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The International Market for Flavor Cocoa
Implications for Grenada

by

C. Curtis Vreeland

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Servicios Tecnicos Del Caribe
P. O. Box 3029
San Juan, P.R. 00903

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EXECUTIVE SUMMARY

Flavor or fine cocoa is produced by Criollo or Trinitario trees in contrast to bulk or ordinary cocoa harvested from Forastero and Amazonian hybrids. Flavor cocoa tends to have a slight to strong aroma and has somewhat larger beans but lower fat yields than bulk cocoa. Amongst the flavor cocoas, Grenadas rank poorly in relation to shell content and fat yields.

Flavor cocoa production has dropped steadily from 52% of world production at the turn of the century to a current 2%. Present production is confined to nine countries, although only a portion of the crop in three countries is considered of flavor quality. Despite recent attempts to renovate or expand flavor cocoa plantings, considerable constraints should hold production at about 22,500 to 33,500 metric tonnes per year. Grenada produces about 2,500 tonnes or 10% of the world's supplies of flavor cocoa or 0.1% of the global supply of cocoa.

Nearly all flavor cocoa and about 70% of bulk cocoa is consumed by Western Europe and North America. The consumption of flavor cocoa in these two regions is currently constrained by the same economic factors, low elasticities of demand and slow population and income growth, that affect the consumption of cocoa in general. Consumption of cocoa between 1985 and 1995 is expected to expand a sluggish 1.9 % per annum in Western Europe and 2.5% in North America.

In addition, dwindling supplies, volatile price movements, and higher costs of flavor beans have encouraged chocolate manufacturers to replace flavor with cheaper bulk beans in their blends. Improved chocolate making processes combined with the loss of consumer sensitivity to bean aroma have also influenced this shift in demand. Thus, the future demand for flavor cocoa consumption is expected to contract, subjecting flavor producers to increasing competition as they attempt to sell their crops.

Analysis of bean premium differentials between flavor and bulk cocoa was difficult owing to the lack of a bean price series for the U.K. market and the near discontinuation of flavor cocoa trading in the U.S. A regression of flavor on bulk export unit values FOB basis, data which is readily available, revealed that both grades moved in tandem, with flavor values somewhat lagged in price response. Flavor beans commanded an average premium of approximately 8% FOB above bulk cocoa.

Considering the traditional lower yields and higher costs of production for flavor cocoa, this paper questions whether an eight percent premium provides sufficient profit at normal market prices to justify the continued rehabilitation of flavor cocoa plantings.

SUMMARY OF RECOMMENDATIONS FOR GRENADA

1. Unless the practice of washing and polishing Grenadian beans produces an objective economic benefit like reducing shell content and/or raising yields of edible material, it should be discontinued. Instead, care should be taken during the early main crop harvest to insure that supplementary artificial drying be utilized to cut down on bean drying times.
2. The Association can profit by strengthening its crop forecasting efforts to minimize the probability of overselling the crop. Meeting all sales contracts improves customer relations and prevents the occurrence of carrying commitments forward at old prices in a rising market.
3. The best security in today's rapidly changing and fickle cocoa market is to diversify one's customer base by recalculating sales quotas to permit a small uncommitted portion to be used for exploring new markets.
4. For the small cocoa producer, the use of market intermediaries provides benefits, like sharing market information, shipping and handling services, and locating prospective new end users, which can far outweigh the incremental cost.
5. As total revenue per unit of area was estimated to be more sensitive to changes in yields than to changes in premiums, most experts recommend that producers plant high yielding bulk hybrids. If producers prefer to specialize in supplying the flavor cocoa market niche, then they must, one, be able to produce sufficiently large outturns (over 4,000 tonnes per year) to support a broad customer base. And two, be able to drop unit costs through cost reductions and yield improvements to boost farmer incentive.

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PREFACE

1. Terms of Reference

Grenada produces about 2,500 tonnes of flavor type cocoa, most of which is sold through dealers to British and European manufacturers. A special relationship exists between the Grenada Cocoa Association and the British manufacturer Rowntree-Mackintosh which has traditionally purchased 1,000 tonnes of cocoa per year and thus acts as a pace setter for the premium for the rest of the trade.

While the Grenada Cocoa Association, on the one hand, is reluctant to risk losing its current customer base by running counter to traditional sales practices; on the other hand, the Association realizes that these same sales practices have left it with little room to maneuver in a risk-filled and shifting world of international cocoa marketing. Is there a "window of opportunity" for Grenada's flavor cocoa producers to exploit?

To answer this question, USAID/Grenada contracted Servicios Tecnicos Del Caribe to provide a cocoa marketing specialist as part of their Agriculture Revitalization Project. The scope of work for this cocoa marketing specialist included:

1. Providing a detailed time series analysis of the supply and demand for flavor cocoa, with projections on future trends.
2. Performing a time series statistical comparison of premiums paid for different flavor and bulk cocoas.
3. Evaluating the position of Grenadian cocoa within the international market for flavor cocoa.
4. Interviewing cocoa agents, buyers, sellers, manufacturers, and commodity analysts in the U.S. and abroad relative to the above analysis.
5. Recommending a course of action for Grenada's cocoa industry concerning cocoa quality improvements, pricing strategy, and market positioning.

2. Literature Search

Literature on the flavor cocoa market is very scant. G.A.R. Wood wrote the only article specifically on the subject in 1978, updated in 1985. A more general discussion of flavor and bulk cocoa can be found in Wood & Lass (1985). Powell wrote excellent articles on the changes in cocoa bean availability (1983) and on

manufacturers' quality requirements for cocoa beans (1984). Discussions on cocoa marketing are found in Williamson (1985), Akiyama & Duncan (1982), International Trade Center (1975), UNCTAD (1975), and in various articles in Coffee & Cocoa International magazine.

Information on current country specific trends in production can be found in various Foreign Agricultural Service reports, Lass & Wood (1985), ICCO documents, and reports available from that country's cocoa marketing organization. Other citations are listed in this study's Reference section.

3. Acknowledgments

Due to the lack of published articles, the majority of this study's information on the international flavor market was garnered through interviews with leading dealers, brokers, analysts, and manufacturer representatives in London, New York, and Washington, D.C. and with appropriate Grenadian officials during a one week visit to the island.

In particular, the author would like to thank Jonathan Sleeper (ADO, USAID/Grenada) and Dr. George Pringle (STC Team Leader) for their invaluable and cheerful assistance. In addition, I would like to express my appreciation to the following members of the Grenada Cocoa Association for their cooperation and comments: L.A. Purcell (Chairman) and Sewlyn Humphrey (Executive Secretary); and from the Cocoa Rehabilitation Project: Fitzroy James (Project Director) and Peter Fehr (Project Advisor, CIDA).

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All opinions and conclusions expressed in this report are that of the author's and may not reflect the official position of the sponsoring agency.

CHAPTER I

INTRODUCTION

1. Introduction to World Cocoa Types

All the world's supplies of cocoa are produced by the tree Theobroma cacao, a native of South and Central America. Three types or populations have since evolved (Figure 1) and each has its own special characteristics and uses (Table 1). These three types are Criollo, Forastero, and Trinitario. Each is discussed briefly below.

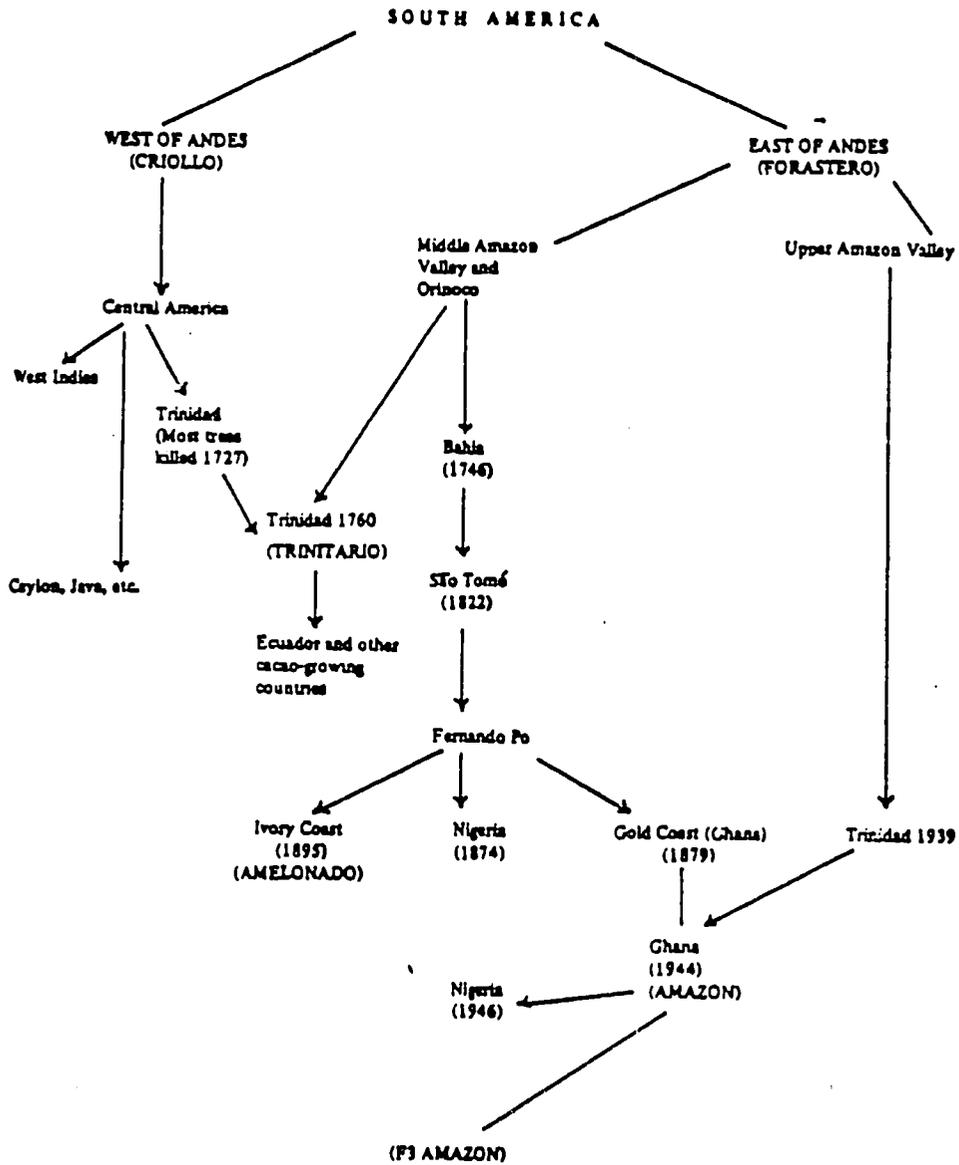
The first type, Criollo, originated in the area between Colombia and Ecuador and was spread northward into Central America in Pre-Colombian times. This was the cocoa the Spaniards found the Aztecs consuming; hence, the name "criollo" means "native" in Spanish. This type was later introduced throughout the West Indies, Sri Lanka, Java, and other parts of Oceania. Most of the cocoa beans exported to Europe until the 1750's were Criollo beans.

Criollo cocoa is considered the finest flavor cocoa and is often used for blending with other types in the making of premium chocolate. The beans require little fermenting, typically only two to three days, but the plant is not very vigorous, disease resistant, or high yielding. As a result, many of the plantations have since been destroyed by disease or insect pests and have been replaced with higher yielding hybrids. Some authorities question whether there are any pure stands still in existence (Wood & Lass:1985:29).

Forastero, the second cocoa type, is indigenous to an area west of the Andes in the Amazon Valley. Forastero seeds were introduced by the Portuguese in 1824 into West Africa where it developed into the Amelonado ("melon-shaped") type, the most extensively planted cocoa in West Africa today. Other seeds were taken in the late 1700's to Bahia, Brazil, where it evolved into the Comun variety, still the most prevalent type of cocoa in Bahia.

Forastero trees are hardier and more prolific than the Criollo type, but lack the latter's fine flavor. One exception is the Cacao Nacional variety of Ecuador that, despite its parentage, has a distinctive and well sought after taste. Few pure stands of Cacao Nacional presently exist owing to its susceptibility to the fungus disease, Witches' Broom (Crinipellis perniciosa), which occurs in areas of Central and South America.

Figure 1
Origin & Dispersion of Cocoa Types



Source: Are & Gwynne-Jones

According to one authority, the majority of the cocoa graded as Arriba comes from plantations planted with hybrid crosses of Nacional and Trinitario types (Soria:1970:17).

The third type, Trinitario, developed from the natural crossing of Criollo and Forastero trees on the island of Trinidad. This hybrid was later planted in other West Indies islands and in Ecuador. Trinitario produces a fine flavored cocoa second to Criollo, but requires more time to ferment. It declines quickly in vigor and now is found only in a few areas of the world today: Ecuador, Trinidad, Java, Papua New Guinea, and, until recently, Cameroon and Venezuela.

Table 1
Varietal Attributes of Criollo, Forastero, and Trinitario Cocoa

Characteristics	Criollo	Forasteros	Trinitarios
Pod Color	Orange/Yellow	Yellow	Orange
Pod Texture	Furrowed	Smoother	Variable
Bean Shape	Plump	Flat	Variable
Aver. Beans/Pod	20 - 30	> 30	> 30
Cotyledon Color	White/Pale	Pale/Purple	Variable
Quality	Flavor	Bulk	Flavor

Sources: Are & Jones (1974); Wood & Lass (1985)

Plant breeding during this century has produced a large variety of hybrids, primarily crosses between Upper and Lower Amazonian Forasteros, that have improved yield bearing, disease/pest resistance, and vegetative growth characteristics. Little to no success has been achieved with imparting a better flavor to the cocoa; hence, hybrids generally produce bulk cocoa.

2. Flavor Versus Bulk Cocoa

In international cocoa marketing parlance, the distinctions in cocoa varieties discussed above have been reduced to two types based loosely on end use. These are flavor or fine cocoa and bulk, filler, or ordinary cocoa. Cocoa beans are further differentiated by country of origin or by port of export and by grades and use of special trade names or marks to assist buyers with assessing the beans' quality. A complete list of cocoa trade names can be found in Table 2. For further assistance, a glossary of important terms relevant to the cocoa trade is included in Appendix 1.

Flavor cocoa, produced exclusively from Criollo and Trinitario trees, is imbued with high levels of cacao aroma and flavor and is generally low in "sour" notes. While the flavor characteristics of Criollo cocoa varies to some extent from

country to country, all have a distinctive "mild nutty" flavor. Trinitario beans have been described as having "... a full chocolate flavor with a certain fruitiness or other ancillary flavor" while Cacao Nacional from Ecuador has a "perfumed" aspect (Wood:1985:506). Table 2 lists odor/flavor characteristics for other flavor cocoas. Since little flavor cocoa is produced today, it is generally mixed with bulk cocoa in the production of premium chocolate.

Table 2
Flavor Cocoa Trade Names & Odor/Flavor Descriptors

COUNTRY	TRADE NAMES	ODOR/FLAVOR
Ecuador	Arriba Superior Summer Plantation Selected; Superior Summer Selected; Machala; Caraquez; Balao	Strong, acrid aroma; somewhat bitter; hardly sour
Indonesia	Java Plantation, according to size: A or B; Light Breaking Fine	Weak aroma; sour trend
P.N.G.	Plantation; Fair Average Quality	Especially aromatic; strong; slightly bitter
Grenada	Fine Estate Grenada; Grenada Plantation	Pleasantly aromatic mildly sweet
Jamaica	Jamaica First Grade Fermented	Slightly aromatic; not bitter; not sour
Trinidad	Plantation Trinidad + trade name	Mild, slightly sweet aroma; not sour; hardly bitter
Samoa	Samoa I and II; Light Breaking Fine	Weak, mild, and pleasant aroma; hardly bitter; not sour
Sri Lanka	Old Ceylon Red; Plantation (EA I and A I); Native (B I and B II); Light Breaking Fine	Weak, acrid aroma; not sour

Source: Gordian Publishing House

Bulk cocoa is produced from Forastero types and from modern hybrid crosses. As the majority of the world's cocoa production is considered bulk cocoa, it provides the "feedstock" of the

chocolate industry. The name need not imply inferior quality for many producing countries now abide by internationally approved standards for bean quality. And, in fact, some bulk cocoas, like the Accras and Lagos, carry premiums over some flavor cocoas, like the Tabascans of Mexico, because the latter are produced in very small quantities, little is exported, and the beans are not of consistent quality (Wood:1975:6).

Bulk cocoas, like flavor cocoas, also differ greatly in aroma and flavor from country to country due to differences in post-harvest handling, inspection, and marketing.

Amongst bulk cocoas, premiums vary. As discussed above, Accra and Lagos beans are usually sold at the highest premiums and are used for making fine quality milk and dark or plain chocolate. Smaller premiums are paid for Bahias (from Brazil) and Ivories (from the Ivory Coast) because they are less uniform in quality, have less aroma, and tend to be more acidic. Bahias, in addition, often have an objectionable "hammy" or smoky aspect.

At the bottom end of the quality spectrum are the unfermented Sanchez beans from the Dominican Republic. With their highly astringent flavor, considered unacceptable to European chocolatiers, they are used by American and Dutch companies in small portions in the making of couvertures for pressing into butter. Of course, the flavor quality of any cocoa can be affected not only by the genetics of the tree, but by the cultural practices of the producer (fermentation, drying, etc.), by climate and soil type, and by the method of bean roasting.

3. Other Quality Aspects

While the measurement of cocoa flavor and aroma, like all foods, is often a very subjective affair, other more objective tests are routinely taken to determine the bean parcel's purity, consistency, and yield of edible material.

Bean purity, measured against local legal requirements appropriate to each consuming country, considers the degree of contamination from pesticide residue, bacteria and insect infestation, and foreign matter.

Consistency in bean quality -- from parcel to parcel and from crop year to crop year -- is especially important to the chocolate manufacturer who desires to produce a product of reliable quality. Part of the higher premiums Accra beans attract on the world market is due to strict Ghanaian grading and sorting practices. Contrawise, producers of beans exhibiting a wide variance of bean quality will soon find their product discounted on the world markets. The discount, or lowering of the bean premium against its potential price, results as the buyer requires a contingency to buffer the costs of replacement or blending.

Bean yields measure the amount of cocoa nib and butter contained per unit of bean. The higher the proportion of the edible material in the bean, the more the manufacturer will pay for the parcel. Tests for bean yields include measurement of the bean size and uniformity, shell and moisture content, and the percentage of fat content in the cotyledon. Table 3 presents comparative bean yield characteristics for about two dozen flavor and bulk bean types.

Table 3
Comparative Bean Characteristics

COUNTRY	BEANS/ 100 G.	SHELL %	FAT %	FAT YIELD	pH	SOURCE
FLAVOR						
Ecuador	76-79	14.2	53.4	42.0	5.8	2
Indonesia	94-95	9.9	53.6	44.9	5.3	2
P.N.G.	75-90	16.4	56.9	44.3	5.1	1 & 2
Grenada	101-104	16.6	56.7	43.8	5.7	2
Jamaica	85-90	14.4	59.5	47.4	5.9	2
Trinidad	93-96	17.3	56.7	43.7	5.5	2
Samoa	78-82	14.9	55.6	44.0	5.8	2
Sri Lanka	<u>n.a.</u>	<u>9.7</u>	<u>57.8</u>	<u>48.7</u>	<u>6.4</u>	2
AVERAGE	86-91	14.2	56.3	44.9	5.7	
BULK						
Ghana	90-95	11.3	57.3	47.8	5.5	1 & 2
Nigeria	90-95	11.7	56.8	47.2	5.6	1 & 3
Ivory C.	92-105	11.9	56.5	46.8	5.9	1 & 3
Cameroon	96-102	12.9	56.3	47.6	5.4	2 & 3
Brazil	85-105	12.8	54.5	44.5	5.4	1 & 2
Haiti	113	13.7	54.6	42.9	6.3	2
Mexico	88	9.0	53.2	45.2	6.5	2
Belize	98	12.7	53.7	n.a.	n.a.	4
D.R.-Sanchez	101	12.3	52.2	41.1	6.1	2 & 4
Malaysia	85-125	16.0	57.0	45.2	4.8	1 & 3
Panama	76-82	15.3	58.8	46.9	5.4	2
Costa Rica	84-87	15.3	59.6	46.8	5.7	2
Venezuela	<u>84-92</u>	<u>16.3</u>	<u>55.7</u>	<u>42.9</u>	<u>5.7</u>	2
AVERAGE	92-100	13.2	55.7	45.4	5.7	

Sources: 1/ Wood & Lass (1985)
 2/ Gordian Publishing House (1962)
 3/ Terink (1984)
 4/ Proprietary information

Table 3 was compiled from several sources using varying test methods, crop years, and sample sizes; therefore, quality comparisons between bean characteristics should be regarded with caution. Unfortunately, no better non-proprietary data exists.

Beans per 100 gram sample is commonly referred to as a "bean count". Fat yield is a measure of grams of cocoa butter per 100 gram sample of dried beans.

All things considered, the larger the bean, the lower the shell content, and the higher the fat yield of the nib, the more valuable the bean is to a typical chocolate manufacturer. Bean counts of under 100 (or beans weighing one gram each or more) are preferred in the trade. In fact, the London Cocoa Terminal Market standard contract stipulates that counts over 110 but less than 120 are subject to price discounts. Counts over 120 are not even tenderable. Finally, manufacturers consider acceptable fat contents of 56 to 57% expressed on a dry basis.

In general, flavor beans as compared with bulk beans were larger size (86 to 91 versus 92 to 100 per 100 grams) but had lower fat yields (44.9 versus 45.4) due to higher shell content. Both flavor and bulk beans had the same average pH, i.e., 5.7. Grenada beans did not fare well when compared with the average flavor bean. With a 101 to 104 bean count, they were generally much smaller and yielded 2% less fat as a result of both higher shell and lower fat content.

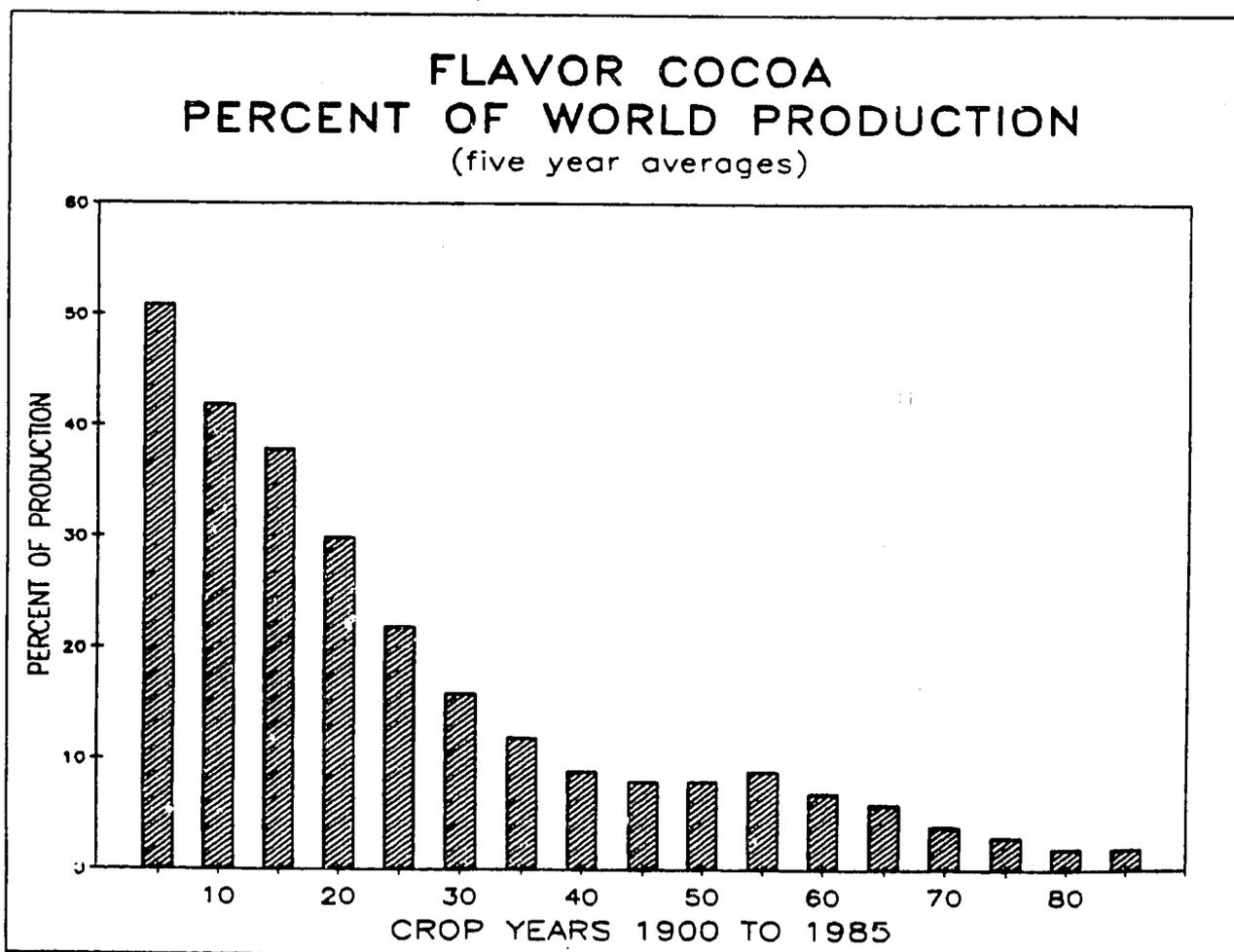
CHAPTER II

THE SUPPLY OF FLAVOR COCOA

1. World Flavor Cocoa Production

At the beginning of the century, more than half of the world's supplies of cocoa were considered of flavor grade. This is displayed in a bar graph in Figure 2 and in Appendix 2. Crop years are averaged over five year periods in order to reduce wide crop variability between years. The five biggest producers during the period 1900-1905 were, in descending order, Ecuador, Brazil, Sao Tome, Trinidad and Tobago, and Venezuela.

Figure 2



Source: Gill & Duffus

By the outbreak of World War II, flavor cocoa's proportion of world production had dropped to 10% due to declining harvests in Ecuador and Trinidad and increasing crop outturns of bulk cocoa in West Africa and Brazil. This trend has continued and by the most recent five year period (1980-1985), only 2% of the world's production of cocoa could be classified as flavor as quality has steadily deteriorated in Papua New Guinea and Ecuador and as Trinidad, Tobago, and Venezuela have concentrated instead on petroleum production.

Gone forever are the classic flavor cocoas with eloquent trade names that Van Hall (1932) used to extol: the Maracaibos, Ocumares, and Chuaos of Venezuela; the Caraquez and Machalás of Ecuador; Ceylon Plantation; and the Criollos of Nicaragua.

The changing nature of flavor cocoa production is illustrated in Table 4. This table lists the proportion of flavor to total cocoa production by country over the past ten years as estimated by the ICCO and by G.A.R. Wood, the author of the standard text on cocoa (see References). The ICCO's classification, compiled nearly twenty years ago, may be considered outdated. It is still important in so far as flavor cocoa producers are not subjected to member country levies or quotas.

Table 4
Flavor Cocoa Production by Country

COUNTRY	1976/77				1983/84		OUTLOOK Thousand Tonnes
	ICCO		Wood		Wood		
	% Flavor	'000 Tonne	% Flavor	'000 Tonne	% Flavor	'000 Tonne	
Ecuador	100	72.0	7	5.0	10	5.0	5.0-10.0
Indonesia	100	3.0	100	1.0	28	5.0	5.0
P.N.G.	75	20.3	50	13.5	18	5.0	5.0
Grenada	100	2.0	100	2.5	100	2.5	2.0-3.0
Jamaica	100	2.0	100	1.5	100	2.5	2.0-3.0
Trinidad	100	4.0	75	3.0	100	2.0	1.5-2.3
Samoa	100	2.0	100	1.5	100	0.5	0.5-1.5
Sri Lanka	100	2.0	100	1.0	100	0.5	1.0-2.0
Other W.I.	100	1.0	100	1.0	100	0.5	0.5-1.5
Venezuela	100	15.0	0	0.0	0	0.0	0.0
Costa Rica	25	2.0	0	0.0	0	0.0	0.0
Sao Tome	50	3.0	0	0.0	0	0.0	0.0
WORLD TOTAL	9	128.3	2	30.0	2	23.5	22.5-33.5

Sources: Wood (1978) and (1985)

Note: Other West Indies = Dominica, St. Lucia, St. Vincent, and Grenadine

Wood has removed three countries - Venezuela, Costa Rica, and Sao Tome - from the ICCO listing of flavor producers. Venezuela was dropped because the areas of flavor cocoa production, the Criollo planted valleys in the western part of the country, have since been abandoned. Further, he has reduced the percentage of flavor to total cocoa production in Ecuador from the ICCO's 100% to about 10%, or from about 60,000 metric tonnes to 5,000 tonnes because of quality related problems. Papua New Guinea's production was reduced from 75% to 18% or from 23,000 to 5,000 tonnes for the same reason. Flavor cocoa production in Indonesia, he estimated, has remained at the same level, approximately 5,000 tonnes, while the country's total production has soared due to recent plantings of new hybrid, bulk quality cocoa.

According to ICCO assumptions, world flavor cocoa production is reckoned at 127,300 tonnes or 9% of total cocoa production, a figure considered far too optimistic by trade sources. Using Wood's assumptions, however, flavor cocoa accounts for an almost insignificant 2% of world production, or 30,000 tonnes in crop year 1976/77 and further dropping to 23,500 tonnes in 1983/84 because of deteriorating quality and lack of uniformity of Papua New Guinea's outturn.

The market for flavor cocoa is highly specialized with small shipments available only at certain times of the year. In Ecuador, for example, this cocoa is produced during the southern hemisphere's summer months of February through May, a time that also corresponds with the rainy season. This cocoa is designated "Arriba Superior Summer" cocoa versus "Seasons" cocoa of lesser quality produced during the drier months of Ecuadorian summer. This seasonality of production is an important factor in month by month fluctuations in flavor cocoa production and in market premiums. See Table 5 for the main and mid harvest seasons for other flavor producers. The marketing and shipping of cocoa would occur one to three months after harvesting.

It is apparent from Table 5 that the majority of the flavor cocoa harvest (e.g., from Ecuador, the Caribbean, and Sri Lanka) coincides with main crop harvesting in the bulk producing areas of West Africa and Brazil. Crop outturn from these latter two regions comprise an estimated 75% of global annual production.

With such huge amounts of cocoa entering international trade channels, terminal prices from October through January are usually at their lower levels. Prices tend to rise during June through August as old cocoa stocks are depleted and estimates of upcoming harvest levels are uncertain. Only Indonesia, Samoa and Papua New Guinea harvest flavor cocoa during this time.

Table 5
Flavor & Bulk Cocoa Harvest Seasons

COUNTRY	MONTH											
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
<u>Flavor</u>												
Ecuador	o	X	X	X	X	X	-	-	-	-	-	o
Indonesia	-	-	-	X	X	X	X	X	X	-	o	o
P.N.G.	-	-	-	-	X	X	X	X	-	-	o	o
Grenada	X			o	o	-	-	-	-	-	X	X
Jamaica	X	X	-	o	o	o	-	-	X	X	X	X
Trinidad	X	X	X	X	X	-	-	-	o	o	-	X
Samoa	-	-	X	X	X	X	-	-	-	-	-	-
Sri Lanka	X	-	-	-	o	o	o	-	-	-	X	X
<u>Bulk</u>												
West Africa	X	-	-	-	o	o	o	o	o	X	X	X
Brazil	X	-	-	-	o	o	o	o	o	X	X	X

Source: Merrill Lynch, Pierce, Fenner, and Smith

Note: X = Main Crop; o = Mid Crop

2. Selected Country Trends in Production

Ecuador

Arriba beans, produced by Nacional type Forastero trees, originally referred to those beans produced in Arriba ("above" in Spanish) District upstream from Guayaquil. As most of this area has since been replanted with more vigorous hybrids, the flavor proportion of what is marketed as Arriba (to be exact, the grades Arriba Superior Summer Plantation Selected and Superior Summer Selected from Table 2) accounts for less than 5 to 10% of the total crop (Lass:1970:10 and Wood:1985:47). These two better grades are primarily sold on the Continent while grades of lesser quality are shipped to the United States, U.S.S.R., and to other South American countries.

Constraints affecting the future of the Ecuadorean cocoa industry are low yields, (e.g., 200-300kg/ha, characteristic of flavor cocoa); the presence of Witches' Broom disease; unstable weather patterns that halved the crop during 1982/83 and 1983/84; and continued high prices which encourage exporters, in the absence of enforced grading standards, to purchase beans regardless of quality.

In addition, bean flavor is extremely variable due, perhaps, to genetic material, environmental conditions, or post-harvest handling. "The tonnage of [Arriba] cocoa now demanded by world chocolate manufacturers is insignificant and the premium [once very high] is almost nonexistent, so no new plantings of pure Arriba cultivars are being made" (Lass & Wood:1985:88).

The National Development Bank is currently funding the Ministry of Agriculture's National Cocoa Program designed to increase the production of existing plantings. This program, called the "Renovation and Rehabilitation Program of Cocoa Plantations", will concentrate on the drier areas of production in traditional cocoa growing areas of the Guayas and Babahoyo River Basins and in the more northern coastal provinces of Manabi and Esmeraldas. No new plantings are anticipated.

Target production will be 210,000 tonnes to be achieved over a twenty year period divided into five 4 year stages. During the first stage, which started in 1984, an estimated 27,000 hectares (66,700 acres) or 10% of the country's current harvestable area will be improved and by the end of the project in the year 2004, 80% will be renewed or rehabilitated. It is not known whether funding for the next four stages has been made available.

Plantation renovation entails replanting, construction of irrigation canals and drainage ditches, use of fertilizers and pesticides, and improved local market networks, i.e., storage facilities near production centers. Higher internal cocoa prices have already resulted in increased interest by growers to upgrade their cultural practices.

Currently, a return to more favorable weather, higher farm prices, and improved cultural practices spurred by government interest in production have increased production to an estimated record 120,000 tonnes for the 1984/85 crop season and 115,000 tonnes for the 1985/86 season, reckon Gill & Duffus in their December 1985 report. Assuming that 5 to 10% of the crop is of flavor quality, then the current crop could produce 5,750 to 11,500 tonnes of flavor cocoa.

Indonesia

Cocoa is cultivated in Indonesia on government-owned estates, small holder plots, and large private estates in East Java, North Sumatra, and West Java. Flavor cocoa production is now confined to East Java. Throughout most of this century, the country produced a few thousand tonnes of Criollo cocoa that was exported to Europe and Japan. In fact, it was illegal to plant hybrid cocoa until the mid-1970's (Trout:private communication).

In order to boost export earnings and employment generation during the current Five Year Development Plan, the government is emphasizing cocoa, as well as other plantation crops, for economic assistance. The Director General of Estates has plans to expand plantings from 67,000 hectares (165,500 acres) in 1983/84 to nearly 127,000 hectares (313,700 acres) by 1988 and to increase production by 10,000 tonnes per year to 56,000 tonnes (Bank Bumi Daya:1983 and Indonesia Commerce Newsletter:1985). Such an optimistic forecast does not allow for a resurgence of the Cocoa Pod Borer or the fungus Vascular Streak Dieback, both potentially serious pests to the country's cocoa plantings (Lass & Wood:1985:75).

This ambitious expansion in hectarage and production will be achieved by planting hybrid, bulk type cocoa. There was no mention in current literature on breeding Indonesian cocoa to retain the flavor aspect of Java beans. And, in fact, some dealers and manufacturers do not now consider Javas as flavor quality cocoa, but rather bought by manufacturers for its light color for milk chocolate. With the supply of Javas steadily increasing these last few years, the bean's premium has dropped on the world market.

Papua New Guinea

Cocoa was introduced into Papua New Guinea by German settlers at the beginning of the century. These first plantings were probably of Trinitaro stock from Samoa, Java, or Sri Lanka. At present, there are about 57,000 hectares (140,800 acres) of cocoa producing an average 30,000 tonnes of beans a year, a level of production that has not changed within the last 15 years.

This stagnation in production is due to several factors, the most important being uncertainty over land tenancy rights of major estate owners, predominantly Australian, since the country's independence in 1975. Although this problem has recently been resolved, lack of a prompt resolution had virtually halted plantation reinvestment. Additional constraints are tree senescence, labor shortages, the presence of the very serious disease Vascular Streak Dieback, Weevils and Coreid Bugs, and low yields (200-300 kg/ha). The quality of New Guinea beans is hindered by high shell content (16.4%) and acidity, although the beans do yield a harder butter.

Current cocoa development efforts include a multi-disciplinary cocoa industry research team experimenting with breeding hybrids for higher yields, lowered tree height, and disease resistance (CSPNG Newsletter:1984:17-19).

Results to date have been promising except in the area of reducing the hybrid cocoa's inherently acidic and astringent flavor. This problem, coupled with the lack of crop and bean quality uniformity, led Wood to lower his estimate of the country's harvest of flavor beans to 18% of the total production, or 5,000 tonnes, in contrast to the ICCO's estimate of 75%. Future production trends should either continue at 5,000 tonnes or dwindle further.

Grenada

Grenada has about 4,500 hectares (11,100 acres) of predominantly Trinitario-type cocoa producing a steady 2 to 3,000 tonnes per year. Cocoa has traditionally been the country's most important export crop, contributing 30% of all foreign exchange earnings.

The Grenada Cocoa Association, a statutory corporation to which all cocoa farmers and buying agents belong, is empowered to operate the central fermentaries, to license buying agents, to inspect and grade the beans, and to act as sole exporter of the island's cocoa crop. The Association is controlled by the Cocoa Industries Board which consists of six elected and three appointed officials. The current Chairman is one of the country's foremost cocoa planters.

The Association acts like an African Marketing Board (see Chapter 4, Section 1) in that it markets all cocoa exports, fixes producer prices, and tries to stabilize these prices with the use of retained earnings. Growers receive an advance payment based on revenue projections at the time cocoa is delivered to the Association and an adjustment or bonus at the end of the year based upon current Association profits plus or minus changes in reserve levels.

Payout over the last four years has included a drawdown of reserves and has averaged 80% of the average prevailing selling price of cocoa. This payment, equivalent to US\$ 0.81/lb., is most generous considering that expenses for post-harvest processing, marketing, and pest and disease control are borne by the Association. Not surprisingly, the high payout and problems with overselling the crop has pushed it into depleting its reserves.

Since 1981, CIDA (Canadian International Development Agency) supported the Association's Cocoa Rehabilitation Project intended to accelerate the replanting and rehabilitation of Grenadian plantations. Original targets involved replanting 675 ha/year, conducting a disease and pest spray campaign on replanted trees, upgrading propagation stations, and providing technical assistance to growers. A US\$ 0.83/ha replanting subsidy was offered to participating growers. The total project is estimated to cost US\$ 7.65 million.

The Project is being redesigned in response to low farmer interest, as evidenced by the replanting of only 41% of target hectareage. Training of extension agents and farmers is to receive more emphasis.

To preserve the flavor characteristics of Grenada's cocoa, rooted cuttings are used for propagation purposes, despite the mixed survivability rate (60%) and the higher costs involved (US\$ 2.37 to 4.31/plant). The full cost of these clones, however, are not passed on to farmers. They are sold for US\$ 0.09 each.

Constraints to expanded production include serious disease and insect problems, including Witches Broom, Black Pot Rot, Cocoa Beetles, and Thrips. In addition, cocoa plantings are small in size, averaging approximately 1 hectare each, and old (average age 32 years). These problems, together with the generally advanced age of the typical Grenadian cocoa farmer and

high unit cost of labor, have kept yields at about 400 to 500 kg/ha. These yields are higher than yields from other flavor producers, but lower than many bulk producers. Future production is estimated to range between 2 to 3,000 tonnes.

Jamaica

Production in Jamaica has averaged 2-3,000 tonnes for the past eighty years. An estimated 12,100 hectares (30,000 acres) of land are planted with cocoa, although this area is shrinking owing to competition from food and more remunerative cash crops. The average holding is a very small 0.5 ha/farmer, an amount on par with West African producers. The Jamaican industry is regulated by the Cocoa Industry Board which, among other responsibilities, subsidizes inputs, distributes seedlings for free, sets producer prices, and is the sole processor of wet beans and exporter of fermented and dried beans.

The Jamaican Cocoa Industry Board has recently inaugurated a "Structural Adjustment Program" to assist the island's cocoa farmers. In 1984 a new company, Cocoa Farms Development Ltd., was incorporated to facilitate and sustain the long-term development of cocoa production through the maintenance of about 1,700 hectares of land formerly operated by the Board. In addition, the Board has started deregulating the industry to permit growers to export their crops directly. None have done so yet, probably because their holdings are so small in size (Planning Institute of Jamaica:1984:7.11). No change in the country's production of cocoa is envisioned at this time.

Rowntree-Mackintosh has a standing contract to purchase 1,200 tonnes of Jamaica cocoa a year, roughly 80% of the crop, to be made into chocolate in their plants in the U.K., West Germany, and Canada.

Trinidad and Tobago

Production in Trinidad and Tobago has dwindled from a high of 35,000 tonnes in 1920/21 to a current steady average outturn of 2-3,000 tonnes grown on 21,000 hectares (51,900 acres). Witches' Broom, Swollen Shoot, Ceratocystis Wilt, and Cocoa Beetles are important pests. Trinidad beans, produced from Trinitario trees, are near substitutes for Grenadas, with the former receiving a 1 cent or 2 cent per pound premium on the New York market.

Reversing a long standing policy of neglect as it encouraged petroleum production, the government inaugurated a program to rehabilitate existing areas and to double production within the next ten years. Approximately 17,600 hectares (43,500 acres) are to be replanted with high yielding and disease-resistant varieties. Other incentives include offering tax exemptions on agricultural income, guaranteed producer prices (US \$1.80/lb.

before devaluation), subsidies on production inputs, loans, infrastructure upgrading, and improvement and expansion of marketing and processing facilities including the establishment of central fermentaries.

Samoa

Samoa, or more properly Western Samoa, has seen its production stagnate at 2,000 tonnes a year. Constraints to higher production are the lack of disease and insect control, better processing facilities, and improved husbandry. Yields are low despite the fertile volcanic soil (Wood & Lass:1985:580-581).

It is not known whether there are any rehabilitation or replanting schemes proposed or in operation. Accordingly, the production of Samoa cocoa beans, still considered 100% flavor, is forecasted to remain at a 500 to 1,500 tonne range. However, some brokers do not consider Samoa I's as flavor beans but rather are pressed for butter. They are being replaced in recipes by Java A Light Breaking Fine beans.

Other West Indies

Most other Caribbean producers, e.g., Dominica, St. Lucia, St. Vincent, and the Grenadines, offer few prospects for expansion of output beyond current trends. Steep hillsides, competition with other tropical crops like bananas, the occurrence of major diseases like Witches' Broom and Black Pod Rot, and the high unit cost of labor preclude any increases in outturn (FAO:1965:90). Production is forecasted to remain at 500 to 1,500 tonnes.

Sri Lanka

Production in Sri Lanka has remained frozen at 2,000 tonnes for decades. The traditional variety planted in the country, a Trinitario type called "Old Ceylon Red", when available is sold to the Continent for butter. Some dealers do not consider it a flavor grade.

No rehabilitation or replanting programs are known to be planned or are currently being implemented. Due to high disease losses, the presence of Swollen Shoot disease, and continued senescence of plantings, production is estimated to linger at 1,000 to 2,000 tonnes a year.

3. Price Elasticities of Supply

In contrast to an annual crop where production levels can be changed from year to year in response to major price changes, the cocoa tree is perennial with a long production cycle. The tree requires three years to mature and eight years to reach full production. As a result, changes in the level of production lag broad price trends.

Several studies estimating price elasticities of supply have been published (Akiyama & Duncan:1982; Bateman:1965; and Behrman:1968). The following discussion is a very general synopsis of their conclusions. Price elasticity of supply expresses the percentage change in quantity supplied in response to a one percent change in price, other factors held constant.

All three studies concluded that cocoa has a relatively low price elasticity of supply. For example, the short-run supply elasticity was estimated at 0.138 (Akiyama & Duncan:1982). In other words, a 10% increase in the world price of cocoa would increase world production by only 1.4% in one year. In contrast, estimated short-run elasticities of supply for eggs and potatoes, with short production cycles, are around 1.0 (Tomek & Robinson:1981:79). The supply response for cocoa in the intermediate-run, about six years, was still an inelastic 0.24. Even after nine years, the elasticity was only 0.42.

Given the inelastic nature of cocoa's supply schedule, four policy-related issues emerge. One, if the government of the producing country sells its cocoa through a marketing board monopoly, then that government must be prepared to run up deficits before incremental revenue covers incremental costs. Relatively large changes in support prices would be required to bring about a compensating change in production.

Two, countries not blessed with available, non-marginal land -- a constraint most flavor producers experience -- will not be able to exploit increases in cocoa prices as readily as countries such as Brazil, Ivory Coast, or Cameroon that do have available land.

Three, supply curve shifts to the right (implying that a larger quantity will be offered at a given price) are possible due to changes in technology that influence both yields and costs of production. Breeding hybrids for higher yields and disease/pest resistance is an example of technology which can shift the supply curve. Contrawise, low yields, high costs of production, and tree senescence, all characteristic of most traditional Criollo and Trinitario plantings, would force the supply schedule to freeze or possibly to drift left-ward, implying less cocoa would be available at a given price.

Four, producing countries shackled to overvalued currency exchange rates (e.g. Ghana and Nigeria) would exhibit more inelastic responses to changes in market prices.

4. Production Forecasts

Though six flavor cocoa producing countries -- Ecuador, Indonesia, Papua New Guinea, Grenada, Jamaica, and Trinidad -- have current or future plans to renovate or expand their plantings of cocoa, considerable constraints to increased production exist. Frequent hurricanes, shortages of labor, high

costs of production, and small size of the holdings may hamper plans, however well intended, to expand local crop production in the Caribbean.

Moreover, all flavor producing countries suffer from major disease and insect occurrences like Witches' Broom in the West Indies and Ecuador; Vascular Streak Dieback in Papua New Guinea; and Pod Borer in Indonesia; Bark Beetle in Grenada; and Black Pod and Thrips in all producing countries. Competition from petroleum production have been factors in Trinidad, Tobago, and, to a lesser extent, in Ecuador; and from more remunerative tropical crops in the West Indies, Grenada, and Jamaica. Finally, producers like Indonesia and Papua New Guinea have decided to shift their attention to the cultivation of bulk quality hybrid from flavor cocoa. Table 6 summarizes these constraints by country. Thus, production of flavor cocoa can be expected to remain at existing levels at best.

Even if some origins have the good fortune to increase their local crop outturns, the world proportion of flavor to total cocoa production should not stray far from the current 2%, as continued record harvests from the Ivory Coast, Malaysia, Brazil, and other bulk producers would far outweigh them. Manufacturers, to varying degrees, have already modified their recipes in response to changes in bean availability. As will be discussed in the next section, this trend might put downward pressure on premiums for flavor beans.

World production of flavor cocoa down trended from an average of 48,900 tonnes in 1970-75 period to 33,400 1975-80, and further to 26,600 in 1980-85. World flavor cocoa production is estimated to fluctuate at a range of 22,500 to 33,500 tonnes a year.

Table 6
Summary of Constraints Affecting Flavor Cocoa Production

COUNTRY	YIELDS kg/ha	DISEASE	INSECT	WEATHER/ CLIMATE	ALTERN. CROPS	LABOR
Ecuador	200-300	Witches' Broom Monilia	Mirids	Unstable	Petroleum	-
Indonesia	300-400	Vascular Streak	Cocoa Pod Borer Mealy Bugs	-	Food Crops	-
P.N.G.	200-300	Vascular Streak Bark Canker	Weevils Coccid Bugs	-	-	Shortage
Grenada	400-500	Witches' Broom Black Pod	Thrips Cocoa Beetle	-	Bananas	Expensive
Jamaica	150-250	Black Pod	-	Hurricanes	Food Crops Bananas	Expensive
Trinidad	150-200	Witches' Broom Swollen Shoot	Cocoa Beetle Mealy Bugs	-	Petroleum	Shortage
Senegal	n.a.	-	-	-	-	-
Sri Lanka	n.a.	Swollen Shoot	Mealy Bugs	-	-	-
Other W.I.	n.a.	Witches' Broom	Cocoa Beetle	-	Bananas	Expensive

Sources: Lass & Wood (1985) for diseases and insects

CHAPTER III

THE DEMAND FOR FLAVOR COCOA

1. World Flavor Cocoa Consumption

The rate of growth in world demand of cocoa is influenced by population growth, by national income changes in consuming countries, by deflated world cocoa prices, and by the prices of cocoa substitutes.

Over the ten year period between 1971 and 1980 higher cocoa prices and a widespread economic recession caused world consumption to increase at a slender 1.2% per annum rate, or half the rate per year as was realized between 1961 and 1970. Between 1980 and 1985 consumption expanded approximately 2.3% per year, a relatively robust level considering that the first part of this five year period was marked by a global recession and the second part by higher cocoa prices.

The consumption of flavor cocoa is currently constrained by five factors: unfavorable demographics, dwindling supplies, volatile cocoa prices, changes in chocolate making technology, and increased concentration in the confectionery industry. Each factor is described briefly below.

Demographics

Over 70% of the world consumption of bulk cocoa and almost all flavor cocoa is accounted for by Western Europe and North America. The rate of growth in cocoa consumption in these two regions has been hampered by relatively low population growth and by low income elasticities of demand (see Section 3). Consumption between 1971 and 1980, for example, contracted 0.6% and 1.7% per annum, respectively, while between 1980 and 1985, it is estimated to expand at about 0.9% and 3.0% per annum (Akiyama & Duncan:1982).

Areas identified by analysts as having higher consumption growth potential are Eastern Europe, the U.S.S.R., and Japan where per capita consumption levels are still relatively low; and in newly developed countries, particularly in Asia, which have higher income elasticities of demand. All of these areas except Japan are currently very minor consumers of flavor cocoa.

Dwindling Supplies

Changing bean formulae, once considered sacred, has become an economic fact of life for chocolate manufacturers as supplies of cocoa beans change worldwide. High quality pre-World War II blends, consisting mainly of Accras, Lagos, and flavor beans,



were developed when Ghana and Nigeria produced 50% and flavor producers 10-20% of the world's supply of cocoa. Currently, the combined production of these three types of cocoa contributes less than 23% of the world total. Now recipes include larger proportions of Ivories, Bahias, Malays, and other bulk beans.

To quote G.A.R. Wood:

As supplies of flavor cocoa have diminished, many manufacturers, particularly the large ones who require large tonnages of uniform quality and flavor, have given up blending and some have found that they can make their products satisfactory without using flavor cocoa (1978:10).

Cocoa Prices

The volatile and at times high prices for cocoa beans have encouraged the shift to using cheaper cocoa butter substitutes and non-chocolate fillers in chocolate products. This is because the typical American milk chocolate bar consists of about 30% cocoa liquor and butter, 50% sugar, and 20% milk concentrate. Yet as a proportion of costs, cocoa liquor and butter contribute 60% of the milk chocolate bar's costs, with milk and sugar contributing 20% each of the remaining costs.

In addition, the increasing volatility of bean costs has led confectionery companies to diversify their product line out of chocolate products and into other food processing activities like operating restaurants, fast food chains, and non-confectionery food items.

Chocolate Making Technology

★ The old adage that American chocolate manufacturers select beans on the basis of cost, while their European counterparts select on the basis of quality, is not now correct. Advances in chocolate making technology have permitted, to a certain degree, manufacturers to adjust processes like roasting temperatures to achieve flavor uniformity without extensive and careful bean blending. This practice is more common with European manufacturers, reported New York cocoa broker Jim Sweeney, who are more innovative in this regard than are American manufacturers.

★ Some manufacturers even report that consumers are not as sensitive to chocolate aroma as previously thought and, as a result, blending with flavor beans has become superfluous.

Manufacturing Concentration

Another influence affecting the demand for flavor beans is the increasing concentration among chocolate and cocoa product manufacturers. This is in sharp contrast to a low degree of concentration found in the sugar confectionery industry. The

intensity of concentration, characteristic of oligopolies, was estimated by UNCTAD (1975) to be highest in the United States and United Kingdom where four of each countries' largest companies were responsible for 75% of the total production of chocolate and cocoa products. Levels of concentration were also significant in France, Belgium, Netherlands, Germany, and Japan. Since this study was written, the confectionery industry has become more concentrated.

Manufacturing concentration, noted Coffee & Cocoa International magazine, has had the following effect on the demand for flavor cocoa:

Standardized formulae for finished products in the large tonnage required made it impractical, if not impossible, to include flavor cocoa, especially as the continued supply of such beans is shrinking (1984:49).

Concentration and the consequent larger markets lengthens the lag between when an ingredient price change can be passed to consumers by way of higher retail prices. The result, continues Coffee & Cocoa International:

... Such adjustments are becoming more complicated logistically, more expensive mechanically, and taking much longer to pass on to the consuming public. Indeed, rather than simply raise the price or reduce the weight of a popular candy line, a manufacturer may prefer to use new processes and different formulae, such as lowering the cocoa butter content, to cut costs (1984:50).

2. Selected Country Trends in Consumption

The demand for different types and quantities of cocoa beans are explained by regional preferences in chocolate. The British, for example, prefer milk chocolate consisting of a higher content of milk solids and sugar and a lower content of cocoa (e.g., Cadbury's Dairy Bar) than is contained in American milk chocolate. The British also prefer beans with a mild flavor and aroma.

On the Continent, Europeans prefer more plain or dark chocolate. Yet their milk chocolate, in contrast to the British, contains proportionately more cocoa than milk solids and uses beans with stronger flavors (Powell:1984:4), although there are wide variations in recipes. The Japanese prefer European-style dark chocolate with a cocoa liquor content of about 15-20% (versus 10-14% for American chocolate). They also favor the more mild cocoa beans for their recipes.

Identifying country-wide trends in flavor cocoa consumption are difficult because of the lack of detailed trade data. The origin of import figures published by the ICCO often fail to include any imports from such flavor producers as Grenada,

Jamaica, Indonesia, Sri Lanka, Samoa, and other West Indies islands. Separate destination of export tables exist for all major bulk producers but only for two flavor producers: Ecuador and Papua New Guinea.

The International Trade Center, Geneva, has compiled an excellent study on the world's major markets for cocoa products, including identifying trade flows, important dealers, and end users. Data from countries producing flavor cocoa were extracted from this report and are presented in a trade matrix in Table 7. It is important to note that this study does not separate quantities of flavor and bulk cocoa from those producers (Ecuador, Indonesia, and Papua New Guinea) that produce both. As the years covered in the study were 1969 to 1974, the trade matrix was named "traditional" sources/users of flavor cocoa in contrast to Table 8 which lists current trade flows.

As can be seen from Table 7, all major consuming countries did to some extent import beans from countries that produce flavor cocoa. The United States imported during this period cocoa from Ecuador, Papua New Guinea (both probably of lower quality), Samoa, and Trinidad. American chocolate companies identified as using flavor beans were Nestle's (for their chocolate chips), World's Finest, and Hershey (mostly Trinidads).

Table 7
Traditional Trade Matrix of Flavor Cocoa by Country
(thousand metric tonnes)

COUNTRY	U.S.A.	U.K.	H. GER.	NETHER.	JAPAN	FRANCE	SWITZ	BEL-LUX	CANADA	ITALY	U.S.S.R.	DEALERS/BROKERS
Ecuador	6-21	0	2-9	8-5	2-4	8-1	1-2	8-1	1	n.e.	8-14	Numerous
Indonesia	0	0	1	0	0	#	#	1-2	0	n.e.	0	Reyners
P.N.G.	4-12	1-2	4-7	1-3	#	2-4	0	0	0	n.e.	0	Numerous
Grenada 3/	0	1-2	#	0	0	0	#	#	0	n.e.	0	Daerhouwer; Heller; Payner; Paci
Jamaica	0	#	#	0	0	0	#	0	#	n.e.	0	Daerhouwer; Rayner
Trinidad	2-4	1	#	0	#	#	#	0	#	n.e.	0	Daerhouwer; Brascan; Rayner
Samoa	#	0	#	0	0	0	#	0	0	n.e.	0	Pacol
Sri Lanka	0	0	0	#	#	#	#	0	0	n.e.	#	Pacol
Other W.I.	0	1	#	0	0	#	0	0	#	n.e.	0	Pacol
Chocolate Manufact.	Nestle; H. Finest Hershey	Rowntree; Terry	Trumpf; Sprangal Suchard	Oreste; Bansdorp	Haji Marinaga Fujiya	Menier COPAR	Sprungli Süchard	Cote d'Or Godiva Callebaut	Rowntree L. Secord Ganong	Perugina Ferraro Iren	Rossija Bolshhevik	

Source: International Trade Center

Notes: 1/ Traditional = Imports for years 1969 to 1974

2/ # = Less than one tonne

3/ Estimated

The United Kingdom imported small amounts from Papua New Guinea, Grenada, Jamaica, Trinidad, and other West Indies countries. These beans went to York-based Rowntree-Mackintosh and Terry. Japan imported a larger portion from Ecuador and small quantities from Papua New Guinea, Trinidad, and Sri Lanka. Several larger Japanese manufacturers were Meiji, Morinaga, and Fugiya. Even Russia imported flavor beans (from Ecuador and Sri Lanka), possibly because their manufacturers were still using pre-war recipes.

Major dealers who made markets for flavor beans included the British firms of J.H. Rayner and Pacol for most beans and the Dutch dealer Daarnhouwer for Caribbean beans. Arribas and New Guineas were traded by numerous firms. Descriptions of the role of dealers and brokers in the international trade of cocoa beans is described in Chapter IV, Section 1.

Table 8 adds more depth to the identification of current international trade flows of beans using a five year average (calendar years 1980 to 1984). Again, export figures for some producers may contain both flavor and non-flavor cocoa as the statistics do not differentiate between grades. Hence, the table's total export figure, 61,200 tonnes, will not match flavor production figures in Table 4.

Table 8
Current Trade Matrix of Flavor Cocoa by Country
Five Year Average (1980 - 1984)
(thousand metric tonnes)

COUNTRY	UNITED STATES	UNITED KINGDOM	WEST GERMANY	NETHERLANDS	JAPAN	FRANCE	SWITZERLAND	BELG./LUXEM.	ITALY	TOTAL
Ecuador	15,823	244	2,205	617	1,320	1,111	1,682	671	1,119	24,793
Indonesia	565	12	4,275	2,968	249	144	150	168	69	8,600
P.N.G.	5,308	1,213	8,349	343	84	1,935	32	3,431	10	20,705
Grenada	0	727	380	7	3	121	309	243	24	1,814
Jamaica	0	657	347	0	8	49	31	288	0	1,381
Trinidad	918	710	73	2	5	35	233	45	34	2,056
Sri Lanka	0	2	235	15	201	8	2	0	138	601
Other W.I.	59	10	0	2	3	10	2	2	0	89
Average	22,673	3,575	15,864	3,954	1,873	3,413	2,441	4,848	1,394	60,039
%	0.38	0.06	0.26	0.07	0.03	0.06	0.04	0.08	0.02	1.00
Source	2	1	1	1	3	1	4	1	1	-

Sources: 1/ Statistical Office of the European Communities
2/ FAS/USDA
3/ Japan Tariff Association
4/ Commonwealth Secretariat

As a further caveat, the nine countries listed in Table 8 represent only major flavor cocoa importers. In most cases minor importers could not be identified owing, one, to the lack of detail in the available trade statistics; or two, to the fact that total export figures are published on a crop year basis (October-September), while country import figures are available on a calendar year basis and therefore could not be matched. Appendix 3 contains yearly trade figures for beans and products.

In brief, 38% of the world's supplies of flavor cocoa, primarily lower quality grades from Ecuador and Papua New Guinea, found their way to the United States. West Germany followed next with 27%, importing all types of cocoa beans, but mainly from Ecuador, Indonesia, and Papua New Guinea. Other minor users were, in descending order, Belgium/Luxembourg, Netherlands, United Kingdom, France, Switzerland, Japan, and Italy.

Ecuador shipped an average of 64% of its total exports to the United States. Indonesia's largest customers were West Germany (50%) and the Netherlands (35%). Papua New Guinea sold 83% of its exports to West Germany, United States, and Belgium/Luxembourg. Both Grenada and Jamaica shipped about 40% of their exports to the United Kingdom and smaller allotments to West Germany, France, Switzerland, and Belgium/Luxembourg. The United States and the United Kingdom bought 80% of Trinidad's crop. Samoa sold 82% of its harvest to the United States and West Germany; while Sri Lanka supplied West Germany, Japan, and Italy. Other West Indies islands sold mainly to the United States.

3. Elasticities of Demand & Income

Elasticities measure the responsiveness of the relationship between product price or income changes and quantity demanded. As there is an inverse relationship between price and quantity demanded, price elasticities are usually negative. Estimates for both price and income elasticities of demand have proven that demand for cocoa is very inelastic. In other words, relatively large increases in income or large decreases in price are necessary before a correspondent increase in quantity demanded of cocoa is significantly affected.

Akiyama and Duncan (1982) estimated world price elasticities of demand for cocoa, weighted by consumption shares, to be -0.16 in the short-run (less than 6 months) and -0.30 in the long-run (more than 9 months). That is, a 10% decrease in the world price for cocoa will cause a 1.6% increase in demand for chocolate products within a half year and a 3.0% increase in about a year. Price and income elasticities are presented on a regional basis in Table 9.

Price elasticities of demand for Western Europe and North America, both important flavor and bulk cocoa importing regions, are responsible for the inelastic nature of world cocoa demand.

Elasticities are -0.21 for Western Europe and -0.23 for North America. The one exception is the Netherlands which, with consumption heavily based on processing intermediate cocoa products, is much more price sensitive.

Average world per capita income elasticity of demand was estimated at 0.32 in the short-run and 0.45 in the long-run (greater than 9 months). In other words, a 10% increase in per capita income generated, let us say, by a global economic recovery, would cause the demand for cocoa to increase 3.2% in the short-run and 4.5% in the long-run. On a country specific basis, income elasticities for West Germany, the United Kingdom, Netherlands, and France were much higher than the average world income elasticity.

Table 9
Elasticities of Demand for Cocoa Bean Equivalents

COUNTRY	PRICE	INCOME	SOURCE
United Kingdom	-0.16	0.71	1
West Germany	-0.18	0.93	1
Netherlands	-0.89	0.62	1
France	-0.38	0.68	1
Switzerland	-0.13	0.30	3
Western Europe	-0.21	0.35	2
United States	-0.14	0.36	3
North America	-0.23	0.34	2
Japan	-0.22	0.52	3
WORLD	-0.16	0.32	2

Sources: 1/ Singh et al (1975)
2/ Akiyama & Duncan (1982)
3/ ICCO (1975)

The third determinant in demand theory is the price of substitutes. As the price for cocoa increases, chocolate manufacturers can minimize their cost exposure two ways. One, they can reduce their usage of cocoa through shrinking the size of their chocolate bars or by switching to filled from solid chocolate bars.

Or, two, in countries other than the United States, manufacturers can substitute expensive cocoa butter for other vegetable oils like illipe and sheanut. Thus, in major importing countries "...high prices can lead to a marked reduction in the volume of demand, even though the price elasticities of demand for cocoa with respect to cocoa prices alone are low...[This phenomenon explains the] gradual trend towards reducing the cocoa content of chocolate products" (Singh et al:1975:95).

Finally, the World Bank study noted that regions characterized by higher national incomes, primarily the high flavor consuming regions of Western Europe and North America, exhibited lower price elasticities than regions with lower income levels. (The income elasticity for the category Other Developing Countries, for example, was 1.54.) The demand for chocolate, in short, is subject to the same economic forces as is demand for food: households with high incomes generally have smaller income elasticities for foods than households with low incomes (Tomek & Robinson:1981:49).

4. Consumption Forecasts

As modern technology improves the manufacturer's ability to regulate chocolate quality at the factory, the less important individual bean types become in chocolate bar recipes. The fact is that manufacturers are not as wedded to their recipes as they were fifteen years ago. Recipes chosen by least cost rather than flavor factors have become more commonplace as manufacturers fight over market share in a mature industry. And, as such, the country that wishes to remain a high cost producer will find shrinking demand for its product. *

In their latest published figures, the World Bank (Akiyama & Duncan:1982) has projected cocoa consumption during the 1985 to 1995 period in Western Europe at a sluggish 1.9% per annum level because of continued low income elasticities of demand and slow population and income growth. Growth in consumption in North America, particularly in the United States, is expected to expand 2.5% per year in response to projected higher levels of economic growth.

In summary, the future demand for chocolate in these prime flavor cocoa consuming regions is not encouraging. Shifts toward least-cost bean blends and cocoa bean substitutes can be expected to continue. Though smaller manufacturers will continue to insist upon incorporating flavor beans in their chocolate recipes, catering to the needs of this specialty market, while potentially remunerative, is much more risky. This discussion will be expanded in Chapter V, Section 4.

CHAPTER IV

MARKETING & PRICE STRUCTURES

1. Cocoa Marketing Channels

Over the years, several marketing and distribution systems for beans and cocoa products have evolved, with each arranged to minimize the risks of adverse fluctuations and uncertainties in the world cocoa market. These channels of marketing and distribution, shown schematically in Figure 3, include parastatal marketing boards, price stabilization funds, and private traders. A more detailed study of cocoa marketing and distribution channels is contained in the report by UNCTAD (1975). Despite the date of this study, these channels have not changed significantly.

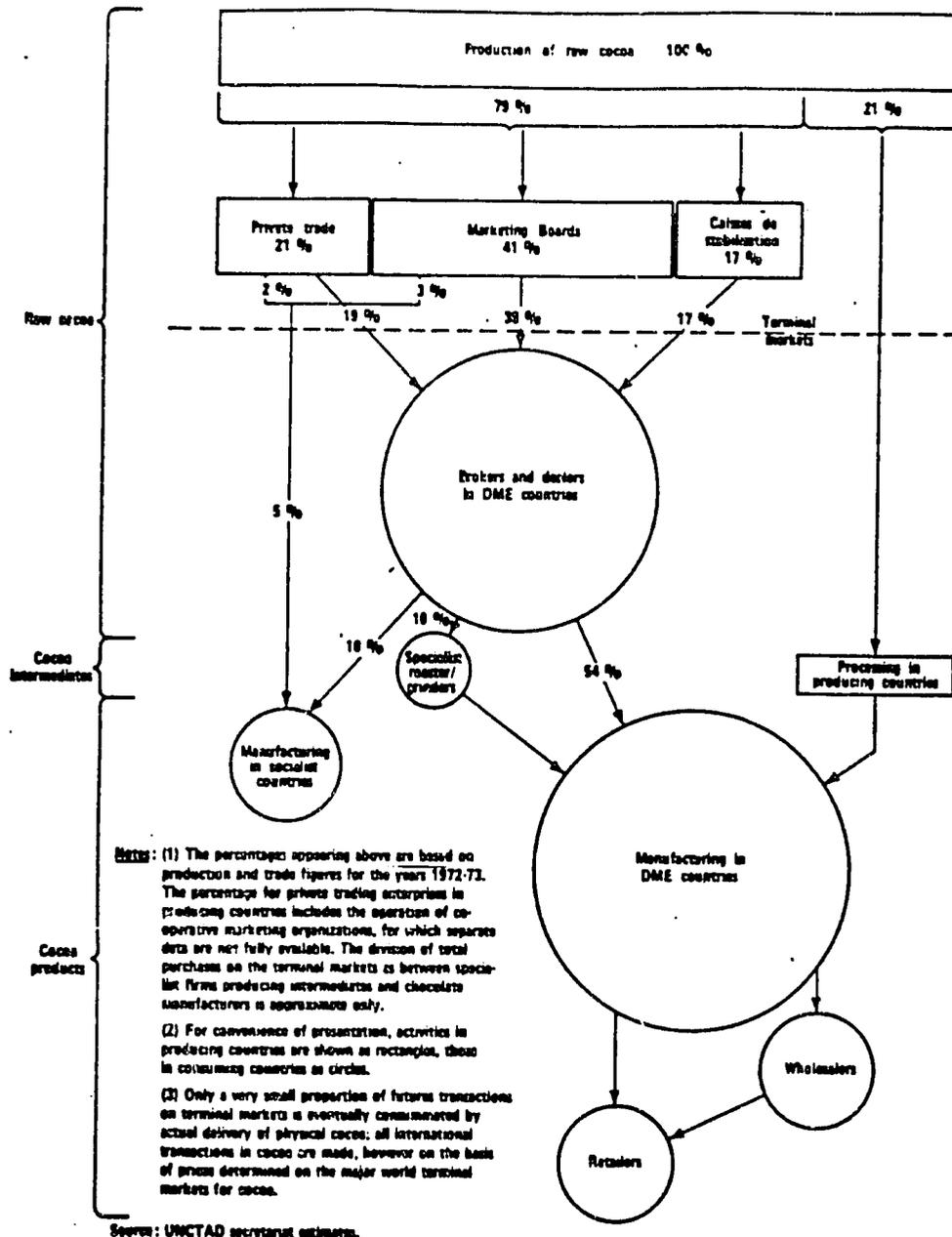
Government marketing boards are empowered to set guaranteed farm gate prices, purchase raw cocoa from individual producers directly or through licensed buying agents, inspect and grade it, transport it to port, and sell it abroad to international dealers or direct to large manufacturers. Countries like Ghana, Nigeria, Trinidad, Jamaica, and Grenada have established cocoa marketing boards. At present, about 17% of the world's production of cocoa, down from 41% ten years ago, is marketed via marketing boards.

Price stabilization funds, better known in French as Caisse de Stabilization, also guarantee farm gate prices and set reference export prices based upon the FOB cost of cocoa but permit private shippers/exporters to actually purchase and move the cocoa through the distribution system. The Caisse, therefore, functions as a fund rather than a marketing body to stabilize cocoa prices. With caisses established in the Ivory Coast, Cameroon, Togo, and Papua New Guinea, approximately 37%, up from 17% in 1972/73, of the world's production of cocoa is marketed through this channel.

Private trading firms or producer cooperatives handle 45% of the marketing of cocoa. Prices paid for cocoa can be either supported by a minimum price, as in Ecuador, or left to the free market to determine as in Brazil and Malaysia.

Middlemen (namely dealers, merchants, agents, and brokers) have evolved to facilitate this movement of cocoa through the world's distribution channels. Many of the largest users of cocoa beans and products secure the bulk of their requirements through middlemen, although some also buy direct. Medium-sized and small users almost entirely rely on middlemen, particularly dealers.

Figure 3
Principal Marketing & Distribution Channels for Cocoa



While a dealer makes a living by taking title to the good and profiting by a favorable differential between his sale and purchase price, agents and brokers sell on a commission basis. Commissions charged by agents and brokers vary with the type of product handled (whether beans or intermediate product), the quantities and value involved, and the services they are expected to render. They also vary from country to country.

2. Conditions of Sale

The conditions of sale of cocoa beans differ between the United States and Europe. In the United States, manufacturers prefer to let suppliers handle the sourcing of the beans, including arranging transportation and insurance, leaving them free to concentrate on the manufacturing and marketing of the finished product.

According to an article printed in Coffee & Cocoa International:

United States cocoa buyers believe that a community of competing importers will supply a more reliable, more flexible, and cheaper source for their cocoa bean needs than if the manufacturer were to buy directly from origin (1983:57).

The cocoa is sold on a delivered ex-dock or ex-warehouse basis often for a specific time of delivery. Consequently, the supplier assumes all risks of transportation until the beans have passed FDA inspection and have entered internal interstate commerce. Thus, American manufacturers free themselves of a host of apparently petty administrative, traffic matters.

European manufacturers, in contrast, favor more vertical integration and buy direct from origins usually on a CIF or FOB shipment or arrival contract. Pre-agreed discounts based upon percentage defects over standard are used to settle claims.

For the large chocolate manufacturer, the cocoa procurement strategy is basically based upon maintaining sufficient forward cover, defined as inventory and actuals and futures contracts, to permit the company to fix the prices of its products for some time ahead. Coverage is calculated as months of usage.

The amount of cover deemed sufficient would be based upon the procurement department's view of future cocoa price movements. If price rises are forecasted, then coverage might be increased. Or, if the price rise is estimated to be short-lived, the company may decide to run down its cover in anticipation of rebuilding it when prices decline again.

Generally, European manufacturers operate with more forward cover than their American counterparts, often out 12 to 18 months. In addition, companies like Cadbury-Schweppes and

Rowntree-Mackintosh do more direct sourcing with countries of origin. With the procurement of quality flavor beans, these two companies can enter contracts for a season at a time, sometimes with selected estates or shippers, to insure sufficient supplies of beans for their blends. This becomes especially important with grades available in small quantities at certain times of the year (see Table 5).

The proportion of inventory in a manufacturer's forward cover is normally kept at levels sufficient to supply the factory without threat of interruption, but not enough to precipitate large financing and storage costs. The levels of forward actual contracts to futures contracts in the forward carry is based upon the comparative strength of the two markets.

Sellers of cocoa commonly use two methods to hedge their product against future price risk. They can take a position in a futures market opposite to a position they hold in the cash or actuals market. Or, if the seller is adverse to setting a price at current price levels, he can "price fix" at a later date.

This gives the seller, say a marketing board, the right to fix the price on any market day he selects, up to a specified date (Futures Industry Association:1985). The buyer, a dealer, can take delivery, but payment is deferred until the final settlement price. When the contract is fixed, the full price for the cocoa consists of the price of the relevant futures or terminal price plus or minus a previously agreed upon basis. This basis or differential takes into account differing quality, handling, location, customs duties, or ICCO levies of the tendered cocoa.

3. Bean Premiums

Prospective or actual changes in supply exert the most direct influence on cocoa prices. This is because of the nature of the cocoa tree itself and because the areas in which it is produced make production forecasting very difficult. Reports of crop disease, droughts or floods, bush fires, or shipping strikes can disrupt supply movement and hence cocoa prices. In addition, news of heavy "afloat" supplies can depress nearby future prices.

The level of cocoa stocks in consuming countries is a closely watched monitor of future price movement, particularly if sizeable changes in either current production or stock carry-over are anticipated. World stocks representing three months of usage are considered small, while a six month reserve is considered adequate.

As discussed above, price differentials between bean grades take into account differing quality, shipping distances, duties, or levies and are expressed as premiums or discounts from par or basis grade or location specified in the futures contract.

Grades deliverable on the New York Cocoa Exchange (the Coffee, Sugar & Cocoa Exchange, Inc.) are divided into three classifications, each with an established premium. Group A includes main crop Accra, Lagos, or Ivory cocoa and carries a \$160/tonne or seven cent/pound premium. Group B cocoa, with a \$80/tonne premium, includes Bahia, Central America, and Venezuela. Group C cocoa is deliverable at par and includes Sanchez, Haiti, Malaysia, and others. Deliveries are discounted for subnormal sized beans.

Time series data for bean premiums are difficult to obtain. No series for United Kingdom premiums are kept. For the United States, the Frank Sweeney Corporation, a major New York-based broker, has a series dating back to only 1973. Premiums for fourteen bean types are listed in Appendix 4.

Premiums for seven bean types -- Ivory, Accra, Lagos, Superior Bahia, Sanchez, Central American, and Malaysias -- were weighted by share of production and averaged together to form a bulk proxy. Constructing a similar premium proxy for flavor type beans was not possible because, as the United States is not a major consumer of flavor cocoa (Chapter III, Section 2), flavor beans are not extensively traded. In fact, the only bean quoted and produced in a country considered by G.A.R. Wood (Table 4) to grow 100% flavor cocoa is Trinidad. Yet even Trinidad was not extensively quoted five of the past thirteen years. Series for countries producing a mixture of flavor and bulk type cocoa were available for Ecuador (Seasons Arriba), Papua New Guinea, and Indonesia. These bean premiums are listed in Appendix 4 under the heading "mixed cocoa."

Also listed in this Appendix are Rio Caribe, La Guayra Ordinary, and La Guayra Fermented all from Venezuela which, although Wood no longer considers this country a producer of flavor cocoa, fetch hefty premiums. In 1981, for example, they averaged 32 to 33 cents per pound as compared with Accras at 22 cents. A graph comparing bulk with Trinidad bean premiums is displayed in Figure 4.

Notice that premiums for bulk and Trinidad beans move together through 1978. Thereafter, while bulk premiums float downward after their steep run-up in 1977, Trinidad premiums climb upward to 20 cents in 1979 and 24 cents in 1982. Unfortunately no quotations were available for 1980, 1981, and since 1983.

What was the futures market doing during this period? Figure 5 presents the above flavor and bulk premium information, together with the ICCO daily price average, and all shown as index values. The ICCO daily price is the average of the first three positions on the terminal markets of New York and London. Bulk premiums, again in contrast to flavor premiums, seem to follow the general market trend. This trend should not come as a surprise as 98% of the world's supplies of cocoa are bulk cocoa.

Figure 4

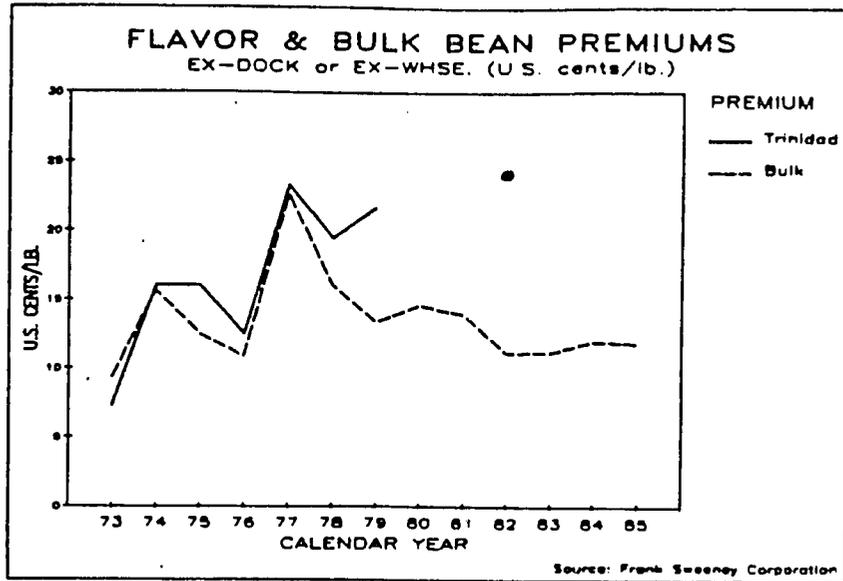
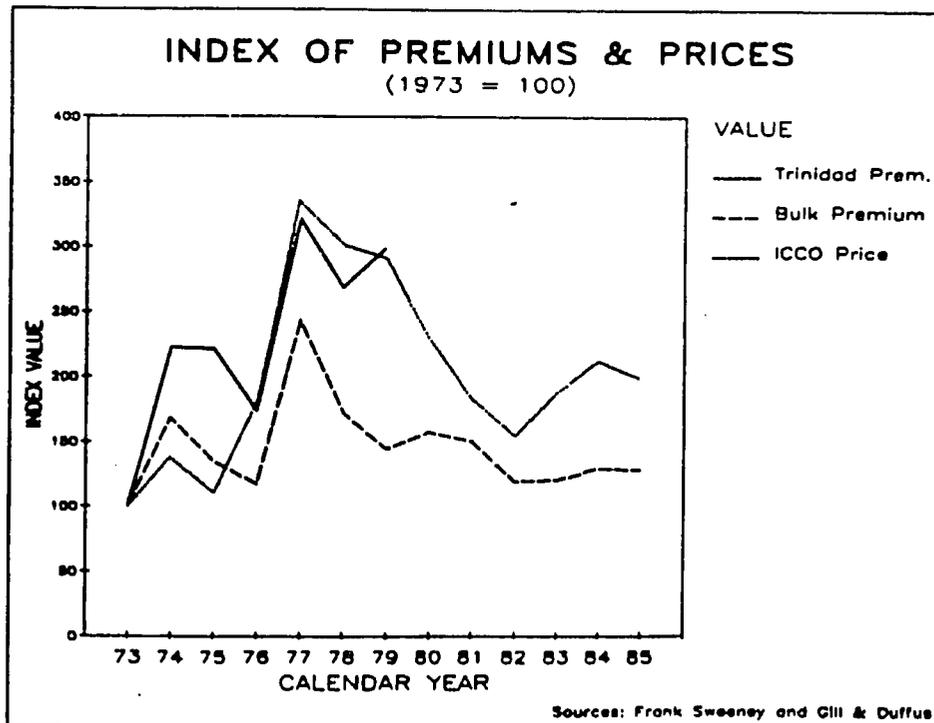


Figure 5



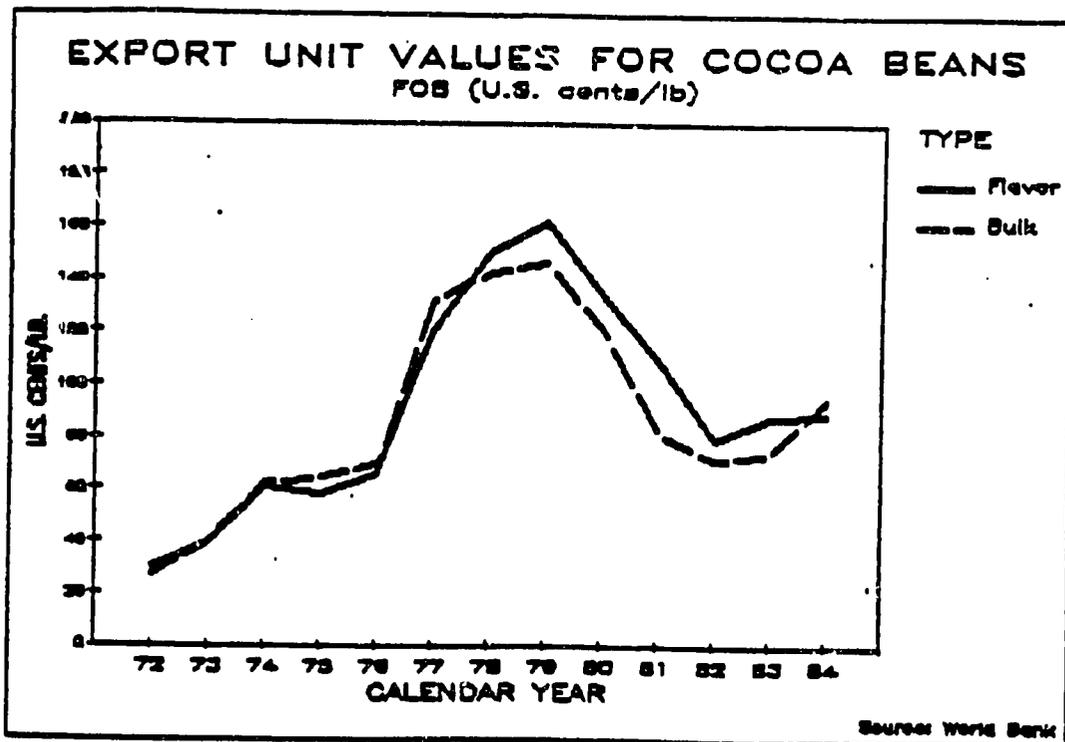
One explanation is that lower prices for cocoa beans during the glut years of crop years 1980/81 and 1981/82, coupled with an economic recovery in North America and Europe, spurred cocoa consumption. Yet with the supplies of flavor cocoa generally constrained, flavor premiums were bid up as manufacturers scrambled to procure sufficient quantities to meet their recipe requirements.

The differential between flavor and bulk premiums would widen further if one suspects that the supply elasticity for flavor cocoa is less elastic than for bulk (Chapter II, Section 3). On the other hand, due to the thinness of the flavor cocoa market in the United States, particularly during the above mentioned years, the price series for flavor premiums may be statistically invalid.

4. Export Unit Values

As a different approach, export unit values FOB basis were calculated from World Bank sources stripped from FAO trade tapes for five bulk producers (Ivory Coast, Ghana, Nigeria, Cameroon, and Brazil) and five 100% flavor producers (Grenada, Jamaica, Trinidad, Samoa, and Sri Lanka). These values are contained in Appendix 5. Bulk, weighted by share of production, and flavor export unit values expressed as U.S. cents per pound have been plotted in Figure 6.

Figure 6



In Figure 6 it is apparent that both flavor and bulk export unit values tend to move together, although flavor values appear to lag bulk value changes. To measure this hypothesis, flavor export unit values were regressed on bulk export unit values. The resulting equation exhibited an extremely good fit (95% level of significance):

$$\text{Flavor}_{(t)} = 0.702 * \text{Bulk}_{(t)} + 0.377 * \text{Bulk}_{(t-1)}$$

In short, 75% of the movement of flavor's export unit value could be explained by current bulk export values, probably as a result of price fixing against actuals, and 25% explained by last period's bulk export values. This latter coefficient is a function of the practice of forward selling the flavor crop 12 to 18 months in advance.

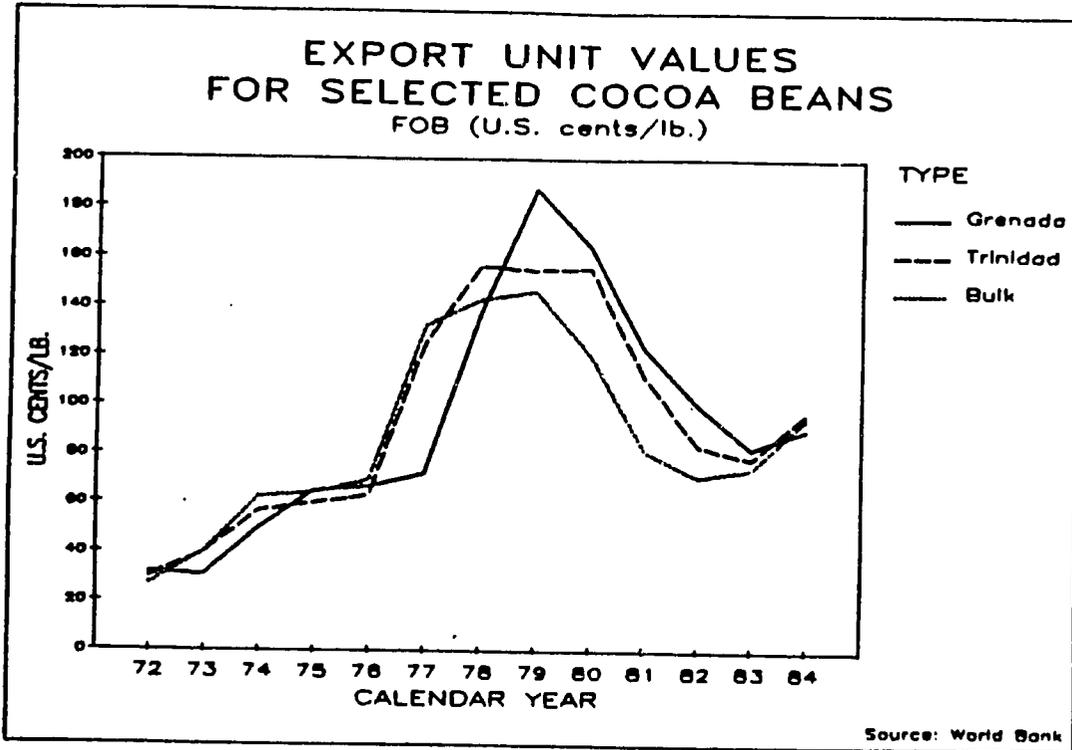
The estimated coefficients also reveal that flavor export unit values, FOB, sell at only an 8% premium over bulk ($0.702 + 0.377 = 1.079$). It appears that the international cocoa market does not place high value on subjective criterion like flavor, despite all the public chest thumping displayed by flavor producers for their "inherently superior" product.

Figure 6 also shows that flavor export unit values have slipped below bulk during the years 1975-78 and 1984. There are two explanations for this phenomenon. One, the higher cost of beans on the Continent over the past several years have affected consumption levels for these more expensive ingredients. As a result, European chocolate manufacturers have continued to shift from expensive blends to least-cost bean selections for their recipes. Two, due to the lag in price changes for flavor beans, the upward trend in unit values for these beans will not occur until the following year.

As a further exercise, export unit values for Grenada, Trinidad, and the bulk proxy are displayed in Figure 7. Notice that Grenada values tend to lag by about one year export unit values for bulk and Trinidad. The lag seems to be the same for upside and downside price movements.

Clear explanations for these movements are elusive. Export unit values should follow general market plus bean premium price movements. Yet for seven out of thirteen years, values for Brazil outperformed Ghana! This may be due to the fact that while West African countries forward sell 12 to 18 months in advance versus only several months ahead and thus can benefit from sudden price increases. Values for other countries are more in line with common expectations. Several other factors that influence export unit value levels are the timing of harvests and sales, the number of shipments a year, and the proportion of subgrade to Grade 1 sales.

Figure 7



CHAPTER V

IMPLICATIONS FOR GRENADA'S COCOA INDUSTRY

1. Quality Improvements

One dealer interviewed for this study stated that Grenada beans have retained their flavor and aroma unlike presently available Arribas and New Guineas. The Grenada Cocoa Association deserves credit for maintaining, through quality controls and fermentation practices, the inherent flavor and aroma of their local cocoa.

The same dealer did mention that mold levels for Grenadas have gradually increased, particularly during crop years 1979/80 and 1980/81. Higher defect rates due to mold resulted in penalties levied in 1980/81 to equal 1% of the FOB value of cocoa that year. And according to Sir Denis Henry, the Grenada Cocoa Association's agent in the United Kingdom, Rowntree has asked that 450 bags (approximately 31 tonnes) of cocoa be replaced during the last season (Henry:1985:4.28).

Discussions in Grenada revealed that increases in internal mold levels were caused by uneven quality control practiced by some of the private processors who ferment and dry 20% of Grenada's cocoa harvest. Mold levels may rise at the Association's central fermentaries during peak processing times when wet bean arrivals overwhelm production capacity. The Association is presently dealing with this problem by requiring that inspection and grading agents become more vigilant and by constructing a new central fermentary.

External mold levels, which affect the visual appearance of the bean but not its chocolate-making quality, are a function of climatic conditions during the post-harvest handling of the crop as the rainy season (May-November) overlaps main crop harvesting (November-January). Although the central fermentaries have artificial driers, the majority of the crop and all of the beans handled by private agents are sun dried. Sun drying can take up to 10 days to complete, compared with a day for artificial drying.

To reduce their moldy appearance, the dried beans are rewetted, polished, and artificially dried in a circular bin with rotating paddles for 2 to 3-1/2 hours. Some international buyers insist that this process, which is also employed in Trinidad and on other West Indies Islands, is necessary to make the beans more attractive to manufacturers.

Other experts disagree. According to Wood & Lass, this process, confers no benefit "...unless shell percentage is reduced and this is uncertain" (1985:495). A Japanese

manufacturer told the Association during a recent visit that heat applied while the beans are polishing could trigger flavor changes due to premature roasting.

It is suggested that the Cocoa Association conduct an experiment to determine what, if any, value is added by washing and polishing beans. This process requires energy, is purely cosmetic, and can raise defect rates due to insect and mold infestation. An alternative would be to rely more heavily on artificial drying during the rainy early days of the harvest, a process which is equally as energy intensive, but would not result in bean breakage.

2. Strengthen Crop Forecasting Efforts

In the United Kingdom, again according to Sir Denis Henry, Grenadas are contracted at Sterling 100 FOB over the London terminal market, a level which apparently had not changed in years until recently when a contract was sold at Sterling 150. How this premium compares with the premiums for other flavor beans in the United Kingdom is not known due to the lack of a premium price series for that country.

Comparing export unit values (Figure 7), Grenadas lag by about a year price movements for either Trinidads or bulk cocoa. In addition, values for Grenada surpassed Trinidad between 1979 and 1983, a fact which speaks well for the former country's sales record. By 1984 Grenada's export unit value slipped below both Trinidad's and bulk's values due to the oversold position of the previous crop which required Grenada to carry forward commitments at old prices.

This problem can be minimized in the future if the Association can improve its ability to forecast future crop outturns. The ability to fulfill all sales contracts promptly improves customer relations and eliminates the need for levying price discounts to cover contingencies.

3. Expand the Customer Base

Grenadian cocoa is generally sold through dealers to chocolate manufacturers such as Rowntree-Mackintosh and Terry in the United Kingdom, Migros in Switzerland, and very recently the Japanese company Lotte. As Rowntree has traditionally bought 1,000 tonnes per year, it acts as "the pace setter of the premium... [which] is accepted by the rest of the trade for the current year" (Henry:1985:4.19). World's Finest Chocolate, Chicago, is the only company that buys Grenadian cocoa direct and on a contract price basis.

Rowntree-Mackintosh and Terry are the only two British chocolate manufacturers that use flavor beans in their blends. Rowntree uses selected estate New Guineas, most of the Jamaica

crop, Trinidads, and Grenadas for making their fine quality Black Magic brand chocolate. The company's total annual usage of beans is estimated at 30-40,000 tonnes, bean equivalent basis (International Trade Center:1975:239). It operates in seven countries in Western Europe, Canada, Australia, South Africa, and New Zealand. Joseph Terry & Sons, relying more upon pre-World War II recipes, uses Javas, Grenadas, and other flavor grades. Its annual bean equivalent usage is estimated at 4-6,000 tonnes (International Trade Center:1975:239).

Migros is a federation of consumer cooperatives with 440 retail stores in Switzerland. The company owns Chocolate Frey AG, Buchs. No statistics on bean usage are available. Lotte Company, based in Tokyo, is one of Japan's five biggest chocolate manufacturers. Chocolate sales constitute a majority of the company's revenue, with chewing gum, ice cream, and candy making up the remainder. Bean usage figures are not available.

The British dealer and member of the Berisford Group, J. H. Rayner, has acted as the main supplier for Rowntree-Mackintosh. Other dealers include Pacol Limited, a subsidiary of Gill & Duffus; Daaranhower, a major Dutch dealer with offices in London; and Walter Matter, a leading European dealer based in Geneva. These dealers did not have their total requirements fulfilled last year. Further, a dealer has reported that Rowntree is presently replacing Grenadas and Trinidads for select estate New Guineas, a trend does not bode well for Grenada.

In short, the Association should realize that the international cocoa market has changed. Confectionery manufacturers have moved away from fixed to least-cost blending in response to increased bean price volatility and to market place competition. These same market forces have forced major commodity players to become more price sensitive and less loyal to old pricing arrangements. Accordingly, it would be prudent for a flavor cocoa producer, like Grenada, to diversify it's customer base as much as expedient to minimize the disruptive effects caused by any one buyer canceling his contracts.

Fortunately, the Cocoa Association has already moved in this direction. According to the Association's Executive Secretary, Selwyn Humphrey, selling quotas originally based upon an inflexible system of former buying patterns which resulted in problems with over contracting, are currently being recalculated. New quotas should permit the establishment of a reserve to be used for potential new buyers. A recent trial shipment to a Japanese manufacturer is a step in the right direction.

There are limits to the degree of customer diversification, however, for it is hard to sustain manufacturer interest in a bean that is available only sporadically and in uncertain amounts. Such is the bane of any small producer.

4. Market Channels: Direct Sales Versus Intermediaries

The question is often asked if small producers like Grenada could profit from direct sales to manufacturers and eliminate middlemen's fees and commissions. Any benefit from such an arrangement, however, would be overwhelmed by added risks.

Since the last war, chocolate manufacturers have become increasingly dependent upon dealers and brokers to fill their bean requirements. Advantages to manufacturers for using this trade channel are:

1. It minimizes the costs associated with carrying heavy physical stocks.
2. It transfers the responsibility of arranging freight, insurance, and customs passage to dealers.
3. It shifts the burden of replacing rejected shipments upon the dealers.
4. It allows manufacturers access to dealer information on price and production forecasts.

While some big buyers in Europe and the United States may purchase direct from large producing countries, most do not. Medium and small companies as a rule buy through dealers and brokers. In Japan all trade is handled by trading houses. Prospective suppliers can submit samples direct to Japanese users, but the business negotiations and transactions will ultimately be handled by a trading house of the user's choice (UNCTAD:1975:151).

Small producers, too, can benefit from the services of dealers and brokers who can provide important market information, shipping and handling, and prospective buyers. Using these services reduces the costs of administering a cocoa marketing association.

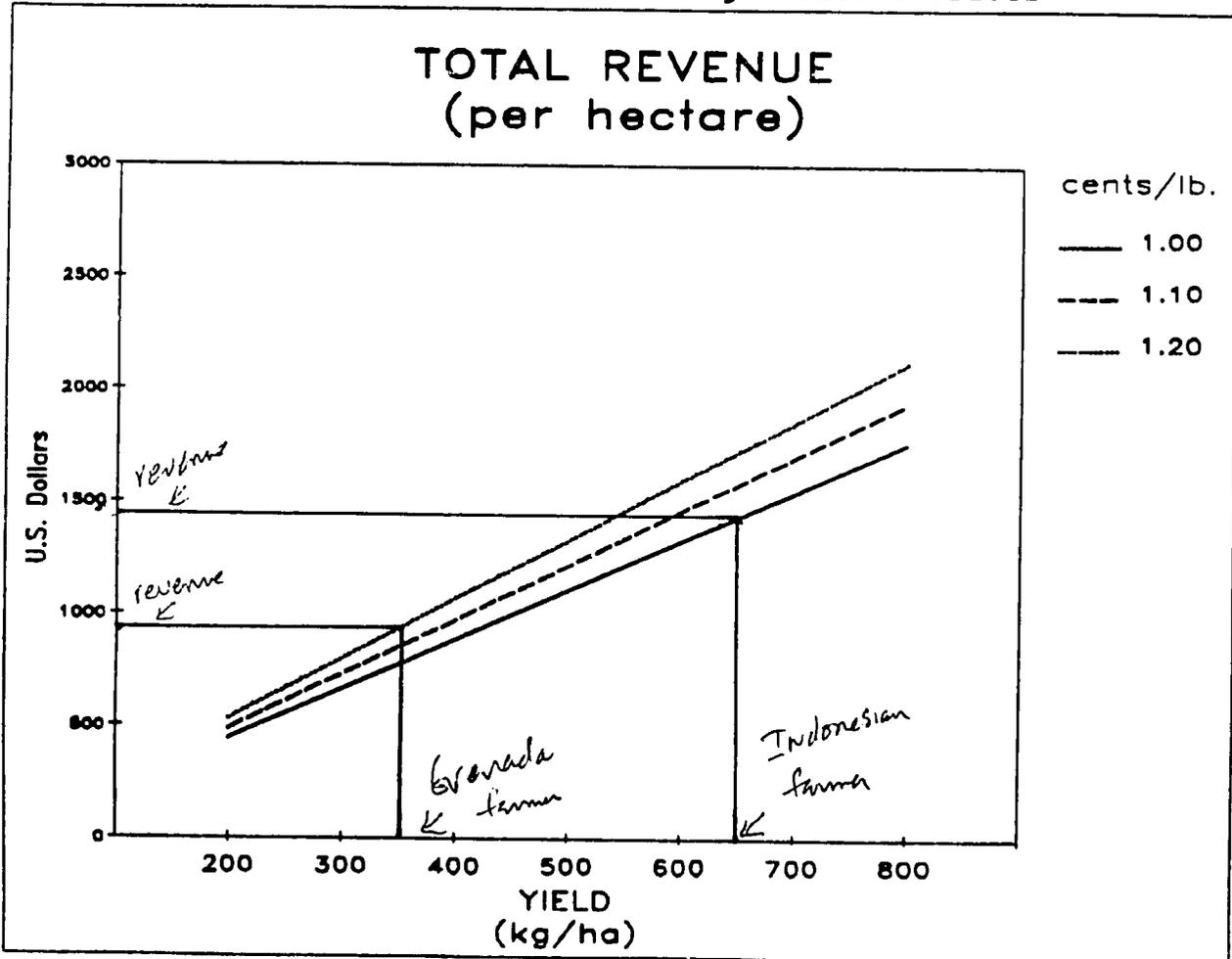
5. Market Specialization: Flavor Versus Bulk

Premiums are paid for a variety of reasons: flavor content, consistency, yield of edible material, freedom from defects, and also quantity available (see discussion in Chapter I, Section 3). Calculations in Chapter IV, Section 4, estimated that flavor cocoa attracts an average 8% premium FOB over bulk cocoa. This section explores the premise that breeding for the latter four characteristics mentioned above can generate comparable profits at lower risks.

Figure 8 projects an array of total revenues, given differing assumptions concerning yields and premiums. For simplicity, costs of production and net income were not considered. It was assumed that the current base price

FOB for bulk cocoa was US \$1.00 per pound and that two premiums for flavor cocoa were US \$1.10 and \$1.20 per pound. It was also assumed that flavor cocoa produces an average yield of about 350 kg/ha (Table 6). Hybrid yields vary widely, but average yields for Brazil and Malaysia are around 650 kg/ha. Each line, therefore, represents an iso-premium curve.

Figure 8
Total Revenue at Differing Yields & Prices



Notice that total revenue is more sensitive to changes in yields than to changes in price. For example, flavor cocoa with a 20 cent premium (or \$1.20/lb. total price) produces about \$900 per hectare in total revenue, in contrast to bulk cocoa selling at the base price (\$1.00/lb.) which produces \$1450 per hectare, a 60% higher return. ★

Flavor cocoa, through successful plant breeding, could potentially produce higher yields and greater total revenue even, perhaps, surpassing bulk revenue. Yet this could be accomplished only with added risk. As Glenn Trout (Chairman, Research Committee, and Member of the Board of Directors for ACRI - retired), explained:

Attributes like flavor, for which there is less agreement among buyers as to what constitutes acceptable flavor, is more open to question. This is in strong contrast to attributes like edible yield, consistency, etc. which can be evaluated objectively by independent analysis" (private communication).

Aversion to gambling with farmer incomes over such subjective criteria led Wood (1978:11) to recommend that it would be more prudent to select varieties on the basis of yields rather than on premiums.

Nicholas Costello, a consultant with over 30 years experience in cocoa marketing, suggested a compromise: that the flavor producer should plant both flavor and bulk, if the market seems large enough to support it. Production could be separated into several grades, as is common in other producing countries, to prevent the dilution of the better quality beans. This planting policy would provide a hedge as the producer could diversify his selling risk by supplying several markets concurrently.

If the flavor producer does decide to specialize exclusively on the high quality flavor cocoa market niche, then the cocoa analysts and commodity traders interviewed for this report offered two suggestions:

1. Target total production should be at least 4,000 tonnes per year in order to supply a broad customer base.
2. Unit costs must drop through yield improvements and cost reduction to permit greater profits and incentives to flow back into the farmer's pockets.

In addition revenue can be expanded further by utilizing wastes like feeding cocoa husks to pigs (up to 25% of the diet) as is being explored in some West African countries and by collecting excess drippings before fermentation for processing into juice, sorbets, jams, and liquor as is now done on a commercial basis in Brazil.

REFERENCES

- Akiyama, Takamasa and R.C. Duncan, Analysis of the World Cocoa Market. Washington, D.C.: World Bank, 1982.
- Are, L.A. and D.R.G. Gwynne-Jones, Cacao in West Africa. Ibadan: Oxford Univ. Press, 1974.
- Babb, Tony et.al., Agriculture in Grenada: A Critical Assessment. USAID project #PDC 1406-I-19-1089-00, 1984.
- Bank Bumi Daya, "Developments in the Production & Marketing of Cocoa," In Economic Review 7(6), June 1983; pp. 1-8.
- Bateman, M.S., "Aggregate & Regional Supply Functions for Ghanaian Cocoa," In Journal of Farm Economics, May 1965.
- Behrman, J.R., "Monopolistic Cocoa Pricing," In American Journal of Agricultural Economics. August 1968.
- CIDA, Cocoa Industry Wide Study, Grenada, November 1985.
- Cocoa Board of Papua New Guinea, Newsletter 4(1), 1984.
- Cocoa, Chocolate, and Confectionery Alliance, Cocoa Beans; Chocolate Manufacturers' Quality Requirements. London, 1984.
- Coffee & Cocoa International, Danger! U.S. Cocoa Traffic Ahead (5), 1983; pp. 57-67.
- , Testing Time Ahead (2), 1984; pp. 47-50.
- Commonwealth Secretariat, Fruit & Tropical Products. London, various issues.
- Cruickshank, A.M. "Cocoa in Grenada," In Cocoa Growers' Bulletin (15), 1970; pp. 4-11.
- FAO, World Cocoa Survey. Rome, 1964.
- Foreign Agriculture Service, Agricultural Attache Cocoa Reports. Washington, D.C.: USDA, various issues.
- Futures Industry Assoc., Futures Trading Course & Handbook. Washington, D.C., 1985.
- Gill & Duffus, Cocoa Market Report. London, various issues.
- Gordian Publishing House, Cocoa Bean Tests 1961/62. Hamburg: Gordian Publishing House, 1962.
- Henry, Sir Denis, "Prospects for the Grenada Cocoa Industry," In CIDA, Cocoa Industry Wide Study, November, 1985; pp. 5.1-5.32.

ICCO, Study of Cocoa Production & Consumption Capacity. London, August 1975.

---, Production Policies in Producing Countries (ICC/28/6). London, January 1985.

---, Quarterly Bulletins of Cocoa Statistics. London, various issues.

Indonesian Commercial Newsletter, Indonesia's Ambitious Cocoa Development Program. Jakarta, 1984; pp. 5-7.

International Trade Center, UNCTAD/GATT, Cocoa Products: Facts & Figures on the World's Major Markets. Geneva, 1975.

Japan Tariff Association, Japan Exports & Imports. Tokyo, various issues.

Lass, R.A., "Cocoa in Ecuador," In Cocoa Growers' Bulletin (14), 1970; pp. 8-15.

Lass, R.A. and G.A.R. Wood, Cocoa Production: Present Constraints & Priorities of Research. World Bank Technical Paper #29, 1985.

Merrill Lynch, Pierce, Fenner, and Smith, Cocoa. New York, 1972.

Murray, D.B. and M.R. Jones, "The Impact of Cocoa Rehabilitation Schemes in Trinidad and Grenada." Proceedings of the Third International Cocoa Research Conference. Accra, 1969; pp. 133-137.

Planning Institute of Jamaica, Economic & Social Survey of Jamaica. Kingston, 1984.

Powell, B.D., "Changes in Cocoa Bean Availability," In The Manufacturing Confectioner. January 1985; pp. 63-69.

--- "Chocolate & Cocoa Manufacturers' Quality Requirements for Cocoa Beans," Proceedings of 1984 International Conference on Cocoa & Coconuts. Kuala Lumpur, 1984.

Singh, Shamsher et. al., Coffee, Tea, and Cocoa: Market Prospects & Development Lending. Baltimore: Johns Hopkins University Press, 1975.

Soria, Jorge, "Principal Varieties of Cocoa Cultivated in Tropical America," In Cocoa Growers' Bulletin (15), 1970; pp. 13-21.

Statistical Office of the European Communities, Eurostat. Luxembourg, various issues.

Terink, J.L., "Same Differences in Cocoa Bean Quality Requirements Between Chocolate Manufacturers and Cocoa Powder & Cocoa Butter Requirements," Proceedings of 1984 International Conference on Cocoa & Coconuts. Kuala Lumpur, 1984.

Tek, W.G. And K.L. Robinson, Agricultural Product Prices. Ithaca: Cornell University Press, 1981.

UNCTAD, Marketing & Distribution Systems for Cocoa (TD/B/C1/164), Geneva, January 1975.

Van Hall, C.J.J., Cacao. London: Macmillan, 1932.

Williamson, A.P., "Marketing," In Cocoa, edited by Wood & Lass. London: Longman, 1985; pp. 528-542.

Wood, G.A.R. "Cocoa in Indonesia," In Cocoa Growers' Bulletin (33), ; pp. 16-21.

--- "The Markets for Fine Flavored Versus Bulk Cocoas," In The Manufacturing Confectioner, January 1985; pp. 45-48.

--- "Quality & Inspection," In Cocoa, edited by Wood & Lass. London: Longman, 1985; pp. 505-527.

Wood, G.A.R. and R.A. Lass, Cocoa. London: Longman, 1985.

World Bank, Cocoa Handbook. Washington, D.C., 1982.

APPENDIX 1
Glossary of Cocoa Trade Names

A

- A:** Additional term for large Java cocoa beans.
ASS: Abbreviation of the term Arriba Superior Summer.
ASSPS: Abbreviation of the term for peak quality Arriba cocoa: Arriba Superior Summer Plantation Selected.

B

- B:** Additional term for small Java cocoa beans.
B I and B II: Trade names of choice cocoa beans from Ceylon.
Bom: Term for second grade quality of Bahia cocoa beans. Also specified as "good fair" (see: Good fair).

C

- Class I:** Quality standard for cocoa beans set by the Working Committee for Cocoa Classification: "Cocoa, thoroughly dry and free from foreign matter, smoky beans and signs of adulteration and, according to the count, containing no more than 3% mouldy beans, no more than 3% slaty beans and no more than 3% of all other remaining bean defects."
Class II: Quality standard for cocoa beans set by the Working Committee for Cocoa Classification: "Cocoa, thoroughly dry and free from foreign matter and smoky beans and, according to the count, containing no more than 4% mouldy beans, no more than 8% slaty beans and no more than 6% of all other remaining bean defects."
Choice quality: Term for the peak quality of choice Trinidad cocoa beans, ranging above the standard "Plantation Trinidad".
Comum: According to official Brazilian classification rules, the following minor defects are to be understood: Ordinary beans (Comum), not fermented, without aroma, of bitter taste, hollow or compact, of slaty or dark grey colour.
Corriente: Trade name of third grade quality of Venezuelan cocoa beans. Used only for slightly or completely unfermented beans.
Cosecha central: Spanish term for the mid crop.
Cosecha principal: Spanish term for the main crop.
Courant: In general, term for cocoa beans of second grade commercial quality, corresponding to the "fair fermented" quality. This term is mainly used for beans coming from Togo, Cameroun and Ivory Coast.

D

- Domingo:** Term for cocoa beans from the Dominican Republic.

E

- EA I:** Trade name for the choice cocoa beans coming from Ceylon.
Epoca: Spanish term for the intermediary or mid crop in Ecuador. Epoca Arriba is the name for mid crop Arriba beans. Crop months are January to February and July to October. Epoca Arriba is valued less than Summer Arriba.
Escochs: Portuguese term for second grade quality of São Tomé cocoa beans.
Estaciones: Spanish term for the intermediary or mid crop.
Estates: This specifies the second grade quality of Trinidad and Grenada beans. Also applied to Surinam beans.

F

- f.f.:** Abbreviation of "fair fermented" (see: Fair Fermented).
- Fair average quality:** Term for third grade commercial quality of cocoa beans. Identical term: Limite. It is used in the following producer countries: Ghana, Ivory Coast, Nigeria, Mexico and the Dominican Republic. According to the regulations of the Cocoa Association of London, these cocoa beans may not contain more than 12% of damaged beans.
- Fair fermented:** Term for second grade commercial quality of cocoa beans. According to the regulations of the Cocoa Association of London, these cocoa beans may not contain more than 10% stony and damaged beans. The term is used in the following producer countries: Cameroun, Ivory Coast, Ghana, Nigeria and Togo.
- Fair shipping:** Term for third grade commercial quality of cocoa from Trinidad.
- faq:** Abbreviation of "fair average quality" (see: Fair average quality).
- Fermented:** Term customary in the USA for cocoa beans of first grade quality. Cocoa beans from the following producer countries are traded under this name at the New York Cocoa Exchange: Costa Rica, Ivory Coast, Ghana, Jamaica and Panama.
- Fine Estates:** Trade name for first quality cocoa beans from Grenada.
- Fine Plantation:** Cocoa beans from Trinidad are exported under this trade name or under the term, "Plantation Trinidad".
- Fino:** Term for second grade quality cocoa beans coming from the Portuguese Islands of São Tomé or Príncipe.
- Fire beans:** Term for cocoa beans dried with the assistance of an open fire. Incorrect drying can result in the beans having a detrimental smoky taste and brittle shells.
- First Grade:** Trade name for the best quality of cocoa beans from Jamaica and Samoa.

G

- g.f.:** Abbreviation of "good fermented" (see: Good fermented).
- "Gestürzte" (buked) cocoa beans:** According to the German regulations for cocoa and cocoa products, these are: "... unsorted cocoa beans, which are no longer in their original bags, also blended with other cocoa beans of the same origin".
- Good average:** General term for good cocoa bean sorts.
- Good fair:** A frequently used trade name for the second grade quality of beans from various producer countries. Identical terms are: Fair fermented or courant. The term is used in the following producer countries: Brazil, Cameroun, Ivory Coast and others.
According to the Brazilian rules of classification (grade 2, also called "bom"), the following is required: Good fermented, clean, dry cocoa of natural aroma, without foreign odour (including "hammy odour"). The following defects are permissible: 6% major defects and 50% minor defects including 40% purple beans, 4% comum beans (see: Comum), 6% other minor defects and 4% broken beans.
- Good fermented:** A frequently used trade name for the first quality of beans from various producer countries: Cameroun, Ivory Coast, Ghana, Nigeria, Togo and others. Identical terms are: Superior or supérieure. According to the rules and regulations of the Cocoa Association of London, these cocoa beans may not contain more than 5% stony and 5% damaged beans. According to the grading and export regulations of Ghana, the commercial "good fermented" cocoa is a mixture of "Grade I" and "Grade II" (see: Grade..).

Grade I: Term for first grade quality of cocoa beans, for which Ghana has established the following requirements: Completely dry, free from adhering foreign matter, smoky beans and adulterations. The beans may not contain more than 5% mouldy, germinated, flat, rotten or infested beans, and no more than 5% slaty beans. Grade I falls within the category "good fermented".

Grade II: Term for second grade quality of cocoa beans for which Ghana has established the following requirements: Completely dry, free from adhering foreign matter, smoky beans and adulterations. The beans may not contain more than 10% mouldy, germinated, flat, rotten or infested beans and no more than 10% slaty beans. The share of mouldy or infested beans may not exceed 5%. Grade II falls within the category "good fermented".

Grade III: Term for third grade quality of cocoa beans for which Ghana has established the following requirements: Completely dry, free from adhering foreign matter, smoky beans and adulterations. The beans may not contain more than 15% mouldy, germinated, flat, rotten or infested beans.

Grades: Term for the grading of cocoa beans according to quality, which serves as a basis for payment to the cocoa farmers (see: Grade I-III and Sub-Grade). Based on these rules of classification and the purchase bonuses connected with them, it was possible to considerably improve the quality of cocoa beans which are exported from Ghana and Nigeria. The same grading system is used officially for cocoa beans from the Ivory Coast.

I

Incolé: French term for the identical quality "good fermented".

Inferior: According to the Brazilian classification regulations the requirements for this fourth grade of quality are: Fermented, dry cocoa which may have the following defects 15% major defects and 20% minor defects, which include 10% comum cocoa (see: Comum), 10% other minor defects, 15% broken beans and 5% unclean parts. Purple cocoa beans are not specified as being defects in this category.

Intermediate crop: English term for light or mid crop.

Island Beans: Trade name for cocoa beans originating in the West Indies. They grow in the Dominican Republic, Trinidad and Tobago, Grenada, Jamaica, St. Lucia, Cuba and Haiti.

L

Light breaking cocoa beans: Trade name for cocoa beans with a very light breaking nib, in particular cocoa beans from Java, Ceylon and Samoa. The relatively expensive beans are especially used for manufacturing very light coloured milk chocolate.

Light crop: English term for intermediate or mid crop.

Limite: A general trade name for the third grade quality of beans from a few producer countries. Identical to the term "fair average quality" (see: Fair average quality). This term is used for cocoa beans from Cameroun and Ivory Coast. According to the grading regulations of Cameroun, the following values were established: Up to 20% unfermented beans, up to 15% damaged beans (no more than 5% mouldy beans).

Lower class: A quality standard for cocoa beans, set by the Working Committee for Cocoa Classification. These are beans which do not meet the requirements of Class I (see: Class II) anymore.

M

- Machine dried:** English term for cocoa beans that have been dried by means of artificial heat in drying ovens.
- Main crop:** English term for the principal crop.
- Medium:** A specification of the second grade quality of cocoa beans from Spanish Guinea.
- Medium red:** Term for the second Trinidad quality.
- Mid crop:** English term for the intermediate or light crop.

N

- Natives:** Term for cocoa beans coming from small local farms. Because they vary in structure, these beans are valued less than "Plantation" brands (see: Plantation). This term is particularly used for cocoa beans from Cameroun and Ceylon.
- Navidad:** Navidad Arriba is a term for the mid crop of Ecuador cocoa, harvested during the month of December. It is valued less than Summer Arriba (see: Summer Arriba).
- No. 1 etc.:** Identical term for Grade 1 etc.

O

- Old red:** Term for a highly aromatic Ceylon cocoa coming from Criollo trees.
- Ordinary:** Term used in the U. S. A. for the second grade quality of cocoa beans. Those from the following producer countries are traded under this name at the New York Cocoa Exchange: Costa Rica, Grenada, Jamaica, Panama and Surinam.

P

- Plantation:** Term for cocoa beans coming from cocoa plantations. Because of their better quality, these beans have a higher price than the "Natives" (see: Natives). The term is mainly used for cocoa from Cameroun, Ceylon, Grenada and Trinidad. In the case of Cameroun and Trinidad, this means a standard quality.
- Plantation Selected Superior Summer Arriba:** Term for the peak quality of Arriba cocoa. It contains from 80 to 85% brown breaking beans.
- Porcelán:** Term for a light breaking cocoa bean type from Venezuela.

R

- Récolte Intermédiaire:** French term for the light or mid crop.
- Récolte principale:** French term for the main crop.
- Red Summer:** Term for an Arriba type of cocoa beans distinguished by the reddish brown colour of its nibs.
- Refugo:** Brazilian term for damaged beans and remnants which cannot be classified under grade 4 anymore (see: "Inferior").
- Regular:** According to the Brazilian classification regulations, the following is required of this third grade quality: Healthy, clean, fermented cocoa, which may have the following defects: 8% major defects and 20% minor defects which include: 45% purple beans, 8% comum cocoa (see: Comum), 7% other minor defects, 5% broken beans, 2% unclean parts.

S

- Safra:** Portuguese term for the main crop.
- Seasons:** English term for Epoca beans (see: Epoca) from Ecuador.
- Selected:** Term for special quality beans. "Selected Superior Summer Arriba", for instance, has a share of 70 to 80% of brown breaking beans.
- Selecto:** Spanish term for the best Maracaibo cocoa beans from Venezuela.
- Slaty beans:** English term for unfermented cocoa beans.
- Smoky beans:** English term for cocoa beans of smoky taste and odour.
- Sub Grade:** Fourth grade quality of cocoa beans for which Ghana has established the following requirements: Completely dry, free from adhering foreign matter and smoky beans. The beans may not contain more than 15% mouldy, germinated, flat, rotten or infested beans. This grade of quality is also customary in Nigeria.
- Summer Arriba:** English term for the Arriba sorts harvested in summer during the months of April to June. Summer Arriba is one of the cocoa sorts in Ecuador which is highly appreciated.
- Sun dried:** English term for cocoa beans which have been dried in the sun.
- Supérieure:** French term for first grade quality cocoa beans. Identical terms are, "good fermented" or "superior".
- Superior:** Term used for first grade quality of many producer countries. This cocoa may be only slightly damaged — and this only in exceptional cases. Identical terms are: "good fermented" or "supérieure". The term is used in the following producer countries: Fernando Pó, São Tomé, Congo, Brazil, Ecuador.
- Sweepings:** Beans swept up from damaged bags. These damaged and unclean beans can only be used under certain conditions after a very careful cleaning.

T

- Temporão:** Portuguese term for the mid crop in Bahia. Harvest time is during the months of May to September. Contrary to other areas of cultivation, the yield of the mid crop here is considerably higher, almost reaching the same amount as that of the main crop.

U

- "Ungestürzte" cocoa beans:** According to the German Cocoa Regulations, this is "the raw product imported from the producer country in its original bag".

V

- Verano:** Spanish term for Arriba beans harvested during the summer months.
- Violetas:** Portuguese term for cocoa beans with purple coloured nibs.

APPENDIX 2
Five Year Average Cocoa Production by Country
(thousand metric tonnes)

REGION	1900/1- 1904/5	1905/6- 1909/10	1910/11- 1914/5	1915/6- 1919/20	1920/1- 1924/5	1925/6- 1929/30	1930/1- 1934/5	1935/6- 1939/40	1940/1- 1944/5	1945/6- 1949/50	1950/1- 1954/5	1955/6- 1959/60	1960/1- 1964/5	1965/6- 1969/70	1970/1- 1974/5	1975/6- 1979/80	1980/1- 1984/5
AFRICA																	
Cameroon	1.00	2.00	4.00	3.00	4.00	8.00	17.00	27.00	32.00	41.00	53.00	61.00	80.00	94.00	114.00	103.00	115.00
Ghana	5.00	15.00	51.00	108.00	180.00	229.00	241.00	278.00	228.00	230.00	234.00	260.00	459.00	395.00	400.00	304.00	194.00
Ivory Coast	0.00	0.00	0.00	1.00	4.00	14.00	32.00	50.00	24.00	39.00	60.00	61.00	105.00	147.00	208.00	291.00	439.00
Nigeria	0.00	2.00	8.00	15.00	32.00	49.00	67.00	106.00	95.00	101.00	105.00	127.00	218.00	221.00	247.00	180.00	152.00
Sao Tome & Principe	20.00	29.00	34.00	30.00	21.00	14.00	11.00	9.00	7.00	8.00	8.00	8.00	9.00	10.00	10.00	7.00	7.00
Other Africa	2.00	2.00	8.00	7.00	11.00	16.00	24.00	26.00	19.00	24.00	33.00	41.00	59.00	73.00	72.00	50.00	44.00
TOTAL AFRICA	26.00	60.00	99.00	164.00	262.00	330.00	392.00	496.00	407.00	443.00	493.00	558.00	930.00	940.00	1051.00	935.00	956.00
C & S AMERICA																	
Brazil	21.00	29.00	36.00	54.00	56.00	70.00	90.00	128.00	123.00	1258.00	132.00	175.00	120.00	172.00	206.00	277.00	343.00
Costa Rica	0.00	0.00	0.00	1.00	3.00	5.00	6.00	7.00	5.00	5.00	6.00	9.00	11.00	7.00	6.00	8.00	5.00
Ecuador	24.00	28.00	40.00	43.00	34.00	18.00	16.00	17.00	15.00	18.00	29.00	33.00	41.00	53.00	64.00	80.00	77.00
Venezuela	19.00	18.00	15.00	17.00	18.00	21.00	18.00	16.00	17.00	16.00	17.00	19.00	20.00	19.00	18.00	16.00	16.00
Other America	8.00	13.00	12.00	11.00	16.00	11.00	18.00	24.00	20.00	1105.00	38.00	45.00	50.00	51.00	59.00	71.00	91.00
TOTAL AMERICA	63.00	80.00	103.00	126.00	127.00	125.00	148.00	192.00	180.00	197.00	222.00	281.00	242.00	307.00	353.00	452.00	532.00
MEST INDIES																	
Dominican Republic	10.00	15.00	20.00	22.00	22.00	21.00	23.00	24.00	22.00	29.00	34.00	35.00	36.00	30.00	32.00	31.00	31.00
Grenada	6.00	5.00	5.00	5.00	4.00	5.00	4.00	4.00	3.00	3.00	5.00	1.00	3.00	3.00	2.00	2.00	2.00
Jamaica	2.00	2.00	3.00	3.00	3.00	3.00	2.00	2.00	2.00	2.00	2.00	3.00	2.00	2.00	2.00	1.00	3.00
Trinidad & Tobago	18.00	20.00	23.00	27.00	27.00	25.00	19.00	12.00	5.00	6.00	8.00	8.00	6.00	5.00	5.00	3.00	2.00
Other West Indies	5.00	7.00	7.00	5.00	4.00	3.00	4.00	6.00	4.00	4.00	8.00	5.00	4.00	5.00	3.00	5.00	11.00
TOTAL MEST INDIES	41.00	49.00	58.00	62.00	60.00	57.00	52.00	49.00	35.00	44.00	52.00	52.00	51.00	45.00	44.00	42.00	47.00
ASIA & OCEANIA																	
Indonesia	1.00	2.00	2.00	1.00	1.00	1.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	5.00	12.00
Malaysia	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	2.00	8.00	24.00	20.00
Papua New Guinea	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	4.00	14.00	22.00	29.00	30.00	24.00
Samoa	0.00	0.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	2.00	1.00	4.00	3.00	2.00	2.00	2.00	1.00
Sri Lanka	3.00	4.00	3.00	4.00	3.00	4.00	4.00	4.00	3.00	2.00	3.00	2.00	2.00	2.00	2.00	2.00	2.00
Other	1.00	1.00	2.00	1.00	2.00	2.00	2.00	2.00	1.00	2.00	2.00	4.00	4.00	6.00	4.00	4.00	11.00
TOTAL ASIA	5.00	7.00	8.00	7.00	7.00	8.00	10.00	10.00	7.00	7.00	9.00	14.00	26.00	36.00	47.00	67.00	125.00
WORLD TOTAL	138.00	186.00	268.00	359.00	446.00	520.00	602.00	746.00	630.00	686.00	776.00	905.00	1249.00	1323.00	1495.00	1496.00	1662.00
TOTAL FLAVOR COCOA	78.00	79.00	101.00	107.00	97.00	83.00	73.00	67.00	53.00	56.00	73.00	64.00	81.00	47.74	48.87	33.40	26.55
% FLAVOR COCOA	0.52	0.42	0.38	0.30	0.22	0.16	0.12	0.09	0.08	0.08	0.09	0.07	0.06	0.04	0.03	0.02	0.02

Source: Hill & Diffus

APPENDIX 3
Destination of Exports of Flavor Beans & Products by Country

		1. Cocoa Beans									
COUNTRY	YEAR	UNITED STATES	UNITED KINGDOM	WEST GERMANY	NETHERLANDS	JAPAN	FRANCE	SWITZ-ERLAND	BELG./LUXEM.	ITALY	TOTAL
Ecuador	1984	25,601	854	2,454	1,491	1,063	1,064	1,896	749	1,161	36,333
	1983	7,906	177	2,055	127	1,320	1,051	1,516	584	1,138	15,874
	1982	27,614	70	2,857	332	1,816	1,241	2,166	527	2,009	38,632
	1981	10,542	95	1,512	531	1,267	1,029	1,512	746	690	17,924
	1980	7,454	22	2,147	606	1,134	1,172	1,322	751	595	15,203
	Average %	15,823 0.64	244 0.01	2,205 0.09	617 0.02	1,320 0.05	1,111 0.04	1,682 0.07	671 0.03	1,119 0.05	24,793 1.00
Indonesia	1984	1,233	21	8,605	8,308	421	108	247	406	59	19,408
	1983	492	0	4,706	4,116	199	104	228	169	84	10,098
	1982	385	40	3,256	970	324	149	121	146	138	5,537
	1981	310	0	2,675	588	218	166	70	94	39	4,160
	1980	405	0	2,132	848	84	191	85	25	25	3,795
	Average %	565 0.07	12 0.00	4,275 0.50	2,968 0.35	249 0.03	144 0.02	150 0.02	168 0.02	69 0.01	8,600 1.00
P.M.S.	1984	3,447	1,425	10,954	479	98	1,836	99	4,307	0	22,645
	1983	5,757	1,141	7,512	38	276	799	16	3,745	50	19,334
	1982	4,709	1,343	7,991	14	15	2,607	10	2,970	0	19,659
	1981	8,483	631	6,065	219	0	1,699	0	2,785	0	19,882
	1980	4,145	1,524	9,223	966	31	2,733	36	3,349	0	22,007
	Average %	5,308 0.26	1,213 0.06	8,349 0.40	343 0.02	84 0.00	1,935 0.09	32 0.00	3,431 0.17	10 0.00	20,705 1.00
Grenada	1984	0	749	340	0	0	0	265	33	0	1,387
	1983	0	675	344	27	0	175	525	32	50	1,828
	1982	0	673	338	0	0	132	227	169	20	1,559
	1981	0	803	531	0	10	196	413	429	50	2,432
	1980	0	736	348	10	5	100	115	553	0	1,867
	Average %	0 0.00	727 0.40	380 0.21	7 0.00	3 0.00	121 0.07	309 0.17	243 0.13	24 0.01	1,815 1.00
Jamaica	1984	0	595	294	0	30	5	41	628	0	1,595
	1983	0	909	299	0	0	0	60	628	0	1,896
	1982	0	450	326	0	10	0	20	165	0	971
	1981	0	673	472	0	0	165	18	0	0	1,328
	1980	0	660	344	0	0	75	18	20	0	1,117
	Average %	0 0.00	657 0.48	347 0.25	0 0.00	8 0.01	49 0.04	31 0.02	288 0.21	0 0.00	1,381 1.00
Trinidad	1984	710	756	105	0	0	27	86	3	20	1,707
	1983	849	469	86	12	0	28	192	5	11	1,652
	1982	862	901	38	0	18	18	377	114	50	2,378
	1981	1,541	810	34	0	0	55	285	58	47	2,830
	1980	630	612	101	0	9	45	226	45	44	1,712
	Average %	918 0.45	710 0.35	73 0.04	2 0.00	5 0.00	35 0.02	233 0.11	45 0.02	34 0.02	2,056 1.00
Samoa	1984	295	36	525	20	0	0	0	0	25	901
	1983	907	10	491	41	0	20	151	0	0	1,620
	1982	257	10	272	58	0	1	73	0	0	671
	1981	331	0	795	171	39	10	28	0	21	1,394
	1980	280	7	647	21	10	1	285	0	0	1,251
	Average %	414 0.35	13 0.01	546 0.47	62 0.05	10 0.01	6 0.01	107 0.09	0 0.00	9 0.01	1,167 1.00
Sri Lanka	1984	0	0	151	0	142	0	0	0	93	386
	1983	0	10	491	41	220	20	0	0	0	782
	1982	0	0	123	0	201	8	0	0	197	529
	1981	0	0	231	34	342	0	0	0	218	825
	1980	0	0	178	0	100	10	10	0	183	481
	Average %	0 0.00	2 0.00	235 0.39	15 0.02	201 0.33	8 0.01	2 0.00	0 0.00	138 0.23	601 1.00
Other W.I.	1984	99	0	0	10	0	50	0	0	0	159
	1983	55	0	0	0	0	0	0	0	0	55
	1982	40	0	0	0	3	0	0	0	0	43
	1981	56	0	0	0	11	0	0	0	0	67
	1980	47	52	0	0	0	0	11	11	0	121
	Average %	59 0.67	10 0.12	0 0.00	2 0.02	3 0.03	10 0.11	2 0.02	2 0.02	0 0.00	89 1.00
Source	-	2	1	1	1	3	1	4	1	1	-

Sources: 1/ Statistical Office of the European Communities
2/ FAS/USDA
3/ Japan Tariff Association
4/ Commonwealth Secretariat

2. Cocoa Butter

COUNTRY	YEAR	UNITED STATES	UNITED KINGDOM	WEST GERMANY	NETHERLANDS	JAPAN	FRANCE	SWITZERLAND	BELG./LUXEM.	ITALY	TOTAL
Ecuador	1984	1,579	0	0	0	172	0	0	0	0	1,751
	1983	1,497	0	30	30	264	0	0	0	0	1,821
	1982	998	0	100	235	196	0	0	0	0	1,529
	1981	2,735	0	55	615	90	0	0	0	0	3,495
	1980	2,889	0	517	1,086	70	65	0	0	0	4,627
	Average %	1,940	0	140	393	158	13	0	0	0	0
		0.73	0.00	0.05	0.15	0.06	0.00	0.00	0.00	0.00	1.00
Indonesia	1984	254	0	10	209	0	0	0	0	0	473
	1983	36	0	0	0	0	0	0	0	0	36
	1982	54	0	0	0	0	0	0	0	0	54
	1981	395	0	0	0	0	0	0	0	0	395
	1980	249	0	0	0	0	0	0	0	0	249
	Average %	198	0	2	42	0	0	0	0	0	0
		0.82	0.00	0.01	0.17	0.00	0.00	0.00	0.00	0.00	1.00
Jamaica	1984	167	0	60	0	0	0	0	0	0	227
	1983	98	0	0	0	0	0	0	0	0	98
	1982	0	0	0	0	0	0	0	0	0	0
	1981	25	0	0	0	0	0	0	0	0	25
	1980	47	0	0	0	0	0	0	0	0	47
	Average %	67	0	12	0	0	0	0	0	0	0
		0.85	0.00	0.15	0.00	0.00	0.00	0.00	0.00	0.00	1.00
Source	-	2	1	1	1	3	1	4	1	1	-

3. Cocoa Liquor or Paste

COUNTRY	YEAR	UNITED STATES	UNITED KINGDOM	WEST GERMANY	NETHERLANDS	JAPAN	FRANCE	SWITZERLAND	BELG./LUXEM.	ITALY	TOTAL
Ecuador	1984	844	0	0	0	68	0	0	0	0	912
	1983	4,350	0	0	0	100	0	0	0	0	4,450
	1982	4,849	0	0	0	50	0	0	0	0	4,899
	1981	4,604	0	0	0	90	0	0	0	0	4,694
	1980	4,619	0	0	0	120	0	0	0	0	4,739
	Average %	3,853	0	0	0	86	0	0	0	0	0
		0.98	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	1.00
Source	-	2	1	1	1	3	1	4	1	1	-

Sources: 1/ Statistical Office of the European Communities
 2/ FAS/USDA
 3/ Japan Tariff Association
 4/ Commonwealth Secretariat

APPENDIX 4
 Flavor & Bulk Cocoa Bean Premiums
 Premium Over Second Shipment Position (U.S. cents/lb.)

Bulk Cocoa								
YEAR	IVORY	ACCRA	LAGOS	SUPER. BAHIA	SANCHEZ	CENTRAL AMERICA	MALAY	WEIGHTED AVERAGE
1973	9.67	10.12	9.90	8.05	1.31	n.a.	n.q.	9.30
1974	14.09	18.85	18.19	12.28	4.09	n.a.	n.q.	15.62
1975	13.17	15.27	14.64	7.61	4.23	n.a.	n.q.	12.50
1976	11.60	12.63	12.01	7.90	3.85	n.a.	n.q.	10.88
1977	24.44	25.52	22.69	20.75	4.80	n.a.	n.q.	22.56
1978	16.09	20.40	18.96	12.27	3.94	n.a.	n.q.	16.03
1979	15.09	22.76	16.91	5.24	1.16	n.a.	n.q.	13.36
1980	14.65	20.66	18.02	8.58	0.20	n.a.	8.33	14.57
1981	9.23	22.07	16.40	14.18	0.89	n.a.	6.48	13.91
1982	9.19	17.64	14.53	9.26	0.39	n.a.	5.12	11.10
1983	10.57	18.81	14.02	8.70	-0.28	5.36	5.37	11.17
1984	10.73	20.06	17.59	11.36	0.21	3.59	5.46	12.00
1985	12.09	18.22	17.34	9.15	0.57	5.55	5.64	11.87

Mixed Cocoa						Flavor	
YEAR	SEASONS ARRIBA	NEW GUINER	JAVA	RIO CARIBE	LAGUAY. ORDIN.	LAGUAY. FERMENT	TRINI DAD
1973	6.53	7.67	n.q.	n.q.	n.q.	n.q.	7.23
1974	9.40	15.23	n.q.	12.24	13.94	14.30	16.03
1975	9.94	12.52	n.q.	10.60	12.78	13.30	16.00
1976	10.77	8.99	n.q.	n.q.	n.q.	n.q.	12.51
1977	n.q.	21.60	n.q.	n.q.	n.q.	n.q.	23.24
1978	n.q.	15.27	n.q.	n.q.	n.q.	n.q.	19.39
1979	n.q.	8.02	n.q.	n.q.	n.q.	n.q.	21.64
1980	6.59	8.87	n.q.	n.q.	n.q.	n.q.	n.q.
1981	11.26	8.74	n.q.	32.38	33.26	33.58	n.q.
1982	3.87	7.51	n.q.	20.63	20.81	23.76	24.18
1983	4.16	10.07	15.23	12.85	12.88	22.80	n.q.
1984	4.39	9.02	15.53	13.06	13.15	18.89	n.q.
1985	2.53	7.29	13.48	n.q.	n.q.	n.q.	n.q.

Source: Frank Sweeney Corporation

Note: Basis is ex-dock or ex-warehouse East Coast

n.q. = not quoted

n.a. = not available

APPENDIX 5
Export Unit Value of Cocoa Beans
FOB (US cents/lb.)

YEAR	BULK COCOA						FLAVOR COCOA					
	IVORY COAST	GHANA	NIGERIA	CAMEROON	BRAZIL	WEIGHTED AVERAGE	GRENADA	JAMAICA	TRINIDAD	SIERRA LEONE	SRI LANKA	WEIGHTED AVERAGE
1972	25.20	24.20	30.66	26.04	26.23	26.45	31.16	30.16	29.42	33.99	24.86	29.21
1973	39.71	35.78	36.24	43.05	48.51	39.50	30.32	40.20	38.95	63.79	37.43	39.33
1974	57.23	58.41	58.11	64.58	73.35	62.04	49.36	50.51	56.50	75.85	71.37	60.65
1975	59.14	67.50	68.49	71.27	56.59	63.97	64.68	49.18	59.64	57.27	50.93	57.64
1976	69.62	62.06	71.08	67.74	77.02	68.87	66.22	50.49	62.96	78.24	63.33	64.91
1977	115.08	105.95	130.68	127.65	183.53	131.49	71.76	74.08	124.29	165.32	155.75	120.39
1978	132.48	138.54	150.23	140.21	153.53	142.82	137.18	173.81	156.45	146.67	140.18	150.10
1979	141.50	155.25	171.55	137.98	140.72	146.18	187.77	171.68	155.01	127.35	152.29	162.42
1980	127.03	152.83	82.46	115.58	107.06	120.99	164.20	153.91	155.58	114.69	96.86	133.82
1981	76.00	94.09	65.68	80.06	87.50	81.09	123.28	146.05	111.65	71.36	79.25	109.16
1982	69.40	72.48	74.03	81.74	68.29	70.72	99.99	105.08	83.31	47.16	68.01	78.76
1983	66.89	70.97	69.35	74.80	84.36	73.81	82.37	114.37	77.93	72.22	69.40	87.76
1984	90.72	79.86	81.65	97.89	105.33	94.17	90.23	92.33	96.29	78.12	83.05	88.93

Source: World Bank from FAO Trade Tapes