

ECONOMIC AND SECTOR WORK

AGRIBUSINESS INDICATORS:  
Mozambique

APRIL 2012



THE WORLD BANK

REPORT NUMBER 68241-MZ

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The World Bank  
1818 H Street NW  
Washington DC 20433  
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## Acknowledgments

This Agribusiness Indicators study has been a collaborative effort involving the following people:

- John Holtzman, principal investigator and author, and program coordinator for ABI
- Emerson Zhou, agricultural economist (consultant)
- Sophie Teyssier, rural and agricultural finance specialist (consultant)
- Danilo Abdulla, agricultural economist with working experience at MINAG/DE and CEPAGRI (consultant)
- Patricia van de Velde, research assistant to ARD

Pedro Arlindo, agricultural economist at the World Bank office in Maputo, was the principal AFTAR backstop.

Holtzman is the main author, although Zhou drafted some of the chapter on access to seed and provided parts of the chapter on mechanization. Teyssier drafted the entire chapter on agribusiness finance. Abdulla provided access to important data sets, and Zhou was instrumental in obtaining trade data, information on tractor sales and distribution, and transport data for Sofala Province (Beira Corridor trucking industry). Patrick Verissimo, lead AFTAR manager for the World Bank in Maputo, provided background and contextual input, as did Karen Faarbaek.

This study benefitted from a recently completed AgCLIR study, financed by USAID and led by Abt Associates Inc., prime contractor for the AgriFuturo Project, in the first half of 2011. Holtzman was also assisted in field work by AgriFuturo Project staff. Sidney Bliss, retired USAID agricultural specialist residing in Maputo, provided access to numerous key informants and kept Holtzman well informed of current developments in the Mozambican economy and agricultural sector. Cynthia Donovan, a Michigan State University agricultural economist formerly resident in Maputo (and based at IIAM), was also very generous in providing useful leads, documents, and access to data sets. Rui Ribeiro of AustralCOWI, a consulting firm, produced an excellent seed sector study for SDC, which greatly informed and influenced our thinking about access to seed, seed multiplication and distribution, and seed sector institutions, policies, and regulations.

Holtzman also benefited greatly from collaborative representatives of NGOs (CLUSA, IKURU, World Relief, and others) and several agribusiness entrepreneurs, who shared their insights and data. IFDC deserves special thanks, as do MozFoods, AgriFocus, Mozambique Fertilizer Company, various importers and distributors of tractors, the Sofala Province Trucking Association, Bridge Shipping (and Trading), TechnoServe, and USAID/Mozambique. Agricultural scientists participating in the multi-donor “platform” in support of IIAM and agricultural research in Mozambique, Director Xavier Vitorino of MINAG/DE, CEPAGRI managers, and other public sector informants working on the agricultural sector also contributed information and insights to this study. Two long-term advisors to ANE, David Geilinger and Larry Herman, also shared insights into road construction and maintenance, and transport policy and regulatory issues.

Any errors and omissions are the responsibility of the Agribusiness Indicators team, particularly John Holtzman. This study has been a broad-gauged work of integration and synthesis, drawing from many sources, which I have tried to cite and recognize. Some of these sources, such as the periodic TIA rural household surveys and the 2009/10 agricultural census, are judged to be highly reliable, whereas other sources—international trade data, international fertilizer import statistics, and data on tractor numbers,



to name a few—are judged to be far less reliable. Like many studies of this nature, this study has encountered hard-to-explain differences in alternative data series, particularly international databases such as FAOSTAT, COMTRADE, and the World Development Indicators of the World Bank, and domestically available (typically government) data sources.

At the beginning of each chapter, we provide a summary table or “scorecard” on indicator findings and data sources. These synthesis tables are not more than a page or so. Busy readers can consult these tables for a quick picture of the indicators for a given area of investigation. More detailed material and tables from some chapters are available in the annexes.

Holtzman and the ABI team invite critical comments and reviews of this document or any section thereof. Given the time and cost required to complete this first-round ABI country study, it is not likely that the agribusiness indicator work will be repeated in less than, say, three to four years, closer to the frequency of the World Bank’s Enterprise Surveys than the annual updates done under Doing Business. We look forward to your feedback and hope that this report will stimulate efforts to improve sectoral and agribusiness system data collection and analysis, as well as broader discussions about the policy and regulatory environment.

John S. Holtzman, PhD  
Program Coordinator, Agribusiness Indicators (in Africa)  
Funded by a grant from the Bill and Melinda Gates Foundation  
Agriculture and Rural Development (ARD), World Bank  
Washington, DC

## Executive Summary

Mozambique, the only Lusophone country covered in the Agribusiness Indicators initiative, has had a turbulent history since independence. Civil unrest over some 20 years and frequent drought in southern Mozambique, coupled with floods near the many waterways that transect the country (mainly east–west), have inhibited an agricultural transformation. Even so, Mozambique could be a regional breadbasket. The country has much potentially usable arable land, along with access to river water for irrigation in many agricultural production zones, particularly in central and northern Mozambique. Sesame, pigeon peas, and cashew exports are significant and rising, not to mention exports of industrial crops such as cotton, leaf tobacco, and sugarcane, yet production of grain and most other food crops remains stagnant. Irrigated area is way below what is possible and needed to increase yields and total agricultural output.

Far removed from the most productive agricultural zones, the capital city of Maputo sits in the southern tip of Mozambique and is tied closely to the South African economy. Concentrated in Maputo, Mozambique’s public institutions depend heavily on budgetary support (from donors) and development funds (for projects). Donor funding has skewed urbanization by fostering higher population growth in Maputo and nearby towns than in the hinterlands.

**Continued low agricultural productivity and underdeveloped input supply networks.** Mozambique’s efforts to expand agricultural productivity through increased access to and use of inputs have not yielded significant results and have not fostered the emergence of an input supply network led by the private sector. For food crops, the use of improved seed and fertilizer is very limited.

**Seed supply** is constrained by inadequate production of breeder seed and foundation seed. The low use of certified seed for basic grains, particularly maize and rice, causes yields of rainfed crops such as maize to be lower than yields in most other countries in sub-Saharan Africa (SSA). Ministry of Agriculture (MINAG) data show that the supply of certified maize seed would cover only an estimated 5.7% of the 2010/11 maize area. Improved seed was used only on an estimated 14% of the 2010/11 rice area, largely in irrigated production zones. In most years, maize production relies heavily on seed of open-pollinated maize varieties rather than of hybrid varieties (either imported or multiplied in country); hybrid seed represents 13–15% of total seed volume.<sup>1</sup>

Private sector seed multiplication is expanding, though slowly. The Basic Seed Production Unit (USEBA), which is a parastatal subsidiary of the national agricultural research institute (IIAM), produces most basic seed (except for rice seed), but volumes are typically too low for sufficient multiplication and wide-scale distribution to farmers. Many assert that demand for improved seed of maize and a wide range of other field crops is very limited. Seed costs are reportedly high (five times or more than the cost of the grain produced), and improved seed is often distributed through donor- or government-funded projects and programs, such as a two-year European Union (EU) scheme that subsidized certified seed and fertilizer for up to 25,000 small farms per year in 2009/10 and 2010/11.

**Fertilizer.** The vast majority of fertilizer was applied to leaf tobacco (51%) and sugarcane (42%) in the 2010/11 cropping season in Mozambique, with vegetables grown in peri-urban areas perhaps receiving

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<sup>1</sup> Of the total estimated maize seed supply of 2,007.4 t, 267.7 t were imported in 2010. If it was all hybrid maize imported by PANNAR, then 13.3% of the certified maize seed supply was hybrid. Some hybrid maize seed reportedly is produced in Mozambique under contract to PANNAR, but we were unable to get details on volumes.

more fertilizer in the aggregate than other food crops. Preliminary estimates for 2011/12 suggest that fertilizer application to bananas and food crops doubled, reducing the proportion of fertilizer allocated to tobacco and sugarcane from 92.8% to 84.4%. Maize and rice likely receive less than 5% of all fertilizer applied to crops in Mozambique, however. Furthermore, fertilizer is expensive by the time it is delivered upcountry and reaches rural villages. Knowledgeable observers report that applying fertilizer (urea, NPK) to maize is unprofitable for most smallholders in most rural areas of Mozambique. Nutrient output ratios are one measure of the feasibility of using fertilizer on maize. They were 8 to 14 in the post-harvest period of 2011, which means that fertilizer is too expensive to buy and apply relative to the low maize prices prevailing in maize surplus zones. Nevertheless, time-series data show that fertilizer use grew by 8.8% per annum from 2000 to 2010.

The fertilizer industry appears concentrated. Compared to Ghana, for example, Mozambique has only three major importers and far fewer agro-input dealers than other SSA countries (no more than 400 vs. some 4,000 in Ghana). The largest buyer of fertilizer, Mozambique Leaf Tobacco Company (MLTC), procures fertilizer from two suppliers. Most imported fertilizer is reportedly urea, while a standard NPK formulation of 12-12-12 is partly blended in Mozambique and partly imported. The NPK 12-12-12 blend is recommended for a broad range of crops and production zones, despite the variability in soil types and nutrient deficiencies across agro-ecological zones in Mozambique. Some NPK 12-24-12 is sold as well.

**Agricultural mechanization** to prepare soil for timely planting is used very little outside of large commercial farms and estate production systems; most farmers practice labor-intensive cultivation. Some animal traction is used in the south but is virtually non-existent in the northern half of the country, partly because of trypanisomiasis but also because cattle were decimated during many years of civil war. As with the provision of other productivity-enhancing inputs in Mozambique, the provision of farm equipment is often subsidized.

Mozambique had an estimated 12.6–14.2 tractors per 100 sq km of arable land from 2000 through 2010, while South Africa had 43.0 tractors per sq km (2004) and Kenya had 25.2 (2002). Our proxy in this study for access to modern farm machinery is the availability of tractor hire services. The demand for tractors has increased on medium to large farms that are strongly commercially oriented. Extensification of agricultural production should drive a vibrant agricultural sector led by the private sector, but government intervention in importing and distributing tractors on subsidized terms with non-transparent selection criteria bodes ill for the emergence of a private sector–led agricultural machinery servicing, maintenance, and custom-hire capability.

**Agricultural finance.** Finance is a critical input for agriculture, enabling new entrants to invest in start-ups and permitting businesses to obtain working capital to operate close to capacity or expand their operations. In Mozambique, access to agricultural finance is difficult. Even when loans are available, they are expensive. Agriculture receives much less attention than other economic sectors from commercial banks; lending to agriculture<sup>2</sup> was a mere 6.5% in 2010, down from 9.4% in 2008. Nominal interest rates on commercial bank lending are in the 23–30% range. Inflation rates, using the gross domestic product (GDP) deflator, have fluctuated from a low of 5.3% in 2009 to 12.7% in 2010; inflation rates began 2011 high but had dropped to a monthly average of closer to 10% in the second half of 2011, largely on the strength of the strong metical. At an inflation rate of 10%, real interest rates on

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<sup>2</sup> The agricultural sector is defined as field crop production, irrigated horticultural and sugarcane production, livestock, forestry, tree crop production (cashews), and fishing.

loans to agribusinesses are still high. According to the International Monetary Fund (IMF), the consumer price index is projected to drop from 10.8% in 2011 to 7.2% for 2012. As inflationary pressures ease, one would expect some scope for commercial bank interest rates to drop.

Many financial service providers hesitate to lend to the agricultural sector due to a long history of non-repayment of subsidized loans, thorny land tenure issues, and the risky nature of rainfed agriculture. Even with guarantee schemes, financial institutions are reluctant to lend to agriculture and agribusiness. While some banks and other financial institutions are showing greater interest in mobilizing rural savings and selectively lending to agriculture, the use of loan guarantee funds remains highly limited. Warehouse receipt systems essentially do not exist. The credit registry bureau is housed in the Bank of Mozambique (BoM, the central bank), and its limited information is not made available to most parties. Several banks do allow agricultural machinery (i.e., moveable assets) to be used as collateral, but at deep discounts to their estimated value. Many foreign-owned agribusinesses and Mozambican/foreign joint ventures access finance offshore in South Africa, Europe, or Asia, so they are less constrained by the shallow Mozambican financial sector, which is slow to lend to agribusiness through domestic financial intermediaries.

**Transport** along trunk roads in the Beira Corridor is efficient, competitive, and reasonably low cost, but transport beyond trunk roads is costly. The Rural Access Index for Mozambique, between 24% and 32% depending on which measure you use, is far lower than Ghana's. The numerous rivers, tributaries, and streams cutting east to west make rural transport costly and render some rural roads impassable (often flooded) during certain months of the rainy season. Field surveys suggest that transport costs are a major component of delivered input costs in rural areas and in marketing of agricultural produce. More conclusive findings require further data collection and analysis, however.

Mozambique's transportation sector outside of major east–west (seaport–interior) roads is not well developed. Rural and feeder roads that are important for agriculture are often not in good operating condition. Despite increases in funding for road maintenance,<sup>3</sup> several challenges need to be overcome. The overloading of commercial vehicles has caused road quality to deteriorate and raised the cost of transporting agricultural goods. Flooding in many low-lying areas near rivers leads to major damage to roads as well. Domestic transporter unions complain of unfair competition from foreign trucking fleets, which operate in Mozambique with few controls, but knowledgeable observers argue that fostering regional competition in transport is the best policy.

Mozambique's **agribusiness policy environment** is considered reasonably conducive to private sector investment, although much investment in commercial agriculture remains foreign (largely because, as discussed, domestic investors suffer from credit constraints and foreign firms can obtain capital more easily). The government's announcement of foreign exchange controls in mid-2011 was an unexpected and unpleasant surprise to many agribusinesses, as the private sector was not consulted about the change in policy. Government regulation and taxes are considered excessive. The legal and regulatory framework affecting agriculture is perceived as not fully transparent, sometimes contradictory, and

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<sup>3</sup> Expenditure on the Regional Roads Investment Program was \$27.2 million vs. a target of \$45.0 million (60% achieved) and represented an increase from \$14.6 million in 2007. Revenues from road users rose from \$68.4 million in 2007 to \$93.4 million in 2010, with 77% of the increase coming from the fuel levy. Road maintenance has improved over time, though only 69% of the road network was rated as being in good and fair condition in the second semester of 2010, against a target of 75%. This percentage drops steadily from primary roads (96%) to secondary roads (82%) to tertiary roads (66%) to vicinal roads (43%).

subject to interpretation by individual government officials. Some private firms fear that the government's interventions in input markets and tractor distribution, along with signs that it may re-enter cereal markets, could undercut private sector competitiveness.

Advocacy on behalf of agribusiness is viewed as weak but improving. The election of a prominent local businessman, who is CEO of MozFoods, to the Board of Directors of the business association ACIS (Associação de Comércio e Indústria) is a promising sign. The Confederation of Business Associations of Mozambique (CTA) is considered dependent on donor funding and a captive of the government as well as urban political, industrial, and trading elites.

Mozambique's budget for agriculture as a percentage of total budgetary expenditure ranged from 5.4% to 5.7% from 2007 to 2009 and included half of district development funds. A recent public expenditure review (PER) by the World Bank found that the actual expenditure typically fell short of the planned expenditure on agriculture (2007 was the last year for which figures on both planned and actual expenditures were available; figures for 2008 and 2009 estimated planned expenditures). The agriculture budget as a percentage of agricultural GDP was 5.9% in 2007 (of actual expenditure) and higher at 7.4% and 7.5% (of planned expenditure) in 2008 and 2009.

Producers' modest share of the cashew export price (39% from 2006 to 2009) is a disincentive to replant the aging stock of cashew trees. It also reflects the market and lobbying power of the cashew industry, which is permitted to buy up raw cashews for processing before the exporters of raw seed are allowed to procure cashews for export.

Only 13% of the maize crop enters formal processing and marketing channels, although larger-scale maize milling and feed mixing (mainly for poultry) appear to be expanding as urban incomes and preferences for poultry meat rise. Maize millers in southern Mozambique source largely from South Africa, as Mozambique's maize surplus zones are far to the north and the costs of transporting maize over long distances to the largest urban areas in the south are very high. South Africa is a very competitive supplier of maize to much of the southern African market, given its much higher maize productivity in relation to its neighbors, its good transportation system, and its links to the region.

The table that follows summarizes study findings on the various indicators. Mozambique has much ground to cover if it is to catch up with such countries as Ghana and Kenya, particularly in engaging small and medium commercial producers and agro-enterprises in a strong agribusiness development dynamic from the bottom up. Mozambique currently exhibits a reasonably strong investment climate for foreign investors but limited support for the vast majority of domestic producers and rural agro-enterprises. Our forthcoming cross-country comparative synthesis will highlight those findings.

**Limited public sector capacity to collect and process statistical information.** Even by sub-Saharan African standards, Mozambique's public institutions have limited capacity to collect, process, and analyze agricultural and economic data. Agricultural statistics—area planted, production, and yields of major field crops—are not scientifically generated each year in a timely way and are rough estimates at best. Getting reliable information on levels of input use, agribusiness finance, international trade, and agro-industry for this study proved a major challenge. Staff turnover is high in key public agencies responsible for gathering, processing, and interpreting statistics.

Given disincentives to public service, government institutions that generate and report agricultural and economic statistics struggle to fulfill their mandates despite high levels of foreign assistance. Of

necessity, this study relied heavily on information of variable quality, reliability, and accuracy, including secondary data from government and international sources as well as on some primary data (e.g., from the national agricultural census and periodic national sample surveys of rural households). In relation to our best efforts to interpret incomplete and sometimes ambiguous data, the critical reader is asked to exercise a healthy skepticism. We have somewhat more faith in information we generated in interviews with key informants, or in their responses to pointed e-mailed questions. Clearly it would be justifiable to further support donor investments in agricultural (and economic) statistics in Mozambique.

**Table 0: Matrix of Agribusiness Indicators and Findings for Mozambique**

Agricultural Productivity Measures		Indicator Findings
<b>Certified seed use</b>	% staple crop area planted to certified seed	5.7% (maize), 14% (rice), 35% (soybeans), 2010
	Existence and implementation of regional and national seed laws and regulations	Rating = 2 (on 0–5 scale)
	Sales of imported seed as % total sales of certified seed. <i>Estimates for maize from different sources cannot be reconciled.</i>	Maize: 11.4–52.7% (2009); 8.3% or 15.4% (2010); rice: 0%
	Time required for registering, testing, and obtaining approval for varietal release	4-year process was shortened to 2–3 years through provisional release of some varieties
	% of foundation seed provided by government organizations	90% for maize; 100% for most field crops. All foundation rice seed is privately produced.
	% of certified seed multiplied by private firms and farms vs. government entities	51% private sector supplied if the Mozambique Seed Company (SEMOC) is considered public sector; 100% if SEMOC is considered private sector. SEMOC was majority private sector owned until 2007.
	Number of private firms operating in country	35 (18 registered as commercial seed producers and active)
	Ease of private sector participation in the seed market (scale: 0–5)	Rating = 2, given Government of Mozambique (GoM) intervention, subsidies, and a poorly managed seed registration process
<b>Fertilizer use</b>	Total fertilizer use (t) in past 3 years: 2008–10	32,000 t (2008), 33,000 t (2009), 51,400 t (2010) ; private sector estimate for 2010 is 56,400–84,000 t; private sector estimate for 2011 is 62,000 t
	Fertilizer application rates (kg/ha)	5.8–10.2 kg/ha of fertilizer; 2.4–3.5 kg/ha in nutrient (NPK) terms from 2006 to 2010
	Fertilizer growth rates (%)	8.8% (total fertilizer, 2002–09)
	Cost of 50-kg bag of NPK and urea in main agricultural production zones (2010/11)	NPK 12-24-12 (US\$ 56.65); NPK 12-12-12 (US\$ 39.47, wholesale); urea (US\$ 51.15)
	Timeliness in the importation of fertilizer (proxy for timeliness in the application of fertilizer): Time it takes the government to pay fertilizer importers (days)	Beira port data not available by month. Timeliness appears not to be a major issue. There is no national fertilizer subsidy program.
	Ease of private sector participation in the fertilizer market (scale: 0–5)	Rating = 3 (for importers and distributors; retail agro-input dealers not queried)
	Nutrient/output price ratio {Pn/Po}	Urea/maize price ratio in 2011 = 8-14. This ratio is too high, indicating that fertilizer use on maize is unprofitable.
	Fertilizer subsidy (% of retail cost)	0% (but EU scheme subsidized fertilizer and seed 69% for ≤25,000

		farmers in 2009/10 and 2010/11)
	Tariffs and taxes on fertilizer	2.5% (duty), which is waived inside Southern Africa Development Community (SADC) region (i.e., from South Africa)
	Number of agro-dealers and number of farms and hectares per dealer	128-member association (AMPIA); an estimated 250 total dealers are active in the fertilizer trade. 29,904 farms or 44,006 ha per active dealer.
<b>Mechanization</b>	Total number of tractors per 100 sq km of arable land	12.7 (2010); equivalent to an estimated 1,079 HP/sq km
	Cost of plowing 1 ha	US\$ 61-91/ha (south); US\$ 55-75/ha (central); US\$ 50-55/ha (north)
	Number of tractors imported by the private sector as a % of the total number of tractors imported into the country	≥ 80% (2005–09); 40% (2010)
	Useful life of tractors	10 years at an estimated 850–870 annual hours of operation
	Tariff on tractor spare parts	7.5% duty + 17% VAT
	Ease of private sector participation in the agricultural machinery market (scale: 0–5)	Rating = 3 for the Beira Corridor, lower for northern Mozambique (1.5–2). Government distribution of tractors on subsidized terms may undercut the emergence of a private distribution, servicing, custom-hire capacity.
<b>Supporting Service Measures</b>		
<b>Agricultural finance</b>	% of commercial bank lending to agriculture	6.5% (2010); declined from 9.4% (2008) and 7.4% (2009)
	Commercial bank interest rates (including interest rate spreads)	23–30%. Interest rate spreads range from 8% to 17%. Inflation rate was 5.3% in 2009, 12.7% in 2010, and projected at 10.8% in 2011. Real interest rates in 2011 were therefore 12–19%.
	% of non-performing loans	1.8% for banking sector as a whole (no agriculture-specific info)
	Bank branches per 100,000 rural adult population	1.5
	% of rural households receiving credit for agriculture	2.3% (from agricultural census of 2009/10)
	Existence of a warehouse receipt system (scale: 0–5)	0 (not yet done)
	Existence of a law on leasing (and extent of use of leasing)	Yes. Rating = 3. There is no specific law on leasing, yet it is practiced. Contract law and banks' ability to repossess leased assets are weak.
	Presence of a collateral registry	Yes. Rating = 1. Nascent (dispersed, incomplete). Some banks will accept moveable assets as collateral (but no law).
Stage of development of a credit reporting system (scale: 0–5)	Yes. Rating = 1.5 (only public; private one coming)	
<b>Transport</b>	Price per bag of maize from major wholesale or assembly market to major urban center (US\$/tkm) or for bag of fertilizer from port to an upcountry market town	US\$ 0.14–0.15/tkm to haul maize/beans in 2009 and 2010; jumped to US\$ 0.23 in 2011 (due in part to fuel price hikes)
	Price paid to ship a standard truck load of inputs and outputs (US\$/t)	US\$/tkm = US\$ 0.09–0.14 in 30-t capacity trucks along trunk roads in the Beira Corridor



	Cost to ship a standard container load of inputs and outputs (US\$/t); should specify whether exports or imports (as rates are different)	Exports for 20- and 40-ft containers to: (1) India: US\$ 1,350, US\$ 2,300; (2) China: US\$ 950, US\$ 1,300; (3) EU: US\$ 2,073, US\$ 3,546; (4) US (NY): US\$ 3,550, US\$ 5,900
	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, information technology)—Logistics Performance Index (LPI)	LPI = 2.29
	Rural Access Index (RAI): % rural population within 2 km of a road	RAI = 27% (LSMS, 2006); 32% (ANE, 2010)
<b>Policy and Institutional Measures</b>		
<b>Private sector perception of policy environment and advocacy role</b>	Private sector perception of agribusiness enabling environment (scale: 0–5)	Rating = 2.8
	Policy consistency: 0–5 scale as perceived by foreign and domestic investors	Rating = 2
	Private sector advocacy group for agribusiness: presence and effectiveness	Rating = 1.5 (CTA). ACIS ranks higher (rating = 3), but it has historically been regionally focused.
<b>Government commitment to agriculture</b>	Federal government budget outlays on agriculture as % total budget	5.1% (2008, 2009) from PER by World Bank. 5.9% (2007) as % agricultural GDP; 7.4% and 7.5% in 2008 and 2009 (proposed budget to agriculture as % of agricultural GDP).
	Development of investment plan under the Comprehensive Africa Agriculture Development Program (CAADP): stage reached by the government in this process	0.5 to 1: GoM does not yet have a draft investment plan (unacceptable delays); CAADP agreement forecast for third quarter of 2012
<b>Export crop indicators</b>	Proportion of a cash crop Free on Board (FOB) export price paid to producers	39% (2005–09) for cashew exports
	% of key export crop that is processed (beyond raw product form) before export	64% (2009) of cashews processed; processing industry revived using labor-intensive methods as of 2002
	Presence of export policy disincentives (export taxes, restrictions)	15% tax on exports of raw cashews (which discourages replanting of aging, underproductive cashew trees; designed to discourage raw cashew exports and increase processing)
<b>Development of maize processing industry</b>	Proportion of maize moving through formal marketing channels (including large-scale processing and feed milling and mixing)	13% of maize production plus net imports

## Acronyms

<b>AADT</b>	Average annual daily traffic
<b>ABI</b>	Agribusiness Indicators (for Africa) initiative of World Bank (Sustainable Development Network, Agriculture and Rural Development)
<b>ACIS</b>	Associação de Comércio e Indústria
<b>ADIPSA</b>	Agriculture Private Sector Support Program (DANIDA funded)
<b>AFD</b>	Agence Française de Développement (French Development Agency)
<b>AfDB</b>	African Development Bank
<b>AgCLIR</b>	Agricultural Enabling Environment (assessment tool)
<b>AgriFuturo</b>	USAID-funded agribusiness development project
<b>AGRA</b>	Alliance for a Green Revolution in Africa
<b>AICD</b>	Africa Infrastructure Country Diagnostic
<b>AIMS</b>	Agricultural Input Market Strengthening (IFDC implemented)
<b>AMITSA</b>	Regional Agricultural Input Market Information and Transparency System for East and Southern Africa (IFDC with IFA, the International Fertilizer Industry Association)
<b>AMODER</b>	Associação Moçambicana para o Desenvolvimento Rural
<b>AMOMIF</b>	Mozambican Micro-finance Operators' Association
<b>AMPIA</b>	Agro-input dealer association (created with IFDC/AIMS support)
<b>ANE</b>	Administração Nacional de Estradas (National Road Administration)
<b>AR</b>	National Assembly (Assembleia da República), the parliament
<b>ASCA</b>	Accumulating Saving and Credit Groups
<b>ATM</b>	Automated teller machine
<b>BCI</b>	Commercial and Investment Bank (Banco Comercial e de Investimentos)
<b>BdPES</b>	<i>Balanço do PES</i> (annual report on execution of the previous year's Economic and Social Plan)
<b>BIM</b>	International Bank of Mozambique (Banco Internacional de Moçambique)
<b>BoM</b>	Bank of Mozambique (central bank)
<b>BT</b>	Banco Terra
<b>CAADP</b>	Comprehensive Africa Agriculture Development Program (Programa Compreensivo para o Desenvolvimento da Agricultura)
<b>CAN</b>	Calcium ammonium nitrate fertilizer
<b>CAP</b>	Censo Agro-Pecuário 2009–2010 (recent agricultural census)
<b>CB</b>	Credit bureau (or commercial bank)
<b>CCOM</b>	Caixa Comunitária de Microfinanças (community micro-finance organization)
<b>CEF</b>	Forestry Experimental Centre (Centro de Experimentação Florestal)
<b>CEPAGRI</b>	Agriculture Promotion Center (Centro de Promoção da Agricultura)
<b>CFFM</b>	Common Flow of Funds Mechanism (of ProAgri)
<b>CFMP</b>	Medium-Term Fiscal Framework (Cenário Fiscal de Médio Prazo)
<b>CGE</b>	General State Accounts (Conta Geral do Estado)
<b>CGIAR</b>	Consultative Group on International Agricultural Research
<b>CIM</b>	Companhia Industrial de Matola (grain milling complex in Maputo and Beira)
<b>CLUSA</b>	Cooperative League of the United States of America (now National Cooperative Business Association or NCBA)
<b>CN</b>	Raw cashew nut equivalent (numeraire used in comparing processed cashew output and exports to exports of raw cashews)

<b>CNS</b>	National Seed Committee (Comité Nacional de Sementes)
<b>CPI</b>	Investment Promotion Center (Centro de Promoção de Investimentos)
<b>CTA</b>	Confederation of Business Associations of Mozambique (Confederação das Associações Económicas)
<b>CUT</b>	Single Treasury Account (Conta Única do Tesouro)
<b>DAF</b>	Directorate of Administration and Finance (Direcção de Administração e Finanças), MINAG
<b>DANIDA</b>	Danish International Development Agency
<b>DAP</b>	Diammonium-phosphate fertilizer
<b>DCA</b>	Development Credit Authority (of USAID, typically offering loan portfolio guarantees)
<b>DDF</b>	District Development Fund
<b>DE</b>	Directorate of Economy (Direcção de Economia), MINAG
<b>DFID</b>	Department for International Development (of the UK)
<b>DNA</b>	National Directorate of Water (Direcção Nacional das Águas) of the Ministry of Public Works
<b>DNCP</b>	Accounts Directorate (Direcção Nacional da Contabilidade Publica)
<b>DNPDR</b>	National Directorate for the Promotion of Rural Development (Direcção Nacional de Promoção do Desenvolvimento Rural)
<b>DNSA</b>	National Directorate of Agrarian Services (Direcção Nacional de Serviços Agrários), MINAG
<b>DNTF</b>	National Directorate of Land and Forestry (Direcção Nacional de Terras e Florestas), MINAG
<b>DPA</b>	Provincial Directorate for Agriculture (Direcção Provincial de Agricultura)
<b>DPPF</b>	Provincial Directorate for Planning and Finance (Direcção Provincial do Plano e Finanças); at provincial level, the planning and finance functions are combined in one single directorate
<b>DS</b>	Seed Department (of MINAG)
<b>DUAT</b>	Direito de Uso e Aproveitamento de Terra (land use certificate)
<b>DUS</b>	Distinctness, Uniformity, and Stability testing of seed
<b>EC</b>	European Commission
<b>EU</b>	European Union
<b>FAAP</b>	Framework for African Agricultural Productivity
<b>FAO</b>	Food and Agriculture Organization of the United Nations
<b>FAOSTAT</b>	FAO statistical database ( <a href="http://www.faostat.fao.org/">www.faostat.fao.org/</a> )
<b>FARA</b>	Forum for Agricultural Research in Africa
<b>FARE</b>	Economic Rehabilitation Fund (Fundo de Apoio a Reabilitação da Economia)
<b>FBO</b>	Farmer-based organization
<b>FDA</b>	Agricultural Development Fund (Fundo de Desenvolvimento Agrário)
<b>FDHA</b>	Irrigation Development Fund (Fundo de Desenvolvimento da Hidráulica Agrícola)
<b>FDM</b>	Women's Development Fund (Fundo de Desenvolvimento da Mulher)
<b>FFA</b>	Agricultural Promotion Fund (Fundo de Fomento Agrário)
<b>FDHA</b>	Irrigation Development Fund (Fundo de Desenvolvimento da Hidráulica Agrícola)
<b>FinScope</b>	FinMark Trust initiative for nationally representative study of consumers' perceptions on financial services and issues
<b>FMR</b>	Financial Management Report
<b>FOB</b>	Free on Board
<b>FOSC</b>	Farmer Owned Service Center
<b>FPC</b>	Facilidade Permanente de Cedência (Standing Lending Facility)

<b>ft</b>	Foot
<b>GAPI</b>	Gabinete de Apoio à Pequena Industria (Small Industry Support Agency)
<b>GDP</b>	Gross domestic product ( <i>produto interno bruto</i> )
<b>GF</b>	Guarantee fund
<b>GIZ</b>	Deutsche Gesellschaft für Internationale Zusammenarbeit (German international cooperation agency, formerly GTZ)
<b>GoM</b>	Government of Mozambique
<b>GPZ</b>	Zambezi Region Development Authority (Gabinete do Plano de Desenvolvimento da Região do Zambeze)
<b>h</b>	Hour
<b>ha</b>	hectare
<b>HICEP</b>	Chókwè Hydraulic Company (Hidráulica de Chókwè E.P.); publicly owned f
<b>HP</b>	Horsepower (in reference to tractors)
<b>IAM</b>	National Cotton Institute (Instituto do Algodão de Moçambique)
<b>ICM</b>	Cereal Institute (Instituto de Cereais de Moçambique)
<b>IFAD</b>	International Fund for Agricultural Development
<b>IFDC</b>	International Fertilizer Development Center
<b>IFMIS</b>	Integrated Financial Management and Information System
<b>IFPRI</b>	International Food Policy Research Institute
<b>IIAM</b>	Institute of Agricultural Research of Mozambique (Instituto de Investigação Agrária de Moçambique)
<b>IKURU</b>	Mozambican Farmer Owned Company
<b>IMF</b>	International Monetary Fund
<b>INAS</b>	Institute for Social Action (Instituto Nacional da Acção Social)
<b>INCAJU</b>	Cashew Promotion Institute (Instituto de Fomento do Cajú)
<b>INDER</b>	National Rural Development Institute (Instituto Nacional para o Desenvolvimento Rural)—(1994–99)
<b>INE</b>	National Statistics Institute(Instituto Nacional de Estatística)
<b>INGC</b>	National Disaster Management Institute (Instituto Nacional de Gestão de Calamidades)
<b>INIA</b>	National Institute of Agronomic Research (Instituto Nacional de Investigação Agrária)
<b>INIVE</b>	Institute of Veterinary Research (Instituto Nacional de Investigação Veterinária)
<b>INNOQ</b>	Institute for Standards and Quality (Instituto Nacional de Normalização e Qualidade)
<b>IPA</b>	Institute of Animal Production (Instituto de Produção Animal)
<b>IPADE</b>	Portuguese Aid Agency (Instituto Português de Ajuda ao Desenvolvimento)
<b>IRAM</b>	Institut de recherches et d'application des méthodes de développement (France)
<b>ISFM</b>	Integrated Soil Fertility Management
<b>IVA</b>	Imposto de Valor Acrescentado (VAT in English)
<b>JICA</b>	Japanese International Cooperation Agency
<b>KfW</b>	Kreditanstalt für Wiederaufbau (German development bank)
<b>km</b>	kilometer
<b>LNV</b>	National Varieties List (seed)
<b>LPI</b>	Logistics Performance Index
<b>m</b>	Meters
<b>MADD</b>	Mozambique Agro-Dealer Development (IFDC implemented)
<b>MADER</b>	Ministry of Agriculture and Rural Development (Ministério da Agricultura e Desenvolvimento Rural) (2000–04)
<b>MDG</b>	Millennium Development Goal
<b>MFC</b>	Mozambique Fertilizer Company (fertilizer mixing/blending company in Chimoio)

<b>MFI</b>	Micro-finance institution
<b>MIC</b>	Ministry of Industry and Commerce (Ministério da Indústria e Comércio)
<b>MINAG</b>	Ministry of Agriculture (Ministério da Agricultura); since 2005
<b>MLTC</b>	Mozambique Leaf Tobacco Company
<b>MOPH</b>	Ministry of Public Works and Housing (Ministério da Obras Públicas e Habitação)
<b>MoU</b>	Memorandum of Understanding
<b>MozFoods/MIA</b>	Mocfer Industries Alimentaires
<b>MPD</b>	Ministry of Planning and Development (Ministério da Planificação e Desenvolvimento)
<b>mt</b>	Metric tons (generally abbreviated as “t” in this report)
<b>MT</b>	Metical (Mozambican abbreviation of the national currency; pl. meticais)
<b>MTEF</b>	Medium-term expenditure
<b>MZ</b>	Mozambique
<b>MZN</b>	New metical (international abbreviation of Mozambique’s currency): US\$ 1= MZN 27 in August 2011
<b>N</b>	Nitrogen (component of fertilizer)
<b>NEPAD</b>	New Partnership for Africa’s Development
<b>NGO</b>	Nongovernmental organization
<b>NPK</b>	Nitrogen, phosphorus (phosphate), potassium fertilizer
<b>NUIT</b>	Número Único de Identificação Tributária (single tax identification number allocated to a registered business)
<b>ODA</b>	Official Development Assistance (grants plus concessionary loans)
<b>OE</b>	State Budget (Orçamento do Estado)
<b>OECD</b>	Organisation for Economic Co-operation and Development
<b>OIIL</b>	Local Initiative Investment Budget (Orçamento de Investimento de Iniciativa Local)
<b>OPV</b>	Open-pollinated variety
<b>PACDE MESE</b>	Competitiveness and Private Sector Development Project - Business Facility Grants (Business Subsidy Mechanism)
<b>PAMA</b>	Agricultural Markets Support Program (Programa de Apoio aos Mercados Agrícolas)
<b>PANNAR</b>	South Africa–based seed company
<b>PAPA</b>	Food Production Action Plan (Plano de Acção para a Produção de Alimentos)
<b>PARPA</b>	Action Plan for the Reduction of Absolute Poverty (Plano de Acção para a Redução da Pobreza Absoluta)
<b>PEDSA</b>	Strategy and Plan for Agro-Development (Plano Estratégico de Desenvolvimento Agrário)
<b>PER</b>	Public expenditure review
<b>PES</b>	Economic and Social Plan (Plano Económico e Social)
<b>PGQ</b>	Government Five-year Plan (Programa Quinquenal do Governo)
<b>PIDA</b>	Integrated Program for Agricultural Development (Programa Integrado de Desenvolvimento Agrário (project funded by Italy)
<b>PRC</b>	People’s Republic of China
<b>PRISE</b>	Integrated Road Sector Program (Programa Integrado do Sector de Estradas)
<b>ProAgri</b>	Agricultural sector strategy and expenditure program (Programa de Desenvolvimento Agrícola)
<b>PRSP</b>	Poverty Reduction Strategy Paper
<b>RAI</b>	Rural Accessibility Index
<b>RBMMP</b>	Roads and Bridges Management and Maintenance Program
<b>RCRN</b>	Community-Based Credit and Savings Associations (Rede das Caixas Rurais de Nampula)
<b>Re-SAKSS-SA</b>	Regional Strategy Analysis and Knowledge Support Systems for Southern Africa

<b>RSA</b>	Republic of South Africa
<b>SACCO</b>	Local saving and credit cooperative
<b>SADC</b>	Southern Africa Development Community
<b>SARL</b>	Limited Liability Company (Sociedade Anónima de Responsabilidade Limitada)
<b>SCRLV</b>	Variety Release and Registration Sub-Committee
<b>SDAE</b>	District Economic Service (Serviço Distrital de Actividades Económicas)
<b>SDC</b>	Swiss Development Corporation
<b>SEMOG</b>	Mozambique Seed Company (Sementes de Moçambique)
<b>SIMA</b>	Agricultural Market Information System (Sistema de Informação de Mercados Agrícolas)
<b>SME</b>	Small and medium (scale) enterprise (PME or <i>micro, pequenas e médias empresas</i> )
<b>SPA</b>	Agricultural Services Department (of DPAs, MINAG)
<b>sq</b>	Square
<b>SSA</b>	Sub-Saharan Africa
<b>SSIP</b>	Small-scale Irrigation Project (funded by AfDB)
<b>t</b>	Ton (metric)
<b>TEU</b>	Twenty-foot Equivalent Unit (refers to 20-foot containers)
<b>TIA</b>	Rural Household Income Surveys (Trabalho de Inquerito Agrícola)
<b>tkm</b>	Ton-kilometer
<b>TNS</b>	TechnoServe (US-based NGO active in several Mozambican value chains)
<b>UEM</b>	Universidade Eduardo Mondlane
<b>UK</b>	United Kingdom
<b>UMASE</b>	Road Sector Unit for Monitoring and Evaluation (Unidade de Monitoramento e Avaliação do Sector de Estradas)
<b>UN</b>	United Nations
<b>UNCDF</b>	United Nations Capital Development Fund
<b>UNDP</b>	United Nations Development Programme
<b>US\$</b>	United States dollar
<b>USA</b>	United States of America
<b>USAID</b>	United States Agency for International Development
<b>USEBA</b>	Basic Seed Production Unit (Unidade de Semente Básica)
<b>VAT</b>	Value Added Tax (or IVA)
<b>VCU</b>	Value for Cultivation or Use (seed testing)
<b>WBG</b>	World Bank Group
<b>WR</b>	Warehouse receipt
<b>WRP</b>	Warehouse receipt program

# 1. Introduction

## 1.1 Background on Mozambican Agriculture

Agriculture plays an important role in Mozambique's economy. The sector accounts for 32% of GDP (2010) and employs a high percentage of the rural labor force (as 68% of the total population is rural). Agricultural exports accounted for 14.4% of total export revenue in 2008, which had declined from 31.4% in 2002; this decline was caused by significant expansion in exports of aluminum and electricity over that same period. Despite this relative decline, agricultural exports increased in nominal United States dollars (US\$) by 51% from 2002 to 2008. From 2006 to 2009, agricultural GDP grew at an average of 10.1% per annum, attributable mainly to the expansion of agricultural land (with increased area planted to staples such as maize, rice, and cassava) and of concession agriculture (for sugarcane, bananas, and other crops). Extensification can continue for some time, as a low percentage of

**Table 1-1: Yields of Major Crops (t/ha)**

Commodity	2001–03	2004–06	2007–09
Maize	0.90	0.81	0.91
Rice (milled)	0.96	0.93	0.86
Sorghum	0.57	0.54	0.60
Millet	0.53	0.49	0.42
All grains	0.84	0.76	0.84
Cassava	6.28	6.55	5.74
Sweet potatoes	6.66	7.18	7.07
Groundnuts	0.37	0.31	0.30

Source: FAOSTAT

potentially arable land is cultivated in Mozambique. The Government of Mozambique and donor agencies would like to promote more intensive and productive agriculture among smallholders, but progress has been limited for a number of reasons discussed later in this report. The agricultural 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. If an agricultural transformation is to occur in Mozambique, smallholder farms will have to develop either as viable agribusinesses or will need to be linked to commercial enterprises that support the use of modern inputs and facilitate access to markets. If not, smallholder agriculture will continue to underperform, as crop yields are currently low<sup>4</sup> and have been stagnant (Table 1-1).

Despite the agricultural sector's generally weak performance, national domestic production of staple food has increased, according to national statistics. Mozambique is self-sufficient in some crops, such as maize, cassava, sweet potatoes, sorghum, and groundnuts, yet highly deficit in rice (Table 1-2) and a major importer of wheat for urban consumption. Certain regions in Mozambique remain food insecure, however, including much of the drought-prone southern provinces (Gaza, Inhambane) and central provinces, where irrigation remains limited and the frequency and distribution of rainfall are inadequate in some years (Manica, Sofala). Flooding also disrupts agricultural production in some years. The very long distances from north to south make shipment of grain costly, so crop surpluses produced in the productive northern provinces (Nampula, Lichinga, Cabo Delgado, Zambézia) cannot economically supply population centers in southern Mozambique,<sup>5</sup> which is strongly linked to the proximate South African economy. The challenges are to ensure that: (1) surplus food reaches food-insecure households, (2) smallholders access inputs at a reasonable cost and increase productivity, (3) farms are linked more tightly and efficiently to markets, and (4) diversification of small- and medium-scale holdings enables

<sup>4</sup> Reported yields in Ghana are far higher for most crops.

<sup>5</sup> Note that significant volumes of higher-value food crops, particularly beans and groundnuts, are shipped from the north to the south.

farmers to produce a mix of staple food crops (for own consumption and sale) and cash crops with strong and growing domestic and international market opportunities. Key complements to such a strategy are to increase irrigated crop area, improve road and rail infrastructure, and expand electrification.

**Table 1-2: Simplified Food Supply Estimates for Key Staples, 2007–09 ('000 t)**

Commodity	Total Domestic Production	Net Imports	Total Supply	Domestic Production as % Supply	Per Capita Availability
Maize	1,291	49	1,340	96.3	59.9
Rice (milled)	104	288	392	26.5	17.5
Wheat (milled)	2	426	428	0.5	19.1
Sorghum	191	0.6	192	99.5	8.6
Millet	25	1.6	27	92.6	1.2
Cassava	5,374	0	5,374	100.0	240.1
Sweet potatoes	869	0	869	100.0	38.8
Irish potatoes	101	16.1	117	86.3	5.2
Groundnuts	88	-4.5	83.5	100.0	3.7

Source: MINAG, FAOSTAT

Notes: Figures are three-year averages for 2007 to 2009. Net imports are imports less exports. Year-to-year stock changes are not taken into account. Per capita availability estimates use a 2008 population figure of 22.38 million.

## 1.2 Context of the Agribusiness Indicators Initiative

The Agribusiness Indicators (ABI) program is testing an initial set of indicators on the ease (or difficulty) of operating agribusinesses in African countries and assessing whether the enabling environment is conducive to agriculture-led growth, agribusiness investment, and competitiveness. This pilot research will help to clarify which factors are important in successful agribusiness development. At the start of this applied research program, the ABI team laid out six broad sets of key success factors.<sup>6</sup> The factors were pilot tested in Ghana in November 2010 with an emphasis on two value chains (rice and maize), using structured key informant interviews among key private and public sector players.

Based on the initial experience in Ghana, the broad sets of indicators identified at the start of this applied research were revisited, and a narrower set of indicators was selected for further work and later cross-country comparisons. These indicators are grouped into the following categories.

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

<sup>6</sup> Key success factors initially considered were: (1) access to critical factors of production (land, technology, finance, and so on); (2) access to markets (freedom to sell, absence of restrictions on internal movements of goods, and so on); (3) quality of supporting institutions and services; (4) positive and transparent regulatory and legal environment; (5) policy environment; and (6) adequacy of rural infrastructure.



## 7) Various policy, trade, and fiscal measures.

The modernization of Mozambique's agricultural sector requires better access to and availability of improved seed, increased use of fertilizer (and its timely application), and use of agricultural production and processing machinery, offered by private sector service providers. Most farm enterprises are unable to invest in inputs to increase yields or scale up their businesses without better access to finance. 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.

Reviewers of this study noted important issues that were not covered, including access to agricultural land, rural infrastructure (particularly electricity in secondary or market towns), and access to water (particularly for on-farm irrigation). Another important constraint raised to doing agribusiness is the government's policy against the use of "piecemeal" labor in agricultural processing. This policy is regarded as one of the major obstacles to value-added processing, particularly in the cashew industry.

### 1.3 Study Approach to Information Gathering

Expanding upon these key critical factors, the ABI team developed a matrix with selected indicators to be used to assess the agribusiness environment in a given country. The team recognizes that certain excluded factors are very important, such as access to water, land, and labor, but given the pilot nature of this work, not all important factors could be covered. Similarly, access to markets and availability of other types of infrastructure (for example, for electricity, communications, and irrigated land) are not included in the indicators examined. Readers should be aware that the choice of indicators is not meant to be comprehensive but rather is selective and strategic.

The indicator matrix was supplemented by a basic checklist and by responses to supplemental questions prepared for each area of investigation—seed, fertilizer, mechanization, agricultural finance, and transport. In Mozambique, the ABI team relied heavily on local consultants with good contacts in the public and private sectors to obtain data from public agencies and private sources, including:

- Government agencies: MINAG, BoM, National Statistics Institute (INE), and Customs.
- Private firms and associations, including fertilizer importers/blenders, seed producers, commercial banks and selected micro-finance institutions (MFIs), transport and logistics companies and associations, and tractor importers and distributors.
- Farmer-based organizations, parastatal organizations, NGOs, donors, and consultants or knowledgeable observers of the agribusiness system.

These data were supplemented by information from selected key informant interviews with managers of agribusiness firms, financial service providers, public agencies working on the agricultural sector, and representatives of donor agencies (and their field projects) and NGOs.

The team also mined World Bank, FAOSTAT, COMTRADE, and other international statistics, as well as findings from surveys undertaken by MINAG and INE and price and transport data from the Agricultural Market Information System (SIMA). The periodic, nationally representative agricultural sample surveys—the Rural Household Income Surveys (TIAs) undertaken five times in the 2000s—and the national agricultural census of 2009/10 are important sources of basic information on the agricultural sector. Annual surveys of agricultural production (the Aviso Previso) were consulted, though many

question the accuracy of the survey results. It proved very difficult in Mozambique to obtain time-series data on cropped area, production, and yields at the national and provincial level—far more difficult than in Ghana or Ethiopia. This failure was surprising and should be considered unacceptable; it suggests that significant investment in the generation and analysis of basic agricultural sector statistics should be a high MINAG (and donor) priority. Accessing international trade data from government sources also proved to be very difficult in Mozambique, with piecemeal information provided in short time series. The data obtained were often hard to interpret, incomplete, raw and not properly verified, and did not cross-check well with international sources of statistics.

In addition to government sources, other important sources of information were:

- Empirical studies by Michigan State University and the International Food Policy Research Institute (IFPRI).
- National Road Administration (ANE) monitoring and evaluation reports.
- Special studies of the World Bank Group (an agricultural PER, a forthcoming cashew export and policy study, and infrastructure studies).
- Special studies funded by other donors, such as a recent Swiss Development Corporation (SDC) report on the seed sector.
- A recently completed Agricultural Enabling Environment (AgCLIR) exercise funded by the US Agency for International Development (USAID) and carried out by the AgriFuturo Project.

An overall judgment of the lead investigator is that Mozambique presents special challenges in information gathering, access to basic economic and agricultural information is poor, and the quality of data from the public sector is highly variable. This situation is disconcerting in light of the high levels of ODA per capita (US\$ 88.1 in 2009, equivalent to 20.6% of per capita GDP) that Mozambique receives relative to other SSA countries. A number of careful reviews of agricultural and economic statistics have pointed out problems and challenges in public statistics, and the Food and Agriculture Organization (FAO) provided a consultant to develop a strategy for improving agricultural statistics in mid-2011. Much work remains to be done, however.

## **1.4 Organization of the Report**

This report addresses each of six indicator groups in succession, devoting a chapter to each set. A summary table or “scorecard” at the beginning of each chapter reports indicator findings and cites data sources. Busy readers without a deep interest in a particular indicator set may consult the table, which is typically no more than one page, to learn of key findings and highlights quickly. Supplemental tables and information for some chapters, such as the agribusiness finance chapter, appear in the annexes.

The ABI team welcomes comments, both critical and constructive. We realize that the scope of our exercise—the sheer number of indicators and their data requirements—is daunting and that the quality of the information to which we had access was uneven. We hope that this modest initiative will stimulate discussion about agricultural and economic data availability and quality, as well as substantive debates about some policy and regulatory issues, institutional mandates and roles, and best ways to promote agribusiness system growth and competitiveness.

## 2. Access to Improved Seed in Mozambique

This chapter draws heavily from a 2011 seed sector study funded by SDC and carried out by the AustralCOWI consulting firm. The figures on seed production, imports, and use presented herein should be treated cautiously, as there are inconsistencies in estimates across data sources. The author welcomes critical comments and suggested improvements, including better data.

### 2.1 Introduction

Most farmers in Mozambique cannot access improved, high-quality planting material. This section focuses on cereal and legume seed developed mainly by the public agricultural research system and expanded to the foundation seed stage mainly by a public agency. The terms “foundation seed” and “basic seed” are used interchangeably in this discussion. This section identifies key institutions and players in the seed production system, discusses their roles, lays out the legal and regulatory framework surrounding seed production, examines foundation seed production and seed multiplication, estimates improved seed utilization for key field crops, and identifies priority policy, regulatory, and institutional issues for a broader public-private sector discussion.

Table 2-1 offers a preliminary scorecard of how Mozambique is doing with respect to ABI seed indicators.

**Table 2-1: Summary Observations on Improved Seed in Mozambique**

Indicators	Indicator Findings	Data Sources
% staple crop area planted to certified seed	<p><b>Maize:</b> 9.3–10.0% of farmers; 10.4% (2008/09) to 2.7% (in 2009/10), and 5.7% (2010/11) of cultivated maize area.</p> <p><b>Rice:</b> 1.8–4.0% of farmers; 6.2% (2008/09) to 18.4% (2009/10) of area cultivated to paddy. The estimate for 2010/11 is 14.0%.</p> <p><b>Groundnuts (large):</b> 3.8–6.4%.</p> <p><b>Soybeans:</b> 35% of seed volume planted by TechnoServe (TNS) program participants (2010). An estimated 50% of soybean producers use improved seed.</p>	<p>% farmers: TIA surveys: 2005, 2006, 2008 (MINAG/DE, <i>Trabalho de Inquérito Agrícola</i>).</p> <p>% area: estimated from certified seed production data from the Seed Department (DS) and National Department for Agrarian Services (DNSA) (for maize) and MozFoods/MIA (for rice); SDC study.</p> <p>TNS soybean improvement program (coordinator’s estimate; 280 of 800 t); 425 t (SDC study). 50% of producers estimate from TNS regional soybean study (2011).</p>
Existence of regional and national seed laws and regulations	<p>2 = Legal and regulatory framework is in place, but weak on implementation bylaws and capacity. Too few, non-certified labs for testing and too few field inspectors, who perform poorly. Variety release legislation constrains timeliness of seed release and does not conform to processes of neighboring countries. National seed strategy was developed for the 1997–2001 period and needs to be updated.</p>	<p>Interviews with key IIAM and MINAG officials. SDC study <i>Analysis of Seed Production, Commercialisation and Use in Mozambique</i>, April 2011.</p>

Indicators	Indicator Findings	Data Sources
Sales of imported seed as % total sales of certified seed	<p>GoM tenders, put out for bid on short notice (not allowing enough time for domestic seed multiplication), have led to imports of maize seed in some years. There are no rice seed imports; MozFoods/MIA produces basic and certified rice seed used mainly in irrigated rice production. Hybrid maize seed is produced domestically by MozFoods/MIA and PANNAR (with conflicting quantities reported by source). MozFoods reports producing 894 t of hybrid maize seed in 2010 for PANNAR (and some of this quantity may have been exported).</p> <p><b>Source 1:</b> No more than 8.3% of estimated maize seed supply for 2010 was imported (all hybrid maize seed imported by PANNAR). For 2009, the estimate from the same source was 52.7%, as PANNAR supposedly imported 1,469.5 t of hybrid maize seed. This 2009 estimate should be treated with caution. <b>Source 2:</b> Based on public data sources, imported maize seed was 15.4% in 2010 and 11.4% in 2009.</p>	<p>Estimates from several sources conflict and are irreconcilable. Customs import data for 2009 show that PANNAR imported 90.5 t of maize seed, making up an estimated 11.4% of certified seed sales. Data from another source state that PANNAR imported 1,469.5 t of hybrid maize seed in 2009 and 150 t in 2010. COMTRADE reports 267.7 t of maize seed imports in 2010. SEMOC imported no improved seed in 2009, 7 t in 2010, and 4 t in 2011.</p> <p>Sources 1) from private sector data; 2) supply estimates from DS/DNSA and COMTRADE import data.</p>
Time required for registering, testing, and obtaining approval for both domestically bred and imported seed	<p>4 years of Distinctness, Uniformity, and Stability (DUS) and Value for Cultivation or Use (VCU) tests are needed to obtain approval for varietal release. Variety release proposals are submitted for initial screening to a Variety Release and Registration Subcommittee and then to the National Seed Committee for approval. Because this process led to a significant backlog of some 80 varieties, most of those varieties were “pre-released” by breeders to commercial seed multipliers in early 2011. This provisional release process shortens the time for release to 2–3 years.</p>	<p>Interviews with key IIAM and MINAG officials. SDC study <i>Analysis of Seed Production, Commercialisation and Use in Mozambique</i>, April 2011. Only locally tested and approved varieties can be imported for distribution or multiplication.</p>
Percentage of foundation seed provided by government organization	<p><b>Maize:</b> USEBA produces 87.4% of maize foundation seed, and private firms produced 12.6% in 2009/10. Private share includes what USEBA contracted out to Lozane Farms.</p> <p><b>Rice:</b> MozFoods/MIA produces 100%.</p> <p><b>Other crops:</b> USEBA produces most, though soybean basic seed is reported to be imported from regional suppliers, with the International Institute of Tropical Agriculture also helping to bring in new varieties. USEBA has pre-released 4 new varieties, which are under production.</p>	<p>USEBA handles all IIAM (national) varieties and any varieties from international agricultural research center programs. PANNAR handles its own varieties (particularly PAN 67, developed in South Africa).</p>
% certified seed multiplied by private firms and	<p>Of 35 seed companies, 18 produce seed. SEMOC, owned entirely by the government, multiplies maize and rice seed, as well as beans, peanuts,</p>	<p>SDC study says SEMOC produced and sold 5,000 t of seed in 2010, while private firms sold nearly 5,200 t. Note</p>

Indicators	Indicator Findings	Data Sources
farms (and imported) vs. government entities	and sorghum, and sold an estimated 49%. We consider SEMOC's share as public sector, with entirely privately owned companies supplying the other 51%. Soybeans: private sector (8 companies) produces 100%.	that these estimates are approximate and lump all crops together (grains, legumes, oilseeds, horticultural seeds). Imports are included in sales.
Number of days to get an import permit (for seeds other than key grains)	For varieties not locally registered, importation is permitted for own use or for research. Average = 1–2 weeks. Application is made to the Minister of Agriculture through the Seed Department of DNSA. Phytosanitary certificate and source documentation are required.	Seed Department

## 2.2 Key Institutions and their Roles

Seed development, production, and multiplication are institutionally complex in Mozambique, so we lay out the key organizations working in the seed sector and their roles (Table 2-2).

**Table 2-2: Institutional Responsibilities in the Mozambican Seed Sector**

#	Area of Responsibility	Specific Responsibilities
1	Sector coordination	MINAG. The National Seed Committee (CNS) is responsible for assessing proposals of seed policies and legislation, subsector programs, and investments. It is also responsible for the final decision on the release of new varieties and for publishing the National Varieties List (LNV). The CNS is chaired by the Minister of Agriculture and co-chaired by the National Directorate of Agrarian Services (DNSA).
2	Seed policies and legislation	Proposed and implemented by DNSA/Seed Services and submitted to the CNS.
3	Seed quality control and registration - Field inspections - Seed quality analysis - Issue of official certificates - Variety release and registration	<ul style="list-style-type: none"> <li>- Seed Department (DS) of DNSA at national level.</li> <li>- Agricultural Services Department (SPA) of the Provincial Directorates of Agriculture (DPA).</li> <li>- 3 regional laboratories—Chókwè, Chimoio, and Nampula, with one more planned for Quelimane. Only Chókwè fully operational, others under rehabilitation. A lab at Unilurio is not registered but does tests as well.</li> </ul>
4	Plant breeding	<ul style="list-style-type: none"> <li>- IIAM for national varieties and others not belonging to seed companies.</li> <li>- MozFoods, for own rice seed varieties.</li> <li>- PANNAR; SEMOC stopped all breeding work in 2007.</li> </ul>
5	Variety release	<ul style="list-style-type: none"> <li>- Tests and all procedures are the responsibility of DNSA's Seed Services Department.</li> <li>- Variety release procedures and the official registration of varieties approved to be released are under the responsibility of DS/DNSA.</li> <li>- Variety release proposals are screened by a Variety Release and Registration Sub-Committee (SCRLV) and submitted to CNS for approval.</li> </ul>
6	Seed quality control and certification	<ul style="list-style-type: none"> <li>- Seed quality control and certification are the responsibility of DS/DNSA, involving regional seed laboratories and SPA of the DPA. DS responsibilities include field inspections of foundation/basic and certified seed production, seed quality laboratory tests, and issuance of official certificates.</li> </ul>
7	Production of breeder seed, pre-basic, and basic (foundation) seed	<ul style="list-style-type: none"> <li>- USEBA for IIAM varieties (open-pollinated maize, rice, sorghum, cowpeas, common beans, groundnuts, sesame, soya) as well as most official varieties that are not the property of seed companies. MozFoods and PANNAR produce their own basic seed varieties.</li> </ul>
8	Seed processing (all information)	8 processing plants operate in the country:

#	Area of Responsibility	Specific Responsibilities
	from SDC report)	<ul style="list-style-type: none"> <li>• MozFoods, Chókwè (capacity of 1.5–2 t/h).</li> <li>• PANNAR, Chimoio: (2–3 t/h).</li> <li>• SEMOC, Chimoio: (3 t/h), plus 1 mobile facility (3 t/h).</li> <li>• IKURU, in Nampula (2–3 ton/h) and in Monapo (sesame: 2–2.5 t/h).</li> <li>• IIAM, in Nampula (3 t/h).</li> <li>• Semente Perfeita: Chimoio (1 t/h).</li> </ul>
9	Production of certified seed	18 of 35 registered seed companies currently produce and distribute seed.

### 2.3 Foundation Seed Production

Basic seed production is centralized at USEBA of IIAM. Lozane Farms was the only private seed company that USEBA contracted to produce basic seed in 2009/10. During that year, the company produced about 25 t, of which about 20 t was sold to SEMOC and the balance to the MINAG/EC/FAO project.<sup>7</sup> According to USEBA, private companies' production of foundation seed is limited because low demand does not justify investing in a substantial increase in basic seed production (the exception is irrigated rice, owing to strong urban demand). Another constraint is the lack of financial resources for contracting seed producers. Unlike Ghana, Mozambique has no interdiction on private firms producing foundation seed.

Information on basic seed production is unfortunately scanty and inconsistent across sources. Some informants report that the quality of basic seed is also suspect. According to a GCP/MOZ/099/EC Project progress report of March 2011, 470 t of basic seed were produced in 2009/10 with support of the MINAG/EC/FAO project: 227.5 t (48%) was maize seed, 165 t (35%) rice, and 76.8 t (16%) soybean. The total quantity of basic maize seed produced in 2009/10 was theoretically enough to produce 9,100 ha of maize C1 seed in 2010/11 (assuming a planting rate of 25 kg/ha), but this amount was not close to achieved in practice (see section 2.4.2). The total quantity of basic rice seed produced in 2009/10 was theoretically enough to produce around 2,000 ha of rice C1 seed in 2010/11 (assuming a planting rate of 80 kg/ha). This estimate appears to be high, as MozFoods reports having grown 2,450 t of certified seed in 2009/10 (likely on some 800 ha, with mean yields around 3.0 t/ha). According to USEBA, 826 t of all types of foundation seed were planned for 2010/11 (of which 33% for maize and 53% for rice).

Private seed companies conclude that at best IIAM is able to meet only 50% of the estimated demand for basic seed. USEBA asserts that the proportion was higher in the past and that the production of basic seed of the main varieties met the multiplying firms'<sup>8</sup> estimated demand in 2009/10. USEBA's constraints to producing basic seed are:

- Low availability of breeder seed: No stocks of breeder seed exist for about half of the released varieties.
- Inadequate facilities to store foundation seed at IIAM and Zonal Centers.
- Inadequate irrigation infrastructure for seed multiplication.

<sup>7</sup> Lozane Farms also produced 168 t of certified seed of open-pollinated maize, bean, sorghum, and soybean varieties in 2009/10, according to a recent SDC seed study (2011).

<sup>8</sup> "Estimated demand" of private multipliers is what these firms request from USEBA, not necessarily an accurate measure of underlying effective demand for improved seed.

## 2.4 Seed Multiplication

### 2.4.1 Local Production of Unimproved Seed

Through the DS and Provincial Directorates of Agriculture, the government has been promoting local seed production by individual farmers, farmer groups, and associations in cooperation with certain NGOs (Table 2-3). This activity is coordinated through regional farmer associations and federations (Southern, Central, and Northern). The commodities covered under this program include maize, rice, groundnuts, sesame, beans (*feijão vulgar*), and cowpeas (*feijão nhemba*). The amount of seed produced under this program increased from a three-year average of 5,871 t from 2004/05 to 2006/07 to an average of 6,474 t from 2007/08 to 2009/10. Seed produced is used for local distribution through farmer organizations, cooperatives, and traders; it is also used in some government seed support programs.

**Table 2-3: Local Production of Unimproved Seed**

Season	Area (ha)	Production (t)
2004/05	3,802.4	5,920.7
2005/06	2,286.7	5,158.6
2006/07	4,212.0	6,535.0
2007/08	1,580.0	3,381.8
2008/09	4,723.5	9,447.0
2009/10	2,767.6	6,588.6

Source: DS/DNSA

### 2.4.2 Private Sector Certified Seed Production and Sales

Of the 35 registered seed companies, 18 produce seed. SEMOC and PANNAR produce over 90% of open-pollinated maize seed (see Box 2-1), and MozFoods/MIA is the only registered rice seed producer, growing 70% of its certified seed on its own farm and 30% under contract with outgrowers. Hybrid seed production in Mozambique is limited. PANNAR was the only company producing hybrid maize seed in 2010 (180 t of PAN 67 multiplied in Mozambique and 150 t imported). In 2009 PANNAR imported 1,469.5 t of PAN 67). PANNAR contracts with MozFoods/MIA and a few commercial seed growers to multiply the hybrid seed in Mozambique.<sup>9</sup>

The other 16 registered companies are smaller, producing less than 150 t of seed per year, mainly open-pollinated varieties (OPVs) of maize and rice, as well as small quantities of sorghum, cowpea, common bean, and groundnut varieties. Lozane Farms produced 168 t of seed in 2009/10, some of it under contract to PANNAR and SEMOC. IKURU, a federation of smallholder organizations, is supposedly an importer and producer of soybean seed and sesame, though one source notes that its seed has had major germination problems in the past several years. IKURU-multiplied seed is produced under contract with smallholder companies and some agribusinesses as part of the TechnoServe program.

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<sup>9</sup> MozFoods claims to have produced 894 t of hybrid maize seed in 2010. This figure does not cross-check with figures from other sources.

### Box 2-1: Role of Two Seed Firms in Mozambique

SEMOC and PANNAR are the dominant seed importers, multipliers, and traders in Mozambique. PANNAR is a major player in the region, exporting nearly half of what it produces in Mozambique. In most years SEMOC sells over around 90% of its grain seed to MINAG programs (4,000–5,000 t per year) and sells only 10% in the private market (to agro-dealers and farmers). PANNAR sells around 50-60% of its grain seed in Mozambique and typically exports the remainder to Southern Africa, mainly to Angola. Those exports consist largely of open-pollinated maize varieties (around 80% of its total exports), sorghum, and groundnuts.

Technically and legally, SEMOC is a private company, but it has been fully owned by the government since Zimbabwe SEEDCO—which held a majority (51%) of the shares—decided to pull out of SEMOC some three to four years ago. SEMOC produced 912.4 t of maize OPVs in Mozambique in 2009 and 1,250.2 t in 2010, whereas PANNAR produced 409 t of OPV maize seed in 2009 and 226 t in 2010. PANNAR produced 180 t of hybrid maize seed in 2010. All of PANNAR's hybrid seed multiplication is contracted out to MozFoods/MIA in Mozambique. Maize OPVs are largely multiplied by smaller commercial farmers under contract to the larger firms. Of the maize seed multiplied by SEMOC and PANNAR in 2010, 89% was OPVs and hence only 11% hybrid (the variety PAN 67). PANNAR has imported as much or more of its hybrid maize seed as it has produced in most years.

SEMOC sells all of the seed it produces in Mozambique and makes up any shortfalls through imports. It has been importing soybean, potato, and wheat seed from the subregion in most years. PANNAR sells 50–60% of its local production in Mozambique, which ranges from 2,500 to 3,000 t in most recent years.

Source: Authors

Based on data for 2010 in the SDC study (2011), larger firms' reported *domestic seed sales* are estimated at 10,182 t of certified seed, which includes an unspecified amount of seed of horticultural crops but covers mainly OPV and hybrid maize, beans, sorghum, soybeans, peanuts, sesame, sunflowers, and other field crops (Table 2-4). This figure also includes sales of significant though unknown volumes of imported seed, including some sales by the two largest companies (SEMOC and PANNAR). According to the partial data reported by the SDC study, SEMOC sold nearly half of the improved seed in 2010, and SEMOC plus MozFoods sold over two-thirds of the total. Adding in PANNAR, whose exports from Mozambique were reportedly greater than its domestic sales in 2010, certified seed sales of the three largest firms reached 86% of the total. In other words, seed sales are concentrated among those three firms. The other 14% of sales were made by eight smaller companies. SDC estimates for 2009 are approximately 9,000 t of certified seed, which is also a plausible order of magnitude.



**Table 2-4: SDC Study Estimates of Domestic Certified Seed Sales, 2010**

Company	Types of Seed Produced	Quantities Sold in MZ (t)	Cumulative % Shares
SEMOC	OPV maize, beans, rice, sorghum, peanuts	5,000	49
MozFoods	Rice, OPV/hybrid maize, wheat, beans	2,050	69
PANNAR	OPV/hybrid maize, sorghum, peanuts	1,500–2,000	86
Dengo Comercial	OPV/hybrid maize, beans, sorghum, etc.	555	92
Morais Comercial	OPV/hybrid maize, beans, peanuts, horticultural crops	270	95
IKURU	OPV maize, soybeans, peanuts, beans, sesame	250	97
Lozane Farms	OPV maize, beans, sorghum, soybeans	168	99
Semente Perfeita	Horticultural crops and broad mix grains, legumes	60	
Quniho Comercial	Grains, horticultural crops	40	
JNB Empreendimentos	OPV/hybrid maize, beans, horticultural crops	15-20	
IAV	Horticultural crops, maize, beans, etc.	21.5	
Green Fields	OPV maize, sesame, horticultural crops	–	
Prime Mozambique	Only horticultural crops	–	
Total		10,182	100

Source: SDC Seed Study, 2011

Notes: The mean of the range of quantities sold is used for PANNAR and JNB in the calculations. Note that PANNAR exports seed to neighboring countries; those sales (as much as 2,500–3,000 t per year) are not included in this table. The proportion of imported seed in total domestic seed sales is unknown, though 267.7 t of maize seed were reported by COMTRADE as imported into Mozambique in 2010. We do not include that figure in this table. One reviewer reports that IKURU wholesales seed to some of the companies listed above, which then retail it, so there may be some double-counting in these figures.

DS/DNSA estimates of certified seed production (Table 2-5) yield three-year averages (from 2007/08 to 2009/10) of 6,339 t, of which maize comprised 31% (1,974 t), rice 45% (2,864 t), and other crops 24% (1,501 t). The variability in maize seed production across years is striking—the highest level occurred in 2007/08 at 3,389 t (calculated yield of 3.1 t/ha),<sup>10</sup> the lowest in 2008/09 at 793 t, and the intermediate level in 2009/10 at 1,740 t (with an implicit yield of 1.7 t/ha).<sup>11</sup> This variability may arise from producing maize seed under rainfed conditions; areas planted to maize seed in 2007/08 and 2009/10 were nearly the same, but production in 2008/09 was far lower due to far lower yield. According to DS/DNSA, certified rice seed production went from 1,070 t in 2007/08 to far higher levels in 2008/09 (3,379 t) and 2009/10 (4,143 t), although yields remained in a narrower range (2.5–3.0 t/ha) because rice seed is produced under irrigation.<sup>12</sup> Given the high degree of variability by crop across years in areas planted to seed under rainfed conditions for multiplication, the DNSA data should be used with caution. Lower yields in 2009/10 relative to the two prior years can be explained by poor rainfall and growing

<sup>10</sup> The implicit or calculated maize yield of 3.1 t/ha for 2007/08 seems high, given that maize seed was produced without irrigation.

<sup>11</sup> A well-placed key informant states that the availability of certified seed, as reported by DS/DNSA, is linked to government (DNSA, MINAG) purchases of seed across years for subsidized distribution and that PANNAR has been the only supplier.

<sup>12</sup> The magnitude of the jump in certified rice seed production from 2007/08 to 2009/10, by a factor of 3.2, also seems implausibly high. Note that MozFoods reports certified rice seed production of 2,450 t in 2009/10, so it is unclear where the additional 1,693 t came from (using the DNSA estimate of 4,143 t of rice seed produced).

conditions, but the decline in areas planted from one year to the next—25% from 2007/08 to 2009/10—is harder to explain.

Limited information is available about numbers of seed growers in Mozambique. The GCP/MOZ/099/EC Project reported that 1,467 seed growers participated in the seed program in 2009/10. MozFoods worked with 25 multipliers of certified rice seed in southern Mozambique in 2009/10. IKURU works with about 300 seed producers. Using these estimates, there were at least 1,800 seed growers in Mozambique, with the EC Project collaborating with approximately 80% of them.<sup>13</sup> The same report notes that in 2009/10, 41% of the outgrowers produced certified maize seed on 2,676 ha and 59% produced certified rice seed on 1,976 ha. These area estimates are nearly twice as large as what DS/DNSA reports (see Table 2-5).

As noted, seed is multiplied mainly by large- and medium-scale growers under contract with the main seed companies (PANNAR, SEMOC, and MozFoods). Small-scale farmers that have 1–5 ha of seed production contracted to large and small companies produce part of the open-pollinated maize seed and most of the sorghum, cowpea, and groundnut seed. Soybean seed is produced by eight agribusiness companies in collaboration with TechnoServe.

**Table 2-5: Certified Seed Production by Crop, 2007/08–2009/10**

Crop	2007/08		2008/09		2009/10	
	Area (ha)	Production (t)	Area (ha)	Production (t)	Area (ha)	Production (t)
Maize	1,077.8	3,388.6	396.7	793.1	1,045.8	1,739.7
Rice	420.1	1,070.2	1,138.1	3,379.4	1,381.0	4,143.0
Millet	604.0	479.6	92.7	100.4	36.0	36.0
Sorghum	30.0	30.0	3.0	6.0	4.0	4.0
Wheat	51.0	150.0	–	–	–	–
Beans ( <i>f. vulgar</i> )	200.4	218.0	0.5	1.5	4.0	3.9
Beans ( <i>f. Boer</i> )	6.8	3.8	2.0	4.0	4.0	3.2
Cowpeas ( <i>f. nhemba</i> )	499.5	458.6	638.0	520.9	64.0	60.9
Pigeonpeas	5.0	2.0	–	–	–	–
Soybeans	95.3	112.4	5.0	17.5	12.0	18.0
Sunflower	67.0	53.6	–	–	–	–
Groundnuts	289.1	346.9	340.5	342.5	14.0	13.3
Sesame	64.5	34.5	239.3	191.4	–	–
Irish potatoes	51.6	774.0	20.0	400.0	16.5	115.0
TOTAL	3,462.1	7,122.2	2,875.8	5,756.7	2,581.3	6,137.0

Source: DS/DNSA

Only five of the registered seed companies are reported to have functional seed processing plants: MozFoods, PANNAR, SEMOC, IKURU, and Semente Perfeita.<sup>14</sup> IIAM also has a seed processing plant in Nampula. The following eight processing plants are operating in the country:

<sup>13</sup> These estimates are very rough and likely to be on the low side.

<sup>14</sup> The SDC study calculates that this installed capacity could process 19,000–21,000 t of seed per year, but that at most 12,000–13,500 t were processed in 2010.

- MozFoods, Chókwè (capacity 1.5–2 t/h).
- PANNAR, Chimoio: (2–3 t/h).
- SEMOC, Chimoio: (3 t/h), plus 1 mobile facility (3 t/h).
- IKURU, in Nampula (2–3 t/h) and in Monapo (sesame: 2–2.5 t/h).
- IIAM, in Nampula (3 t/h).
- Semente Perfeita: Chimoio (1 t/h).

These firms' installed capacity of 14.5–17.5 t/h is well in excess of what is required at current seed production levels and hence underutilized.

## 2.5 Government Distribution of Improved Seed

Government is the main supplier of seed to farmers through PAPA, its food production support program, and the EU voucher program implemented by the International Fertilizer Development Center (IFDC). Table 2-6 shows its annual distribution of various seed types.

**Table 2-6: PAPA Seed Distribution**

Crop	2008/09		2009/10		2010/11	Total
	1 <sup>st</sup> Season	2 <sup>nd</sup> Season	1 <sup>st</sup> Season	2 <sup>nd</sup> Season	1 <sup>st</sup> Season	
Rice (t)	697.8	-	2,000.0	-	1,825.0	4,522.8
Maize (t)	1,179.0	500.0	1,600.0	527.0	2,967.5	6,773.5
Millet (t)	-	-	-	-	535.0	535.0
Soybeans (t)	300.0	-	100.0	-	300.0	700.0
Sunflower (t)	75.0	-	-	-	-	75.0
Wheat (t)	-	1,152.0	-	1,350.0	-	2,502.0
Potatoes (t)	-	1,265.0	-	1,995.0	-	3,260.0
Horticulture (kg)	-	-	-	2,204.0	-	2,204.0
Beans (t)	-	-	-	107.0	-	107.0

Source: DNSA

Note: All seed of horticultural crops is imported and reported in kilograms, not in metric tons.

The seed distributed under PAPA is acquired from local companies through public tenders, which some suspect are not as open and competitive as they might be. Seed of horticultural crops and potatoes normally is imported from South Africa and other sources. Winning bidders are required to deliver seed to target districts. The District Department of Economic Services (SDAE) is thereafter responsible for handling all distribution, although it lacks the capacity to do so to the farm level. For that reason, seed is distributed through the rural trade network, which is expected to retain 30% of the sale price and pay back 70% to SDAE. The seed is sold to farmers at about 50% of the delivered cost of the seed to the district. SDAE also organizes seed/input fairs as platforms for farmers to acquire seed made available through government programs.

In 2009/10 and 2010/11, IFDC implemented an experimental voucher program<sup>15</sup> with support from the EU and FAO in Sofala, Zambezi, Manica, Nampula, and Tete Provinces. The voucher program provided maize or rice seed as well as 50 kg of urea and 50 kg of NPK, sufficient for planting 0.5 ha of either crop. Each farmer received one or two vouchers. For the rice crop, some farmers shared a voucher, i.e., two

<sup>15</sup> IFDC Quarterly Report, March 2010.

farmers obtained a single voucher and divided the inputs by half for each farmer. Producers were required to pay 31–33% of the voucher package price. The program benefited 20,626 producers during the 2009/10 cropping season and 25,000 producers during 2010/11, and the subsidy cost was US\$ 1.5 million in 2009/10 and US\$ 1.6 million in 2010/11 (excluding IFDC and donor management costs). A total of 12,926 vouchers (86% of the planned target) were distributed for maize and 7,700 vouchers (77% of the planned target) for rice in 2009/10. The total value of subsidized agro-inputs under this program was MZN 64.2 million in 2009/10, with farmers paying one-third (MZN 21.3 million). The figures for 2010/11 were MZN 83.6 million for the program, with farmers paying 31% of the cost (MZN 26.1 million) of the subsidized inputs.

**Most seed sector participants say that government intervention tends to crowd out the private sector and has not been helpful for the seed sector's long-term development.** The dilemma facing the seed industry is that the general perception of low effective farmer demand deters substantial investments in upgrading capacity and quality and in adapting regionally available varieties to local conditions. Given that government seed requirements are unpredictable and that government tenders are often put out too late to allow for local multiplication, the two largest players, SEMOC and PANNAR, typically end up importing seed from South Africa or Zimbabwe (supplied by SeedCo) to meet government demand.

The fact that smallholder farmers are not paying for the seed delivered by PAPA or are paying highly subsidized prices affects the demand for seed from alternative private sources. Dealers attempting to sell seed at its full value have difficulties in disposing of seed stocks in areas benefitting from subsidized seed.

The low apparent level of demand among farmers arises for several reasons:

- Low levels of commercial farming in Mozambique. Larger-scale commercial farmers value seed homogeneity highly, as it facilitates the maturation and mechanical harvesting of all plants in a field at the same time.
- Smallholder farmers prefer to plant a mix of varieties as a hedge against the failure of a single variety. They prefer to use their own retained seed, despite reputedly lower yields compared to certified seed, because of its heterogeneity and other attributes (see the next point).
- Farmers' main criterion for choosing a variety is not necessarily its biological yield potential. Traditional varieties typically have other attributes that farmers value, such as better storability (associated with resistance to boring insects), drought resistance, or pest/disease resistance in the field. Breeders do not always account for the importance of traits valued by farmers in varieties suitable to their field conditions.
- The limited reach and ineffectiveness of the extension system may also contribute to slow uptake of improved varieties.
- The cost of improved maize seed is high relative to the price of maize grain. The SDC study indicates that in general, seed prices increased substantially from 2007 to 2010. According to data provided by some seed companies (as reported in the SDC seed sector study), prices increased as follows over the three year period: Matuba (maize OPV): 50%; PAN 67 (hybrid maize): 50%; Nametil (groundnut): 63%; IT-18 (cowpea): 34%; sesame: 10%; soybean: 15%. **Seed retail prices were in general more than 5 times higher than farm gate grain prices in 2010** (note that seed use is considered profitable at up to 5 times the cost of grain). In 2010 this ratio was as follows: OPV maize: 5–6; hybrid maize: 9–10; Nametil groundnut: 3–3.5; cowpea: 5–6; and sesame: 5–5.5. On the other hand, farm gate maize producer prices remained within a narrow range at MZN 4–6/kg between 2007 and 2010. From July through November 2011, the

price ratios for hybrid maize and OPV maize seed to maize grain averaged 6.8 and 5.0, respectively.<sup>16</sup> The rice seed to paddy price ratio was far lower at only about 1.0.

- The lack of production credit further limits farmers' ability to invest in yield-improving technologies, including seed.
- Seed distributed in rural areas is often of poor quality with low germination rates. Some small- and medium-scale farmers might be willing to buy certified seed, as they appreciate high germination rates, an absence of weed seed, and limited organic matter content (Box 2-2), but poor quality acts as a disincentive for those farmers.

### **Box 2-2: A Commercial Viewpoint of Improved Seed Demand in Mozambique**

From 93% to 97% of the national cultivated area is farmed by "subsistence farmers," who use very low levels of technical inputs (shallow soil preparation, no fertilizer, no irrigation, no mechanization, and so forth). They rely on manual technology such as hoes or oxen to prepare soil, manual sowing and/or transplanting, and manual weeding. These farmers appreciate seed with the following attributes: *properly identified main variety; high germination rates; an absence of weed seed, and little organic matter*. They do not care much about the purity of the main variety; for them, growing a mixture of varieties is a good strategy to avoid losses, because the various varieties will have different harvest dates. While the earliest maturing varieties are harvest manually, panicle by panicle, varieties that mature later are harvested at the right ripening moment. If these subsistence farmers were able to harvest mechanically, they would not be able to store all their production or to transport surpluses easily or at the same time, as the post-harvest infrastructure is not in place for them to do so.

*In contrast, a commercial, mechanized farmer producing for a market requires strict varietal homogeneity and seed of a determined quality. This farmer will start harvesting with a combine when the whole crop has reached the quality and maturity demanded. Varietal purity is vital, as it guarantees an even production cycle, similar panicle height, and homogeneous quality. Seed-certifying entities first inspect the cleanliness of the equipment on a seed grower's farm, particularly the planters and harvesters. Clean equipment helps to prevent varietal mixtures. When inspecting the seed production fields, inspectors look for mixtures to ensure that other varieties of the same crop have not mixed with the particular variety under production.*

Source: Authors

## **2.6 Seed Imports**

The law permits imports of seed of registered varieties. Seed of varieties that are not registered can also be imported by individuals for direct use, subject to obtaining an import license from MINAG. To obtain an import permit, one needs to make an application to MINAG through the Seed Department of DNSA. The process normally takes 1–2 weeks, depending on the availability of the Minister to issue the authorization.

National statistics on seed imports for field crops are not readily available, with the exception of 2009. Some information has been obtained from the Customs Department on seed importation, but the seed classification system applied does not allow one to distinguish among most types of seed, because the majority of entries are registered as "other." The Customs import data for most years appear to be for seed of horticultural and secondary crops, however, and not for key grains, legumes, or oilseeds.

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<sup>16</sup> This calculation takes maize seed price data from the AMITSA website for Mozambique and maize grain price data from SIMA (MINAG's market information system) at <http://www.sima.minag.org.mz/>.

Customs reported that PANNAR imported 90.7 t of maize seed in 2009, whereas private sources reported 1,469.5 t. COMTRADE data show that maize seed was imported each year from 2006 to 2010, but only the value of imports was reported for 2007–09. COMTRADE reported 267.7 t of maize seed imports in 2010, while SEMOC claims to have imported 7 t of hybrid maize seed in 2010 and PANNAR 150 t. The reason for the discrepancies among data sources is unclear.

## 2.7 Certified Seed Utilization by Farmers

No official information is readily available on how much certified seed farmers use by crop. TIA survey results for three recent seasons, during which nationally representative sample surveys were conducted, show that a low percentage of producers use certified seed (Table 2-7). The higher utilization of improved maize seed than other seed types may reflect efforts by the government, donor projects, or NGOs to distribute subsidized seed. The unusually high proportion of farmer-reported improved seed use across crops in 2006 may also be due to widespread subsidized seed distribution.

**Table 2-7: Percentage of Farmers Using Improved Seed, by Crop, 2005–08**

Crop	2005	2006	2008
Maize	5.6	21.1	10.0
Rice	3.3	22.1	1.8
Millet		31.4	3.6
Sorghum		5.8	
Groundnuts	2.0	12.2	3.8
Cowpeas	4.3	26.7	4.7
Beans	4.9	8.9	7.1
Pigeonpeas	3.5	3.9	4.2

Source: TIA farm surveys, MINAG, various years

The **maize yield gap** is very pronounced in Mozambique. Farmers planting hybrid maize seed under good management can supposedly achieve yields of 6.0 t/ha, yet the average maize yield calculated using FAO figures is 0.9 t/ha, leading to a yield gap of 85%. According to one knowledgeable observer, it is difficult to get information on where hybrid seed has delivered good yields in the field (as opposed to research stations). For example, PAN 67 is supplied on a large scale to MLTC (the tobacco company), whose contract farmers rotate maize with their tobacco. Given that MLTC farmers are among the most disciplined and well supervised in the country, one would expect yields exceeding 3 t/ha, but lower yields of 1–1.5 tons are typically achieved. This yield gap raises the issue of whether an imported variety such as PAN 67 is suited to the hotter, lower growing conditions prevalent throughout much of Mozambique (compared to the higher-altitude growing areas in South Africa and Zimbabwe).

The SDC study of 2011 estimates that total seed use for “grain”<sup>17</sup> crops is approximately 90,000 t, of which no more than 10% is improved. The rest comes from farmers’ retained seed, as well as seed purchases from or exchanges with other local farmers. An estimate of 9,000–10,000 t for purchased seed cross-checks well with the estimated sales of nearly 10,200 t of certified seed sales in 2010 by leading seed production and trading firms (reported in section 2.4.2).

In estimating the proportion of maize and rice area that is planted to improved seed, it is important to keep in mind the absence of credible and accurate estimates of area planted to each crop at the regional

<sup>17</sup> “Grain” refers to field crops such as maize, rice, sorghum, as well as legumes and oilseeds.

and national levels in Mozambique. Therefore, such attempts should be considered rough approximations. As shown in Table 2-8, we estimate that only 5.0% of the maize area in 2010/11 was planted to improved seed multiplied in Mozambique (OPV and hybrid). If maize seed imports of 267.7 t for 2010 (COMTRADE data) are included, the proportion rises to 5.7%.

We estimate that the area planted to improved rice seed was 14.0% in 2010/11, using MozFoods' estimate of certified rice seed production in 2009/10. If we use the DS/DNSA estimate of certified rice seed production in 2009/10, the proportion of area planted to improved rice seed in 2010/11 rises to 23.8%, which is considered too high an estimate by key informants.

Note that MozFoods estimates that 95% of irrigated rice area (approximately 6,000 ha) in Mozambique is planted to improved seed. Use of improved seed on non-irrigated land in both lowland (approximately 164,000 ha) and upland (approximately 20,000 ha) production systems falls between 8% and 13% of that combined area. Across all types of rice production systems, MozFoods estimates that improved seed is planted on 10.5–16% of paddy area. This breakdown is consistent with the 14% estimate based on MozFoods production of certified seed.

**Table 2-8: Estimated Area Cropped to Improved Seed, using Certified Seed Production Data**

	2007/08			2008/09			2009/10		
Crop	Area (ha)	Prod (mt)	Yield	Area (ha)	Prod (ton)	Yield	Area (ha)	Prod (ton)	Yield
Maize	1,077.80	3,388.60	3.1	396.7	793.1	2.0	1,045.80	1,739.70	1.7
Rice	420.1	1,070.20	2.5	1,138.10	3,379.40	3.0	1,381.00	4,143.00	3.0
Improved Seed Planted in the Following Year	2008/09			2009/10			2010/11		
	Estim Area to Improv. Seed (ha)	Total Area Planted	% Area to Impr. Seed	Estim Area to Improv. Seed (ha)	Total Area Planted	% Area to Impr. Seed	Estim Area to Improv. Seed (ha)	Total Area Planted	% Area to Impr. Seed
Maize (local multipl.)	135,544	1,300,000	10.4%	31,724	1,300,000	2.4%	69,588	1,400,000	5.0%
Maize (adds imports)				35,344	1,300,000	2.7%	80,296	1,400,000	5.7%
Rice (DS/DNSA estim.)	13,378	215,000	6.2%	42,243	230,000	18.4%	51,788	218,000	23.8%
Rice (MozFoods)							30,625	218,000	14.0%

Source: DS/DNSA for certified seed. Area cropped estimates from USDA, as reported in [www.indexmundi.com](http://www.indexmundi.com)

Note: Estimates of area planted to improved seed use certified seed production estimates from the previous year and assume seeding rates of 25 kg/ha for maize and 80 kg/ha for rice.



## 2.8 Existing Seed Legislation and Regulations

The legislation establishes that at least two years of Distinctness, Uniformity, and Stability tests (DSU) and Value for Cultivation or Use (VCU) tests are required before proposing the release of a new variety. The plant breeder proposing the variety is responsible for conducting these tests and for submitting all data to DS. Then DS is responsible for two years of additional DSU and VCU testing to check the information provided by the breeder, leading to a four-year testing process. Variety release proposals are submitted for initial screening to a Variety Release and Registration Subcommittee and thereafter to the National Seed Committee for approval.

This variety release system is considered unable<sup>18</sup> to respond to demand, with more than 80 varieties awaiting approval through this long and cumbersome process. The low capacity of DS to conduct the required tests has been identified as one of the major constraints. To overcome these problems, MINAG issued a decree<sup>19</sup> that allows for the provisional release of varieties based on data provided by the proposing plant breeder/seed company. This process may reduce to two years the time required for formally approving the release of a variety, but it does not yet seem to be functioning well. Breeders need to provide proof from trials that new varieties are effective for at least one year.

The procedures laid out in the existing legislation are also considered demanding and time-consuming. DNSA is working on a proposal to develop a new Seed Industry Policy and Guidelines that would introduce new procedures. The following decrees and regulations (*diplomas*) are currently in place.

- Diploma Ministerial 95/1991—Regulamento de importação de sementes (Seed Importation Regulation).
- Decreto 41/1994—Normas para produção e comércio de sementes (Seed Production and Marketing Guidelines).
- Diploma Ministerial 11/1998—Regulamento interno do comité nacional de sementes (Internal Regulation for National Seed Committee).
- Diploma Ministerial 67/2001—Diploma interno do Subcomite de Registo e libertação de variedades (Internal Regulation for the committee responsible for variety release and registration).
- Diploma Ministerial 184/2001—Regulamento sobre produção, comércio, controle de qualidade e certificação de sementes (Quality Control and Seed Certification).
- Decreto 57/2006—Normas de protecção de novas variedades de plantas (Plant Breeders Rights).

Stakeholders consider the existing legislation to be comprehensive enough to regulate the functioning of the seed industry, but public sector capacity limitations undercut its implementation. According to the Department of Seed Services of DNSA, the ongoing and emerging issues include:

- DNSA and DPA are unable to undertake timely laboratory analyses or inspect seed multiplication fields. The three regional seed laboratories, in Chókwè/Gaza Province, Chimoio/Manica, and Nampula, are all under rehabilitation. The laboratory at Chókwè is now operational, and the other two were planned to be fully operational by the end of 2011. A new seed laboratory will be built in Quelimane/Zambézia in 2012. No more laboratories are planned for future years. Each DPA of the provinces noted above has an agronomist responsible for seed inspection.

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<sup>18</sup> Only 3 varieties of maize, 5 of cassava, and 15 of sweet potato were provisionally released during the last five years.

<sup>19</sup> Diploma Ministerial 67/2001—Regulamento Interno do Sub-Comité de Registo e Libertação de Variedades.

- No detailed regulations exist for effectively implementing the Plant Breeders Rights Decree of 2006.
- Variety release legislation must be changed to introduce more flexibility and be aligned with practices in neighboring countries.
- A new National Seed Strategy is needed to replace the existing one, which covered the period from 1997 to 2001 but remains in effect. A new policy would reflect the significant changes that have occurred in the regulatory environment for the seed sector and agriculture in general.

## 2.9 Priority Policy Issues/Problems and Actual/Planned Advocacy Role

Table 2-9 summarizes constraints to improved seed production. Most of them raise policy or regulatory issues or suggest public sector investment priorities.

**Table 2-9: Constraints to Improved Seed Production**

Stakeholder Group Level	Constraint
Breeding and seed maintenance	<ul style="list-style-type: none"> <li>• Low capacity of existing public institutions (few breeders; lack of equipment, financial resources, and qualified staff)</li> <li>• Complex variety release system</li> <li>• Limited legal ability to protect plant breeders' rights</li> <li>• Poor linkages with extension and farmers</li> </ul>
Seed-producing companies	<ul style="list-style-type: none"> <li>• Insufficient basic seed</li> <li>• Basic seed lacks quality due to poor maintenance</li> <li>• Varieties not adapted to local farmers' conditions</li> <li>• Alleged lack of demand; subsistence farmers are well aware of the importance of good quality seed, but prefer varietal heterogeneity as a hedge vs. risk that a single variety will fail (due to uncertain harvests in rainfed farming).</li> <li>• Seed companies lack qualified staff to provide technical extension</li> <li>• Official seed inspection not done on time</li> <li>• Poor seed distribution system (agro-dealers lack product knowledge)</li> </ul>
Seed quality inspection	<ul style="list-style-type: none"> <li>• Low capacity (few inspectors, lack of equipment, lack of financial resources, lack of qualified staff)</li> </ul>
Farmers	<ul style="list-style-type: none"> <li>• Varieties not adapted to local farmers' conditions</li> <li>• High cost of seed</li> <li>• Inadequate availability of seed in rural areas</li> <li>• Lack of financial resources to buy seed</li> <li>• Farmers not fully aware of the importance of quality seed</li> <li>• Weak network of extension services in rural areas</li> </ul>

It is important to note that no seed policy advocacy program is underway. The Alliance for a Green Revolution in Africa (AGRA) has started an initiative to organize seed sector stakeholders to address seed policy issues. A seed policy node established<sup>20</sup> under the leadership of DNSA (with AGRA support) has identified key policy issues to address (Table 2-10).

<sup>20</sup> AGRA has granted \$300,000 to each of two nodes (for seed and fertilizer) to implement identified activities.

**Table 2-10: Seed Policy Areas**

<b>Policy Issue</b>	<b>Suggested Policy Entry Point</b>
Facilitate the development of a new Seed Sector Development Strategy	Existing strategy misaligned with sector developments
Facilitate the implementation of harmonized seed laws and regulations	The current length of time taken to coordinate the registration of new seed improved varieties is considered to be excessive
Review and disseminate best practices for increasing seed purchases and use	Farmers are aware of the existence of improved seed varieties, but improved seed is neither widely available nor affordable

Source: AGRA Workshop, 1 November 2011

### 3. Fertilizer Indicators in Mozambique

#### 3.1 Introduction and Summary Scorecard

This section summarizes findings from an analysis of secondary data; informal interviews with private importers, selected government officials, and NGOs; and consultations with IFDC. IFDC has assembled time-series data on eight eastern and southern African countries, including Mozambique, which provide details on fertilizer imports and consumption, as well as selected monthly retail fertilizer product prices (supplied by collaborating agro-input dealers) since mid-2010.

Fertilizer importation and blending are highly concentrated in Mozambique. A limited number of participants in agro-input distribution provide modest quantities of fertilizer to some commercially oriented (or subsidized) farmers. Farmers use little fertilizer on crops other than leaf tobacco and sugarcane; Mozambique trails neighboring countries in fertilizer use on staple food crops. Despite the scope to expand fertilizer imports and use in Mozambique, at present farmers' fertilizer purchases are constrained by limited access to input credit and the high costs of fertilizer delivered to rural areas. Dealer turnover is low, and transport costs to rural areas are very high. Table 3-1 offers a preliminary scorecard for fertilizer access and use in Mozambique.

**Table 3-1: Summary Observations on Fertilizer Access and Use in Mozambique**

Indicators	Indicator Findings	Data Sources
Fertilizer use	54,600 t (2010) and 62,000 t (2011) (estimates of a private importer) 51,400 t (DNSA, 2010) Growth rate per annum from 2000 through 2010 is 8.8% for all fertilizer types 34,480 t (average, 2006 through 2010)	2010, 2011 estimated by a private importer; second 2010 estimate from DNSA. AMITSA estimates ( <a href="http://www.AMITSA.org">www.AMITSA.org</a> ) (regional agricultural input market information system) are far higher than those of MINAG or private importers; probably include re-exports to other countries.
Fertilizer consumption rates	Fertilizer: 7.0 kg/ha (average 2006–10) N, P, and K nutrients: 2.8 kg/ha (2006–10) 2.6–4.7% of farmers surveyed used fertilizer in 2002–08	Calculated from MINAG/DNSA data  TIA national sample surveys
Cost of 50-kg bag of NPK and urea in one main agricultural production zone (Manica and Sofala Provinces)	<b>NPK 12-24-12:</b> <u>Wholesale:</u> MZN 1,100 (US\$ 41.35) per 50-kg bag = US\$ 827/t <u>Retail:</u> MZN 1,507 (US\$ 56.65) per 50-kg bag = US\$ 1,133/t  <b>NPK 12-12-12:</b> <u>Wholesale:</u> MZN 1,050 (US\$ 39.47) per 50-kg bag = US\$ 789/t  <b>Urea:</b> <u>Wholesale:</u> MZN 1,000 (US\$ 37.59) per 50-kg = US\$ 752/t <u>Retail:</u> MZN 1,361 (US\$ 51.15) per 50-kg bag = US\$ 1,023/t	<u>Retail prices:</u> IFDC as reported on AMITSA website; IFDC collects monthly retail prices from selected agro-input dealers. <u>Wholesale prices:</u> Mozambique Fertilizer Company (MFC), Chimoio. Prices are MFC sales prices at the factory gate in early August 2011.

Indicators	Indicator Findings	Data Sources
Nutrient/output price ratio	Using urea as the source of the major nutrient nitrogen and producer maize prices, the price ratio = 8 to 14 for Manica Province in the Beira Corridor. This ratio is way too high to encourage fertilizer use on maize.	Key informants from August 2011 field trip to Beira/Chimoio. Retail maize prices (SIMA) and retail fertilizer prices (IFDC, as reported on <a href="http://www.AMITSA.org">www.AMITSA.org</a> ).
Timeliness in the importation of fertilizer (proxy for timeliness in the application of fertilizer)  % of imported fertilizer that was delayed (2010)	Fertilizer imports into Beira are concentrated during 3–4 months (March through June). What is unknown is typical time to unload and the length of delays (demurrage charges were reportedly high in the past) in getting fertilizer out of the port. Some shipping companies report extended storage at the port, where there is significant warehousing capacity. Fertilizer must then be moved upcountry to distribution points, where farmers obtain it from agribusiness company suppliers or small agro-dealers. Transport up to Chimoio (MFC blending factory) and Tete (HQ of the tobacco company MLTC) is rapid, but distribution to rural zones requires time and strong management of logistics.  Sample farms in the TIA surveys (last one in 2008) and the Agricultural Census (2009/10) were not asked about timeliness of delivery of fertilizer and of application.	Interviews of port officials and shipping/freight forwarding companies.  Month-by-month Beira port import data are not released in disaggregated form.  Farm surveys collected no information on timeliness of fertilizer use.
Entry into the fertilizer market (scale: 0–5)	Rating = 3. Three principal importers serve needs of MLTC, some sugarcane producers, and some smaller buyers. Significant capital or access to trade finance required to import in large volumes competitively. Import/mixing: High entry requirements, given financing costs to meet volume requirements. Most agro-dealers handle multiple inputs (and some are commodity traders). Access to finance to buy stock before farmers start to buy fertilizer is problematic (though Banco Oportunidade is working with IFDC on this issue).	Market thin other than two major customers —MLTC (tobacco) and sugarcane plantations. Lack of credit (to farmers) limits their capacity to buy. Retail sales: no score (IFDC would need to do a survey of its dealers, which could be done through AMPIA, the input dealer association).
Fertilizer subsidy	An EU/FAO pilot, implemented by IFDC, provided fertilizer and seed to ≤25,000 farmers at a subsidy of 69% (in 2010/11). An evaluation of the subsidy program (2009 and 2010) is underway to assess the economic impact on sample households vs. a control group.	IFDC publications; information from interviews and email inquiries with IFDC managers.
Tariffs and taxes on fertilizer	2.5% tariff; no VAT applied to fertilizer sales of MFC.	Importers and tariff book

Indicators	Indicator Findings	Data Sources
Private sector participation in the fertilizer market (scale: 0–5)	Rating = 3 for importers/blender  Agro-dealers: not interviewed	Informal interviews IFDC could obtain information about dealer activities and perceptions in a survey of AMPIA members.
Number of agro-dealers, and farms and area cultivated per dealer	128 members in AMPIA; 250 dealers total (rough estimate) One agro-input dealer per 20,088 farms or per 29,405 ha cultivated (per AMPIA member). One dealer per 29.904 farms or per 44,006 ha cultivated (for country).	Estimate of 250 active dealers from Fertilizer Strategy paper by C. Zandamela, August 2011. Farm numbers and area data for five AMPIA provinces and entire country from INE agricultural census for 2009/10

### 3.2 Fertilizer Imports and Utilization

All fertilizer used by producers in Mozambique is either imported by several firms or blended by one fertilizer mixing plant, which began operations in 2007.<sup>21</sup> Fertilizer consumption equates to imports, with very limited carryover stocks from year to year.

The website for AMITSA—the Regional Agricultural Input Market Information and Transparency System for East and Southern Africa, established by IFDC with support from IFA—shows a threefold increase in fertilizer imports from 2006 to 2010, with peak imports of 248,400 t reported for 2010. Note, however, that these estimates appear to be for Mozambique, Malawi, and part of what is imported into Zimbabwe and Zambia. For this reason, they are too high and capture some fertilizer that is trans-shipped to neighboring countries, particularly along the Beira Corridor. According to AMITSA, 74% of the fertilizer imported into Mozambique (and destined for several countries) over the past decade was urea, although this proportion had dropped to 39% of fertilizer imports in 2010. Calcium ammonium nitrate is a distant second, at 14% of imports over 2000–09. Ammonium nitrate, ammonium sulfate, and diammonium phosphate (DAP) comprised only 12% of fertilizer imports.

According to Government of Mozambique estimates of fertilizer consumption (Table 3-2), consumption grew at 8.8% per annum from 2000 through 2010 for all fertilizer types. (The growth rate for Mozambique plus neighboring countries, using AMITSA data, was nearly the same, at 9.6%).

DNSA’s and private suppliers’ estimates of fertilizer use in Mozambique for 2010 range from 51,400 t to some 84,000 t. The lower government estimate of 51,400 t of imports includes 31,400 t of fertilizer applied to tobacco (61.1%), 15,000 t to sugarcane (29.2%), and 5,000 t (9.7%) to other crops. The DNSA estimates could not be cross-checked against Customs import data, which are very difficult to interpret. The raw data have many data entry errors and mislabeling of the types of fertilizer imported. Furthermore, many import entries refer to “other fertilizers” rather than specific types.

<sup>21</sup> According to a recent report by AGRA and IFPRI, the Export Trading Company of Tanzania established a fertilizer blending plant in Beira in late 2011.

**Table 3-2: Estimated Fertilizer Consumption in Mozambique**

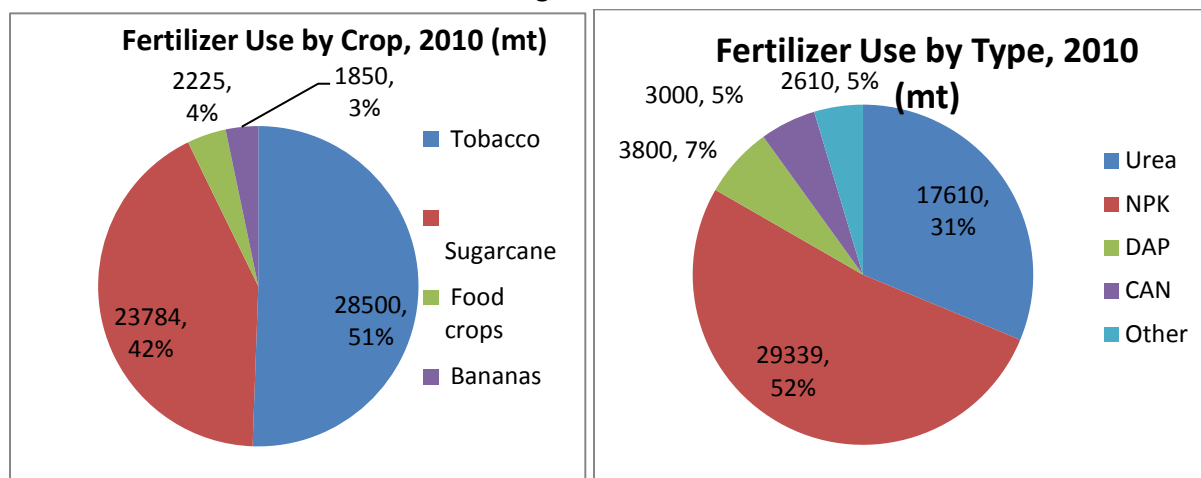
Year	Tobacco	Sugarcane	Other Crops	Total
1999				18,000
2000				18,000
2001				18,000
2002				20,000
2003				25,000
2004				28,000
2005				28,000
2006	13,000	10,000	5,500	28,000
2007	13,000	10,000	5,000	28,000
2008	15,000	12,000	5,000	32,000
2009	16,000	12,000	5,000	33,000
2010	31,400	15,000	5,000	51,400

Source: *Estratégia e Sistema de Regulamentação de Fertilizantes em Moçambique*, Carlos B. Zandamela, MINAG/DNSA, July 2011; (data drawn from TIA farm surveys, DINA/MADER, and IFDC)

A highly disaggregated set of estimates by a private fertilizer importer put fertilizer imports and use at approximately 56,400 t in 2010, broken down as follows (Figures 3-1 and 3-2):

- 28,500 t purchased by MLTC, 50.6% of estimated national use.
- 23,784 t used by sugarcane growers (four plantations), 42.2% of estimated national use.
- Only 3.9% (about 2,225 t) used on food crops.
- 29,393 t (52.1%) blended (or imported) as NPK and used for multiple crops (this figure represents mainly MFC production and sales)
- 17,610 t (31.2%) imported and sold as urea and applied mainly (92.6%) to tobacco and sugarcane.
- No fertilizer use on cotton.

**Figures 3-1 and 3-2**



Note: These data represent one private sector source's best estimates.

Preliminary estimates for 2011 were 10% higher, with MLTC and sugarcane growers reportedly using the same volumes. However, the expanded use of fertilizer on bananas and food crops reduced the combined share of fertilizer use on tobacco and sugarcane to 84.4% in 2011 as opposed to 92.8% in 2010. The greatest expansion in estimated fertilizer use in 2011 was in banana production (from 1,800 to 4,440 t). Fertilizer use on food crops, including bananas, was also estimated to be higher, rising from 2,225 t to 3,700 t. Application of fertilizer (typically one time) to forestry projects was also reported for 2011 (1,600 t, as opposed to zero or simply unrecorded in 2010).

In contrast, Malawi, with a far smaller land area and population of only 15 million, imported more fertilizer than Mozambique in three of five years from 2005 to 2009, although Malawi's fertilizer imports were driven largely by government subsidies.<sup>22</sup> Large volumes of fertilizer are imported into the landlocked countries of Malawi, Zambia, and Zimbabwe through the port of Beira, leading to seasonal peaks (March–June) in demand for berths, port handling services, and trucking along the Beira Corridor to the interior countries. As the main rainy season does not begin until October in southern Africa, these fertilizer imports come into Mozambique (and neighboring countries) well before they need to be applied by farmers in rural areas.

### 3.3 Structure of the Fertilizer Import and Blending Industry in Mozambique

All fertilizer or fertilizer ingredients are imported into Mozambique from other countries by private firms. The only fertilizer “manufacturer” is MFC, a private firm that operates a fertilizer mixing/blending plant in Chimoio with the installed capacity to process up to 60,000 t per year (using one eight-hour shift). MFC is part of a larger holding company based in South Africa.

YARA, an enthusiastic participant in the Beira Agricultural Growth Corridor launch, undertook engineering and architectural studies with the intention of investing in a fertilizer import receiving, warehousing, and blending complex near the port of Beira, but decided to forego this investment when cost estimates of building such a complex on marshy, low-lying land with a very high water table proved to be too high. A perception of limited demand for fertilizer also dissuaded YARA from investing. Other large agribusiness firms, such as Export Marketing (of the Export Trading Group) and OLAM, are reported to be contemplating the feasibility of investing in fertilizer mixing and blending in the Beira Corridor. ETC has reportedly invested in a fertilizer mixing plant in Beira.

MFC's market share could be as high as 50% in Mozambique, though company management thinks that annual fertilizer importation and consumption in Mozambique is more likely in the 84,000–100,000 t range. As of August 2011, MFC capacity utilization was running at 50–55%,<sup>23</sup> which could be expanded to accommodate increases in demand. MFC sells modest amounts of fertilizer (<10% of total output) to clients in neighboring countries. Most of the blends sold in Mozambique are NPK, although urea is also sold. MFC sells the following fertilizer products, with NPK 12-24-12 being the most common formulation:

- NPK 12-24-12, used on maize and other grains, with the standard MoA recommendation being 100 kg/ha; sold for MZN 1,100 per 50-kg bag at the factory gate.

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<sup>22</sup> It is reported, though not confirmed, that Malawi has imported over 200,000 t of fertilizer in one or more recent years.

<sup>23</sup> MFC runs only one eight-hour shift for 260 days per year. A second shift could be added, or more days work, to increase blended fertilizer output.



- NPK 12-12-12, used on tobacco and sold for MZN 1,050 per 50-kg bag at the factory gate.
- Urea, sold for MZN 1,000 per 50-kg bag at the factory gate.

The other key sellers of fertilizer in Mozambique are importers. AgriFocus, based in southern Mozambique, imports some fertilizer from South Africa, but its core business is agri-chemical importation and sale. AgriFocus imports about 1,700 t of fertilizer per year and is supplied by both Omnia, a South Africa–based fertilizer supplier in much of southern Africa, and more recently Profert. Omnia Fertilizer Africa manages exports from Johannesburg, as well as its own facilities in Zimbabwe, Zambia, and Malawi. As more South African investors have established plantations in southern Mozambique, they have continued to maintain relationships with South African fertilizer suppliers, and Omnia has supplied fertilizer directly to some of these producers without having any sales office or outlet in Maputo. MFC, which supplies some 28,000 t to the local market, claims that high south–north transport costs (and hence shipping costs from South African manufacturing facilities) make AgriFocus and South African suppliers uncompetitive in much of central and northern Mozambique.<sup>24</sup> The August 2011 trucking cost from South Africa to central/northern Mozambique was quoted at US\$ 160/t.

Bridge Shipping Group, headquartered in South Africa, has a commodity trading division that bids on MLTC tenders of approximately 29,000 t per year. It supplied MLTC with 10,000 t of urea in 2011 and 14,000 t in 2010, split between urea and NPK 12-12-12. Other South Africa–based suppliers to Mozambique reportedly include YARA, Sasol, and Profert.

IFDC created an association of agro-input dealers (AMPIA, with 128 members) and trained about 400 agro-input dealers in management, fertilizer use, and agri-chemical applications. Zandamela (2011) reports that some 250 agro-input dealers function in all of Mozambique, less than 10% of the total in Ghana, where over 3,000 are active.

The private sector manages virtually the entire fertilizer importation and distribution system in Mozambique. The biggest user of fertilizer, MLTC, extends inputs on credit to tobacco leaf growers and provides extension oversight. The privately owned and managed sugarcane plantations buy their fertilizer mainly from South African suppliers, as well as some NPK from Mozambique Fertilizer Company.

It is important to remember that the port of Beira is the entry point for fertilizer going to four countries, as shown in Table 3-3. Even so, the estimates in that table of fertilizer that remains in Mozambique appear to be too low.

**Table 3-3: Fertilizer Imports through the Port of Beira in 2005–08 (t)**

Country	2005	2006	2007	2008
Malawi	104,252	52,977	113,390	118,930
Zimbabwe	62,430	41,696	103,477	31,532
Mozambique	19,647	23,646	72,959	14,885
Zambia	6,800	29,525	27,678	25,963
Total/Year	193,129	147,844	317,504	191,310

<sup>24</sup> Central Mozambique covers Sofala, Manica, Tete, and Zambézia Provinces, while the north comprises Nampula, Cabo Delgado, and Niassa Provinces. Nampula and Zambézia Provinces have the largest number of farm households (829,642 and 828,802 respectively, 43% of the 3,827,754 total), according to 2009/10 agricultural census data.

Source: Mazvimavi, Kizito et al., *A Review of the Agricultural Inputs and Outputs Market Development in Mozambique*, MozSAKSS Workshop, 21 July 2011, Maputo

### 3.4 Fertilizer Prices

In 9 of 11 months for which price data are reported on the AMITSA website (in the June 2010 through July 2011 period), NPK 12-24-12 varied between US\$ 947/t and US\$ 1,133/t, with a mean value of US\$ 982/t over 11 reporting months (Table 3-4). The ratio of NPK 12-24-12 to urea retail prices averaged only 1.2 over this reporting period. The ratio of urea prices at retail sales points to the FOB price (from a major foreign supplying point) varied between 1.8 and 2.6 for most months during the reporting period. We were unable to obtain reliable CIF price estimates.

Most observers (among fertilizer importers and NGOs) feel that fertilizer prices paid by producers to agro-dealers are too high, suggesting high gross profit margins, which are estimated in Table 3-5 at 24–25%. A late 2011 set of cost estimates for importation and distribution of urea shows that retail fertilizer sales margins are high in rural Mozambique—27% for urea and 31% for NPK (12-24-12). This calculation is based on the decomposition of costs of international sea freight, port handling/clearance fees, transport upcountry, and storage and handling fees, as shown in Table 3-6. NPK distribution costs, ex-blending factory gate, are also shown for a common mix. Mixing/blending costs are not available. Road transport costs in total appear to be barely 5% of the fertilizer retail cost, which seems surprisingly low. Perhaps some of the apparent retailer margin is made up of additional rural transport costs. Nevertheless, the high apparent retail mark-ups merit closer examination. Perhaps IFDC can track these costs periodically, in coordination with its efforts to collect and disseminate retail fertilizer prices on the Internet and in conjunction with its work with AMPIA and its members.

**Table 3-4: Monthly Fertilizer Prices in 2010/11 for Mozambique (US\$/t)**

Fertilizer Type	2010				2011						
	Jun	Aug	Oct	Nov	Jan	Feb	Mar	Apr	May	June	July
CAN 26-0-0		820	469						867	883	
CAN 28-0-0											703
NPK 10-15-10					919						
NPK 10-20-10						898	1,004				
NPK 12-24-12	1,029	738	1,077	801	950	997	1,025	947	1,067	1,043	1,133
NPK 23-21-0 + 4S	1,059										
Urea 46-0-0	882	629	635	677	919	861	917	762	900	948	1,023
FOB urea	239	283	345	383	392	387	358	345	345	492	501
Local/intl. urea ratio	3.7	2.2	1.8	1.8	2.3	2.2	2.6	2.2	2.6	1.9	2.0
DAP 18-46-0								872			
FOB DAP								621			
Local/intl. DAP ratio								1.4			

Source: AMITSA, IFDC

Note: FOB prices are from the Arab Gulf (urea) and the Baltic Sea ports (DAP). S = sulphur.

**Table 3-5: Illustrative Fertilizer Costs and Margins within Manica Province, August 2011 (US\$ /t)**

Prices/Costs along Supply Chain	NPK 12-24-12	Urea
Ex-mixing factory gate price, Chimoio	827	752
Transport cost to retail sales point	20	20
Delivered cost to point of sale	847	772
Retail price, Manica Province	1133	1023
Retail margin	286	251
Margin as % of retail price	25.2%	24.5%

Notes: (1) US\$ 20/t is an estimated factory to rural consumption point distribution cost and not empirically verified. One buyer paid US\$ 90/t to ship MFC-supplied fertilizer from Chimoio to Namialo in Nampula Province. (2) The retail margin is a gross margin that includes a return to management, labor, and capital (at a minimum the cost of credit for carrying fertilizer, as well as the cost of investing in and maintaining storage facilities). Storing fertilizer for up to several months has both a real cost and an opportunity cost.

**Table 3-6: Decomposition of Fertilizer Importation and Distribution Costs in Central Mozambique, late 2011 (US\$ /t)**

Prices/costs per ton	NPK 12-24-12	Urea	% Urea Price at Retail
FOB price (at source, Saudi Arabia)		449	43.9
Sea freight and logistics		152.3	
Insurance		4.5	
Warehousing, demurrage, bagging		18.0	
CIF price (at Beira)		623.8	61.0
Import duty @ 2.5%		11.2	
Transport cost to Chimoio		25	
Delivered cost at factory gate		660	64.5
Factory processing costs			
Ex-factory gate price, Chimoio	750	720	70.4
Transport cost to retail sales point	27.5	27.5	
Delivered cost to point of sale	778	748	73.1
Retail price, Manica Province	1133	1023	100.0
Retail margin	356	276	26.9
% retail price	31.4%	26.9%	

### 3.5 Fertilizer Use per Hectare in Nutrient Terms

According to FAO data, fertilizer use in nutrient terms in Mozambique is very low at 4.8 kg/ha (average of 2000–07), compared with 9.5 kg/ha in Ghana and 8.2 kg/ha in Ethiopia for 2002–07.<sup>25</sup> Decomposing

<sup>25</sup> From the World Bank Development Indicators database (with data originally from FAOSTAT). Fertilizer consumption measures the quantity of plant nutrients used per unit of arable land. Fertilizer products cover nitrogenous, potash, and phosphate fertilizers (including ground rock phosphate). Traditional nutrients--animal

Government of Mozambique fertilizer import data (from Table 3-2) into its nutrient components and summing up imports in N, P, and K terms yields a lower estimate for 2000–10, an average of 2.6 kg/ha per annum. Nutrient imports were higher in 2009 (3.0 kg/ha) and 2010 (3.5 kg/ha), however. Fertilizer imports (gross amounts) show that an average of 6.0 kg/ha was supplied in 2000-10, with imports peaking at 10.2 kg/ha in 2010. The AMITSA data appear to overstate fertilizer imports and nutrient application per hectare, as they seem to include imports destined for Malawi (mainly) and Zimbabwe and Zambia (secondarily).

**Table 3-7: Fertilizer Availability or Use in both Gross Fertilizer and Nutrient Terms, 2000-2010**

Source Year	Government of Mozambique Data			FAO	AMITSA
	Nutrient Imports, NPK (t)	Nutrient Application (kg/ha)	Fertilizer Application (kg/ha)	Nutrient Application (kg/ha)	Nutrient Application (kg/ha)
2000	8,614	2.2	4.6	3.7	2.6
2001	8,280	2.1	4.5	6.2	4.8
2002	9,423	2.1	4.5	6.0	6.7
2003	10,945	2.4	5.6	7.9	7.8
2004	12,289	2.7	6.1	5.3	9.3
2005	11,476	2.6	6.2	1.6	6.0
2006	11,840	2.5	5.8	4.7	7.5
2007	11,615	2.4	5.8	2.9	7.8
2008	13,634	2.8	6.7		15.2
2009	15,095	3.0	6.5		9.9
2010	17,477	3.5	10.2		16.6

Source: MINAG/DNSA, FAOSTAT, AMITSA website (<http://www.amitsa.org>)

Note: Fertilizer Imports are converted to nutrient terms by using standard conversion factors for N, P, and K. Only the sulphur component of ammonium sulfate is not included in the nutrient import and use estimates. As government fertilizer consumption data are gross aggregates (not differentiated by fertilizer type), the breakdown of government estimates into fertilizer types for each year assumes the same breakdown as in the AMITSA import data. The AMITSA data appear to cover Mozambique, Malawi, and some of the fertilizer imported into Zimbabwe and Zambia. All data on fertilizer and nutrient use per hectare should be treated as rough and subject to error. *The essential point is that nutrient use is very low in Mozambican agriculture, well under 10 kg/ha in most years.*

**Nutrient Output Ratio ( $P_N/P_O$ ).** High fertilizer prices adversely affect fertilizer use if farmers find that the investment in fertilizer will not yield sufficiently high returns, which are in large part a function of the prices they get for their output. The nutrient to output ratio helps to assess the amount of grain (in kilograms) needed to purchase one kilogram of fertilizer nutrient. In Mozambique, the nutrient output ratio was measured by calculating the average wholesale price per kilogram of maize and average price per kilogram of nitrogen, using urea as the main nitrogen source. In July 2011, the average wholesale price for maize was US\$ 0.22–0.24/kg (as compared to US\$ 0.43/kg in Ghana), while the price for urea was US\$ 1.02/kg, twice the level of Ghana for May 2011 (0.51/kg).<sup>26</sup> Using the information in Table 3-8,

and plant manures--are not included. For the purpose of data dissemination, FAO has adopted the concept of a calendar year (January–December). Some countries compile fertilizer data on a calendar-year basis, while others are on a split-year basis. Note that the *Abuja Declaration on Fertilizer for a Green Revolution in Africa* of 2006 called for fertilizer use in SSA to expand from 8 kg per hectare in 2005 to 50 kg per hectare by 2015.

<sup>26</sup> Urea is 46% nitrogen. The price of nitrogen was then calculated to be US\$ 2.22 per kilogram of nitrogen.

the nutrient output ratio was calculated to range from 7.1 to 10.1. This ratio implies that farmers in Mozambique have little or no incentive to use fertilizer, as fertilizer prices are way too high relative to maize prices in the post-harvest period (May–August), when most maize is sold.<sup>27</sup>

**Table 3-8: Nutrient Price Ratios Calculated for Selected Production Zones in Mozambique**

Production Zones	Buyer and Seller (or Key Informant)	Late July/Early August 2011 (MZN/kg)	Late July/Early August 2011 (US\$/kg)	Nutrient Output Price Ratio
Sofala	CIM buys at factory gate from 3–4 wholesale assemblers	6.5	0.24	9.2
		8.5	0.31	7.1
Manica	Big volume buyers' (based in Chimoio) prices to producers in rural areas	6.0	0.22	10.0
Gurue	CLUSA	6.0	0.21	10.1
Nampula	IKURU	6.3	0.23	7.7
Chókwè	AfricaWorks	8.6	0.31	9.4

Source: Key informants in Beira and Chimoio; *FEWSNET Bulletin*, July 2011; field staff of selected NGOs (not actual buyers).

Note: SIMA maize prices for Nampula are wholesale prices, while they are retail market prices for Gurue (actually from the closest reporting town, Alto Molócuè). The Chókwè price is a producer price.

Using SIMA maize producer price data for Manica Province and Gorongosa District (of Sofala Province), a production zone of typically large maize surpluses, as well as IFDC retail fertilizer prices, the nutrient to output price ratio varied between 8 and 14 during the main maize marketing season of 2011 (Table 3-9). The ratio for Gorongosa District was worse (15–18), given lower maize producer prices than in Manica Province. The high cost of fertilizer relative to grain prices in the main marketing season clearly suggests that fertilizer is costly, which discourages its use.

**Table 3-9: Fertilizer Nutrient/Grain Price Ratios, May through August 2011**

	29 Aug–4 Sept	1–8 Aug	4–11 July	30 May–6 Jun	2–9 May
<b>Maize prices</b>					
Manica	6.86	5.71	5.71	5.71	8.00
Gorongosa	4.08	3.43	4.16	4.35	4.35
Urea	30	30	36.1	32.5	29.5
US\$/t	1,180		1,023	948	900
NPK 12-24-12	30	30	40.0	35.7	35.0
US\$/t		1,214	1,133	1,043	1,067
Exchange rate	27.30	27.63	28.31	29.19	30.49
<b>Nutrient/grain price ratio</b>					
Manica	9.5	11.4	13.8	12.4	8.0
Gorongosa	16.0	19.0	18.9	16.2	14.8

Source: SIMA website (<http://www.sima.minag.org.mz/>) and [www.AMITSA.org](http://www.AMITSA.org)

<sup>27</sup> Maize prices do go higher in the lean season, which begins later in the calendar year, but our working hypothesis is that most grain is sold during the 3–4 months following the main harvest.

The nutrient to output price ratio is a first-cut approximation of farmer incentives to use fertilizer, but it does not get at the effect on maize productivity (marginal value of increased maize output) of using fertilizer. Value-Cost Ratios, shown directly below, have been estimated for Ethiopia, but we were unable to obtain fertilizer response data for maize grown in Mozambique. A CIMMYT researcher based in Mozambique noted that it is not profitable for smallholders to use fertilizer on maize under rainfed conditions, given the high input costs relative to product prices in most production zones.

Value-Cost Ratio  $\left\{ \frac{O}{N} \right\} \left\{ \frac{P_N}{P_O} \right\}$  of using fertilizer input; where  $P_N$  is the Price of fertilizer,  $P_O$  is the Output price of maize, O is the quantity of output from one unit of nutrient N.

### 3.6 Fertilizer Use by Farmers in Mozambique

Most fertilizer is applied to cash crops such as tobacco and sugarcane rather than to staple food crops. Fertilizer application to grains is reported to be very low, with use on legumes and oilseeds essentially non-existent. The rapid expansion in area planted to soybeans and in soybean production in the past several years, promoted by TechnoServe in central and northern Mozambique, has been on fertile lands where no fertilizer has been applied<sup>28</sup> (personal communication, TechnoServe).

The nationally representative sample of small- and medium-scale farmers in Mozambique, the TIA, administered in six years between 2002 and 2008, revealed that only 2.6– 4.7% of smallholders used chemical fertilizer during that period, with only 2–6% of small farms using organic fertilizer (Table 3-10). Regional differences in fertilizer use were striking, with higher percentages of farmers in Tete, Niassa, and Maputo using fertilizer because of tobacco production in Tete and Niassa and horticultural crop and irrigated rice production in Maputo.

**Table 3-10: Percentage of Small and Medium Farms Using Chemical Fertilizers, Mozambique, 2002–08**

Province/Nation	2000	2002	2003	2005	2006	2007	2008
Niassa	.	7.5	11.7	17.9	15.1	7.2	9.8
Cabo Delgado	.	2.7	0.0	0.2	4.8	1.1	2.8
Nampula	.	3.3	0.3	3.0	3.0	2.3	2.7
Zambézia	.	0.7	0.7	0.0	1.7	1.1	0.4
Tete	.	15.1	12.1	16.5	17.8	21.3	14.9
Manica	.	3.0	2.8	2.3	.8	1.1	4.7
Sofala	.	0.7	1.5	0.5	1.7	1.1	0.6
Inhambane	.	1.7	1.8	1.0	2.4	3.8	2.3
Gaza	.	5.2	2.2	4.2	2.1	1.9	3.8
Maputo	.	3.6	3.3	6.8	7.0	11.6	9.1
National	.	3.8	2.6	3.9	4.7	4.1	4.1

Source: MINAG/DE, *Trabalho de Inquérito Agrícola*, 2000–08.

Note: Figures are based on farms with cultivated fields.

<sup>28</sup> At some point yields will decline on those soils, and fertilizer application will become necessary.

More recent results on fertilizer (and pesticide) use come from preliminary tabulations of the 2009/10 national agricultural census and show low rates of fertilizer use, 3.7%, for small farms (of which 97.4% are reportedly smaller than five hectares) (Table 3-11). Tete had 62.9% of all fertilizer users; most of the 89,065 small-scale farmers using fertilizer in Tete received it from MLTC. In 2009/10 in Tete, 24% of farmers used fertilizer, a higher percentage than in 2002–08, when 12–21% of Tete farmers used fertilizer. Only in Tete, Maputo City (10%), and Niassa (7.6%) did more than 2.2% of farms use fertilizer in 2009/10.

**Table 3-11: Number and Percentage of Farms Using Fertilizer (and Pesticides) by Farm Size Category**

Farm Size	# Farms	# Using Fertilizer	% Using Fertilizer	# Using Pesticide	% Using Pesticide
Small	3,801,259	140,516	3.7	93,194	2.5
Medium	25,654	2,733	10.7	2,452	9.6
Large	841	250	29.7	242	28.8
Total	3,827,754	143,499	3.7	95,888	2.5

Source: Censo Agro-Pecuário 2009–2010: *Resultados Preliminares*, Instituto Nacional de Estatística (INE), Maputo, 2011

A recent analysis of maize-producing households in rural Mozambique by Michigan State University (see Mather et al., forthcoming 2011), using 2005 TIA survey data, shows that only 4.2% of maize growers used fertilizer. The average quantity of fertilizer applied per maize farmer using fertilizer in 2005 was, however, quite high at 277 kg/ha. It is important to recognize that only 1.8% of maize producers used purchased hybrid seed, and only 3.3% of maize producers received (input) credit. In sharp contrast, among maize farmers in Kenya 71% used fertilizer (applying 145 kg/ha), 70% used hybrid seed, and 52% received credit. Although Mozambican maize farmers using fertilizer applied much more per hectare than their Kenyan counterparts, the proportion of maize farmers using fertilizer in Mozambique is far lower than in Kenya.

### 3.7 Fertilizer Subsidies

Mozambique has no national fertilizer subsidy, unlike neighboring Malawi, which has subsidized fertilizer heavily and reportedly imported over 200,000 t of fertilizer in each of several recent years. At different points in the past in rural Mozambique, however, the distribution of fertilizer, seed, and some agricultural implements has been subsidized by NGOs or development projects, particularly following floods (and earlier as Mozambique emerged from civil war). Fertilizer imports are subject to a modest 2.5% duty, which IFDC and the national agro-dealer association AMPIA have lobbied to remove, but that would require an act of Parliament.

An input subsidy scheme, implemented by IFDC with FAO funding, is part of the EU-funded Food Facility,<sup>29</sup> under which up to 25,000 farmers received vouchers to obtain subsidized seed and fertilizer to

<sup>29</sup> FAO assisted in providing tools, fertilizers, pesticides, and a training package to around 200 farmers' associations to encourage local production of basic seed of maize, rice, wheat, soybeans, and sunflower. Farmers' associations are supposed to link up with private seed companies to market the seed. A seed processing plant—owned and operated by a farmers' association company—will be installed, enabling farmers to clean, grade, calibrate, dry, and package seed for commercial use. Support will be given to rehabilitating and equipping seed testing laboratories in five provinces in an effort to boost quality control capacity at the national and provincial levels. To offset high input prices, around 25 000 smallholder farmers received a 50 percent (*or higher*) input subsidy, which also

cultivate 0.5 ha of maize or rice in 2009/10 and 2010/11. As discussed in chapter 2, adequate seed (either 12.5 kg of maize seed or 20 kg of rice seed) to sow 0.5 ha was provided, along with one 50-kg bag of NPK and one 50-kg bag of urea. The total cost of the subsidy program (excluding IFDC management and coordination costs) was US\$ 1.5 million in 2009/10 and estimated to be US\$ 1.6 million in 2010/11. In total, 2,062.6 t of fertilizer were supplied to smallholders under this program in 2009/10 for use on food crops, while 2,500 t was planned for 2010/11. The voucher scheme<sup>30</sup> concluded in 2010/11, but it is under economic evaluation this cropping season. The economic evaluation of the impact of the two-year scheme tracks participants in the voucher scheme versus a control group with respect to ongoing fertilizer purchases and application, as well as effects of the program on rural household income and crop production and disposal.

There is no particular government policy on fertilizer subsidies. While the government has given ad hoc support to provide seed, draft power, and mechanization as part of the poverty alleviation program (PAPA), this support has not extended to fertilizer, which the government has not considered a priority input to subsidize. The EU-funded, IFDC-implemented voucher program was the first attempt at subsidizing fertilizer inputs. The government is reportedly considering a fertilizer subsidy scheme that would scale up the pilot voucher scheme to the national level. Where funding for an expanded subsidy would come from, however, is unclear.

### 3.8 Efforts to Strengthen Agro-Dealer Networks

Under AIMS (Agricultural Input Market Strengthening II, 2009–12) IFDC helped to create and strengthen AMPIA. This agro-input dealer association has 128 members in five provinces in central and northern Mozambique, yielding a ratio of one agro-input dealer per 20,088 farms or per 29,405 cultivated hectares (in those provinces). Note that these ratios worsen if we use the figure for 250 active agro-input dealers in all of Mozambique selling fertilizer: one agro-input dealer per 29,904 farms or one per 44,006 ha. Key components of AIMS II are business development and capacity building, association building, technology transfer and extension support, increased production of improved seed, and improving the agro-input policy environment.

An AGRA-funded project that supports IFDC's efforts in Mozambique is called MADD, Mozambique Agro-Dealer Development (2009–12), which “promotes private sector investment in agro-input technologies and improves farmers’ access to these technologies through competitive markets and stronger dealer networks. Building on these efforts, MADD is strengthening and expanding dealer networks in the Manica and Tete Provinces of Mozambique” (<http://www.ifdc.org/Nations/Mozambique>).

IFDC has trained a larger number of agro-dealer firms (estimated at 400) with financial support from USAID and AGRA. Banco Oportunidade de Moçambique has received AGRA support (a loan guarantee scheme) to encourage lending to 50 agro-dealers in 2010, which has been scaled up to more agro-

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included access to the types of improved seed produced by farmer associations. (This information was taken directly from [http://www.fao.org/europeanunion/eu-in-action/euff\\_countries/mozambique/en/](http://www.fao.org/europeanunion/eu-in-action/euff_countries/mozambique/en/)).

<sup>30</sup> According to IFDC, “vouchers are coupons that transfer purchasing power to targeted smallholder farmers either by reducing the input’s price below market cost or by providing liquidity as production credit, with repayment at a later date. Farmers redeem the input vouchers through agro-dealers. In turn, dealers receive payment for redeemed vouchers and a specified margin for operating expenses and profit from the program sponsors” (*IFDC Report* Vol. 36, No. 1, 2011, “An IFDC Core Competency: Fertilizer Voucher Programs”).



dealers in 2011, combined into five groups (sub-associations), where each group receives MZN 500,000 (approximately US\$ 18,500) for use in Manica and Tete Provinces.

From 2001 to 2007, the IFAD-financed PAMA (Agricultural Markets Support Program) worked with 66 input traders (33 in Niassa, 33 in Cabo Delgado) in a capacity-building program involving the development finance institutions GAPI and AMODER, as well as a business training institution, Enterprise Mozambique. These traders are still active in the north and financed by these institutions.

### 3.9 Policy and Regulatory Issues

As of late 2010, IFDC placed a resident policy advisor in MINAG's DNSA, the National Directorate of Advisory Services. He drafted a fertilizer strategy paper in mid-2011 that proposes medium- to long-term investments in improved fertilizer distribution systems (strengthening agro-input dealers and their association), funded by donors. The paper also advocates strengthening smallholders' demand for fertilizer through subsidies and credit. It encourages the government to conduct research on fertilizer's impact on different crops under different soil and agro-ecological conditions so that it can extend empirically based recommendations to farmers. The strategy paper envisions a role for government in monitoring and disseminating fertilizer prices, as well as in monitoring fertilizer quality and conducting soil testing. Promoting entry into fertilizer marketing and training new (and existing) entrants should expand and densify fertilizer distribution networks, increase competition, and reduce margins and prices.

IFDC and others have pointed out that the 2.5% tariff on fertilizer imports adds to fertilizer cost, but its removal would require an act of Parliament and thus is unlikely. In any event, eliminating such a low tariff would have very little effect on smallholders' fertilizer purchases and use because of the questionable profitability of using fertilizer on maize.

A recently created "fertilizer hub" in MINAG, led by DNSA, will address the policy issues set out in Table 3-12, yet IFDC is pursuing no major policy agenda. The fertilizer hub's priority in the last quarter of 2011 was to develop a fertilizer regulatory framework, with DNSA taking the lead in hiring a team of consultants to develop the framework. In addition to the issues identified in Table 3-12, it is important to note that wild fires, the continued prevalence of shifting agriculture, and other production practices also negatively affect soil fertility in Mozambique.

### 3.10 Concluding Comments

Prices of maize<sup>31</sup> in the post-harvest marketing period are simply too low, and prices of fertilizer delivered to rural areas simply too high, for farmers to buy and use much fertilizer. This case is different for horticultural crops, which are typically grown closer to urban areas on farms to which fertilizer can be delivered at lower cost. MLTC provides credit to tobacco growers to provide fertilizer, but it easily recaptures its financial outlay at harvest, given that leaf tobacco is not a food crop that can be eaten, diverted, or easily side-sold, and that tobacco prices are attractive to producers.

Under these circumstances, fertilizer use on staple food crops is only likely to expand in Mozambique with subsidy programs and the provision of input credit to producers. At this point, however, there is

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<sup>31</sup> Prices paid to producers of paddy are not available for us to do this same type of analysis for applying fertilizer on paddy.

limited interest in distributing fertilizer to smallholders other than for use on high value crops such as vegetables or tobacco. The government does not appear to be crowding out the private sector in fertilizer importation and distribution.

An important factor that may reduce fertilizer costs over the medium term is the completed dredging of the main channel into the port of Beira, which was previously too shallow to allow for larger vessels to dock. Enabling large vessels to call on the port should reduce the per ton international shipping costs to Beira port. It may also reduce any need for trans-shipment of goods such as fertilizer from South African ports, particularly Durban, to Beira, which adds to shipping costs.

**Table 3-12: Soil Health Policy Areas**

<b>Activity</b>	<b>Suggested Policy Entry Point</b>	<b>Suggested Policy Intervention (“What Should Be Done”)</b>	<b>Suggested Way(s) to Intervene (“How It Should Be Done”)</b>	<b>Intervention by Whom? (Institutional Mix)</b>
Review impact of fertilizer tax structures on fertilizer demand	Need for increased demand for, and private sector-led supply of, inorganic fertilizers	Implement Abuja Declaration of zero tax on fertilizers and tax breaks for private companies to produce inorganic fertilizers	Government should make use of public-private partnerships	Private companies, MINAG, Transport and Communications Ministry, Ministry of Finance
Facilitate the harmonization of regional fertilizer regulations	No fertilizer regulations are in place at the moment	Draft fertilizer regulation; set up fertilizer regulatory authority for quality control	Assist in review and finalization of a draft fertilizer law	MINAG(DNSA), IFDC, INNOQ, Ministry of industry, Trade, and Commerce
Facilitate the development and implementation of policies to increase the demand for integrated soil fertility management technologies	Develop integrated policy on soil health (not just on inorganic fertilizers)	Develop integrated strategy and policy to guide the management of soil health in a broad sense	To be determined	To be determined

Source: Fertilizer Policy Hub, MINAG/DNSA. This information was presented at an AGRA workshop in Maputo in early August 2011.

## 4. Agricultural Mechanization in Mozambique

This chapter focuses on the use of tractors in land preparation as a proxy for mechanization of agricultural operations. Table 4-1 summarizes findings on agribusiness indicators related to tractor numbers and imports, costs of tractor use and custom hire land preparation, and the ease of private sector participation in the domestic agricultural machinery market. Although this section addresses tractor use as a proxy for mechanization, it is important to note that animal traction remains important in certain production zones of Mozambique, even though Mozambique's cattle population declined precipitously during many years of civil war, particularly in northern Mozambique.

**Table 4-1: Summary Scorecard on Agricultural Mechanization in Mozambique**

Indicators	Indicator Findings	Data Sources
Total number of tractors per 100 sq km (or ha) of arable land	13.6 tractors per 100 sq km (2006) 12.7 tractors per 100 sq km (2010) HP per 100 sq km decreased from 1,158 to 1,079 from 2006 to 2010	2006, FAOSTAT 2010, estimated from import figures and an assumed replacement rate
Cost of plowing one hectare (in 2010)	US\$ 61–91/ha in Southern MZ; US\$ 55–75/ha in Central MZ; US\$ 50–55 in Nampula (North). Crude rule of thumb: operation is 4 times the cost of fuel used per hectare.	Key informants (large farmers; NGO field managers)
Useful life of tractors and hours of operation per year	Reportedly 10–12.5 years for most durable brands, with regular maintenance. Estimated hours of operation per year for normal farm operations range from 600 to 1,100 h per year, with an average of 850–870 h (63% for land preparation).	Tractor importers; MINAG/DNSA; selected users/owners
No. of tractors imported by the private sector (as a % of total no. of tractors in the country)	Private sector imported ≥80% of the tractors imported from 2005 to 2009. This share declined to 40% in 2010, as public sector imports increased by nearly sevenfold in 2010 over 2009.	DNSA/MINAG, Customs data (for private imports)
Tariffs on imports of tractors and tractor spare parts	5% duty on imports of tractors for agricultural purposes. Spare parts are subject to 7.5% duty and 17% VAT. Import clearing costs and port fees are approximately 25,000 MZN (US\$ 925) per tractor.	Customs Department
Government subsidy on tractors	Imports of tractors going to public projects and schemes increased strongly in 2010; these tractors were distributed on a subsidized basis.	DNSA/MINAG
Ease of private sector participation in the agricultural machinery market	Ranking = 3. Duties and taxes relatively low (5%). Takes only three days to clear a tractor. High cost of financing limits acquisition, with interest rates of over 25% (recent John Deere leasing scheme with AgriFuturo offers 19%).	Perception of stakeholders (ranked on 0–5 scale)

### 4.1 Tractor Numbers and Horsepower

FAOSTAT data show that tractor numbers, both in total and per 100 sq km of agricultural land, increased very gradually from 1998 to 2006 at an average annual rate of 2.8%. After 2006 tractor numbers are estimated by adding imports and subtracting (assumed) numbers of tractors falling out of service (at the

end of their useful working lives). Tractor numbers decreased slightly from 6,540 units in 2006 to an estimated 6,413 units in 2010, from 13.6 tractors per 100 square kilometers in 2006 to 12.7 in 2010 (Table 4-2). In terms of horsepower (HP) per 100 sq km, tractor horsepower dropped from 1,158 HP in 2006 to 1,079 HP in 2010.<sup>32</sup> There are no data on the regional distribution of tractors, but tractors are more common in southern and central Mozambique than in the north, where their use is limited to a few large farms.

It is important to note that these estimates are sensitive to the assumption about the average working life of a tractor. Our initial unpublished estimates assumed that average tractor life was 10 years, which led to a drop in estimated tractor numbers from 2006 to 2010 of 530 tractors, which seemed counterintuitive. We also reduced the original estimate of tractor imports in 2010 by excluding significant imports of 2x2 walking tractors (64 units from China), which are much cheaper than 4x4 or 4x2 tractors yet have far lower HP.

**Table 4-2: Tractor Numbers and Imports into Mozambique, 1998–2010**

Year	Total Tractors (FAO)	Estimated Tractor Numbers (A)	Tractors per 100 sq km	HP per 100 sq km (average= 85)	Imports (B)	Estimated Number of Tractors Going out of Use (C)	Net Additions to Total (D)
1998	5,040		12.6		344		
1999	5,140		13.0		309		
2000	5,300		13.6		275		
2001	5,490		13.7		20		
2002	5,690		12.8		329		
2003	6,050		13.4		1,483		
2004	6,250		13.6		605	500	105
2005	6,380		14.2		412	510	-98
2006	6,540		13.6	1,158	548	523	25
2007		6,565	13.7	1,163	336	525	-189
2008		6,376	13.3	1,129	447	510	63
2009		6,313	12.5	1,063	605	505	100
2010		6,413	12.7	1,079	424	513	-89

Source: FAO (tractor numbers to 2006, imports from 1998 to 2007); Customs for imports from 2008 to 2010

Note: (1) C : 8% of tractors assumed to go out of use each year (assumes a 12.5-year life span). (2) D: Net additions = Total imports – Tractors going out of use. (3) Estimated tractor numbers calculation:  $A_t = A_{t-1} + B_t - C_t$ . (4) 64 hand-operated 2 x 2 Chinese tractors were dropped from the import total in 2010.

<sup>32</sup> This assumes that a sample of approximately 46% of tractor imports in 2009 through mid-2011, with an average HP of 85 per tractor, is representative of the existing stock of tractors (up to 12.5 years old) as well as of imports before 2009. If we assume that the average HP for existing stock reflects imports of the three most common tractor HPs ≤80 HP in 2010 and half of 2011, we arrive at 14% lower average horsepower of 73 HP/tractor. Using this lower average HP would result in a decline in HP from 995 per 100 sq km in 2006 to 927 by 2010.

## 4.2 Tractor Hire Services

Tractor hire services are limited in Mozambique. Some large-scale producers provide custom land preparation services to smaller-scale neighbors, typically after they have plowed and disc harrowed their own fields. As the larger farms generally plow their own land first, land preparation is delayed for farms that hire tractors, which affects the timeliness of planting and may thus reduce yields. Some development programs such as USAID's AgriFuturo Project have been providing grant financing to selected farmers to purchase tractors for their own use and as an incentive to provide tillage services to neighboring farmers. The government has specifically targeted potential tractor hire service providers in its tractor support programs: Italian Aid, PAPA, and the Zambezi Region Development Authority (GPZ). These private companies would thereafter provide the required tractor hire services to their respective communities.

Farmers' associations and cooperatives also provide tractor hire services. They have benefitted from donor programs or government-subsidized programs to acquire agricultural machinery. Some have also acquired tractors through the MZN 7 million District Development Funds.<sup>33</sup>

Rates for land preparation vary by region and by type of operation (Table 4-3). In the central provinces of Sofala and Manica, common charges are US\$ 55–60/ha for plowing and US\$ 27–30/ha for discing. Nampula rates are comparable. In Chókwè in southern Mozambique, where there is a large irrigation scheme and more commercial farming (and hence likely higher demand for mechanization services), rates are higher at US\$ 61–91 for plowing one hectare.

Another commonly applied method is to charge 4–5 times the cost of fuel used per operation per hectare. The amount of fuel used varies depending on the type of operation and the size of the tractor. A normal-size (85-HP) tractor consumes 20–25 liters per hectare for plowing and heavy discing operations, which translated to a cost of US\$ 73–91/ha in late 2010.<sup>34</sup> Light operations consume 10–15 liters of fuel per hectare, so they would have cost US\$ 36–55/ha in 2010. Some private contractors charged a flat rate of US\$ 70/ha (2,100 MZN/ha) in 2010. In contrast, in most areas of Ghana, the average cost of plowing was less than US\$ 50/ha in 2010.

In Pemba in northern Mozambique, a few small tractor-hire operations reportedly rent 85-HP tractors for US\$ 120/day (or MZN 3,200/day) including fuel (with trailer as attachment), largely for transport. Corredor Agro has provided discing to its contract growers on credit, which would tend to increase the cost of mechanization services (with typical monthly credit rates of at least 3–4%).

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<sup>33</sup> In 2006, the government created District Development Funds (FDD), which transfer MZN 7 million per year to each of 128 districts (equivalent to \$233,000–280,000 per year, depending on the exchange rate). The total annual cost of this program is therefore in the \$30–36 million range. Of MZN 4.2 billion disbursed from 2006 to 2010 through the FDD, only MZN 227 million have been repaid—a rate of just 5.4% (from USAID, AgriFuturo Project, "AgClir Mozambique: Commercial, Legal and Institutional Reform in Mozambique's Agricultural sector. Agenda for Action," August 2011).

<sup>34</sup> Diesel fuel costs have risen significantly since September 2010. They were MZN 30 per liter in October–November 2010 but had reached MZN 40 per liter by August 2011. Hence, one would anticipate land preparation costs to rise significantly in 2011 relative to 2010.

**Table 4-3: Selected Tractor Hire Land Preparation Services and Their Costs, 2010**

Location	MZN/ha	US\$/ha	Type of Operation	Provider (or Source)
Massingir	1,500–1,800	45–55	Plowing	Cooperative association
Chókwè	2,000–2,500	61–76	Plowing	Cooperative association
Manica	2,000	61	Plowing/heavy discing	Large farms
Manica	900–1,000	27–30	Light disc	Large farms
Sofala	1,800	55	Plowing	Private individuals
Sofala	1,000	30	Discing and other light operations	Private individuals
Chókwè	2,400–3,000	73–91	Plowing	(International Rice Research Institute)
Zambézia	1,500–1,800	62–75	Plowing	Dunavant quote (2008)
Gurue	2,300	70	Plowing	(CLUSA)
Gurue	1,150	35	Ripping	(CLUSA)
Gurue	1,000	30	Animal traction	Local farmers (provided by CLUSA)
Nampula	1,800	55	Plowing	(IKURU)
Nampula	1,600	49	Discing (on credit)	Corredor Agro
Nampula	900	27	Discing	(IKURU)

Note: As these operations were performed at the beginning of the last cropping season (in October–November 2010), we apply the US\$–MZN exchange rate from that period.

### 4.3 Useful Life of Tractors

The rated economic life of most tractor brands is 10 years, assuming regular maintenance. Observers in the field report a range of 5–15 years of service, with 7 years being typical owing to less-than-optimal maintenance. Some commercial farmers interviewed in Manica Province estimated that hours of operation of tractors for normal farm operations ranged from 700 to 1,000 each year. Informants in other regions of Mozambique provided a range of 600 to 1,100 h. The mean of these ranges is 850 hours per year, with a calculated average of 870 h from observers in different agricultural production zones in Mozambique. The breakdown of time allocated to land preparation services and transport and other operations is 63% and 37%.

The uses of tractors in agriculture include preparing land (plowing and disc harrowing), transporting farm inputs and outputs, and powering other agricultural machinery such as threshers or shellers. Tractors are also used for seeding and/or weeding on some commercial farms.

### 4.4 Imports of Tractors

Imports of tractors for agricultural uses averaged 451 units from 2005 through 2010. FAO data for 2005 through 2007 show that imports averaged 377 units; Customs data from the government show that imports increased to an average of 524 units per year in 2008–10. It is reported that both new and used tractors are imported into Mozambique, with the majority being new.

Nominal average import values doubled from US\$ 11,968 on average in 2006 to US\$ 25,780 in 2008. This may have something to do with the new/used composition of imports, or imports of larger horsepower tractors in 2010 compared to 2006 and in earlier years. The average unit value of imported tractors from 2008 to 2010 was US\$ 24,563 (using Customs data), while US\$ 18,887 per year from 2005 to 2007 (using FAO figures). Adjusting these values for inflation—putting average tractor values for

2005–10 in constant 2010 prices—reveals that mean tractor prices were essentially flat between the first period (2005–07) and second period (2008–10), going from US\$ 27,503 per unit to US\$ 27,550.

## 4.5 Duties on Imports of Tractors and Spare Parts

The current duty on imports of tractors for agricultural purposes is 5%. Spare parts are subject to 7.5% duty and 17% VAT. Other import-related fees/charges include port charges and freight forwarding and clearing agency fees. The total fees and agency costs of importing a US\$ 15,000 unit are about MZN 25,000 (approximately US\$ 925, or 6.2%). Added to import duties of 5%, this increases costs by 11.2%.

## 4.6 Government Distribution of Tractors

The government plays an increasingly important role in the purchase and distribution of tractors in Mozambique. The government purchases tractors from local dealers of the respective brands, and from 2005 to 2009, it used state funds to purchase tractors that were distributed through public funds (FDA) or programs (PAPA). The government also imported 98 tractors in 2005 for distribution through FDA, concentrated in Maputo (40%), Gaza (21%), and Nampula (15%). Although the government does not appear to have imported tractors in 2006 and 2007, in 2008 it imported 50 tractors for distribution through FDA in Beira and Nampula. These imports of John Deere, Massey Ferguson, and New Holland tractors were valued at US\$ 1.7 million for an average of US\$ 34,654 per tractor. Through PAPA, the government imported another 50 tractors in 2009. In 2010, tractor imports jumped to 330 units, one-third of which (n=110) were purchased by the Government of Italy through the Commodity IDA Project. The program used BCI to lease these tractors. Regional distribution of these tractors was more balanced than in earlier years—74% went to Inhambane, Manica, Cabo Delgado, Zambézia, and Nampula. The GPZ purchased 220 tractors from China as part of a government-to-government deal in 2010.

The beneficiaries of these government-supported tractor schemes depend on the objectives of the specific program (Box 4-1). The Italian Aid Program sought to increase irrigated crop production (mainly rice). Consequently the beneficiaries were farmers' associations and Mozambican companies producing defined priority crops (especially rice) with access to irrigation water. The GPZ program beneficiaries have been private companies interested in providing tractor hire services, as well as farmers' associations and cooperatives.

### Box 4-1: Two Programs Supporting Tractor Access

#### Italian Aid

- Companies  $\geq$ 51% Mozambican ownership
- Properly licensed and active
- Producing priority crops
- Working within an irrigation system (e.g., rice) or on land with permanent access to water
- Minimum area of 10 ha
- Initial deposit: 5% of value + insurance
- Interest rate: 5% per year
- Repayment Term: Up to five (5) years
- Beneficiaries: Producers and service providers
- Period of approval: at least one season

#### GPZ tractors

- Beneficiaries: Cooperatives and companies involved in service provision
- Ownership of equipment during lease/loan repayment period: MINAG
- Access modalities: Through credit contract signed between beneficiary and distributing company
- Initial minimum deposit: 15% of value plus insurance against all risks
- Interest rate: 12%/year
- Repayment period: Up to 5 years
- Grace period: 3 months

**Table 4-4: Government Distribution of Tractors**

No.	Year	Tractors	4x4	4x2	Origin
1	2008	50	25	25	FDA
2	2009	50	25	25	PAPA
3	2009/10	110	70	40	Commodity AID
4	2009/10	220	150	60	GPZ
Totals		430	270	150	

Source: DNSA

## 4.7 Private Sector Participation in the Agricultural Machinery Market

Tractors can be imported freely by both private individuals and companies planning to resell. A review of tractor sales by the major distributors from 2008 through 2010 showed that the bulk of sales went to public institutions. Demand from private operators has been generally low, partly reflecting the low level of commercial farming activities in the country and partly due to the high cost of finance. The cost of finance is between 23% and 30% per annum, which is considered prohibitive by many.

**Table 4-5: Private and Public Sector Imports of Tractors, 2008–11**

Year	Number	4x4	4x2	2x2	Private (%)	Public (%)
2008	38	27	11		0	100
2009	77	62	15		26	74
2010	284	242	15	27	21	79
2011	70	51	19		86	14
Total	469	382	60	27		

Source: Private importers and public agencies importing tractors (including CEPAGRI)

Note: There are slight discrepancies between Tables 4-4 and 4-5, because the government may not have acquired all of its tractors from registered dealers.

Most tractors sold by the distributing companies are four-wheel riding tractors. Tractor sales data reviewed for the past three years show that over 80% of these tractors are four-wheel drive (4x4) tractors. One company, Sorvel, which imported 197 GPZ tractors on behalf of the government, also imported 27 two-wheel tractors that were sold mainly to rice producers within the Zambezi Valley.

As noted, some of the largest private owners of tractors, such as South African-owned sugarcane estates, finance tractor acquisition through offshore finance on terms that are far more favorable than those offered through domestic sources.

**Table 4-6: Sales of Sorvel Tractors, 2010**

Type	Quantity
120 HP (4x4)	54
80HP (4x4)	57
65 HP (4x4)	59



## 4.8 Importance of Animal Traction

Across all provinces (TIA Survey, 2008), 11% of farms used oxen for traction and less than 1% used donkeys. Only 1.4% of farms indicated using tractors, and 96% of those rented in the service, with only 4% of the users actually owning the tractors.

In central and southern Mozambique, however (below Zambézia Province), the use of animal traction is substantially higher than the national average (see Table 4-7). Nearly 50% of smallholders used animal traction in Inhambane and Gaza Provinces, while 20–40% of small farmers used traction in 2002–08. Animal traction is virtually nil in Zambézia and the northern provinces due to slaughter during the civil war and trypanisomiasis. Using animals for traction in southern Mozambique is also more feasible, as more of the soils are sandy and require less power to till.

Oxen do not provide the same traction power in heavier soils as tractors, but they are multipurpose animals used to prepare land and haul carts and (or other forms of transport), in addition to providing manure and having a positive salvage value (eventual sale for slaughter). Oxen ownership—unlike tractor ownership (or even access)—typically is not beyond the reach of lower-income smallholders.

**Table 4-7: Percentage of small- and medium-scale farms that utilized animal traction, 2000–08**

Province	2000	2002	2003	2005	2006	2007	2008
Niassa	.						
Cabo Delgado	.						
Nampula	.		0.2	0.1	0.1	0.2	0.0
Zambézia	.		0.0	0.1	0.1	0.2	0.2
Tete	.	35.2	31.2	17.5	39.0	32.7	21.1
Manica	.	11.5	13.5	10.9	13.9	9.5	16.6
Sofala	.	1.6	1.5	2.2	2.0	1.7	6.3
Inhambane	.	48.0	47.1	45.9	53.6	47.1	48.1
Gaza	.	45.2	50.7	39.2	55.3	58.1	47.3
Maputo	.	12.0	14.7	16.3	15.9	15.8	30.8
National	.	11.4	11.3	9.5	12.8	12.0	11.3

Source: MINAG/DE. Trabalho de Inquérito Agrícola, 2000-2008; Censo Agro-Pecuária 2000

## 4.9 Concluding Observations on Public/Private Sector Roles

While private importers and distributors are allowed to operate competitively, the fact that many of the tractors they import go to public agencies suggests that private sector demand for tractors remains low. A tractor is a large, lumpy investment for most farmers, beyond the reach of smallholders and difficult for “emerging farmers,” the medium- to large-scale producers who are more commercially oriented. Almost all private service providers appear to be large-scale farmers who are able to offer custom land preparation services to surrounding smaller producers once they complete work on their own fields. Some business-oriented cooperatives (such as IKURU) and commercial organizations (such as Corredor Agro) are also able to provide custom land preparation services to smallholders. There are evidently no

agro-machinery service centers in Mozambique, as we have found in Ghana, other than several recently established by John Deere.

While the purpose of this chapter has not been to estimate returns to tractor ownership, it appears as if many tractors are provided to users with subsidies. It remains to be seen whether these owners will be able to (1) repay the subsidized “loan” part of tractor acquisition, (2) keep the tractors maintained and running well (with minimal down time), and (3) reinvest in tractors at the end of the (subsidized) tractors’ useful lives. The high cost of agribusiness finance works against private purchases of or reinvestment in agricultural machinery. The availability of spare parts and after-sale servicing is critical; the John Deere franchisee, Trak Auto, is reported to be making good headway in these areas, having established upcountry service centers.

Our overall impression is that the private sector market for custom tractor hire services is at best nascent and will remain so for some time. The government will likely continue to provide tractors to selected users on subsidized terms. This practice has the potential for abuse or favoritism and could undercut the emergence of private tractor service providers. At the same time, the effective demand<sup>35</sup> among smallholders and most medium-size farms for both tractors and tractor hire services remains limited, particularly with formal credit being so costly. To say, therefore, that the government is “crowding out” the private sector may not be entirely fair. Yet it behooves the government to do the following with respect to its subsidized tractor distribution programs:

- Show that beneficiaries of its mechanization promotion programs were selected in a transparent way according to objective criteria. (This observation also applies to District Development Funds used for tractor acquisition).
- Monitor the use and maintenance of tractors provided with subsidies, as well as revenues from using these tractors and how those revenues are used.
- Monitor repayment of tractors provided on subsidized terms.

It is hoped that initiatives such as the recent AgriFuturo/Trak Auto (John Deere franchisee) leasing program will help resolve the financing constraint and enable private and farmer organizations to use tractors and provide tractor hire services with minimal or no subsidies, thereby contributing to sustainable uptake. Mozambique will not be able to develop its reportedly vast unused stock of arable land without mechanization. With migration from rural areas and young people less willing to go into farming, as well as limited use of divisible, productivity-enhancing inputs such as improved seed and fertilizer, mechanization would appear to be a *sine qua non* of expanded domestic agricultural output in Mozambique.

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<sup>35</sup> Effective demand is demand backed by purchasing power, i.e., an ability to pay for equipment or services.

## 5. Agribusiness Finance in Mozambique

Finance for agricultural production and agribusiness operations and investment is limited in Mozambique (see the summary in Table 5-1). It is viewed by many agribusiness system participants and knowledgeable observers as a serious constraint, not only to seasonal operations related to agricultural production cycles but to the domestic and foreign investment required over the medium and long term. This chapter briefly examines access to finance; Annex 1 provides further details for interested readers. The chapter is not a substitute for an in-depth agribusiness finance survey, but it provides sufficient data to inform selected agribusiness indicators.

**Table 5-1: Summary Observations on Agricultural Finance in Mozambique**

Indicators	Indicator Findings	Data Sources
% of commercial bank lending to agriculture	6.5 % (includes crops, livestock, forestry, and fishing) (2010); down from 9.4% (2008) and 7.4% (2009)	BoM, bank statistics <a href="http://www.bancomoc.mz/credit">www.bancomoc.mz/credit</a>
% of non-performing loans within the agriculture portfolio of commercial banks	Not available: For the banking sector as a whole (across sectors), default rates were 2.6% (2007), 1.9% (2008), and 1.8% (2009)	BoM and banks did not provide sector-specific information. Annual Report, BoM, 2009
Commercial bank interest rates (average interest rates offered by the banks for loans to agriculture)	23–30%: prime + 7% (most borrowers are subject to 28–30% rates) Preferential MFI rates are 3.0–3.5% per month (not compounded); normal MFI rates = 4.5–6% per month Subsidized government credit lines : 10%	Interviews with banks and MFIs
Interest rate spread	Rates paid to depositors range from 8% (simple savings account) to 17% (for larger term deposits). Hence, the spread is from 6% to 22%. Assuming most depositors earn 8-10%, the spread for them narrows to 13% to 22%.	Interviews with banks. Note that the banks do not readily disclose their interest rates.
% of rural households receiving credit for agriculture	2.3%, but disaggregated as follows: 2.26% of 3.8 million small farms; 7% of 25,654 medium farms; 14% of 840 large farms. Loans are provided mainly by input providers, government, NGOs, family members, self-help groups, and others. Commercial banks serve only 3.7% of the farmers receiving credit.	National Agricultural Census, 2009/10
Bank branches per 100,000 rural adult population	(>=20 years) 1.6 branch/100,000.adults (15–59 years) 1.5 branch/100,000 adults	INE and BoM
% of farmer organizations with access to finance	Although this information is available in Ghana, it is not available in Mozambique.	No source
Existence of a warehouse receipt program (Y/N; scale: 0–5)	No, rating = 0 IKURU was offered inventory credit for agricultural products in storage by BCI and Banco Terra, but chose not to use it.	Interviews with banks and stakeholders
Availability of loan guarantee programs for agriculture (Y/N)	Yes. Numerous, with total guarantee funds = to US\$ 26.8 million, plus a US\$ 72 million credit line. Some guarantee funds do not target agriculture explicitly. AGRA, USAID/DCA, Rabobank and DANIDA have credit guarantee programs. DCA targets small and medium	Interviews with banks and donor providers of guarantee funds

Indicators	Indicator Findings	Data Sources
	enterprises (SMEs), including small firms in agribusiness. The Agence Française de Développement (AFD) also targets SMEs (able to guarantee agricultural loans).	
Existence of law on leasing	Yes, rating = 3. Rules on leasing exist and are accepted by FIs. There is 1 leasing company in MZ, plus project-supported leasing programs (AgriFuturo, plus Gov/CEPAGRI).	Banco Terra, Procredit, CEPAGRI, AgriFuturo Project
Existence of a law for use of moveable assets as collateral, and use of moveable assets as collateral	Yes, rating = 3. BoM Aviso 7/GBM/2009 foresees “immoveable assets” and “other guarantees” as collateral (for provision of credit). This law is not for the use of moveable assets as collateral, but it is a start. Banco Terra considers moveable assets as collateral. Other financial institutions accept equipment such as tractors and irrigation equipment. ProCredit accepts cattle as a moveable asset.	BoM, commercial banks
Presence of a collateral registry	Yes, rating = 1. There is a collateral registry, but it is incomplete and dispersed, and every province has one vehicle registry. There is no registry for other equipment, but an asset can be legally recognized by a public notary ( <i>notario</i> ).	BoM, commercial banks
Existence of a credit reference bureau	Yes, rating = 1.5 Housed in BoM (Supervision) and compulsory for all regulated institutions. Limited services (access, available information). Does not cover non-regulated MFIs or other lenders, but covers 351,324 individuals and 9,660 firms. New law to authorize private credit bureau is under preparation, but public credit bureau will remain compulsory, and information sharing with private commercial banks will not be “automatic.” BoM is very “conservative” regarding banking privacy obligations.	Interviews with BoM’s Supervision Department and several users of the information

## 5.1 Background and Current Structure of the Financial Services Industry

After the financial sector was liberalized in 1991, the banking network rapidly grew from two state banks and one private bank to the current 18 private commercial and/or investment banks, mostly with foreign capital. The initial years were turbulent, with one new private Mozambican bank going bankrupt and the two former state banks saved from bankruptcy by massive public subsidies. As a result, BoM tends to be quite rigorous on the quality of collateral and the provision for loan defaults<sup>36</sup>—often controlled—and in maintaining high portfolio quality. The loan-loss provision requirement increases from the borrower’s own house (strong guarantee) to other collateral (weaker guarantee). To control inflation, BoM also maintains a tight monetary policy.

From 1997 on, direct aid donations to support war-affected populations were replaced progressively by micro-finance programs. Those programs were mainly urban and credit oriented, due to a restrictive

<sup>36</sup> Aviso 7/GBM/2009 sets up categories for provision according to the age of default and the quality of guarantee, with decreasing guarantees provided by collateral on the borrower’s house, then a guarantee of rental property income, followed by collateral on commercial buildings, other guarantees, and no guarantees.

banking law prohibiting savings mobilization. At the same time, community-based Accumulating Saving and Credit Groups (ASCAs) were introduced in the north and also spread around the country, mainly in rural areas. Since 1997, the government has been supporting the micro-finance industry. Specific legislation was promulgated in 2005, differentiating between supervised and monitored institutions, in which the former (micro-banks and credit and saving cooperatives) are authorized to collect savings.

Today, the financial sector in Mozambique is more complex, but it remains very much concentrated in Maputo, with 18 commercial and/or investment banks, the last of which opened in August 2011 (Table 5-1, Figure 5-1). Another state-owned investment bank is already authorized by the Bank of Mozambique and should start operating soon. Most of those 18 commercial or investment banks have only a few branches in Maputo City or Maputo Province; 13 of them are “classical” commercial banks, 4 are dedicated to micro-finance, and 1 is dedicated to “electronic banking.” Most focus on developing an urban client base; only a few MFIs and the ASCAs concentrate on more rural, isolated areas. Nearly all loan activity is focused on non-agricultural sectors, although MFIs are starting to develop agriculture-linked lending products.

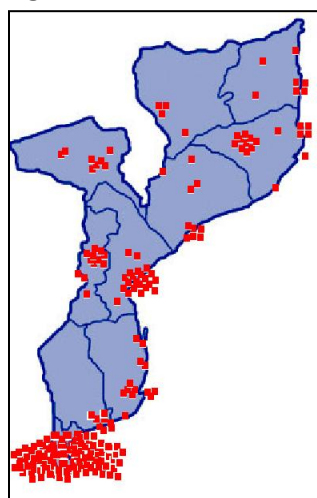
Access to financial services is therefore concentrated in Maputo, which accounts for 37% of the operating branches, or 42% if one includes Matola, the second-largest city in the country and capital of Maputo Province.<sup>37</sup> The distribution of automated teller machines (ATMs) is also concentrated in Maputo City and Province, with 47% of the ATMs in Mozambique (Table 5-2).

**Table 5-1: Financial Sector in Mozambique, 2011**

13 commercial banks + 1 authorized, will start operations soon	2 major banks with 60% of the market; 4 major banks cover 80% of the market
4 commercial banks oriented to micro-finance	
1 “electronic money” commercial bank	Could be characterized as a “micro-finance”-oriented bank. Will not provide credit, but does offer deposit, payment, and transfer services. Maximum deposit is MZN 20,000 (US\$ 700).
1 financial investment institution	2 new institutions to be created by donors; plan to manage funds that will support agriculture
Approximately 30 active MFIs, mostly NGOs (153 registered at BoM but most inactive)	No deposit taking. Report 50,000 active clients in June 2011.
Over 20 promoters of savings and credit groups (mainly NGOs)	More than 5,000 groups (100,000 people).
7 credit and saving cooperatives	
6 micro-banks, which are legally allowed to collect savings as MFIs but need specific BoM authorization for this activity.	Existing plan for 36 micro-banks set up. Smaller MFIs that do not take deposits will adopt this status eventually.
1 leasing company	

<sup>37</sup> Maputo City is a province by itself, and Matola is the capital of Maputo Province.

**Figure 5-1: National Coverage of Bank Branches, BoM, 2010**



**Table 5-2: Financial Institutions' Presence in Districts (outside Provincial Capitals), December 2010**

Province	Active Branches	%	Branches in Rural District	No. of Districts	Credit Coops	Micro-Finance Operator	Micro-bank	ATM	POS
Maputo City	153	36.8			3			271	3,213
Maputo Province	41	9.9	17	7		77	2	61	357
Gaza	29	7.0	18	6	1	10		48	141
Inhambane	28	6.7	14	7		6		44	217
Sofala	39	9.4	11	6		3	1	61	358
Manica	22	5.3	7	5		1	1	28	102
Tete	25	6.0	11	5	1	1		36	83
Zambézia	21	5.0	12	8		7		43	46
Nampula	38	9.1	8	7	2	5		64	212
Cabo Delgado	10	2.4	5	4		5	2	21	70
Niassa	10	2.4	5	3		2	1	25	62
Total	416	100	108	58	7	117	7	702	4,861

Source: BoM

Note: POS = point of sale, which are establishments that will accept bank debit or credit cards as payment or to withdraw cash.

As the competition in the major towns and provincial capitals has become much tougher with the dramatic increase in the number of banks over the last five years, the two largest commercial banks—the International Bank of Mozambique (BIM) and Commercial and Investment Bank (BCI)—have undertaken an aggressive expansion campaign in the countryside to collect more deposits. As a result of increased competition and a lack of liquidity, some banks are now remunerating deposits at higher rates than the central bank lending reference rate, referred to as the FPC (*Facilidade Permanente de Cedência* or Standing Lending Facility).

Banks have increased their national coverage significantly in the last few years. Mozambique has 58 serviced districts out of 128 (45%) versus 28 five years ago (at the end of 2006). The number of branches increased from 228 to 416 in just four years (2006–10). The urban concentration is still strong, however, with only 108 branches (26%) in rural districts. The government's objective is to increase the rural

coverage to 80% of districts within six years (by 2017),<sup>38</sup> meaning that 102 districts would have at least one bank branch. To facilitate the expansion of financial services, some measures have already been taken, such as special, more lenient requirements regarding rural branches (Aviso 10/GBM/2007) and reduced minimum capital for MFIs established outside of Maputo (Decreto 4/2005). Despite banks' expansion into rural areas, the FINSCOPE Mozambique survey (2009)<sup>39</sup> showed that only 22.2% of the population had access to financial services, either through formal banks (11.8%) or through other formal (0.9%) or informal (9.6%) sources. Compared to 10 other countries in Southern and Eastern Africa, Mozambique had the highest percentage of adults excluded from financial services. Almost half of those with access to formal financial services in rural areas had to spend more than two hours to reach their financial institution (46.2%); a third (34.3%) required more than three hours, and some had to stay overnight.

Table 5-3, which defines the adult population as persons aged 15–59, shows low levels of banking services in Mozambique, with only 3.7 bank branches per 100,000 adults.<sup>40</sup> This means that a branch is actually serving an average of 27,000 adults, or around 10,000 households if referred to the total population. In the rural areas, the situation is obviously worse, with an average of 1.5 branches per 100,000 adults, or 68,300 adults/branch (28,700 households). Nampula Province, a strong agricultural producer and one of the most populated provinces, is among the least well served, with 0.55 branches per 100,000 adults in the rural districts. Taking both Zambézia and Nampula (the two most populous provinces) into consideration, 43% of the rural population is served by only 18.5% of the banks. Zambézia Province is especially poorly “banked,” with only 1 bank branch per 100,000 rural inhabitants, while Nampula and the other northern provinces of Cabo Delgado and Niassa have only 1.7, 1.1, and 1.5 branches per 100,000 persons, which is far lower than the central and southern regions.

**Table 5-3: Adult Population Served per Bank Branch, 2010**

Province	Active Branches	Total Population (proj. 2010)	Population /Branch	Branch/ 100,000	Branches in Rural Districts	Rural Population (proj. 2010)	Population /Branch	Branch/ 100,000
Maputo City	153	706,588	4,618	21.7		0		
Maputo Province	41	764,402	18,644	5.4	17	214,924	12,643	7.9
Gaza	29	624,661	21,540	4.6	18	447,713	24,873	4.0
Inhambane	28	646,570	23,092	4.3	14	475,515	33,965	2.9
Sofala	39	889,345	22,804	4.4	11	510,742	46,431	2.2
Manica	22	760,327	34,560	2.9	7	554,761	79,252	1.3
Tete	25	969,595	38,784	2.6	11	822,008	74,728	1.3
Zambézia	21	2,046,465	97,451	1.0	12	1,630,864	135,905	0.7
Nampula	38	2,243,643	59,043	1.7	8	1,544,013	193,002	0.5
Cabo Delgado	10	880,088	88,009	1.1	5	672,001	134,400	0.7
Niassa	10	668,756	66,876	1.5	5	505,780	101,156	1.0
Total	416	11,200,440	26,924	3.7	108	7,378,321	68,318	1.5

Source: BoM (Branches) and INE (population)

Note: Adults defined as 15–59 years old.

<sup>38</sup> Rural Finance Strategy, approved in April 2011.

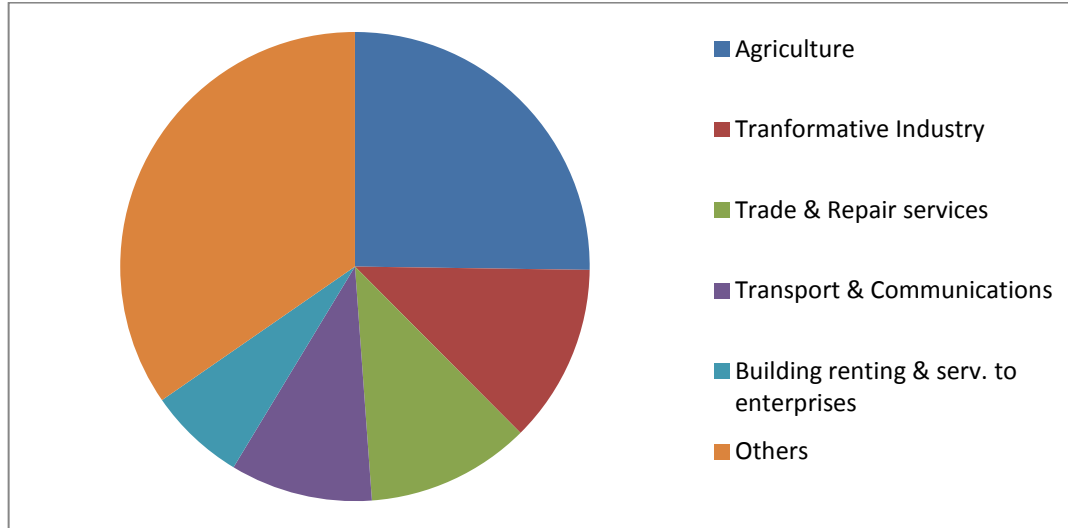
<sup>39</sup> AustralCowi, *Finscope Mozambique 2009, Survey Report*, Ministry of Finance – FSTAP program, 2009.

<sup>40</sup> According to World Bank indicators, Mozambique had 2.9 commercial bank branches per 100,000 adult population in 2009, 0.7 MFIs, and 0.1 (savings) cooperatives.

## 5.2 Agricultural Lending in Mozambique

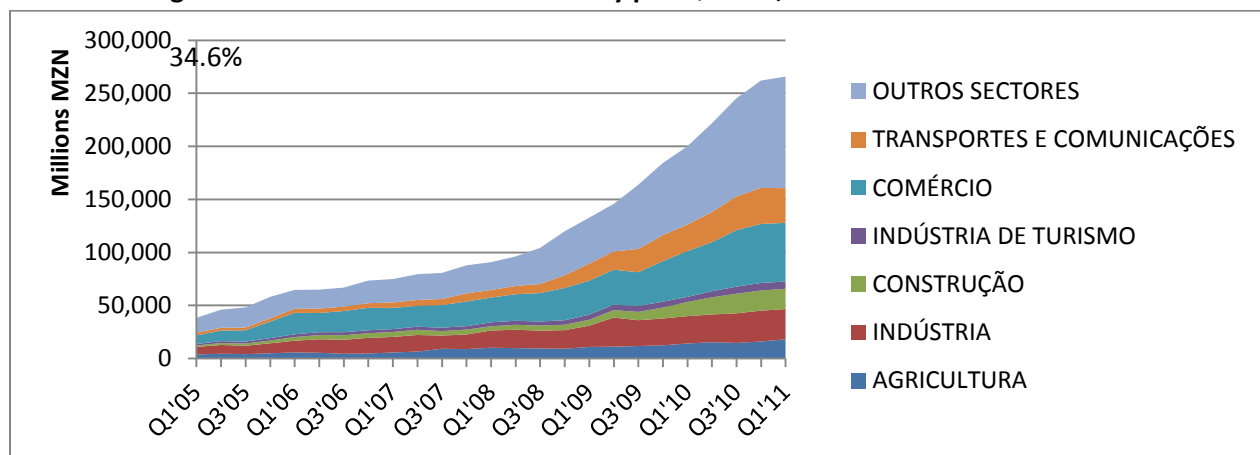
Agriculture contributes more than a fourth of the Mozambican GDP, rising from 28% in 2006 to 31% in 2009, according to the World Bank, although the figure drops to 25% when BoM data are used (Figure 5-2). Credit to agriculture represents only a small proportion of total lending to the economy, however, and its share is actually declining against lending to “other” sectors (including housing and consumption),<sup>41</sup> trade, industry, and transport and communications (Figure 5-3).

**Figure 5-2: Contribution to Mozambique’s GDP by sector, 2009**



Source: Annual Report 2009, Bank of Mozambique

**Figure 5-3: Total Credit to the Economy per Quarter, 2005-2011 in current MZN**



In the last 10 years, the volume of lending to the Mozambican economy expanded by a factor of nine in local currency terms, but lending to agriculture only tripled during the same period (2000–10). However, in constant value terms (in year 2000 meticaís), the total lending to the economy actually only tripled,

<sup>41</sup> This might include micro-loans made by micro-finance-oriented commercial banks (Procredit, Socremo).



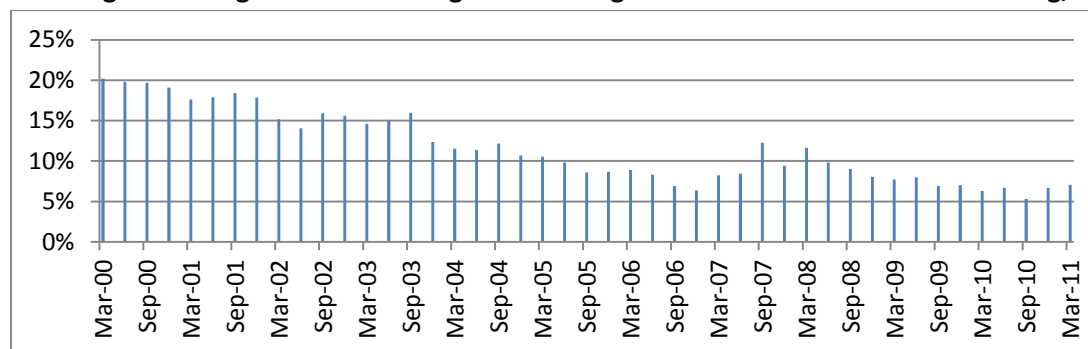
growing from MZN 108,000 million in 2000 to 330,000 in 2010, while the credit to agriculture remained nearly constant, going from MZN 21,363 to 21,439 million (Table 5-4). “Transport and communication” was the sector enjoying the biggest growth as a credit user, followed by “other,” “construction,” and “tourism.” The “mega-projects” leading Mozambican economic growth (the MOZAL aluminum plant, heavy sands of Moma, coal mining in Tete) do not appear to be reflected in the lending information, with credit to industry growing by only 19% in constant 2000 terms, probably because these enterprises are financed mainly by foreign investors and offshore credit. Lending to agricultural production actually declined as a proportion of total lending, from 20% at the beginning of the decade to around 6% at the end (Figure 5-4).

**Table 5-4: Credit to the Economy in Constant (2000) Meticaís, by Sector**

Sector	Volume of Credit in Year 2000 MZN ('000 MZN)		Increase of lending (in Year 2000 MZN) %
	2000	2010	
Agriculture	21,362,391	21,438,666	0.4
Industry	32,526,641	38,700,718	19.0
Construction	4,966,941	23,780,940	378.8
Tourism industry	2,064,762	8,667,756	319.8
Trade	21,344,171	70,393,730	229.8
Transport and communications	5,642,656	42,316,332	649.9
Other sectors	20,321,498	124,784,703	514.1
TOTAL	108,229,059	330,082,845	205.0

Source: INE (IPC) and BoM (credit by sector)

**Figure 5-4: Agricultural Lending as Percentage of Total Commercial Bank Lending, 2000–10**



Source: BoM

During the first few years of the 2000s, the “Manica Province Miracle” contributed to the relatively high lending to agriculture. The installation of Zimbabwean farmers in Mozambique after Mugabe’s land reform, and initiatives such as paprika, rose, or tropical fruit production, led to investments in agriculture (and agribusiness, with tobacco plants and fruit- and flower-processing units). Unfortunately, the miracle ended, and little is left from this major effort (Hanlon and Smart, 2008).<sup>42</sup> The massive external support Mozambique received after major floods in 2000 also contributed to the high

<sup>42</sup> “Há mais bicicletas – mas há desenvolvimento?” Hanlon, J. and Smart, T. CIEDIMA, 2008

proportion of agricultural lending at the beginning of the decade. In addition to direct aid to displaced people, USAID, Italy, and other countries provided funding of more than US\$ 25 million (Table 5-9), distributed as subsidized loans to reestablish the affected areas, mainly agricultural zones. Those funds, under the responsibility of the Ministry of Industry and Commerce (MIC), were channeled through BCI and BIM. They still represented a small part of the total credit to agriculture, however; they would represent only 3% of the credit to agriculture, and 0.5% of the total credit to economy if they had been lent out in 2000. The 2007–08 period corresponds with the use of the revolving fund (of US\$ 7 million) created from the repayment of the “flood” loans but also with the establishment and use of the cashew industry credit line and guarantee fund.

The share of commercial bank lending to agriculture has declined by 30% during the last three years, decreasing from 9.4% to 6.5% of the total lending to the Mozambican economy from 2008 to 2010 (Figure 5-5). In volume terms, however, agricultural lending increased by almost 20% in 2009 and 30% in 2010. This trend is consistent with banks’ declaration of an increasing volume of credit to agriculture (Table 5-5).

**Table 5-5: Total Commercial Bank Lending to the Economy (Including Lending by Micro-finance-oriented Banks), 2008–10  
(in current 2010 ‘000 MZN)**

	Total 2008	% of Total	Total 2009	% of Total	Total 2010	% of Total	Variation 2008/09 (%)	Variation 2009/10 (%)
TOTAL	411,173,721	100.0	626,567,770	100.0	929,103,762	100.0	52.4	48.3
Agriculture	38,800,360	9.4	46,490,024	7.4	60,344,686	6.5	19.8	29.8
Industry	67,875,497	16.5	96,889,120	15.5	108,933,207	11.7	42.7	12.4
Construction	18,506,512	4.5	30,851,824	4.9	66,937,623	7.2	66.7	117.0
Tourism	15,632,272	3.8	20,970,103	3.3	24,397,647	2.6	34.1	16.3
Trade	105,596,658	25.7	134,935,982	21.5	198,141,406	21.3	27.8	46.8
Transport and communications	35,294,989	8.6	79,741,502	12.7	119,110,289	12.8	125.9	49.4
Other sectors	129,467,433	31.5	216,689,214	34.6	351,238,905	37.8	67.4	62.1

Source: BoM website

Note: “Agriculture” includes animal husbandry, fisheries, and forestry, though the total for “Agriculture” does not exactly equal the sum of its component parts listed in Table 5-6.

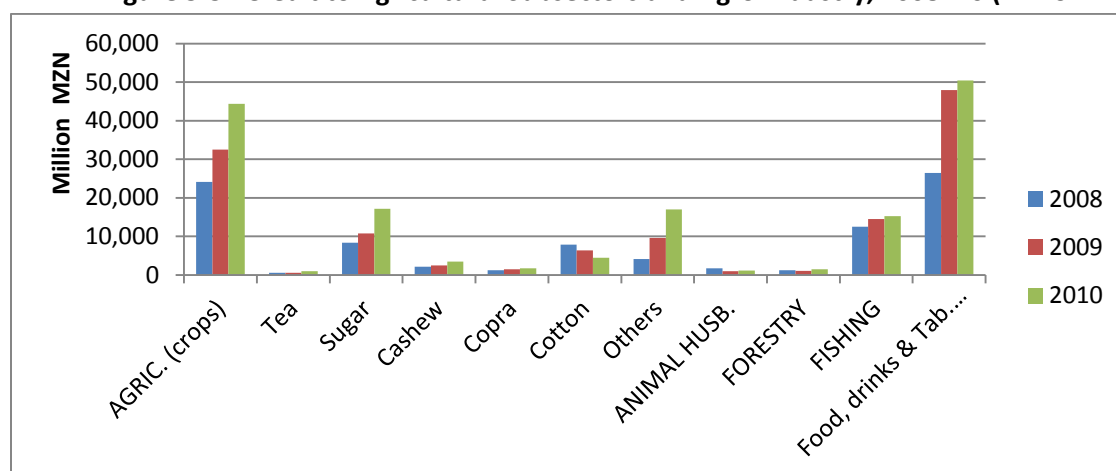
**Table 5-6: Credit to Agricultural Subsectors, 2008–10 ('000 MZN)**

	2008		2009		2010	
	Total	%	Total	%	Total	%
AGRICULTURE (excluding animal husbandry, forestry, fishing)	24,133,478	100	32,497,455		44,396,083	
Tea	540,058	2	562,527	2	917,309	2
Sugar	8,326,278	35	10,712,591	33	17,131,059	39
Cashew	2,085,691	9	2,439,926	8	3,434,257	8
Copra	1,176,043	5	1,446,852	4	1,664,256	4
Cotton	7,826,057	32	6,364,180	20	4,422,804	10
Others	4,082,698	17	9,614,632	30	16,935,234	38
Animal husbandry	1,725,748		933,412		1,114,326	
Forestry and logging	1,217,302		1,049,535		1,482,164	
Fishing	12,458,455		14,448,131		15,269,080	
INDUSTRY (food, drinks, and tobacco)	26,394,075		47,916,066		50,448,612	

Source: Bank of Mozambique

Note: The “Industry” row is not included in “Agriculture” totals, as it focuses on processing activities.

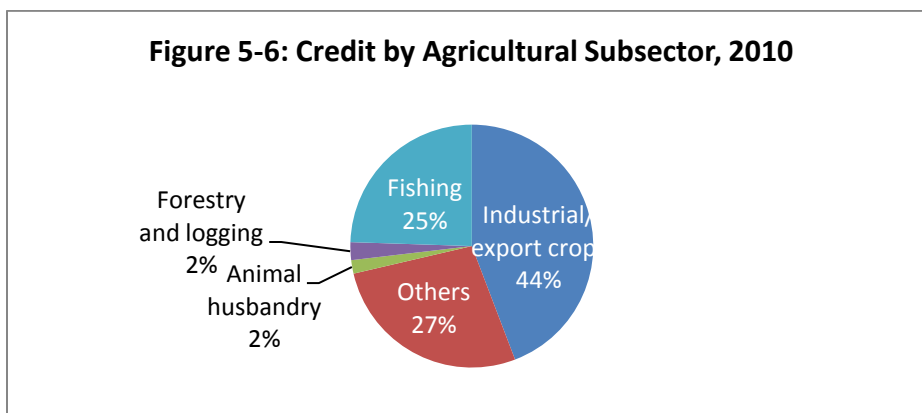
**Figure 5-5: Credit to Agricultural Subsectors and Agro-Industry, 2008–10 (million MZN)**



Note: The food, drinks, and tobacco category is part of the industrial sector, what we are referring to as agro-industry, though there may be agro-industrial activity not captured in this category.

Preliminary figures for the first four months of 2011 put agricultural lending at 6.9% of commercial bank lending; extrapolating the early 2011 figures to one year would lead to total agricultural lending of MZN 97.7 billion, which would be a 62% increase over 2010 lending. The figures show only the credit to agricultural production, as the other segments of the agricultural value chains are classified as “trade” or “industry.” The “food, beverage, and tobacco” industries received 65% of the credit to the industrial sector (2010), however, which was more than the total credit to crops. Lending to agricultural production still focuses on the traditional industrial crops (sugar, cotton, cashew, copra, and tea; see also Figure 5-6). Sugar is continuously and vigorously increasing in importance as a credit priority, as the volume of loans doubled in three years. Lending to cashew and copra also grew, although in lower proportions. In contrast, cotton lending declined significantly during the same period.

The share of traditional crops decreased during the past three years, however, and the share of lending to “others” increased from 17% to 38% of all “agriculture” loans. There is no detail on what those “others” are, but the category probably includes bananas, mangoes, citrus, macadamia nuts, jatropha, new export or biofuel crops, and cereals.<sup>43</sup> Tobacco is probably also one of the “other” crops.

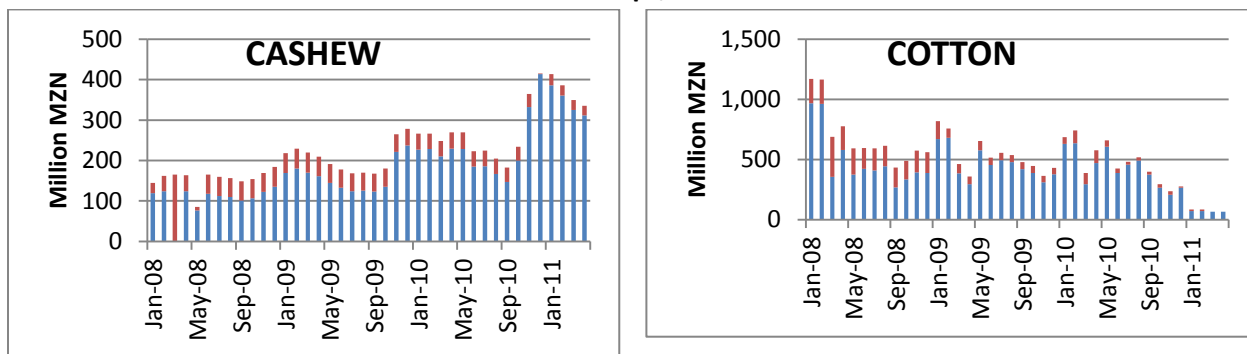


Source: BoM

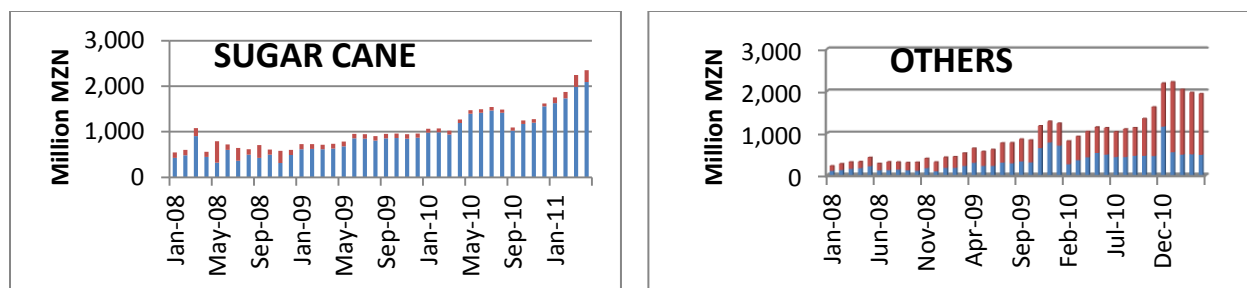
Deeper analysis shows that the “other” agricultural sector is the only one receiving large amounts and a high percentage of investment loans, compared to the traditional crops, which receive mainly working capital, as illustrated by Figures 5-7 to 5-10.

It is important to note that foreign investments are limited by the current policies regarding foreign repatriation of profits and/or results of firm liquidation in foreign currency. The Investment Promotion Center must clear all export of foreign currency for foreign investment projects. Although this is still possible, the recent revision of the Foreign Exchange Regulation Act (11/2009) and regulation 83/2010 increased the red tape and paperwork for currency movements, with central bank (BoM) authorization required to open a foreign bank account and strong central bank control of foreign currency inflows and outflows. These policies actually make it more complex for banks to receive and use credit lines in foreign currency.

**Figures 5-7 to 5-10: Distribution of Lending between Working Capital and Investment for Main Crops, 2008–11**



<sup>43</sup> “Getting Credit,” Carvalho Neves, in *AgCLIR, Commercial, Legal, and Institutional Reform in Mozambique’s Agricultural Sector: Agenda for Action*, USAID, 2011.



Legend: Blue: Working capital ; red: investment capital

Source: BoM

### 5.3 Farmers' Access to Credit

As noted, Mozambique's agricultural sector comprises smallholders (the majority of farmers), a few "emerging" or "medium"-scale commercial farmers, and a handful of large companies that produce, trade, and process agricultural products, often for export. Those companies are mainly involved in traditional export crops, but recently the mix has diversified with tobacco, bananas, rice, and sesame.

There are 3,827,754 farms in Mozambique,<sup>44</sup> most of them concentrated in Nampula and Zambézia Provinces (approximately 829,000 each, or 22% of the total), followed by Tete and Cabo Delgado (respectively 10% and 9%), and Sofala, Manica and Inhambane (7%). Among those farms, 840 are considered "large" and 25,654 "medium," with the other 3.8 million being considered "small."<sup>45</sup> Potentially the 26,500 medium and large farms could be financed to improve productivity and production. This number could be broadened to include the 95,500 small-scale farmers cultivating more than 5 ha (but less than 10 ha), who must either have access to mechanization or employ a permanent labor force, as manual farming with family labor generally is limited to 2–2.5 ha of cultivated land. There are also 200,000 farmers using irrigation, 140,000 using fertilizers, 60,000 using tractors, and 69,000 using plows; in one way or another, all of those farmers are commercially oriented. One cannot combine these figures to estimate a prospective agricultural production lending clientele, as many of the same farms probably use irrigation, fertilizer, and tractor land preparation. Even so, it would appear that agricultural production credit could be expanded well beyond current recipients, adding at least 140,000 farms using conservative assumptions. Access to credit is still extremely limited, however, with less than 88,000 farms (2.3%) reporting successful access to credit.

Table 5-7: Access to Credit, by Farm Category

Farm Category	No. of Farms	No. of Farms Accessing Credit	As % of Each Category
Small	3,801,259	86,044	2.26
Medium	25,654	1,790	7.00
Large	840	119	14.00
TOTAL	3,827,754	87,953	2.30

Source: Agricultural Census, 2009–2010, INE

<sup>44</sup> INE, Agricultural census, 2009–2010

<sup>45</sup> Farms are considered "large" if they exceed at least one of the following criteria: 50 ha of rainfed cropped area or 10 ha of irrigated land; 100 cows/500 pigs-goats; or 10,000 poultry. Farms are considered "small" if all of the indicators are below the following limits: 10 ha of rainfed cropping area or 5 ha of irrigated land; 10 cows/50 pigs-goats; or 2,000 poultry. Medium farms are those exceeding at least one of the indicators for large farms above.

Access to formal credit is even more exceptional; among the 88,000 farmers reporting access to credit, only 3,269 (3.7%) had commercial bank credit, while 36,475 received credit from input providers (likely the final buyer “promoting” the commodity), 4,021 from the government (probably the District Development Funds, discussed later in this chapter), 4,539 from relatives and friends, 2,781 from “self-help groups,” and 17,727 from other sources. Another 9,141 farmers received credit from “development banks” or “credit cooperatives” (see Table 5-8). We can assume that MFIs are included under those two terms. It is noteworthy that out of those receiving credit from input providers, 32,600 are located in Tete Province, where MLTC (the tobacco company) operates.<sup>46</sup> Furthermore, 13,679 of the farmers responding “other sources” were in Tete and also likely to be working with MLTC. Hence, as many as 46,274 recipients of credit—52.6% of the 87,953 farmers who reported receiving credit in 2009/10—may be getting credit from MLTC to grow tobacco.

**Table 5-8: Access to Credit, by Credit Source**

Source of Credit	Number of Farms Accessing Credit	%
Commercial banks	3,269	3.7
Agricultural development banks	1,743	2.0
Credit societies or cooperatives	7,398	8.4
Input providers	36,475	41.5
Self-help groups	2,781	3.2
Relatives and friends	4,539	5.2
Government	14,021	15.9
Other	17,727	20.2
TOTAL	87,953	100.0

Source: Agricultural Census, 2009–2010, INE

Financial institutions report the following as reasons for not financing agribusiness in general and agricultural production in particular:

- Low technical knowledge of farmers and rural entrepreneurs.
- Lack of business skills and entrepreneurial spirit among many farmers and rural entrepreneurs. Those potential clients do not plan, and they actually require a lot of support to prepare business plans. They tend not to place high importance on quality issues in production and productivity, resulting in poor quality and low productivity and an inability to attain sufficiently high standards.
- Lack of quality business development services and technical support providers to train and provide extension follow-up to farmers. Many financial institutions relied on NGOs and were disappointed; others relied on private farms or enterprises that manage outgrowing schemes, but this arrangement did not always work as well as expected.
- Scale is an issue: It is said that crops require a minimum cultivated area to be profitable (i.e., 8 ha for irrigated rice), but most farmers are cropping less than this minimum.
- The scale of farms and also of small and medium agribusinesses is also an issue for lenders. Banks have set minimum amounts for their loans to generate sufficient income to cover and

<sup>46</sup> MLTC supposedly works with over 120,000 farmers in Tete, Zambezi, and Niassa Provinces (<http://www.macaub.com.mo/en/2011/03/21/mozambique-leaf-tobacco-expects-production-of-65000-tons-this-year/>).

justify the analysis and follow-up costs. Banco Terra (a commercial bank) and ProCredit (a micro-finance commercial bank) have set this minimum at MZN 100,000 (US\$ 3,700), while other banks have set it much higher (Standard Bank sets it at US\$ 40,000), except in cases where government “special lines” are used (see below).

- Lack of a conducive agribusiness operating and regulatory environment; which makes markets difficult to secure.
- Lack of collateral (see the discussion on land below).

## 5.4 Issues Affecting Cost of Credit and Risks of Lending

Extending credit to agribusiness or agricultural producers is costly in Mozambique for both formal banks and MFIs. The sections that follow provide details.

### 5.4.1 Commercial Bank Lending

Commercial banks have no specific conditions for agricultural/agribusiness loans. They require the normal documentation and charge the same preparation fees (from 1% to 2% of the loan value, though sometimes negotiable) that they charge other clients. Banks also require the same levels of collateral. The documentation normally includes:

- A letter requesting the loan.
- Opening a deposit account at the bank. This process will require a firm manager’s or owners’ ID (the manager must prove that he or she is allowed to operate the bank account) and all the firm’s legal documentation, including the official notification of firm creation, a commercial registry certificate, a license delivered by MINAGRI for farming and husbandry or by MCI for trading and processing activities, a Finance Ministry *quitus* certificate, and a tax number (NUIT).
- To get a loan, Individual farmers are requested to register as a company, a process that has been somewhat simplified but remains complex and costly for those outside the provincial capitals.
- Bank account history.
- A business plan (the complexity of which depends on the size of the loan).
- CVs of the firm’s managers.
- A land use certificate (DUAT).
- Financial statements of the company for the last three years.
- Proof of collateral covering 100–120% of the loan value (see below).

Obtaining all those documents is not difficult for major firms, but it is very time-consuming and costly for medium-size or even large-scale farmers, as well as out of reach for most small-scale farmers. Smallholders are not the targeted loan recipients of the commercial banks, however.

### 5.4.2 Interest Rates

The interest rate is always variable and set according to the risk of the operation. This risk is evaluated with reference to the management capacity of the borrower, the type of activity or commodity to be financed (preferably located in an irrigated area with an assured market), and the quality of collateral, with urban real estate preferred.

The interest rate is based on the bank’s internal “prime rate” plus an added margin. The banks’ prime rates follow BoM’s FPC rate, with additional percentage points (from 2 to 5) to reach the minimum rate banks estimate to be profitable. The extra spread also varies from 2 to 7 percentage points and will

depend on the negotiation between the bank and the client, the quality of the client's project and collateral, and other factors. In August 2011, this meant that commercial bank loans started at a minimum of 22% and could be as high as 30% per annum, against 16% per year for the FPC.

### 5.4.3 Moveable Assets as Collateral

Collateral registration represents an extra cost for borrowers. It includes the valuation of the proposed buildings/equipment, normally performed by a specialized company like CPU (*consultores de avaliação*), pledging buildings as collateral, and registry of vehicles under the bank's name (those latter steps might not be very costly but take time). Buildings and equipment must also be insured, adding another cost. Collateral is usually not accepted for its full value by commercial banks but rather for a proportion of it, from 50% up to 80%. Micro-finance banks accept collateral at its estimated value, as do MFIs (without professional valuation). It is interesting to note that some banks are experimenting with a "back-leasing" process to secure the collateral, which simplifies the sale of the equipment if needed. Most banks do not initiate judicial proceedings to seize guarantees, because the process is complex, time-consuming, and yields few results, especially as the seized equipment and properties lose their value over time. Banks normally prefer to negotiate with clients to restructure their debt rather than accept complete default, but the difficulty of collateral seizure also explains the banks' caution in lending.

Warehouse receipts are not currently used as collateral by banks. Some inconclusive experiments in inventory credit have been attempted.

No specific law covers the use of moveable assets as collateral, but BoM's Supervision Department states that collateral is classified according to its "quality." Based on the classified quality, loan provision obligations vary (the less "secure" the collateral, the higher the loan provisions). BoM assesses bank's loan provisions against the rated quality of collateral; the banks claim that BoM is very demanding regarding collateral. Aviso 7/GBM/2009 established a classification scheme for different types of collateral; moveable assets are treated as "other collateral," with higher loan provision rates. Another regulation (Aviso 5/GBM/2007) sets up prudent ratios, limits, and weighting factors that vary with the risk of active operations, with the risk levels being no risk, low risk, medium risk, and high risk. Only cash and titles from the government, BoM, or international financial institutions are considered to pose no risk, while low and medium risk is assigned to credits backed by immovable collateral. All other types of collateral are considered high risk.

### 5.4.4 Leasing

Leasing is also a common product offered by banks to finance equipment. In this case, no extra collateral is required, as the equipment provides the guarantee. Normally banks require participation from the borrower in the form of a down payment of 10–20% of the equipment's value.

While no specific laws govern leasing, leasing is referenced in several official documents. An old decree established the "intermediary financial institutions" and how they should work. Later, banking law 15/99 ruled that leasing societies (*sociedades de locação financeira*) were "credit institutions," but no specific articles in this law address leasing companies. Other regulations (*avisos*) for credit institutions refer to leasing, but no specific law or decree covers them. Leasing is better established and stronger in the shipping and transport sectors.



The AgriFuturo Project is working with John Deere and Standard Bank to identify leasing candidates for tractors. The proposed interest rates for the leases have been reduced, as John Deere is paying two percentage points of interest, while the bank collects 21.5% in total. The lessee will therefore end up paying a leasing interest rate of 19.5%, marginally below market rates. Other requirements—down payments, guarantees—show no appreciable change from regular market terms.

#### 5.4.5 Other Factors

In addition to those costs, life insurance is compulsory and represents an additional cost. Vehicles, equipment, and infrastructure are also to be insured. Standard Bank also requests weather index insurance to finance agricultural production under the AGRA scheme, when financing rainfed crops (not required for non-AGRA, irrigated crop loans). Weather index insurance adds an extra 4–6% of the value of the loan and will cover up to 50% of the loan amount in case of crop failure.

Finally, the requested participation of borrowers adds to the real cost of the loans. Standard Bank, for example, finances only up to 75% of the investment (80–90% for leasing), with borrowers putting up the remaining 25% of the required funds.

Another important issue is the term of the loan. Most banks do not offer loans for more than five years, thereby limiting the types of investments borrowers can undertake. For example, loans for terms of less than five years can restrict investments in tree crops, which have long maturation and payback periods.

For commercial banks, agribusiness loans are regarded as any other investment made by the bank, though generally more risky. The process of analyzing and approving a loan follows the normal procedures unless loans are extended under “special lines” (see below). It is important to note that the delays for loan approval can be very long, sometimes more than two months, requiring that borrowers take a medium-term planning horizon that is not typical. On the other hand, banks do not always understand the exigencies and specific characteristics of the agricultural sector, where the flexibility to adapt to weather/market variations is required, which means that planned activities cannot always be performed.

#### 5.4.6 Collateral and the Land Issue

In Mozambique, land is owned by the State, and individuals or companies can obtain a renewable lease only for up to 50 years. The process of “acquiring” land can be long and involves:

- Community consultation to make sure the land is not already used by community members (or that they agree to “lease” it).
- Topographic demarcation and preparation of an investment plan.
- The bureaucratic process ending with the delivery of a DUAT (the land use certificate).

The DUAT is tied to the development of the land according to an investment plan, as well as payment of land taxes. Land cannot be sold or used as collateral for a bank loan, a situation that many claim is a major limitation for increasing credit to agriculture. However, any improvement or investment made on the land (*beneficiations*) can be sold, and the land under it is passed on to the new owner and therefore can be used as collateral. This is already taking place, as banks theoretically accept industrial or farm buildings, warehouses, and private irrigation systems, despite the fact that liquidating these assets to

generate cash is typically lengthy and complex. Actually, the investments on acquired but not owned land are what give value to the land, as land is still plentiful and available in Mozambique.<sup>47</sup>

Even if land could be used as collateral by banks, it might not be enough to eliminate the banks' perception of risk, unless the legal seizure process is improved and the land is situated in a "developed area," with good access roads and other public investments such as energy and communications. A plot of empty land, with no investment on it (fences, road access, irrigation systems, warehouse, trees), will be worthless, even in the potential context of private land ownership. This situation is reflected in the failed attempt to install Zimbabwean farmers in Niassa Province.

#### 5.4.7 Credit Bureau

Mozambique has established a public credit bureau, housed in the Bank of Mozambique. The information available to banks is limited to the current lending situation—the loan balance, whether the loan is in default or not—but no details are made available regarding payment history or the current lending institution. In addition, access to the information is limited to three "posts" per institution, meaning all credit information has to go through the banks' headquarters. Access to the credit bureau is restricted to banks that are supervised by BoM, excluding not only all monitored MFIs but also other types of credit providers that have appeared recently, such as furniture shops selling on credit or service providers whose borrowers' payment patterns could give a risk evaluation indicator. According to the World Bank's *Doing Business*<sup>48</sup> report, only 2.2% of the firms and individuals are covered by the credit bureau (351,324 individuals and 9,660 firms), as opposed to 54% in South Africa and 100% in the USA, where private credit bureaus play a critical role in financial institutions' assessments of the risk of borrowers.<sup>49</sup>

New legislation allowing the establishment of private credit bureaus is under preparation<sup>50</sup> and should be discussed and approved by March 2012. This legislation will not eliminate the public credit bureau, however, where supervised institutions will still have to report. Cross-communication between public and private bureaus is also not foreseen, in keeping with the banking secrecy principle, although this intercommunication could be regulated later. Even if the new legislation should open the road for improvements in credit risk evaluation, it will still be difficult for banks and MFIs to get proper information regarding their clients' credit history and repayment habits.

### 5.5 Special Mechanisms for Agricultural Lending

One can differentiate five types of mechanisms used to promote agricultural and agribusiness lending:

1. Policy measures.
2. Credit lines, with or without subsidies.

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<sup>47</sup> In some areas, land pressure has started to appear, and with it the potential for conflict. The Millennium Challenge Account (MCA) program is now registering households' plots to provide them with land titles, which will facilitate (but not guarantee) access to credit, as banks normally require the DUAT. According to J. Carrilho, former Vice Minister of Agriculture and manager of MCA and the Community Land Initiative (Iniciativa para Terras Comunitarias), it will also provide a new and improved status to small- and medium-scale farmers, from "campones" to "agriculture producer."

<sup>48</sup> World Bank, *Doing Business in Mozambique 2*,

<http://www.doingbusiness.org/data/exploreeconomies/mozambique/>

<sup>49</sup> AgCLIR, op. cit.

<sup>50</sup> Personal communication, M. Umaia, head of the Supervision Department of the Central Bank, September 2011.

3. Guarantee funds.
4. Matching grants and catalytic loans.
5. Technical support enabling farmers/entrepreneurs to access finance.

These mechanisms are discussed in the sections that follow. While the first mechanism depends only on the government, the other four rely heavily on donor funds. Lately most support programs for agribusiness development have used a mix of credit lines and/or guarantee funds, matching grants, extension, and business development services.

### 5.5.1 Policy Measures

The Government of Mozambique has shown continuous interest in micro-finance and rural finance. The expansion of financial services has been promoted through specific banking policies, such as:

- Minimum capital requirements have been reduced for rural-based financial institutions outside of Maputo Province<sup>51</sup> (Aviso 4/GBM/2005).
- Incentives are offered for opening branches in rural areas (Aviso 10/GBM/2007).
- The opening of BoM branches in all provinces is designed to improve supervision, minimize liquidity issues, and reduce cash transportation costs.<sup>52</sup>

Several government documents strengthen the importance of rural finance, such as the Rural Finance Strategy (2011), the Micro-finance Strategy (still under development), Rural Development Strategy (2007), the Poverty Reduction Action Plans (PARPA II, 2006–09, and PARPA III, 2010–14), and other key agricultural sector planning documents. Those policy documents tend to promote small- and medium-size financial operations. As mentioned, however, the new foreign exchange legislation complicates inflows and outflows of foreign currency and has provided disincentives to invest in agriculture.

### 5.5.2 Credit Lines

Credit lines are essentially provided to promote/increase the volume of credit to a specific sector, alleviating the banks' liquidity and risk perception constraints. Credit lines can be reimbursable or not (through capital donations or revolving funds). Regardless of whether interest payments are required when credit lines must be reimbursed, donor and government agencies usually impose their own conditions, such as specifying the activities to be financed (or excluded from the credit) or the interest rates charged to final clients, among other conditions.

In Mozambique, with donor money or its own funds, the government has provided credit lines for agribusiness to banks, MFIs, and FDA through CEPAGRI/FDA for agricultural loans; through MIC for SMEs; and through the Economic Rehabilitation Fund (FARE) for rural micro-finance promotion. Private/international donor capital can also be lent directly to banks or MFIs. Government credit lines are subsidized (CEPAGRI: 10% per year). Even when channeled through commercial banks or MFIs, they

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<sup>51</sup> BoM grants incentives for banks to establish their headquarters outside of Maputo and other major cities through AVISO 4/2005. These incentives include reduced capital to 50% of the normal requirement when the headquarters are based in Lichinga (Niassa Province) and to 70% in other cities, except for Maputo, Matola, Xai-Xai, Beira, Quelimane, and Nampula.

<sup>52</sup> "Increased bankability of the economy: rural extension of financial services", 31 Directive, Council of BoM, Nampula, 2007. Note that banks claim that the cost of transferring funds to/from branches between Maputo and provincial capitals is not high, but costs are high between those cities and the district branches in smaller towns.

have had poor results. For example, CEPAGRI's revolving fund started with MZN 571 million (US\$ 25 million) in 2005/06 but is now only managing MZN 107.7 million, with an outstanding balance of MZN 93.7 million, of which MZN 42.9 million is non-performing and probably irrecoverable. CEPAGRI credit line beneficiaries claim the bureaucratic process leads to untimely credit delivery and poor loan repayment.

### 5.5.3 District Development Funds (DDF)

From the end of the 1990s, the government adopted a decentralization policy that was progressively built through official or legal tools, such as the Guidelines for District Planning (1998 and 2001), Decree 15/2000 (which recognizes the Community Authority), and Law 8/2003 (which defines the legal framework for "local state entities") and its regulation in 2005. In 2005, the Central Government allocated a lump sum of MZN 7 million to each district to realize their District Development Plans, which would be developed through a consultative process with the community and District Councils. The first plans were strongly oriented to public investments (such as preparing roads or building schools), but the government later reserved the funds for loans to local associations as well as for production and food security. Loan policies were not defined clearly, but it has been generally admitted that interest rates were subsidized at 10% and 12% per year. Loans were typically for terms of less than a year, although some were for terms of up to two years. In this process, many local associations were created under Decree 2/2006, which simplified the legalization of farmers' associations at the district level as a replacement for the long, complex, and costly process at the provincial level.

Management of the DDF has been very weak. Loans have been misallocated and in some cases used as a political tool, and repayment has been very poor, generally less than 20%. Even so, the sum of MZN 7 million has been allocated in successive years to each district, representing a total of MZN 900 million per year injected into rural areas (around US\$ 33 million at an exchange rate of MZN 27 = US\$ 1). The DDF did lead to money circulation, stimulated some investments among farmers' associations, and created some local jobs. The district funds have been supplemented by another MZN 7 million to fund public investments not eligible for the DDF. Loans funded under the DDF are managed by the District Consultative Councils, while the district investment funds fall under the district administration's responsibility. A proper impact study needs to be performed to appreciate not only the financial results (which generally appear to have been poor) but also the social and economic impacts of the DDF.

### 5.5.4 Mechanisms Used under Development Programs

Many donor-funded development programs include access to finance for their target audience. We can differentiate among the following:

- Rural/agribusiness development.
- MFI development support, with special activities directed to rural areas.
- SME support (not necessarily directed to rural areas/agribusiness, but not excluding those sectors).

All of those programs use one or more of the available tools—subsidized or unsubsidized credit lines, guarantee funds, catalytic funds, and technical support—to enable beneficiaries to get a loan. Table A1-4 in Annex 1 provides an overview of the most recent programs, 17 of which (between finished and ongoing programs) have been identified, though more probably exist. The major actors in this field are IFAD, USAID, AGRA, Germany (through both KfW and GIZ), and DANIDA. The United Nations Capital Development Fund (UNCDF), together with the African Development Bank (AfDB), Germany, and the EU,

also supports the extension of financial services into rural areas through the creation and/or strengthening of MFIs and community-based credit and savings organizations.

Assuming a share of the credit risk, the guarantee fund facilitates access to credit for farmers or entrepreneurs who lack sufficient collateral to qualify for a loan under a bank's normal terms and conditions. Some guarantee funds are deposited within the partnering bank (and therefore become quasi credit lines), while others stay with the guarantor, who pays only after its own analysis of the risk level and management.

In Mozambique, guarantee funds have had mixed results. They have definitely allowed banks to provide loans to non-traditional clients (emerging farmers, for example), but they are also very much under-utilized, with 25% used in the Development Credit Authority (DCA)/Banco Terra facility, only one loan under the AFD/BCI guarantee scheme (12 more under analysis), and no use at all of the Portuguese SME line. The Agriculture Private Sector Support Program (ADIPSA)/ Banco Terra guarantee fund was fully employed, but the high rate of default among borrowers ended it. The USAID Cashew Guarantee Fund has been fully used, and even though some small- and medium-scale cashew processing enterprises did not repay their loans, the guarantee fund actually enabled reestablishment of the industry. A number of new guarantee funds are on their way.

Providing access to guarantee funds has a cost for banks ranging from 1.5% to 2.5% per year. Although institutions say they do not pass the cost on to clients, they will probably do so in the future, increasing the cost of credit even more. ProCredit claims that the guarantee fund cost is higher than farming clients' default costs and says it is therefore not interested in such a fund, unless the conditions are adapted to each institution's performances.

Matching grants and catalytic loans respond to two objectives. The first is to reduce the overall cost of a business investment loan, as part of the investment bears a subsidized interest rate and the other part is subject to the full commercial interest rate. The second is to allow the client to provide collateral to the bank, therefore facilitating access to formal banking credit. These instruments are gaining importance in new development programs. Although the use of matching grants has not been evaluated to determine how effectively they facilitate access to formal bank loans and increase the overall profitability of investments, such grants are considered an important tool to promote agribusiness. Strong monitoring and controls are required to manage matching grants and catalytic loans. Increasingly, all stakeholders regard the provision of technical support for improving production and for strengthening business skills and institutional effectiveness as indispensable to the success of financed projects. Although none of these instruments has proven to be "the answer" to the lack of agricultural lending in Mozambique, they respond partially to the main constraints, namely:

- Lack of liquidity (and negative risk evaluation) for the financial institutions, either banks or MFIs.
- Lack of collateral for borrowers.
- Cost of the credit and overall profitability of the project, especially for cash crops/activities requiring investments.
- Borrowers' lack of business skills and low productivity.

Combining all those tools—plus the cost of the programs' design, studies, and management—one can assume that the total amount of finance dedicated to agribusiness in Mozambique is far higher than simple bank credit as registered in national statistics.

In summary, most donors and financial institutions now seek to combine technical assistance (for both production and business/management skills), credit, and grants/catalytic loans in a broader approach to rural finance. A more detailed discussion of the financial components of development projects, guarantee funds, and government credit lines is found in Annex 1.

## 5.6 Policy Issues and Concluding Observations

Agricultural and agribusiness finance is a complex area with scope for improvement but serious underlying constraints. Probably the major constraint is the unprofitability of much smallholder agriculture, which is largely rainfed and hence risky in most production zones of Mozambique. Tools exist to offset weather-related risks but come at a cost. Agricultural finance has been more forthcoming in Mozambique for irrigated agriculture, which typically produces higher-value crops for ready markets. While many observers point to the high interest rates plaguing agribusiness in Mozambique, the real interest rates seem less burdensome once inflation is factored in (not to mention depreciation of the metical over much of 2005–10).

Another factor worth mentioning is the role of offshore finance in underwriting large commercial agricultural investments, such as sugarcane and banana production, as well as agro-processing ventures and agricultural exports. As quite a few foreign agribusiness investors in Mozambique are based in South Africa, they can raise capital and access credit lines at lower real interest rates than in Mozambique. Large international agribusiness concerns, such as OLAM, Export Marketing/Trading, and Agriterra, are also able to access finance at more attractive rates, which gives them a competitive advantage. The Government and Bank of Mozambique obviously wish to promote larger-scale foreign investment, but foreign investors will be at an advantage relative to domestic investors, who typically cannot benefit from lower offshore rates.

Some issues worthy of further examination are:

- The scope for reducing the FPC (BoM lending reference rate) for agribusiness lending to put downward pressure on interest rates.
- Encourage increased transparency in banking transactions, especially clearer information on effective credit rates (which factors in fees and other costs).
- The recent imposition of tighter foreign exchange controls and rules affecting repatriation of profits and capital (from investments).
- Review and complete micro-finance legislation (review savings limitation; establish prudent ratios for use of savings in credit).
- DUAT issuance (for collateral): Facilitate DUAT issuance using technology. The Millennium Challenge Account program currently does this systematically in “potential conflict areas” with satellite imagery and ground-truthing field work. Stakeholders say that the government has not issued any DUATs for three years in some parts of Mozambique.
- Promote business skills development in SMEs and farms in rural areas.
- Consider setting up a government guarantee fund for small and medium agribusinesses.

It would improve our understanding of agribusiness finance if the central bank (BoM) provided more details on commercial bank lending to agricultural producers, small and medium agro-enterprises, and larger agribusiness firms. Yet it seems as if the banks themselves do not have this information in a disaggregated, readily available, or sharable format.

## 6. Transport Indicators

### 6.1 Introduction

This section draws heavily from a recent Africa Infrastructure Country Diagnostic (AICD) study completed for Mozambique in 2011.<sup>53</sup> This study notes that Mozambique has a “privileged and strategic location as the natural exit to its landlocked neighbors” (AICD, p.6). The port of Beira is a major gateway to central Mozambique, Zimbabwe, Malawi, and Zambia. Large volumes of agricultural and industrial products, transport equipment, and construction materials are unloaded at Beira for long-distance trucking to the interior.

It is also important to note that “transport infrastructure is developed transversally, west–east, connecting mining and agricultural clusters inside Mozambique and its neighboring countries to exit ports” (AICD, p.6), mainly Beira, Nacala, Pemba, Inhambane, and Maputo. South–north highway development historically has been impeded by numerous rivers flowing east or southeast and their tributaries, though bridge construction has proceeded steadily. The bridge crossing the Zambezi River has been completed and is making a difference in north–south transport.

The AICD study provides important statistics related to road transport, from which we draw a few highlights:

- Road network density per land area: 29 km/1,000 sq km.
- Total road network density: 37 km/1,000 sq km.
- Rural accessibility: 24% of the rural population lives within 2 km of an all-season road (GIS indicator).
- Main road network condition: 83% in good or fair condition.
- Rural road network condition: 56% in good or fair condition.
- Classified paved road traffic: 1,033 average annual daily traffic (AADT).
- Classified unpaved road traffic: 60 AADT.
- Perceived transport quality: 23% of firms included in the study report that transport is a major business constraint.

Summary findings from our transport investigations are shown in Table 6-1. The remainder of this chapter will focus on road transport issues and costs, with most information pertaining to the Beira Corridor, and to a lesser extent on the Beira port and sea freight shipping costs.

**Table 6-1: Summary Observations on Transport Sector in Mozambique**

Indicator	Indicator Findings	Data Sources
Price per bag (US\$/bag converted to US\$/tkm) of maize from major wholesale or assembly market to major urban center	Beira Corridor trunk roads: US\$ 0.09–0.14/tkm Beira-Chimoio: US\$ 0.09–0.12/tkm South to North long hauls: US\$ 0.08–0.11/tkm	Informal interviews with private users of trucking services; quotes of selected shipping companies (Beira based).

<sup>53</sup> See *Mozambique’s Infrastructure: A Continental Perspective, Africa Infrastructure Country Diagnostic*. Carolina Dominguez-Torres and Cecilia Briceño-Garmendia, World Bank, June 2011.



Indicator	Indicator Findings	Data Sources
Opinion of traders and truckers on the competitiveness of trucking services (scale: 0–5)	Rating = 3. Trucking industry complains that the government allows foreign trucks to operate freely and undercut local operators without reciprocal privileges in countries of competitors.	Trucking industry, especially Sofala Trucking Association
Price paid to ship a standard 20- and 40-ft container from the port of Beira to international destinations (ocean freight costs only); add US\$ 1,220 per container for Beira port charges and various fees	Nava Sheva (India): US\$ 1350, US\$ 2,300 EU destinations: US\$ 2073, US\$ 3,546 New York: :US\$ 3550, US\$ 5,900 Shanghai, Xingang: US\$ 950, US\$ 1,300 Other Far East ports: US\$ 1,450 (40') Durban, Dar es Salaam, and Mombasa: US\$ 800 (20')	Shipping companies, international trading companies
Ease of entry into trucking of foodstuffs (scale: 0–5)	Rating = 4	Trucking industry, especially Sofala Trucking Association
Government intervention in setting transport prices	None	
Length of time required to register a truck for hauling agricultural products	5 days	Trucking industry, especially Sofala Trucking Association
Tariff and tax rates on imported vehicles and spares	Trucks: 5% tariff; 17% VAT Trailers: Same Spare parts: 7.5% tariff; 17% VAT Tires: 20% tariff; 17% VAT	Trucking industry, especially Sofala Trucking Association
LPI; the quality of trade- and transport-related infrastructure (e.g., ports, railroads, roads, information technology)	LPI = 2.29 (out of 5)	World Bank; standard infrastructure quality indicator
Rural Access Index	RAI = 24% (GIS), 27% (LSMS) RAI = 31.9% (UMASE)	LSMS Household Survey, 2006 UMASE, 2010

## 6.2 Transport Policy and Investments in Mozambique

During 2006, in close collaboration with road sector development partners, the Government of Mozambique developed PRISE, the 2007–2009 Integrated Road Sector Program. PRISE is based on the 2007–2011 Road Sector Strategy (RSS) and the Road Sector Policy. The Road Sector Strategy is an update of the 2001–2011 Roads and Bridges Management and Maintenance Program (RBMMP), based on which the International Development Association’s (IDA) Adaptable Program Lending (APL) was first developed.

The AICD study for Mozambique provides the following assessment:

Mozambique has made important strides in procuring and protecting funds for maintenance through the road fund, as well as increasing spending on roads in general with the recent investment program. This raises the question of whether Mozambique should reassess the balance of its spending between investment and maintenance, or find additional sources of funding to make maintenance affordable.

(AICD, p.18)



Table 6-2 summarizes the characteristics of Mozambique’s road network.

**Table 6-2: Road Network of Mozambique (in kilometers), 2007**

Road Type	Paved	Unpaved	Total
Classified roads	5,814	23,535	29,349
Urban unclassified roads (estimate)	500	2,500	3,000
Rural unclassified roads (estimate)		5,000	5,000
Total	6,314	31,035	37,349

Source: World Bank 2007

According to the most recent data available, “only 19% of the needed preservation spending is covered by the road fund and an additional 13% from government transfers. Therefore, about 70% of known preservation needs require securing funds from private or multilateral sources.” Road maintenance has improved over time, though only 69% of the road network was rated as being in good and fair condition in the second semester of 2010, against a target of 75%.<sup>54</sup> This percentage drops steadily from primary roads (96%) to secondary (82%), tertiary (66%), and vicinal roads (43%). Note that these percentages had not improved markedly since 2007, when the percentage was lower for primary (70%) and secondary (72%) roads, yet higher for tertiary (71%) and vicinal (58%) roads. In 2010, 96% of the classified road network was considered transitable, compared to 77% in 2007. Expenditure on the Regional Roads Investment Program was US\$ 27.2 million vs. a target of US\$ 45.0 million (60% achieved), though it had tripled from US\$ 14.6 million in 2007. Revenues from road users had increased from US\$ 68.4 million in 2007 to US\$ 93.4 million in 2010, with 77% of coming from the fuel levy.

The Beira Corridor is one of the most heavily traveled trunk roads in Eastern and Southern Africa, with AATD between Beira and Chimoio of well over 1,000 vehicles. The Vale coal field investments in northern Tete Province could double this traffic load within a couple of years, and export shipments will come on stream shortly, though there is talk of a 600-km railway planned from Beira to the coal mines (through Moatize in Tete). Parts of National Highway No. 6, connecting Beira to the Zimbabwean border, are in very poor shape (much of the road in Sofala Province between Dondo and Inchope), but the government plans to put this road under a concession, supposedly by the end of the first quarter of 2012. Repairs to the damaged sections of this road will not likely begin before late 2012 or early 2013.

Because Mozambique is intersected by many rivers and their tributaries, which flood seasonally, construction of bridges, particularly along south–north routes, is critical. The World Bank and Japan have funded significant bridge construction in recent years.<sup>55</sup>

<sup>54</sup> Data on road maintenance come from an ANE annual report to the PRISE program for 2010.

<sup>55</sup> A recent PRISE Annual Report notes construction or reconstruction of the following bridges: 3.3 km bridge to Ilha de Mozambique, Samora Machel Bridge over the Zambezi River in western Tete Province, the reconstruction of four bridges in Zambézia and Tete Provinces on the Cuacua I and Licungo II and III Rivers with financing from Japan, government-funded construction of three bridges in Manica Province (Mussapa, Lucite, and Nhancuarara), and bridges on the Pompue and Muira Rivers in Sofala Province.

## 6.3 Private Sector Participation in the Transport Sector

Entry into trucking of agricultural products (0–5 scale) is considered relatively easy, with a score of 4. The key requirements are (1) vehicle inspection, (2) insurance, (3) company registration (a license operating fee of about MZN 5,000 per six-month period), and (4) and an approval from the transport association (where the annual membership dues are only MZN 100 per truck).

The transport association of Sofala has 136 members. Of these, some trucking companies are evidently “inactive”: 107 firms reported having 1,372 trucks. Three of the 107 companies have well over 100 trucks each—TCO, JJ Transporters, and TCM (a third-party estimate for the three firms is 800 trucks). Another firm reports having 76 trucks, and a fifth reports 50. Table 6-3 shows the distribution of truck ownership by size of trucking firm. The top three firms own an estimated 40% of the Sofala association fleet; the top 11 firms own 70%. Among the firms that are active in the association, 64% own only 10% of the regional association fleet, averaging 1.4 trucks each. In other words, truck ownership among Sofala association members is highly concentrated, which is not unusual in SSA.

**Table 6-3: Size Distribution of Trucking Firms in Sofala Province**

	No.	% of Association Members	Total Trucks	Mean in Category	% Total	Cumulative (%)
<b>Total in association</b>	<b>107</b>	<b>100.0</b>	<b>1,372</b>		<b>100.0</b>	
<b>Size of trucking firm:</b>						
Largest three >100 Trucks Each	3	2.8	800	266.7	58.3	58.3
Next three largest: 40–75	3	2.8	168	56.0	12.2	70.6
Firms with >15 and <35	5	4.7	122	24.4	8.9	79.4
Firms with 10–15	6	5.6	67	11.2	4.9	84.3
Firms with >5 and <10	9	8.4	62	6.9	4.5	88.8
Firms with 4–5	13	12.1	57	4.4	4.2	93.0
Firms with 1–3	68	63.6	96	1.4	7.0	100.0

Source: Sofala Trucking Association, Beira

Note: These data should not be viewed as definitive, as nearly 30 truck companies did not provide information on the size of their trucking fleets.

The association identified the following main problems in the industry. The “counterpoint” observations are drawn from expert observers.

- The recent ban on importation of left-hand drive trucks (mainly of United States origin) is an issue because they are better priced than right-hand drive alternatives. **Counterpoint:** The ban is a reasonable requirement from a safety standpoint, although many left-hand drive Freightliner trucks of United States origin already ply the Beira Corridor (and are responsible for accidents, according to some key informants).
- The new Road Traffic Act requires trailers to be licensed separately and imposes requirements for separate insurance for the trailers. These requirements increase operating costs.
- The recent introduction of obligatory annual vehicle inspections increases costs and causes time to be lost in queuing for inspections. **Counterpoint:** Truckers were given over one year to

comply with this regulation, but many waited until the last minute, creating lines and delays. An annual vehicle inspection requirement in SSA is not unreasonable.

- Urgent need to repair National Highway No. 6, especially between Beira and Inchope, as the poor condition of most of this highway damages vehicles and causes accidents. **Counterpoint:** As noted, a concessionaire will be selected to manage, maintain, and (it is hoped) upgrade this road soon.
- The government allows local registration of foreign operators, but neighboring countries do not offer reciprocity. There was insufficient consultation with associations when this was being decided. **Counterpoint:** Allowing foreign operators to truck within Mozambique increases competition and puts downward pressure on trucking rates, which are very competitive with other countries in SSA for long hauls on trunk roads.
- There is a need to harmonize transporter taxes and insurance for transporters within the SADC region to create an even playing field. **Counterpoint:** This is a valid point; regional organizations typically lag in developing and especially ensuring proper *implementation* of regionally harmonized policies and regulations.
- Weighbridges at load check points are inaccurate. **Counterpoint:** The problem is actually broader. Overloaded trucks are a major cause of trunk road degradation. Shippers complain about inadequate infrastructure (old weighbridges and poor equipment) and rent seeking by ANE, which administers their operation. In the view of transport experts, this operation should be privatized.

The Sofala association reports that it meets regularly with key public agencies and officials, including the Police, Customs, ANE, the Beira Municipality, and the Ministry of Transport, though we are unable to evaluate the association's effectiveness in policy advocacy.

## 6.4 Transport Prices in Mozambique

Prices for long-distance trucking over trunk roads from the port of Beira to points in Mozambique and regional destinations range from US\$ 0.09 to US\$ 0.14/tkm. Haulage is done largely by Freightliner tractors, purchased second hand from the USA, which pull Chinese-made flatbed trailers with a load capacity of 30–34 t. In most cases below, we assume a load of 30 t. Beira Corridor rates are similar to long-distance haulage rates over the best trunk roads in Ghana, which cluster in the range of US\$ 0.09–0.12/tkm.<sup>56</sup>

Note that rates quoted for hauling 20-ft containers within Mozambique are US\$ 0.23–0.25 tkm. These higher rates from Beira to the hinterland probably reflect the fact that a flatbed trailer, with bulk or bag loading capacity of 30–34 t, may be used to haul only one 20-ft container.<sup>57</sup> For return shipments, i.e., backhaul from the Mozambican hinterland to Beira, transport charges are reportedly about half or less than those from the port to the hinterland and on to neighboring countries. Although exports of maize, pigeon peas, and sesame have increased from Mozambique in recent years, demand in the Beira Corridor for transport services remains lower from the hinterland to the port.<sup>58</sup> An exception might occur during the tobacco export season, when high volumes of tobacco leaf (an estimated 65,000 t were

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<sup>56</sup> Note, however, that haulage rates along secondary roads in Ghana were higher, clustering in the range of \$0.23–0.35/tkm.

<sup>57</sup> It is possible to put two 20-ft containers on some flatbed trailers, however.

<sup>58</sup> This may not be the case for Nacala-Nampula-Lichinga.

expected to be harvested in 2011)<sup>59</sup> move from Tete Province to Beira, as well as from Malawi to Beira (with production forecast at 218,000 t in 2011).<sup>60</sup> It is important to note that while transport costs from southern to northern Mozambique are high, north–south shipments of agricultural products benefit from lower backhaul rates from Nampula/Zambézia to Maputo.

We were unable to obtain freight haulage rates for agricultural products moved from rural areas over secondary or tertiary roads to market towns. These rates are probably 2–4 times the rates charged for shipping goods over trunk (primary) roads.

**Table 6-4: Illustrative Long-distance Trucking Costs in the Beira Corridor, August–September 2011**

Shipping Point	Destination	Distance (km)	Cost to Ship Truckload (US\$)	Cost (US\$/t)	Cost (US\$/tkm)
Beira	Chimoio	260	789	23	0.09
			900	30	0.12
Beira	Harare	565	2,500	70	0.12
				75	0.13
				78	0.14
				80	0.14
Beira	Bulawayo	726		120	0.17
				125	0.17
				102	0.14
Beira	Blantyre	784		80	0.10
				84	0.11
Beira	Lilongwe	929		90	0.09
				88	0.09
Beira	Lusaka via Zimbabwe	1,054	4,000	133	0.13
		1,054		110	0.10
		1,054		103	0.10
		1,500		140	0.09

Sources: Freight, logistics, and trucking companies (mainly in Beira); several big users of trucking services  
 Note: Multiple rows for each itinerary allow for more than one observation (from different sources).

Another source of information on transport costs, which focuses on agricultural commodities, is MINAG’s market information system (SIMA). We abstracted costs for shipping bags of maize and beans (MZN/bag) reported in SIMA weekly bulletins (*Informação Semanal de Mercados Agrícolas*, at <http://www.sima.minag.org.mz/quente/index.htm>) for August–September in the four years from 2008 to 2011. Many of the itineraries included secondary and trunk roads, but we were unable to determine the proportion of kilometers on primary vs. secondary roads for each itinerary, so the road types (and conditions) should be viewed as a hybrid of the two. Mean (unweighted) transport costs increased from US\$ 0.07/tkm in 2008 to US\$ 0.15/tkm in 2009, US\$ 0.14/tkm in 2010, and US\$ 0.23/tkm in 2011. Increases were driven in large part by higher fuel costs in 2011 but also by an appreciating metical in

<sup>59</sup> This forecast came from Rod Haggard of MLTC, reported in <http://www.macauihub.com.mo/en/2011/03/21>.

<sup>60</sup> *The Malawi Democrat*, 14 March 2011, “Malawi 2011 Tobacco Output Seen Down.”

2011 relative to 2010. Note that as the shipping itineraries changed from year to year in SIMA reporting, these averages should be treated with caution. A table summarizing findings is found in Annex 2.

## 6.5 Port of Beira Issues

The port of Beira is of pivotal importance to southeastern Africa, as it ties much of Mozambique as well as three neighboring countries (Zimbabwe, Malawi, and Zambia) to international markets and suppliers. The port is managed by a private concessionaire, as are the two other major ports in Mozambique—Maputo and Nacala. Cornelder de Moçambique<sup>61</sup> manages only Beira and is not required to make much information available about port traffic (disaggregated by product group and month for exports and imports). Highly aggregated estimates appear in Annex Table 2-2.

Shipping traffic through Beira has expanded significantly since 2004, when a total of 208 ocean-going ships and 80 coastal vessels called at Beira. The container terminal handled 46,775 twenty-foot equivalent container units (TEUs), which consisted of 240,333 t landed (imported), 240,669 t shipped (exported), and 48,456 t of coastal traffic. General cargo handled consisted of 345,729 t of cargo landed, 486,032 t shipped, and 6,019 t of coastal general cargo. Total port throughput in 2004 reached 1,367,238 t. Port shipping volume was higher for January through June 2011 than it was in all of 2004, attaining 1,655,830 t. General cargo handled in the first half of 2011 reached 718,561 t, of which 39.7% was for Mozambique (both exports and imports), and 60.2% was for transit cargo. Nearly 80% of general cargo is imported. In addition, 937,269 t were handled by the port of Beira in the form of 67,592 TEUs during the same period, of which 46.6% was represented by Mozambique traffic and 53.4% as transit traffic. Of the tonnage associated with these containers, 41% was imported, 53% exported, and 6% in the form of empty containers (Annex Table 2-1).

Stakeholders (port users) complain that Cornelder has underinvested in port equipment and that the port performs poorly relative to its potential. They also perceive port charges as high, as they are also reported to be in Nacala and Maputo. Cornelder has stated that it is upgrading equipment and plans to continue to do so. Various articles in the press state that port capacity and throughput will double by 2015.

Until July 2011, there were many complaints of the limited draft in the main channel from open water to the port and at quay side, which restricted the size of vessels that could dock at the port. Dredging<sup>62</sup> of the main channel into the port has increased the draft limit to 11 m,<sup>63</sup> which allows larger vessels with capacity of more than 60,000 gross tons to call at Beira. This should reduce the need for transshipping cargo through the port of Durban, South Africa, which has been one factor contributing to high shipping costs in and out of Beira. It should also greatly reduce demurrage charges that reportedly accumulated during peak periods, such as from February to May/June, when fertilizer imports and certain agricultural

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<sup>61</sup> Cornelder de Moçambique is a joint venture between Cornelder Holdings of the Netherlands (70%) and CFM of Mozambique (30%).

<sup>62</sup> Dredging work that cost € 43 million was completed in July 2011 at Beira port. The project dredged 27.5 km to an 11-m depth and 230-m width to enable larger vessels to enter the port's access channel.

<sup>63</sup> The LBH shipping group reports (<http://www.tallships.co.za/beira.htm>) that maximum permissible draft on spring tide before dredging of the main channel was 10 m. The channel runs 17 nautical miles from open water to the port along a dredged channel. Maximum permissible draft on neap tide was between 6.5 and 8.5 m. Four of the twelve berths had a draft of barely over 6 m.

product exports (namely leaf tobacco) are concentrated. Even with port improvements, it is reported that shipping costs out of Durban are US\$ 400–500 per 20-ft container lower than out of Beira.

Cornelder predicts that the dredging plus ongoing upgrading of the port will increase traffic and allow larger vessels to call at Beira, which will reduce shipping costs per container. While Cornelder considers the trucking industry serving the port and the Beira Corridor to be very competitive, it judges the efforts of the Indian railway concessionaire on the Beira to Zimbabwe line to be highly inadequate. Cornelder claims that railway traffic on this line by mid-2011 was only some 20–30% of rail traffic two years previously. Furthermore, rail shipping capacity out of Tete Province needs to expand to move the coal that will soon be exported by Vale (of Brazil) and other mining companies (such as Riverdale).

Table 6-5 provides illustrative ocean freight rates into and out of Beira for both 20- and 40-ft containers. Shipping costs are higher for containers coming from China (PRC) and India than for those coming from the EU or USA. China is a major exporter to the EU and USA, and shipping companies place a high premium on “diverting” containers to African ports that could be shipped and processed through ports (typically in fewer days) at a major export destination, such as the West Coast of the USA or the EU. Shipping costs for exported containers are lowest to China, as its export machine has a voracious appetite for containers and hence is keen to get containers to China as quickly as possible (for rapid use and re-export). Shipping a container from Beira to an EU port costs over twice as much as shipping to India. Forty-foot containers for export typically command a premium of approximately 70% over twenty-foot containers. The premium is higher, ranging from 74% to 100%, for imported containers.

**Table 6-5: Illustrative Ocean Freight Rates into and out of Beira Port, August 2011**

Shipping Point or Destination	20-ft Containers		40-ft Containers		% Premium for 40-ft Container	
	Imports	Exports	Imports	Exports	Imports	Exports
Nava Sheva, India	1,250	1,350	2,350	2,300	88	70
Shanghai and Xingang, PRC	1,475	950	2,950	1,300	100	37
Barcelona, Spain	1,175	2,073	2,050	3,546	74	71
Felixstowe, England	975	2,073	1,950	3,546	100	71
Antwerp, Belgium	975	2,073	1,950	3,546	100	71
New York, USA	950	3,550	1,650	5,900	74	66

Source: Private shipping companies

Note: Nava Sheva serves Mumbai. Xingang serves Beijing. The rates above do not include all port-related costs of processing containers.

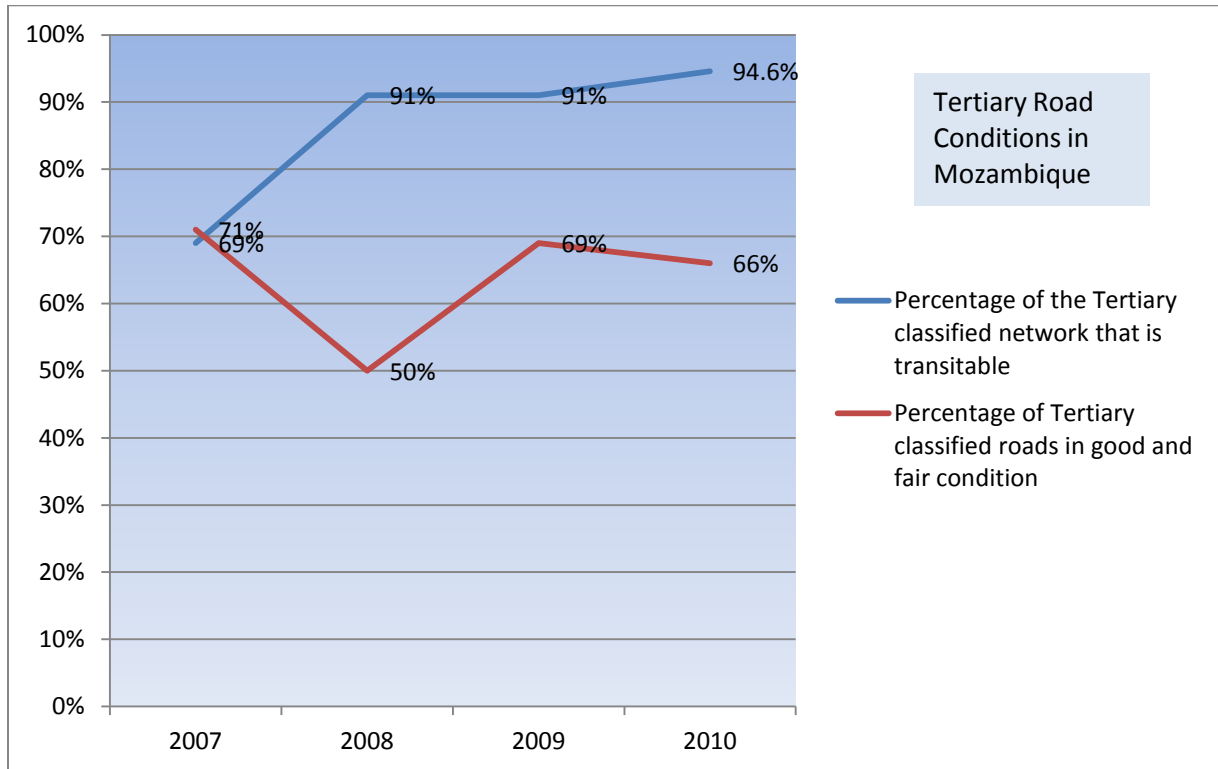
Beira port charges for containers are US\$ 875 per 20-ft container and US\$ 1,360 for a 40-ft container. These include port stripping for break bulk transport and empty container turn in. Export charges, which include loading, are about 10% lower, at US\$ 785 and US\$ 1,220, respectively.

## 6.6 Rural Access, Quality of Roads, and Logistics Performance

Mozambique receives mixed reviews on road indicators. While the improvement of the primary roads through a combination of reorganized and strengthened government agencies, some use of tolls, and significant, continuous outside funding is considered successful, the quality of rural access roads, linking agriculturally productive zones to transport routes, is below sub-Saharan African averages.

The Rural Accessibility Index (RAI) is a standard measure of access of the rural population to motorable, practicable roads.<sup>64</sup> It does not, however, show the quality of rural roads, over 40% of which are in poor condition in Mozambique. The RAI measure for Mozambique was 27% of the rural population in 2006, but according to the latest Road Fund reports this measure has improved, ranging from 31% to 32% from 2007 through 2010 (ANE Annual Report, 2010). This figure is well below the RAI for Ghana, which was 61% in 2006 (from LSMS survey). The poor condition of the rural road network contrasts with the relatively good condition of Mozambique’s primary and secondary road network (Figures 6-1 and 6-2). According to recent studies on Mozambique’s infrastructure, “the high quality of the main network comes from a recent revamping program of rehabilitation and construction of roads. In a few cases, however, this revamping might have led to the over-engineering of roads with annual average daily traffic (AADT) levels below 300.” This information raises questions about the efficiency of spending.

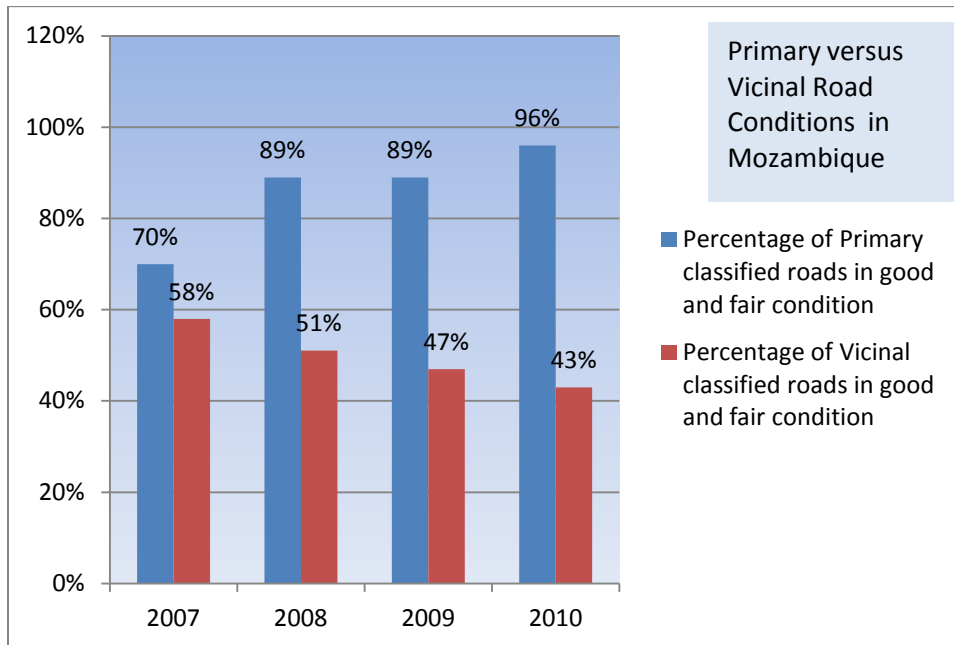
**Figure 6-1: Tertiary Road Conditions in Mozambique**



Source: PRISE Annual Report 2010

<sup>64</sup> “The RAI measures the number of rural people who live within two kilometers (typically equivalent to a walk of 20–25 minutes) of an all-season road as a proportion of the total rural population. An “all-season road” is a road that is motorable all year round by the prevailing means of rural transport (typically a pick-up or a truck which does not have four-wheel-drive).” (RAI White Paper, World Bank, 2006).

**Figure 6-2: Primary versus Vicinal Road Conditions in Mozambique**



Source: PRISE Annual Report 2010

The Logistics Performance Index (LPI) is the weighted average of a country's scores on six key dimensions:

1. Efficiency of the clearance process (i.e., speed, simplicity, and predictability of formalities) by border control agencies, including Customs.
2. Quality of trade- and transport-related infrastructure (e.g., ports, railroads, roads, information technology).
3. Ease of arranging competitively priced shipments.
4. Competence and quality of logistics services (e.g., transport operators, customs brokers).
5. Ability to track and trace consignments.
6. Timeliness of shipments in reaching destination within the scheduled or expected delivery time.

Even in comparison to other countries in SSA, Mozambique's performance is worse on all but one sub-indicator (competitive international shipments, probably because Mozambique has three good ports with increasing traffic and possibly because of the proximity of South Africa's ports) (Table 6-6). Mozambique has particularly low scores on customs efficiency, tracking and tracing, and timeliness of shipments.

## 6.7 Concluding Observations

While Mozambique's trunk road and bridge infrastructure is improving, ancillary roads are often poorly maintained and impracticable during certain periods of the year. The financial requirements to upgrade Mozambique's road infrastructure are enormous and unlikely to be met fully by the government or donors. Corridor development strategies are one way to engage the private sector, particularly foreign investors, in partnerships with provincial and local governments.



**Table 6-6: Logistics Performance Index Comparisons between Mozambique, SSA, and the World**

	Mozambique		Sub-Saharan Africa		World	
			Score	Difference	Score	Difference
Overall LPI	Score:	2.29	2.42	-0.13	2.87	-0.58
	Rank:	136				
Customs	Score:	1.95	2.18	-0.23	2.59	-0.64
	Rank:	145				
Infrastructure	Score:	2.04	2.05	-0.01	2.64	-0.6
	Rank:	124				
International shipments	Score:	2.77	2.51	0.26	2.85	-0.08
	Rank:	87				
Logistics competence	Score:	2.2	2.28	-0.08	2.76	-0.56
	Rank:	130				
Tracking and tracing	Score:	2.28	2.49	-0.21	2.92	-0.64
	Rank:	135				
Timeliness	Score::	2.4	2.94	-0.54	3.41	-1.01
	Rank:	150				

Source: World Bank 2010 <http://www1.worldbank.org/PREM/LPI/tradesurvey/mode1a.asp?countryID=98>

The quality of Mozambique's infrastructure is lower than that of Ghana or Kenya. Rural access is often poor, and transport costs to rural communities are high (though not well documented in this study). The poor quality of transport infrastructure causes small-scale farmers to pay a high price for inputs and receive lower prices for their agricultural products. Evidence for this assessment comes from data collected by IFDC since mid-2010 (showing the high retail prices of fertilizer) and data from SIMA's website and reports (showing low prices paid to farmers for cereals by rural collectors and wholesale traders). We advise that more research be done on rural transport costs in agricultural production zones, particularly in central and northern Mozambique, to improve the understanding of cost factors contributing to high input costs and low product prices.

## 7. Policy and Enabling Environment for Agribusiness Development

Mozambique's agricultural sector accounted for 31.5% of GDP in 2009, up from 24.0% in 2000. It employs nearly 80% of the labor force (2009), and it is an important source of export earnings. The policy direction provided by the Strategy and Plan for Agro-Development (PEDSA), which emphasizes a value chain approach to agricultural development that focuses on value addition and market access, has laid the foundation for a favorable environment for agribusiness development. Mozambique's policy is found to be generally conducive for agribusiness development (Table 7-1), though the private sector does object to (1) the limited transparency in formulating policy; (2) the inconsistent implementation of some regulations, decrees, and procedures; and (3) warning signs that the public sector is assuming more of the input delivery and marketing functions that had been left to the private sector in recent years. Performance in some agricultural subsectors (e.g., cashew) is clearly mixed, though increased production of soybeans and expanding exports of sesame, pigeonpeas, and in some years maize provide grounds for guarded optimism. The overall food system has a long way to go in terms of productivity enhancement and modernization, as shown in the very low use of purchased inputs and in staple food processing (maize is one example).

**Table 7-1: Summary Observations on the Policy Environment for Agribusiness**

Success Factors	Indicators	Results of Indicators
Private sector perception of policy environment and advocacy role	Private sector perception of agribusiness enabling environment (scale: 0–5)	Rating = 2.8. Managers of private firms representing the fertilizer (4), seed (1), machinery (3), transport (3), and finance (3) industries rated the enabling environment to do agribusiness in Mozambique. The overall environment is good, but the private sector fears increasing government intervention in the market will potentially crowd out the private sector. Weak public institutions do not adequately perform functions of a public good nature that support private sector-driven agribusiness development.
	Policy consistency (scale: 0–5)	Rating = 2. Private sector is concerned about recent policy changes suggesting that the government will take a more active role in certain agribusiness activities (agro-input delivery and product marketing, storage, price, and margin controls). More than policy inconsistency, the private sector notes the lack of transparency in government policy making and lack of consultation prior to decrees and interventions (one example is the treatment of foreign currency holdings).
	Private sector advocacy group for agribusiness: Existence and effectiveness (scale: 0–5)	Rating = 1.5. CTA, an umbrella organization representing the private sector, is viewed as captured by urban and industrial elites and not effectively representing private agribusiness. ACIS, started in Beira/Sofala but now national, represents many major private firms, including agribusinesses, but the government views it with some suspicion as being dominated by foreigners, foreign investors, and Mozambican firms with foreign capital or ties. Commodity-specific groups are weak, poorly funded (dependent on donors), and not strong policy advocates.
Selected policy measures	% of annual federal budget allocated to agriculture (CAADP indicator)	The approved Government of Mozambique budget allocated 11.2% for agriculture as recently as 2007, but actual expenditure never topped 7.6% from 2006 through 2009, and was very low in 2008 (3.3%) and 2009 (3.5%), according to the government. The World Bank PER showed expenditure on agriculture clustered in the 4.6–6.9% range from 2002 to 2009 (5.1% in 2008 and 2009).

Success Factors	Indicators	Results of Indicators
	Farmer share of cash crop export price (cashew)	Was 39% in 2005–08, the highest level since 1996–99. Low ratio is due to multiple factors: the tax on raw cashew nut exports discourages competition among buyers; market power of processors is significant; and public sector underinvests in cashew production. Delay in buying raw cashews for export allows processors to meet their requirements with less competition (as exporters not allowed to buy), which lowers producer prices.
	% cashew exports that are processed	64% of cashew exports (in raw nut cashew equivalent terms) were processed kernels in 2009. Exported processed cashews would be higher in value terms, but the data from our sources are hard to reconcile.
	% of a key staple (maize) industrially processed	Difficult to determine with any precision in Mozambique for maize—approximately 13.2%. This indicator measures the proportion of maize that is bought as processed food products (in the form of flour, grits, meal, and so forth) plus used as feed. Imports of maize from South Africa appear to undercut the development of a private processing industry and probably reduced incentives for farmers to upgrade their productivity and meet processors’ quality standards.

## 7.1 Private Sector Perception of the Policy Environment for Agribusiness

Stakeholders generally perceive that the agribusiness environment is good but not improving and that disquieting signs point to expanded government participation in input distribution and product marketing. This perception is not, however, reflected in the final score (2.8) for this indicator. In the seed subsector, private firms are active in seed multiplication, but USEBA is unable to produce sufficient foundation seed for multiplication. The government also has given away or heavily subsidized seed distribution through some parastatals and programs. There are complaints that government tenders provide insufficient time for seed multiplication, which leads to importation of seed (not always of high quality). Such measures discourage the emergence of a private seed multiplication and distribution capability. Fertilizer importation and sale are freely allowed, though the government has provided subsidized fertilizer with seed through some programs. Implementation of a nationwide fertilizer subsidy program is well beyond the government’s financial means, however. Tractor importation is fully liberalized, though the government has procured tractors (following importation by the private sector) for subsidized and preferential distribution to selected producers, farmer organizations, and production schemes.

Private sector investment and participation in trucking along trunk roads is viewed as straightforward and subject to minimal regulation, despite problems with weighbridges and road maintenance. Private trucking companies focus on the profitable yet competitive long-haul business; the secondary and tertiary road network is considered underdeveloped and inadequate. Although truckers complain of the government’s road transport rules and oversight, government measures appear to be reasonable, justified on safety grounds, and designed to prevent further deterioration of major trunk roads. One contentious issue is that the government permits foreign truckers to operate in Mozambique without requiring apparent reciprocity in neighboring countries along key trade corridors. Getting to the bottom of this issue requires further investigation at the regional (SADC) level.

Agribusiness finance providers do not object to BoM oversight and rules governing deposit/loan ratios and the like. Recently imposed foreign exchange conversion requirements have elicited protests from banks and domestic agribusinesses. High interest rates are in large part a function of high domestic inflation rates, although recent appreciation of the metical vis-à-vis the dollar will dampen inflation in local currency terms. Higher interest rates to agribusiness relative to urban-based enterprise in Mozambique are evidence of a risk premium for lending to agriculture and agro-enterprise. Larger domestic agribusiness firms, typically with partial or full foreign ownership, and foreign investors are able to access finance for investment and working capital at lower real interest rates than smaller agro-enterprises. This competitive advantage will favor foreign investment and ownership in commercial agriculture and larger-scale agro-enterprise.

## **7.2 Policy Consistency and the Role of Private Sector Advocacy**

The private sector's perception of policy consistency in Mozambique is rated 2, given the recent evidence of government intervention (often subsidized) in input distribution and signs of increasing interest in staple crop marketing and storage. As discussed, another suspected negative is the recently announced restrictions on the use and holding (in bank accounts) of foreign currency. The restrictions are perceived to be vague and non-transparent in implementation, and they surprised many companies because they were announced without consulting the private sector.

Many participants view trade policy and import-related fees as consistent, though the recent waiving of duties on maize and soybean feed imports was viewed as beneficial to larger, established agribusiness interests and trading enterprises, while discouraging local investment in maize and soybean production, processing, and feed mixing. Cashew subsector policy has a long and turbulent history, though the policy environment has been consistent since 2002/03 and has contributed to significant private investment in labor-intensive cashew processing, a strong positive development. Critics argue, however, that it has come at a cost to producers in the form of continued low prices for cashew nuts and consequent underinvestment in renewing the stock of aging cashew trees.

## **7.3 Mozambique in the CAADP Investment Plan Development Process**

The Government of Mozambique has not yet signed a CAADP compact but is instead using an early 2011 agricultural sector strategy document (PEDSA) as a broad set of guidelines. MINAG needs to go well beyond this, and a team is working on the needs and requirements to operationalize PEDSA. Every MINAG directorate was recently asked to produce a matrix with specific actions to operationalize PEDSA.

A recent planning and progress report, "Pacto para o Desenvolvimento do Sector Agrário em Moçambique no Contexto do CAADP" (October 2011), provides an update on the CAADP investment planning process and a timetable. The compact is supposed to be signed in the final quarter of 2011 and followed by a specific set of investment proposals by the end of the third quarter of 2012. While this interim step is welcome, Mozambique has lagged other SSA countries in the CAADP investment planning process. In fact, Mozambique does not appear in the initial list showing completion or near completion of the planning process on the CAADP website <http://www.caadp.net/library-country-status-updates.php>. The website shows that 20 African countries have signed CAADP compacts, two have "unsigned" compacts (Central African Republic and Zambia), three have "draft" compacts (Democratic Republic of Congo, Mauritania, and Swaziland), and Benin has an investment planning document but no compact. Mozambique is

listed as having “launched CAADP implementation and working towards signing compact,” along with five other countries. Nine countries are poised to advance with pre-compact CAADP implementation, while six are listed as “newly engaged” in the CAADP process. Much work remains to be done in the case of Mozambique.

## 7.4 Government Expenditure on Agriculture

Government expenditure on agriculture has fallen well short of the NEPAD/CAADP target of 10% of total government expenditure. The approved government budget allocated as much as 11.2% for agriculture as recently as 2007 (see Table 7-2), but actual expenditure never topped 7.6% from 2006 through 2009 and was a much lower 3.3% in 2008 and 3.5% in 2009, according to the government. The World Bank PER shows expenditure on agriculture clustered in the 4.6–6.9% range from 2002 to 2009, including 5.1% in 2008 and 2009 and excluding the Local Initiative Investment Budget (OILL).<sup>65</sup> These percentages rise to 5.7% and 5.6% with inclusion of 50% of OILL grant funds.

Each SSA country is given some latitude in defining what constitutes agricultural sector expenditure in its reporting on this indicator to the African Union. In Ghana, federal allocations to the parastatal cocoa input provision and marketing board (COCOBOD) are included in expenditures on agriculture, along with allocations to rural road maintenance beginning in 2009. Expenditures on forestry, fisheries, various Presidential Special Initiatives, and “debt servicing” are also included in Ghana’s calculation, helping to push Ghana to 9–10% in most recent years.

Unfortunately, disaggregated figures for the government’s budget and actual expenditure, as reported by the government, are not available. The World Bank did, however, disaggregate expenditure by public institutions working in the agricultural sector in its 2011 PER. The World Bank PER provides a fuller picture and many useful details, as shown in Table 7-3 and included in the following observations:

- In 2007, some 41% of spending by MINAG and its institutes (including the FDA, but not considering the OILL) was from domestic resources, with earmarked external funds making up the rest (59%). A large share of external funds was centrally managed by MINAG, which manages 47% of total expenditure.
- In 2007, 49% of government expenditure on agriculture went to MINAG and 15% to large-scale irrigation authorities (with OILL included). Excluding OILL, the figures were 58% and 17%.
- It is not possible to provide a subsectoral breakdown of spending by function.
- Budget execution rates have been around 80% in the past, but the exact figure varies according to the spending unit and the source of funds.
- Agriculture’s contribution to GDP is growing, and spending as a share of agricultural GDP is high in Mozambique relative to other African countries. Public spending on agriculture represented 7.4% and 7.5% of agriculture and fishing GDP, *as budgeted* in 2008 and 2009 (i.e., not actual expenditure).
- Real expenditure increased from 2005 to 2007 because of the increased spending by the FDA and the appearance of the OILL in 2007. Accounting for OILL adds another 0.8 percentage points to the 2007 estimate of actual expenditures on agriculture, and 0.5-0.6 percentage points to the share of budgeted expenditure estimates for 2008 and 2009 in Table 7-2.

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<sup>65</sup> Under OILL, the Government of Mozambique allocates MZN 7 million per year to all 128 districts to provide grants for economic development initiatives that will increase food production and create employment.

**Table 7-2: Government Expenditure on Agriculture in Mozambique, 2001–09 in '000 MZN**

Year	Public Expenditure on Agriculture (Government of Mozambique Reported)						World Bank Reported Expenditure on Agriculture		
	Approved Budget			Actual Expenditure			Total	Agriculture	% to Agriculture
	Total	Agriculture	% to Agriculture	Total	Agriculture	% to Agriculture			
2001	27,076	1,192	4.4	27,076	516	1.9	24,289	504	2.1
2002	29,822	1,610	5.4	29,821	1,779	6.0	29,124	1,655	5.7
2003	29,213	3,106	10.6	29,213	1,635	5.6	28,294	1,470	5.2
2004	28,607	3,287	11.5	28,607	2,333	8.2	31,630	2,040	6.4
2005	34,204	2,528	7.4	34,204	3,061	8.9	40,710	2,795	6.9
2006	36,931	2,851	7.7	36,939	2,806	7.6	48,274	2,679	5.5
2007	43,338	4,860	11.2	43,337	2,799	6.5	60,293	2,773	4.6
2008	59,852	2,163	3.6	46,868	1,525	3.3	87,098	4,434	5.1
2009	62,626	2,597	4.1	54,161	1,871	3.5	102,705	5,195	5.1

Source: Government-reported figures from “Monitoring Agricultural Sector Performance, Growth and Poverty Trends in Mozambique” (draft report). Bank-reported figures from *Mozambique: Analysis of Public Expenditure in Agriculture* (World Bank Report, February 2011)

Note: World Bank estimates in this table include estimates for OIIL funding to agriculture and assume 50% of funds allocated to districts under an economic development transfer of funds scheme.

Calculating public expenditure on agriculture as a percentage of agricultural GDP in Mozambique provides a more favorable picture of Mozambique relative to most other African countries. For 2007 the estimates are 5.9%, 5.0%, and 7.7% for agricultural expenditure with OIIL, without OIIL, and adding in conservatively estimated off-budget expenditures. When nine countries in SSA are compared to Mozambique using 2004 data, only two countries (Mali and Ethiopia) had higher percentages of agricultural expenditure as a percentage of agricultural GDP.<sup>66</sup> Based on another measure, public agricultural spending per rural capita, Mozambique had lower expenditures (US\$ 12.2 per rural capita) than four other countries in SSA (Burkina Faso, at US\$ 44.5; Uganda, US\$ 18.8; Ethiopia, US\$ 15.8; and Kenya, US\$ 14.9) and a marginally higher expenditure than Ghana (US\$ 11.0 per rural capita). This comparison illustrates how the use of alternative methods for calculating the share/magnitude of public expenditure on agriculture can lead to quite different rankings among countries.

<sup>66</sup> The additional measures of agricultural expenditure are drawn directly from *Mozambique: Analysis of Public Expenditure in Agriculture* (World Bank Report, February 2011), Volume I, pp. 82–83.

**Table 7-3: Public Expenditure in Agriculture as a Percentage of Agricultural GDP and as a Percentage of the Government Budget**

Expenditure by Institution (in '000 MZN)	Actual Expenditures							Budgeted	
	2001	2002	2003	2004	2005	2006	2007	2008	2009
Ministry of Agriculture (MINAG)	405.8	1,194.7	1,082.9	1,236.4	1,388.4	1,456.7	1,611.0	2,490.0	3,044.2
Large-scale irrigation (MoPH, HICEP)	48.4	299.1	271.1	435.4	975.2	520.5	482.3	482.3	482.3
Agricultural Development Fund (FDA)	22.2	31.7	44.4	66.0	97.0	217.1	281.8	281.8	242.0
Ministry of Fisheries	27.4	129.6	55.2	299.8	213.7	340.4	250.6	1,032.7	1279
Rural Development/DNPDR					116.6	135.7	135.0	135.0	135.0
Zambezi Region Development Authority (GPZ)			16.7		3.7	8.9	12.2	12.2	12.2
OIIL allocated to agriculture (50%)							507.8	511.4	533.1
Total including OIIL							3,280.7	4,945.4	5,727.8
Total excluding OIIL	503.8	1,655.1	1,470.3	2,037.6	2,794.6	2,679.3	2,772.9	4,434.0	5,194.7
Total Government Expenditure (Budget)	24,289.0	29,124.0	28,294.0	31,630.0	40,710.0	48,274.0	60,293.0	87,098.0	102,705.0
Agricultural GDP	16,912	25,289	28,133	31,878	37,122	45,852	55,693	67,245	75,889
Agriculture	15,463	23,508	26,007	29,634	34,838	43,042	52,637		
Fishing	1,449	1,781	2,126	2,244	2,284	2,810	3,056		
Spending as % agricultural GDP, w/OIIL							5.9%	7.4%	7.5%
Spending as % agricultural GDP, w/o OIIL	3.0%	6.5%	5.2%	6.4%	7.5%	5.8%	5.0%	6.6%	6.8%
Spending as % total budget, w/OIIL							5.4%	5.7%	5.6%
Spending as % total budget, w/o OIIL	2.1%	5.7%	5.2%	6.4%	6.9%	5.6%	4.6%	5.1%	5.1%

Source: *Mozambique Analysis of Public Expenditure in Agriculture* (World Bank Report, February 2011); adapted from Table 4b in Annex 1, p. 184

Note: Figures from 2001 through 2007 represent actual expenditures. Figures for 2008 and 2009 are amounts budgeted by the government.

## 7.5 Cashews: Farmers' Share of Cash Crop Export Price, and the Proportion of Processed Cashew Exports

Mozambique is an important producer of cashews in Africa, which as a continent is now the world's leading producer of raw cashews. Mozambique's Cashew Promotion Institute (INCAJU) claims that nationwide 1.45 million rural households participate in cashew production. During the 1990s, Mozambique's capital-intensive industry for processing cashews paid producers low prices and lobbied successfully for marketing rules that limited raw cashew exports. A tax on raw cashew nut (RCN) exports, as well as an initial post-harvest period during which traders were not permitted to buy cashews for export, resulted in low annual cashew output averaging only 40,800 t from 1990 to 1999. Output expanded to an estimated 66,700 t in 2000–09 (according to FAOSTAT). By 2001, however, exports of raw cashews, principally to India, were permitted, causing raw cashew exports to go from nil in 2001 to 93–97% of cashew exports in RCN equivalent terms during 2002–04. Cashew exports in RCN equivalent terms increased from an average of 19,000 t in the 1990s to 33,800 t from 2000 to 2009. By 2009, 64% of the exports in RCN terms were in the form of processed cashew kernels, as some 20–25 cashew factories using labor-intensive processing technology introduced from India had reached an installed processing capacity estimated at 38,400 t.<sup>67</sup>

During the 1990s, producer prices averaged less than 30% of export prices for raw cashew nuts, though the price ratio rose significantly from the first six years of the decade (1990–95, when they averaged only 22%) to the last four years of the 1990s (39%). The year 2000 was the high point in the ratio of producer to export price (50.5%). Excluding that year, the ratio averaged 38% from 2001 through 2008, with no discernible trend.

**Table 7-4: Ratio of Producer Price to Export Price for Cashew Nuts in Mozambique**

	1990–95	1996–99	2000	2001–04	2005–08
Average producer price (US\$/kg)	0.21	0.35	0.47	0.23	0.32
Average FOB price (US\$/kg)	0.93	0.89	0.93	0.62	0.81
Producer price as % FOB export price	22	39	51	37	39

Source: Data from Aksoy, Ataman and Fahrettin Yagci, "Mozambique Cashew Reforms Revisited," World Bank draft policy research working paper, May 2011.

The complex political economy of Mozambique's cashew subsector is discussed in detail in a World Bank Policy Research Working Paper by Aksoy and Yagci (2012). As noted, producer prices were held low in the 1990s to benefit larger, capital-intensive processors. The export tax on raw cashew exports, which has ranged between 14% and 18% from the mid-1990s to the present, effectively subsidizes processors. Because INCAJU can also delay exports of raw cashew nuts, processors can meet their requirements at a lower cost during the early post-harvest and marketing period and offer lower prices to producers without competition from other buyers (i.e., exporters) until later in the marketing season.

<sup>67</sup> This estimate is from Filomena Maiopue, Director of INCAJU, as reported in <http://www.macaclub.com.mo>, 13 May 2011. In October 2011 the INCAJU chairman stated that cashew processors in Mozambique could process 42,000 t of cashew nuts (from AllAfrica, 10/18/11).



Aksoy and Yagci provide a nuanced analysis of the unfolding and outcomes of the cashew reform process:

The expected reforms lead to producer price increases, and the exported output responds to this price increase. This continues until there is an external shock which is the international price collapse (*of 2001/02*). The possibility of this external shock is not built into the reform program and there is no mechanism to redistribute the losses among the stakeholders. Therefore the output decreases and the inefficient (*capital-intensive*) processing industry is completely eliminated. Collapse of prices and the exit of processors lead to a less competitive environment for the purchasers of raw cashews, who lower the share of export price received by the farmers further reducing the marketed output. There is an effective non-price support for the processors by the donors, and a more competitive (*labor-intensive*) processing technology and corporate structure emerges, aided by the existing export tax (*on raw cashew nuts*) and lower share of export price going to the farmers. In recent years, real producer prices do not increase despite the increases in international export prices, due to the lower share of export prices going to farmers and a seriously appreciating currency. On the other hand, during this period, there is increasing but still weak support to the farmers.

Aksoy and Yagci (draft World Bank Policy Research Working Paper, 2011, p. 18)

As mentioned, a major problem throughout the past two decades in the Mozambican cashew subsector is that producer prices have remained too low to justify reinvestment in the cashew tree stock, whose productivity has declined steadily. The capital-intensive, urban-based cashew processing industry of the 1990s was closed in 2000–02 and soon succeeded by labor-intensive processing using techniques borrowed from Indian factories. According to INCAJU, over 20,000 t per year have been processed since 2005 (through 2010), representing 25–37% of the cashew crop. The factory owners, like the previous generation of (capital-intensive) processors, gained sufficient political clout to ensure that the tax on raw cashew exports remained in place at 18%. INCAJU, which receives the revenue from that tax, continues to operate as a semi-governmental organization that has provided some support to farmers in the form of subsidies on spraying and replanting. That support is considered inadequate to spur significant productivity advances, however. While world cashew prices increased steadily from 2001/02 to 2008, real producer prices in Mozambique did not keep pace.

## 7.6 Development of the Maize Processing Industry

Most maize is sold to households as grain in Mozambique and milled in small lots on a custom-hire basis at small, local hammermills in large and small towns. Some larger poultry farms have their own mills and feed-mixing equipment. Industrial processing that leads to value addition is not prevalent. The processing industry is therefore still at an early stage of development. Our crude estimate of formal maize processing is 13.2%.

Thirteen maize millers operate at an industrial scale in Mozambique, including CIM and Meref Industries<sup>68</sup> in Matola and Beira, DECA in Chimoio and Tete, CIMPAN in Nampula, and SOCIMOL in Maputo. There are also numerous other small hammermills operating at a lesser scale, but these are not included in the following calculation. Their total estimated maize processing capacity (in raw material terms) is 170,000 t per annum, used to produce maize flour and 19,600 t of maize bran, which goes largely to poultry feed.

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<sup>68</sup> AFRICOM Group, owner of SASSEKA brand, manages MEREK Industries.

Three milling companies—DECA, CIM, and CIMPAN—operate 70% of installed industrial scale milling capacity in Mozambique (Table 7-5). According to CIM, only 12% of its maize processed annually in Matola, Beira, and Nampula (where CIM is part owner of a mill) comes from domestic sources. In contrast, all of the maize that DECA mills in Chimoio and Tete (an estimated 60,000 t per year) is sourced locally.

**Table 7-5: Largest Industrial Maize Millers in Mozambique  
(t of installed capacity)**

<b>Milling Company</b>	<b>Maize Flour</b>	<b>Maize Bran</b>
DECA	60,000	4,200
CIM	36,800	9,200
CIMPAN	21,600	
<i>Subtotal</i>	<i>118,400</i>	<i>13,400</i>
as % Total	69.6%	68.3%
<b>Total</b>	<b>170,070</b>	<b>19,624</b>

Source: MIC, Direção Nacional da Industria

Urban demand for maize flour and meal in Mozambique is steadily expanding. There is significant competition from imported maize meal, particularly in southern Mozambique (notably in the Maputo market). The availability of high-quality processed maize meal from South Africa poses a competitive challenge for the development of the Mozambican maize processing industry.

Economic, quality, and policy factors contribute to the sourcing of maize from South Africa. Both the proximity and cost of South African maize relative to Mozambican maize make it cheaper in Maputo and Matola (in southern Mozambique) than maize shipped from the maize-surplus zones of central and northern Mozambique. As maize production is more commercialized and the crop is grown to a higher quality standard in South Africa, CIM imports significant volumes of maize to process in its mills in Matola and Beira. CIM reports that it mixes local with imported maize in processing in Beira, yet it rejects up to 25% of the local maize supplied by local wholesale traders. Recently, the government decided to remove VAT on imports of maize and soybeans from foreign suppliers, legislating away protection of domestic producers, which led to an outcry.

Some salient features of maize utilization and international trade in Mozambique are:

- Maize is not used in beer brewing in Mozambique, as in Ghana and many West African countries. (Cassava is now used.)
- There is no reliable point estimate of the volume of poultry feed used in Mozambique, which would allow an accurate estimate of the maize component of that feed.
- Maize trade is highly variable from year to year. COMTRADE data show high inter-annual variability between maize exports and imports. It is very likely that a good proportion of maize trade is not recorded, though the informal trade (on bicycles and motorbikes and on top of minivans) is not considered formal commercialization for the purposes of this indicator.

Based on work done by TechnoServe on the poultry industry and soybean meal demand, we can indirectly estimate a range for maize volumes required as an ingredient in poultry feed in Mozambique. TechnoServe estimated the “demand” for soybean meal at 39,000 t in 2010. Assuming that soybean

meal comprises 15–20% of the weight of the feed ration, total feed “demand” can be estimated at 195,000–260,000 t. As maize comprises 55–60% of the poultry feed ration (by weight), maize used in feed in Mozambique likely ranges between 107,000 and 156,000 t. Taking the midpoint of that range, we estimate that some 131,600 t of maize are currently used in the poultry industry.

Table 7-6 summarizes our estimates of formal maize trade and processing. Industrial-scale processing of maize utilizes an estimated 119,000 t of unprocessed maize. Adding this figure to estimated feed use of 131,600 t yields an upper limit of 250,600 t of maize for human consumption and animal feed, which represents 13.2% of the total estimated maize crop, plus net imports of maize, in 2009/10. The actual percentage could be lower, as some of the maize used in the poultry industry probably comes from industrial processors,<sup>69</sup> so there is undoubtedly some double counting. We lack the firm-by-firm information to break down the proportions of industrially processed maize going to food (human consumption), feed, and alternative uses, so we assume that all of the maize flour produced is destined for human consumption.

**Table 7-6: Industrial Processing of Maize, 2010**

<b>Maize production and trade (t)</b>	
Production	1,840,700
Import	66,200
Export	6,800
<b><i>Net maize available (t)</i></b>	<b><i>1,900,100</i></b>
<b>Buyers of maize for processing*</b>	
Maize milled by industrial processors (for human consumption)	119,000
Estimated poultry industry use of maize	131,600
Breweries	0
<b><i>Total estimated maize processed (t)</i></b>	<b><i>250,600</i></b>
<b><i>% processed industrially</i></b>	<b><i>13.2%</i></b>

Source: COMTRADE for international trade; USDA for production (three-year average, 2008–10)

Notes: The raw material input into industrial maize milling is assumed to be 70% of installed capacity. Author estimates for poultry industry use are based on a TechnoServe estimate of soybean meal requirements for poultry feed, which enables us to calculate total poultry feed needs and from that estimate the required maize volume as a feed ingredient.

<sup>69</sup> Estimated capacity of industrial mills to produce maize bran is 19,600 t, which we assume goes largely to the poultry industry and hence makes up part of the 131,600 t figure for poultry industry maize requirement.

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## Annexes

### Annex 1: Supplemental Information on Agribusiness Finance

This annex includes more detailed information on agribusiness finance that may interest some readers:

- A list of commercial banks and MFIs that provide loans for agricultural production or agribusiness.
- A description of major development programs with financial components, including government credit lines, development projects, and guarantee funds.
- Some more detailed information on GDP shares, inflation and exchange rates, and other statistics.

#### 1. Commercial Banks and Other Financial Institutions in Mozambique

This section lists commercial banks with different degrees of activity in agricultural lending. It also provides information on MFIs, investment companies, and other financial institutions.

**Commercial Banks.** There are now 18 commercial and/or investment banks, with the last one opening to the public in August 2011. Another bank is already authorized by BoM and should start operating soon. Most have only a few branches in Maputo City or Maputo Province. Among those 18 commercial banks, 13 are “classical” banks, 4 are dedicated to micro-finance, and 1 is dedicated to “electronic banking.”

- BIM: Banco Internacional de Moçambique, SA (Portuguese capital).
- BCI: Banco Comercial e de Investimentos, SA (Portuguese capital).
- Standard Bank, SA (South African capital).
- Barclays Bank Moçambique, SA (South African capital).
- Banco Terra, SA (Dutch capital).
- BMI: Banco Mercantil e de Investimentos, SA.
- MCB: Mauritius Commercial Bank Moçambique, SA (Mauritian capital).
- FNB: First National Bank Moçambique, SA (South African capital).
- ICB: International Commercial Bank (Mozambique) SA (Malaysian capital).
- Moza Banco, SA (Macau capital: Stanley Ho).
- BancABC: African Banking Corporation (Moçambique), SA (South Africa capital and IFC).
- UBA: United Bank for Africa (Nigerian capital).
- Banco Unico (starting operations in August 2011) (Portuguese capital).

BNI, the National Investment Bank,<sup>70</sup> has been allowed and will start operations soon with Portuguese and Mozambican government capital.

Four commercial banks specialize in micro-finance:

- Banco ProCredit, SA (German and IFC capital).
- Socrema Banco de Microfinanças, SA. with Africap and NordicMicroCap capital

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<sup>70</sup> BNI was set up by the Mozambican and Portuguese governments under agreements reached last year. The Portuguese and Mozambican states each hold 49.5 per cent of the capital of the BNI. The third shareholder, with one per cent, is BCI, the second-largest commercial bank in Mozambique. (Source: <http://allafrica.com/stories/201101310177.html>).



- Banco Oportunidade de Moçambique, SA (capital from charitable organizations in the USA and UK).
- Banco Tchuma, SA (100% Mozambican capital, two major investors, staff and former cooperative members).

**Other Financial Sector Players.** The numerous other financial sector players include one “electronic money” bank, Carteira Movel,<sup>71</sup> branded as MKesh, with Mozambican capital from Mcel and the State Shares Management Institute (Instituto de Gestão das Participações do Estado, IGEPE).

An investment company (also providing short- and medium-term loans) is the Small Industry Support Agency (Gabinete de Apoio à Pequena Industria, GAPI SA ). Originally set up as a government financial tool to promote small-scale industry, GAPI evolved into a private company, although government retained a 30% share. GAPI is providing financial services (investment and loans) and business support to rural enterprises and farmer-based organizations. It started recently to promote the development of financial services in rural areas through the establishment of Micro-banks and Savings and Credit Associations.

Over 30 MFIs, mostly NGOs, operate in the financial sector as well. Some specialize in micro-lending, while others are development NGOs with some micro-lending activities. None collect deposits, as those MFIs are not allowed to collect voluntary savings, but some of them introduced compulsory savings as a component of their loans. Compulsory saving is allowed as a form of guarantee.

Added to this list are over 20 ASCA promoters, mainly NGOs (the number has varied as new operators appear while others stop this activity at the end of project funding), and over 5,000 ASCA groups. There are also five Credit and Savings Cooperatives (three of which are in Maputo City), as well as three registered Micro-banks. These are local, profit-oriented, and privately owned banks. Other private initiatives are still registered as “Micro-finance Operators” and are not allowed to collect savings. GAPI is currently promoting the creation of a Rural Micro-bank network and reports it already has three micro-banks legalized. Last, there is one leasing company (African Leasing Company Mozambique, SA).

**Micro-Finance Institutions.** MFIs still have limited experience in agricultural lending: Procredit started in 2007, Banco Oportunidade de Moçambique in 2009, and the Women’s Development Fund (FDM) in 2010. Only Hluvuko initiated agricultural lending earlier, with its foundation in 1995 in Maputo Province; it subsequently worked with IRAM (Institut de recherches et d'application des méthodes de développement) in 1999 in the Chókwè area, under the Caixa Comunitaria de Microfinancas (CCOM) Project in the Cabo Delgado cotton area, as well as under the RCRN (Rede das Caixas Rurais de Nampula) Project in 2006 in Nampula Province. On the whole, agricultural lending still is only a very small share of MFIs’ portfolio, although they all claim they will expand not only the volume of loans but the proportion of agricultural lending in total lending during the next several years. ProCredit hopes to devote 30% of its portfolio to agricultural lending, as it considers agriculture a promising market.

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<sup>65</sup> Carteira Movel, an electronic banking service accessed through mobile phones, started public operations in September 2011 and appears to belong among the micro-finance-oriented banks, as the maximum amount per account is limited to MZN 25,000 (USD 800) per client. Although it does not provide loans, it offers deposit and savings services as well as payment and money transfer facilities. In its first two weeks of operation, it opened 20,000 accounts through mobile phones.

**Table A1-1: Agriculture Lending Trends in Some MFIs (loan volume in '000 MZN)**

Institution	2008		2009		2010		2011	
	No. Loans	Volume	No. Loans	Volume	No. Loans	Volume	No. Loans	Volume
Procredit	n/a	n/a	2,767		887			
CCOM	1,733	11,632	804	8,317	900	10,735	331	3,582
FDM	n/a	n/a	19	49	143	1,134	310	4,839

While the number of loans provided by Procredit decreased, the value of each loan actually increased after Procredit set up a minimum of MZN 100,000 for agricultural loans (against MZN 40,000 for other loans). CCOM agricultural lending, mainly in Cabo Delgado Province, also decreased in recent years, after an uncontrolled increase in 2007 led to massive default. In contrast, FDM is progressively increasing its agricultural lending in Gaza Province, and it has hired specialized staff to follow those loans with external support. Hluvuko, another MFI in Maputo Province, is following FDM's lead (but no data are available).

The MFIs' practices for agricultural lending are quite different from those of commercial banks (although Banco Oportunidade de Moçambique and ProCredit are registered as commercial banks). Except for ProCredit, the value of the loans is much lower than the commercial banks' minimum, and required collateral is the "classical" micro-finance guarantees: domestic goods, productive equipment if it exists, savings, third-party guarantors or solidarity groups, and sometimes animals. In all cases, the interest rate on agriculture production is lower than the "normal" one, from 3% to 3.5% per month—very expensive credit, but cheaper than the normal 4.5–6% per month<sup>72</sup> that characterizes most other loans by MFIs.

Some MFIs have an extra life insurance cost, up to 1% of the loan value. Preparation fees vary from a fixed fee of MZN 25 (less than US\$ 1) to 3% of the loan value. Compulsory savings is another added cost, and can be up to 25% of the loan value. A compulsory savings deposit is sometime requested before issuing the loan, or it can be paid together with the loan installments. In any case, it can be used as collateral in case of default.

All MFIs rely on close follow-up of their clients, a key factor for good repayment, but their agricultural lending seems to follow two approaches:

- 1) Agricultural loans to produce specific cash crops or poultry, tied to technical assistance—the major trend in micro-finance. Technical assistance is provided not only for the production process but for marketing the produce, and it is generally financed by external funding, as are most of the credit funds (FDM, Banco Oportunidade de Moçambique). Like commercial bank loans, these loans are often limited to favorable production zones like irrigation schemes. To ensure that the resulting produce is marketed, some MFIs even plan to finance more of the value chains in which they are involved, such as vegetable packing facilities or poultry slaughterhouses (e.g., FDM in Gaza Province).
- 2) Loans to rural people with modalities adapted to agricultural production cycles but without a specific crop focus (IRAM, Hluvuko). This approach is based on the premise that small-scale farmers have diversified production systems and will use the loans more to offset the peak

<sup>72</sup> Note that preparation fees, compulsory savings (as collateral), and other fees are typically added to this already high rate.

constraints than to invest in a specific crop. For example, in Mozambique, the greatest overall constraint is a shortage of farm labor, and loans are used to pay for additional, temporary labor. The idea is also to prevent borrowers from claiming that a production failure with one crop (allegedly owing to poor technical advice or ill-considered lending) prevents them from repaying the loans. Even under this approach, however, there should be a “leading” commercial crop within the cropping system, preferably with technical support of some kind and an established market.

**Bank Coverage of the Rural Population.** This section presents an alternative way to calculate bank coverage of Mozambique’s rural areas and population. In Table A1-2, we consider the adult population as all people  $\geq 20$  years, as persons under 21 years cannot open a bank account.

As with the 15–59 classification of the adult rural population, this table shows the extremely low level of banking services in the country, with only 4.2 bank branches per 100,000 adults. In other words, taking the total population into consideration, one branch actually serves an average of 24,000 adults or around 10,000 households. In rural areas, the situation is obviously worse, with an average of 1.6 branches per 100,000 adults, or 61,200 adults per branch (28,700 households). Nampula Province, a strong agricultural producer and one of the most populated provinces, is among the least served, with 0.6 branches per 100,000 adults in the rural districts. The closer a province and its rural areas are to Maputo, the better they are served. Maputo City and Province have 194 branches, 46.6% of the total.

**Table A1-2: Adult Population Served per Bank Branch, 2010**

Province	Active Branches	Total Population (Projected 2010)	Population /Branch	Branches/ 100,000	Branches in Rural Districts	Rural Population (Projected 2010)	Population /Branch	Branches/ 100,000
Maputo City	153	617,693	4,037	24.8				
Maputo Province	41	677,890	16,534	6.0	17	202,367	11,904	8.4
Gaza	29	568,122	19,590	5.1	18	415,444	23,080	4.3
Inhambane	28	607,547	21,698	4.6	14	457,825	32,702	3.1
Sofala	39	766,108	19,644	5.1	11	448,347	40,759	2.5
Manica	22	647,064	29,412	3.4	7	479,660	68,523	1.5
Tete	25	836,951	33,478	3.0	11	714,718	64,974	1.5
Zambézia	21	1,778,561	84,693	1.2	12	1,434,785	119,565	0.8
Nampula	38	1,983,786	52,205	1.9	8	1,389,002	173,625	0.6
Cabo Delgado	10	805,566	80,557	1.2	5	626,125	125,225	0.8
Niassa	10	579,138	57,914	1.7	5	444,641	88,928	1.1
Total	416	9,868,426	23,722	4.2	108	6,612,914	61,231	1.6

Source: BoM (branches) and INE (population), where adults are defined as  $\geq 20$  years old.

## 2. Major Development Programs with Financial Components

This section begins with a summary table on special government credit lines. It then provides further details on development programs that have financial components to promote agriculture or agribusiness.

## 2.1 Government Credit Lines

**Table A1-3: MINAGRI/CEPAGRI Special Credit Lines (in million MZN, unless other currency is specified)**

Program	Starting Date	Regional Focus	Objective/Product	Available Value (MZN millions)	Implementing Partner	No. of beneficiaries
<b>Completed programs</b>						
Private Sector Restart Program I (Italy)	2006	South	Production	137	BCI and BIM	118
USAID Credit Line (Originally Managed by MIC)	2005/06	National	Leasing (5 yr)	119	BCI	36
			Production (rice in flood-affected areas)	315	BCI and BIM (96); MBM (63)	258
<b>Ongoing programs</b>						
Revolving Fund (from the Previous USAID Credit Line)	2008	South	Rice, vegetables, and equipment	65	BCI, BIM, and CLP	153 (2009) 195 (2010)
			Rice	32	BIM and BCI	70
Poultry (GoM)	2010	Maputo Province and City	Poultry	30	BCI in partnership with integrators	37
Mechanization (GPZ)	2010	Zambezi Valley and South	220 tractors from GPZ—leasing (farmers pay 15% up front)	20	SOVAL (service provider)	40 (?)
Vegetable Growers (GoM)	2011	Maputo and Gaza	Vegetables	512 30 as loans 21.2 in greenhouses	BIM	16 farmers
<b>New programs to start operations</b>						
PRSP II (Italy)	2011	Manica, Sofala, Zambézia		120 (from PRSP I)	Not chosen	
Mechanization (Italy)	2011	South		€ 72 million	Not chosen	

Source: CEPAGRI

## 2.2 Development Programs

**IFAD** funds two major projects. The Rural Finance Support Project (RFSP) provides matching grants and subsidized credit lines (through FARE, the economic rehabilitation fund) to institutions to expand in rural areas. Credit lines are charged 10–14% per year for a duration of two years. The total amount available for credit line was US\$ 12.5 million, while matching grants accounted for \$4.8 million. The second major IFAD project is the Small-scale Fishery in Sofala Coast Program, which provides loans for fishery activities in South Nampula, Zambézia, and Sofala through the Small Industry Promotion Fund (FFPI). The original credit fund was US\$ 1.2 million (MZN 18 million), which has been reduced to half of this amount in United States dollars but remains stable in meticaís. The project is finished and the funds should progressively return to the Treasury. A new program will cover all of Mozambique’s coastal areas; it will

have funds for financial services development, up to US\$ 8 million, including a Guarantee Fund (US\$ 1 million), business development services, and Savings and Credit Group promotion. The credit line will be the RFSP line that already exists in FARE.

**UNCDF Building Inclusive Financial Sector in Mozambique Program (BIFSMO)** provided institutional development, technical assistance, and credit lines to MFIs. The credit lines were directed to agriculture or youth financial services. Already financed MFIs are paying back their loans to UNCDF, which is redirecting the funds to the BIFSMO project. The program was ending in 2011, but a new program was already approved, focusing exclusively on rural finance. In this new phase, UNCDF is planning to create an apex structure to manage the funds for institutional support, technical assistance, and a credit line. The credit line will be “non-reimbursable” unless the receiving institution is not performing according to the agreed plan, as the mechanisms proved to be complex, time-consuming, and disruptive for the supported MFIs.

**KfW** invested € 6.4 million as credit line in Banco Terra (to be reimbursed in seven years) to finance agricultural value chains and is prepared to launch another € 169 million to support SMEs (to be managed by two or three financial institutions). KfW previously invested in GAPI, which was supposed to cease lending and pass all lending activities over to Banco Terra, of which GAPI is a shareholder.

**AGRA–Government of Mozambique CredAgro Guarantee Fund.** Standard Banks is mobilizing US\$ 25 million for agricultural loans directed to small-scale farmers, with a US\$ 25 million Guarantee Fund from the government and AGRA. AGRA already disbursed its US\$ 1 million contribution; the government/CEPAGRI has disbursed only US\$ 0.5 million of the 1.5 million it committed to contribute. The fund guarantees 20% of the loss in year 1, 15% in year 2, and 10% in year 3. Standard Bank is charging its normal interest rates of 23–25% per annum, plus other costs and weather Index insurance, adding an extra 4–6% of the value on production loans. Standard Bank’s policy for those funds is to channel the credit to smallholder through “aggregators,” either commercial companies or farmer associations. So far, four loans have been disbursed for a total of US\$ 2 million.

**USAID Loan Guarantee Fund for Cashew Industry.** The fund is intended to support marketing and purchases of raw material. The Guarantee Fund started in 2005 and ends in 2013, with BCI managing US\$ 5 million. The fund covered 50% of the loans (shared base), but we were unable to obtain information on its use (e.g., percentage of Guarantee Fund used, number and average size of loans, repayment rates).

**USAID/DCA Guarantee Fund** guarantees up to 50% of the loan (shared base). Other collateral/risks must be from bank/clients; no other guarantee fund is accepted. Interest rates are the same as commercial bank rates, and loans are available for all three regions (the North, Center, and South each receive one-third of the fund). The fund is available for seven years and can cover loans up to five years.

This DCA Guarantee Fund had reached agreements with BoM and Banco Terra as of September 2011. Banco Terra has a total loan portfolio guaranteed equivalent of US\$ 4,540,000 (which means that US\$ 2,280,000 of funds are guaranteed). The maximum guarantee that can be applied to an individual loan is US\$ 1 million, with no subsidized interest rates (23–25%). Banco Terra used US\$ 1 million of its Guarantee Fund portfolio for 105 rice farmers in Chókwè, where repayment has been very low due to excessive rain during planting and bad irrigation scheme management (drainage problems).

The Banco Oportunidade de Moçambique loan portfolio has a guaranteed equivalent of US\$ 2 million (meaning guarantee funds are US\$ 1 million), with a maximum loan amount of US\$ 400,000 and no change in the interest rate. Banco Oportunidade de Moçambique has used US\$ 302,000 of the Guarantee Funds.

Under another DCA fund to be used by Banco Terra, loan portfolio guarantees will apply to US\$ 10 million—consisting of US\$ 5 million from USAID and US\$ 5 million from the-Swedish International Development Cooperation Agency (SIDA)—of loans for agribusiness and tourism, with a maximum loan size of US\$ 1.5 million.

**ARIZ–AFD Guarantee Fund** offers a 50% guarantee for investment loans of one to five years to SMEs under two modalities

- Portfolio guarantee for loans from € 10,000 to a maximum € 300,000 ( $\geq$  US\$ 400,000). The selection process is fully under the partnering bank's responsibility.
- Individual guarantee for loans between € 200,000 and € 4,000,000 (risk covered up to € 2,000,000). The final decision on the loan is taken by AFD.
- MFI Guarantee: Banks can also lend to MFIs and get 75% risk coverage.
- Cost: 1.35% per semester on loan balance.

All risks are covered and no specific sectors are targeted, although 14 activities are forbidden because they are environmentally or morally adverse. The interest rates on loans are the normal bank rates.

Two agreements have been signed, one with BCI for a loan portfolio guarantee (only one loan approved after one year) and another with BIM for an individual guarantee (no loan approved). AFD noticed that lower-level staff were not even aware of the guarantee funds and promoted training of BCI credit officers to increase their use. One result of the training was the BCI loan; another 10 are undergoing screening. Training will also take place in BIM, which has yet to use the guarantee fund. Negotiations continue with Standard Bank, Barclays, and ProCredit.

**Institutionalized ADIPSA III Guarantee Fund.** ADIPSA, the Danish Agricultural Private Sector Development Phase II Project, just ended. It provided matching grants of up to US\$ 40,000 for individuals and US\$ 50,000 for farmer associations for investments (tractors, irrigation systems, new production techniques, warehouses). It also provided a credit line (US\$ 1 million) and guarantee fund (US\$ 1 million) to Banco Terra to facilitate small-scale farmers' access to finance. Phase III of the project will start soon with the creation of a foundation to provide technical assistance and a financial institution that will manage a guarantee fund for agribusiness. The project will have a total budget of US\$ 38 million for five years, of which 10 million will be put in the guarantee fund.

**UNAC (União Nacional de Camponeses) guarantee fund initiative.** This national union of small-scale farmers also plans to create a guarantee fund to facilitate access to formal finance for its members (farmer organizations) and smallholders in general. The guarantee fund is under discussion with UNAC partners but nothing concrete has been set up to date.

**USAID's AgriFuturo project** provides matching grants to facilitate access to commercial loans for agribusiness investors. Grants can be up to US\$ 75,000 and should enhance the capacity of the beneficiary to get a commercial bank loan.

**The Beira Agricultural Growth Corridor**, funded by the government (via CEPAGRI, CPI, and the Ministry of Transport and Communication), international donors (AfDB, World Bank, IFC, AGRA, UK, Norway, USAID-AgriFuturo, Japan, Denmark, and the Netherlands), and private companies, also provides catalytic investments in the agricultural sector. The Catalytic Fund has already financed 8–10 projects for a portfolio of US\$ 12 million. The Beira Agricultural Growth Corridor Initiative is setting up a financial investment company to manage those funds.

**Leasing: An AgriFuturo/USAID/John Deere and Standard Bank Mechanization** program, to start soon, will facilitate access to tractors. John Deere will provide the technical training; AgriFuturo will provide training in business management to clients and assume 2 percentage points of the interest rate costs (thus Standard Bank will provide loans at 21% instead of 23%).

**Warehouse receipt** schemes are still very rare in Mozambique. Banco Terra said it experimented once with IKURU, a highly subsidized and technically supported farmers' marketing enterprise, providing a loan of MZN 2 million to IKURU against stocks in a warehouse. Banco Terra's request for weekly reports on the status of the warehouse stock was not fulfilled, but the money was not used.

**Table A1-4: Main Development Programs with Financial Components**

Program and Donor/Funds	Mechanism*	Date	Area	Objective/Product	Available (in million US dollars unless specified)	Implementing Partner for Finance Component
PAMA: IFAD	CL, TA	2001–08	Maputo, Cabo D., Niassa	Support to market small scale traders	Total: 27.6 CL: not known	GAPI AMODER
Small-scale fisheries: IFAD, Belgium, Norway, Germany	CL	2002–11	Coast of Central Moz.	Support small scale fisher value chain	Total:33 CL: 1.2	FFPI
RFSP: IFAD and AfDB	CL, MG, TA to FI	2005–13	Entire country	Rural finance expansion	Total:34.3 CL: 12.5 MG: 4.8	FARE
Small-scale fisheries: IFAD	CL, MG, GF	2011–18	Coast, entire country		Total: 43.5 CL: 8 GF: 1	FARE
BISFMO 1: UNCDF	CL, IS to MFIs	2006–11	Entire country	Financial inclusion and MFI support	Total: 4 CL+IS: 2	DNPDR UNCDF
BIFSMO 2: UNCDF	MG, IS to MFIs	2012–16	Entire country	Financial inclusion and MFI support	Total: 6 CL: 3 IS: 1	Apex institution to be created
KfW	CL		Entire country	Rural enterprise	CL: 9 (6.4 mill. €)	Banco Terra
KfW	CL	2011	Entire country	SME promotion	CL: 23 (€16.7 mill)	To be selected
KfW	CL, MG, TA		Entire country	Financial inclusion, creation of 36 micro-banks		GAPI

<b>Program and Donor/Funds</b>	<b>Mechanism*</b>	<b>Date</b>	<b>Area</b>	<b>Objective/Product</b>	<b>Available (in million US dollars unless specified)</b>	<b>Implementing Partner for Finance Component</b>
ADIPSA 2: DANIDA	CL, GF, MG, TA			SSF	Total: 15 CL: 1 GF: 1	Banco Terra
ADIPSA 3: DANIDA	GF, MG, TA	2011 –16		Rural SSFs and SMEs	Total: 38 GF: 10	New fin. Inst. To be created
AGRA-GoM Standard Bank	GF CL	2010 –13	Entire country	SSF through “aggregators”	GF: 2,5 CL: 25	Standard Bank
Cashew support: USAID	GF, CL, TA	2005 –13	Entire country	Cashew industry	GF: 5	BCI
AgriFuturo: USAID	MG, TA	2009 –14	Nacala and Beira Corridors	5 value chains: cashews, bananas, mangos, soybeans, groundnuts	Total: 20 MG: 2	
Beira Agricultural Growth Corridor (various donors, NGOs)	Catalytic Fund		Beira Corridor		Total: Cat. F: 12	Beira Agricultural Growth Corridor to create a financial institution.
DCA Guarantee Fund: USAID	GF	2010 –17	Entire country	SSF / emerging farmers	So far GF: 3,3 In process + 5	Banco Terra Banco Oportunidade de Moçambique
SME support: AfD	GF		Entire country	SME (large) – investment only		BCI, BIM
SME Support IPADE/MIC	CL, GF		Entire country	SME		BCI, BIM

\* CL = credit line; MG = matching grant; GF = guarantee fund; TA = technical assistance; IS = institutional support; SSF = Small-scale farmer; SME = Small and medium enterprise



### 3. Selected Macroeconomic and Financial Sector Statistics

**Table A1-5: Inflation Rates, 2006–10**

2006	2007	2008	2009	2010
8.13%	12.10%	11.82%	2.25%	17.44%

**Table A1-6: Credit to the Economy (in current MZN)**

Sector	2005	2006	2007	2008	2009	2010	var 05/10	Factor 05-10
Agriculture, forest, and fisheries	22,815	30,901	36,579	38,800	46,471	60,345	149%	2.5
Industry	22,842	38,571	42,287	56,194	81,348	91,444	270%	3.7
Construction	7,503	18,744	26,285	30,188	46,277	84,427	921%	10.2
Tourism	7,408	11,001	12,081	15,632	20,967	24,398	229%	3.3
Trade	44,018	79,400	84,140	105,597	135,078	198,141	350%	4.5
Transportation and communications	10,758	16,513	24,186	35,319	79,810	119,110	1007%	11.1
Partic. housing and other	65,409	74,875	97,710	129,470	216,668	351,239	389%	4.9
TOTAL	180,754	270,005	323,267	411,201	626,619	929,104	384%	4.8

**Table A1-7: Credit to the Economy (in constant 2005 MZN)**

Sector	2005	2006	2007	2008	2009	2010	var 05/10	Factor 05-10
Agriculture, forest, and fisheries	22,815	28,578	30,177	28,626	33,531	37,076	63%	1.6
Industry	22,842	35,671	34,886	41,459	58,697	56,183	146%	2.5
Construction	7,503	17,335	21,685	22,272	33,391	51,871	591%	6.9
Tourism	7,408	10,174	9,967	11,533	15,129	14,990	102%	2.0
Trade	44,018	73,430	69,415	77,907	97,465	121,738	177%	2.8
Transportation and communications	10,758	15,271	19,953	26,058	57,587	73,181	580%	6.8
Partic. housing and other	65,409	69,246	80,610	95,521	156,337	215,800	230%	3.3
TOTAL	180,754	249,704	266,692	303,377	452,136	570,839		

One indicator of how the public sector might absorb capital and reduce liquidity for bank loans is through Treasury bill or note rates. The Treasury bill interest rate was very close to the FPC—that is, 16.4 % in June and 16% in August 2011.

## Annex 2: Additional Transport Related Statistics

**Table A2-1: Container Traffic through Beira Port, 2010 and First Half of 2011**

Origin/Destination and Type of Traffic	2010			2011 (January-June)		
	TEUs	t	% total	TEUs	t	% total
<b>Total traffic</b>	<b>105,707</b>	<b>1,440,349</b>	<b>100.0%</b>	<b>67,592</b>	<b>937,269</b>	<b>100.0%</b>
Cabotage	126	290				
Moz. International	51,169	585,994	40.7%	37,277	436,616	46.6%
Export	26,655	266,608	18.5%	9,268	168,883	18.0%
Import	24,514	319,386	22.2%	12,719	212,835	22.7%
Empty				15,290	54,898	5.9%
<b>Total transit</b>	<b>54,412</b>	<b>854,065</b>	<b>59.3%</b>	<b>30,315</b>	<b>500,653</b>	<b>53.4%</b>
Zimbabwe	18,936	340,672	23.7%	12,751	234,990	25.1%
Export	8,361	175,979	12.2%	5,898	122,923	13.1%
Import	10,575	164,693	11.4%	6,853	112,067	12.0%
Malawi	26,863	370,664	25.7%	12,815	186,825	19.9%
Export	13,294	171,861	11.9%	4,793	66,124	7.1%
Import	13,569	198,803	13.8%	8,022	120,701	12.9%
Zambia	8,523	140,953	9.8%	4,747	78,789	8.4%
Export	2,410	47,068	3.3%	1,116	23,606	2.5%
Import	6,113	93,885	6.5%	3,631	55,183	5.9%
Other	65	1,311	0.1%	2	49	0.0%
Transit empty				82	725	0.1%
<b>Total export</b>	<b>50,747</b>	<b>662,015</b>	<b>46.0%</b>	<b>21,077</b>	<b>381,585</b>	<b>40.7%</b>
<b>Total import</b>	<b>54,834</b>	<b>778,044</b>	<b>54.0%</b>	<b>31,225</b>	<b>500,786</b>	<b>53.4%</b>
Total empty	na	na		15,372	55,623	5.9%

Source: Cornelder, port concessionaire at Beira

Notes: Empty containers were not reported for 2010. Not all goods arrive at the port in containers. For the first six months of 2011, 718,561 t came in as "general cargo," typically in bulk or bagged.

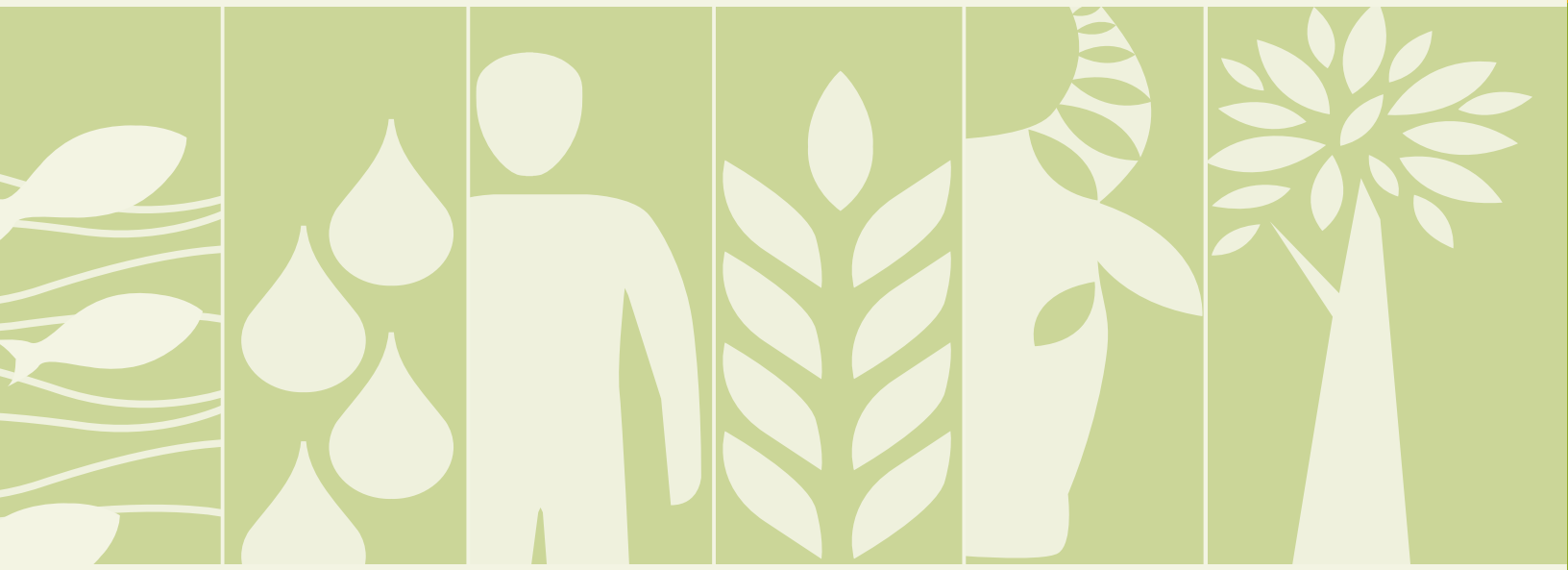
**Table A2-2: Trading across Borders Indicators, 2010**

Indicator	Mozambique	SSA	Organisation for Economic Co- operation and Development
Documents to export (number)	7	7.7	4.4
Time to export (days)	23	32.3	10.9
Cost to export (US\$ per container)	1,100	1,961.50	1,058.70
Documents to import (number)	10	8.7	4.9
Time to import (days)	30	38.2	11.4
Cost to import (US\$ per container)	1,475	2,491.80	1,106.30

Source: *Doing Business* 2010 (World Bank)

**Table A2-3: Transport Costs in Shipping Agricultural Products in Mozambique**

Year	Ag. Product	Origin	Destination	Distance (km)	Cost (MZN/bag)	Size Bag (kg)	Cost (MZN/t)	Cost (US\$/t)	US\$/tkm	Exch. Rate	Mean (US\$/km)
2011	Maize	Morrumbala	Beira	353	50	50	1,000	37	\$0.11	26.73	0.23
		Lugela	Mocuba	58	35	70	500	19	\$0.32		
		Balama	Pemba	300	80	70	1,143	43	\$0.14		
		Mocuba	Nampula	396	35	50	700	26	\$0.07		
		Namuno	Montepuez	62	50	50	1,000	37	\$0.60		
		Alto Ligonha	Nampula	136	70	70	1,000	37	\$0.28		
		Nhamatanda	Maputo	1,116	100	70	1,429	53	\$0.05		
	Beans	Linchinga	Maputo	1,434	120	50	2,400	90	\$0.06		
		Gurue	Beira	762	100	50	2,000	75	\$0.10		
		Changar	Tete	90	90	50	1,800	67	\$0.75		
Gurue		Quelimane	350	50	50	1,000	37	\$0.11			
2010	Maize	Chiure	Nacala	310	50	80	625	17	\$0.05	36.88	0.12
		Alto Ligonha	Nampula	136	40	70	571	15	\$0.11		
		Mugulama	Nampula	270	50	70	714	19	\$0.07		
		Mecufi	Pemba	50	50	70	714	19	\$0.39		
	Beans	Gurue	Maputo	1,842	110	50	2,200	60	\$0.03		
		Chitungo	Manica	622	40	50	800	22	\$0.03		
		Tambara	Chimoio	366	50	50	1,000	27	\$0.07		
		Gurue	Tete	498	150	50	3,000	81	\$0.16		
2009	Maize	Changar	Tete	90	95	120	792	30	\$0.33	26.53	0.15
		Morrumbala	Mutarara	145	50	70	714	27	\$0.19		
		Ancuabe	Pemba	106	50	60	833	31	\$0.30		
		Ile	Nampula	293	30	70	429	16	\$0.06		
		Lalaua	Nampula	220	70	70	1,000	38	\$0.17		
		Chiure	Nacala	310	40	80	500	19	\$0.06		
		Nhamatanda	Maputo	1,116	80	70	1,143	43	\$0.04		
	Beans	Linchinga	Maputo	1,434	120	50	2,400	90	\$0.06		
		Domue	Tete	257	90	120	750	28	\$0.11		
2008	Maize	Guro	Chimoio	220	30	50	600	22	\$0.10	23.95	0.07
		Mecuburi	Nacala	245	35	80	438	16	\$0.07		
		Ile	Nampula	293	50	70	714	27	\$0.09		
		Muidumbe	Pemba	226	50	80	625	23	\$0.10		
		Ile Mulevala	Xai-Xai	1,530	120	100	1,200	45	\$0.03		
		Nhamatanda	Maputo	1,116	100	70	1,429	53	\$0.05		
	Beans	Linchinga	Maputo	1,434	120	50	2,400	90	\$0.06		
		Alto Molocue	Maxixe	1,361	90	50	1,800	67	\$0.05		
		Angonia	Chimoio	664	100	70	1,429	53	\$0.08		



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**THE WORLD BANK**

Agriculture and Rural Development (ARD)  
1818 H Street, NW  
Washington, D.C. 20433 USA  
Telephone: 202-477-1000  
Internet: [www.worldbank.org/ard](http://www.worldbank.org/ard)

