

Cocoa in Ghana: Shaping the Success of an Economy

Shashi Kolavalli and Marcella Vigneri

No other country comes to mind more than Ghana when one speaks of cocoa. Likewise, one cannot think of Ghana without thinking of its cocoa sector, which offers livelihoods for over 700,000 farmers in the southern tropical belt of the country. Long one of Ghana's main exports, cocoa has been central to the country's debates on development, reforms, and poverty alleviation strategies since independence in 1957. The cocoa sector in Ghana has not been an unmitigated success, however. After emerging as one of the world's leading producers of cocoa, Ghana experienced a major decline in production in the 1960s and 1970s, and the sector nearly collapsed in the early 1980s. Production steadily recovered in the mid-1980s after the introduction of economywide reforms, and the 1990s marked the beginning of a revival, with production nearly doubling between 2001 and 2003. These ups and downs offer interesting lessons.

Various administrations in Ghana, including the colonial one, have used cocoa as a source of public revenue, and in so doing the Ghanaian experience offers a recurrent example of a policy practice followed by many other African countries: taxing the country's major export sector to finance public expenditure (Herbst 1993). Revenue extraction by the state has had varying effects on production

depending on global prices, marketing costs, explicit taxes on the sector, and macroeconomic conditions such as inflation and overvaluation of exchange rates and inelasticity of cocoa supplies. Regardless of the level of extraction, the need for sound macroeconomic management, of inflation and exchange rates in particular, becomes evident for continuing to offer incentives for production. The other is the need for Ghana's cocoa pricing policy to arrive at a marketing arrangement that does not kill the goose that lays the golden eggs. Ghana appears to have achieved such an arrangement without fully liberalizing the sector as other producers in West Africa have.

OBSERVABLE ACHIEVEMENTS IN THE COCOA SECTOR

Since the introduction of cocoa in Ghana in the late 19th century, the crop has undergone a series of major expansions and contractions. Ruf and Siswoputranto (1995) suggest that cycles are intrinsic to cocoa production because cocoa is influenced by environmental factors such as availability of forest land; ecological factors such as deforestation, outbreaks of disease, and geographic shifts in production; and economic and social factors such as migration.

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Emergence as a leading producer

Four distinct phases can be identified in regard to cocoa production in Ghana: introduction and exponential growth (1888–1937); stagnation followed by a brief but rapid growth following the country’s independence (1938–64); near collapse (1965–82); and recovery and expansion, starting with the introduction of the Economic Recovery Program (ERP) (1983 to present). Figure 12.1 shows long-term trends in levels of production.

Exponential growth (1888–1937). Cocoa was introduced in the southern region of the Gold Coast in the mid-19th century by commercial farmers from the Eastern region districts of Akuapem and Krobo, who had moved west toward the adjacent district of Akyem to purchase mostly unoccupied forest land from the local chiefs for cocoa cultivation (Hill 1963).

The conditions that encouraged these farmers to migrate and buy land for cocoa are well documented: a fall in the world price of palm oil after 1885, which pushed farmers to search for alternative export crops; a boom in rubber exports in 1890, which provided the capital for the purchase of new land; increasing population pressure in the Akuapem area, which encouraged commercial farmers to go further afield in search of alternative export agriculture opportunities; and the establishment of European produce-

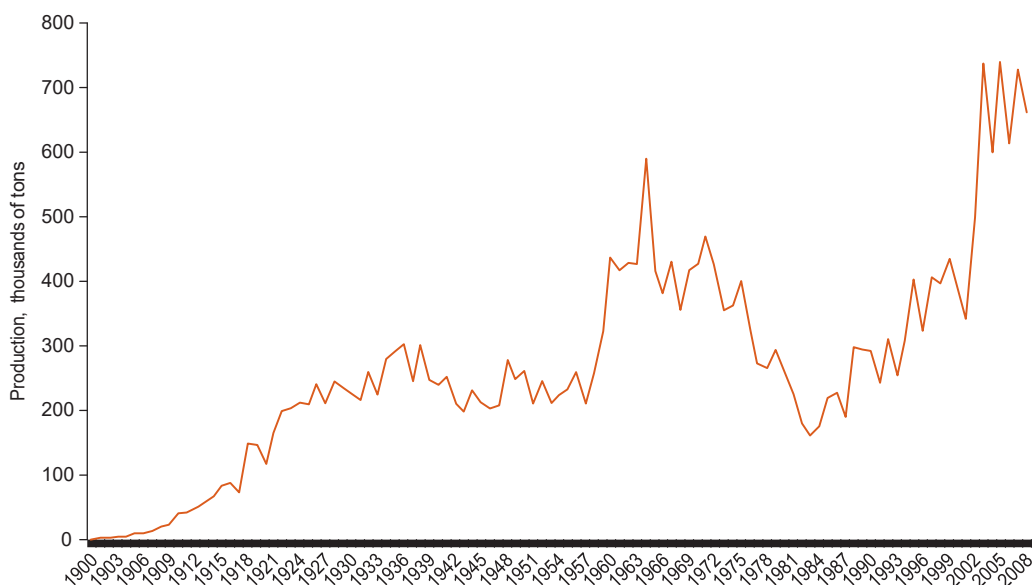
buying companies on the coast of West Africa that were prepared to trade the new crop (Hill 1963; Amanor 2010; and Gunnarsson 1978).

Three social classes: land-owning farmers, peasants, and laborers emerged among cocoa producers as a second wave of migrants from Akyem moved to the region. Without sufficient money with which to buy land, these migrants sharecropped with earlier settlers under a system called *abusa*, in which laborers were paid one-third of the sales price of the harvested cocoa. Simultaneously, there was a large influx of migrants from relatively distant Upper Volta (now Burkina Faso), Niger, and Mali, who were attracted by the generous remuneration that cocoa production offered in southern Ghana.

The growing population of cocoa farmers reinvested its profits in cocoa production in the western end of Ghana’s Forest Zone, rapidly shifting the production frontier into the Ashanti and Brong Ahafo regions, and consolidating Ghana as the leading world producer between 1910 and 1914. Facilitated by the rapid expansion of the road and rail network which began in 1920 and the organization of cocoa marketing by Ghanaian middlemen, cocoa earnings accounted for 84 percent of the country’s total exports by 1927. By the mid-1930s, production reached 300,000 tons.

Stagnation and growth postindependence (1938–early 1964). The interwar period marked a slowdown in cocoa

Figure 12.1 Ghana’s Cocoa Production, 1900–2008



Source: Gill & Duffus Group, various issues; Ghana Cocoa Marketing Board, various issues.

production, caused by decreasing demand and growing difficulties in transport (Gunnarsson 1978). Outbreaks of pests and diseases (swollen shoot virus in particular) reduced production in the Eastern region in the early 1940s, pushing cocoa cultivation further into the western Brong Ahafo frontier (Amanor 2010). Production picked up again during the second half of the 1940s but was now concentrated in the Western region. In 1947, the colonial government established the Cocoa Marketing Board (CMB) and gave it a monopoly over the purchase of beans. Until 1951 the bulk of profit made by the CMB went into its reserves, which were then used for public investment (Brooks, Cropstedt, and Aggrey-Fynn 2007). In 1961 a cooperative society was given the monopoly right to purchase cocoa replacing the network of private agents, brokers, traders, and middlemen who until then had controlled internal marketing.

As Beckam (1976) noted, the Convention People's Party (CPP), founded by Kwame Nkrumah, benefited from extremely favorable postwar market conditions and accumulated cocoa income on a massive scale: following the sharp increase in market prices in the 1950s, farmers were paid two to three times more than they received before the war, and between 1947 and 1965 the government collected almost one-third of the total value of cocoa export as export duties. In 1950/51 the government increased export duties and began to take a much larger share of cocoa revenue by means of a graduated ad valorem tax that increased with the increase of the average selling price per ton of cocoa. To extend its influence to the rural sector, in 1953 the Nkrumah regime also created the United Ghana Farmers' Council (UGFCC), which was mainly concentrated in the cocoa-growing regions despite its remit to cover the interest of farmers all over the country. The UGFCC was made the monopoly buyer of cocoa to create a platform for organizing the farmers behind the government and its administration.

Following the second elections in 1954, the cocoa export tax was further increased while the producer price remained at the same level for four years. This generated unrest and political agitation among cocoa farmers, ultimately forcing the government to increase the producer prices and to stabilize them during 1956–57 despite declining world cocoa prices. As a result, the share of government revenue in cocoa sales dropped from 60 percent to 13 percent between 1954/55 and 1956/57. After its third political victory of 1957, the government increased its share of cocoa revenues by reducing producer prices to the 1954 levels. It also obtained a “voluntary contribution,” announced by the UGFCC on behalf of cocoa farmers, to share the burden of

the Second Development Plan at a time when the government was also receiving soft loans from the CMB. These events made it obvious that by then the CMB had been transformed into an instrument of public finance. The capturing of windfall profits from high cocoa prices had important fiscal implications. Government expenditures grew dramatically over the 1950s: in real terms total consolidated public expenditures increased almost sixfold during this period. The share of government expenditure in GDP grew from 7 percent to 18 percent over the decade, and the share of extraordinary and development expenditure grew from 27 percent to 36 percent. In 1961, a cooperative society was given the monopoly right to purchase cocoa. From 1957 to 1964 exports grew steadily, and production reached an unprecedented level of 430,000 tons despite the significant decline in world prices between 1960 and 1962.

In the early 1960s, when world prices plummeted, farmers were required to save 10 percent of their earnings in National Development Bonds, redeemable after 10 years. In 1963 this scheme was replaced by a farmers' income tax charged at a flat rate equal to previous saving deductions. The government started to rely heavily on the CMB's reserves, and the producer price was reduced from 224 to 187 new cedi per ton between 1961 and 1964. With foreign exchange reserves declining and the budget deficit rising sharply, the government introduced a number of strong restrictive measures, an increase in taxes, foreign exchange controls, and comprehensive import licensing. The austerity of these measures lost Nkrumah much of his political consent, especially from cocoa farmers who had been aggravated by declining producer prices and by the conversion of the compulsory saving scheme into an explicit export tax.

In the second half of 1964 the world cocoa price collapsed with a bumper crop in West Africa—Ghana alone reaching an unprecedented production record of 538,000 tons. After the purchasing and marketing costs of the CMB and UGFCC were covered, virtually nothing was left for the government, and the CMB's liquidity resources were nearly exhausted. To meet its expenses, the government started printing money, which ignited a 35 percent rise in inflation between October 1964 and July 1965. In the face of such pressure, cocoa producer prices were reduced to their lowest levels in years. The introduction of such highly restrictive measures represented a turning point in the fortunes of the Nkrumah government, which was overthrown in February 1966 and replaced by the National Liberation Council (NLC).

The downturn (1964–82). The collapse of world cocoa prices in 1965 triggered another downturn (Stryker 1990).

Real producer prices dropped consistently through the 1960s because of inflation fueled by the government's printing of money to compensate for loss of revenue from cocoa and the introduction of an exchange rate policy that led to the heavy overvaluation of the *cedi*, the local currency. By 1983, market exchange rates were nearly 44 times the official rate. Between 1970s and early 1980s, it is estimated that as much as 20 percent of Ghana's cocoa harvest was smuggled into Côte d'Ivoire (Bulir 2002). Meanwhile, an aging tree stock and the continued spread of disease made investment in cocoa unattractive. Farmers in old cocoa production areas, who found that sales prices barely covered their costs, increasingly turned from cocoa to food production (Amanor 2005). Ghana's cocoa production dipped to a low of 159,000 tons in 1982/83, a mere 17 percent of the total world volume, down from the 36 percent in 1964/65.

The National Liberation Council dissolved the UGFCC and established the Producing Buying Company as a subsidiary of the CMB. Producer prices were raised and farmers were paid a bonus for top grade cocoa beans to upgrade the quality of cocoa being exported. Shortly before the Busia government came to power the *cedi* was devalued by 43 percent and cocoa prices were raised by 30 percent. Cocoa production stagnated in the face of unchanged real producer prices that remained at their 1950s levels. The Busia administration took advantage of windfall profits from high cocoa prices in 1970 to enable a rapid expansion of public expenditure.

In 1971 the Busia regime was replaced by the Acheampong-led National Redemption Council. Because of high world cocoa prices, this administration was initially able to offer higher prices to farmers without cutting public revenues, creating positive incentives to production. But a progressively worsening balance of payments situation fueled inflation and undermined subsequent increases in real wages, producer prices, and other real incentives.

With the fall in world cocoa prices in the mid 70's, the general macroeconomic picture began to worsen: the government budget deficit rose to 127 percent of total government revenue and inflation accelerated to 116 percent. The strong overvaluation of the *cedi* implied that little was left of export revenues to divide between the government and the farmers. Cocoa revenue went from 46 percent in 1974 to 23 percent in 1979 and into negative figures between 1980 and 1981 because of the exchange rate misalignment. The rising costs of the CMB further reduced government revenues.

In July 1978 the government underwent another regime change, and the *cedi* was devalued again, an austerity budget

was introduced, and interest rates and cocoa producer prices were raised. Cocoa production sunk to its lowest level ever in 1980–81; the world price at the official exchange rate was lower than the producer price plus marketing costs.

The domestic conditions that led to the downturn in Ghana's cocoa sector took place against an international backdrop of increasing supply of cocoa from new producers such as Indonesia and Malaysia and expanded production in Côte d'Ivoire and Brazil. By the early 1970s Ghana had also lost much of its cheap labor supply from Burkina Faso and Côte d'Ivoire, as migrant farmers, reluctant to work in the old cocoa-producing areas that had become less productive, were attracted to the neighbouring Ivorian regions, where policies granted migrants access to land at favorable terms.

The recovery and second expansion phase (1983–2008). The turnaround in Ghana's cocoa sector began with the implementation of the ERP in 1983, which included a special program to revive the sector (the Cocoa Rehabilitation Project). Policy changes included increasing the farm gate prices paid to Ghanaian farmers relative to those paid in neighboring countries, thus minimizing the incentive to smuggle, and devaluing the *cedi*, thus reducing the level of implicit taxation of farmers.

As part of the Cocoa Rehabilitation Project, farmers were also compensated for removing trees infected with swollen shoot virus and planting new ones. This effort led to substantial rehabilitation, with a large number of farms planting higher-yielding cocoa tree varieties developed by the Cocoa Research Institute of Ghana. Production rebounded to 400,000 tons by 1995/96 and productivity increased from 210 to 404 kilograms per hectare. Another important reform took place in 1992, when Cocobod (as CMB was renamed in 1984) shifted responsibility for domestic cocoa procurement to six privately licensed companies (commonly known as licensed buying companies or LBCs) and reduced its staff by 90 percent between 1992 and 1995.

Growth in cocoa production became more pronounced starting in 2001, possibly driven by a combination of record-high world prices, increased share being passed onto farmers, and a set of interventions rolled out by the Cocobod to improve farming practices: mass spraying programs and high-tech subsidy packages to promote the adoption of higher and more frequent applications of fertilizer (Vigneri and Santos 2008). Some of the growth during this period may also have been due to the influx of cocoa smuggled from Côte d'Ivoire, estimated between **120,000 and 150,000**

thousand tons in 2003/4 (Brooks, Croppenstedt, and Aggrey-Fynn 2007).

Since 2001 a significant share of Ghana's agricultural productivity gains have been generated by export crops, with cocoa accounting for 10 percent of total crop and livestock production values (World Bank 2007a) and contributing to 28 percent of agricultural growth in 2006, up from 19 percent in 2001. At the same time, economic growth has been solid, averaging more than 5 percent since 2001 and reaching 6 percent in 2005–06. Coupled with the effects of greater access to education, health services, and land ownership (World Bank 2008), this rate of growth has contributed to the near halving of the national poverty rate since the beginning of the 1990s, from 51.7 percent in 1991/92 to 28.5 percent in 2005/06 (Breisinger et al. 2008).

Over time, cocoa farmers have changed the way they access land and labor in response to the changing production conditions of a constantly moving cocoa frontier. Until the early 1940s, when both land and labor were abundant, large farms were able to attract rural workers to establish new farms by selling them small plots of land, an arrangement that often also drew the workers' family members to establish and maintain new farms. By the second half of the 1960s, when land became scarce, sharecropping arrangements increasingly replaced land sales. During times when the cost of hiring waged workers became too high, alternative forms of labor were used—mostly, either sharecropping arrangements or informal labor groups known as *nnoboa* (Berry 1993; Blowfield 1993; Vigneri, Teal, and Maamah 2004; and Amanor 2010). Since 1990 noticeable changes have taken place in the technology of cocoa production, in particular increased use of fertilizers; the adoption of hybrid cocoa varieties, and better control of pests and diseased trees (Boahene, Snijders, and Folmer 1999; Edwin and Masters 2003; Gockowski and Sonwa 2007; Teal, Zeitlin, and Maamah 2006; Vigneri, Teal, and Maamah 2004; and Vigneri 2008).

Increased use of fertilizer. Fertilizer use in Ghana has increased significantly since the 1990s. Surveys of cocoa farmers in the three main cocoa-producing regions of Ghana show that fertilizer application rates increased from 9 percent in 1991 to 47 percent in 2003 (table 12.1). Although the quantity of fertilizer used decreased between 1991/92 and 1997/98, the proportion of farmers applying fertilizer increased, possibly from liberalization of input

Table 12.1 Fertilizer Use in Cocoa-Producing Regions: 1991/92–2003/04

	Brong Ahafo Western			Total
<i>Number of farmers</i>				
1991/92	112	71	137	320
1997/98	132	54	227	413
2001/02	108	94	226	428
2003/04	108	94	226	428
<i>Quantity of fertilizer used (50-kilogram bags)</i>				
1990/91	0.28	0.13	0.03	0.14
<i>Adoption rate (%)</i>	(13)	(8)	(6)	(9)
1997/98	0.10	0.06	0.10	0.09
<i>Adoption rate (%)</i>	(10)	(13)	(19)	(15)
2001/02	0.35	0.17	0.74	0.52
<i>Adoption rate (%)</i>	(5)	(7)	(12)	(9)
2003/04	4.17	4.39	6.10	5.24
<i>Adoption rate (%)</i>	(57)	(52)	(41)	(47)

Source: Authors' calculations from GLSS3, GLSS4, and Ghana Cocoa Farmers Survey, 2002 and 2004 rounds.

markets in 1996/97, which eliminated subsidies but improved private distribution (Vigneri and Teal 2004).

Adoption of improved varieties. Hybrid cocoa varieties were introduced in 1984 through the government's Cocoa Rehabilitation Project (CRP). Hybrid varieties outperform the older "Amazons" and "Amelonado" varieties in two ways—by producing trees that bear fruit in three years compared with at least five years for the older varieties, and by producing more pods per tree.¹ But hybrid cocoa trees underperform older varieties in that they require optimal weather conditions and complementary farming practices such as the application of chemical inputs, adoption of new planting procedures, pruning, and spraying. Hybrids varieties also require that farmers make more harvest rounds at the beginning and the end of the season, something they are reluctant to do when it conflicts with other farming or trading activities (Boahene, Snijders, and Folmer 1999; Bloomfield and Lass 1992).

Despite the increased labor input for hybrid cocoa trees, farmers have increasingly adopted them. In the late 1980s only 10 percent of cocoa grown in Ghana was of the high-yielding type (Nyanteng 1993). By 2002, 57 percent of farmers in the three main cocoa-producing areas were growing hybrid trees (Vigneri 2005). Traditional varieties may have disappeared entirely from all fields planted after 1995 (Edwin and Masters 2003).

Better disease and pest control. Control of disease and pests, swollen shoot virus and capsid in particular,

has improved significantly in recent years. After Cocobod initiated a free mass spraying program in 2001, 93 percent of cocoa farmers who participated in a survey conducted in 2002 linked their yield improvements to the effects of the program (Steedman 2003). Similarly the cocoa farmers' panel referred to above for the crop years 2002 and 2004 suggests that nearly all farms were sprayed in 2003/04, when producers reported an average of more than four spraying applications during the crop year, of which 46 percent were carried out by the government (Vigneri 2005).

The effect of all these improved practices has been an increase in productivity of about 30 percent, which brought productivity to the levels achieved in the 1980s (figure 12.2). Productivity was stagnant until the late 1980s, with production largely related to area harvested. The first big jump in productivity occurred in the 1980s, corresponding to the year of the Cocoa Rehabilitation Program rolled out under the ERP, and the second more recently, with improved practices. The correlation between production and area harvested remains strong.

Cocoa's contribution to economic growth and poverty reduction

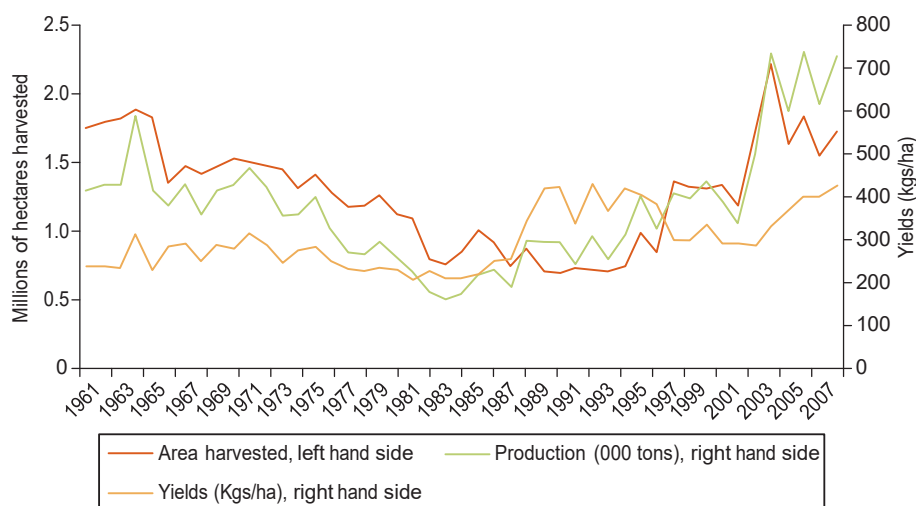
In the Southern Forest Belt, where cocoa is produced, aggregate figures suggest that through the 1990s, cocoa-farming households, along with those engaged in mining or timber (the other predominantly export-oriented activities) and other commercial activities, experienced improvements in

their living conditions compared with food crop farmers (McKay and Coulombe 2003). Poverty reduction among cocoa farmers is clear. Household surveys indicate that poverty among cocoa-producing households dropped to 23.9 percent in 2005, down from 60.1 percent at the beginning of the 1990s (World Bank 2007b).

Reputation for high-quality cocoa

Cocoa, like many other commodities, is often differentiated by country of origin, and this in turn is associated with a reputation based on average quality. The reputation, a national public good, enables the country to earn a premium in the global market for the crop it is producing. Generally, Ghana receives a price premium for its cocoa in world markets because of the slightly higher-than-average fat content; low levels of debris, which results in higher cocoa butter yields than beans containing high levels of debris; and low levels of bean defects, which generate a cocoa liquor flavor preferred by some end users. In addition to these attributes, the reputation of the Cocoa Marketing Company (the government division in charge of all exports) in ensuring the consistency and reliability of cocoa-related shipments and documents has played a central role in establishing the country's reputation for high-quality beans (Agrisystems Ltd. 1997). Using trade NYSE Liffé cocoa market information, Gilbert (2009) suggests that Ghanaian cocoa draws a premium of 3 to 5 percent relative to Côte d'Ivoire, currently the world's largest producer of cocoa (table 12.2).

Figure 12.2 Cocoa Production, Area Cultivated, and Yields, 1961–2008



Source: FAOSTAT.

Table 12.2 Cocoa Unit Values and Terminal Market Differentials
Percent

Period	Cameroon		Ghana		Nigeria	
	Unit value	Differential	Unit value	Differential	Unit value	Differential
1988–1991	2.7	—	3.7	—	-0.4	—
1992–2002	-3.0	0.20	1.1	4.8	-2.1	-0.5
2003–2008	-7.8	—	5.2	4.9	-0.7	-0.9
1988–2008	-3.3	—	2.8	4.9	-1.4	-0.7

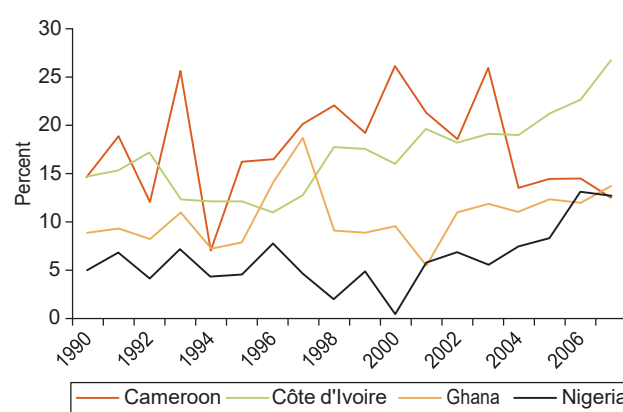
Source: Adapted from Gilbert (2009). Figures reported are relative to those of Côte d'Ivoire, the reference country.

Note: — = not available.

Characteristics that determine the quality of cocoa include content and quality of fat, consistency in the size of the beans, and their moisture content. These characteristics determine the quality of cocoa butter and cocoa liquor produced from the beans, the two ingredients that control texture, aroma, color, and flavor of chocolate. The fermentation, drying, storage, and evacuation of wet beans can alter the quality of cocoa beans dramatically, particularly in the development of the flavor of cocoa liquor. The classic “West African” cocoa flavor is obtained by fermenting beans in a heap under banana leaves for about six days with frequent manual turning and thorough drying in the sun. Drying beans slowly on raised platforms is very important for the quality of flavor because it quickly decreases the acidity level of the beans. Quality is also maintained by quickly collecting properly fermented and dried beans from smallholder farmers and promptly shipping them to avoid the buildup of moisture, mold, and free-fatty acids that can rapidly deteriorate the quality of the bean.

Partly because of its reputation for high-quality cocoa, Ghana is able to sell most of its annual production through forward contracts, which fix the price farmers are given for their cocoa for the entire crop year. The value that international firms place on Ghana’s cocoa is also reflected by the amount of investment they have made in processing facilities in the country. Ghana’s export earnings from processed cocoa products more than tripled between 1991 and 2004, from \$32 million to \$105 million (figure 12.3).² However, because of the limited conditions under which semiprocessed cocoa can be transported effectively (Fold 2002), it is not clear whether local value-adding efforts will be sufficiently profitable for international companies to expand their operations in Ghana. Thus far, informal discussions with the private sector participants indicate that the net benefits from processing locally may not be significant, particularly because the government allows only a limited quantity of low-quality beans to be

Figure 12.3 Share of Processed Cocoa Products in Total Cocoa Exports in West African Countries, 1990–2007



Source: FAOSTAT.

Note: Cocoa processed products include cocoa butter and cocoa paste.

used for local processing, which has resulted in considerable underutilization of existing capacity in the country.

Increased share of free on board prices going to farmers

Agricultural exports continue to be the most important source of foreign exchange for the majority of Sub-Saharan African countries (Gilbert 2009). In virtually every country in Africa with a major export crop, including Ghana, the government has intervened through state-owned marketing boards, or *caisses de stabilisation*, to coordinate the production and marketing of the crop, offering farmers stable farm gate price that shield them from price volatility. Many scholars (Bates 2005; McMillan 1998; Akiyama et al. 2001) hold that marketing boards in Africa have long operated as corrupt institutions taxing farmers through the power to set prices and indirectly by maintaining overvalued exchange

rates. That said, the role of governments in the agricultural sector has changed substantially since independence.

Despite granting Cocobod the monopoly over marketing, Ghana has managed to develop a marketing system that passes on an increasingly larger share of export prices to farmers. Prices received by Ghanaian producers have been a function of government interest in using the sector as a source of revenue and a balance against global prices, exchange rate distortions, and inflation. Price policies were also made ineffective by macroeconomic policies. In the early 1980s, for example, the Provisional National Defense Council (PNDC) had to choose between supporting cocoa farmers and continuing to maintain highly overvalued exchange rates (Stryker 1990).

In Ghana, the price producers are paid for cocoa is currently set at the beginning of the harvest season for the entire crop year by the Producer Price Committee.³ The price is based on the price Cocobod expects to receive, having already sold nearly 70 percent of the crop. To this price, Cocobod adds the costs of its operations and the export tax to arrive at what it calls “net free on board (f.o.b.) price.”

The share of the net f.o.b. price received by cocoa farmers in Ghana has increased to nearly 80 percent after having fallen below 20 percent before the economic reforms of the 1980s, and as low as almost 5 percent between 1975 and 1981. By 1987/88, real producer prices in Ghana had increased threefold compared with 1983/84, largely as a result of Cocobod’s revised policy of paying higher prices to

the farmers, in response to pressure from multilateral organizations to streamline its operations (Brooks, Cropstedt, and Aggrey-Fynn 2007). Figure 12.4 shows the share of f.o.b. prices paid to producers, the share retained by Cocobod (shown as direct taxation), and the share of indirect taxation imposed by the exchange rate.⁴ Exchange rate distortions can further erode the share producers receive. These distortions were high in the mid-1980s but have completely disappeared.

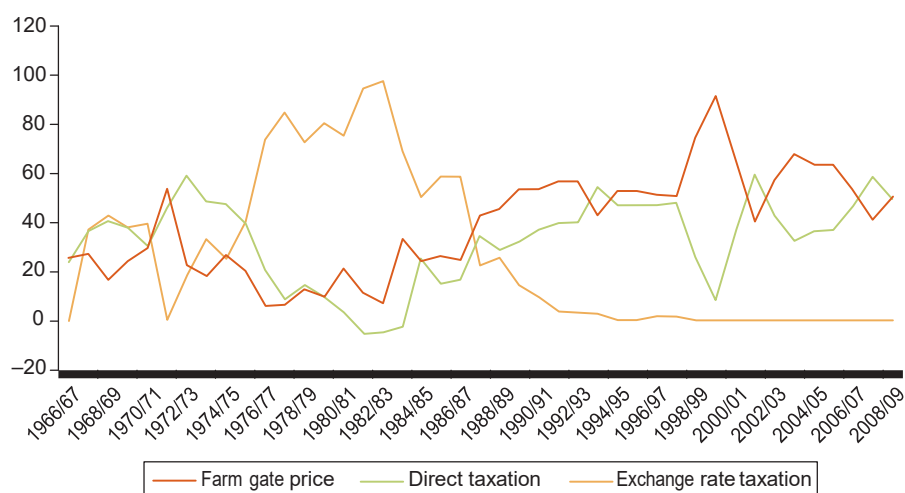
REASONS FOR SUCCESS OF THE COCOA SECTOR

A number of factors have contributed to the success of Ghana’s cocoa sector: a favorable price regime, both in terms of the f.o.b. share passed on to producers and the real price received by farmers; improved marketing through partial liberalization; and Cocobod’s interventions to raise cocoa productivity.

Favorable prices

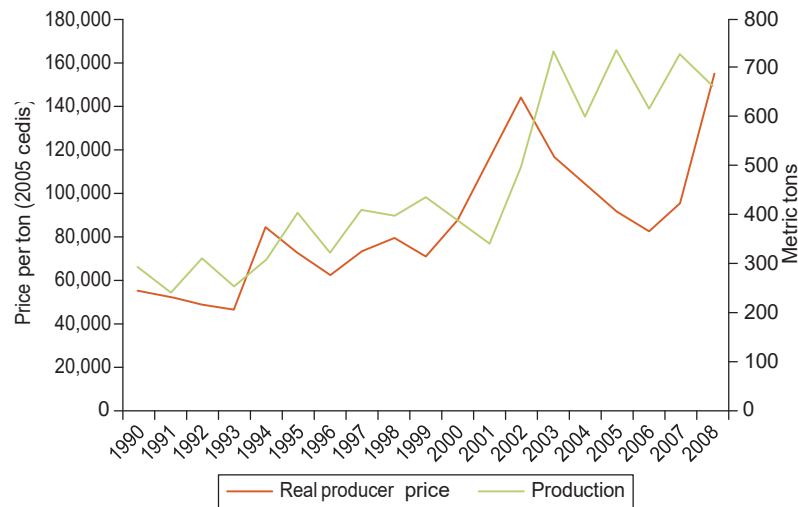
With the exception of 1998–2000 and 2003–06, world cocoa prices have steadily increased since 1990. This, combined with a higher share of the price being passed on to farmers, has offered farmers increasing real producer prices (figure 12.5). A variety of models estimating the sensitivity of production supply to farm gate prices find that

Figure 12.4 Farm Gate Prices, Direct Taxation, and Exchange Rate Taxation for Ghanaian Cocoa, 1966–2008
Percent



Source: Vigneri 2005.

Figure 12.5 Ghana Cocoa Production and Real Producer Price, 1990–2008



Source: Cocobod and ICCO.

small-scale cocoa producers in Ghana have responded positively to these price incentives (Bulř 2002; Hattink, Heerink, and Thijssen 1998; and Vigneri 2005, among others).

Although strictly comparable data are not available, informed inference on the returns on cocoa farms using the results from two rural surveys, one conducted in 1996 (Agrisystems Ltd. 1997) and one in 2006 (Barrientos and Asenso-Okyere 2008), show that cocoa production has not become more profitable for farmers. In fact, calculations show that cocoa, which usually is the largest source of earnings in cocoa-producing households, accounting for more than 67 percent of revenues, has actually declined over time: net cocoa profits for cocoa-producing households were 7 percent lower in 2005 than in 1996. While the real price of cocoa increased by 47 percent between these two years, the cost of inputs increased more. These estimates, however, do not suggest a trend because they are based on observations for two specific years.

Liberalization of domestic cocoa marketing

Following pressures from multilateral organizations in the early 1980s, wide-ranging changes were introduced to improve Cocobod’s efficiency: transport was shifted to the private sector, feeder road development was transferred to the Ministry of Roads and Highways, and in 1988–89 input subsidies were phased out (Brooks, Croppenstedt, and Aggrey-Fynn 2007). Following the 1992 elections more drastic measures were undertaken: Cocobod staff levels were

reduced from 100,000 in the early 1980s to 10,400 in 1999 to just over 5,100 in 2003, bringing down costs considerably. In the same year, Cocobod ended its control over all domestic purchases by allowing a number of private licensed companies to compete with its former purchasing agency, the Producing Buying Company (PBC), to buy and transport the cocoa crop from farms; the board, however, specifies a minimum price. This partial liberalization appears to have benefited producers. The internal marketing of cocoa has also become more competitive in recent years, with nearly 20 licensed buyers, along with PBC, procuring cocoa through nearly 3,000 buying stations manned by purchasing clerks or individuals from cocoa communities who purchase the crop on the buyers’ behalf. Although the total number of licensed buyers is relatively large, five dominate the market: the Produce Buying Company, Kuapa Kokoo, Olam, Armajaro, and Global Haulage, a former transport company comprising three Ghanaian buyers (Federal Commodities, Transroyal, and Adwumapa) Additionally, Cocobod extends funds to producers at rates slightly below the market rate to finance their operations. It also monitors producers’ operations, particularly with regard to quality of beans. Though licensed buyers are free to export, none of them has thus far because none is large enough to acquire the minimum amount needed to be eligible to export.

Zeitlin (2006) finds a positive correlation between the concentration of licensed buying companies at the village level and production. But the direction of causality is not clear, because buyers are also likely to locate themselves

where large quantities of cocoa are available for purchase. The PBC continues to operate as a buyer of last resort. While Cocobod sets a minimum price that must be paid to producers, the buying companies are free to pay higher prices. Even in the absence of price competition among licensed buyers, farmers have benefited. Payments to farmers have become more reliable, and corruption, which characterized the contractual negotiations when the PBC was the only buyer, has diminished. While licensed buyers may not compete on prices, they do offer occasional price bonuses, subsidized inputs, or credit extensions for producers (Laven 2007). Because the licensed buyers buy cocoa throughout the year, however, the new buying system puts a steadier stream of money into the hands of producers (Vigneri and Santos 2008), giving farmers working capital to buy labor and other inputs when they need them.

Although the efforts at liberalization are likely to have made procurement and transport more efficient than before, it is unclear whether Cocobod's costs have been reduced by "outsourcing" procurement and transport and to what extent liberalization may have helped Cocobod pass on a higher share of f.o.b. prices to farmers. But regardless, retaining control over exports and other aspects of marketing has enabled Cocobod to support producers in ways that would not have been feasible had it devolved these responsibilities to other organizations.

Cocobod's impact on productivity

Importantly, Cocobod's continued involvement in the cocoa sector in Ghana has allowed surpluses generated in good years to be used to finance deficits during years when prices were low. Similarly, Cocobod has invested in research, disease control, and credit programs that are of general benefit to the cocoa industry (Stryker 1990). In 2001 the Cocoa National Disease and Pest Control Committee was established to develop strategies to control capsid and black pod through a nationally coordinated spraying program under which Cocobod, through a network of regional offices, undertakes spraying of all cocoa fields at no cost to the producers.⁵ By Cocobod's estimates, the scheme has had a positive impact on national cocoa production, particularly during the 2003/04 and 2005/06 seasons. Cocobod also reports that the protection of the cocoa plants that the program offers has encouraged farmers to undertake additional spraying applications.

In 2002/03, Cocobod rolled out the "Cocoa High-Tech" program designed to encourage farmers to apply a minimum of 5 bags of fertilizer per hectare of planted cocoa, supplying

fertilizer on credit. The program collapsed after one year, however, because of poor repayment rates. Following this pilot, a private agri-input company, Wienco, tested a package of agricultural inputs and farm practices known as the "Abrabopa package." In 2003, its first year of testing, the package raised yields from 510 to 1,081 kilograms per hectare and to 2,317 kilograms per hectare after the third year.

In 2006 the Cocoa Abrabopa Association (CAA) was established, under which groups of farmers with mature trees on at least one hectare of land were given the Abrabopa package on credit and offered technical and business training. The number of farmers participating in this program reached 11,000 in 2008. An evaluation of the program in 2008 (Opoku et al. 2009) suggests that the principle of group liability employed in this program ensured, to some extent, the effective use of the fertilizer and other inputs provided by the CAA package. That said, a large proportion of farmers, nearly 40 percent, dropped out of the program, so the benefits of the CAA package reached only a small share of cocoa growers.

Cocobod's role in maintaining quality

In terms of quality practices by government marketing boards among West African cocoa-producing countries, Ghana is an exception, because maintenance of quality continues to be Cocobod's mandate even after its restructuring. In other countries, dismantling and restructuring of marketing boards in the 1980s radically reduced quality control systems (Fold 2001; Gilbert 2009). One rationale for a government role in maintaining quality is that cocoa is transported in bulk, and poor-quality cocoa beans can diminish the quality of other beans in the same shipment, thereby affecting the price of all beans in the shipment. Maintaining a government role is also important because it allows the government to control the national reputation of Ghana's cocoa and keep its premium in the world market (Fold and Ponte 2008). This quality maintenance comes at a cost, however, including the cost of ensuring that lower-quality beans are not mixed into those prepared for export and the costs of administration.

SUSTAINABILITY OF THE COCOA SECTOR

Ghana's cocoa sector faces a number of challenges. For one, productivity levels are lower than they are in other countries. Ghana also faces the possibility that its quality advantage may disappear in the coming years. In addition, Ghana must determine how to keep its cocoa sector competitive as

cocoa-producing households change. Finally, the environmental impact of current farming practices may soon constrain cocoa production expansion. On the other hand, however, Ghana has been quite successful in taking advantage of niche cocoa markets.

Productivity and competitiveness

Notwithstanding the technical changes that have occurred in cocoa production, Ghana still needs to close a large productivity gap to remain competitive. The gap between observed and achievable yields is 50–80 percent (Gockowski 2007), depending on the production practices adopted by farmers (for example, thin shading and the amount of fertilizer applied). A survey conducted in the 1980s, however, indicated that Ghana was the lowest-cost producer in the world (Bloomfield and Lass 1992). Ghana’s yields are low compared to those of its leading competitors, Côte d’Ivoire and Indonesia (figure 12.6). Additionally, it is not clear which technologies intended to increase productivity are attractive to farmers. For example, farmers may not have much incentive to apply fertilizers to hybrid trees, because the returns from doing so may not be higher than those achieved on traditional varieties (Edwin and Masters 2003).

On experimental farms, application of fertilizers to young trees has increased yields as much as threefold

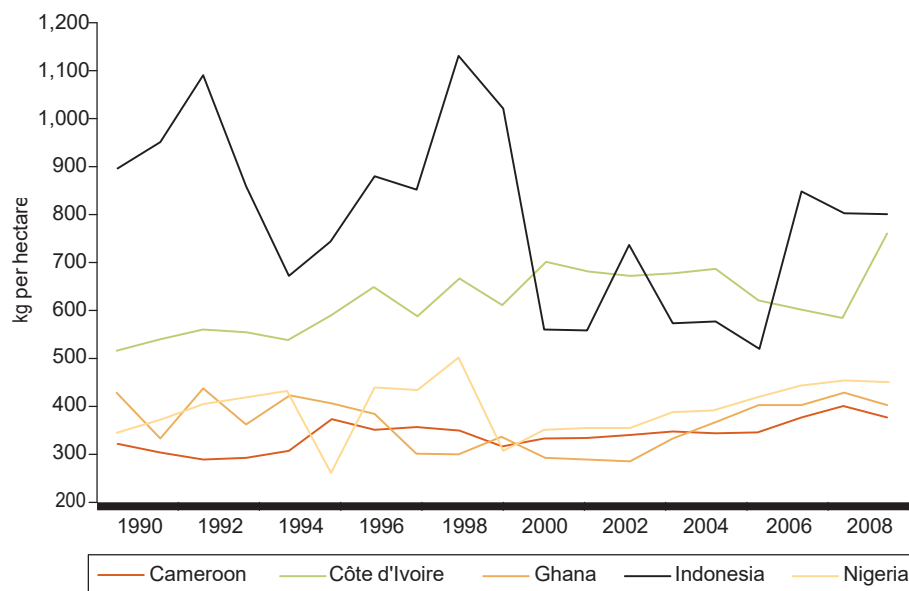
(Gockowski and Sonwa 2007). One evaluation (Opoku et al. 2009) suggests that the high dropout rate from the CAA program may result from high variability in the expected returns from fertilizer applications.

The low level of tree replanting is an additional threat to the sustainability of Ghana’s cocoa production. Often, farmers find it more economical to expand their farms rather than to replace old and diseased trees (Vigneri 2005; Ruf and Burger 2001), because it takes twice as long to clear an old farm as it does to clear new forest land (Masdar Ltd. 1998). Additionally, farmers regard the expansion of land on which cocoa is planted as both an investment and a means to establish land ownership. Given that migrants and sharecroppers represent an increasing share of the cocoa-farming population, this dual view means that many farmers seek to acquire permanent land rights by expanding into uncultivated land, where land ownership is established by clearing land and planting new trees (Amanor 2010; Berry 2009; Takane 2002).⁶ Further opportunities to increase production by land expansion may be limited, though, by the decreasing availability of virgin forest land.

Longevity of the quality advantage

Although Ghanaian cocoa draws a premium price for its reliable quality, this advantage may be eroded in the future

Figure 12.6 Cocoa Yields, by Country, 1990–2008



Source: FAOSTAT.

because of technological advances in processing (Agrisystems Ltd. 1997; Fold 2001). On the other hand, current quality control processes in Ghana guarantee minimum parameters that are important to large industry players like Cadbury, which is known to use Ghanaian cocoa beans exclusively in all its U.K.-retailed chocolate products. A second, potential threat is when other cocoa-producing countries improve on their quality. Currently, this is not much of a threat to Ghana, because smallholder farmers in countries such as Malaysia and Indonesia lack the institutions to support quality. In Côte d'Ivoire, the mixing of good cocoa beans with the bad ones in shipments for export results in variability in quality (Bloomfield and Lass 1992).

Competitiveness of cocoa on farms

Cocoa is a mixed crop system in which other crops may be consumed or sold. Intercropping with plantain and cocoyam, for example, provides early returns when cocoa trees are still young. Studies conducted in the 1970s and in the 1990s (Rourke 1974; Masdar 1998) report that almost all cocoa farmers grew alternative crops for subsistence and sale, mostly roots and tubers but also a variety of cereals and vegetables. Both studies also suggest that many farmers shifted to crops other than cocoa (mixed plantain and cocoyam, mixed maize and cassava, and oil palm intercropped with maize and cassava) on a scale greater than that needed to satisfy subsistence needs. This shift occurred for several reasons: the crops offered farmers greater income continuity throughout the year, and returns were perceived to be higher relative to cocoa, especially in the presence of significant problems with the rehabilitation of the existing cocoa tree stock.

More recent research has questioned the viability of cocoa on small farms. A 2001 survey conducted by the Sustainable Tree Crop Programme (STCP) in four cocoa-producing countries in West Africa shows that the top 25 percent of households (ranked by the amount of cocoa produced) have average costs of production four times lower and yields nearly four times greater than the bottom 25 percent, and that a significant share of small cocoa farms incur losses (Gockowski 2007). The study recommends the urgent adoption of policies that vary for larger, more efficient producers and poorer marginal ones as a necessary step in keeping Ghana's cocoa sector competitive and efficient.

For the larger producers, the STCP study recommends implementing innovations through the strategic distribution of improved planting material (hybrid pods) in the

most densely populated regions of the cocoa belt. The study estimates that this could result in the replanting of up to 24,000 hectares of land, and that integrating this intervention with the expansion of fertilizer use would achieve productivity gains in excess of 50 percent. For less efficient cocoa producers, the STCP recommends implementing a different set of policies that would either allow these producers to exit the sector or support their transition to alternative production systems. One option for these less efficient farmers would be the conversion from a no-shade cocoa system to a partial-shade system with cocoa and non-cocoa trees intercropped, allowing producers to augment their incomes from the sale of forest products, and possibly from the additional payments for higher carbon sequestration associated with shaded tree systems.

Environmental impact of current farming practices

An issue closely related to the competitiveness of cocoa on farms is the environmental impact of existing farming practices. Since its introduction in West Africa, cocoa has been the major cause of land use change in the high forest zones of the regions in which it is grown, where it has replaced agricultural activity that incorporated fallowing to maintain land fertility (Gockowski and Sonwa 2007). Although the initial expansion of cocoa production did not entail a complete removal of the forest shade because the traditional shade-dependent and tolerant *tetteh quarshie* variety of cocoa did not require forest clearing, trees have been cut down en masse in recent years to accommodate the open-field hybrid variety, which grows in full sun conditions. In nearly three-quarters of Ghana's production area, there is little to no shade (table 12.3).

Farmers in Ghana have a strong preference for full-sun crops because their much shorter growing cycle is linked to higher short-term profits (Obiri et al. 2007). The damage to cocoa trees from capsid attacks tends to be higher for cocoa trees growing in full sun than for those in shaded systems,

Table 12.3 Shade Levels in the Cocoa Belt of Ghana (percent)

Region	None to light	Medium to heavy
Ashanti	52	47
Brong Ahafo	52	47
Eastern	50	49
Western	77	21
Ghana	72	29

Source: Adapted from Gockowski and Sonwa (2007).

however, and the carbon sequestration potential of full-sun cocoa systems is significantly less than that of traditional shaded cocoa systems (Norris 2008).

The best possible environmental alternative to the current cocoa-growing practices in Ghana would be a mixed agroforestry system, where the forest is selectively thinned and fruit trees with economic value—such as oil palm, avocado, and citrus—are grown next to cocoa trees, providing both shade for the cocoa trees and food and income for the farming household (Gockowski and Sonwa 2007). This practice, which is used in southern Cameroon, could offer farmers up to 23 percent of total revenues from their non-cocoa holdings, but it is rarely practiced in Ghana. One reason is that in the biodiversity hotspots in remote areas of the Western region, the profitable marketing of agroforestry products would not be easy. Additionally, past logging practices, in which concessionaires harvested in a way that destroyed cocoa farms with no compensation for producers, have discouraged the use of fruit and timber-producing trees in cocoa fields (Obiri et al. 2007).

Ghana's role in a changing global market for cocoa

Ghana is well positioned to expand its position in high-value markets, with Cocobod proving to be responsive to trends in international markets. The chocolate industry also has expanded into secondary markets, such as fair trade in the late 1980s. Although these markets offer strategic opportunities for countries to build competitiveness, estimated in 2000 at 2.6 percent of world cocoa bean trade (Abbott 2002), they largely remain niche markets because of their limited capacity for expansion.

Ghana's considerable progress in the fair-trade cocoa market began with the establishment, in 1993, of Kuapa Kokoo, a farmers' cooperative that operates as a private, licensed buying company. Its share in the domestic market is now estimated to be around 10 percent of total purchases, and a panel survey of farmers spanning 2002 to 2006 shows the cooperative to be farmers' second preferred outlet for selling beans (Vigneri and Santos 2008). Within Cocobod, a special channel exists for fair-trade cocoa sourced and exported from Kuapa Kokoo, although the system traces such cocoa back to the cooperative rather than to the individual farmer. The social premium earned on fair-trade exports, which in 2000 was reported to be \$150 per ton (Abbott 2002), goes into a trust fund that sponsors development projects in cocoa-producing communities. Recently, the CAA became the first cocoa cooperative in Ghana to

obtain certification for organic production, with more than 500 members meeting the required standards.

LESSONS FROM GHANA'S EXPERIENCE WITH COCOA

Cocoa was developed in Ghana, largely by commercial farmers, many of whom were smallholders and laborers drawing on their own savings and labor, in response to market opportunities and the development of infrastructure. Policies and institutions have played an important role. The importance of macroeconomic management, the avoidance of distortions in the exchange rate in particular, is clearly evident from the effect of its absence on farm gate prices in the mid-1980s.

Ghana appears to have emerged with an appropriate institutional mix in which competition has been introduced in internal marketing to benefit from efficiencies in procurement and transport, while the government marketing board retains control over setting minimum prices for the year, maintaining quality, and managing exports. The control it has retained over exports enables it to stabilize prices and use the surpluses to offer some services such as plant protection, research, and extension that may not be forthcoming from the private sector, as suggested by the experience of the fully liberalized producing countries in the region. Public support to farmers to rehabilitate the diseased tree stock, public research that produced new hybrids, and the continued state intervention to promote fertilizer use have all been instrumental in reviving the sector. More recently public spraying and dissemination of technical packages have spurred private action.

Would the cocoa sector have been better if it were fully liberalized? Examining the experience of liberalization of cocoa sectors in four West African countries, Gilbert (2009) suggests four criteria to address this question: (1) the level of competition achieved on both the export and import side of producing countries, (2) the ability to sustain quality standards, (3) the share of the f.o.b. price passed on to the farmers as an indication of the degree of state taxation, and (4) the extent of producer price stabilization achieved. The evidence suggests that it may not be so.

Liberalization has not resulted in competition in the value chain, particularly in exports. Local companies engaged in exports without access to global financing have withdrawn over the years, leaving exports largely in the hands of multinationals, either converters or their agents (Gilbert 2009). But, there has been greater competition in internal trade. As for the share of the f.o.b. price passed on

to the farmers, the proportion is higher in countries such as Cameroon and Nigeria, but Ghana's government has made concrete efforts in the recent past to raise the share similarly. Finally, in relation to the price stabilization objective, Ghana has clearly been successful in reducing farmers' exposure to price variability during the crop year through its practice of forward sales. This, combined with the more stable inflation rate of the past decade, has de facto acted as an insurance mechanism against the variability in the world price of the commodity. Global businesses like the Ghana model because it delivers consistently high quality. Local businesses are also content because they can continue to participate in the sector (Gilbert 2009).

The interesting question is whether it is possible to arrive at this mix of public and private institutions and also be certain that a parastatal organization such as the Cocobod would operate reasonably efficiently. Ghana's experience suggests that external pressures as a part of the ERP to reform the sector were instrumental in making Cocobod liberalize some of its operations and streamline its own working to reduce costs. Ghana appears to have done enough to fend off pressures for further liberalization of the sector. To what extent it will strive to continue to pass on a higher share of prices to farmers without external pressures and whether there is a recognition of the benefits from appropriate management that survives political changes are not clear. The affairs of the Cocobod are not as transparent as they should be, and the line between cocoa revenues and government finances remains fuzzy. Whether the Cocobod will be able to stabilize prices if the world market were to become more volatile than it has been in recent years is not clear.

The pressure on the government and on its marketing institution to improve their efficiency (as measured by the share of the world price going to producers) rather than to seek full liberalization appears to have worked well in Ghana. Given the preponderance of smallholders in the sector and the risks associated with the total withdrawal of the government's services, the partial liberalization experience of Ghana's cocoa sector has so far offered a unique example of how it is possible to learn from past reforms and to continue to seek further reform to sustain the sector. However, the scope for future improvements and for further learning opportunities will require appropriate pressures from both local political processes and from external sources.

NOTES

1. Using survey data collected in 2002, Edwin and Masters (2003) show that the new tree varieties yield approximately

twice as much cocoa per hectare as similar-aged fields planted with traditional trees.

2. Ghana maintains a state-owned processing plant, the Cocoa Processing Company (CMC). Historically, CMC has operated at low capacity. A five-year rehabilitation and expansion program, however, allowed it to double its annual processing capacity between 2004 and 2009.

3. The committee includes a variety of representatives from the cocoa sector: Cocobod, government officials, and representatives of cocoa buyers, the national cocoa farmers' association, and haulers and transporters.

4. Indirect taxation is measured as the difference between world prices converted using the official exchange rate and world prices converted using the market exchange rate. Direct taxation includes Cocobod's marketing costs and export duties imposed by the government (export duties have been close to 25 percent in recent years). The share of f.o.b. prices received by farmers does not correspond with global prices. For example, between 1971 and 1983, the farmer share declined sharply while global prices were rising. This period, however, coincided with acute domestic currency overvaluation in Ghana, which further eroded farmers' real producer prices. Similarly, in the mid-1990s, producers' share of world prices increased while global prices were falling.

5. How much of the program is funded by cocoa revenues and whether any of the program is subsidized by the government is not clear, however.

6. In Ghana, the distinction between land ownership and usufruct rights over what grows on land has traditionally shaped smallholders' investment choices.

BIBLIOGRAPHY

- Abbott, P. 2002. "Towards more Socially Responsible Cocoa Trade." Working Paper 03-3, presented at the Annual Meeting of the International Agricultural Trade Research Consortium (IATRC), Monterey, CA, December 15–17.
- Agrisystems Ltd. 1997. "Study of the Cocoa Sector to Define Interventions on Behalf of Ghana's Smallholder with Particular Reference to the Framework of Mutual Obligations." Prepared for the Stablex 1992 and 1993 Allocation.
- Akiyama, T., J. Baffes, D. Larson, and P. Varangis. 2001. *Commodity Market Reforms: Lessons of Two Decades*. World Bank Regional and Sectoral Studies. Washington: World Bank.
- Allman, J. M. 1993. *The Quills of the Porcupine*. Madison, WI: University of Wisconsin Press.
- Amanor, K. 2005. "Agricultural Markets in West Africa: Frontiers, Agribusiness and Social Differentiation." *IDS Bulletin* 36 (2).

- _____. 2010. "Family Values, Land Sales and Agricultural Commodification in Rural Ghana." *Africa* 80 (1): 104–125.
- Austin, D. 1978. *Politics in Africa*. Manchester, U.K.: Manchester University Press.
- Awanyo, L. 1998. "Culture, Markets, and Agricultural Production: A Comparative Study of the Investment Patterns of Migrant and Citizen Cocoa Farmers in the Western Region of Ghana." *Professional Geographer* 50: 516–30.
- Barrientos, S. W., and L. Asenso-Okyere. 2008. "Mapping Sustainable Production in Ghanaian Cocoa: Report to Cadbury." Institute of Development Studies, University of Sussex, and University of Ghana.
- Bateman, M. 1965. "Aggregate and Regional Supply Functions for Ghanaian Cocoa: 1946–1962." *Journal of Farm Economics* 47 (2): 384–401.
- Bates, R. H. 2005. *Markets and States in Tropical Africa. The Political Basis of Agricultural Policies*. Berkeley, CA: University of California Press.
- Beckman, B. 1976. *Organising the Farmers: Cocoa Politics and National Development in Ghana*. Uppsala: Scandinavian Institute of African Studies.
- Berry, S. 1993. *No Condition Is Permanent: The Social Dynamics of Agrarian Change in Sub-Saharan Africa*. Madison, WI: University of Wisconsin Press.
- _____. 2009. "Building for the Future? Investment, Land Reform and the Contingencies of Ownership in Contemporary Ghana." *World Development* 37 (8): 1370–78.
- Bloomfield, E. M., and R. A. Lass. 1992. "Impact of Structural Adjustment and Adoption of Technology on Competitiveness of Major Cocoa Producing Countries." Working Paper 69. Paris: Organisation for Economic Co-operation and Development.
- Blowfield, M. 1993. "The Allocation of Labour to Perennial Crops: Decision-making by African Smallholders." NRI-Socioeconomic Series 3, Natural Resources Institute, University of Greenwich, Kent, U.K.
- Boahene, K., T. A. B. Sniijders, and H. Folmer. 1999. "An Integrated Socio Economic Analysis of Innovation Adoption: The Case of Hybrid Cocoa in Ghana." *Journal of Policy Modelling* 21 (2): 167–84.
- Breisinger, C., X. Diao, S. Kolavalli, and J. Thurlow. 2008. "The Role of Cocoa in Ghana's Future Development." IFPRI Background Paper 11, IFPRI, Ghana.
- Breisinger, C., X. Diao, J. Thurlow, and R. M. Al Hassan. 2009. "Potential Impacts of a Green Revolution in Africa – The Case of Ghana." Paper presented at the 27th IAAE Conference, Beijing, August 16–22.
- Brooks, J., A. Croppenstedt, and E. Aggrey-Fynn. 2007. "Distortions to Agricultural Incentives in Ghana." Agricultural Distortions Working Paper 47, World Bank, Washington, DC.
- Bulř, A. 2002. "Can Price Incentive to Smuggle Explain the Contraction of the Cocoa Supply in Ghana?" *Journal of African Economies* 11 (3): 413–39.
- Coulombe, H., and Q. Wodon. 2007. "Poverty, Livelihoods, and Access to Basic Services in Ghana." In "Ghana Country Economic Memorandum: Meeting the Challenge of Accelerated and Shared Growth." World Bank, Washington, DC.
- Edwin, J., and W. A. Masters. 2003. "Genetic Improvement and Cocoa Yields in Ghana." Working Paper, Purdue University, West Lafayette, IN.
- Fold, N. 2000. "A Matter of Good Taste? Quality and the Construction of Standards for Chocolate Products in the European Union." *Cahiers d'économie et sociologie rurales*, 55–56.
- _____. 2001. "Restructuring of the European Chocolate Industry and Its Impact on Cocoa Production in West Africa." *Journal of Economic Geography* 1: 405–20.
- _____. 2002. "Lead Firms and Competition in 'Bi-polar' Commodity Chains: Grinders and Processors in the Global Cocoa-Chocolate Industry." *Journal of Agrarian Change* 2 (2): 228–47.
- Fold, N., and S. Ponte. 2008. "Are (Market) Stimulants Injurious to Quality? Liberalization, Quality Changes and the Reputation of African Coffee and Cocoa Exports." In *Globalization and Restructuring of African Commodity Flows*, ed. N. Fold and M. N. Larsen. Uppsala, Sweden: Nordic Africa Institute.
- Ghana Cocoa Marketing Board. Various years. "Cocoa Marketing Board Newsletter."
- Ghana Ministry of Manpower, Youth and Employment. 2006. "Labour Practices in Cocoa Production in Ghana (Pilot Survey)." Accra.
- Gibbon, P., Y. Lin, and S. Jones. 2009. "Revenue Effects of Participation in Smallholder Organic Cocoa Production in Tropical Africa: A Case Study." DIIS Working Paper 2009:06, Danish Institute for International Studies, Copenhagen.
- Gilbert, C. L. 2009. "Cocoa Market Liberalization in Retrospect." *Review of Business and Economics* 54: 294–312.
- Gill & Duffus Group. Various years. "Cocoa Statistics."
- Gockowski, J. 2007. "The Analysis of Policies, Productivity and Agricultural Transformation in the Cocoa-Producing Rural Economies of West Africa." STCP Technical Report Executive Summary.
- Gockowski, J., and D. Sonwa. 2007. "Biodiversity Conservation and Smallholder Cocoa Production Systems in West Africa with Particular Reference to the Western Region of Ghana and the Basassandra region of Côte

- d'Ivoire." Draft paper, Institute of Tropical Agriculture, Ibadan, Nigeria. <http://www.odi.org.uk/events/2007/11/19/434-paper-discussion-biodiversity-conservation-smallholder-cocoa-production-systems-west-africa.pdf>.
- Government of Ghana. 2003. "Ghana Poverty Reduction Strategy, 2003-2005: An Agenda for Growth and Prosperity." Government of Ghana, Accra.
- Gunnarsson, C. 1978. "The Gold Coast Cocoa Industry 1900-1939. Production, Prices and Structural Change." PhD thesis, Department of Economic History, Lund University, Lund, Sweden.
- Gyimah-Brempong, K. 1987. "Scale Elasticities in Ghanaian Cocoa Production." *Applied Economics* 19: 1383-90.
- Hattink, W., N. Heerink, and G. Thijssen. 1998. "Supply Response of Cocoa in Ghana: A Farm-Level Profit Function Analysis." *Journal of African Economies* 7 (3): 424-44.
- Herbst, J. 1993. *The Politics of Reform in Ghana, 1982-1991*. Berkeley, CA: University of California Press.
- Hill, P. 1963. *The Migrant Cocoa Farmers of Southern Ghana. A Study in Rural Capitalism*. Cambridge, UK: University Press.
- International Cocoa Organization. Various years. "Quarterly Bulletin." London.
- Konings, P. J. J. 1986. *The State and Rural Class Formation in Ghana: A Comparative Analysis*. Leiden, Netherlands: African Studies Centre.
- Laven, A. 2007. "Marketing Reforms in Ghana's Cocoa Sector: Partial Reforms, Partial Benefits?" Background Note, Overseas Development Institute, London. <http://www.odi.org.uk/resources/download/420.pdf>.
- Masdar Ltd. 1998. *Socio-Economic Study of the Cocoa Farming Community*. Wokingham, United Kingdom.
- McKay, A., and H. Coulombe, 2003. "Selective Poverty Reduction in a Slow Growth Environment: Ghana in the 1990s." Human Development Network, World Bank, Washington, DC.
- McMillan, M. 1998. *A Dynamic Theory of Primary Export Taxation*. Discussion Paper 98-12. Department of Economics, Tufts University.
- Norris, K. 2008. "Carbon, Biodiversity and Cocoa Farming in Ghana." Climate Change Unit, Forestry Commission of Ghana, Accra.
- Nyanteng, V. K. 1993. "The Prospect of the Ghanaian Cocoa Industry in the 21st Century." Paper presented at the International Conference on Cocoa Economy, Bali, Indonesia, October 19-22.
- Obiri, B. D., G. A. Bright, M. A. McDonald, L. C. N. Anglaaere, and J. Cobbina. 2007. "Financial Analysis of Shaded Cocoa in Ghana." *Agroforestry Systems* 71: 139-49.
- Okali, C. 2010 "The Organisation of Cocoa Production on the Farm and its Evolution over Time." Unpublished paper.
- Opoku, E., R. Dzene, S. Caria, F. Tea, and A. Zeitlin. 2009. "Improving Productivity through Group Lending: Report on the Impact Evaluation of the Cocoa Abrabopa Initiative." Centre for the Study of African Economies, University of Oxford, Oxford, United Kingdom. <http://www.csae.ox.ac.uk/output/reports/pdfs/rep2008-01.pdf>.
- Piasentin, F. and L. Klare-Repnik. 2004. "Quality Matters." Global Research on Cocoa and CABI, Conservation International.
- Quisumbing, A. R., E. Payongayong, J. B. Aidoo, and K. Otsuka. 2001. "Women's Land Rights in the Transition to Individualized Ownership: Implications for the Management of Tree Resources in Western Ghana." *Economic Development and Cultural Change* 50 (1): 157-81.
- Rourke, B. E. 1974. "Profitability of Cocoa and Alternative Crops in Eastern Region, Ghana." In *Economics of Cocoa Production and Marketing*, ed. A. Kotey, C. Okali, and B. E. Rourke. Proceedings of Cocoa Economics Research Conference, University of Ghana, Legon, 1973.
- _____. 2007a. "The Cocoa Sector: Expansion, or Green and Double Green Revolutions?" Overseas Development Institute Background Note, London.
- _____. 2007b. "International Perspectives on the Cocoa Sector: Expansion or Green and Double Green Revolutions?" <http://www.odi.org.uk/events/2007/11/19/434-presentation-session-1-international-perspectives-cocoa-sector-francois-ruf.pdf>.
- _____. 2009. "Libéralisation, cycles politiques et cycles du cacao: le décalage historique Côte-d'Ivoire-Ghana." *Cahiers Agricoles* 18 (4).
- Ruf, F., and K. Burger. 2001. "Planting and Replanting Tree Crops. Smallholders' Investment Decision." Unpublished paper, Centre de coopération internationale en recherche agronomique pour le développement (CIRAD), Paris.
- Ruf, F., and H. Zadi. 1998. "Cocoa: From Deforestation to Reforestation." Prepared for the First International Workshop on Sustainable Cocoa Growing, Smithsonian Institute, Panama.
- _____. and P. S. Siswoputranto. 1995. *Cocoa Cycles: The Economics of Cocoa Supply*. Cambridge, U.K.: Woodhead Publishing Ltd.
- Shepherd, A. W., and S. Farolfi. 1999. "Export Crop Liberalization in Africa: A Review." *Agricultural Services Bulletin* 135, FAO, Rome.
- Sjaastad, E. and D. Bromley. 1997. "Indigenous Land Rights in Sub-Saharan Africa: Appropriation, Security and Investment Demand." *World Development* 25: 549-62.

- Steedman, C. 2003. "Agriculture in Ghana: Some Issues." Unpublished paper, World Bank, Washington, DC.
- Stryker, J. D. 1990. "Trade, Exchange Rate, and Agricultural Policies in Ghana." World Bank Comparative Studies, World Bank, Washington, DC.
- Takane, T. 2002. *The Cocoa Farmers of Southern Ghana: Incentives, Institutions, and Change in Rural West Africa*. Chiba, Japan: Institute of Developing Economies and Japan External Trade Organization.
- Teal, F., A. Zeitlin, and H. Maamah. 2006. "Ghana Cocoa Farmers Survey 2004: Report to Ghana Cocoa Board." Centre for the Study of African Economies, University of Oxford, Oxford, United Kingdom.
- Vigneri M. 2005. "Trade Liberalisation and Agricultural Performance: Micro and Macro Evidence on Cash Crop Production in Sub-Saharan Africa." DPhil thesis, University of Oxford, Oxford, United Kingdom.
- _____. 2008. "Drivers of Change in Ghana's Cocoa Sector." IFPRI-GSSP Background Paper 13, International Food Policy Research Institute, Washington, DC.
- Vigneri M., and P. Santos. 2008. "What Does Liberalization without Price Competition Achieve? The Case of Cocoa Marketing in Rural Ghana." IFPRI-GSSP Background Paper 14. International Food Policy Research Institute, Washington, DC.
- Vigneri M., F. Teal, and H. Maamah. 2004. "Coping with Market Reforms: Winners and Losers among Ghanaian Cocoa Farmers." Report to the Ghana Cocoa Board, Accra.
- World Bank. 2007a. *World Development Report: Agriculture for Development*. Washington, DC: World Bank.
- _____. 2007b. "Ghana: Meeting the Challenge of Accelerated and Shared Growth." Country Economic Memorandum, World Bank, Washington, DC.
- _____. 2008. "Country Brief: Ghana." World Bank, Washington DC.
- Zeitlin, A. 2006. "Market Structure and Productivity Growth in Ghanaian Cocoa Production." Unpublished paper, Centre for the Study of African Economies, University of Oxford, Oxford, U.K.