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AGRIBUSINESS INDICATORS:

Ghana

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ACRONYMS AND ABBREVIATIONS

ADB	Agriculture Development Bank
AESD	Agriculture Engineering Services Directorate
AFD	French Development Agency
AGRA	Alliance for a Green Revolution in Africa
AMSEC	Agriculture Mechanization Service Center
BOG	Bank of Ghana
CAADP	Comprehensive Africa Agriculture Development Program
CEPS	Customs, Excise, and Preventive Service
CIF	Cost, Insurance, and Freight
COCOBOD	Cocoa Board
CRI	Crop Research Institute
COFOG	Classification of the Functions of Government
DANIDA	Danish International Development Agency
DCA	Development Credit Authority
DTMA	Drought Tolerant Maize in Africa
ECOWAS	Economic Community of West African States
EDIF	Export Development Investment Fund
EDAIF	Export Development and Agriculture Investment Fund
EPA	Environmental Protection Agency
FAOSTAT	Food and Agriculture Organization Corporate Statistical Database
FASDEP	Food and Agriculture Sector Development Policy
FBO	Farmer-Based Organization
FOB	Free On Board
GAIDA	Ghana Agricultural Input Dealers Association
GALCO	Ghana Association of Leasing Companies
GGC	Ghana Grains Council
GHA	Ghana Highway Authority
GIS	Geographic Information System
GLDB	Ghana Grains and Legumes Development Board
GLSS5	Ghana Living Standards Survey Round 5
GOG	Government of Ghana
GPHA	Ghana Ports and Harbors Authority
GREL	Ghana Rubber Estates Ltd
GRIB	Ghana Rice Inter-professional Body
GSS	Ghana Statistical Service
IITA	International Institute of Tropical Agriculture

ICT	Information Communication Technology
IFAD	International Fund for Agricultural Development
IFC	International Finance Company
IFDC	International Fertilizer Development Center
IFPRI	International Food Policy Research Institute
ISSER	Institute of Statistical, Social, and Economic Research
KFW	German Development Bank
LPI	Logistics Performance Index
MiDA	Millennium Development Authority
MOFA	Ministry of Food and Agriculture
MOTI	Ministry of Trade and Industry
MT	Metric Ton
NAA MSECO	National Association of Agriculture Mechanization Service Centers
NEPAD	New Partnership for Africa's Development
NGO	Non-Governmental Organization
NHIS	National Health Insurance Scheme
NIB	National Investment Bank
NPK	Nitrogen, Phosphorus, and Potassium
OISL	Opportunity International Savings & Loan Ltd
OP	Open Pollinated
PPRSD	Plant Protection and Regulatory Services Directorate
RAI	Rural Access Index
RAFiP	Rural and Agricultural Finance Program
RCB	Rural and Community Bank
RSA	Republic of South Africa
SARI	Savannah Agriculture Research Institute
SEEDPAG	Seed Producers Association of Ghana
SoA	Sulphate of Ammonia
TOPP	Twifo Oil Palm Plantation Ltd
USAID	United States Agency for International Development
WDI	World Development Indicators

EXECUTIVE SUMMARY

Agriculture plays an important role in the economies of most countries in Africa. However, few African countries have been able to capitalize on the sector's considerable potential to contribute to economic development through commercialization. Few have created an enabling environment for agricultural finance in which lenders and other agents are encouraged to develop innovative financial products that are well tailored to meet the needs of local producers. Few African countries have purposefully set out to encourage the use of modern farm machinery. Some, however, have invested in road infrastructure and transport facilities to reduce transaction costs and improve producers' access to markets. The countries that have undertaken initiatives to expand producers' access to agricultural technologies such as certified or hybrid seeds and fertilizers have generally been the most effective at increasing agricultural productivity. The research described in this volume used a set of agribusiness indicators to collect data that capture the performance of the agriculture sector in the Republic of Ghana, using a list of preliminary indicators covering the following areas: (i) access to and availability of certified seed; (ii) availability of and access to fertilizer; (iii) access to farm machinery, particularly tractor hire services for land preparation; (iv) access to agricultural and agro-enterprise finance; (v) cost and efficiency of transport; (vi) measures of policy certainty and the orientation of the enabling environment as perceived by the private sector; and (vii) various policy, trade, and fiscal measures. Ghana was the first country in which these indicators were tested for ease and consistency. The indicators were then finalized and used for data collection in two other African countries (Ethiopia and Mozambique).

Access to and availability of certified seed: The data collected in Ghana indicate that relatively few farmers who cultivate field crops have access to improved seeds, and seeds of high-yielding hybrid crops in particular. Seed supply is constrained by inadequate production of both breeder and foundation seed. According to Ministry of Food and Agriculture (MOFA) data, just 19 percent of the area used for maize production in 2010 was cultivated using certified seed, and only 8 percent of the area used for rice production. However, a number of recent Government initiatives are promising. In 2010, the Parliament of Ghana passed a national seed law known as the Plants and Fertilizer Act, which opens the door for an increased role for the private sector in producing seeds for a number of grains. The regulations of the Act have also been developed. The Parliament will not, however, approve new varieties from within the ECOWAS region or elsewhere until adaptive trials covering two growing seasons have been conducted to ensure that seeds are safe from viruses or other diseases. Until recently, imports of improved seed were banned altogether. Now it is open to private companies, although only a few of them have begun to import hybrid maize seed. Although the capacity of the private sector seed multiplication industry in Ghana remains limited, investment in seed technology and expanded production of improved seed are increasing. As a result, the number of certified seed growers is increasing, and private sector firms are exploring the possibility of producing hybrids and OP varieties for domestic use and for export to regional markets as well.

Availability of and access to fertilizer: Fertilizers are another important input for raising agricultural productivity in Ghana. In the five years of 2006 to 2010, the country's fertilizer imports increased from 189,878 metric tons to 308,786 metric tons, an increase of more than 60 percent. Fertilizer consumption has also increased to 40 kilograms per hectare, which is just 10 kilograms per hectare short of meeting the Abuja declaration on fertilizer. The nutrient output ratio of 2.6 indicates that fertilizer use is profitable for Ghanaian farmers, particularly as the grains they produce command higher prices in local markets. In the 1990s, the Government monopoly over fertilizer imports and distribution was abolished, and the resulting liberalized environment made market entry relatively easy for importers, distributors, and retailers, who are able to obtain a license in a short period of time. With 8 major importers, between 35 and 50 distributors, and as many as 4,000 retailers, the market is already quite robust, and the density of agro-dealers in some regions is high.

Access to farm machinery: In addition to improved seeds and fertilizer use, the third element our indicators sought to measure was modern farm machinery—for which the proxy used was the availability of tractor services. Agricultural production in

Ghana is labor intensive, with little use of machinery. In recent years, however, the demand for tractors has been on the rise, owing to an expansion in the amount of land that is cultivated by large commercial farms. As a result, a number of importers and distributors of well-known tractor brands have come into operation. Tractor services are utilized for land preparation and for other agricultural activities such as planting, post-harvest processing, and hauling. This trend toward mechanization has generally not applied to smallholders, who are unable to afford the purchase of tractors that have high financing requirements. The timely availability of spare parts has also been problematic. In 2010, Ghana had an estimated 11 tractors per 100 square kilometers of arable land—compared to 43 and 25 tractors in South Africa and Kenya, respectively. To promote commercialization within the agriculture sector, the Government of Ghana has decided to enter the machinery market by providing tractors under a subsidized program of public-private partnership. The program has proven to be problematic in its implementation, with stakeholders raising concerns about mechanical breakdowns, poor after-sale services, unavailability of spare parts, and political interference and favoritism in distribution. Some are also concerned that the Government's involvement in the agriculture machinery market could crowd out the private sector.

Access to agricultural and agro-enterprise finance: Agricultural finance is another critical input in enabling businesses to invest in scaling up and managing risk. Access to agricultural finance in Ghana is difficult to obtain, and where it is available, it is expensive. Agriculture receives substantially less commercial bank lending than other sectors—barely 6 percent.[1] Interest rates of commercial bank loans are typically in the range of 25 to 40 percent. Many providers of financial services are hesitant to provide loans for agricultural purposes owing to land tenure issues, a history of non-repayment of subsidized loans, and the overall riskiness of investing in rain-fed agriculture. Although financial institutions have generally not tailored specific financial products or instruments for agricultural clients, more recently there have been a number of positive developments. Some banks and other financial institutions are showing interest in the sector. Loan guarantee funds are being designed and implemented, insurance products are being tested, a warehouse receipt system is being developed, and more financial institutions are becoming members of the credit registry bureau for increased transparency and information sharing. All of these are steps in the right direction for the development of the agriculture sector.

Cost and efficiency of transport: In addition to agricultural finance, agricultural transport is found to be a major cost factor in doing business throughout much of Africa as the result of limited infrastructure in most of the countries. Roads are the predominant mode of transportation in Ghana. Field surveys have confirmed that transport costs are a major component in the marketing of both agricultural inputs and produce. Though Ghana's transport sector is relatively well developed according to the country's Rural Access Index, rural and feeder roads that are important for agriculture is not always in good operating condition.[2] Despite increases in funding for road maintenance, a number of serious challenges still need to be overcome.[3] One of them is overloading among commercial vehicles, a practice that has caused road quality to deteriorate, adding to the cost of transporting agricultural goods. In trans-border corridors, check points and bribery have added to the delays and increases in transport costs. Ultimately these challenges add significantly to transport prices.

Agribusiness policy environment: Changes in agricultural and private sector development policy in Ghana have made for a more enabling environment for the private sector and market development, although some in the private sector express concerns over specific policies such as the subsidy on fertilizer and mechanization. The new Private Sector Development Strategy (PSDS II) emphasizes the need to foster public-private dialogues. Many associations either focusing on specific commodities or subsectors advocating the interests of the private sector exist. Yet, efforts are mainly fragmented, and there is an absence of an active establishment of one group that speaks in the interest of the sector overall. In 2009, 9 percent of the total federal government budget was allocated to agriculture. The agriculture budget as a percentage of GDP nearly doubled from 2008 to 2009. Still, budget allocations fall short of the CAADP compact that had set targets for allocating at least 10 percent of Government expenditure on agriculture.

A summary table of study findings on the various indicators follows on the next two pages.

1 *Agriculture sector* is defined as cereal production, cocoa, livestock, poultry, forestry, logging, and fishing.

2 Rural Access Index for Ghana is 61 percent (RAI measures % of rural people living within 2 km of an all-season road (or 20 minutes walking distances).

3 Government spending on road maintenance (routine, periodic, and minor rehabilitation/upgrading) has more than doubled from $34.22 million in 2004 to $97.22 million in 2008.

TABLE E.1: Matrix of Agribusiness Indicators and Findings for Ghana

AGRICULTURE PRODUCTIVITY MEASURES		INDICATOR FINDINGS
Improved Seed	Existence and implementation of regional and national seed laws and regulations (Y/N; Scale: 0–5)	Y; Rating = 3
	% staple crop area planted to certified seed	19% (maize), 8% (rice), 12% (soybeans), 2010
	Sales of imported seed as % total sales of certified seed.	Maize: 7% (2010)
	Time required for registration, testing, and obtaining approval for imported seed	2–3 years
	% of foundation seed provided by government organizations	100%
	% of certified seed multiplied by private firms and farms vs. government entities	100% private sector supplied
	No. of private seed companies operating in country	10
	No. of days to get an import permit (for seeds other than key grains)	5 days (Avg.)
	Ease of private sector participation in the seed market (Scale: 0–5)	Rating = 2.5
Fertilizer	Total fertilizer use in past three years: 2008–10	172,733 MT ('08); 209,213 MT ('09); 295,900 MT ('10)
	Fertilizer application rates (kg/ha)	40 kg/ha ('10) gross
	Fertilizer growth rates in %	10% (total fertilizer, 2006 to 2010)
	Cost of 50 kg bag of NPK, urea, and SoA in main agricultural production zones	NPK: $20.8; Urea: $18.8; SoA: $13.9
	Ease of private sector participation in the fertilizer market (Scale: 0–5)	Rating = 3 (for importers and distributors, not retail agro-input dealers)
	Nutrient/Output Price Ratio {Pn/Po}	Urea/maize price ratio in 2011 = 2.6. There is an incentive to use fertilizer in Ghana.
	Fertilizer subsidy (% of retail cost)	42%
	Tariffs and taxes on fertilizer	0%
	Agro-input dealers density (agro-dealers/1,000 farmers)	0.84
Mechanization	Total # of tractors per 100 sq km of arable land	11 tractors per 100 sq km (2010)
	Cost of plowing one hectare of land	$46/ha (national avg.); S. Savanna = $42/ha; Forest = $47/ha; and Coastal Savana = $50/ha.
	Government subsidy on tractors	33% (of CIF price)
	Useful life of tractors	Avg. of 10 years at an estimated 1,100–1,320 annual hours of operation for farm tillage purposes only.
	Tariff on tractor spare parts	10% import duty + 12.5% VAT, 2.6% NHIS, 1% processing fee, 0.5% ECOWAS, & 0.5% EDIF levies
	Ease of private sector participation in the agricultural machinery market (Scale: 0–5)	Rating = 1.9
SUPPORTING SERVICE MEASURES		
Finance	% of commercial bank lending to agriculture	6.1% (2010); 4.7% (2009); 4.3% (2008)
	Commercial bank interest rates (Avg. interest rates offered by the banks for loans to agriculture)	25–40% (2010). Interest rate spread in 2010 was 21.8%. Inflation rate was 16.5% in 2008, 19.3% in 2009, and 10.9% in 2010.
	% of nonperforming loans (within agriculture sector)	21%
	Bank branches per 100,000 rural adult population	5 banks
	% of rural HHs receiving credit for agriculture	8% (GLSS5 (2008))
	Existence of a warehouse receipt system (Y/N; Scale: 0–5)	Yes; Rating = 1
	Existence of a law on leasing (and extent of use of leasing)	Yes; A taskforce has been formed with membership of Govt., Ghana Grains Council, and donors to prepare the groundwork for a warehouse receipt law and its accompanying regulations to be completed in 2012.
	Presence of a Collateral Registry	Yes; The Parliament of Ghana enacted the Borrowers and Lenders Act (773) under which the Collateral Registry was established and began operations on February 1, 2011.

Transport	Price per bag of maize from major wholesale or assembly market to major urban center ($ per ton per km)	$0.10–$0.44/ton per km
	Price paid to ship a standard 40-foot container to international destinations	Tema-Newark: $4,638; Tema-Durban (South Africa): $3,827; Tema-Rotterdam (Netherlands): $2,006
	Length of time required to register a truck for hauling agricultural products (days)	5 days
	Ease of entry into trucking of foodstuffs (Scale: 0–5)	Rating = 4
	Opinion of traders and truckers on the competitiveness of trucking services (Scale: 0–5)	Rating = 3
	Quality of trade and transport related infrastructure (e.g., ports, railroads, roads, IT)—LPI (Scale: 0–5)	LPI = 2.52
	Rural Access Index: % rural population within 2 kilometers of a road	RAI = 61% (GLSS5, 2008)
POLICY AND INSTITUTIONAL MEASURES		
Private Sector Perception of Policy Environment & Advocacy Role	Private sector perception of agribusiness enabling environment (on 0–5 scale)	Rating = 2.9
	Policy Consistency: perceptions of foreign and domestic investors and concerns over frequent, unexpected, or arbitrary changes in policy, regulations, and rules that affect the operations and profitability of their businesses (Scale: 0–5)	Rating = 2.6
	Private sector advocacy group for agribusiness: existence and effectiveness (Scale: 0–5)	Rating = 1
Govt. Commitment to Agriculture	Federal government budget outlays on agriculture as % total budget	9% (2009); 10% (2008); 13% (2007)
Export Crop Indicators	Proportion of a cash crop FOB export price paid to producers	53% (2005 to 2009)
Development of Maize Processing Industry	Proportion of maize moving through formal marketing channels (including large-scale processing and feed milling and mixing)	10% of maize production

Source: Summary of Indicators presented in the Report.

Chapter 1: INTRODUCTION

1.1 BACKGROUND ON GHANA'S AGRICULTURE

Agriculture plays an important role in Ghana's economy. The sector accounts for 30 percent of GDP and employs nearly 60 percent of the labor force. The value of cocoa exports alone contributes nearly one third of the country's total foreign exchange earnings. Income from non-traditional agricultural commodities such as seafood and horticultural products are also becoming increasingly important for Ghana's economy. In recent years, agricultural GDP has been growing at about 6 percent per annum. Increases in commodity prices have contributed to agriculture's contribution to GDP. However, most of this growth can be attributed to an expansion in the area cropped with staples such as maize, rice, and cassava rather than to increases in agricultural productivity. Over the medium to long term, this expansion into previously uncultivated areas will not be sustainable, and the country will need to effectively prioritize intensification and large improvements in productivity. The agriculture sector continues to consist mainly of smallholder farmers using minimal inputs of improved seeds, chemical fertilizer, and irrigation. They cultivate small and fragmented plots of land. For Ghana's agriculture sector to successfully transform, these smallholders will need either to become viable agribusinesses themselves or to be linked to commercial enterprises that support the use of modern inputs and facilitate access to markets. If not, the sector will continue to underperform with the low crop yields that currently prevail (Table 1.1).

TABLE 1.1: Yields of Major Crops (MT/ha)

COMMODITY	2007	2008	2009
Maize	1.5	1.7	1.7
Rice (milled)	1.7	2.3	2.4
Millet	0.7	1.1	1.3
Sorghum	0.7	1.2	1.3
Cassava	12.8	13.5	13.8
Yam	13.5	14.1	15.3
Plantain	10.6	10.7	10.9
Groundnut	0.8	1.3	1.5
Cocoyam	6.5	6.7	6.7

Source: MOFA, 2010.

Despite the low performance of the sector, national domestic production of food staples has increased, and Ghana is now food sufficient in most of the crops produced in the country, except for rice (Table 1.2). Certain regions in Ghana, however, remain food insecure. The challenge is twofold. It is to ensure that the surplus food produced reaches food-insecure households and at the same time that commercialization extends to each stage of the value chain so that surplus food can be processed and even exported. The development of agribusinesses, in which private sector actors play an active role in value chains along with the Government will be critical in bringing this to pass.

The demographic shifts resulting from rural to urban migration have also had an impact on the agriculture sector. These too underscore the importance of agribusiness development. In Ghana, 52 percent of people (age 7 or above) are migrants. Migrants comprise 55 percent of the population

TABLE 1.2: Food Supply and Demand of Key Staples, 2009 ('000 MT)

COMMODITY	TOTAL DOMESTIC PRODUCTION	PRODUCTION AVAILABLE FOR HUMAN CONSUMPTION	ESTIMATED DEMAND FOR FOOD	SURPLUS (+)/DEFICIT (−)
Maize	1,620	1,198	1,052	146
Rice (milled)	235	204	577	−373
Millet	246	214	24	190
Sorghum	351	305	12	293
Cassava	12,231	8,562	3,673	4,889
Yam	5,778	4,622	1,007	3,615
Plantain	3,563	3,028	2,037	991
Groundnut	526	474	288	186
Cocoyam	1,504	1,429	961	468

Source: MOFA, 2010.

of Accra (GLSS5, 2008). In 1980, 31 percent of the country's population was classified as urban. By 2009, this proportion had increased to 51 percent. The increased numbers of people in urban areas imply that there are fewer people left in rural areas who are available to produce food for the growing urban population. This calls for commercial farming that uses better seeds, fertilizer, and other inputs that raise agricultural productivity.

1.2 CONTEXT OF THE AGRIBUSINESS INDICATORS INITIATIVE

The Agribusiness Indicators program pilot tested an initial set of indicators on the ease (or difficulty) of operating agribusinesses in African countries. The indicators are used to assess whether the countries have an enabling environment that is conducive to agribusiness investment, competitiveness, and ultimately agriculture-led growth. This pilot research will help to clarify which factors are important for successful agribusiness development. At the start of this applied research program, the Agribusiness Indicator team laid out six broad sets of key success factors.

1. Access to critical factors of production (land, technology, finance, etc.)
2. Access to markets (freedom to sell, absence of restrictions on internal movements of goods, etc.)
3. Quality of supporting institutions and services
4. Positive and transparent regulatory and legal environment
5. Policy environment
6. Adequacy of rural infrastructure

These were pilot-tested in Ghana in November 2010, focusing on two value chains—rice and maize. Based on this pilot experience in Ghana, the broad sets of indicators that were identified at the start of the pilot were revisited, and a narrower set of indicators were selected for further work. The pilot exercise also determined that a value chain approach was not appropriate for the purpose of cross-country comparisons, as the same crops may not have equal importance in all countries. The new set of indicators is grouped into the following categories.

1. Availability of and access to fertilizer
2. Access to farm machinery, particularly tractor hire services for land preparation
3. Access to agricultural production and agro-enterprise finance
4. Cost and efficiency of transport, particularly trucking
5. Measures of policy certainty and the orientation of the enabling environment as perceived by the private sector
6. Various policy, trade, and fiscal measures

The pilot exercise confirmed that modernization of the agricultural sector and agribusiness development cannot be enhanced without better access and availability of certified seeds, improvement in fertilizer application rates, and provision of modern machinery. Agribusinesses enterprises require access to credit and other financial services to invest in inputs to increase yields or to scale up their business operations. Lack of good quality roads can raise the cost and affect the timely availability of inputs such as fertilizer. Similarly, without good road networks and transport services, farm produce will have fewer options to reach external output markets.

1.3 AGRIBUSINESS INDICATORS METHODOLOGY—GHANA

Based on these key critical factors, the Agribusiness Indicators (ABI) team has developed a matrix with selected indicators to be used to assess the agribusiness environment in a country. The team is cognizant of the fact that other factors may be equally important, such as access to water, land, and even labor. Similarly, access to markets and availability of other types of infrastructure such as electricity and communications are not included in the indicators examined.

The matrix was supplemented by a checklist that was prepared for each area of investigation: seeds, fertilizer, mechanization, agriculture finance, and transport. In Ghana, the ABI team conducted key informant interviews with Government agencies (MOFA, Customs, MOTI), private firms (fertilizer importers, seed companies, tractor importers and distributors, transporters), commercial banks, farmer-based organizations, donors, and NGOs. In addition to the interviews, data were collected from the Statistics Unit of MOFA, FAOSTAT, World Bank WDI indicators and from surveys undertaken by IFDC, IFPRI, and GSS. The interviews and sourcing of secondary data were combined with literature reviews.

The indicators are classified in three ways: (i) Absolute value; (ii) Ordinal ranking (0–5); and (iii) Yes/No.

1.4 ORGANIZATION OF THE REPORT

This report consists of seven chapters focusing on each of the indicator groups. Each chapter begins with a summary of findings, followed by data generated for the indicators under that specific category.

Chapter 2: IMPROVED SEED

Few Ghanaian farmers who cultivate field crops have access to improved seed, particularly high-yielding hybrids. Seed supply is constrained by inadequate production of breeder seed (primarily by two research centers, CRI and SARI) and of foundation seed (by a public agency, the GLDB). New seed law has outlawed the monopoly foundation seed (FS) production by GLDB; private seed companies are now allowed to produce FS but must be registered and certified by PPRSD. Imports of improved seed had been effectively barred until recently, when two companies (Wienco and Agriserve) began to import hybrid maize seed from South Africa. Private sector seed multiplication is growing, though it lacks capacity, and private firms are unable to obtain credit to expand certified seed multiplication. A private sector association, SEEDPAG, participates in national seed deliberations and has been instrumental, along with other actors in the agriculture sector, in lobbying for change. One result of these efforts was enactment of the national Seed Law.

TABLE 2.1: Summary Observations on Improved Seed in Ghana

SUCCESS FACTOR	INDICATORS	RESULTS OF INDICATORS
Improved Seed	Existence of regional & national seed laws & regulations (Y/N; Scale: 0–5)	Y; Rating = 3. Parliament passed a national Seed Law (Plants and Fertilizer Act, 2010) in 2010, which is in line with the 2008 ECOWAS regional seed harmonization regulation.[1] The regulations have also been developed. The new Seed Law opens the door for an increased role of the private sector in seed production of different types of grains. It will encourage international seed companies to introduce new open-pollinated and hybrid varieties. On a 0–5 ordinal scale,[2] Ghana receives a 3. Over time, tracking of the seed law implementation will be a critical indicator for the seed sector.
	% staple crop area planted with improved seed[3]	Maize: 19% Rice: 8% Soybean: 12%
	Sales of imported seed (incl. from ECOWAS region) as % total sales of certified seed	7%—Most of the improved maize and rice seeds are currently produced within Ghana. Imports of improved seed were effectively barred until 2010, when some companies began importing hybrid maize seed for limited sale and are currently undertaking test trials for possible large volume commercial imports into Ghana.
	Time required for registering, testing, and obtaining approval for imported seed	2–3 years of field-level adaptive trials are needed to obtain approval to import certified seeds for cereals. National crop research institutes must confirm, in writing to the PPRSD, the authenticity of varietal attributes. The level of cooperation received from the above bodies significantly determines the length of the approval process. Under the new policy, this could improve, as Ghana now only requires adaptive trials for two seasons, which can be covered in one calendar year, if irrigation is available.
	% of foundation seed provided by Govt. organization % certified seed multiplied by private firms and farms vs. government entities	100%—Foundation seed production is monopolized by the Grain & Legume Development Board (GLDB) in Ghana. Multipliers of this foundation seed report inadequate supply and a varietal mix not corresponding to farmer/market demand. 100%—Currently, about 1,500 private certified seed producers are registered with the Ghana Seed Inspection unit. Of this number, 150 grow seeds on 10 hectares or more. Active membership of SEEDPAG is estimated around 600 growers. All certified seed-producing firms are 100% privately owned without any Government intervention. In the past few years, several local seed companies have emerged with support from AGRA, which is helping nascent companies with start-up grants, investment funds, and training. Seven companies have received support thus far.
	Number of private seed companies operating in the country	10
	No. of days to get an import permit (for seeds other than key grains)	Avg. 5 days—Application is submitted to the head of Plant Protection and Regulatory Services Directorate and GH¢10 to be paid as application fee per each permit issued/consignment imported. Phyto-sanitary certificate and source documentation required.
	Seed to grain price ratio	2 to 1
	Ease of private sector participation in the seed market (Scale: 0–5)	2.5

Source: Summary of Indicators presented in the Chapter.

1 Regulation C/REG. 4/05/2008 (harmonization of the rules governing quality control, certification, and marketing of plants seeds and seedlings in ECOWAS Region).

2 Ordinal scale: 0 = no framework; 1 = draft law or revision, 2 = passage/conforms with regional protocols, 3 = development of bylaws or guidelines for implementation, 4 = actual implementation, 5 = effective implementation.

3 MOFA, 2010.

2.1 LEGAL AND REGULATORY FRAMEWORK FOR SEED PRODUCTION, MULTIPLICATION, AND CERTIFICATION

Parliament passed a national Seed Law (Plants and Fertilizer Act, 2010) that is in line with the 2008 ECOWAS regional seed harmonization regulation. The new Seed Law opens the door for an increased role for the private sector in seed production of different types of grains. It will encourage international seed companies to introduce new and hybrid varieties. Yet, Ghana will not approve a new variety from the ECOWAS region or elsewhere until adaptive trials of two seasons have been conducted in the country to protect seeds from pest infestation carried from another country. Two trial seasons could be carried out in Ghana in 1 calendar year if trials are conducted in different regions and irrigation is available. This represents progress from earlier experiences of 2–3 years. The seed legislation is the same for both grains and vegetables, but they are applied differently.

In Ghana, the breeder seeds are currently produced by the CRI and SARI. The foundation seeds are in the hands of the Ghana Grains and Legumes Development Board (GLDB), a parastatal that exercises a monopoly.[4] Private seed growers who have been involved in the multiplication of seeds since the 1990s report that the GLDB does not produce enough foundation seed to meet their multiplication needs and that it does not produce the varieties most demanded by growers (and the market of consumers and other end users). Inefficiency in coordination among these agencies, such as late payment for seed supplied to private sector multipliers and GLDB's inability to assess market demand for seeds, has led to either shortages or excess production of some seed varieties. The seed cleaning and processing equipment GLDB uses is also obsolete, and the quality of seeds produced is not always good.

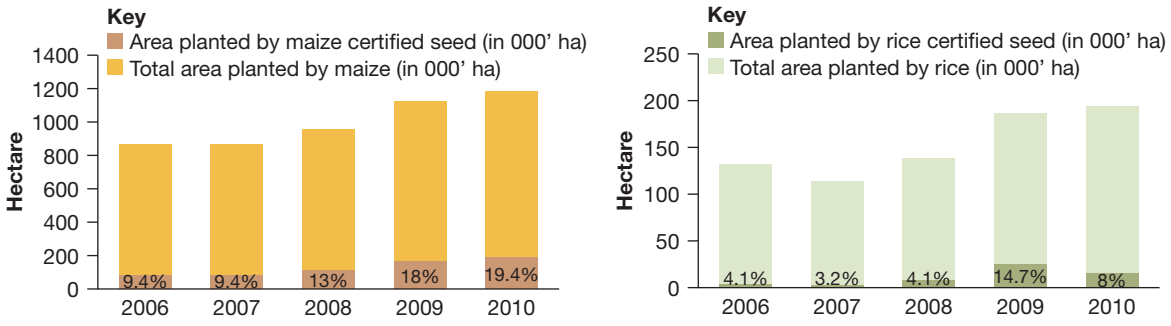
On a 0–5 ordinal scale, Ghana receives a 3 for having passed a seed law and developed the regulations that were approved by the Minister of Agriculture and validated by stakeholders. Currently, the regulations are with the Attorney General for formatting before they are presented before Parliament for approval. The Plant Protection and Regulatory Services Directorate (PPRSD) is responsible for regulating production and distribution of improved seed, including certification. The research centers are responsible for introducing new varieties, but they are under-funded and under-staffed. In addition, the GLDB and Seed Inspection Unit runs six seed processing and cleaning units in Tamale, Ho, Winneba, Bolga, Wa, and Kumasi. These plants use outdated equipment that needs to be upgraded. And they could arguably be better managed by private sector firms.

4 Though this has been outlawed under the new seed law, and private seed companies are allowed to produce foundation seed but must be registered and certified by PPRSD.

2.2 SUPPLY OF IMPROVED SEED FOR MAJOR CEREALS AND LEGUMES

Data from MOFA indicate that in 2010 the supply of certified maize seed could be used to cover 19 percent of the total area cultivated with maize; coverage for rice is only 8 percent (Figure 2.1). Most farmers retain seed from their prior year cereal or legume crop for planting. According to agricultural researchers in Ghana, seed from open pollinated (OP) varieties may be retained by smallholders for planting in two successive years without a significant loss in productivity, but OP varieties need to be replaced by year 4. Nearly all seed varieties developed for release in Ghana are OP varieties (with a limited amount of hybrid maize seed). The adjusted percentage calculation accounts for the requirement of one in every three-year renewal of open pollinated seed varieties. Certified seed therefore needs to be provided in years 1, 4, 7, etc.

FIGURE 2.1: Area Planted by Certified Maize and Rice Seed



Source: MOFA, 2010.

In addition to the low production of seeds in a given year, the marketing of seeds in Ghana is a major problem, according to the PPRSD. On one hand, certified seed growers complain that they cannot sell the seed. On the other, farmers complain about accessibility and availability. Processing facilities are found in regional capitals and are not always close to farm-based growers. The other key challenge is weak extension. Agro-dealers were found to be more involved in fertilizer distribution and less likely to be engaged in supplying seeds. Their relative lack of interest in seed may be the result of limited available supply or of limited demand on the part of farmers.

2.3 PRIVATE SECTOR PARTICIPATION IN SEED PRODUCTION AND DISTRIBUTION

The private sector seed multiplication industry is limited but keen to expand production of improved seed and develop seed technology in Ghana. In addition to importing seeds, the private sector is looking into breeding hybrids and OP varieties that are suitable for the prevailing conditions in Ghana. Currently, there are 1,500 certified seed growers, out of which in a given year, there are about 150 growers producing improved seeds.[5] In addition, two companies, Wienco and Agriserv, have undertaken trials for hybrid maize seeds (Pan53).[6] Despite hundreds of growers in the certified seed sector, many are small and have limited capacity (for example, see Box 2.1). Production of seeds is dispersed, and even larger seed growers do not seem to control more than 1 percent of the total certified seed produced. Foundation seed production is entirely dominated by the public sector, primarily by GLDB but with CRI producing modest quantities. All seed multiplication is done by private farms or firms. The market shares (degree of concentration) of private seed producers are unknown, but the private seed industry is not oligopolistic (and there has been recent entry) and is actually quite fragmented.

The private sector seed association SEEDPAG was created in 2005, with 600 members, mainly producers. Three SEEDPAG leaders sit on the National Seed Advisory Committee, representing three agro-climatic/production zones: middle, north, and south. AGRA is helping a number of SEEDPAG member companies to undertake capacity building to enable them to emerge as viable private firms. Seven such growers are already registered as certified seed-producing companies, an increase from just one company in 2006. It is the SEEDPAG position that the existing monopoly in foundation seed production is not conducive to the sector's development. Private seed multipliers claim that foundation seed varieties produced by GLDB do not correspond well to market demand and that the volume of seed for multiplication is inadequate. SEEDPAG also maintains that without clear and effective regulations, the new seed policy will not improve the policy environment for the sector. In addition, private seed companies cannot access financing to expand the area multiplied to certified seed or to invest in seed-processing facilities. A study conducted in 2008 outlines some of the challenges faced by the seed sector (Table 2.2).

2.4 PROCESS OF IMPORTING SEED

Seed importers in Ghana are required to obtain a permit from the PPRSD. The importers interviewed indicated that the process is not cumbersome; if the appropriate papers (which include a phyto-sanitary form) are submitted, an import permit can be obtained in an average of 5 days. If the imported seeds are for vegetables, the importer can bring the seed into the country and sell it in the market directly. However, the process is not the same for grain seeds, which require in-country trials. A key finding of the USAID-funded AgCLIR study on Ghana, conducted in 2008, was that the time (three full cropping cycles) needed to undertake trials required obtaining approval from the Ghanaian agricultural research establishment and MOFA to introduce imported high-yielding hybrid seed was prohibitively long, deterring

TABLE 2.2: Major Barriers to Entry into the Seed Business Identified by Seed Producers

BARRIERS	% OF SEED PRODUCERS (GHANA)
Competition with larger companies	8
Seed marketing problems	23
Lack of access to production credit and other credit facilities	23
Unfavorable seed policy environment	54
Low adoption rate by farmers	—
Lack of access to suitable germplasm	15
Lack of qualified manpower	—
Lack of access to extension services	8
High initial investment outlay	54
Unfavorable climatic conditions	—

Source: Drought Tolerant Maize in Africa (DTMA) Seed Sector Survey, IITA (International Institute of Tropical Agriculture), 2008.

5 Estimate obtained from an interview with the PPRSD, which regulates and certifies production of improved seeds.

6 Pan53 was developed by Pannar of South Africa, which is now majority owned by Pioneer Hi-Bred (of the Dupont group of companies).

BOX 2.1: Dynamic Female Seed Multiplier in Northern Ghana

Aisha Idrissu Kadiri is a woman in the Tamale District, who is both a farmer (farm is 16 km away in Tugu Yapala) and a multiplier of certified rice seed. In 2008, she first received 59 bags of certified rice seed from CRS/Tamale (in 12 kg bags), each supplying enough seed for 0.5 acre (hence, 29.5 acres total). This expanded to 72 bags in 2009 and 200 bags in 2010.

Kadiri is also an input dealer who distributes fertilizer, seed, and various agro-chemicals (herbicides, pesticides, rodenticides, nematicides) and sprayers. She joined the Ghana Agricultural Input Dealers Association (GAIDA) in 2009 as a registered input dealer. GAIDA has 156 members in the Northern Region and about 4,000 in all of Ghana, of which about half have been trained by EPA and MOFA. Training focuses on safe handling of pesticides, calibration of sprayers to avoid overuse, concept of establishing demonstration plots, and management and operations of an input dealership.

According to Kadiri, YARA, one of the major importers of fertilizer in Ghana, is the only supplier of fertilizer in the North, using Iddisal (whose office is very near the MOFA Regional Office in Tamale) as its distributor. There are three or four prominent, well-established wholesale and retail distributors of inputs in Tamale.

Kadiri claims to reach (female) farmers at their doorsteps with inputs. She also says she has some demonstration plots to show farmers how/when to apply inputs. Her interest in being an agro-entrepreneur is relatively recent. Her husband had to negotiate with a chief in a village (away from her family's farm) to acquire use rights to 40–45 acres of land. She claims that she would not have been able to access this much farm land without his help. The "leasing" arrangement requires that she provide some of her output (only two bags) to the chief for use of the land.

Source: Field interview.

seed imports. Under an ECOWAS agreement on seed, seed trade among member countries is permitted without a field testing requirement. However, this agreement does not appear to be enforced, and improved seed entry faces barriers to entry. In 2009, Ghana continued to import 100 metric tons of maize seeds and 40 metric tons of rice seeds (MOTI, 2010). In addition, there is little evidence of importation of improved seed from neighboring countries, except small-volume trade carried out informally and unofficially across borders.

No well-known multinational seed companies have established a presence in Ghana. However, Wienco, a Dutch and Ghanaian joint venture specializing in the import and distribution of agricultural inputs, began importing hybrid maize seed from South Africa in 2010. The maize was used for trials in northern Ghana, where it was limited to Masara N'Azariki farmers. Masara N'Azariki is a producers' cooperative in northern Ghana, where 3,000 farmers produced approximately 31,500 metric tons of maize on about 14,000 acres in 2010 (Table 2.3). Masara N'Azariki estimates that 10–15 percent of its output in 2010 consisted of yellow maize sold mainly for poultry, using South African varieties. Wienco brought in these varieties from a seed producer in South Africa called Pannar. Wienco and Masara N'Azariki requested and obtained permission from the PPRSD to import and use RSA hybrid maize seed that has been supplied to their farmers.

2.5 FARMER SEED USE

Farmer use of improved seed, which needs to be established quantitatively by survey research, is reported to be very low. Farmers perceive certified seed to be expensive. Field interviews and observations revealed that seed found in the market is sometimes mixed and contaminated. Private sector players indicated that there is inadequate government monitoring of seed purity, though this is part of MOFA/PPRSD's mandate. Improved seed is almost entirely open pollinated varieties rather than more productive hybrids. In 2010, only

TABLE 2.3: Maize Area Cultivated and Output by Masara N'Azariki Farmers in Northern Ghana, 2008–11

YEAR	NO. OF FARMERS	TOTAL AREA PLANTED TO MAIZE (ACRES)	AVERAGE MAIZE AREA CULTIVATED PER FARM	TOTAL OUTPUT OF MAIZE (MT)	AVERAGE MAIZE YIELD	AVERAGE MAIZE OUTPUT PER FARM (MT)
2008	1,250	3,200	2.6	2,300	0.72	1.84
2009	2,200	10,400	4.7	20,000	1.92	9.09
2010	3,000	14,000	4.7	31,500	2.25	10.50
2011 (est.)	5,000	40,000	8.0	100,000	2.50	20.00
2015 (est.)	7,500	57,143	7.6	200,000	3.50	26.67

Source: Masara N'Azariki, Tamale. Figures for 2011 and 2015 are optimistic projections.

TABLE 2.4: Expenditures on Crops Inputs

INPUT	% OF AMOUNT SPENT ON INPUT		
	NORTHERN ZONE	AFRAM BASIN	SOUTHERN HORTICULTURAL ZONE
Organic fertilizer	6.8	0.7	1.2
Inorganic fertilizer	7.4	1.6	1.2
Weedicides	1.3	3.3	2.5
Insecticides	0.1	0.7	0.2
Fungicides	0	0.3	0.1
Purchased seed, seedlings	15.9	11.8	14.5
Hired labor	43.1	59.7	43.2
Transport of crops	2.7	4.3	7.2
Renting of farm land	0.7	4.3	4.1
Tools	12.9	11.9	16.1
Others	9.2	1.5	9.8
Total	**100**	**100**	**100**

Source: Report of the Baseline Survey 2009, ISSER.

35 tons of Mamaba hybrid seed was multiplied by growers in Ghana.[7] Despite the low adoption rate of improved seed by farmers, 22 percent of the rural households surveyed in the Ghana Living Standards Measurement Survey in 2006 reported their seed expenditures (IFPRI 2011). Seed expenditures amounted to an average of 14 percent of input cost for farmers based on a survey of 23 districts carried out by ISSER for the MiDA program (Table 2.4). This relatively high number could be more due to the tendency of farmers to purchase seeds for vegetables than for grain production.

7 Interview with PPRSD, April 2011.

Chapter 3: FERTILIZER

In the early 1990s, Ghana liberalized the fertilizer sector by abolishing the Government monopoly in fertilizer imports and distribution. Since then, a large number of importers, distributors, and retailers have entered the market, and by the accounts of those interviewed, they did so with considerable ease. Currently, there are 8 major importers and between 35 and 50 major distributors, a few of which import as well on an occasional basis. There are as many as 4,000 fertilizer retailers operating in the market. YARA, the leading fertilizer company, is one of the major importers in Ghana and has a market share of 50–60 percent of fertilizer imports. Despite the strong participation of the private sector in the market, fertilizer consumption on average is only about 40 kilograms per hectare. Reported consumption of nitrogen fertilizer is significantly lower, at 6 kilograms per hectare. As a result of these low rates of fertilizer use, the yields of major crops are very low. They average 1.7 tons per hectare for maize and 2.4 tons per hectare for rice (MOFA, 2010). Moreover, over the years, national yield levels of major crops have only improved slightly.

TABLE 3.1: Summary Observations on Fertilizer Use and Prices in Ghana

SUCCESS FACTOR	INDICATORS	RESULTS OF INDICATORS
Fertilizer	Fertilizer consumption	Fertilizer nutrient consumption per ha is low in Ghana at an average of 6 kg/ha. This contributes to low yields of major crops: 1.7 tons/ha for maize and 2.4 tons/ha for rice. Meanwhile, fertilization application rate[1] is 40 kg/ha, which is reaching the Abuja declaration on fertilizer's goal of 50 kg/ha by 2015 but falls short in comparison to South Africa with 120 kg/ha and Kenya with 93 kg/ha.
	Fertilizer use[2]	295,900 MT (2010)
	Cost of 50 kg bag of NPK, urea, and SoA in 2–3 main agricultural production zones in a country	Fertilizer cost in rural market towns in Ghana can be double that of the CIF cost due to finance and in-land transportation costs. Since 2008, to address the high prices of fertilizer in world markets, GOG decided to introduce a subsidy program in partnership with the major importers. Without the subsidy, fertilizer costs are high, and many smallholder farmers report that fertilizer is too costly to use. In 2010, the average prices for the following fertilizer products in Ghana were: NPK: $415/ton; SoA: $277/ton; and urea: $376/ton.
	Nutrient/output ratio (maize)	The nutrient/output ratio in Ghana is 2.6, which imply that farmers in Ghana have good incentives to use fertilizer despite higher input prices as they are receiving good output prices.
	Timeliness in the importation of fertilizer (proxy for timeliness in the application of fertilizer)	In 2010, about 40% of the fertilizer imports to Ghana were supplied for the subsidy program. The subsidy program is based on an annual decree from the Government, which is usually announced between May and July. As numerous documents need to be completed for fertilizer supply to be accepted under the subsidy program, it takes about 2 months (after the fertilizer is in the port) to get the approval from the Govt. for importers to distribute fertilizer into the market. Hence, the arrival of the fertilizer is late for the planting season in the Southern region, which is in late March through April.
	% of imported fertilizer that was delayed (2010)	37% (estimated figure) – In 2010, MOFA data shows that 91,244 MT of fertilizer were supplied under the subsidy program, out of the estimated volume of 244,395 MT of fertilizer imported. Due to late announcement from the Government, fertilizer under the subsidy was delayed, especially for the transitional zones.
	Time it takes the government to pay fertilizer importers	Avg. 6 months; time lags for payment has progressively deteriorated over the 3 year period.
	Entry into the fertilizer market	License from EPA to sell chemicals: Up to 2 months (as little as 2 weeks). Entry into the fertilizer market in Ghana is not difficult, but getting a license from EPA to be able to sell chemicals can take time—sometimes up to 2 months. On the other hand, for some companies, it took only 2 weeks. In addition to the operating license, agro-dealers are also required to register as formal businesses with the Registrar General's Department. License renewal from EPA is done annually and is issued from Accra, though forms can be submitted in the regional offices.

1 This indicator is calculated based on total fertilizer use and arable land area.
2 This is an estimated number based on calculation of annual volume imported, discounted by the volume that is exported. Interviews with importers confirmed that there is very little carryover stock, and Ghana does not produce any fertilizer.

TABLE 3.1: (continued)

SUCCESS FACTOR	INDICATORS	RESULTS OF INDICATORS
	Fertilizer subsidy	% of the retail cost: 42% (in 2010) In 2008, Government decided to introduce a subsidy program that depended largely on the private marketing and distribution system. This has resulted in an increase in import volumes. but its impact on improved adoption rates are yet to be seen. Despite the good intention of the program, experience has been mixed as fertilizers are not always available on time for the major planting season (March–April) in Southern zones. The stocks from the previous year are not always adequate. (Details provided under section 5).
	Tariffs & taxes on fertilizer	0%. Although there are no tariffs and government has waived all taxes for fertilizer imports, the following handling charges and levies apply: EDIF levy of 0.5%, ECOWAS levy of 0.5%, 1% processing fee for zero rated commodities and 2.5% NHIS levy. Additionally, importers have to pay for the following charges: stevedoring (including port charges), handling and possibly demurrages if delays occur in clearing of the commodity.
	Agro-input dealers[3] density (Agro dealers/1000 farmers)	0.84
	Private sector participation in the fertilizer market (Scale: 0–5)	Score—3; The private sector's perception of the fertilizer market is an average of 3 due to the delays in payment from the Government for the fertilizer subsidy program. A significant delay in payment in 2010 led to late distribution of imported fertilizers.

Source: Summary of Indicators presented in the Chapter.
Note: EDIF (Export Development Investment Fund); NHIS (National Health Insurance Scheme).

3.1 FERTILIZER CONSUMPTION

Fertilizer is not produced in Ghana. The country's fertilizer imports have been increasing with a least square growth rate of 12 percent in the five-year period beginning 2006. Although almost all fertilizer ingredients are imported, some blending is done in-country by YARA. The general increase in imported fertilizer beginning in the early 2000s slowed between 2006 and 2008, when it remained somewhat constant, before resuming in 2009 (Annex, Table A.2). Most of the fertilizer used in Ghana is NPK. In 2010, 68 percent of fertilizer used was NPK, followed by urea and SoA. Out of the imports, small volumes are exported to neighboring countries. In 2010, about 4 percent of total imports was subsequently exported.

Despite the increase in fertilizer prices beginning in 2007, fertilizer consumption has increased in Ghana, primarily due to the fertilizer subsidy schemes of the Government (Figure 3.1). Compared to the Africa-wide average of 9 kilograms per hectare used, application rates in Ghana average 40 kilograms per hectare. This higher-than-average rate is still significantly lower than South Africa and Kenya, where the average is 120 and 93 kilograms per hectare, respectively. However, if the 10 percent rate of growth in fertilizer use Ghana has seen in recent years persists, the country is likely to reach the average 50 kilograms per hectare prescribed by the Abuja Declaration by 2015.

On fertilizer used and crop types, only about 30 percent of fertilizer imported is absorbed by the food crops, followed by another 20 percent by large industrial farms of plantation crops like palm oil, rubber, cotton, pineapple, and banana. The remaining 50 percent is then consumed by cocoa. No recent field level surveys have been conducted to validate this anecdotal evidence based on interviews with private importers, but it is consider to be well-established knowledge. As for access to fertilizer, 19 percent of households in Ghana reported buying inorganic fertilizer during 2005–2006 (GLSS5, 2008). This figure does not encompass fertilizer offered through Government and donor programs, which is a small percentage of total fertilizer use in Ghana.[4] This may have changed following the Government's subsidy program that was introduced in 2008.

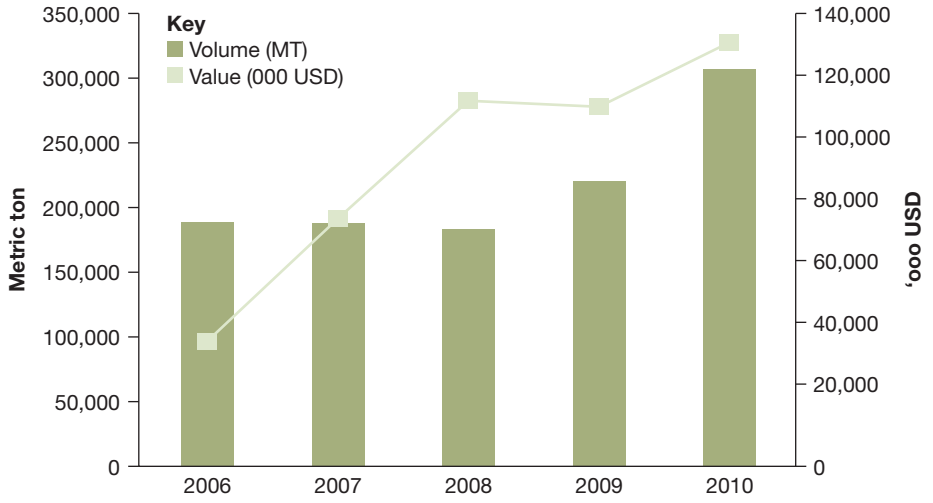
3.2 LEGAL AND REGULATORY FRAMEWORK FOR FERTILIZER IMPORTS AND DISTRIBUTION

In the early 1990s, Ghana liberalized the fertilizer sector by abolishing the Government monopoly in fertilizer imports and distribution. Since then, many actors (importers, distributors, and retailers) have entered the market with relative ease. Prior to the newly enacted Plants and Fertilizer Act of 2010, the fertilizer sector was not regulated under any specific act. The Crop Services Directorate and EPA shared the regulatory function, with importers, distributors, and retailers having to

3 Agro-input dealers are mainly small to mid-sized retailers who distribute and sell key agriculture inputs such as fertilizer, seeds, and machinery. IFDC estimates that there are about 4500 agro-input dealers in Ghana.

4 According to GLSMM5, only 1 percent of rural households that used fertilizer referred to the Ministry of Agriculture providing them fertilizer.

FIGURE 3.1: Total Fertilizer Consumption and the Value of Imports in Ghana



Source: MOTI, 2010.

register prior to engaging in the sector. Very little monitoring of fertilizer quality within the country was undertaken. Under the new Act, the regulatory responsibilities are streamlined with the creation of a new fertilizer regulatory division under the PPRSD. This Act and its regulation will be critical for increased participation of private sector firms, because over the past two years, despite increases in fertilizer imports, farmers' mistrust of fertilizer dealers has risen, as there have been instances of adulterated products in the market, including violation of truth in labeling in terms of contents, quantity, and quality (Fuentes, Johnson & Bumb, 2011).

3.3 ENTRY INTO THE FERTILIZER MARKET

Entry into the fertilizer market in Ghana is not difficult. However, obtaining a license from EPA to sell agro-chemicals, including fertilizers, can take time—sometimes up to 2 months. For some companies it took only two weeks. In addition to the operating license, agro-dealers are also required to register formally as a business with the Registrar General's Department. License renewal from EPA is done annually and is issued from Accra, though forms may be submitted in the regional offices.

Retail level input dealers have a major constraint in being able to access credit (for example, see Box 3.1). Unlike importers, who have access to financing in international markets at much more competitive interest rates, few smaller retailers who are closer to rural areas and to farmers are reached by financial institutions. Those who are reached are charged exorbitant interest rates. As a result, those who enter fertilizer sales have to find alternative means of financing. Despite these challenges in start-up, there has been an increase in the numbers of new entrants in the market. According to the IFPRI/IFDC agriculture-input dealer survey of 2010, 357 agro-dealers started operations in 2008 and remained in operation in 2009, which is an 18 percent increase from the 1,978 enterprises that existed in 2007. In 2009, 481 additional agro-dealers were established that were still in operation at the time of the survey.

3.4 PRIVATE SECTOR PARTICIPATION IN THE FERTILIZER MARKET

YARA has a market share of between 50 and 60 percent of fertilizer imports. The other four major players are Chemico, Golden Stork, Afcott (an Indian multinational), and Dizengoff (a subsidiary of the British-Israeli firm Balton CP Ltd). Fertilizer retailers are spread throughout the country, though the Ashanti region has the highest density, both in terms of the number of retailers active in the area and the number per 1,000 farmers. With the exception of the Upper East Region, the northern part of the country has a significantly lower density of retailers (especially in terms of numbers per farmer) than the southern part of the country. Nationally, in Ghana, the agro-dealer density is 1.21[5] (IFPRI, 2010). Despite the coverage, most of the larger and better-stocked retailers are close to cities. Small-scale sellers tend to be less well stocked.

5 Agro-dealer density is measured as a ratio of agro dealers and farmers (no. of agro-dealers/1,000 farmers).

BOX 3.1: A Well-Established Agro-Dealer in the Brong-Ahafo Region

The business started in 1999 and was registered in 2002. The company wholesales as well as retails fertilizer, pesticides, seeds, and agricultural machinery like drip irrigation equipment and spraying machines. In addition, the business owns and manages a 61 hetare maize farm and a 4 hectare cocoa farm.

In 2009, the company's turnover was about GH¢9 million, representing an estimated 50 percent market share in the region. It sells inputs to agents in rural areas as well as to farmers who come directly to the retail store. The agents in rural areas are given credit of 7 to 30 days. The default rate is low at about 3–7 percent. There is no written agreement with agents, so extension of wholesaler credit is based on trust against the issuance of an invoice.

Although the business is performing well, the input dealer noted a number of constraints:

- Loans from banks are not favorable. Interest rates are high, and lending is always for short terms of 6 months to 1 year.
- There are no duties on fertilizer imports, but port charges are high for small and mid-sized fertilizer importation and distribution companies.
- The dealer is of the view that Government directly supplying inputs to block farms does not favor increased participation of the private sector in the fertilizer sector.

The other major constraint the business faces is the quality of infrastructure. Roads in rural areas are not in good condition, and this increases costs and delivery time to rural areas. Rural road maintenance has devolved to the district level, and it is not clear that district assemblies have the budgets to fund road repair and maintenance adequately.

Source: Field interview.

Private Sector Players: Ghana Fertilizer and Chemical Market

Importers:

YARA, Chemico, Golden Stork, Afcott, Dizengoff, Calli Ghana, Reiss & Co., and Sidalco

Distributors:

About 35–50 local distributors (some are importers as well)

Retailers:

4,000-plus retailers in 10 regions

Since 2003, some of the key private sector agro-dealers have been organized into the Ghana Agricultural Input Dealers Association (GAIDA), which has a strong regional presence in the country with 1,700 members. GAIDA was formed to be a platform for advocacy to the government and is active in facilitating capacity building among its members.

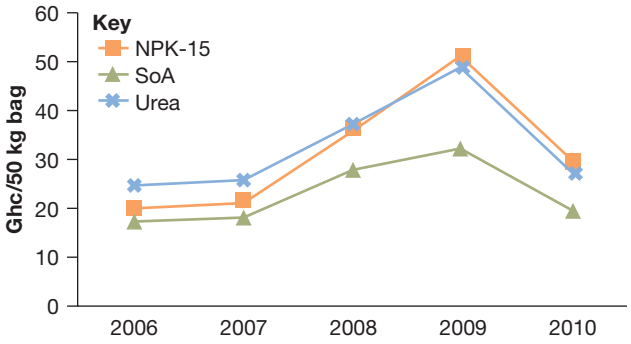
Despite the important role the private sector plays in the fertilizer sector of Ghana, private sector perception of the policy environment and the market overall is an average (Ghana received a rating of 3 out of 5).[6] One of the key reasons given relates to the subsidy program that was introduced by the Government in 2008. The Government has been making late payments to the importers from year to year. There is also a perceived lack of transparency in the procedures through which the Government negotiates the price of fertilizer with private importers.

3.5 FERTILIZER PRICES AND SUBSIDY

Fertilizer Prices. In 2007 and 2008, there was a large increase in fertilizer prices globally. Since that time, prices remained high in Ghana until 2009 but have dropped since then due to the subsidies provided by Government. In addition to the increase in global fertilizer prices, high financial and transport costs within Ghana also served to raise domestic fertilizer prices. As a result, the retail prices in Ghana can be about 50 percent higher than CIF prices (IFDC/IFPRI, 2011). In rural areas where farmers buy fertilizer, the cost would be even higher. Figure 3.2 depicts the prices of three fertilizer products in Ghana.

6 Rating was measured on a scale of 0–5 on perception of major fertilizer importers and some dealers on govt. roles and intervention in fertilizer market.

FIGURE 3.2: Average Prices of Major Fertilizers in Ghana



Source: Fuentes et al., 2011 (Forthcoming); 2010 IFDC monthly price data (June–December 2011).

TABLE 3.3: Wholesale Prices for Maize in Selected Markets in Ghana

MARKETS	MAY 2011 ($/kg)	MARKETS	MAY 2011 ($/kg)
Agbogbloshie	0.50	Hohoe	0.39
Tamale	0.35	Damango	0.32
Nima	0.48	Bole	0.34
Ashaiman Main Market	0.56	Navrongo	0.34
Tema	0.40	Jirapa	0.34
Tumu	0.34	Asafo	0.54
Sekondi	0.67	Ejura	0.40
Takoradi	0.67	Kaneshie	0.40
Kotokuraba	0.58	Salaga	0.32
Bolgatanga	0.35	Bawku	0.32
Mankessim	0.54	Wenchi	0.47
Koforidua	0.43	Sunyani	0.52
Central Mkt	0.53	Wa	0.35
Techiman	0.39	Yendi	0.32

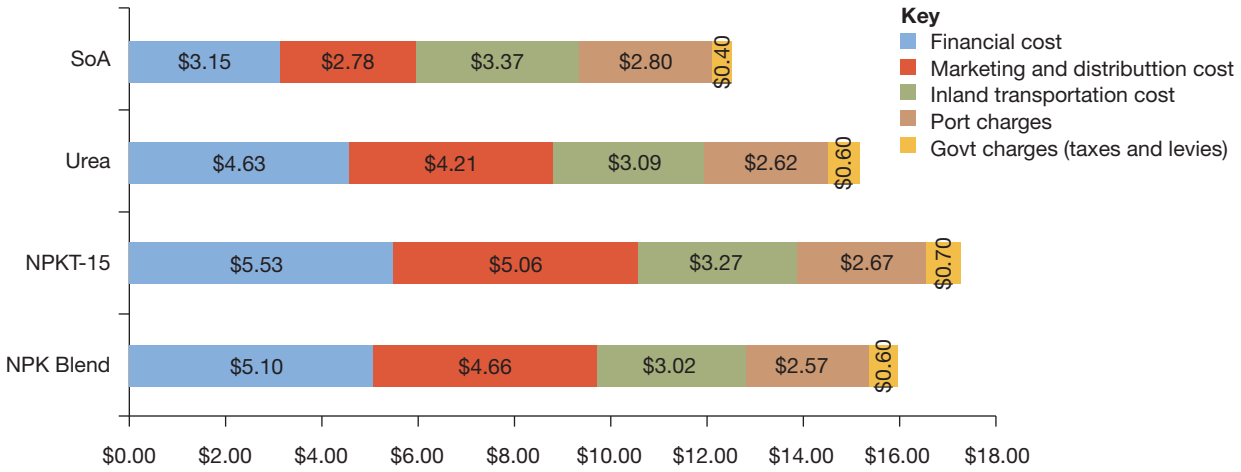
Source: Esoko Price Bulletin, May 2011.

In the IFDC/IFPRI report on field data in Ghana in 2009 and 2010, finance emerged as the largest component of fertilizer costs, averaging 30 percent (although varying somewhat by specific fertilizer product) (Figure 3.3). This cost is then followed by the marketing and distribution cost of an average 27 percent, which includes profit margins. Inland transportation cost contributes on an average of 21 percent, and port charges average 18 percent. Fertilizer imports are not subject to taxes, but the Government charges fees that account for about 4 percent of total costs.

The Profitability of Fertilizer Use. The profitability of using fertilizer is determined in large measure by the price the farmer must pay for the fertilizer and the price the farmer can get for his or her produce. The nutrient output ratio is used to assess the amount of grains in kilograms that is needed to purchase one kilogram of fertilizer nutrient. In Ghana, the nutrient output ratio was measured by calculating the average wholesale price per kilogram of maize and the average price per kilogram of nitrogen. In May 2011, the average wholesale price for maize was $0.43 per kilogram (Table 3.3), while price of urea was $0.51 per kilogram (IFDC Monthly Price Report).[7] Based on this information, the price of the nitrogen nutrient was $1.10 per kilogram, giving a nutrient output ratio

7 Urea consists of 46% nitrogen. The price of nitrogen was then calculated to be $1.10.

FIGURE 3.3: Fertilizer Domestic Cost Components per 50 kg Bags in Ghana (US$/bag)



Source: Fuentes et al., 2011 (Forthcoming).

of 2.6. This implies that fertilizer use is profitable in Ghana and that farmers should have sufficient incentives to use it, especially given higher maize prices. To some extent, the fertilizer subsidy may have contributed to this favorable ratio in some areas and at certain times of the year when farmers had access to subsidized fertilizers. In 2010, the subsidy on urea alone was 39 percent (Table 3.4).

The Fertilizer Subsidy Program. During the 1980s, the Government of Ghana provided input subsidies to farmers. The rate of the subsidy on fertilizer imports was as high as 65 percent. Following the liberalization of the fertilizer market in the 1990s, the subsidy program was phased out. In 2007, however, global fertilizer prices began to rise, and the following year the Government introduced a new subsidy program in partnership with the country's major importers.

In 2008, 21 percent of Ghana's public agriculture budget went to support the subsidy program. Two years later in 2010, that proportion had fallen to 12 percent. Despite the decrease in allocation, sustainability of the Government's subsidy program is of a concern.

The program started with the introduction of a voucher system, which was disbanded after 2 years as the result of operational deficiencies and delays in payment to importers. Subsidized fertilizer was not always reaching the smallholder farmers, and in some instances, it was re-exported informally to neighboring countries. The bureaucratic process of redeeming the vouchers from the MOFA district offices also provided a disincentive. Some farmers reported having to make repeated visits because MOFA officials were not in their offices. The payments to importers came late, averaging 6 months, leading to late delivery of fertilizer to retailers. In the southern zones of the country this caused them to miss the most important planting season in March and April. Although importers claim they maintain stocks from previous years that are available for sale during the growing season, a number of farmers complained that the subsidized fertilizer was not available when it was needed. Many farmers would both wait for the fertilizer and apply it when the optimal period had passed or end up buying it at market rates. On the other hand, the three northern regions, where the major planting season is 2–3 months later, have been more able to take advantage of the subsidy.

Beginning in 2010, a new program was introduced whereby the Government and the importers negotiated a discounted price to be used for selling fertilizer in the local market. (See average subsidy levels in Table 3.4.) The remaining amount would then be paid by the Government directly. The effectiveness of this program has yet to be determined. On another front, the problem of late payment to importers has not yet been resolved, and the resulting delays in fertilizer delivery persist, particularly in the south.

TABLE 3.4: Fertilizer Subsidy Budget, Volume, and Cost

ITEM		2008	2009	2010
Agric. budget ('000 GH¢)		97,131	202,632	256,886
Subsidy amount ('000 GH¢)		20,654	34,417	30,002
% Agric. budget		21.3%	17.0%	11.7%
Total vol. fert. subsidy (MT)		43,176	72,795	91,244
Disbursement methodology		Coupon	Coupon	Waybill
NPK	*Farmer pays (GH¢)*	25	25	27
	Subsidy amt. (GH¢)	26	26	17
	% subsidy	51%	51%	38%
Urea	*Farmer pays (GH¢)*	26	26	25
	Subsidy amt. (GH¢)	26	26	16
	% subsidy	50%	50%	39%
Sulfate of Ammonia	*Farmer pays (GH¢)*	16	16	18
	Subsidy amt. (GH¢)	18	18	16
	% subsidy	53	52	47%
Yearly avg. fert. subsidy, includes flat rate transport (%)		**51%**	**51%**	**42%**

Source: Agric. Extension Directorate, MOFA.

Chapter 4: MECHANIZATION

The agricultural production system in Ghana is labor intensive. Most farmers have little if any access to agricultural machinery. In recent years, however, the demand for tractors has been on the rise. This increase has, for the most part, been the result of an expansion in the area under cultivation. Much of this expansion has been on the part of large commercial farms. However, it has also involved smallholders who traditionally used simpler tools such as cutlasses and hoes. A number of importers and distributors of well-known tractor brands have emerged to satisfy this demand. In addition, tractor services are available for land preparation, planting, post-harvest processing, hauling, and other agricultural activities. Because mechanized farming reduces the drudgery of farm labor and can be instrumental in expanding cultivation into areas where there is a significant amount of unutilized arable land, such as in much of northern Ghana, it is regarded as a positive development. A 2011 survey by IFPRI found that mechanized land preparation for maize production led to a 25 percent decrease in labor demand and a 35 percent reduction in costs in Ghana's cereal belt (IFPRI, 2011).

In 2007, the Government of Ghana entered the machinery market to promote commercialization in the agriculture sector. It did so by providing tractors under a subsidized program of public-private partnership. Based in part on the experience of similar public sector involvement in managing commercial ventures in other countries, this raises a number of concerns, including the risk that the government's role will serve to crowd out private sector investment. A number of reports to date seem to support the legitimacy of these concerns, including stakeholders' accounts of tractor breakdowns, poor after-sale services, and a lack of available spare parts.

4.1 GOVERNMENT POLICY ON MECHANIZATION

The Food and Agriculture Sector Development Policy (FASDEP II) is the overarching agriculture sector policy of the Government of Ghana. FASDEP II provides a broad guideline for agricultural mechanization in Ghana. Its objective is to facilitate access of farmers and agro-processors to mechanized services at affordable cost. Six strategies have been developed under this broad policy framework: (i) Collaborate with the private sector to build capacity of individuals and companies to produce or assemble appropriate agricultural machinery, tools, and equipment locally; (ii) Promote small-scale multi-purpose machinery, along the

TABLE 4.1: Summary Observations on Agriculture Mechanization in Ghana

SUCCESS FACTOR	INDICATORS	RESULTS OF INDICATORS
Mechanization	Total # of tractors per 100 sq km (or ha) of arable land	11 tractors per 100 sq km
	Cost of plowing one hectare of land (in 2010)	Avg. $46/ha; S. Savanna = $42/ha; Forest = $47/ha; Coastal Savanna = $50/ha
	Govt. subsidy on tractors	33% (of CIF price); GOG introduced the subsidy in 2006 through the establishment of the Agriculture Mechanization Service Centers (AMSECs). Government-imported tractors were then handed out to the private sector. The private operators received 5 tractors and were required to make a down payment of 10–30% (started with 10%; increased over time), with the remaining amount to be paid over 3 years.
	Useful life of tractors	Average of 10 years, depending on brand, usage, and regularity of maintenance. Estimated hours of operation per year for farm tillage purposes only range from 1,100 to 1,320 hrs per year.
	Tariffs on tractor spare parts	0% when imported together with tractor, although levies and charges such as 2.5% NHIS levy, 1% processing fee, 0.5% ECOWAS, and 0.5% EDIF levies are applied. However, if one is unable to prove that the particular part is for agricultural machinery and secure a waiver with respect to applicable taxes, in addition to paying the above, the importer would need to pay 10% import duty and 12.5% VAT. The above levies, tariffs, and taxes apply to wheels/tires, gear boxes, and radiators, among other agricultural machinery parts.
	Ease of private sector participation in the agricultural machinery market by perception of stakeholders (Scale: 0–5).	1.9; the private sector's perception on the ease of private sector participation in the agricultural machinery market is not very favorable. There is skepticism in the private sector about the ability of the Government to make an impact from the subsidized program, which is known to have problems.

Source: Summary of Indicators presented in the Chapter.

value chain, including farm level storage facilities; appropriate agro-processing machinery and equipment, and intermediate means of transport; (iii) Intensify the use of animal traction through the establishment of animal traction centers; (iv) Facilitate the establishment of mechanization service centers and machinery hire-purchase and lease schemes that have adequate inventories of spare parts of all machinery and equipment; (v) Promote local assembly of tractors, and encourage adaptation and local fabrication of processing equipment; and (vi) Develop human capacity in agriculture machinery management, operations, and maintenance within the public and private sectors.

The Government of Ghana introduced tractors in the late 1940s and early 1950s. Agricultural mechanization was later an integral component of the country's seven year development plan covering the years 1963 to 1969. The objectives of the plan were to increase the cash incomes of farmers and to effectively meet the demand for food and fiber in the domestic economy. For planners and policy makers, this would entail moving away from traditional farming, which relied on the use of cutlasses, hoes, and other simple tools and moving toward intensification and diversification of farm resources. It would also involve eliminating shifting cultivation (IFPRI, 2011). Under the plan, the Government invested in tractors and provided mechanization services directly which lasted till late 1980s. But, as efforts did not result in sustainable impacts under the economic recovery program, policy makers decided to disengage from such direct involvement and rely instead on private sector participation in the sector.

4.2 GOVERNMENT'S CURRENT PROGRAM AND INVESTMENT IN TRACTORS

After a hiatus in Government's direct involvement in the machinery sector, the Government has again become active in the agriculture machinery market. In 2007, it approved $3.4 million of public funds for the purchase of tractors. Most of the tractors are imported from India and are between 60 and 80 horsepower (Table 4.2). In addition, the Government has also received grants from the Japanese Government for tractor imports that are usually tied to importing Japanese equipments. As of now, Ghana does not manufacture any tractors in the country, but a few distributors are in the planning stages of developing the infrastructure necessary for local assembly of tractors.

In the program, the Government imports tractors and sells them to private mechanization service centers, or AMSECs. A subsidy is applied to reduce the price of the tractors. The process of allocating the tractors is quite cumbersome, requiring approval all the way up to the ministerial level. (i) The farmer prepares an application to the Ministry of Food and Agriculture through recommendation of the District Director of Agriculture; (ii) The Regional Director then writes a formal letter to the Minister of Agriculture, which is copied to AESD; (iii) The Minister then confers with AESD; (iv) The AESD approves the deal and provides an allocation letter indicating the price and the horsepower of the tractor; (v) An agreement is signed between the farmer and the AESD. The farmer produces a bank draft in MOFA's name for the down payment of 30 percent of the two-thirds CIF value of the tractor. The balance will then be paid over 3 years during which time the tractors remain the property of the Government.

As of 2011, there were 89 AMSECs covering the country's 10 regions (Table 4.3). A typical AMSEC offers services to between 400 and 1,000 farmers. With the increase in the number of AMSECs in the country, a national association of AMSECs (NAAMSECO) was established in 2008 to advocate an improved policy and business environment for tractor businesses. In addition to the tractors provided by the Government, AMSECs have reached out to the private sector and have recently been offered financing from Stanbic Bank. The Bank is ready to sign an agreement with NAAMSECO to finance the purchase of 28 tractors (125 horsepower each).

TABLE 4.2: Tractor Imports by Government

YEAR	MAKE/ MODEL	QTY IMPORTED (UNITS)	COUNTRY OF ORIGIN
2004	Farmtrac-70 tractor	200	India
2005	Farmtrac-70 tractor	350	India
	Farmtrac-80 (4x4)	50	India
2006	Farmtrac-70 tractor	350	India
	Farmtrac-80 (2x4)	50	India
	Landini tractors	50	Italy
	Kubota-Power Tillers	100	Japan
2007	Farmtrac-60 tractor	230	India
	Farmtrac-80 (2x4)	51	India
	Yukon compact tractors	120	Czech
2008	Farmtrac-60 tractor	200	India
	Mahindra-705DI tractor	100	India
	Mahindra-605DI tractor	132	India
	John Deere tractor	500	India
	Kubota tractor	78	Japan

Source: Agriculture Engineering Services Directorate (AESD), 2011. In 2009 and 2010, Government did not import tractors but is in final stages of importing tractors from Brazil.

TABLE 4.3: Number of Farm Mechanization Centers Established/Operational

REGION	2008	2009	2010	2011	TOTAL
Western		1			1
Central	1	2	1		4
Greater Accra	1	2			3
Eastern	2	6	2		10
Volta	1	6		2	9
Ashanti		5			5
Brong Ahafo	2	8	3		13
Northern	2	16	8	2	28
Upper East	2	3	1	1	7
Upper West	1	8			9
Total	**12**	**57**	**15**	**5**	**89**

Source: AESD, 2011.

4.3 SUPPLY AND AVAILABILITY OF AGRICULTURE MACHINERY AND SPARE PARTS

In 2004, a census was carried out by the AESD, which found that there were 1,736 serviceable tractors in Ghana.[1] This finding was far lower than the estimate many had made that there were nearly 4,000 tractors in the country. Since then, there has been no systematic collection of data, but with the increased involvement of the Government in the mechanization sector and through grant funding from some donors, the number of tractors in the country has grown (Table 4.4).

In spite of the increase in the number of tractors in Ghana since 2004, the average of 11 tractors per 100 square kilometers remains quite scarce compared to other developing countries. Both Kenya and South Africa, for instance, had 43 tractors per 100 square kilometers in 2004. Brazil had 129 per 100 square kilometer in 2006, and India had 158 in 2003. In field interviews with farmers, the lack of tractor services is widely mentioned as one of the major constraints to increasing agricultural production.

Some wealthier Ghanaian farmers who own tractors offer land preparation services to smallholders, although these are usually not provided at the optimal time, and delays of between 2 and 4 weeks are not uncommon. For farmers who are interested in buying a tractor, financing arrangements are often difficult. Although smaller, 60 to 80 horsepower tractors are available, especially under the Government's subsidy program, many users interviewed complained about the durability of the types or brands of tractors offered under the subsidy scheme, as well as their suitability to the terrain in Ghana.

In addition to financing, the timely availability of spare parts was often cited by farmers as being problematic. Access is also a problem because very few distributors systematically stock spare parts, which can therefore only be obtained in Accra or Tema. The distributors generally corroborate these accounts, explaining that it is not the result of neglect but rather of the lack of financing available to them. Aggravating these issues is the inefficiency of the duty drawback system for spare parts. Although tractors and the spare parts that are imported along with them are not subject to import duties, imports of stand-alone spare parts are. Importers and distributors need to submit paperwork authenticating the imports to be for agricultural machinery in order to receive duty reimbursement. The paperwork to be prepared for MOFA can take several weeks, so most of the time importers do not follow this procedure; instead, they pay import duties and then pass on the higher cost to their customers. As a result,

TABLE 4.4: Tractor Availability in Ghana

YEAR	NO. OF TRACTORS IN USE	ARABLE LAND AREA (SQ Km)	TRACTOR PER 100 SQ Km
2004	1,736	40,000	4
2005	2,264	40,000	6
2006	2,988	42,000	7
2007	3,899	44,000	9
2008	4,381	44,000	10
2009	4,857	45,000	11
2010	4,855	45,000	11

Sources: AESD (2004); FAO (imports from 2005–2008); CEPS (2009–2010).
Note: It is assumed that tractors have a life span of 10 years; therefore, from each year's data, 10% is discounted. Arable land area excludes land area under permanent crops (palm, rubber, cocoa, etc.).

1 Interview with AESD, April 2011.

some spare parts are found to be quite expensive and not affordable to farmers or smaller tractor hire services.

4.4 PRIVATE SECTOR PARTICIPATION IN THE AGRICULTURE MACHINERY SECTOR

There are eight major tractor importers in Ghana. All of them are local representatives of leading tractor manufacturers such as John Deere, Massey Ferguson, Farmtrac, and Mahindra (for example, see Box 4.1). In the past, when the Government would import tractors, it would either do it directly or donors would import them on their own. But, from time to time, some of the importers have also imported tractors on behalf of the Government.

Despite good prospects for private sector tractor businesses in Ghana, private sector perceptions of the ease of doing business in the agricultural machinery market are not favorable. Out of 5, Ghana received a rating of 2.[2] Private sector representatives interviewed expressed skepticism over the prospects that the program of government subsidy can have any real positive impact. Given the problems that have emerged in the conduct of the program and the large budgetary commitment that financing and administering it entails, many feel it is an area of the economy in which the Government should be less involved. Some respondents said that most of the tractors imported were not durable. Some said the Government has not done its homework in selecting the brand of tractors suitable for the soil type of Ghana, as heavy soils in the certain regions (southern Ghana) require higher HP. Instead, decisions seem to have been driven by costs. The Government-managed program is fraught with political interventions that could lead to local elite capture and leverage for political patronage.

2 Rating was measured on a scale of 0–5 on perception of major importers and distributors on government roles and intervention in the machinery market.

4.5 TRACTOR PRICES AND COST

Tractor prices are high in Ghana, but the Government has imported less expensive Indian brands under the subsidy program. The average cost of 55 to 70 horsepower Indian tractors is GH¢30,000 and goes up to GH¢35,000 for tractors that are 75 horsepower and above. Well-known brands like John Deere and Massey Fergusson tractors could cost nearly double. In interviews with tractor service providers and farmers, the consensus was that inexpensive brands are not in popular demand due to their unfavorable experiences. Some argue that these brands' durability was much less of

BOX 4.1: Business Prospects on the Rise for a Tractor Importer and Distributor in Ghana

Mechanical Lloyd is a company that imports, sells, and services vehicles in Ghana and is one of the leading tractor brands in the world. The company has been importing tractors (mainly 65–80 HP) for the past 40 years and operates service centers in Kumasi, Accra, and Tamale with a total staff of 16 for the tractor business alone. In addition, Mechanical Lloyd makes use of mobile vans to provide services to distant areas.

The company has seen increased demand for tractors recently. In past years, it sold an average 28 tractors annually, but in 2011, it had already sold 20 in April. Hence, market prospects look good, but there are constraints for buyers as their brand of tractors is more expensive (but durable) and financing is a major problem. A 2 WD, 72 HP tractor sells for US$35,000, while a 4WD costs $42,000. As for financing, the company does not offer credit to its buyers, though it receives an interest-free 150 days credit from the parent manufacturing company.

In the view of the company's manager, Government's involvement in the machinery sector has not affected its business. The Government program caters to the needs of small farmers who otherwise would be unable to receive services. It also creates demand for machinery services. Up to now, its main customers have been commercial farms and big farmers. The company's tractors have not been included in the Government's subsidy program due to their relatively higher cost.

The company manager agrees that spare parts are expensive but indicates that spare parts are not difficult to get for its tractors. The company keeps stocks of most smaller parts, but due to cash flow issues, bigger and expensive parts may need to be ordered from overseas, which takes no more than 3–4 weeks. As the duty drawback system is cumbersome, the company pays all the duties and charges to import spare parts, which are included as part of the selling price. This raises the cost of tractor operation and may discourage ownership.

Source: Field interview.

an issue than availability of skilled tractor users and after-sale services. On the other hand, certain brands such as John Deere and Massey Fergusson are popular but much more expensive.

Because most farmers in Ghana do not own a tractor, they are dependent on tractor hire services. In addition to the AMSECs, there are commercial farms or farmers who provide tractor hire services after they have completed their own field operations. In Ghana, the current national average rate for rental of tractors is $46; regionally, average rates are: S. Savanna = $42; Forest = $47; and Coastal Savanna = $50.[3]

3 Interview with NAAMSECO.

Chapter 5: FINANCE

Over the years, Ghana has experienced growth in the financial market with an increased number of banks, non-bank financial institutions, and microfinance institutions. The number of borrowers has expanded as well. Yet access to financial services by businesses, particularly in the rural areas, is difficult and, when it is available, expensive. Despite falling nominal rates, the combination of domestic inflation and the steady depreciation of the Ghana cedi have contributed to an overall increase in interest rates. Agriculture receives substantially less attention on the part of commercial banks than other sectors, accounting for about 6 percent of commercial loans (BOG, 2011).[1] Many providers of financial services are

TABLE 5.1: Summary Observations on Agricultural Finance in Ghana

SUCCESS FACTOR	INDICATORS	RESULTS OF INDICATORS
Finance	% of commercial bank lending to agriculture	6.1% (includes crops, livestock, forestry, and fishing) (2010)
	% of non-performing loans within the agriculture portfolio of commercial banks	21%
	Commercial bank interest rates (avg. interest rates offered by the banks for loans to agriculture)	25–40%; The lending tier is as follows: (i) farmer organizations and small scale traders tend to pay about 35–40%, while mid-sized processing firms or input dealers pay 30–35%. Bigger importers are offered better rates between 25–30%, while rates lower than 25% are offered where some kind of guarantee is available.[2]
	% of rural HHs receiving credit for agriculture	8%; this indicator is based on the Ghana Living Standards Measurement Survey, which interviewed 8,687 households (5,069 rural households) in 2006 all across Ghana.[3]
	Bank branches per 100,000 rural adult population	Ghana has 5 banks per 100,000 rural adults.
	% of Farmer-Based Organizations (FBOs) with access to finance	43%; MOFA monitors the existence of functioning agricultural FBOs in all regions of Ghana and has maintained a database since 2006. From 2008 to 2009, there was a 62% increase in the number of FBOs in Ghana that accessed finance. Additional details were not monitored by MOFA.
	Existence of a warehouse receipt program (Y/N; Scale: 0–5)[4]	Y; Rating = 1; A task force has been formed with membership of Govt., Ghana Grains Council, and donors to prepare the groundwork for a warehouse receipt law and its accompanying regulations, to be completed in 2012.
	Availability of loan guarantee programs for agriculture (Y/N)	Y; Since 2010, Stanbic Bank has offered a $15 million guarantee fund from AGRA. Recently, an additional $15 million is offered by DANIDA. USAID/DCA also have a credit guarantee program with ECOBANK for $9.3 million. NIB, ADB, and a couple of rural banks have funds from MiDA, AFD, and KFW for onward lending to farmers.
	Existence of law on leasing (Y/N)	Y; Law on leasing exists and is accepted by all FIs and utilized as such by them. In 2007, there were 14 leasing companies in Ghana, including 9 banks and 5 non-bank financial institutions.
	Existence of a law for use of movable assets as collateral (Y/N)	Y; The Parliament of Ghana enacted the Borrowers and Lenders Act (773) under which the Collateral Registry was established and began operations on February 1, 2011.
	Existence of a credit reference bureau (Y/N)	Y; Government of Ghana enacted the Credit Reporting Law (Act 726) in 2007. As a result, in 2009, the first license was awarded to a private company to operate as a credit reference bureau.

Source: Summary of Indicators presented in the Chapter.

1 Agriculture sector is defined as cereal production, cocoa, livestock, poultry, forestry, logging, and fishing. Processing of agriculture goods are not included and was not possible to be tracked as the banks did not keep disaggregated data. Hence, this indicator captures lending to "agriculture production" only, but as this exercise evolves, it is expected that the scope will expand and there will be a way to capture data that finances the remaining stages of the agriculture value chain.

2 The breakdown is given based on interviews with various actors of the agriculture value chain.

3 Note that IFPRI planned to launch national surveys of rural households in collaboration with MOFA in 2011 that would generate current estimates.

4 (0) Does not exist; (1) Warehouse receipt system under development; (2) WR law developed & passed/approved by a legislature/WR law, by-laws, and supporting regulations developed; (3) WR law, by-laws, regulations implemented & certified commercial warehouses & banks begin participating in a WRS; (4) Warehouse receipts are accepted by commercial banks; farmers/traders able to use them as collateral; (5) WRS expands—increased no. banks & certified warehouses, increased grain stored in certified warehouses; (6) A secondary market emerges for tradable warehouse receipts.

hesitant to provide loans to the agriculture sector due to a history of non-repayment of subsidized loans, land tenure issues, the risky nature of rain-fed agriculture business, and in many instances, a general lack of knowledge about how to tailor programs for the purpose of agricultural finance. Alternative sectors such as trade, commerce, and government bonds are widely perceived as being less risky and more likely to generate higher yield returns.

However, in part owing to Government interest in agriculture, especially after the food and fuel crisis, banks and other financial institutions are showing greater interest in the sector. Loan guarantee funds are being designed and implemented, private equity funds are coming up, insurance products are being tested, a warehouse receipt system is in development, and more financial institutions are becoming members of the credit registry bureau for increased transparency and information sharing. All of these developments potentially have positive implications for investment in the agriculture sector.

5.1 POLICY AND LEGAL ENVIRONMENT FOR FINANCE IN GHANA

Since the 1980s, the financial sector in Ghana has undergone a series of reforms. It has moved from a sector that consisted primarily of state-owned banks to a diverse market of private commercial banks, non-bank financial institutions, and microfinance institutions. These include domestic, regional, and international institutions (see box). Despite these changes, the Government still has major shareholding in some of the banks.

Ghana's Financial Landscape[5]

Banks

Deposit money banks—26;
Rural and community banks—135

Non-Bank Financial Institutions

Finance companies—19;
Leasing and hire purchase companies—7;
Venture capital funds—5;
Mortgage finance companies—1;
Savings and loan companies—18;
Credit unions—500 (approximately)

Other Microfinance Institutions

Financial NGOs; Susu collectors[6]—4,000
(of which 1,200 are Susu companies);
Micro insurance and leasing companies

5 Ghana Financial Sector Strategic Plan II 2010 (draft).
6 Susu collectors in Ghana are financial agents (some are informal) that offer credit and savings to clients that are in need of short-term loans.

Commercial banks and savings and loan companies operate under the supervision of the Central Bank, while rural and community banks are monitored by ARB Apex Bank. Credit unions are separately monitored through an association, and the same type of mechanism is in place for financial NGOs. The overall legal framework for finance in Ghana has been found to be flexible, and laws allow bank and non-bank financial institutions, with very few restrictions, to: (i) accept pledges of livestock and equipment as collateral; (ii) allow purchase of livestock or equipment on credit; (iii) finance standing crops as preferred collateral; (iv) provide a security interest that can attach to rotating inventory or to proceeds of collateral; and (v) lend on the strength of a signature (credit card)(AgCLIR, 2008).

5.2 COMMERCIAL LENDING TO THE AGRICULTURE SECTOR

In Ghana, there are numerous financial providers in the market, such as commercial banks, rural development banks, non-bank financial institutions like finance companies and credit unions, and microfinance institutions. Most of the institutions in the private sector are doing well financially and have expanded their businesses over time. Yet, many institutions are not targeting the agriculture sector and production-related farm activities. In reviewing the portfolio of 26 commercial banks for the month of February 2011, it was found that only 5.6 percent of their total lending goes to agriculture. Three out of the 26 banks do not lend to agricultural borrowers. Ten banks are lending in the range of GH¢1–20 million (Table 5.2). Some modest improvements

TABLE 5.2: Degree of Outstanding Loans to Agriculture, Feb. 2011

VOLUME, GH¢	NO. OF BANKS
No Lending	3
Less than 500,000	3
>=500,000 & <1 million	3
>=1 million & <20 million	10
>=20 million & <40 million	5
>=40 million & <100 million	0
>=100 million	2
Total	**26**

Source: Bank of Ghana, 2011.

TABLE 5.3: Commercial Bank Lending to Key Sectors[7] in Ghana

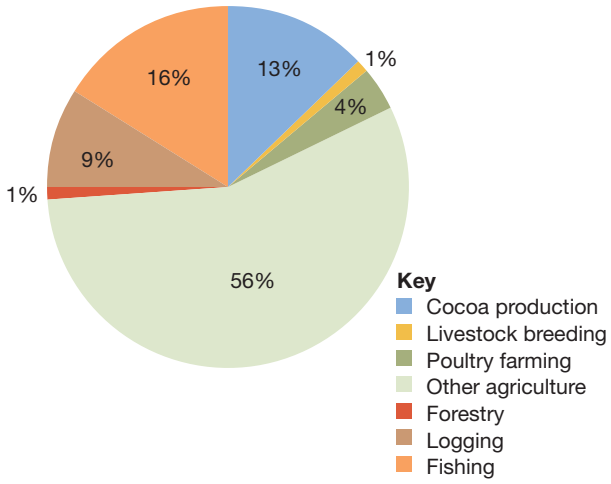
SECTOR	2008		2009		2010	
	GH¢ MILLION	SHARE OF LENDING	GH¢ MILLION	SHARE OF LENDING	GH¢ MILLION	SHARE OF LENDING
Agriculture, Forestry, & Fishing	255.2	4.3%	328.3	4.7%	489.8	6.1%
Cocoa Marketing	59.7	1.0%	47.1	0.7%	39.1	0.5%
Mining & Quarrying	172.7	2.9%	190.4	2.7%	216.8	2.7%
Manufacturing	709.3	11.9%	805.8	11.6%	1,060.3	13.3%
Construction	404.7	6.8%	543.1	7.8%	601.8	7.5%
Electricity, Gas, & Water	237.9	4.0%	437.3	6.3%	521.0	6.5%
Import, Export, & Domestic Trade	1,952.1	32.7%	2,155.8	31.1%	2,476.0	31.0%
Transport, Storage, & Communication	176.0	2.9%	276.5	4.0%	321.3	4.0%
Services	1,425.2	23.9%	1,452.6	21.0%	1,650.0	20.6%
Miscellaneous	574.1	9.6%	691.9	10.0%	618.6	7.7%
Total	5,966.8	100%	6,928.6	100%	7,994.7	100%

Source: Bank of Ghana, 2011.

are evident in 2010 as compared to previous years. In 2008 and 2009, the shares of commercial bank lending to agriculture (which excludes financing that goes for cocoa marketing) were 4.3 percent and 4.7 respectively (Table 5.3).

Investment in general agricultural production accounts for more than 50 percent of the agriculture portfolio of commercial banks in Ghana (Figure 5.1). This is followed by fishing (16 percent), cocoa (13 percent), and forestry and logging (10 percent). Because agro-processing is classified as manufacturing sector, it is omitted from agricultural investment figures. Data from February 2011 indicate that the subsector termed as "food, drink, and tobacco" amount to GH¢207 million lending from commercial banks, which accounts to 2.8 percent of total lending.

FIGURE 5.1: Agriculture Sub-sector Composition of Commercial Lending in Ghana



Note: The chart contains data for the month of February 2011.

Source: Bank of Ghana, 2011.

In addition to Ghana's commercial banks, the Agricultural Development Bank was established in the mid-1960s to provide financing specifically for agriculture. The Bank's performance since that time has been mixed. Loan repayment rates have been poor even though the Bank offers lower interest rates than commercial banks, with a base rate of 19 percent for maize farmers and 22 percent to the rest of the agriculture sector. Despite its name, most of the Agricultural Development Bank's lending portfolio is not devoted to agricultural investment. In 2009, just 25 percent of its lending went to agriculture, a proportion that rose to 29 percent in 2010.[8] Two-thirds of its lending portfolio is invested in construction, services, manufacturing, commerce and finance, and mining and quarrying (ADB 2009 and 2010). Within the Bank's agricultural lending portfolio, just 3 percent went to food crop production in 2009. The rest went to industrial crops, cocoa, poultry and livestock, and agricultural marketing. The Government is in the process of setting up the Ghana Export Development and Agriculture Investment Fund (EDAIF) to offer financing on reasonable terms and potentially serve as an alternative to the Agricultural Development Bank.

Rural and Community Banks (RCBs) are major players among the financial institutions that serve rural Ghana. As of 2010,

7 This table excludes financing COCOBOD raises to finance the cocoa sector.

8 Interview with ADB Staff at the Head Office in Accra.

135 such banks were licensed and supervised by the Bank of Ghana. Data collected from a sample of 11 RCBs indicated that the sectoral composition of their lending portfolio was as follows: trading (41 percent); personal loans for salaried clients (42 percent); agriculture, forestry, and fishing (9 percent); cottage industries (6 percent); transport (3 percent) (Nair and Fissha, 2010). Although a proportion of personal loans and loans for trading may very well be made for agricultural purposes, information that is collected by the RCBs do not specify whether this is the case.

In addition to banking, there has been an increase in the number of leasing companies in Ghana. Fourteen companies were engaged in leasing at the end of 2007; nine were bank lessors, and five were non-bank. By then, the value of new leases booked had increased dramatically. In 2006, new leases had amounted to $31.46 million. In 2007, this value had risen to $93.31 million. Less than 1 percent of this amount related to the agriculture sector. The retail sector accounted for 20 percent of the value of leases, while construction, mining, and manufacturing sectors together constituted more than 35 percent of total leases booked (IFC 2008).

5.3 ACCESS AND THE COST OF AGRICULTURAL CREDIT

Access to Finance for Farmers

Though finance is a key input for agriculture, access to finance is a major constraint in Ghana. According to the Living Standards Measurement Survey (GLSMS5, 2008), only 8 percent of rural households in Ghana reported receiving credit for agricultural purposes. Out of the households that received credit, more than 50 percent received financing through informal means (money lender, traders, relatives, friends, etc.). In the formal sector, a larger percentage of households' sources of credit are from State Banks and Cooperatives (Table 5.4).

TABLE 5.4: Sources of Agriculture Credit (first/most important source)

SOURCE	NUMBER OF RURAL HOUSEHOLDS	% OF RURAL HHS
State bank	46	11%
Private bank	22	5%
Cooperative	34	8%
Government agencies	16	4%
NGO	11	3%
Business firm	4	1%
Employer	0	0%
Money lender	10	2%
Trader	53	13%
Farmer	22	5%
Relative, friend, etc.	189	45%
Other	11	3%
	418	100%

Source: GLSS5 2008, IFPRI 2011.

Access to Finance for Agro-Enterprises

It can be as difficult for aggregators, wholesale traders, and processors in Ghana to get access to credit as it is for farms and rural households. Because banks and financial institutions do not keep disaggregated data on their borrowers or track purposes of their loans, it has not yet been possible to measure what proportion of agricultural lending goes to these agro-enterprises. A formal survey would be required to ascertain this. What is evident is that agro-enterprises have difficulty in securing a loan from banks and have to rely on personal and informal means. A study undertaken by IFDC and IFPRI found that 79 percent of registered agro-input dealers reported lack of working capital as a top challenge in effectively running their business (Table 5.5). The problem with financing is consistent across all regions of the country and is a barrier to firms based in urban as well as rural areas. An enterprise survey that focused on collecting data from formal firms in Ghanaian cities found that 56 percent of food and beverage companies (many of whom may even be exporting internationally) indicated that access to finance is a major constraint for their business. Only 30 percent of the same firms had a line of credit or loan from financial institutions, and just 28 percent took loans from the bank to finance investments. The value of collateral for the loans was very high, at an average of 169 percent of the total loan (Enterprise Survey, 2007).

Cost of Credit and Loan Periods

For those agro-enterprises or farmers who are offered loans from financial institutions, the cost of credit in terms of interest rates and additional fees charged are high. Based on data provided by commercial banks, Bank of Ghana quotes a range of 25–40 percent. Those lower interest rates closer to the 25 percent level are generally only offered in cases in which a guarantee program is available. The larger importers tend to get relatively favorable rates at about 25–30 percent (although international companies that import are able to much more favorable rates in international markets).[9]

9 But they do expose themselves to currency risk, especially if they are net exporters.

TABLE 5.5: Top Challenges to Running a Business

	ASHANTI	BRONG-AHAFO	CENTRAL	EASTERN	GREATER ACCRA	NORTH	UPPER EAST	UPPER WEST	VOLTA	WEST
Low customer demand for items for sale	16	10	10	15	6	8	19	5	25	17
Lack of reliable suppliers	4	5	4	4	3	13	3	15	6	5
Lack of capital	49	65	55	55	76	53	65	59	56	46
High cost to transport goods	10	7	14	8	5	16	6	12	5	13
Lack of tech. knowledge	3	1	5	5	0	3	2	2	1	1
Lack of adequate & safe storage facilities	3	1	3	2	6	5	2	5	1	2
Low quality of products	1	1	2	1	0	0	0	1	0	1
Others	9	8	6	8	3	2	3	0	6	14

Source: IFPRI/IFDC 2009.

Medium-sized firms reported being charged 30–35 percent, while farmer-based organizations and smaller agro-enterprises (aggregators, traders) are offered rates as high as 35–40 percent. Most loans have short repayment periods that usually do not exceed one year. Such terms do not make capital expenditure attractive to agro-enterprises and commercial farms where investments have to be made for a longer time period. Those that cultivate tree crops, for instance, have little interest in a loan that must be repaid in less than a year, given that their investment will take several years to yield returns. (A mango tree takes at least 5 years to produce commercial quality fruit.)

In addition to the interest rates themselves, interest rate spreads among Ghanaian banks are quite high (Table 5.6). This may be the result of any number of factors, or combination of factors. The banks may be mismanaged or not be lending efficiently. They may be experiencing high operational costs or have higher than expected levels of non-performing loans.

TABLE 5.6: Interest Rate Spread,[10] Selected Countries, 2009

COUNTRY	INTEREST RATE SPREAD	NON-AFRICAN COUNTRIES	INTEREST RATE SPREAD
Ghana	21.8%	Thailand	4.9%
South Africa	3.2%	Malaysia	3.2%
Tanzania	7.1%	Singapore	5.1%
Kenya	8.8%	Indonesia	5.2%
Mozambique	6.2%	Sri Lanka	5.1%

Source: International Financial Statistics 2010, IMF; Note: Data on Ghana is for 2010 (Bank of Ghana).

10 Interest rate spread is the interest rate charged by Banks on loans to prime customers minus the interest rate paid by commercial or similar banks for demand, time, or savings deposits.

5.4 SPECIAL MECHANISMS FOR AGRICULTURE FINANCING IN GHANA

A number of potentially important private initiatives and public programs have been introduced or are being planned to increase the availability and improve the performance of agricultural finance in Ghana (Table 5.6).

Stanbic/AGRA Loan Guarantee Program

Stanbic Ghana is part of the Standard Bank Group of South Africa. Stanbic started operations 10 years ago and has 23 branch offices in 9 regions in Ghana. Over the past few years Stanbic Ghana has become interested in the agriculture sector. Before this, the firm was mainly involved in financing projects in the construction and manufacturing sectors. The AGRA Program, signed in March 2010, is being implemented in four countries: Ghana, Mozambique, Tanzania, and Uganda. The Agriculture Finance Facility, referred to as "first loss guarantee," operates as follows: Stanbic will lend its own funds, and for every US$10 the Bank invests, AGRA provides a first loss guarantee of $1 (as of years 3–5). For year 1, AGRA guarantees 20 percent, which is reduced to 15 percent during the second year, and to 10 percent between years 3 and 5. The AGRA program aims to cover a total lending volume of $25 million, targeting at least 5,000 smallholders.

Establishment of a Collateral Registry

The Parliament of Ghana enacted the Borrowers and Lenders Act (773) under which the Collateral Registry was established

TABLE 5.7: Selected Examples of Agriculture and Value Chain Financing Programs in Ghana

TITLE	PROGRAM OBJECTIVES	IMPLEMENTING AGENCIES	DEVT. PARTNERS	TYPE OF FUNDING	TOTAL BUDGET	TIME PERIOD
Program for the Promotion of Perennial Crops (Rubber, Oil Palm)	The program will support smallholder farmers in expanding production of rubber and oil palm subsectors through the arrangement of outgrower schemes in partnership with industrial operators.	MOFA, GREL, TOPP, ADB, NIB	KFW	Loan	Eur 40.7 million	2006–2012
Outgrower and value chain fund (Successor of Promotion of Perennial Crops)	The fund will provide medium- to long-term loans to commercially viable value chains, especially outgrower schemes that will improve the income of small-scale farmers.	Private Fund Management Team	KFW	Loan	Eur 32 million	2011–2016
Development Credit Authority	The program will encourage short-, medium-, and long-term financing to SMEs through a guarantee program.	Opportunity International Savings & Loans (OISL) Ltd	USAID	Grant	US$9.3 million	2009–2013
Rural and Agricultural Finance Program (RAFiP)	The program will improve the rural and agricultural population's access to sustainable financial services through enhanced outreach, sustainability, and linkages. The program will target rural poor, particularly women and vulnerable groups.	Bank of Ghana, financial institutions, MOFA, Apex Bank	IFAD	Loan	US$41.8 million	2010–2016

Source: MOFA.

and began operations on February 1, 2011. The system promotes transparency of information about borrowers' assets that are registered as collateral for bank borrowing. When fully operational, the system will be 100 percent electronic. Both movable and immovable properties are registered. The registration fee is GH¢7 per user. Companies that are interested in doing a search on assets pay GH¢5 and a GH¢2.00 annual renewal fee. The fees are low because the Registry is operating under the Central Bank and there are plans for it to be placed in the private sector once it is fully functional and builds its reputation. Seventy entities are currently registered. These include commercial and rural banks as well as some of the non-bank financial institutions. As of March 2011, 6,000 searches had been conducted in the database. In addition to transparency of information, the system allows financial institutions to recover assets from defaulters and place them on sale (with 30 days notice) without having to go to court. This feature is attractive to lenders and may have a positive impact on agricultural lending that lenders consider high risk.

Warehouse Receipt System

In the absence of easy access to credit, a warehouse receipt system that would allow secure storage of commodities and reduce price volatility will be instrumental in increasing investment in agriculture. Inventory credit on an informal basis is common practice in Ghana. No formal receipt system has yet been put in place. The Ghana Grains Council (GGC) has taken the lead in training owners of private grain storage centers and has so far certified five warehouses. The GGC is a membership-based organization that represents the interests of the grain industry, including advocacy on policy and regulatory issues before the Government. A task force has been formed to prepare the groundwork for a warehouse receipt law and its accompanying regulations to be completed in 2012. Once the law and regulations are in place, the GGC will help link these warehouses with banks to provide collateral management services. The task force consists of the Government of Ghana, GGC members, and donors. The Government participates through representatives from Ministry of Justice, Attorney General's Office, Ministry of Trade, Ministry of Finance, Ministry of Agriculture, and Ghana Standard Board. The donors are the World Bank and the UN Development Program.

Establishment of a Credit Reference Bureau

The Government of Ghana enacted the Credit Reporting Law (Act 726) in 2007. As a result, the first license was awarded to a private company named XDS Data Ghana to operate as a credit reference bureau. The bureau started operations in April 2010 and collects credit information on borrowers, making it available for banks and non-bank financial institutions. Two new companies are currently in the process of getting licenses. All commercial banks and about 25 non-bank financial institutions in Ghana have signed up for the services of XDS Data. XDS Data is currently discussing service fees and payment modalities with commercial banks. In June 2011, about 8,000 enquiries were recorded. So far, banks are only sharing negative information. It is hoped that in the future, the amount of information shared about clients with good

credit histories will increase. In a market where the banks are hesitant to lend to new borrowers, this mechanism will help reduce information asymmetries by providing the lending institutions with credit history information about borrowers.

Export Development Investment Fund (EDIF)

EDIF was established in 2001 by Parliamentary Act 582 to provide financing for the development of export trade. It offers a low subsidized interest rate of 12.5 percent per annum and includes short (up to 1 year), medium (5 year) and long term (5 years plus) financing. Loans approved from April 2002 to May 2010 totaled GH¢125 million for 214 projects, averaging more than GH¢500,000 per project. Agricultural projects accounted for 16 percent of the finance provided. In addition, EDIF operates a development facility that awards grants to producer associations to develop their capacity to secure or apply for commercial loans. Though the financing is available, the process to access loans for enterprises has been characterized as cumbersome. With the renewed interest in agricultural financing, the fund is being reorganized to make agricultural lending a priority, and an amendment bill is awaiting action by the Parliament. The name of the fund will be changed to the Export Development and Agriculture Investment Fund (EDAIF).

Chapter 6: TRANSPORT

Ghana's transport sector is relatively well developed. Roads are the predominant mode of transport, accounting for 94 percent of freight and 97 percent of all traffic movement in the country (World Bank 2009). The transport sector is fully liberalized, and the trucking industry is for the most part a private sector activity, with relatively easy entry for new businesses. As of 2009, the road network in Ghana consisted of 12,400 kilometers of urban roads, 42,209 kilometers of feeder roads, and 12,839 kilometers of trunk roads.[1] Over the years, sustained investments have been made in expanding road infrastructure.[2] Road density has increased to 158 kilometers per 1,000 square kilometers, and rural access has improved (Rural Access Index: 61 percent). Despite a recent funding increase for road maintenance, however, improvements in existing roads are needed.[3] Overloading of commercial vehicles traveling on roads averaged an estimated 15 percent in 2009 (Vision Consult Ltd, 2011). The resulting deterioration in road quality adds to the costs of transporting agricultural goods. In trans-border corridors, check points and demands for bribes can add to further delays, increasing transport costs and ultimately leading to higher transport prices.

1 Urban roads are almost entirely paved, whereas feeder roads are typically not, ranging from hard lateritic surfaces to sandy or dirt tracks. Trunk roads are primarily paved roads, though some have not been upgraded from hard lateritic (yet graded) surfaces.
2 Total financing for roads in 2009 was $274 million.
3 Government spending on roads maintenance (routine, periodic, and minor rehabilitation/upgrading) has increased nearly two times from $34.22 in 2004 to $97.22 million in 2008.

6.1 TRANSPORT POLICY AND INVESTMENTS IN GHANA

The transport sector accounts for about 5 percent of GDP and plays a critical role in the economy of Ghana. Since the 1990s, the Government has undertaken major efforts to develop the sector through increased involvement of the private sector in port operations, maritime trade, and roads. In the roads subsector, Ghana established the Roads Fund to provide funding for maintenance. The current transport policy aims at further developing the sector by establishing Ghana as a transportation hub for the greater West Africa region. During the past decade, this objective has been complicated by ongoing political problems, insecurity, and harassment on roads in neighboring Côte d'Ivoire. The Government is working toward creating an accessible and affordable transport system that meets the needs of the

TABLE 6.1: Summary Observations on Transport Sector in Ghana

SUCCESS FACTOR	INDICATORS	RESULTS OF INDICATORS
Transport	Price per bag ($/bag converted to ton/km) of maize from major wholesale or assembly market to major urban center	Kumasi-Accra: $0.10/ton/km Wenchi-Accra: $0.12/ton/km Kumasi-Ejura: $0.35/ton/km
	Opinion of traders and truckers on the competitiveness of trucking services (Scale: 0–5)	Rating = 3.4
	Price paid to ship a standard 40-foot container to international destinations	Tema-Rotterdam (Netherlands): €970 (20ft), €1,464 (40ft) Tema-Newark (U.S. East Coast): $3,763 (20ft), $4,638 (40ft) Tema-Durban (South Africa): $2,374 (20ft), $3,827 (40ft) Tema-Apapa (Lagos/Nigeria): $1,700 (20ft), $2,700 (40ft)
	Ease of entry into trucking of foodstuffs (Scale: 0–5)	Rating = 4
	Government intervention in setting transport prices	None
	Length of time required to register a truck for hauling agricultural products	5 days (Avg.)
	LPI–Quality of trade and transport related infrastructure (e.g., ports, railroads, roads, IT)	Rating = 2.52 (Scale: 0–5)
	Rural Access Index	Rural Accessibility Index—HH Survey: 61 percent (2006)

Source: Summary of Indicators presented in the Chapter.

TABLE 6.2: Road Sector Funding Sources, US$ million

SOURCES OF FUND	2005	2006	2007	2008	2009	5 YR AVG.
Ghana Road Fund	108	121	119	170	97	123
Consolidated Fund	73	93	40	231	54	98
Donor Fund	91	93	173	101	123	116
Total Financing	**272**	**307**	**332**	**502**	**274**	**337**

Source: Statistical and Analytical Report, Ministry of Roads and Highways and GSS, 2011.

people and business enterprises, including farmers and agro-entrepreneurs.

Government investment to the subsector accounts for 99 percent of its overall investment in the sector, which is mainly financed by three main sources. A key source, which is a dedicated financing mechanism for maintenance, is the Road Fund, which is generated from fuel levies, road tolls, and registration fees. An additional Consolidated Fund is used to finance development works, including minor rehabilitation and upgrading. Donors play a critical role and financed 45 percent of total funding for roads in 2009 (Table 6.2). From 2008 to 2009, there was an increase in donor funding, but a sharp decline was observed in the Road Fund due to the depreciation of the national currency. This decreased the real value of the fuel levy, which is the principal source of revenue for the Ghana Road Fund.

There is considerable dissatisfaction with the quality of rural roads in Ghana. Maintenance works are identified and included as part of the road sector annual plans (referred as "approved" in the bar chart below), but are not achieved due to budget constraints resulting from increased priority for other capital-intensive investments for road reconstruction and rehabilitation. As a result, funds available for maintenance are inadequate. Poor quality roads, particularly feeder roads, affect the agriculture sector and add to the cost of transporting goods from farms and rural areas to major wholesale markets.

6.2 PRIVATE SECTOR PARTICIPATION IN THE TRANSPORT SECTOR

The transport sector in Ghana is liberalized and free of Government interventions. Trucking firms are privately owned and are free to set prices based on supply and demand. Entry barriers are relatively low, and Ghana receives a high score of 4 on a scale of 5. Once a truck is purchased and delivered, it takes about 5 days to go through registration formalities and get the truck ready for business. Although no formal registration with a transport association is mandated, a number of formalities are required. These include obtaining a certificate verifying that the vehicle is roadworthy, the purchase of insurance covering the driver and any third party, and payment of a vehicle income tax.

FIGURE 6.1: Feeder Roads Routine Maintenance—Approved vs. Achieved

Source: Statistical and Analytical Report, Ministry of Roads and Highways and GSS, 2011.

The private operators (truckers) find the environment to be conducive to doing business and assign a rating of 3.4 on a 5-point scale.[4] The major concern they express is the inability of regulatory authorities to enforce some of the regulations governing the road sector. Axle load limit non-compliance, overloading, and unlawful parking on highways and trunk roads are among the major concerns truck operators express. In Ghana, the transport sector comprises not only registered companies but also individuals who own vehicles they operate informally. Operators in the formal sector are more favorable about the business environment than informal actors. Factors such as payment of unauthorized fees, vehicle maintenance fees, and higher down time, among others, could contribute to the lower rating given by the informal sector. As their businesses are not well organized, they are more vulnerable to changing market conditions, especially their ability to manage down times efficiently. Yet they are contracted by agro-processing firms to undertake short distance deliveries, as they charge relatively lower charges due to their low fixed costs.

For truckers who import vehicles, the process of clearing trucks through customs can take up to 30 days, depending on the source, type, and capacity of truck. It can take up to 7 days to clear trucks through the port, another 7 days to complete processing with the Driver and Vehicle Licensing Authority (DVLA), and about 14 days to bring the vehicles into compliance with standards—a process that often entails increasing clearance, replacing balloon shock absorbers with springs, and refitting axles. According to customs officials, it is possible to clear vehicles in between 1 and 3 days if the importer is able to present all necessary documentation up front. However, customs is not the only agent involved. Importers report that most delays relate to the number of approvals that are required from agencies other than customs, including National Security, Ghana Port and Harbors Authority (GPHA), the Shippers Council, freight and terminal operators, and in some cases laboratory requirements. Because these other agencies may not be employing ICT at all stages of their operations, the process can easily be delayed.

4 Rating was measured on a scale of 0–5 on perception of private operators of trucks about their opinion on the business environment and competitiveness of the trucking services.

6.3 TRANSPORT PRICES IN GHANA

Transport prices paid by businesses in Africa are among the highest in the world.[5] Transport costs add to the high cost of doing business in Africa and several country transport corridor studies have confirmed it. The cost of transporting goods along the Tema-Ouagadougou corridor is 35 percent higher than the average for other African and Asian corridors such as Dacca-Chittagong, Laem Chabang-Vientiane, Durban-Nelspruit, and Maputo-Nelspruit (analyzed by Nathan Associates and USAID, 2010). According to the Logistics Performance Index survey conducted in 2009, 64 percent of the logistics companies (global freight forwarders and express carriers) consider transport rates in Ghana to be high or very high. In comparison, only 40 percent in South Africa and 32 percent in India find transport rates to be high or very high (Table 6.3).

Among domestic routes in Ghana, cost per ton of transporting material varies among different routes resulting from a number of factors. The high-cost routes are those that consist of old 5–10 metric ton trucks that carry between 50 and 100 125-kilogram bags. Poor quality roads lead to high maintenance and operational costs that the transporters then pass on to traders. Some routes have low volume commodities and inadequate competition, and sometimes collusion by truckers leads to high rates. On the other hand, the routes between major cities such as Accra, Kumasi, and Tamale are much lower owing to competition, the availability of more vehicles, and better maintained roads. On some routes such as Accra-Tamale, the use of larger 40-foot articulator trucks has led to lower costs.

Almost all the routes referred to in Table 6.4 are paved, but with intermittent construction on certain sectors. The Wenchi-Techiman route has the highest cost per

5 Global comparisons are referenced in the study done by Teravaninthorn and Raballand, showing that the average transport prices are more than two-thirds less in Pakistan than in major corridors in Africa.

TABLE 6.3: Logistics Companies' Response on Road Transport Rates

PERCENTAGE OF RESPONDENTS ANSWERING HIGH/VERY HIGH		
Ghana	**South Africa**	**India**
64%	40%	32%

Source: LPI, WB 2010.

TABLE 6.4: Transport Prices between Major Markets in Ghana (in May–June 2011)

FROM	TO	WEIGHT/ BAG(kg)	PRICE ($)/BAG	PRICE/kg($)	PRICE/MT($)	DISTANCE (km)	COST ($)/ MT/km
Wenchi	Sunyani	130	4.00	0.03	30.77	97	0.32
Wenchi	Techiman	130	2.67	0.02	20.51	29	0.71
Wenchi	Accra	130	6.67	0.05	51.28	427	0.12
Kumasi	Accra	50	1.33	0.03	26.67	272	0.10
Kumasi	Tamale	50	1.67	0.03	33.33	382	0.09
Kumasi	Ejura	50	1.73	0.03	34.67	98	0.35
Kumasi	Nkoranza	50	1.73	0.03	34.67	150	0.23
Abofour	Nkekensu/ Aseuso/ Asuboi	130	2.00	0.02	15.38	35	0.44
Wenchi	Kumasi	50	1.33	0.03	26.67	155	0.17
Accra	Tamale	50	2.33	0.05	46.67	654	0.07
Accra	Nkoranza	130	5.33	0.04	41.03	428	0.10

Source: Interview with traders and transporters in main transport terminals in Ghana.

kilometer. Despite being a busy route, many of the trucks operating on this route are older, and there is limited competition.

6.4 RURAL ACCESS AND QUALITY OF ROADS

Major road indicators show that Ghana is doing quite well in comparison to other low-income countries but fares poorly in most indicators when compared to middle-income countries (Table 6.5). Roads in rural areas are particularly important for the agriculture sector. Many actors who were interviewed identify the poor quality of rural roads as one of key constraints to doing business in the agriculture sector in Ghana. Due to poorly maintained roads, transporting goods from the farm to the markets has resulted in delays in delivery and has added to the cost of agriculture goods. The Rural Access Index for Ghana is 61 percent, while the GIS Rural Accessibility, which would be more reliable, shows a much lower performance at 24 percent.[6]

Over the years, Ghana's agricultural exporters have been seeking entry into foreign markets. Some horticultural produce has found markets in Europe. Other subsectors are being developed, and there is a high potential for Ghana's agricultural goods to be exported. Because roads are the primary mode of transport, the current system of logistics will require significant improvement. According to the Logistics Performance Index (LPI), Ghana received an overall rating of 2.47 out of 5 (Table 6.6). The LPI is the weighted average of

6 Rural Access Index measures the percentage of rural people living within 2 km of an all-season road. This data was generated based on the Ghana Living Standards Measurement Survey conducted in 2006.

TABLE 6.5: Ghana's Road Indicators Benchmarked against Low- and Middle-Income Countries

INDICATORS	UNIT	LOW-INCOME COUNTRIES	GHANA	MIDDLE-INCOME COUNTRIES
Paved road density	Km/1000 sq km of arable land	86.6	158.1	507.4
Unpaved road	Km/1000 sq km of arable land	504.7	804	1,038.3
Paved network condition	% in good or fair condition	80	75	79
Unpaved network condition	% in good or fair condition	57.6	74	58.3
GIS rural accessibility	% of rural population within 2 km of all-season road	21.7	24	59.9

Source: AICD National Database (as reported in Ghana's Infrastructure: A Country Perspective, World Bank 2011).

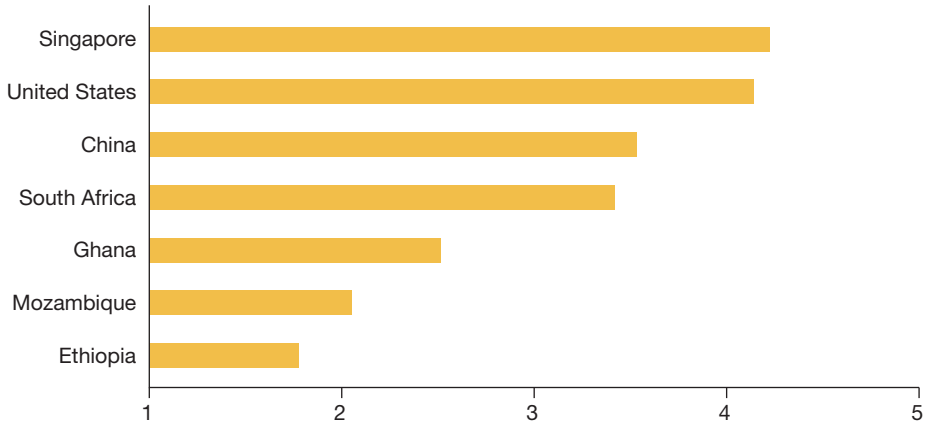
TABLE 6.6: Ghana's Performance in the Logistics Performance Index

	GHANA		SUB-SAHARAN AFRICA		WORLD	
			SCORE	DIFFERENCE	SCORE	DIFFERENCE
Overall LPI	score	2.47	2.42	0.05	2.87	–0.39
	rank	117				
Customs	score	2.35	2.18	0.17	2.59	–0.24
	rank	86				
Infrastructure	score	2.52	2.05	0.47	2.64	–0.12
	rank	71				
International shipments	score	2.38	2.51	–0.12	2.85	–0.46
	rank	129				
Logistics competence	score	2.42	2.28	0.14	2.76	–0.34
	rank	99				
Tracking & tracing	score	2.51	2.49	0.02	2.92	–0.41
	rank	108				
Timeliness	score	2.67	2.94	–0.27	3.41	–0.74
	rank	142				

Source: Logistics Performance Index, World Bank 2010.

the country scores on the six key dimensions: (i) Efficiency of the clearance process (i.e., speed, simplicity, and predictability of formalities) by border control agencies, including Customs; (ii) Quality of trade and transport related infrastructure (e.g., ports, railroads, roads, information technology); (iii) Ease of arranging competitively priced shipments; (iv) Competence and quality of logistics services (e.g., transport operators, customs brokers); (v) Ability to track and trace consignments; and (vi) Timeliness of shipments in reaching destination within the scheduled or expected delivery time. Compared to the rest of Sub-Saharan Africa, Ghana's performance is better in all indicators, except on the ease of arranging competitively priced international shipments and in timeliness of shipments to reach their destinations. However, when the indicator on Quality of Trade and Transport related infrastructure is compared with selected countries outside Africa and South Africa, Ghana is found to lag behind (Figure 6.2).

FIGURE 6.2: International Comparisons: Quality of Trade and Transport Related Infrastructure



Source: Logistics Performance Index, World Bank 2010.

Chapter 7: POLICY AND ENABLING ENVIRONMENT FOR AGRIBUSINESS DEVELOPMENT

Ghana's agriculture sector accounts for 30 percent of GDP. It employs more than 60 percent of the labor force, and it is an important source of export earnings. The policy direction provided by the Food and Agriculture Sector Development Policy (FASDEP II) toward a value chain approach to agricultural development, with a focus on value addition and market access, has created a favorable environment for agribusiness development. The new Private Sector Development Strategy (PSDS II) emphasizes the need to foster public private dialogues. Many associations either focusing on specific commodities or subsector advocating the interests of the private sector exist. Yet, efforts are mainly fragmented, and there is an absence of an active establishment of one group that speaks on the interest of the sector overall. While Ghana's policy is found to be conducive for agribusiness development, the private sector does have reservations from time to time on certain policy issues such as the fertilizer subsidy. In some agricultural subsectors, cocoa in particular, Ghana has performed well and producers' share of export prices is relatively good.

7.1 PRIVATE SECTOR PERCEPTIONS OF THE POLICY ENVIRONMENT FOR AGRIBUSINESS

The general perception among private stakeholders is that the agribusiness environment is favorable but could be improved. This perception did not, however, reflect in the final score (2.9) received on this indicator. In the fertilizer sector, private actors are supportive of the Plants and Fertilizers Act of 2010 and the regulations that are being prepared. Procedural and operational aspects of the fertilizer subsidy program are the main concern they expressed. The Government negotiates the prices of subsidized fertilizers with only a small, restricted number of importers, which makes the process less than transparent. The average 6-month delay in providing private importers with payment for subsidized inputs is also considered highly unfavorable, particularly where it has led to late delivery of fertilizers, such as in the South and in transitional zones. Private seed business operators express optimism about the effects of the Plants and Fertilizers Act of 2010, which they hope will allow the private sector to play an

TABLE 7.1: Summary Observations on Policy Environment for Agribusiness in Ghana

SUCCESS FACTORS	INDICATORS	RESULTS OF INDICATORS
Private sector perception of policy environment & advocacy role	Private sector perception of agribusiness enabling environment (Scale: 0–5)	Rating = 2.9; Managers of private sector representing the fertilizer, seed, machinery, transport, and finance sectors gave an average rating of the enabling environment to do business in Ghana. Overall environment seems to be good for all, but some sectors seem to be concerned about policies (i.e., subsidy) of the Government that has influenced their ratings.
	Policy consistency (Scale: 0–5)	Rating = 2.6; Private sector expects that the Government changes its policy from time to time, but the frequency is not that high, as shown from their average rating. More than policy inconsistency, private sector respondents were concerned that there is not a lot of transparency from the side of the Government in sharing policy and strategies.
	Private sector advocacy group for agribusiness: existence and effectiveness (Scale: 0–5)	Rating = 1; In Ghana, there are a lot of advocacy groups, including major business associations, such as the Association of Ghana Industries (AGI). In the agriculture sector, advocacy groups represent issues related to specific commodities. Only recently, there has been an initiative to start focusing on commercial agriculture with the advent of a group called Consultative Group for a Competitive Ghana (CG^2), which is at an early stage of operation. The 1 rating signifies that an agribusiness advocacy organization has been formed but has not done much in the way of policy advocacy (as of this writing).
Selected policy measures	% of annual federal budget allocated to agriculture (CAADP/NEPAD indicator)	9% (2009, latest year available); Ghana has signed the CAADP compact, which has set a target to allocate 10% of Government expenditure on agriculture. In 2009, GOG spent 9% of Government expenditure on agriculture, but over the last three-year period (2007–09), the average percentage was higher, at 11%.
	Farmer share of cash crop export price (cocoa)	57% (2009–10); COCOBOD is ensuring that producers receive better prices and as a result, they have been receiving more than 50% of FOB prices on cocoa exports.
	% of a key staple (maize) industrially processed	10%; This indicator measures the proportion of maize that is bought as processed food products (as flour, grits, meal, etc.) or feed or that is used as an input into beer brewing.

Source: Summary of Indicators presented in the Chapter.

increasingly important role in producing seeds for the internal as well as external markets. Private operators appear to be somewhat less concerned about the Government's role in the agro-machinery sector. Much of the concern they have about the Government's implementation of the mechanization problem involves operational modalities that have led the Government to import brands of tractors that are not durable and suitable for the soil type found in many zones of Ghana. Other than this, dealers consider the policy environment to be conducive to profitably providing tractors to mechanization centers, which in turn will be better able to profitably expand services to smallholders.

7.2 POLICY CONSISTENCY AND ROLE OF PRIVATE SECTOR ADVOCACY

Private sector perceptions of policy consistency in Ghana are comparable to perceptions of the broader policy environment (rating of 2.6). Most firms and individuals interviewed reported their impression to be that the Government provides a consistent policy environment. Some exceptions to this related to government input policies that had changed more frequently. One example was the fertilizer subsidy policy, the implementation of which had changed twice in 3 years. Import duties on rice have also been less stable. Every other year, the budget statements refer to changes in tariff rates, though these changes are not always applied in practice. The tariff on rice was removed in mid-2008 through the end of 2009 to soften the blow of world rice price hikes on urban consumers in Ghana. It was then reimposed in 2010, although some importers of rice through Tema complain that imports of rice from Cote d'Ivoire escape either tariffs or taxation. Some private sector players are of the view that there is very little information sharing that takes place about Government's policies and strategies that affect their operations.

A variety of lobby groups have been formed in Ghana to engage public officials in dialogue, often advocating for reforms. Many of these groups are quite new. There are some commodity-focused horticulture associations and a few in the grains sector (e.g., GRIB; GGC) that have been effective in their advocacy work. GRIB, in particular, is well organized and has useful contacts in MOFA, regularly engaging with relevant public agencies to advocate on behalf of its members in the rice industry. A recent private sector initiative called the Consultative Group for a Competitive Ghana (CG^2), representing commercial farms, traders, and processors of a number of agricultural commodities, is proposing that the MOFA establish a permanent Private Sector Liaison Office that ensures private sector inclusion in policy and program development for agriculture.

7.3 GOVERNMENT EXPENDITURE ON AGRICULTURE

The Government of Ghana has signed the CAADP compact. It is working toward achieving one of the compact's key targets—to allocate 10 percent of Government expenditure on agriculture. Ghana achieved this target from 2006 to 2008 but fell short in 2009 despite a budget that nearly doubled (Table 7.2). A large proportion of the MOFA budget covers recurrent costs, which increased substantially in 2008 and 2009. In 2009, the Government decided to add the budget line item for feeder roads.

The current methodology for calculating this indicator has been questioned, because it does not capture agricultural investments by bilateral donor investments, which are channeled directly through the Ministry of Finance. A more comprehensive view of public agricultural investment in Ghana will be needed for all investments and expenditures that go to the sector, not only by MOFA but by the Ministry of Finance and other institutions. For this purpose, an Agriculture Public Expenditure Review (PER) is now underway in Ghana.

TABLE 7.2: Government Agriculture Expenditure in Ghana

BUDGET ITEM (GH₵ '000)	2006	2007	2008	2009
MOFA	74,964	77,636	155,320	338,598
Fisheries	4,184	5,404	17,950	14,567
Forestry	15,480	25,923	34,234	67,815
Agriculture-related research	67,180	94,181	56,510	93,332
Debt servicing	42,343	47,166	68,418	5,462
Presidential support initiatives	15,709	30,868	2,168	650
Cocoa[1]	148,716	112,915	57,613	169,225
Feeder roads	—	—	—	91,732
Total agriculture	368,576	394,093	392,213	781,381
Total government expenditure	3,569,970	3,064,297	3,842,750	8,659,268
Agriculture Expenditure as % of Government (CAADP indicator)	**10%**	**13%**	**10%**	**9%**

Source: MOFA 2010.

1 There is some dispute on whether the budget for cocoa should be counted, as it is spending by a parastatal marketing company that should not count as public expenditure according to COFOG definition.

TABLE 7.3: Producer Prices for Cocoa Beans in Ghana

	2005–2006	2006–2007	2007–2008	2008–2009	2009–2010
Producer price/ MT ($)	978.26	943.30	888.43	1,141.26	1,536.00
FOB/ MT ($)	1,487.18	1,790.00	2,103.69	2,400.00	2,702.20
Producer price as % FOB export price	66%	53%	42%	48%	57%

Source: COCOBOD.

7.4 FARMER SHARE OF CASH CROP EXPORT PRICE

Ghana is one of the leading producers of cocoa in the world. Cocoa exports account for nearly a third of total foreign exchange earnings. It also plays an important role in the domestic economy, with more than 700,000 farmers whose livelihoods are dependent on cocoa cultivation. Over time, the industry has contributed significantly to poverty reduction in Ghana.

Since the early 1990s, world prices have been favorable for the cocoa sector, providing the COCOBOD with an important incentive to introduce reforms. Cocoa was an important priority of the Economic Recovery Program, which began during the early 1980s, seeking to improve producer prices. With internal reforms of the COCOBOD itself and by introducing initiatives to reform cocoa marketing with the opening of licensed buying companies, farmers have benefited through timely payments, access to subsidized input supplies, improvement in farming practices, etc. As a result, producer prices in proportion to FOB prices have been favorable (Table 7.3).

7.5 DEVELOPMENT OF THE PROCESSING INDUSTRY

Ghana's agriculture sector has experienced growth through increased production of staple crops, as well as diversification leading to increasing exports of cocoa and other nontraditional products, such as horticultural products and seafood. As a result, food security has improved, and the rate of poverty has declined. In addition, the Government offers incentives for foreign investment in agro-processing activities with a 5-year tax holiday and provision of reduced corporate tax incentives based on location of the industry. Despite these incentives, the processing industry is still at a nascent stage.

Maize is an important component of the Ghanaian diet. It is sold to households as grain and is milled on a custom hire basis by local millers. Most maize in urban areas is processed using small hammer mills, where households go to have their maize ground. Larger poultry farms have their own milling facilities. This small scale of processing leads to substantially less value addition than would be achieved through larger scale industrial processing. However, a small segment of the market has emerged in recent years for both packaged maize flour and pre-mixed food that contains prepared maize products such as banku, kenke, and porridge. The value addition is mainly done by small processing firms, either at the household level or in small/medium processing plants found in large towns. The packaged products are then sold in retail stores and supermarkets in big cities.

Some of the medium-sized processing firms are exploring opportunities to enter the consumer breakfast cereal market. So far, they are processing grits for the breweries and operating well under capacity. The domestic urban market for maize and other packaged goods is not easy to penetrate for local manufacturing companies, as the market is dominated by multinational brands such as Nestle and Unilever. Nonetheless, with technical assistance and innovations, there are prospects for local firms to expand into packaged food based on maize.

For the sector to modernize, industrial processing of maize is necessary to add value to the crop. The indicator we propose on industrial processing of maize would help measure the proportion of maize that is bought as processed food products (as flour, grits, meal, etc.) or as feed. So far, only about 10 percent of the maize available in Ghana is processed by medium to large-scale firms. More than 95 percent of processed maize is for the feed industry, and there is minimal processing for human consumption (Table 7.4).

TABLE 7.4: Industrial Processing of Maize (2009–2010)

Maize Production and Trade	
Production	1,871,695
Import	955
Export	121
Net maize available (MT)	**1,872,529**
Buyers of Maize for Processing	
Multinational companies (e.g., Nestle)*	1,100
Poultry industry*	175,000
Breweries*	5,640
Total estimated maize processed (MT)	**181,740**
% processed industrially	**10 percent**

Source: MOFA, MOTI.
*Data on buyers based on interviews.

Annex 1: SUPPORTING TABLES AND FIGURES

TABLE A.1: Certified Seed Supply and Its Potential Coverage of Cultivated Area in 2010

CROP	AREA CULTIVATED (Ha) 2010	CERTIFIED SEED PRODUCTION		SEEDING RATE	ESTIMATED AREA CROPPED WITH CERTIFIED SEED (Ha)	% CROPPED AREA THAT CAN BE PLANTED WITH CERTIFIED SEED	
		(MT)	(Kg)	(Kg/Ha)		% TOTAL AREA	ADJUSTED %
Maize	991,669	4326.6	4,326,600	22.5	192,294	19.4	58.2
Cowpea	166,980	27.2	27,210	17.5	1,555	0.9	2.8
Rice	181,228	1451.3	1,451,000	100.0	14,511	8.0	24.0
Soybean	76,220	339.8	339,760	37.5	9,060	11.9	35.7
Sorghum	252,555	5.04	5,040	7.5	672	0.3	0.8
Groundnut	353,376	19.7	19,700	70.0	281	0.1	0.2

Source: MOFA 2010.
Note: As the recommended or optimal seeding rate may not always be followed by farmers, the estimated area cropped to improved seed should be viewed as an approximation. Also, as the seeds used are open pollinated varieties that are found to be effective for 3 years, the cropped area is adjusted accordingly.

TABLE A.2: Fertilizer Consumption in Ghana, 2005–09

YEAR	FERT. CONS (Kg/Ha)	FERT. NUT. CONS (Kg/Ha)	ARABLE LAND AREA ('000 Ha)	TOTAL IMPORTS		TOTAL CONSUMPTION (MT)	NPK	% NPK	UREA	SoA	TOTAL
				VOLUME (MT)	TOTAL VALUE ('000 USD)						
2005	19	6	6,800	128,745	42,551	128,551	55,325	60.0%	4,491	32,341	92,157
2006	27	12	7,000	189,879	39,087	185,607	82,573	74.8%	8,771	19,090	110,434
2007	25	10	7,250	189,633	77,022	178,846	79,172	78.5%	4,262	17,458	100,892
2008	24	6	7,250	185,605	113,337	172,733	17,136	49.5%	13,456	4,047	34,639
2009	29	—	7,312	220,176	111,627	209,213	80,250	78.0%	8,685	13,991	102,926
2010	40	—	7,312	308,786	131,722	295,900	98,917	68.3%	13,025	32,965	144,908

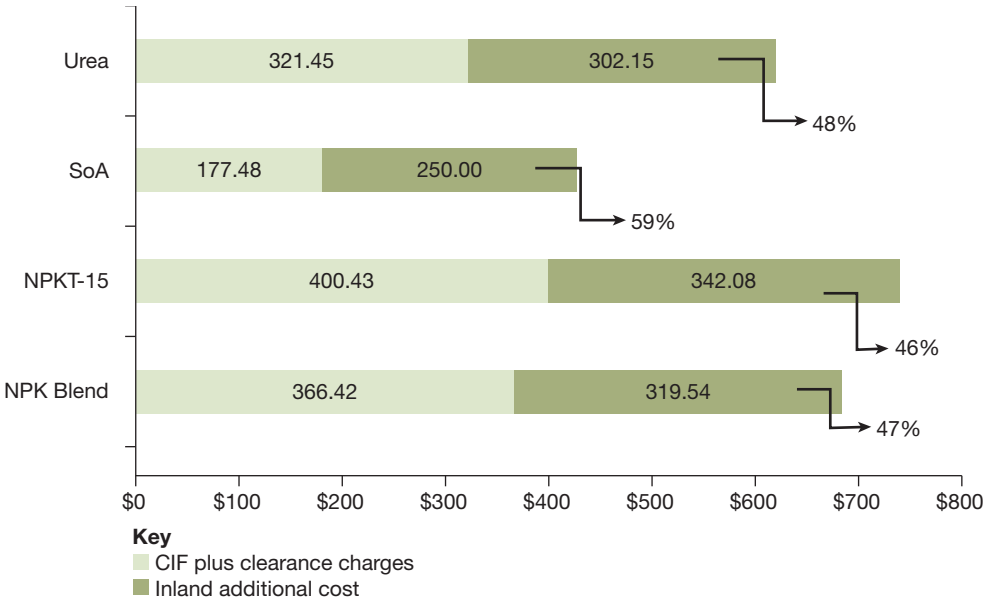
Source: MOFA (Arable land data for 2009); MOTI 2010; IFDC 2010; FAOSTAT, Author's calculation.
Note: Total consumption is less than total imports, reflecting exports. Arable land includes data for permanent crops.

TABLE A.3: Fertilizer Prices in Ghana (2006–10)

FERTILIZER PRODUCT	AVERAGE PRICES (GH¢/50 KG BAG)					PERCENTAGE CHANGES			
	2006	2007	2008	2009	2010	2006–07	2007–08	2008–09	2009–10
NPK-15	20.4	21.7	36.1	51.2	30.1	6.3%	66.2%	41.7%	–41.2%
SoA	17.5	18.1	28.1	32.4	20.1	3.2%	55.2%	15.4%	–37.9%
Urea	24.6	25.8	37.1	49.0	27.3	5.1%	43.7%	32.1%	–44.3%

Source: IFDC/IFPRI 2011 (Forthcoming); Price data for 2010 (IFDC 2010).

FIGURE A.1: Ghana Fertilizer Cost Components per MT (US$)



Source: Fuentes et al., 2011 (Forthcoming).

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