaragua enjoys a superior *terroir* for

agriculture, the existence of multiple small farmers and the uncertainty of the rural land tenure regime significantly inhibit productivity.

Nicaragua's National Diamond faces difficulties



Context for Firm Strategy and Rivalry: In addition to the policy challenges discussed above, Nicaragua's competitive environment is hampered by weak antitrust enforcement and lack of government resources to invest in facilitating both collaborative and competitive arrangements that will promote innovation. In a positive development, the country has implemented intellectual property rights reforms in accordance with DR-CAFTA. Moreover, if the elections bring enhanced political stability, the absence of restrictions on foreign ownership of property coupled with cluster development policies should result in an improved business environment to attract domestic and international investment.

Demand Conditions: With one of the lowest per capita incomes in the region, Nicaraguans possess low purchasing power and an unsophisticated consumer demand. The country's poverty

also prevents it from investing in new technological improvements. The sophistication of demand is also weakened by low regulatory standards and weak consumer protection.

Related and Supporting Industries: While the government has initiated a cluster development strategy that embraces development of related and supporting industries for Nicaragua's main products and services, at present the country's economy is quite shallow. The decline in manufacturing experienced from 1984 to 2004 poses a particular challenge to the development of linkages that will enhance a cluster's productivity and prosperity. Nicaragua's growth in its service sector, however, reflects a booming tourism industry, which provides a starting point for promoting competitiveness. Similarly, the building of clusters in the agricultural sector provides an opportunity to develop this part of the national diamond.

IV. THE COFFEE CLUSTER AND DIAMOND

IV.1 Nicaragua Coffee History

Coffee is one of the most valuable primary products in world trade, often second in value only to oil as a source of foreign exchange for developing countries. Today, most coffee is grown between 28 degrees North and 30 degrees South; so growing areas include Central America, Caribbean, Brazil, West Africa, East Africa and Yemen, Madagascar, India, Indonesia and Vietnam. Approximately 70 countries produce coffee, led by Brazil, Colombia, Vietnam and Indonesia. The largest importers are the United States, followed by Germany, Japan, France and Italy.

The crop first became popular in Arabia around the 13th Century. By the 18th Century, the beverage was widely known in Europe countries, which developed coffee plantations in many of its colonies. By the end 19th century, Brazil produced 80% of the world's supply.

Coffee was first introduced to Nicaragua in 1796 as a decorative plant. By 1824 it developed into an agricultural crop in the province of Carazo and later, in the province of Managua. By 1841, small quantities of coffee (around 800 sacs a year) were being exported to Europe together with other agricultural products such as indigo, cotton and tobacco (Kühl, 2004).

In 1849 during the Gold Rush, Cornelius Vanderbilt established a Steamship company via a route across the San Juan River in Nicaragua to serve passengers traveling to California. Shorter than the traditional Panama or continental routes, this “Transit Route” triggered an unprecedented demand for coffee by the thousands of travelers, many of which decided to stay in Nicaragua thanks to several incentives by the Nicaraguan government to promote immigration. The government also established initiatives to introduce coffee crops in the central highlands, such as El Crucero, and enacted laws obligating indigenous people to work on the plantations during the coffee seasons. The particular way in which the producers and the labor force interacted had profound impact in the social structures and history of Nicaragua.

The growth of coffee exports created a strong semi-rural elite in the province of Managua, which eventually became the country’s capital. The 1870s saw coffee introduced in Matagalpa during which it became the leading agricultural export. By 1880, the large number of northern European immigrants who settled in the northern Nicaraguan provinces of Matagalpa and Jinotega focused on growing coffee using new techniques to increase exports to Europe and the United States (Kühl, 2004).

While Nicaragua developed other agricultural crops, such as cotton and bananas, during the first half of the 20th century, coffee remained the principal crop, especially in Northern Nicaragua, where it became the main source of income for Matagalpa, Jinotega, Estelí, Nueva Segovia and Madriz. During the second half of the 20th century coffee, Nicaraguan producers in

this region concentrated on increasing productivity rather than improving quality. Thus, during the decade of 1960-1970 the government launched a major “planting” campaign that enabled the central highlands to reach higher volumes than those produced in the southern Pacific cities (Solórzano Interview, 2006).

During the civil war, coffee was among the most affected crops due to the fighting principally in the northern highlands. Government expropriation of the many coffee farms further reduced productivity. Subsequently, the Sandinistas replaced a substantial number of “haciendas” by a system of inefficient cooperatives. The government remained as the sole buyer establishing a fixed price that, over the 1980s, averaged \$37 per bag, at least \$100 less than the average world price of \$140 per bag during the same period (Solórzano Interview, 2006). Thus, by the end of the Sandinista period coffee production was at a historic low of 600,000 quintals per year as compared to 1,600,000 in 1978. Additionally, investment in coffee farms had been almost nonexistent for over ten years.

In 1990, the new government pursued a policy of returning many expropriated properties back to their original owners. In 1992, as part of the “program of coffee renewal” program, to which the government committed a portion of its scarce budgetary resources, more land was devoted to coffee planting than to any other crop. With a special loan from BCIE the government channeled funding to coffee farmers for “upgrading” 34,500 acres of coffee crops. The program was never completed, however, as the government defaulted on its foreign debt, and two state banks, BANIC and BANADES, subsequently collapsed. This was followed by Hurricane Mitch.

The importance of coffee to Nicaragua’s economy is not just in its export value but also in the number of people who depend on the crop for their livelihood. Coffee continues to support

around 32% of rural employment and 12% to 14% of the country's total labor. About 30,000 households grow coffee and another 150,000-200,000 households receive some part of their income as full-time or part-time laborers in coffee production, processing and marketing (Plan Nacional de Desarrollo, 2002).

In February 2002, as a response to the lingering "coffee crisis," newly elected president Enrique Bolaños created a Presidential Coffee Commission presided over by then vice-president Jose Rizo, himself a coffee producer. He charged the Commission with drafting a "definitive strategy" to overcome the coffee crisis and develop a competitive cluster. Initially, the public-private collaboration produced modest proposals towards developing a comprehensive strategy. Since then collaborative and strategic efforts have intensified as shown by the publication "Estrategia para la Reconversión y la Diversificación Competitiva de la Caficultura en Nicaragua"⁶ and the creation of the Specialty Coffee Association of Nicaragua. While funding for the implementation remains questionable⁷, most stakeholders concur that despite coffee's vulnerability as crop to external price shocks and natural disasters and its arguably "questionable" profitability, Nicaraguan coffee has several advantages that the country may be able to capture with an appropriate strategy.

IV.2 The Basics of Coffee Production

The two most important species of coffee are *Coffea Arabica* (Arabica coffee), which accounts for over 70% of world production, and *Coffea Canephora* (Robusta coffee). Arabica is grown throughout Latin America, including Nicaragua, in Central and East Africa, in India and to some extent Indonesia. Robusta is grown in west and Central Africa, South-East Asia and Brazil. Arabica coffee is considerably higher quality and value.

⁶ Strategy for the Transformation and Competitive Diversification of the Coffee Sector in Nicaragua, published by the Nicaraguan Ministry of Agriculture and Forestry, 2004.

⁷ The Ministry of Agriculture has calculated the costs of implementing the strategy in 120 million US.

Coffee beans are the seeds of fruits, which resemble cherries, with a red skin when ripe. These must be picked and dried, either by the dry or wet methods. These beans are known as green coffee. The dry method, also known as the natural method, requires little machinery. First the cherries are sorted and cleaned, often by hand, then laid out in the sun for up to four weeks. Sometimes machine driers are used. It is very important not to over-dry the cherries. The dried cherries are then stored in bulk before being taken to a mill for hulling, removing the outer shell of the cherry, sorting, grading and bagging.

The wet method requires specific equipment and lots of water. It preserves the coffee beans better and is generally used for Arabica beans. After sorting, the pulp is squeezed from the cherries by a machine, and the beans separated out but left in a thin parchment skin. The beans are washed and placed in fermentation tanks to clean them properly. This can take a couple of days. The beans are then washed again and dried out in the sun, or on top of drying machines, for eight to ten days.

After drying, and before export, coffee beans are milled in three basic steps: hulled to remove the parchment layer (husk); polished (optional); graded and sorted according to size and quality, often by hand. This “green coffee” is then shipped.

Quality testing, known as “cupping,” is performed at every stage of production. The trained cupper looks at several characteristics identified through subjective sensory criteria applied by licensed graders. This is critical to pricing decisions. The Specialty Coffee Association of America (SCAA) has defined five grades of coffee, determined by the number of defects found per sampling.

IV.3 The World Coffee Market

Coffee has long suffered from price volatility, owing to weather variables, long supply routes, speculation by investors who treat it as a financial instrument and the mismatch between supply and demand cycles. It takes three to four years for a coffee plant to become harvestable, making it hard for producers to match their production planning to short-term demand.

As supply outstripped demand in the late 1990s, low prices drove out many producers. Due to recent droughts in Vietnam and Brazil, the current projections predict a global shortage of coffee of around 10 million bags. The USDA's December 2005 estimate for world coffee production in 2005/2006 is 113.2 million bags, 5.5% down from the 2004/2005 season (Roast Magazine).

The most significant growth area for coffee is in the higher value specialty coffee, where consumption has risen from 2.3 million bags in 1992 to 6 million in 2002 to an estimated 8.6 million in 2007. In order to guarantee supply, importers and roasters are pro-actively moving into growing areas. Starbucks, for example, has established a regional buying office in Central America, while Nestle has set up a specialty mill in Costa Rica.

IV.4 Structure and Market: Over 80% of Nicaraguan coffee grows above 600 meters, qualifying it for "strictly high grown" status, a criteria for quality coffee. However, only 10-15% of Nicaraguan coffee is sold as a differentiated product, with a premium price. By contrast, Costa Rica sells 35-40% of its coffee to differentiated markets, and Guatemala sells 40-50%. Similarly, Nicaragua sells only 24000 bags per year as Fair Trade coffee, despite the fact that 135000 bags per year would qualify for this premium designation. It produces only 10,000 bags of "organic" coffee per year.

In addition to its lost opportunity for securing premium prices, the World Bank 2005 comparative studies concluded that Nicaragua has significantly higher costs than the rest of

Central America due mainly to higher prices of energy, agricultural inputs, financing and logistic costs. Although productivity per block has been increasing since 1995, Nicaragua produces around 17 quintals of dry coffee per hectare, or an equivalent of 12 quintals per block on average (Kruger, 2000), which is about half the average yields of Costa Rica.

Nicaragua's coffee market is essentially divided in two, between the large, efficient operations, integrated from production forward into milling and even exporting, and the huge number of small farmers who struggle to make a living on small plots in rural areas hobbled by poor infrastructure. Today coffee growing in Nicaragua is concentrated in the central highland regions of Matagalpa and Jinotega, which produce more than 80% of Nicaraguan coffee. National production over the past four years has averaged 1.26 million 60kg bags, of which around 90% is exported. This makes it the world's 16th largest coffee producer, behind its neighbors Costa, Rica, El Salvador, Honduras and Guatemala.

Nicaragua's coffee farms can be divided into two major categories: large farms, more than 50 blocks; medium farms, between 21 and 50 blocks; and small farms, fewer than 20 blocks. The large farms are much more productive, generating more coffee per block at a lower cost per bag than the smaller farms. However, 95% of Nicaragua's coffee farmers work on the small farms. 44% of coffee farmers work on plots of just 1-2 blocks. Just one percent of farmers work on the large farms, which nonetheless produce 36% of all Nicaragua's coffee.

The cost and productivity disadvantages of working a smaller plot are enormous. The large farms yield over 34 quintals per block, whereas the small farms yield just 5. The economies of scale are reflected in the cost to produce each quintal: \$72.18 for a small farm versus \$68.86 for the large farm. Given the volatility of coffee prices, this \$3.32 can be the difference between bankruptcy and survival.

The preponderance of low-yield farms means Nicaragua struggles to compete globally. Vietnam, the world leader in yield, produced 48.5 quintals per hectare in 2001, and Costa Rica produced 30.8. The Central American average was 18.1, while Nicaragua produced just 16.6.

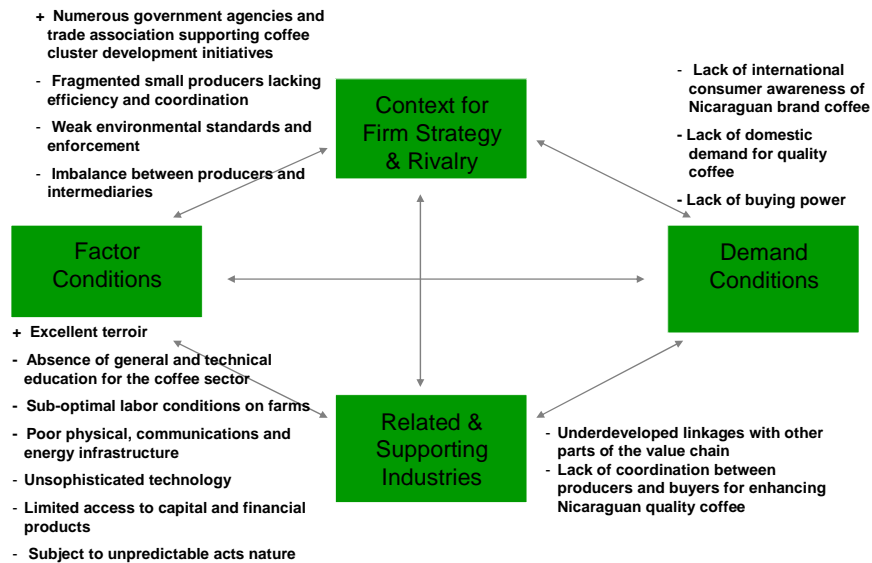
Coffee takes various routes from Nicaragua's farms to its export markets. The majority, 75%, goes from producers via intermediaries, who may perform functions such as drying and milling the coffee, to exporters, traders and foreign importers. Approximately 10-12% is handled by vertically integrated companies which manage every stage from planting and harvesting to export. Another 10-12% is grown, harvested, dried and milled by co-operatives before being sold to exporters or directly to foreign importers. Just one to two percent goes directly from producers directly to foreign importers. This final category may include products such as Fair Trade coffee, where importers have very strict environmental and social criteria regarding production methods.

Buyer power is concentrated among the top five buyers, who purchase 45% of all export coffee. The largest is COFNA LTD., followed by COEX Coffee International, then ECOM Agroindustrial Corp, Melrose Finance & Trading Corp., Atlantic (USA). Twelve brokers account for 65% of total Nicaraguan exports.

On a positive note, it is worthwhile noticing that Nicaragua experienced the highest yield increase of all Central American coffee producing countries during the 1995-2001 (40% vis-à-vis regional average of 11%). Furthermore, since 2002, several samples of Nicaraguan coffee have established world records on Internet auctions by reaching prizes 22 times higher than the price of coffee on the New York market (Technoserve, 2004).

IV.5 Coffee Cluster Diamond Analysis

Coffee Cluster Diamond



IV.5.1 Factor Conditions:

Although Nicaragua is blessed with an excellent terroir for coffee-growing, other factor conditions such as technical education, labor conditions, infrastructure, technology, financial services need to be improved. Furthermore, as mentioned earlier, Nicaragua is subject to unpredictable natural disasters.

Terroir: Because of its “terroir” Nicaragua specializes in a set of Mild Arabica variants known as Central American Mild Coffees, which quality is closely associated with high farm altitudes, “shade” and high rain levels. An appropriate combination of the different components of quality is referred as to “Strictly High Grown” (SHG), the highest quality of coffee according to international standards. More than 90% of Nicaraguan coffee is SHG

Table 1: Distribution of Coffee by Altitude

Category of Coffee	% of production
High Altitude (above 1000m)	32%
Medium Altitude (800-1000m)	28%
Low altitude (below 800m)	40%
Shade coffee	96%

Adequate rain levels	75%
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Source: Comisión Presidencial de la Competitividad

Labor Conditions: There is a general lack of education among coffee laborers. One of the most challenging problems is recruiting and retaining workers due to the poor working conditions and low pay on most farms. This situation is a barrier to obtaining certification for fair trade coffee.

Labor productivity is extremely low. This is in part due to low educational levels, which impede the transmission of technical expertise. Moreover, improper handling of the beans can result in defects that reduce the quality of the coffee bean and its market value. Lack of education also inhibits many producers from exploiting more advanced methods of production. There are few incentives to encourage the rural population to participate in the formal sector.

Land Tenure: Many coffee farms are sub-scale, but Nicaraguan producers face difficulties in consolidating farms because of the uncertainty of the property rights regime.

Infrastructure: Lack of access to basic infrastructure is a serious impediment to the competitiveness of the coffee sector. Most of farms are located in rural areas, where there is poor road access and insufficient coverage from the electricity grid. For example, only 36% of the population in the rural coffee-growing regions of the north has access to electricity, compared to 56% to 68% of the urban population. In areas without electricity, producers have to rely on inefficient private generators. Poor road conditions both increase the cost of transporting fuel to generators in rural areas.

With marginal access to electricity, there is little possibility of using modern processing plants, modern communication technology that enables access to market information, or production equipment, such as irrigation pumps.

One serious drag on Nicaraguan coffee is the parlous road and port system. Just 12.5% of Nicaragua's roads can be used year round and the secondary road system up in the rural areas is

extremely poor. As a result of this, and over-elaborate border controls, the average speed of a truck crossing Matagalpa and Jinotega is just 14km/h. Furthermore, the lack of a deep-water port on Nicaragua's Atlantic coast means that well over 50% of coffee exports must be trucked up to Honduran ports. This additional cost ends up penalizing Nicaraguan coffee.

Technology: Agribusiness in Nicaragua needs to be modernized. In the agricultural sector as a whole, there is a lack of investment in technology, partially due to high costs of capital and insecurity of land tenure. Access to better technology is poor at both the production level and processing level. Furthermore, harvesting technology needs to be improved.

In the coffee sector, low investment in technology has led to high production costs. For example, most wet and dry milling facilities are obsolete, and storage facilities are underdeveloped. Market information systems are also lacking. In a World Bank survey, producers complained that although there was much information available, a lot of it was not useful. This indicates a need for greater coordination between producers and the chief provider of information, The Ministry of Agriculture, Livestock and Rural Development (MAGFOR).

Financial Services: Credit flows from Nicaraguan banks to the private sector increased by 330% in real terms between 1995 and 2001. However, loan disbursements to the agricultural sector declined by 2.4% (World Bank, 2003). Some banks do not trust coffee producers because in the past, in many cases coffee producers defaulted on loans and banks could not recover loans. Furthermore, some coffee producers do not practice prudent financial management. For example, some producers speculate on coffee prices, holding back inventory in hope that prices will rise. However, producers have been caught holding inventory during falling prices, and were consequently unable to pay off their loans. This aversion for the coffee sector limits also limits the degree of innovation of products targeted to the sector (Aráuz Interview).

IV.5.2 Context for Firm Strategy & Rivalry

The competitiveness of the coffee cluster benefits from the enthusiastic support of numerous government agencies, trade associations and IFCs. However, much work needs to be done in the area of consolidating small producers, raising environmental standards, and equalizing the imbalance between producers and intermediaries.

Government Agencies, Trade Associations and IFCs: The key government ministries and agencies involved include the ministries of agriculture, environment, industry and commerce, labor, transportation, institutes of agricultural technology, rural development and the center for export logistics. In addition to improving factor conditions, such as educational, health, and environmental standards, government agencies work with the private sector to coordinate research and development, market information, and technical education.

Weak Environmental and Quality Standards: The regulatory framework for ensuring high quality and environmental standards needs to be improved. This is particularly important for specialty coffee which often demands high farm environmental standards in addition to superior flavor.

Imbalance between Producers and Intermediaries: Nicaraguan farmers lack market information vis-à-vis intermediaries such as exporters and traders. Also, farmers are fragmented and do not have the same degree of concentration and bargaining power.

IV.5.3 Demand Conditions:

*“Nicaraguans have a culture of producing coffee but not a culture of consuming coffee”
Maussie Kühn, Co-Owner of Selva Negra Estate Coffee Farm, 27 March 2006.*

Lack of International Consumer Awareness: Nicaraguan coffee has not yet developed a strong international brand, such as Colombia's "Juan Valdez" coffee or Jamaica's Blue Mountain.

Lack of Domestic Demand: Nicaraguans consume only 2 kg of coffee per person per year, in contrast to 4 kg for Americans and 11 kg for Finns (Earthtrade, 2003). Only 8% of production is consumed domestically. Nicaragua exports 45% of production to the US (Competitiveness Commission, 2006).

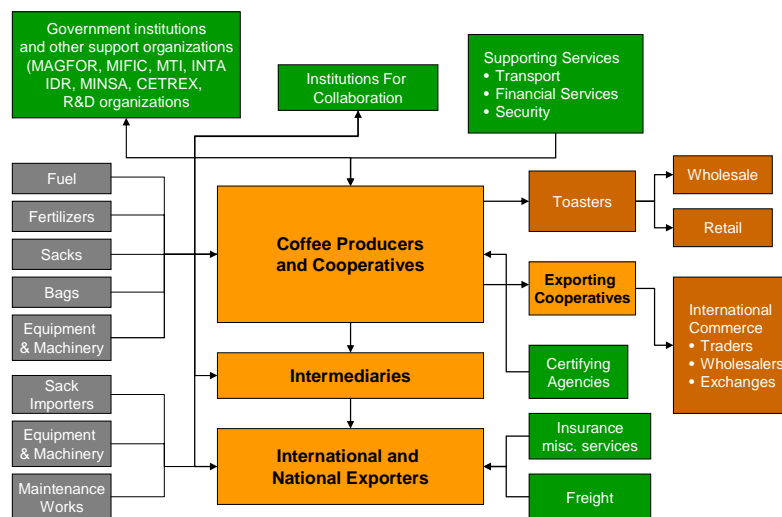
Lack of Buying Power: Aside from a low cultural preference for drinking coffee, Nicaraguan consumers do not purchase the more expensive types of coffee. Most of the coffee consumed in Nicaragua is not suitable for export.

IV.5.4 Related and Supporting Industries:

Underdeveloped Linkages: Despite the coffee's long history in Nicaragua, its supporting industries are still relatively underdeveloped. There is very little value added beyond the milling stage. A large portion of the roasting is carried out abroad. Unlike coffee farms in neighboring countries, 99% of Nicaragua's coffee farms have wet mills on their premises (Solórzano Interview, 2006). Nicaragua has been unable, however, to capitalize on this advantage. There are some small related domestic businesses involved in making coffee sacks. Within the agrochemical products market, there are only a few large importers who serve the coffee industry, which keeps fertilizer costs high and hinders competition.

Information Asymmetry between Producers and Buyers: There has been a general lack of coordination in upgrading coffee quality. Coffee buyers have not traditionally assisted farmers to decide which varieties to grow in order to secure better pricing.

Coffee Cluster Map



V. RECOMMENDATIONS

Increasing the prosperity and assuring the sustainability of the Nicaraguan coffee cluster starts with building upon the country's inherited resources, creating new factor conditions to improve quality and efficiency, and ensuring a favorable context for firms' operations, through enabling government policies, private-public partnerships and strategic investments. Initially, the cluster should embrace two primary objectives for improving its competitive advantage:

- Differentiate Nicaraguan coffee as a recognizable quality coffee product, both internationally and domestically;
- Accelerate cluster development by improving (a) the national context in which the cluster operates; (b) the environmental conditions in which the coffee is grown and harvested; and (c) the efficiency of operation and the quality of the product.

Eventually, the cluster should foster development of and linkages to value-adding activities, including downstream enterprises such as roasting and differentiation, which will capture more of the value for Nicaraguans. To achieve its full potential as an industry and

contributor to the economic development of the country, initiatives for improvement should address every facet of the cluster diamond so as to create a comprehensive strategy for prosperity.

V.1 Factor Conditions

Strategies aimed at improving the productive and quality capacities of the producers should include:

- Educating growers and their workers on how to produce the highest quality coffee, including how to
 - (a) minimize defects in the beans, such as those from improper growing conditions, harvesting, and storage;
 - (b) meet the international standards to qualify for specialty labeling, such as organic, free trade, shade or eco-friendly; and
 - (c) understand and satisfy potential buyer demands. Developing a multifaceted educational program requires a collaborative effort of educational institutions, cluster institutions for collaboration (IFCs), and government as a facilitator and enabler.
- Improving the management and efficiency operating conditions on coffee farms. Implementation of this strategy entails both educational programming as well as access to resources for upgrading farming and processing equipment.
- Investing in human resources utilizing a cluster-government partnership to provide incentives to socially responsible growers. The government should also enforce labor conditions on coffee farms for worker protection and work with local public and private interests to establish public schools and child care facilities for workers' children.
- Facilitating compliance with environmental regulations and conservation programs to
 - (a) minimize damaging externalities; and
 - (b) increase the quantity of coffee eligible for various specialty certification categories.⁸ Government efforts should include effective enforcement programs for water management programs to avoid pollution, reforestation promotion, and development of sustainable energy sources and responsible disposal of farm bi-products such as the skin of coffee beans.

In addition to challenges associated with growing of the coffee beans, producers face challenges associated with producing and marketing. Most notably, producers require access to

⁸ This includes Fair Trade, Eco-Friendly, Rainforest, and Organic, among others.

capital and the physical infrastructure that will enable them to transport and ultimately to export their product. Efforts to improve factors that enable cluster growth should include:

- Improving access to financial capital by facilitating the development of rural finance institutions, specialty financial products and microfinance opportunities tailored to the needs of producers;
- Developing risk management strategies, such as crop insurance and price hedging mechanisms to minimize losses associated with natural disasters, transportation challenges, and dramatic market price fluctuations;
- Upgrading the transportation infrastructure and shipping facilities to minimize the delay in moving the coffee beans from the farm to their final destination to avoid deterioration of the beans.

The cluster also faces the challenge of promoting innovation to capture and maintain a niche in the world wide specialty coffee market while also producing a high quality affordable product for domestic consumption. A collaborative initiative of all stakeholders should work with the country's educational institutions to identify research and development needs.

Investment in R&D should include:

- Establishing coffee laboratories for conducting basic research on growing and production of quality coffee;
- Applied research programs for developing new differentiated products, including premium coffees, and creating new quality designations, such as "estate" or area branded beans;
- Improving productivity including developing advanced equipment and technology;
- Developing strategies for improving efficiency, including new land use strategies for unproductive coffee farms and relocation and training programs for owners and workers displaced by consolidation and quality improvement initiatives.

V.2 Context for Firm Strategy and Rivalry

Nicaragua's many government agencies with responsibility for some aspect of coffee production should insure that their efforts are coordinated to facilitate the productive capacity of producers and to foster the competitive position of the product. Moreover, the government

should facilitate improving operations within and communications between the IFCs that provide the private sector context for the country's coffee producers. Areas the government should address to enable cluster growth include:

- Reforming the land tenure system, including implementing of a transparent legal process for resolving legal title and improving the Property Registry and Cadastre. This is the first step in identifying coffee farm owners, to whom productivity and quality improvement programs should be directed.
- Promoting policies aimed at consolidating the smaller coffee farms to improve the efficiency of production and quality of the product. The government should evaluate offering incentives for small farmers to sell, while facilitating the creation of effective cooperative arrangements for the remaining small farmers to realize economies of scale and achieve specialization. While consolidation in general will significantly enhance productivity, some of the smaller farms are producing the highest quality bean. The government should adopt policies that balance both of these competitive advantages.
- Insuring the soundness of the country's banking system, while working with IFCs and producers identify the government's role in providing access to capital, such as loan guarantees incentives, and facilitating creation of insurance mechanisms that enable producers to minimize the magnitude of their losses resulting from market price fluctuations or natural disasters.
- Assuming an active role in marketing initiatives to create demand for Nicaraguan coffee both internationally and domestically.

The government should also ensure that policies assist rather than hinder cluster growth and development. To this end the government should consider:

- Advocating, in collaboration with other Central American coffee producing countries, revision of the tariff system to remove world trade barriers for their coffee, particularly lowering or eliminating the high tariffs many countries place on importing processed coffee.
- Reviewing laws and regulations that affect coffee producers and processors to reduce the barriers to productivity and unnecessary costs while ensuring enforcement of standards for quality, working conditions, environmental conservation, and market competition.
- Moving gradually towards institutionalizing a sufficiently stringent regulatory environment to increase productivity and innovations.
- Working with producers and IFCs to establish information and regulatory systems for implementation and enforcement of best practices, production standards, and product quality. Costa Rica provides a model that Nicaragua might adapt to its circumstances. In the near

term, the government is best positioned to develop “quality maps” for the types of coffee produced in various areas of the country.

- Enforcing environmental regulations and developing incentives for best farming practices, including
 - (a) replenishment of old coffee tree stock;
 - (b) promotion of organic fertilizing; and
 - (c) improvement of production zoning practices to ensure the integrity of the point of origin labeling of premium coffee.

Finally, a public-private partnership is essential for creating a context that promotes collaboration in positioning Nicaraguan coffee in the worldwide market and promoting increased domestic production. At the same time, the government must insure that its policies foster a level of competition among efficient coffee producers that will lead to continued innovation and cluster growth.

V.3 Demand Conditions

Promoting local consumption and developing a more sophisticated domestic demand for Nicaraguan coffee is an essential element for increasing competitiveness, promoting innovation, realizing cluster prosperity. The challenge is to both to expand the “coffee drinking culture” among Nicaraguans and to change preferences of many current coffee drinkers from low quality instant to higher quality premium coffee.

To these ends, collaborative efforts between coffee trade associations and IFCs as well as the related business enterprises, particularly the tourist, restaurant, and retail food industries, should examine the successful strategies employed by other coffee producing countries, including Brazil, Costa Rica, and Guatemala, as well as the "Action Plan" developed by the International Coffee Organization (ICO, 2003). Strategies adapted to Nicaraguan demand should seek to increase the quality of coffee remaining in the country for local consumption and to promote "corrective publicity" that advertising the positive health benefits of coffee drinking.

Successful initiatives, such as Casa del Cafe and Selva Negra suggest that Nicaraguan consumer preferences can be modified resulting in the willingness to pay for a quality cup of coffee. Creating additional outlets for coffee consumption and purchase should be part of a successful strategy.

Increasing international demand for Nicaraguan coffee requires developing a marketing strategy for promoting the distinctive premium coffee products that follow from earlier recommendations for improving quality and creating differentiated Nicaraguan brands that identify the point of origin of the coffee bean, such as “Segovia Strictly High Grown.” International marketing efforts require a public-private collaboration to identify and capitalize on available promotion opportunities.

V.4 Related and Supporting Industries

Developing the supporting and related industries in the diamond should be part of a longer term strategy for facilitating creation of domestic industries and services and linkages that will add value throughout the supply chain. Ideas for such expansion of the cluster include:

- Developing the agrichemical subcluster
- Establishing roasting enterprises in Nicaragua or linked to Nicaraguan producers to enable the latter to capture the added value associated with this activity
- Promoting establishment of a domestic certification program and an internationally recognized certifier training program. This will enable the cluster to implement a unique program for branding its various types of premium coffee and stimulate domestic and international demand.

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DISCLOSURE:

One member of our team, Felix Maradiaga-Blandon is a citizen of Nicaragua. During the period of this project he traveled to Nicaragua with the permission of Prof. Porter.