Coffee Cultivation and Economic Development in the Castañer Region

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Executive Summary

Coffee has been grown in Puerto Rico for over 275 years. Between 1855 and 1898, for a relatively brief moment, all the necessary conditions to sustain a vigorous coffee industry were satisfied in Puerto Rico: cheap land; an abundant, dependent, and low-paid labor force; credit and financing by merchant firms; favorable access to international markets; relatively high market prices; and the agricultural know-how to take advantage of it all. Today, however, the coffee industry is on the verge of disappearing from the island. It has been the victim of wars and international political decisions, hurricanes and floods, intense international competition, relatively low prices, structural economic change, and an economic development policy with a strong urban and manufacturing bias.

At a fundamental level, the problem is that coffee cultivation traditionally has been an unsteady business. International coffee prices, like that for many other agricultural and mineral commodities, are subject to unpredictable fluctuations due to international politics, market speculation, wars, hurricanes, floods, famines, droughts and other assorted natural and man-made disasters. In Puerto Rico, coffee cultivation and processing historically has also been adversely affected by a general scarcity of workers, poor access to export markets, and a severe shortage of capital.

In spite of all this hardship and difficulty, however, coffee has been grown and consumed in the Western world for more than five hundred years and for much longer in the East. Today it is one of the world's most valuable trading commodities, second only to oil, and the demand for good quality coffee seems to increase every year. Similarly, in spite of all the fluctuations, high quality coffee has been cultivated in Puerto Rico at least since the 18th century. The morning cup of coffee has become a staple of the Puerto Rican diet and getting together for coffee with friends or business partners is a quotidian ritual in modern day Puerto Rico.

Yet, despite the existing demand for high quality coffee, the coffee industry in Puerto Rico today is in dire straits. Land and farms dedicated to coffee cultivation have declined significantly. Income, employment, and value added by the industry are not statistically significant. Policy measures to protect and regulate the industry have not generated the expected results. In short, the coffee industry in Puerto Rico is on the verge of disappearing after 275 years. In order to reverse this trend Puerto Rican policymakers have to completely rethink their approach to agriculture and recognize that the agricultural sector can play an important part in economic development.

In our view, if coffee production is to become the anchor of economic development in the Castañer region, then, in addition to the production of high-quality premium-grade coffee, the following elements have to be in place: (1) the institutional structure to promote and facilitate the organization and cooperation of the area's coffee producers; (2) legislation establishing "Denomination of Origin" rules and regulations for coffee grown in the Castañer region; (3) the establishment of a self-monitoring mechanism to discipline and police wayward producers; (4) a steady supply of field workers to pick and process the coffee; (5) financial credit on an affordable basis; (6)

access to markets and adequate financial resources for advertising and marketing; (7) sufficient crop insurance coverage to hedge against potential losses caused by hurricanes and other weather phenomena; and (8) the implementation of a broad economic diversification strategy to avoid the pitfalls associated with monoculture.

Introduction

In 1861 a fourteen-year-old boy set sail from Palma de Mallorca, via Barcelona, to the port city of Ponce in the southern part of the island of Puerto Rico. Like many other young men from the Balearic Islands at the time he sought to improve his economic situation, and perhaps attain some degree of fame and fortune, in one of the last remnants of the once mighty Spanish colonial empire.

Upon arrival in Ponce he continued his travels on the difficult road to the mountain town of Yauco, probably by mule. His destination was the *estancia* of Juan Colom, where the young man would work as a field hand (*mozo de labor*) and learn the process of cultivating, picking, washing, drying, and packing coffee for sale in the international market. Within a couple of years the young man would be promoted to overseer at the *estancia*. In that position he would learn first hand the intricacies of running a coffee farm. He was also able to identify trade and business opportunities in the thriving agricultural economy that was then developing in the emerging town of Yauco.

Seven years after arriving in Puerto Rico the young man decided to strike it on his own, and using a significant part of his accumulated savings bought a small plot of land on which he built a small store. According to the still-existing accounting records, that store reported a profit of some 190 pesos between September and December 1868. From these humble beginnings, the young immigrant rose to be one of the largest landowners in Puerto Rico, as well as a successful coffee farmer, merchant, and exporter. His name, which is still used to identify a region that overlaps the modern-day municipalities of Adjuntas, Maricao, Lares, and Yauco in Puerto Rico, was Juan Castañer.[1]

The cultivation of coffee in Puerto Rico is associated in the popular imagination with a fabled, cosmopolitan era, the so-called "golden age" of agriculture in the island, when Puerto Rican coffee was sold in Hamburg, Bremen, Le Havre, Southampton, and other major European cities.[2] Puerto Rican grandmothers to this day tell their grandchildren stories about how Puerto Rican coffee was once served in the Vatican; it was literally, according to grandmotherly lore, the "coffee of Popes."

It would be a mistake, however, to romanticize the farming of coffee and its processing because the "history of coffee is inextricably bound up in a history of inequity."[3] The coffee trade historically has been related to, or connected with, colonialism, several revolutions, the oppression of workers, the accumulation of massive debt burdens, and unequal economic development. Furthermore, "economies that are historically coffee-based have created the ground rules by which a ruling oligarchy can impose its will on the unrepresented masses."[4] In Puerto Rico, coffee farming during the mid to late 19th century was similarly associated with debt peonage, labor exploitation, land speculation, and property foreclosures.

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[1] Juan Castañer's basic biographical data is taken from *Castañer: Una Hacienda Cafetalera en Puerto Rico (1868-1930)* by Luis Edgardo Díaz Hernández, (Editorial Edil: Río Piedras, 1983), p. 18-19.
[2] Fernando Picó, *Amargo Café (los pequeños y medianos caficultores de Utuado en la segunda mitad del siglo xix)*, (Ediciones Huracán: San Juan, 1981), p. 34.
[3] Mark Pendergrast, *Uncommon Grounds: The History of Coffee and How it Transformed our World*, (Basic Books: New York, 2010), p. 373.
[4] Antony Wild, *Coffee: A Dark History*, (W. W. Norton & Co.: New York, 2005), p. 15.

Moreover, coffee cultivation traditionally has been an unsteady business. International coffee prices, like that for many other agricultural and mineral commodities, are subject to unpredictable fluctuations due to international politics, market speculation, wars, hurricanes, floods, famines, droughts and other assorted natural and man-made disasters. In Puerto Rico, coffee cultivation and processing historically has also been adversely affected by a general scarcity of workers, poor access to export markets, and a severe shortage of capital.

In spite of all this hardship and difficulty, however, coffee has been grown and consumed in the Western world for more than five hundred years and for much longer in the East. Today it is one of the world's most valuable trading commodities, second only to oil, and the demand for good quality coffee seems to increase every year. Similarly, in spite of all the fluctuations, high quality coffee has been cultivated in Puerto Rico at least since the 18th century. The morning cup of coffee has become a staple of the Puerto Rican diet and getting together for coffee with friends or business partners is a quotidian ritual in modern day Puerto Rico.

In this paper we will (1) briefly describe the current state of the agricultural sector in the Puerto Rican economy; (2) provide an overview the coffee industry; (3) analyze the historical dynamics of coffee farming and production in Puerto Rico; (4) provide some recommendations to revive coffee farming in the Castañer region of Adjuntas, Maricao, Lares, and Yauco and (5) set forth some conclusions about the future of agriculture as a contributor to economic growth in Puerto Rico.

Current State of the Agriculture Sector in Puerto Rico

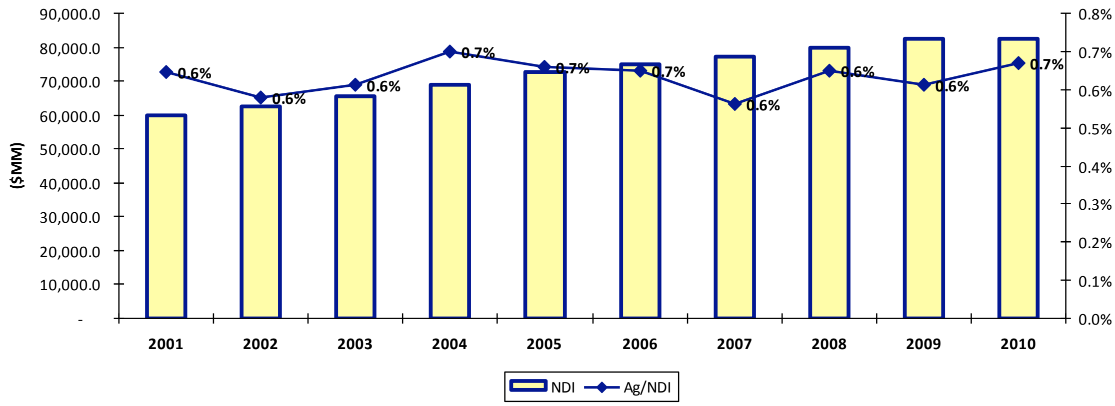
Large scale agriculture did not take place in Puerto Rico until the 1830s, but even prior to that date, the island, according to reports written by Fray Iñigo Abbad y Lasierra (1788) and Col. George D. Flinter (1834), managed to export small amounts of coffee, sugar, rice and even corn. After the 1830s, the Spanish Crown actively promoted the production coffee and sugar for export. By 1897, coffee accounted for 48.9% of all cultivated land in the island, some 122,358 *cuerdas*, and for 76.9% of the value of total exports that year.[5] Sugar cane, also in 1897, accounted for 17.8% of cultivated land, some 61,556 *cuerdas*, and refined sugar accounted for 20.7% of the value of all exports.

However, after the American occupation, sugar replaced coffee as Puerto Rico's primary export crop. By 1935, some 765,375 *cuerdas* were dedicated to sugar cane cultivation and sugar exports accounted for 60% of the value of total exports that year. In contrast, some 182,316 *cuerdas* were dedicated to coffee production but coffee accounted for only 0.3% of the value of total exports that year.

The current situation is that the agricultural sector has been all but abandoned in the island. While agricultural production accounted for 17.5% of Puerto Rico's GNP and 35.9% of all employment in the island in 1950, by 1970 the respective shares were down to 3.4% and 9.9%. As of 2010, agriculture has virtually disappeared from Puerto Rico's national income and production accounts, generating only 0.7% of Puerto Rico's net domestic income and accounting for 1.5% of all employment in the island.

[5] A *cuerda* is a land measurement equal to 0.97 acres.

Figure 1:
Agriculture Share of Net Domestic Income

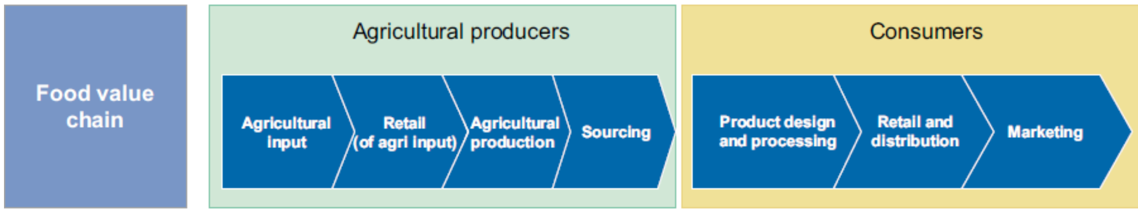


Source: Puerto Rico Planning Board

According to data from the Puerto Rico Department of Agriculture, during 2010 Puerto Rico imported 70% of the eggs, 80% of the chicken, and 90% of all the beef and veal meat consumed in island. Indeed, Puerto Ricans imported that year more than 50% of all the staples in their diet, with the exception of milk, plantains, and green bananas.

These meager statistics mean that the food value chain in Puerto Rico is severely fragmented. As shown on Figure 2 below, the process of growing, producing and marketing food accounts for most of the activity in the agriculture sector and drives many other parts of the economy. It involves multiple steps, engages a diverse set of actors, and depends heavily on the operating environment, which is influenced by climate, governance and other external factors.

Figure 2:
The Food Value Chain



Source: World Economic Forum, The Next Billions: Business Strategies to Enhance Food Value Chains and Empower the Poor, January 2009, p.12.

The weakening of Puerto Rican agriculture can be traced historically to a policy agenda implemented more than sixty years ago by a technocratic, "new bourgeoisie" that associated modernization with an industrial and urban society and which perceived rural society to be the last redoubt of the island's *ancien regime,* led by a politically conservative landed elite that was inimical to its political interests.

The crux of the matter is that, contrary to the labor-surplus models upon which Puerto Rico's industrialization program was based and which are predicated on achieving significant productivity growth in the agricultural sector *prior* to agricultural workers moving away from the fields and towards the factories, the development program implemented during the 1950s by the then new cadre of Puerto Rican technocrats completely discarded and abandoned agriculture. A big agricultural sector just didn't fit with the image of modernization and progress that the island's government wanted to project back then and it clashed with the technocratic project of implementing a new, "modern" political, economic, and social order in Puerto Rico.

According to James Dietz, the fundamental flaw in Puerto Rico's development program "was the degree to which it extended the otherwise sound premise that agriculture was too fragile a base for economic development."[6] Furthermore,

> From the assertion that industrialization was required because agriculture *alone* could not provide an adequate economic base, a program was forged that functioned as if agriculture could be ignored altogether, and industrialization, at nearly any cost, was the exclusive goal. Yet the choice need not have been either agriculture *or* industry; it could have been a mix of agriculture *and* industry, and of industry *in* agriculture, along with selective manufacturing.

Urban Bias in Traditional Development Theory

The industrialization-led strategies adopted by Puerto Rico, and many other developing countries, resulted in what economic historians have described as a pronounced "urban-bias" in policy and investment decisions.[7] This policy bias has consistently generated a structural transformation where the share of agriculture in employment and GDP declines as per capita income rises. As shown on Figure 3 below, this pattern of structural transformation shows remarkable consistency across time and geographical areas. In this sense, the Puerto Rican experience is quite similar to that of dozens of other developing countries.

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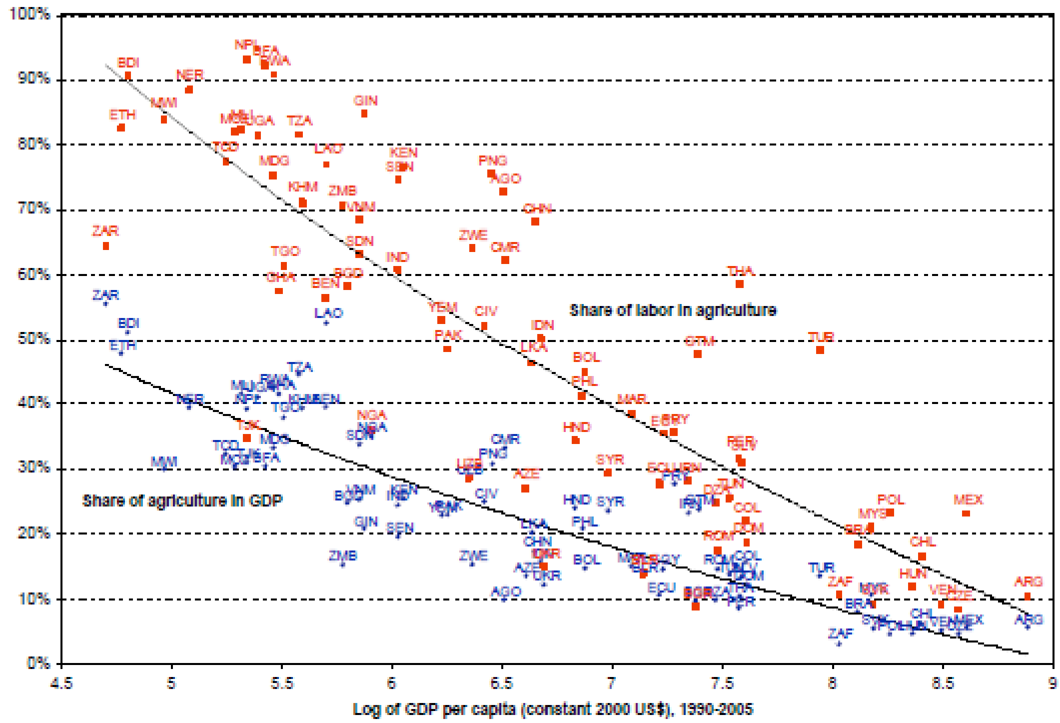
[6] James Dietz, *Economic History of Puerto Rico: Institutional Change and Capitalist Development*, (Princeton University Press: Princeton, 1986), p. 274.

[7] Derek Byerlee, Alain de Janvry, and Elisabeth Saudolet, *Agriculture for Development: Toward a New Paradigm*, Annual Review of Resource Economics, Vol. 1, No. 1, 2009, p. 2.

Figure 3:
GDP Per Capita and Share of Labor in Agriculture and Share of Agriculture in GDP



Source: Byerlee, de Janvry, and Saudolet (2009)

This urban bias was the subject of intense debate in the field of development studies during the 1960s and 70s, as it was recognized that a modernized agricultural sector could contribute significantly to growth and as economists identified strong linkages and documented the significant multiplier effects of agricultural growth on non-agricultural sectors.

Indeed, as we will demonstrate below, agriculture, especially the cultivation of coffee and sugar for export, generated employment and income for thousands of Puerto Ricans during the 19th century and a good part of the 20th century.

Coffee – The Basics

The coffee plant is a woody shrub that can reach up to thirty feet in height, depending on the species and growth conditions. In practice, it is usually pruned to a height of about eight feet to facilitate harvesting. Coffee is a member of the genus *Coffea* in the family *Rubiaceae* and can be naturally found in the tropical forests of Africa where it grows in the shadow provided by naturally dense tree canopies of trees. The plant thrives in tropical conditions at altitudes between 1,000 and 6,000 feet above sea level, with significant sunshine, moderate rainfall, average temperatures between 60 and 70 degrees Fahrenheit and no frosts.[8]

During the flowering season, small white flowers bloom from the base of deep green, shiny leaves. After pollination, the flower withers and is replaced by a fleshy fruit surrounding a hard seed. Each "cherry" usually contains two seeds or coffee "beans" that are covered by gummy mucilage (known as "*baba*" in Spanish). A mature coffee tree (three to five years after planting) produces about 2,000 coffee cherries per year on average, or about 4,000 coffee beans, roughly the equivalent to one pound of roasted coffee.[9]

The green coffee cherries can take from seven to eleven months to ripen, depending on climate and other conditions. When ripe, the coffee cherries (known as "*café uva*" in Spanish) turn bright red and are about the size of a small oval grape.

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[8] Nina Luttinger and Gregory Dicum, *The Coffee Book: Anatomy of an Industry from Crop to the Last Drop*, (The New Press: New York, 2006), p. 39-40.
[9] Id. at p. 40.

However, not all cherries mature uniformly at the same time, and a tree may need to be harvested two or three times to obtain the full amount of mature coffee cherries. In addition, harvest seasons vary throughout the world, depending on altitude, climate, species, and variety.

At harvest time fieldworkers usually handpick the mature coffee cherries. The beans need to be removed relatively quickly because otherwise the spontaneous fermentation of the mucilage will spoil them. There are two methods to remove the bean. The first and oldest, known as the dry method, is still widely used in Brazil and Asia today. According to Pendergrast:

> Both ripe and unripe cherries, along with buds and leaves, are stripped from the branches onto big tarps spread under the trees. Then they are spread to dry on huge patios. They must be turned several times a day, gathered up and covered against the dew at night, then spread to dry again. If the berries are not spread thinly enough, they may ferment inside the skin, developing unpleasant or "off" tastes. When the skins are shriveled, hard, and nearly black, the husks are removed by pounding on them.[10]

The dry method often yields poor results and dry-processed coffee is generally considered to be of inferior quality and taste.

The second method, known as the wet method, is widely used in Central America and the Caribbean and is far more labor intensive, requires relatively sophisticated machinery and infrastructure, and needs an abundant supply of water. With this method the mature coffee cherries are depulped by machine and left in water-filled fermentation tanks for up to forty-eight hours. After the mucilage decomposes the tanks are drained and the mucilage washes off with the wastewater. The coffee beans, however, are still

[10] Pendergrast at p. 26.

covered with a white parchment ("*pergamino*" in Spanish) that needs to be removed prior to roasting and grinding.

According to some coffee experts, the wet method produces beans with a more subtle and seasoned flavor due to the decomposition and fermentation of the mucilage. The downside is that this processing method, although prized by coffee aficionados, produces an enormous amount of waste product, which if not handled properly may cause significant environmental pollution, especially of rivers and other water sources.

The Coffee Industry: Species, Classifications, and Grades

There are more than twenty species within the genus *Coffea*, but two species account for most of the coffee sold worldwide. *Coffea arabica*, commonly known as arabica, is native to the highlands of Ethiopia, and has been the traditional source for coffee beans for centuries. *Coffea canephora* (robusta variety), traditionally known simply as robusta, is native to the lowland forests of West Africa, and entered the commercial market relatively recently.

The arabica and robusta species differ in taste, caffeine content, disease resistance and optimum growing conditions. High grown arabica beans, for example, develop slowly, are denser and more flavorful than lower growths. Arabica is by far the preferred bean of coffee connoisseurs, commands a higher market price, and is used in fine, gourmet, or specialty coffees and as a flavor component in robusta blends.

Two varieties of the arabica species dominate the global market today: (1) the *typica* variety is the base from which many coffee varietals have been developed and while its trees have relatively low yields it is deemed to have an excellent cup quality; and (2) the *Bourbon* variety, a type developed by the French in the island of Bourbon (now called Reunión in the Indian Ocean) in the 18th century and which is well regarded in the coffee trade.[11]

According to data from the International Coffee Organization (ICO) world coffee production in 2010/11 totaled some 131 million 60kg bags, or approximately 17.3 billion pounds. During that year, arabicas accounted for approximately 62% per cent of the world coffee supply, with Brazil and Colombia being the larger producers. Robustas, on the other hand, accounted for 38% of world production, with Brazil and Vietnam reporting the highest production.

Table 1-A
Overview of World Coffee Production (millions of 60kg bags)

Coffee Year	2006/07	2007/08	2008/09	2009/10	2010/11*
World	**127.1**	**127.8**	**126.7**	**128.6**	**131.1**
Arabicas	**77.3**	**80.1**	**75.8**	**77.8**	**80.8**
Brazil	29.1	30.3	32.2	32.5	33.6
Colombia	12.6	12.5	8.7	9.0	9.2
Other Americas	23.1	24.2	22.8	21.8	23.2
Africa	8.3	8.7	7.6	9.6	10.3
Asia and the Pacific	4.2	4.4	4.4	4.9	4.4
Robustas	**49.7**	**47.7**	**50.9**	**50.8**	**50.4**
Brazil	10.2	10.7	10.6	10.9	12.7
Other Latin America	0.5	0.4	0.4	0.4	0.3
Viet Nam	19.3	16.5	18.5	18.0	18.5
Indonesia	6.4	6.9	8.1	8.6	6.8
Other Asia and Pacific	5.4	5.3	5.5	6.2	4.9
Côte d'Ivoire	2.8	2.6	2.4	1.9	2.2
Uganda	2.2	2.6	2.6	2.4	2.2
Other Africa	2.9	2.7	2.8	2.4	2.8
Shares (%)					
Arabicas	60.8	62.7	59.8	60.5	61.6
Robustas	39.2	37.3	40.2	39.5	38.4

Source: ICO and USDA.
* Preliminary.
Note: Totals may not add up owing to rounding. For more up-to-date statistics visit *www.ico.org*.

[11] Pendergrast at p. 15.

The ICO has classified coffee production into four quality groups on the basis of the predominant type of coffee produced by each member country. As shown on the table below, the ICO's classification consists of: (1) Colombian mild arabicas, (2) Other mild arabicas, (3) Brazilian and other natural arabicas, and (4) Robustas.

Figure 4:
ICO Quality Classification Groups

Quality group	Producers
Colombian mild arabicas	Colombia, Kenya, United Republic of Tanzania
Other mild arabicas	Bolivia (Plurinational State of), Burundi, Costa Rica, Cuba, Dominican Republic, Ecuador, El Salvador, Guatemala, Haiti, Honduras, India, Jamaica, Malawi, Mexico, Nicaragua, Panama, Papua New Guinea, Peru, Rwanda, Venezuela (Bolivarian Republic of), Zambia, Zimbabwe
Brazilian and other natural arabicas	Brazil, Ethiopia, Paraguay, Timor-Leste, Yemen
Robustas	Angola, Benin, Cameroon, Central African Republic, Congo, Côte d'Ivoire, Democratic Republic of the Congo, Equatorial Guinea, Gabon, Ghana, Guinea, Indonesia, Liberia, Madagascar, Nigeria, Philippines, Sierra Leone, Sri Lanka, Thailand, Togo, Trinidad and Tobago, Uganda, Viet Nam

Source: The Coffee Exporter's Guide, 3rd Edition, International Trade Center, (Geneva: Switzerland, 2011)

Brazil has been the dominant coffee producer in the world for quite some time now. The Brazilians have successfully "technified" coffee production, breeding high-yield varieties that grow best in partial or full sun and that can be planted in the lowlands.[12] However, Brazilian coffee, with some exceptions, traditionally has lacked acidity and body and is usually considered inferior to Colombian and other mild arabicas produced around the world.

Price differentials among the different coffee classes can be significant. According to data from the ICO's 2011 Annual Review, set forth on Table 1 below, the

[12] In addition to low quality coffee, technification also produces adverse environmental effects. Cultivated without shade, Brazilian coffee grows very quickly and depletes the soil unless artificially fertilized. Furthermore, the lack of shade trees facilitates soil erosion.

international market price for a pound of Colombian mild green (unroasted) coffee beans was more than 2.5 times the price for a pound of green robusta beans.

Table 1: ICO indicator and futures market prices
Coffee year averages 1995/96 to 2010/11

	ICO Composite	Colombian Milds	Other Milds	Brazilian Naturals	Robustas	New York*	London*
1995/96	106.39	130.23	121.66	123.92	91.10	112.45	83.01
1996/97	126.94	188.05	177.38	153.55	76.50	151.95	71.75
1997/98	115.23	155.61	148.72	137.15	81.72	136.38	76.00
1998/99	88.53	115.61	104.85	88.97	72.21	105.32	68.58
1999/00	72.86	112.66	96.88	86.61	48.83	103.81	46.63
2000/01	47.84	77.05	65.81	57.53	29.88	66.24	27.27
2001/02	45.46	63.74	59.21	43.72	26.85	52.36	21.83
2002/03	52.17	65.89	64.89	48.94	37.23	65.89	34.56
2003/04	57.77	74.41	73.51	62.07	36.37	73.24	33.16
2004/05	85.30	112.29	111.22	98.22	46.05	108.03	42.72
2005/06	91.44	113.04	110.84	100.86	61.45	108.17	54.61
2006/07	104.24	122.08	120.08	108.35	82.73	118.70	74.71
2007/08	126.67	145.79	142.98	130.44	106.36	140.37	98.28
2008/09	111.80	164.37	135.43	110.14	78.62	122.16	71.43
2009/10	134.41	209.90	176.46	138.17	73.85	149.06	66.74
2010/11	205.65	281.32	268.55	236.82	107.34	249.66	100.66
% change 2009/10 to 2010/11	**53.0**	**34.0**	**52.2**	**71.4**	**45.4**	**67.5**	**50.8**

In US cents/lb
*Average of 2nd and 3rd positions

Source: International Coffee Organization, 2011 Annual Review

In addition, green coffee is graded and classified for export with the aim of obtaining the highest price possible. However, there is no universal grading and classification system – each producing country has its own, which it may also use to set (minimum) standards for export.

Two of the more widely used methods for grading coffee are the Specialty Coffee Association of America (SCAA) Green Coffee Classification Method, which is deemed to be appropriate for grading green specialty beans, and the Brazilian/New York Green

Coffee Classification Method, which is deemed to be more precise but also more time consuming.

Both methodologies begin with a 300-gram sample of “properly hulled coffee beans”. The beans are then measured using different-sized screens. The theory being that coffee beans grown in the highest altitudes are denser and larger in size than coffee beans grown at other altitudes and have the best flavor profiles. The beans are then inspected for various defects, such as insect damage, mold, parchment remnants, withered or mottled beans, etc., and classified according to a pre-set scale. Finally, the coffee beans must be roasted and cupped to evaluate cup characteristics.

The SCAA coffee bean classification system is as follows:

1. **Specialty Grade Green Coffee (1):** Specialty green coffee beans have no more than 5 full defects in 300 grams of coffee. No primary defects are allowed. A maximum of 5% above or below screen size indicated is tolerated. Specialty coffee must possess at least one distinctive attribute in the body, flavor, aroma, or acidity categories. Must be free of faults and taints. No quakers are permitted.[13] Moisture content is between 9-13%.

2. **Premium Coffee Grade (2):** Premium coffee must have no more than 8 full defects in 300 grams. Primary defects are permitted. A maximum of 5% above or below screen size indicated is tolerated. Must possess at least one distinctive

[13] *Quakers:* Unripe coffee beans, often with a wrinkled surface. Quakers do not darken well when roasted.

attribute in the body, flavor, aroma, or acidity categories. Must be free of faults and may contain only 3 quakers. Moisture content is between 9-13%.

3. **Exchange Coffee Grade (3):** Exchange grade coffee must have no more than 9-23 full defects in 300 grams. It must be 50% by weight above screen size 15 with no more than 5% of screen size below 14. No cup faults are permitted and a maximum of 5 quakers are allowed. Moisture content is between 9-13%.

4. **Below Standard Coffee Grade (4):** 24-86 defects in 300 grams.

5. **Off Grade Coffee (5):** More than 86 defects in 300 grams.

The traditional coffee exported from Puerto Rico during the 19th century, and for a good part of the 20th, was a mild arabica, oftentimes of the Bourbon variety, usually depulped and processed using the wet method, and the beans were hand-selected to assure the highest quality.[14] If we were to apply the SCAA classification methodology retroactively, Puerto Rican coffee would probably have rated either as a Specialty or Premium grade coffee.

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[14] Luis Pumarada O'Neill, *La Industria Cafetalera de Puerto Rico, 1736-1969*, (Oficina Estatal para la Preservación Histórica: San Juan, 1990), p. 8.

Coffee Cultivation in Puerto Rico – The Beginnings

There are two different versions about the origins of coffee cultivation in Puerto Rico. According to Salvador Brau's *Historia de Puerto Rico* (1904), Governor Ramírez de Estenós, who was familiar with the coffee business in Cuba, introduced and promoted the cultivation of coffee in Puerto Rico in 1755. However, Cayetano Coll y Toste, in his *Propiedad Territorial en Puerto Rico*, asserts that coffee was introduced into the island from San Domingo (Haiti) in 1736. [15]

Circumstantial and archival evidence appears to support Coll y Toste's version. The French colony of San Domingo was the principal coffee producer in the region during most of the 18th century. Given the intensity of the contraband trade at that time among and between the Caribbean islands it was only a matter of time before coffee was introduced to Puerto Rico. Furthermore, Alejandro de O'Reilly in his 1765 report to the Spanish king mentions that coffee was already being exported from Puerto Rico, albeit in small quantities. Given that coffee plants take anywhere from three to five years to mature, it seems unlikely that Puerto Rico would be already exporting coffee by 1765 if the plants had been introduced in the island only in 1755.

It must be noted that at that time Puerto Rico was essentially a military garrison, guarding the eastern approach to the Caribbean. According to Laird Bergad, the island

[15] Francisco Moscoso, *Agricultura y Sociedad en Puerto Rico: Siglos 16 al 18*, (Instituto de Cultura Puertorriqueña: San Juan, 2001), p. 181.

was characterized by "underpopulation, economic stagnation, and colonial neglect until late in the 18th century".[16]

This official policy of benign neglect was consistent with Spain's principal interest in its colonies in the New World, which was to obtain gold and silver, "a mercantilist obsession that Spain retained long after that doctrine had become discredited in Europe."[17] Puerto Rico, according to contemporaneous reports, had small quantities of these precious metals and they were promptly depleted. Unfortunately, the Spanish fixation with mercantilism, which equated a nation's wealth with a positive trade balance and the accumulation of metallic reserves, endured and manifested itself in economic regulations that prevented Spanish colonies from producing manufactured goods for their own consumption because that would have reduced their need for imports from the Spanish mainland.[18]

Spain viewed its colonies largely as extractive enterprises and actively discouraged the establishment of indigenous agricultural or manufacturing production for export. So strong was this imperative that according to some observers already by 1580 "Spaniards [were] a rentier race, a nation of gentlemen, living in parasitic dependence upon the gold and silver of the Indies and the industry of the Low Countries."[19] This lack of attention to productive activities highlights a fundamental failure of economic policy

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[16] Laird W. Bergad, *Coffee and the Growth of Agrarian Capitalism in Nineteenth-Century Puerto Rico*, (Princeton University Press: Princeton, 1983), p. 3.
[17] Dietz at p. 6.
[18] Victor Bulmer-Thomas, *The Economic History of Latin America Since Independence*, (Cambridge University Press, 2003), p. 2
[19] Gerald Brenan, *The Spanish Labyrinth: The Social and Political Background of the Spanish Civil War*, (Cambridge University Press, 2006)(originally published in 1943), p. 11.

during the Spanish era and imposed enormous costs on Spanish colonies throughout the New World.[20]

Puerto Rico was not the exception to this rule and it is not until the 1830s, when Spain had already lost most of its colonies in the New World, that the island became a significant producer of coffee and sugar for export. Until that time, however, Puerto Rico had been one of the Spanish Empire's poorest colonies and it lacked any significant savings, accumulated profits, or agricultural surplus to finance its economic development.[21]

Specifically, the lack of financial capital posed a significant constraint for the development of the island's economy. This structural weakness manifested itself in two ways. First, there were no banks or lending institutions capable of mobilizing financial resources from abroad. This failure of modern or capitalist market-based financial intermediation was caused in large part by powerful landowners and large merchants who had a monopoly on lending to smaller producers, often at usurious rates.[22] This monopoly would last well into the 19th century, and it is not until the 1880s that the first financial institutions are established in the island.

Second, there was a shortage of generally accepted and widely circulated currency in the island. In 1813, the Crown authorized Venezuelan coins to circulate as legal tender

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[20] John H. Coatsworth, "Economic and Institutional Trajectories in Nineteenth-Century Latin America" in *Latin America and the World Economy Since 1800*, John H. Coatsworth and Alan M. Taylor, editors, (Harvard University Press: Cambridge, 1998), p. 31.
[21] Dietz at p. 25.
[22] Id. at p. 29.

in Puerto Rico. This was the state of affairs until 1857, when the Mexican peso replaced Venezuelan currency. Nonetheless, the continuing shortage of currency forced some *haciendas* and commercial houses to issue their own coins and paper money. It is not until 1895 that the Crown allowed for the minting, in Spain, of Puerto Rico's own currency, a development that greatly facilitated commercial transactions in the island.[23]

Notwithstanding these structural impediments, the island economy did show some signs of increased activity by the 1790s due to several factors. First, the Spanish Crown terminated the monopoly long enjoyed by the ports of Cadiz and Seville with respect to trade with the colonies. The authorization of nine other ports to engage in commercial activity with the colonies was a significant development that led to increased trade opportunities for Spanish companies like the *Real Compañía Barcelonesa de Nuestra Señora de Montserrate* and the *Compañía Aguirre Aristegui*.[24]

Second, the arrival of French and Irish immigrants, among others, in the 1790s stimulated economic growth as these newcomers brought with them capital and commercial experience in the sugar and coffee trades. Finally, the slave revolt in San Domingo in 1791 and the subsequent bloody civil wars that followed effectively destroyed that country's significant production capabilities. During the 18th century the French had made their colony one of the world's leading producers of sugar and coffee. Indeed, by 1788 San Domingo, accounted for approximately *half* the world's coffee

[23] Id. at p. 89. The Puerto Rican peso remained in circulation until 1900.
[24] Rafael de Jesús Toro, *Historia Económica de Puerto Rico*, (South-Western Publishing Co.: Ohio, 1982), p. 27.

production.[25] The decline in production from Haiti generated a surge in the price of both sugar and coffee and higher prices, in turn, created opportunities for Puerto Rico's emerging merchant class.

A significant fraction of that emerging merchant class, it must noted, had economic and political interests that often clashed with policies of the Spanish government, as it became evident during the political crisis of 1808-1814 generated by the French invasion of Spain. In 1810, the local elites sent a representative to the Cortes scheduled to meet in Cadiz. There, the representative from Puerto Rico, Ramón Power y Giralt, presented a series of recommendations ostensibly to improve economic activity in the island. Among these, we find a request for the abolition of tariffs and, initiating a pattern that will be repeated to this day, a recommendation to *end all taxes* on the land. The social and political significance of these demands is important as they evidence the rise of a local *hacendado* class that by the early 19th century was able to reflect on local economic problems and articulate a specific policy program for promoting investment and long-term economic activity in the island, independently of the commercial interests of the metropolitan power. This emerging *criollo* landed class, however, would eventually become subordinated to an immigrant merchant class, led by the likes Juan Castañer, which had a different outlook and sought other long-term objectives.

For now, though, the important point is that all these factors generally contributed to an increase of economic and commercial activity in the island by the late 18th century. However, "it would be misleading to give the impression that the entire island was

[25] Pendergrast at p. 17.

integrated into the world trading system by the commodities boom of the eighteenth century."[26] The island economy at that time consisted of coastal enclaves of export agriculture that contrasted sharply with the interior mountainous regions, which remained as "an internal frontier, underpopulated [and] unexploited." This dichotomy between the relatively developed coast and the relatively undeveloped interior regions would be one of the defining characteristics of the island economy until the mid-1800s.

The 19th Century – Part I (1800-1850)

The commercial foundations laid during the last third of the eighteenth century facilitated the intensive development of commercial agriculture for export during 19th century. As we have mentioned, two crops dominated the island's agricultural production during the 1800s. Initially, sugar was the leading export; both in terms of value and volume, and its dominance lasted for roughly the first half of the century. During this period, coffee cultivation had relatively low importance in the island's economy and was mostly relegated to coastal territories that were not appropriate for its development.[27] Beginning in the 1850s, however, coffee grows in relative importance until it becomes the dominant export crop by the end of the century.

The promulgation of the *Real Cédula de Gracias*, a royal decree that facilitated immigration to Puerto Rico, was an important development that enabled the intensive

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[26] Bergad at p. 10.
[27] Fernando Picó, El café y el inicio de la agricultura comercial en la montaña puertorriqueña, 1855-1928, in *Al filo del poder: Subalternos y dominantes en Puerto Rico, 1739-1910*, (Editorial de la Universidad de Puerto Rico: Río Piedras, 1993), p. 61.

production of coffee in Puerto Rico later in the 18th century. According to the terms of the decree, approximately six acres of land would be granted to every free, white immigrant and an additional three acres for each slave. Free black immigrants qualified to receive the same allotment as slaves. In addition, immigrants were granted tax exemptions on slaves and on personal income for up to ten years. The immigrants attracted by these grants "brought with them not only slaves and other means of production; they came laden with the ideas, experiences, skills, and emphasis on production and profits of the capitalist revolutions sweeping Europe and North America."[28]

Among these immigrants we find Corsicans, who settled mostly in Yauco and San German; Mallorcans, who arrived and settled in Lares and other towns of the central interior; French from Haiti, who also settled in the western zone of the island; and Canarians, who settled mostly in the north coast of Puerto Rico. According to Bergad, "wherever their origins, and regardless of where they resided in Puerto Rico…in every municipality, whether dominated by sugar or coffee culture, immigrants pushed the old *criollo* families into the background."[29]

Immigrants to Puerto Rico during this period followed a pattern similar to that of other contemporaneous migrants to the coffee-growing regions of El Salvador, Nicaragua, and Costa Rica, where "the new immigrants generally used their skills to

[28] Dietz at p. 22.
[29] Bergad at p. 19.

move into the more technical and financially demanding but also much more profitable processing and exporting activities, and sometimes into production."[30]

Similarly, the Corsicans and Mallorcans that arrived in Puerto Rico during the early 1800s usually operated initially as merchants, running general supply stores, first in the towns and then in the rural areas, establishing commercial linkages with the highland zones, where "small country stores distributed manufactured goods in return for coffee or food crops later sold in the towns."[31] Able to draw on the capital of large commercial houses established in the coast, they in turn became key providers of credit, one of the essential elements necessary for establishing a modern capitalist market economy in the central highlands of Puerto Rico. These loans were usually collateralized with crops and ultimately with land. As a consequence many of these immigrant merchants became landowners literally by default, as many *criollo* farmers who were unable to pay their obligations were forced to turn over title to their land.

The general scarcity of laborers, however, remained a problem. This was due in part to the general underpopulation of the highland areas during the first half of the 19th century and in part to the relative availability of uncultivated land for squatters. *Agregados* (roughly sharecroppers) and squatters were relatively free to move around and were understandably reluctant to be converted into day laborers.[32] In practice, therefore,

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30 Jeffrey Paige, *Coffee and Power: Revolution and the Rise of Democracy in Central America*, (Harvard University Press: Cambridge, 1997), p. 15.
31 Bergad at p. 23.
32 Id. at p. 50.

the only way to guarantee the availability of labor prior to 1850 was by relying on slave labor, which, in turn required large capital investments.

The poor development of the infrastructure for exporting was another factor limiting the growth of the coffee industry. Transportation and communications were rather rudimentary in the island at that time. Furthermore, merchants in the highlands depended on the large costal commercial houses for information about international prices and shipping schedules and for transporting the coffee from the highlands of Yauco or Lares down to the port of Ponce.

In spite of these difficulties, coffee exports from Puerto Rico increased substantially during the first half of the century, from 44,000 *quintales* (hundredweight) in 1815 to about 100,000 *quintales* in 1850. It must be noted that the earnings generated by this increase in export activity were not necessarily reinvested in Puerto Rico. The migrants from Mallorca, in particular, retained close ties with the families left behind and many of them repatriated a good portion of their earnings with the hope of eventually returning back home. From the available records it appears that "the goal of every Mallorcan merchant established in Lares was to return to Europe, either to retire or continue their merchant careers."[33]

[33] Bergad at p. 163.

The 19th Century – Part II (1850-1898)

The production of coffee in Puerto Rico intensified significantly during the second half of the 19th century. Several factors contributed to this economic expansion. First, it is during the second half of this century that the world economy became fully interconnected. Steamships, railways and telegraphs all contributed to connect the then imperial powers with their far-flung colonies around world, as "outward from London, Glasgow, Amsterdam, and Hamburg there radiated the lines – shipping lines, railway lines, telegraph lines – that were the sinews of Western imperial power."[34]

Puerto Rico, in general, benefitted from these developments because they reduced the island's relative isolation. Coffee producers in Yauco, in particular, benefitted from the establishment of a telegraph line in that town, which allowed price information to be transmitted almost in real time, and from the construction of a direct rail line to the port in Ponce, which lowered transportation costs from the highlands to the docks for direct shipment to Europe.

Second, the establishment of the *jornalero* law in 1849 had an immediate short-term impact on the labor market. This was a so-called anti-vagrancy statute that essentially coerced all property-less, able-bodied males age 16 and over to work and carry with them at all times a *libreta*, or workbook, with his registration number. On this workbook landowners would set forth the details of labor contracts with the *jornalero*, as

[34] Niall Ferguson, *The War of the World: Twentieth Century Conflict and the Descent of the West*, (Penguin Press: New York, 2006), p.15.

well as his behavior at work and any debts incurred. Failure to carry the *libreta* was an offense punishable by law. The enactment of this law had several immediate effects:

> First, was the quest for land titles by those who could secure the credit or generate the capital to purchase small plots that would legally exempt them from the *jornalero* classification. Second, was the legal conversion of many *agregados* (sharecroppers) to *arrendatarios* (leaseholders) who had to appear before the local notary and agree to contracts with established landowners. Third, was the creation of a specific legal category of *jornalero*, who were supplied with workbooks…[35]

The promulgation of the *jornalero* law, therefore, simultaneously (1) ended the relative availability of uncultivated land for squatters; (2) promoted the establishment of highly fragmented small farms; and (3) created what essentially was a captive labor force, thus ending the relative scarcity of labor in the highlands.

It would be a mistake, however, to assert that the *libreta* system created a modern labor force working under labor market conditions. Instead, Bergad, Dietz, and Picó find that the implementation of the *libreta* system led to a marked increase in debt peonage and other abuses as *jornaleros* in many cases became heavily indebted to their employers and many were reported by prominent landowners to the local *Junta de Vagos y Amancebados* to be disciplined for even relatively minor violations of the *jornalero* law.[36] The important point is that by the time the *libreta* regime officially ended in 1873, a large class of landless workers had been created. It was these laborers who provided the essential hands for harvesting Puerto Rican coffee.

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[35] Bergad at p. 116.

[36] Fernando Picó, "Lucha en el cafetal: resistencia a subordinación económica y social en la zona cafetalera puertorriqueña en la segunda mitad del siglo XIX", in *Al filo del poder: Subalternos y dominantes en Puerto Rico, 1739-1910*, (Editorial de la Universidad de Puerto Rico: Río Piedras, 1993), p. 149.

During this period we also observe a greater degree of vertical integration and diversification among some of the larger producers. The career of Juan Castañer is indicative of this trend. After establishing his small store in Lares, he began to acquire land, usually as a result of foreclosure on loans his company had made to *criollo* coffee farmers, often at interest rates between 15 and 25 percent. His total landholdings eventually exceeded 2,000 *cuerdas* dispersed among various municipalities. His large *hacienda* in Barrio Bartolo in Lares had state-of-the-art machinery for processing coffee, large covered patios for drying the beans, as well as a large warehouse space, which he also leased to smaller farmers. In addition, Castañer operated a commercial store in Yauco to negotiate directly with merchants in Ponce. Finally, in addition to his farming and warehousing operations, credit and factoring services, and merchant house, by the early 1880s Castañer's firm provided coffee transportation services from Lares to Yauco and from there to Ponce. Therefore, Castañer and other diversified merchants generally derived profits from three distinct activities: from the sale of goods they brought in from the coast; from interest on loans to smaller, mostly *criollo* producers; and from processing and exporting the coffee they received either as payment for loans to *criollo* producers or bought from local farmers at favorable prices set by the merchants themselves.

The tendency to integrate and diversify, exemplified by Juan Castañer, is also typical of certain coffee elites in Central America, especially in El Salvador. According to Paige, there are important differences between coffee growers and coffee processors. Growers are essentially members of a landed elite engaged in agrarian production, own a significant amount of land, and exercise paternalistic or coercive control over at least a portion of the rural population to ensure a steady supply of labor. Processors, on the other hand, are essentially industrial capitalists using an agricultural raw material and employing wage labor, that is, "they are manufacturing capitalists".[37]

Furthermore, "to the degree that the coffee elite is involved in industrial processing, it becomes more an agro-industrial, financial, or commercial class and less a purely agrarian class."[38] This division between coffee growing and harvesting on the one hand and coffee processing and export on the other, tends to parallel, although not perfectly, the division between the *criollo* and the immigrant members of the Puerto Rico coffee elite. The *criollo* landowners, notwithstanding their status as members of the landed coffee elite, for the most part did not diversify their economic activities and were largely subordinated to the agro-industrial and commercial fraction of the coffee elite led by immigrants such as Juan Castañer.

According to Bergad the Puerto Rican experience, exemplified by Juan Castañer, was similar to that of "agricultural export economies in other regions of Latin America" during the same period when

> Rising demand for primary agricultural products in the North Atlantic world led to capital investment from abroad, the development of an unexploited internal frontier, European migration, the destruction of peasant autonomy, labor force regimentation, and the concentration/fragmentation of land. [39]

[37] Paige at p. 54.
[38] Id. at p. 77.
[39] Bergad at p. xv.

He also finds that "the role of immigrant entrepreneurs was critical in Puerto Rico", but that it was "control of capital markets, credit facilities, and the distribution of goods and services" which had "a greater impact on rural life in Puerto Rico coffee country than domination over land."[40] In other words, it was the diversified agro-merchants, mostly immigrants like Juan Castañer, who were the driving force behind the growing coffee processing and export industry in Puerto Rico at the expense of the *criollo* landed elite.

In sum, these disparate developments—the significant improvements in communication and means of transportation, the creation of a captive labor market, and the increased vertical integration and diversification by immigrant merchants—coalesced to dynamically transform the coffee industry in Puerto Rico between 1850 and 1885. During this period exports increased considerably, from 12.1 million pounds in 1851 to 67.2 million pounds in 1879.

However, it is during the period between 1885 and 1897 when Puerto Rico experiences a true, if rather short-lived, "coffee boom." Production skyrocketed during this period, increasing from 300,000 *quintales* in 1883 to over 500,000 *quintales* by 1897. It was during this period that "the development of infrastructure, credit, marketing, warehousing facilities, methods of cultivation, and a labor force", all of which occurred prior to 1885, finally paid off.[41] By the early 1890s, Puerto Rico was Latin America's third largest non-Brazilian producer, right after Venezuela and the Dominican Republic

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[40] Id.
[41] Bergad at p. 191.

and well ahead of Colombia.[42] The increase in local production jointly with the steep rise of international coffee prices during this era resulted in coffee surpassing sugar as the main cash crop for export and its dominance would continue until the American occupation. Coffee exports were worth 4.7 million pesos and 49.4 percent of total Puerto Rican exports in 1886; in 1896 the value of coffee exports had almost tripled to 13.9 million pesos and accounted for 76.9 percent of gross exports by value.

The boom times, however, were short-lived; the subsequent decline abrupt. International coffee prices, which had been in an upward spiral since the 1880s, dropped precipitously from $14.60 per *quintal* in 1895 to $6.50 in 1898.[43] Planters who had contracted debts in the early 1890s when prices were high found it extremely difficult to honor their obligations. As a result, foreclosures increased and credit began to dry up. Early in 1897 the merchant houses and the few banks then in operation declared a payment moratorium. People began to hoard currency, and commercial activity slowed down to a crawl.[44] The crisis intensifies after the American invasion on July 25, 1898. According to Bergad all business activities in Lares were suspended even before the occupation; the town's notary protocol records cease on July 12, 1898 and do not begin again until December 12.[45]

In 1898, Juan Castañer, as ever in touch with prevailing *zeitgeist*, winds up his partnership, named "Castañer Hermanos", sets up a new firm called "Sucesores de

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[42] Id. at p. 147.
[43] Pumarada O'Neill at p. 47.
[44] Díaz Hernández at p. 98.
[45] Bergad at p. 207.

Castañer" to oversee his remaining business and properties, and retires to Palma de Mallorca, where he died in 1916. Ramon Castañer, Juan's son, administered the new firm until it finally shut down all operations in 1928.

Commercial activity and economic life in the heartland of the coffee-growing region appears to stabilize somewhat during 1899. However, on August 8th of that year Hurricane San Ciriaco, one of most viciously destructive storms ever to strike Puerto Rico, swept straight across the mountain region of the island. The storm destroyed the 1899 crop and damaged many coffee bushes as well as many of the shade trees. Most planters were unable to pay loans secured by the 1899 crop, while the destruction of the coffee trees, which can take up to five years to mature after planting, left them without a source of income during the short to medium term. Many merchants, exporters, and planters simply retired from business and a significant number of them went back to Spain. Laborers and field workers abandoned the highlands in search of opportunities in the coastal regions. Given this bleak environment, it should not be surprising that coffee exports dropped sharply, from 579,000 *quintales* in 1898 to 122,000 *quintales* in 1901.

The 20th Century

The American invasion brought in its wake several institutional changes that permanently affected the Puerto Rican economy, as well as the coffee industry. First, in 1901 Puerto Rico became part of the U.S. customs union. Accordingly, there were to be no trade barriers between the island and the mainland United States. This change benefitted local sugar and tobacco producers, as their products could now enter the U. S. market duty-free and were protected from foreign competition in that market by existing high tariff barriers. In theory, the new legal regime should have also benefitted Puerto Rico coffee producers, but the American coffee market was already dominated by cheap Brazilian imports and the island coffee producers found it difficult to compete. Furthermore, the integration of Puerto Rico into the U.S. customs system allowed European countries, until then the principal market for Puerto Rican coffee, to impose higher tariffs on a product that was thenceforth classified a U.S. export.

The dollarization of the Puerto Rican economy was the second big institutional change produced by the U.S. invasion. The Foraker Act, which went into effect in May 1, 1900, mandated the conversion of Puerto Rican pesos into dollars at the rate of 60 U.S. cents to the peso, a rate that constituted a de facto devaluation from the peso's value of 66.6 cents at the time. According to Dietz, this had the effect of increasing prices by as much as 40% due to "both the conversion rate itself and the scarcity of money created as pesos were removed from circulation."[46]

The Foraker Act also mandated that all goods moved between the island and the mainland were to be carried by U.S. flag shipping lines. Prior to that mandate, "less than 16 percent of Puerto Rico's exports and 22 percent of its imports had been carried on U.S. ships, even though more than 80 percent of its trade was conducted with the United States."[47] This legal requirement, which persists to this day, had the effect of increasing

[46] Dietz at p. 90.
[47] Id.

the price of goods traded between Puerto Rico and the mainland because the U.S. merchant fleet was, and still is, significantly more expensive than that of other countries.

The collective effect of all these changes—the integration with the U.S. customs system, the dollarization of the economy, and the requirement to use U.S. ships for trade with the mainland—was to significantly increase production costs for Puerto Rican coffee planters. These cost increases, in combination with the effects of high European tariffs, sharply reduced profit margins for Puerto Rican coffee producers.

However, the local coffee industry slowly adjusted to the new market situation and by 1910 was able to recapture its share of the European markets.[48] The increase in European demand, coupled with rising market prices, jumpstarted investment and production in the traditional coffee growing region in the highlands. This renewed activity generated a mini-boom from 1910 to 1915 when total exports amounted to 511,000 *quintales* (51,100,000 pounds), the highest export level achieved in entire 20th century. Unfortunately, this bonanza, just as had happened many times before, came to a sudden end due to events taking place far away from the coffee fields. The First World War closed the German market to Puerto Rican producers and demand declined significantly in other important markets such as France, Austria, and Italy. Reduced European demand, in turn, had a severely depressing effect on international prices, which fell again to "disastrous levels."[49]

[48] Pumarada O'Neill at p. 52.
[49] Id. at p. 53.

In retrospect, the period between 1910 and 1915 would turn out to be the last hurrah for Puerto Rico's once mighty coffee industry. In 1928, another devastating hurricane, San Felipe, destroyed a good number of farms and many planters could not obtain the credit necessary to rebuild their farms. The Great Depression further aggravated their precarious situation. Notwithstanding several public and private efforts to prop up the industry during the 1920s and early 1930s, both production and exports continued to decline. By 1935, some 765,375 *cuerdas* were dedicated to sugar cane cultivation and sugar exports accounted for 60% of the value of total exports that year. In contrast, only 182,316 *cuerdas* were dedicated to coffee production but coffee accounted for only 0.3% of the value of total exports that year.

Total production in 1939 amounted to 189,490 *quintales*, less than half of the total amount produced in 1921. The beginning of the Second World War closed European markets (again) and the institution of the military draft produced a severe shortage of field workers. A significant portion of the 1941/42 harvest was left to rot on the trees. From 1943 onward total production was insufficient to satisfy domestic demand for coffee in Puerto Rico and had to be supplemented with imports.[50]

World coffee prices surged in 1950 as a result of a severe frost that affected the Brazilian harvest. Exports from Puerto Rico jumped in response to the increase in the world price. However, the increase in exports generated a shortage of coffee for local consumption and Puerto Rico had to import about a third of all the coffee consumed domestically that year. Puerto Rican coffee producers demanded that the domestic price,

[50] Id. at p. 64.

regulated by the government, be increased to world levels, but the government refused. Puerto Rico, thus, was in the curious position of not being able to produce enough coffee to satisfy local demand while subsidizing the exportation of a significant part of its yearly production.

In general terms, the industry enjoyed a brief respite in the early to mid-1950s, while prices remained at relatively high levels. However, the recuperation of Brazilian production and the subsequent drop in world prices severely affected Puerto Rico's ability to compete in the world market. By 1968, "the government was importing low-quality, low-priced coffee and selling it [locally] at a higher price by blending it with higher quality local coffee, and it was using the profits to subsidize the export by local farmers of Puerto Rico's highest quality coffee to Europe and the United States."[51] Given this irrational state of affairs, it should not be surprising that Puerto Rico ceased exporting coffee completely in 1969.

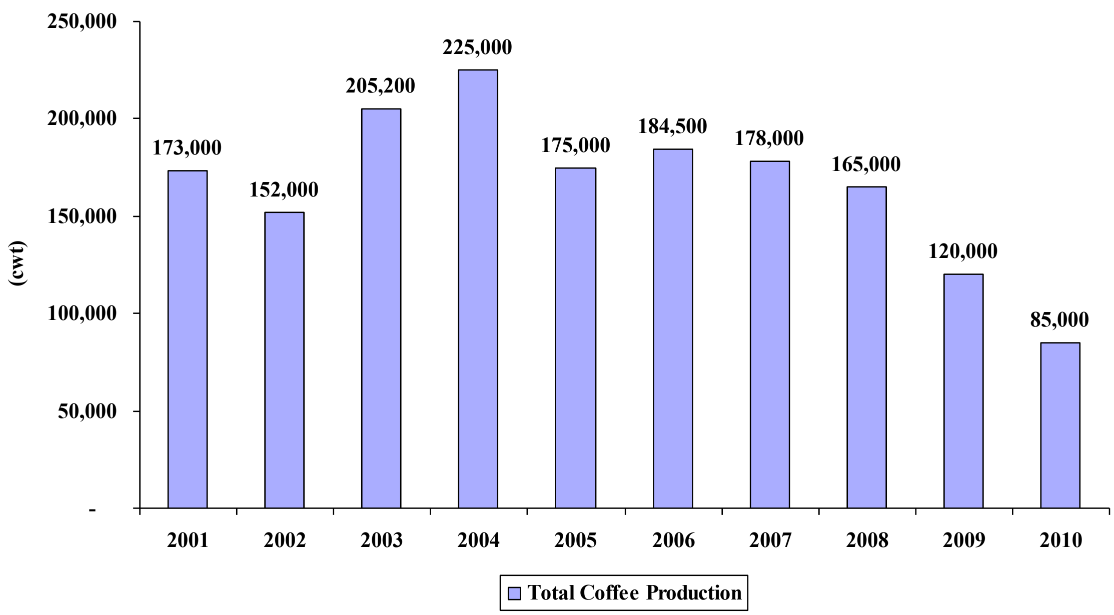
Coffee Production in Puerto Rico Today

Puerto Rico's coffee industry is practically non-existent today. The amount of land and the number of farms dedicated to coffee production has declined significantly during the last ten years. According to the Census of Agriculture carried out by the U.S. Department of Agriculture, in 2002 there were 9,805 coffee farms in Puerto Rico with 57,549 *cuerdas* under cultivation. By 2007, the number of coffee farms had decreased to 5,885 and the amount of land under cultivation had also declined to 38,535 *cuerdas*.

[51] Id. at p. 70.

As a consequence of this reduction in both the amount of land and the number of farms, coffee production in Puerto Rico has also decreased considerably. As shown in Figure 5 below, according to data from the Puerto Rico Agriculture Department, total coffee production in Puerto Rico was 85,000 *quintales* in 2010, equal approximately to 28% of total domestic coffee consumption of 300,000 *quintales* that year. Only a negligible amount was produced for export. Puerto Rico has passed from being an important producer of coffee for export, to being a large net importer of coffee, importing approximately 75% of the coffee consumed in the island.

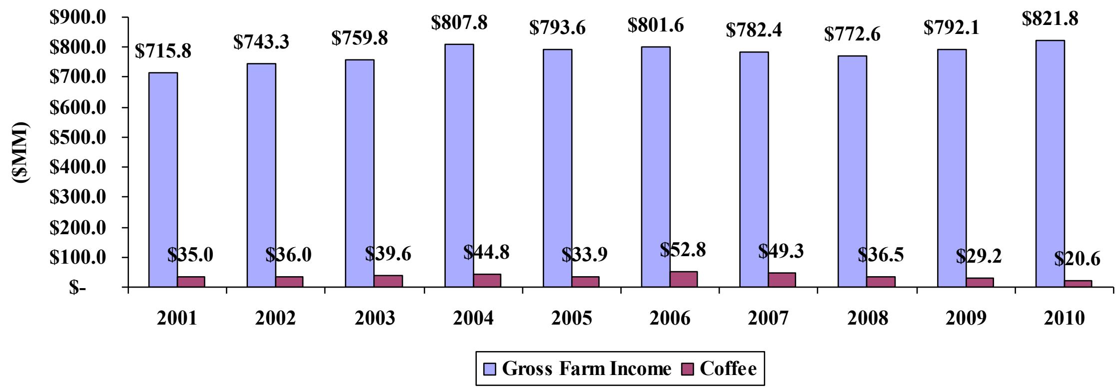
Figure 5:
Coffee Production in Puerto Rico



Source: Puerto Rico Agriculture Department

In terms of income, the Puerto Rico Planning Board reports that farm income generated from the sale of coffee amounted to $20.6 million in 2010, a paltry 2.5% of total gross farm income of $821 million reported in Puerto Rico that year.

Figure 6:
Gross Farm Income



Source: Puerto Rico Planning Board

In terms of employment it is difficult to find accurate estimates of direct and indirect employment generated by coffee cultivation and processing in Puerto Rico. According to data from the Puerto Rico Agriculture Department, in 2010 there were 4,094 coffee farmers; 68 *beneficiadores* (processors that buy coffee cherries from farmers and prepare them for sale to a roaster); and 58 *torrefactores* that roast, grind, and market the coffee. In total, it is estimated that the coffee industry creates some 5,000 direct jobs and approximately 20,000 indirect jobs, including temporary hires during harvest time.

The government of Puerto Rico has repeatedly and unsuccessfully tried to protect and promote the coffee industry through regulation. For example, in 1930 the U.S. Congress authorized the legislature of Puerto Rico "to impose tariff duties upon coffee imported into Puerto Rico, including coffee grown in a foreign country coming into Puerto Rico from the United States."[52] This provision is still in effect. Currently, the Puerto Rico tariff on coffee imported into the island stands at $2.50 per pound of green

[52] 19 U.S.C. §1319.

coffee and $3.00 per pound of toasted or ground coffee. A recent bill introduced in the Puerto Rico Senate (S.B. 201) seeks to increase the tariff imposed on imported coffee to $3.265 per pound of green coffee and to $4.081 per pound of toasted or ground coffee. This bill, however, has not been enacted into law.

Similarly, the Puerto Rico Department of Consumer Affairs, commonly known as DACO, issued Regulation No. 6 in 1976 to regulate the price of coffee at each stage in its processing. According to this regulation, as amended, current retail prices for ground "60/40 coffee", a mix of 60% grade A, mature arabica beans ("*café de primera")* and 40% semi-ripe or green beans ("*café de segunda")*, are: $4.45 per pound, $2.25 per half pound, and $1.13 per quarter pound. This price applies only to coffee sold in paper bags. Prices for coffee sold in other packaging (aluminum, plastic etc) are subject to other pricing schemes that must be approved by the DACO secretary.

More recently, the government of Puerto Rico has sought to incentivize beneficiaries of the Nutritional Assistance Program, the Puerto Rico version of the nationwide foodstamp program, as well as other low-income workers, to work in the coffee fields during harvest time. Act 38 of March 30, 2011, commonly known as "*Manos pal Campo*" directed the Puerto Rico Department of the Family and other departments in charge of social welfare programs to exclude income earned from picking coffee from the income limits applicable to program beneficiaries. It also authorized the Puerto Rico Labor Department to facilitate the process for enabling foreign workers to temporarily migrate to Puerto Rico during the coffee harvest. These provisions, among others, were implemented for the first during the coffee harvest in late 2011 and early 2012. Preliminary results were disappointing as coffee farmers still reported a significant shortage of field workers willing and able to work during the harvest.

The coffee industry in Puerto Rico today is in dire straits. Land and farms dedicated to coffee cultivation have declined significantly. Income, employment, and value added by the industry are not statistically significant. Policy measures to protect and regulate the industry have not generated the expected results. In short, the coffee industry in Puerto Rico is on the verge of disappearing after 275 years. In order to reverse this trend Puerto Rican policymakers have to completely rethink their approach to agriculture and recognize that the agricultural sector can play an important part in economic development.

Agriculture for Development

The World Bank has contributed to a renewed global focus on agriculture by dedicating the 2008 issue of the World Development Report to the subject of "agriculture for development". According to the World Bank, "in the 21st century, agriculture continues to be a fundamental instrument for sustainable development and poverty reduction."[53]

The Report recognizes that agriculture fulfills multiple functions for development, including growth, poverty reduction, reducing inequality, food security, and environmental sustainability. The World Bank staff also notes there are important synergies and trade-offs between each of these functions. For example, how growth is achieved has important implications for poverty reduction, income disparities, and environmental impact.

How these synergies and trade-offs play out in different countries depends, to a large extent, on the structure of poverty and the importance of agriculture as a source for growth. According to the World Bank's analysis, "the contribution of agriculture to growth and poverty reduction can be seen by categorizing countries according to (1) the share of agriculture in aggregate growth over the last 15 years, and the (2) current share of total poverty in rural areas, using the $2 a day poverty line."[54]

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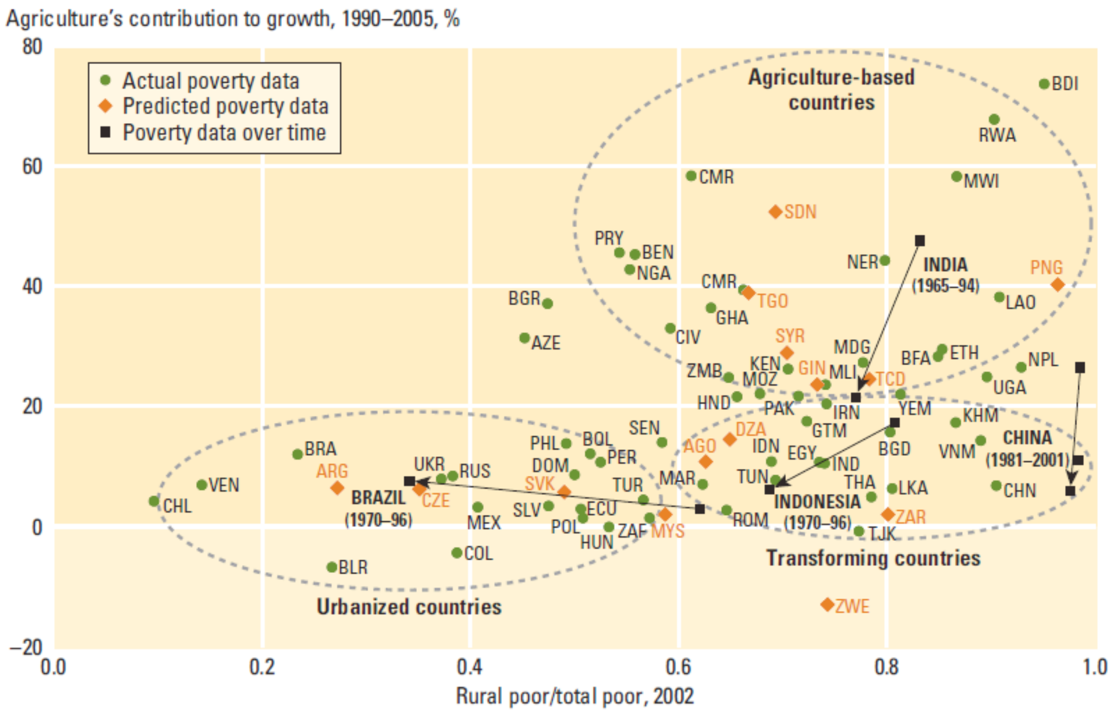
[53] 2008 World Development Report, p. 1.
[54] Id. at p. 4.

Figure 7:
Agriculture's Contribution to Growth and Rural Poverty Rates



Source: WDR 2008 team.

As shown on Figure 7 above, this methodology yields a three-tiered typology of the rural world. In *agriculture-based countries*, agriculture is a major source of growth, accounting for 32% of GDP growth, on average, and most of the poor live in rural areas (70%). This group of countries is represented in the upper-right quadrant of Figure 7.

Second, *transforming countries* are those in which agriculture is no longer a major source of economic growth, contributing on average 7% to growth, but where poverty remains overwhelmingly rural. This group of countries is represented in the lower-right quadrant of Figure 7.

Finally, in *urbanized countries* agriculture contributes directly even less to economic growth, 5% on average, and poverty is mostly urban. This group of countries is represented in the lower-left quadrant of Figure 7.

Policy interventions will vary by on a country-by-country basis, depending on a given country's location along this spectrum. For example, accelerating growth is likely to be the dominant policy objective in the agriculture-based countries, while reducing inequalities may be the priority in transforming countries. For urbanized countries, the policy challenge lies in linking smallholders to modern food markets and providing good jobs, not only in the agricultural sector, but also in rural agro-industry and the rural non-farm economy.

In sum, the World Development Report argues that making agriculture more effective in supporting sustainable growth and reducing poverty requires defining an agenda for each country type, based on a combination of four policy objectives:

- *Objective 1*: Improve access to markets and establish efficient value chains.
- *Objective 2*: Enhance smallholder competitiveness and facilitate market entry.
- *Objective 3*: Improve livelihoods in subsistence farming and low-skill rural occupations.
- *Objective 4*: Increase employment in agriculture and the rural non-farm economy, and enhance skills.

These four policy objectives form the core of the agenda for agricultural development in the Castañer region that we set forth in the next section.

Coffee for Development in Castañer

According to the World Bank typology, Puerto Rico is an urbanized country where agriculture contributes little to economic growth and employment, and poverty is a mostly urban phenomenon. In these countries, the policy challenge lies in linking small farmers to modern food markets and providing good jobs, not only in the agricultural sector, but also in rural agro-industry and the rural non-farm economy.

Several elements need to come together in order to increase income and employment in agriculture and significantly improve the livelihood of small farmers in the Castañer region. The first essential element, of course, is the coffee. In this regard Castañer may have a comparative advantage as it overlaps the municipalities of Adjuntas, Lares, Maricao, and Yauco, four towns in the heart of Puerto Rico's coffee historic growing region. According to the 2007 U.S. Census of Agriculture these four municipalities (referred to in the table below as the "big four") accounted for 38.1% of all coffee farms in Puerto Rico and for 41.4% of the land under coffee cultivation during that year. This area, therefore, contains a good-sized coffee-producing cluster relative to the other potential coffee-growing regions in Puerto Rico. In addition, coffee farms in this region tend to be slightly larger than those in the rest of island, averaging 7.1 *cuerdas* per farm in contrast with 6.5 *cuerdas* in Puerto Rico as a whole, and are slightly more productive, yielding 5.0 coffee *quintales* per *cuerda*, compared with the island-wide average yield of 4.7 *quintales* per *cuerda*.

Table 2:
Coffee Assets in the Castañer Region

				Number of Trees				
Municipio	**Coffee Farms**	***Cuerdas***	**Avg. Size**	**Bearing Age**	**Non-Bearing Age**	**Total Yield (cwt)**	**Average Yield per Farm**	**Average Yield per *Cuerda***
Adjuntas	925	5,662	6.1	5,345,355	460,077	29,790	32.2	5.3
Lares	648	4,478	6.9	4,055,622	365,233	19,375	29.9	4.3
Maricao	283	3,029	10.7	3,174,409	168,158	17,712	62.6	5.8
Yauco	385	2,769	7.2	2,685,750	255,806	12,624	32.8	4.6
Total Big 4	**2,241**	**15,938**	**7.1**	**15,261,136**	**1,249,274**	**79,501**	**35.5**	**5.0**
Total Puerto Rico	5,885	38,535	6.5	36,196,787	2,819,753	180,594	30.7	4.7
Big 4/PR	**38.1%**	**41.4%**	**--**	**42.2%**	**44.3%**	**44.0%**	**--**	**--**

Source: 2007 Census of Agriculture (USDA); CNE Analysis

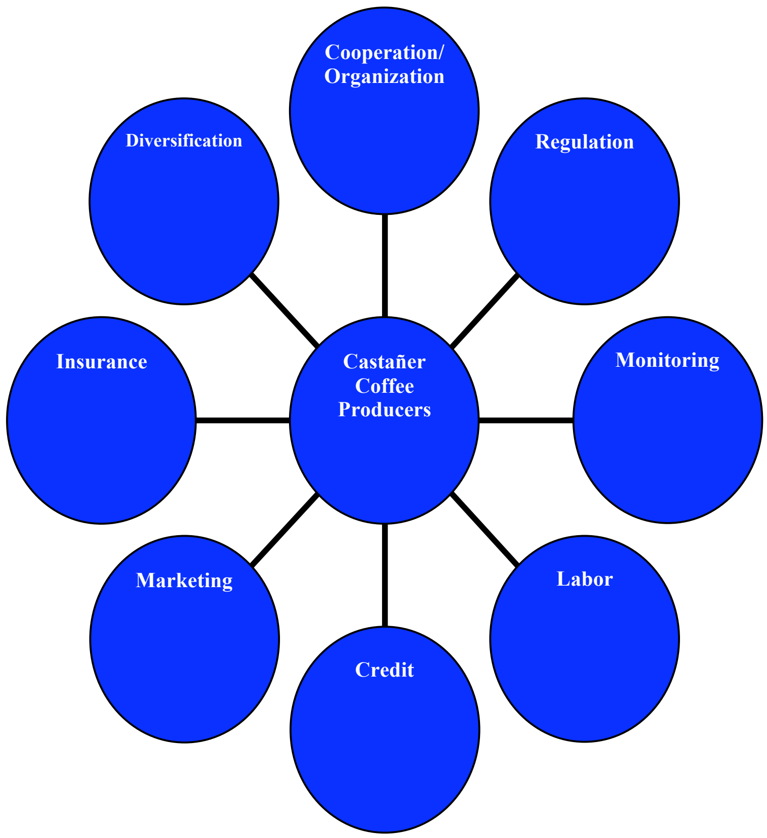
Coffee farms, collectively, in these four municipalities produced 180,594 *quintales* (18,059,400 pounds) of coffee in 2007. The Agriculture Census data, however, needs to be qualified. First, these data points are five years old. We must bear in mind that *total* coffee production in Puerto Rico during 2010 is estimated to have been only around 85,000 *quintales*. Thus, while the Agriculture Census states that the Big Four municipalities produced in 2007 twice as much coffee as the entire island of Puerto Rico did in 2010, it is perhaps possible that a significant number of these farms may be currently out of production or may have been outright abandoned since then.

Second, the Agriculture Census provides no information about the *quality* of the coffee produced in these four municipalities. Historically, this area has been planted with arabica trees of the Bourbon variety. However, we currently have no hard data about the coffee variety produced in the area. It is necessary, therefore, to carry out an inventory of existing farms, the species and variety of coffee that is planted, and the current condition of the land and the trees.

We emphasize the importance of maintaining a high degree of quality control. In order to command premium prices in the world market these farms must operate according to world-class standards and the coffee marketed from this region must be certified 100% arabica grown in the Castañer area, "washed" or wet-processed, and selected by hand according to a set of internationally accepted criteria (we suggest the criteria used by the Specialty Coffee Association of America because the U.S. is the world's largest coffee consumer and Puerto Rico enjoys duty-free access to that market). Coffee beans that do not qualify as specialty or premium grade can be marketed under a cheaper second label, just as top vintners in France do it, or sold in the wholesale market for blending with coffee grown in other areas in Puerto Rico.

A steady supply of world-class premium quality coffee is, of course, only the first step in creating a sustainable coffee industry in the Castañer region. As shown in the figure below, we have identified at least eight other elements that need to coalesce around coffee production in order for this to be a successful endeavor. We call this the "Coffee Ecosystem".

Figure 8:
The Coffee Ecosystem



The first three elements—organization/cooperation, government regulation, and self-monitoring—are derived from Professor Richard Locke's experience analyzing regional development efforts in Brazil (mango producers in the Petrolina – Juazeiro region) and Italy (*mozzarella di bufala* producers in the Campania region).

Organization/Cooperation – As we have shown on Table 2, there are over 2,000 coffee farms in the Big Four area with an average farm size of seven *cuerdas*. This level of fragmentation makes it difficult to achieve economies of scale in production, to execute successful marketing strategies, and to generate sufficient capital to vertically integrate and move up the food value chain.

According to Locke, the formation of a consortium of *mozzarella di bufala* producers in southern Italy was important in developing the industry, promoting technological innovation, establishing common production standards, lobbying government, organizing collective marketing efforts, and developing and enforcing product quality standards.[55] Coffee producers in the Castañer region could realize similar benefits from organizing and cooperating with each other.

This kind organization/cooperation, however, cannot be artificially created. Community organizers can facilitate the process but for organization to be effective it is imperative that community leaders, as well as a significant number of coffee producers, become involved in the process. The form of organization can vary depending on community preferences and the objectives sought, for example, it could take the form of a formal producers' cooperative or consortium, or that of a rather more informal trade association. The Pathstone team can provide guidance and organizational help to community leaders and coffee producers in jumpstarting this process.

Government Regulation – The organization of producers is a necessary but insufficient condition to ignite the process of regional economic development. There are natural limits to cooperation among people and, as economists since the time of Adam

[55] Richard M. Locke, *Building Trust*, paper presented at the Annual Meetings of the American Political Science Association, September 2001, p. 16. On file at the Center for the New Economy. Available online at http://rlocke.scripts.mit.edu/docs/papers/Locke_BuildingTrust.pdf.

Smith have noted, cooperation among like-minded producers tends to "end in a conspiracy against the public, or in some contrivance to raise prices."[56] Government intervention in certain specific forms can, on the one hand, facilitate cooperation among producers, and limit the tendency to form cartels on the other. According to Professor Locke

> cooperative efforts initiated by self-interested actors are more likely to become more encompassing and responsive organizations that produce benefits not just for their own members but also for the broader community when government policy intervenes to reinforce this behavior…government agencies are often able to accomplish this goal by trading the provision of a public or quasi-public good which directly benefits the cooperating group in exchange for the group's inclusiveness and responsiveness.[57]

Puerto Rico's legal and regulatory framework needs to be modernized to facilitate the development of a modern agricultural sector in the island, to promote the organization of producers of high-value added, low-volume agricultural products, and to set general quality control standards. This regulatory framework would (1) legally define important terms such as "organic", "premium", and "locally grown", among others; (2) set the correct incentives and subsidies to encourage production; and (3) establish "Denomination of Origin" rules for certain products that use the terms "made in Puerto Rico" or "Puerto Rican" (rum and coffee, for example).

Coffee growers in Castañer, specifically, could benefit from legislation designating Castañer as a special geographic zone for the production of premium coffee. This designation would allow all coffee growers in the region who comply with the strict quality control requirements established by the growers collectively to use a special

[56] Adam Smith, *The Wealth of Nations,* (Bantam Classics: New York, 2003), p. 177, (originally published in 1776).
[57] Locke at p. 11.

trademark or seal to identify their product. Sellers of coffee grown in other areas in Puerto Rico, or grown in Castañer but that fails to comply with quality control standards, would be prohibited from using the Castañer denomination of origin. In exchange for that governmental protection, which essentially creates a government-sanctioned barrier to entry, membership in any Castañer coffee growers' organization would be as inclusive and open as is feasible and consistent with strict quality control standards.

Self-Monitoring – The temptation to engage in opportunistic behavior will increase as new producers, who are not necessarily well known to existing producers, enter the market and as economic growth and profits increase. Therefore, the law establishing the Castañer denomination of origin should also vest the Castañer coffee growers association with the power to enforce quality control standards and to punish those producers who "defect", that is, cheat, shirk, or otherwise cut corners or fail to "play by the rules".

We agree with Locke, "government does not have the know-how, let alone the capacity to intervene and continually monitor the behavior of individual members."[58] In our experience, market regulation and supervision in Puerto Rico tends to be an all or nothing affair: the government either overplays its hand enacting excessive regulations and mandating compliance with burdensome bureaucratic requirements or else it fades into the background, letting the chips fall where they may, according to the ruthless logic of the all-powerful invisible hand. In the case of Castañer coffee growers, the farmers

[58] Locke at p. 11.

themselves are in the best position to determine who may be shirking or cheating and have the right incentives to monitor and discipline any potential shirkers.

In addition to organization, regulation, and self-monitoring, historians of the Puerto Rico's coffee region have identified three other factors that traditionally have been described as necessary to sustain coffee production in Puerto Rico over time. These factors are (1) a labor force that is available, willing, and able to work the fields and process the coffee; (2) access to credit financing on affordable terms; and (3) access to internal and external markets as well as resources for advertising and marketing the product on a commercial scale.

Labor – After the end of the *libreta* system in 1873, field hands in the Puerto Rico coffee industry were paid a fixed daily wage, often for working from six in the morning until six in the afternoon (*"de sol a sol"*) under tough and often highly uncomfortable conditions. More recently, pickers have been paid a flat fee per *almud* (approximately 28 pounds of coffee cherries) collected. This type of work is highly seasonal and provides little or no fringe benefits or significant opportunities for advancement.[59] Given these terms and conditions of employment, it should not be surprising that there has been a shortage of field workers during recent years.

We note that it is not entirely clear to us whether the practice of paying coffee pickers on a per quantity basis is consistent with existing federal labor laws and

[59] Total compensation for coffee pickers may also include bonuses paid by the Puerto Rico Department of Agriculture pursuant to Act 38 of March 30, 2011, the "Manos pal Campo" law.

regulations. To the best of our knowledge, it appears that under the applicable provisions of the federal Fair Labor Standards Act, as amended, the hourly minimum wage for farm workers in Puerto Rico is equal to 70% of the regular federal minimum wage, or approximately $5.08 ($7.25 x 0.70). Yet the local practice seems to be to pay coffee farm workers a flat fee per *almud*, not a fixed hourly wage. Determining whether this practice is in compliance with applicable U.S. and Puerto Rico labor laws, rules, and regulations is beyond the scope of this paper. We suggest that Pathstone seek the advice of specialized counsel with respect to this question.

Be that as it may, and regardless of the level of any minimum wage that may be legally applicable to farm workers, the fact is that there *is a shortage* of available workers to pick and process coffee grown in Puerto Rico. Recently, the mayor of Maricao, among others, suggested that Puerto Rico petition the U.S. government to allow temporary migrant workers to enter Puerto Rico during harvest time to make up for the local labor shortage.

In our opinion, bringing in temporary migrant workers should not be necessary in an island with a 15% unemployment rate. Furthermore, unemployment rates in the municipalities of Adjuntas, Lares, Maricao, and Yauco have been reported recently (March 2012) at 23%, 15.5%, 22.9%, and 16.6%, respectively. Given the high rates of unemployment in the area, we believe it is possible to encourage work in the coffee farms with the appropriate incentives. It may be necessary to implement a system of substantial wage subsidies or tax credits to encourage people to work the coffee fields. For example, farmers may qualify for a Puerto Rico tax credit based on the level of wages paid and the amount of new fieldworkers hired. These subsidies and/or credits would inevitably be expensive. However, we believe this is a policy option worth pursuing before initiating the process of recruiting temporary migrant workers.

Credit – As we noted in our historical summary, lack of access to financial credit on affordable terms has been one of the traditional impediments to the development of the coffee industry in Puerto Rico. Coffee farmers need working capital to maintain and upkeep the farm, to buy fertilizer and pesticides, and to pay laborers during the harvest. They also need longer-term credit to purchase machinery and equipment and to finance other capital expenditures.

In our view, the agricultural sector in general, and the coffee sector in specific, presents an opportunity for Puerto Rico's credit unions. According to data from the Puerto Rico Commissioner of Financial Institutions, as of December 2011, credit unions in Puerto Rico had total assets of $7.88 billion and total capital of $2.42 billion. However, in Puerto Rico, credit unions provide mostly personal and consumer loans. Credit union capital, therefore, has not, by and large, been used for financing local productive enterprises.

We believe credit unions can contribute greatly by providing credit to Puerto Rican farmers on affordable terms. Credit unions, because of their cooperative nature, are used to collaborating on complex projects. In addition, many credit unions are already committed to community outreach efforts, offering, for example, financial education and counseling, which help overcome barriers to access; are willing to cooperate with other credit unions in developing new products; have a strong geographic presence and enjoy widespread membership, which allows for scale and diversification; and are non-profit entities, which gives them financial flexibility when evaluating the costs of offering new products to agricultural enterprises. What is missing is the institutional leadership to focus these elements to reach small and medium agricultural enterprises in Puerto Rico. The Pathstone team should develop and present a "value proposition" to credit unions in the Castañer region to persuade them to develop credit products for coffee farmers in the region based on a triple bottom line of helping local farmers, fulfilling their social mission, and generating a reasonable profit.

Access to Markets/Marketing – Limited access to internal and external markets is another of the traditional obstacles faced by Puerto Rican coffee producers. Selling agricultural commodities in the modern marketplace also requires significant financial resources for advertising and marketing. In this regard we recommend that Castañer coffee growers concentrate first on the Puerto Rico market and consider exporting only after establishing a solid beachhead in the local retail market. Needless to say this would require a significant investment in marketing, advertising and brand building. Furthermore, obtaining access to prime supermarket shelf space in Puerto Rico is an expensive endeavor, requiring significant upfront cash outlays.

The Puerto Rico coffee market at the retail level is currently dominated by Puerto Rico Coffee Roasters, which has a 75% market share and sells coffee under ten different brand names: *Café Yaucono, Café Crema, Café Rico, Café Rioja, Café Encantos, Alto Grande, Yauco Selecto, Adjuntas, Garrido Expresso* and *Yaucono Selecto*. It is owned by the CC1 investment group headed by the president of Coca-Cola Puerto Rico Bottlers. This level of concentration makes it extremely difficult for new producers to enter and successfully compete in the Puerto Rico coffee market.

In the absence of government intervention to break the chokehold on the retail market by Puerto Rico Coffee Roasters, Castañer coffee producers may need to form a strategic alliance with one of the big food distributors in Puerto Rico to be able to sell their product across the island. The Castañer coffee producers could share the required expense collectively. Perhaps, all coffee producers in the Castañer area could contribute to a special fund set up to finance at least a portion of these marketing expenditures. The Puerto Rico Department of Agriculture could also contribute to this fund.

An alternative strategy would be to start small, building the brand slowly through word of mouth advertising by aficionados and connoisseurs, concentrating retail sales efforts mostly in the southwestern region, selling to gourmet and specialty stores in the rest of the island, and perhaps opening and operating a small coffee shop somewhere in the San Juan metro area. Sales through the Internet, using either the U.S. Postal Service or some other private cargo company for deliveries, could also form part of this strategy. The payoff under this strategy will take longer and require significant coordination and concentration of effort, but the upfront expenses would be lower. It would be a matter for the Castañer coffee growers to decide which strategy to follow.

Insurance – Puerto Rico is located right in the middle of the Atlantic Ocean's "hurricane alley." These destructive weather phenomena traditionally have had a material adverse effect on the island's agricultural production. Specifically, with regards to coffee, the hurricanes of 1819, 1825, 1867, 1876, 1893, 1899, and 1928 inflicted particularly severe damage on the coffee industry.[60] More recently, hurricanes Hugo in 1989 and Georges in 1998 also wreaked havoc in Puerto Rico's coffee region.

Given the frequency and unpredictability of hurricanes and other severe weather phenomena in the Caribbean region, obtaining crop insurance at reasonable prices becomes an essential necessity for any farmer operating in Puerto Rico. The U.S. federal government currently provides some crop insurance coverage but the consensus appears to be that this coverage is not sufficient. Insurance companies operating in Puerto Rico, to the best of our knowledge, do not cover crop losses, at least not on affordable terms. Therefore, there are currently few alternatives available to Castañer coffee producers with respect to crop insurance.

In our view, this is yet another area where Puerto Rico cooperative enterprises could satisfy an important social need. Two of Puerto Rico's largest insurance companies, the *Cooperativa de Seguros Múltiples* and the *Cooperativa de Seguros de Vida de Puerto Rico*, are cooperative institutions. We recommend that Pathstone

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[60] De Jesús Toro at p. 50.

approach these two cooperative enterprises and make the case for developing crop insurance products for coffee farmers in the region, based, again, on a triple bottom line of helping local farmers, fulfilling their social mission, and generating a reasonable profit.

Diversification – The failure to diversify has bedeviled the coffee industry in Puerto Rico since its inception and has subjected the coffee growing region to the wild and oftentimes unexpected fluctuation in worldwide coffee prices. This focus on monoculture, which has been a recurrent theme in Puerto Rico's economic history to this day, "breeds certain patterns of economic behavior, found regardless of time period or geographical region. The most prominent trait seems to be the continual reinforcement of the same activities rather than the emergence of alternative industries that would lead to economic stability."[61] The continued reliance on monoculture, therefore, appears to be a particularly severe form of "path dependence." According to Douglass North, path dependence arises when:

> …institutions that have accumulated give rise to organizations whose survival depends on the perpetuation of those institutions and which hence will devote resources to preventing any alteration that threatens their survival…Path dependence is not "inertia," rather it is the constraints on the choice set in the present that are derived from historical experiences of the past.[62]

The problem of path dependence becomes rather more complicated when entrepreneurs largely represent and operate on behalf of the political and economic interests of a colonial metropolitan power. In the case of Puerto Rico's coffee producers

[61] Bergad at p. 213.
[62] Douglass C. North, *Understanding the Process of Economic Change*, (Princeton, NJ: Princeton University Press, 2005), p. 52.

during the 19th century and the early part of the 20th it is quite obvious that they exercised little control over capital and were otherwise dependent on external markets and political decisions. This economic structure by itself does not rule out the possibility of a more balanced or diversified pattern of economic development. However, the fact that the agro-industrial merchant class in Puerto Rico was constituted almost exclusively of immigrants means that "not only was capital transferred from agriculture to commerce, but it was also channeled back to Europe by an immigrant community with little interest in Puerto Rico", or, we may add, in investing to diversify its economic structure over the long term.[63]

In our view, it is imperative that any efforts to revive the coffee industry in Castañer be part of a broader strategy to diversify the economy of the region. In general terms, this diversification can take place along three dimensions: (1) along the coffee value chain; (2) within the agricultural sector in general; and (3) outside the agricultural sector.

In terms of the coffee value chain, it is important that Castañer coffee producers not only grow the coffee but also partake in "downstream" value added activities such as roasting, grinding, distribution, and marketing. The capital expenditures necessary to acquire the required machinery and equipment could be shared among the area's producers; financed on favorable terms by a credit union; and perhaps even partially subsidized by the government of Puerto Rico. Participating in these activities would

[63] Bergad at p. 214.

allow coffee producers to diversify their income stream away from production and towards other activities that add value to the commodity they produce.

Second, farmers in Castañer can diversify by growing other crops besides coffee. During World War I many coffee producers began to grow bananas and plantains for local consumption to make up for income lost to due to the closing of European markets.[64] However, these efforts to diversify agricultural production ceased with the end of the global conflict. Given Puerto Rico's current dependence on imports to satisfy demand for such basic food staples of the Puerto Rican diet such as eggs, rice, beans, pork, chicken, and beef, among others, there exists an opportunity for coffee producers in the Castañer region to dedicate a part of their land to the cultivation of other products for at least part of the year. The cultivation of "exotic" tropical fruits and flowers, such as mangoes and orchids, for export are other opportunities that deserve further study.

Finally, Castañer's farmers should diversify into other areas besides agriculture. Agro-tourism and eco-tourism appear to be two such promising areas. Tourists from all over the world flock every year to coffee plantations in Central and South America to partake in the coffee harvest, learn first hand where their coffee comes from, and buy a couple of pounds of high quality beans to bring back home. For example, Steve Aronson, grower of high-altitude, high-quality coffee in Costa Rica conducts a Coffee Tour for tourists visiting his roasting plant in Heredia, which includes a quick history of coffee

[64] Pumarada O'Neill at p. 54.

presented by young Costa Rican actors. Approximately 40,000 people annually make the Coffee Tour, making it Costa Rica's third-biggest tourist attraction.[65]

Coffee eco-tourism is also a growing trend in Latin America, where the coffee harvest coincides with the cold northern winter. For example, Eddy and Mausi Kuhl, the owners of the 2,000-acre Selva Negra farm in Matagalpa, Nicaragua, run an "ecological coffee resort" where

> Visitors eat at a central Swiss-style chalet and sip sun-dried coffee. The coffee mucilage, along with cow and pig manure, undergoes anaerobic decomposition in an underground tank, producing enough methane to cook the food. Electricity for the coffee mill is produced by Pelton water turbine. The farm's laboratory experiments with various "teas" to prevent coffee rust. The staff grows tilapia for guests, but the fish waste also feeds worms that decompose pulp to make fertilizer. All that ecological work has produced an astonishing biodiversity, with over 350 types of butterflies and 280 bird species.[66]

The Castañer region, in addition to coffee farms, contains many natural assets, such as lakes, forest land, and native animal and plant species, which make it a potential destination for agro and eco-tourists. However, competing with places such as Costa Rica and Nicaragua for these sorts of tourists requires designing and implementing a thorough and well thought-out strategy, a significant capital commitment, the appropriate development of the area's natural assets and resources, as well as the required infrastructure of roads, lodging, communications, entertainment, etc.

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[65] Pendergrast at p. 381.
[66] Id. at p. 367

Conclusion

Coffee has been grown in Puerto Rico for over 275 years. Between 1855 and 1898, for a relatively brief moment, all the necessary conditions to sustain a vigorous coffee industry were satisfied in Puerto Rico: cheap land; an abundant, dependent, and low-paid labor force; credit and financing by merchant firms; favorable access to international markets; relatively high market prices; and the agricultural know-how to take advantage of it all. Today, however, the coffee industry is on the verge of disappearing from the island. It has been the victim of wars and international political decisions, hurricanes and floods, intense international competition, relatively low prices; structural economic change, and an economic development policy with a strong urban and manufacturing bias.

In our view, if coffee production is to become the anchor of economic development in the Castañer region, then, in addition to the production of high-quality premium-grade coffee, the following elements have to be in place: (1) the institutional structure to promote and facilitate the organization and cooperation of the area's coffee producers; (2) legislation establishing "Denomination of Origin" rules and regulations for coffee grown in the Castañer region; (3) the establishment of a self-monitoring mechanism to discipline and police wayward producers; (4) a steady supply of field workers to pick and process the coffee; (5) financial credit on an affordable basis; (6) access to markets and adequate financial resources for advertising and marketing; (7) sufficient crop insurance coverage to hedge against potential losses caused by hurricanes and other weather phenomena; and (8) the implementation of a broad economic diversification strategy to avoid the pitfalls associated with monoculture.

An objective observer would be justified in concluding that efforts to revive the coffee industry in Puerto Rico are bound to face multiple difficulties and probably end in failure. Yet, for all the problems and obstacles facing the industry, the core assets upon which it rests, the fertile land and the arabica coffee trees, are still there, up high in the mountains of Lares and Yauco. Given this natural endowment Puerto Ricans owe it to themselves to give this ancient industry another try.

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