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Mali's Agricultural Sector: Trends and Performance by Duncan Boughton and Valerie Kelly¹

I. Introduction

This selective brief on Mali's agricultural sector trends and performance focuses on cereal, livestock and fisheries production. We also review recent developments in the fertilizer sector given the importance of sustainable intensification to reduce pressure on natural resources. We begin with a thumbnail sketch of Mali's agricultural sector.

Mali's land resource inventory includes 46 million hectares of land suitable for agricultural use (broadly defined), of which one quarter is suitable for crop production and two thirds as pasture, the remainder being forest and wildlife reserves. Mali's 2004 agricultural census identified 8.9 million people, or 78% of the estimated total population, with livelihoods based on agriculture. Amongst the 805,000 farm households 75% practice mixed farming, 10% cultivate only crops, 10% livestock only, with the remainder involved in fishing (PNIA, 2009). The average farm size for crop-based farming is 4.7 hectares, with one third of households farming less than one hectare. Fewer than 5% of households have landholdings more than 20 hectares. Land preparation is carried out using animal traction for more than 70% of cropped area compared to just 1% using mechanized power. Around 40% of households had access to agricultural extension, but the information was provided by women extension workers in only 2% of cases.

2. Trends in cereal production

Over a 15-year period cereal production grew from 1.9 million tons (three-year average 1990/1 to 1992/3) to 3.3 million tons (three-year average 2004/5 to 2006/7), an average annual growth rate of 3.9%. Table 1 presents information on changes in area, yield and production for each of the main cereals over time, as well as groundnuts (the major oilseed).

Growth in cereal production has been driven primarily by increases in the production of rice, maize and millet. Rice and maize production have grown rapidly (6.4% and 7.6% annual growth respectively). In the case of maize, productivity levels have been dependent in part on the rise and fall of cotton production since the devaluation of the CFA franc in 1994, as maize benefits from residual fertilizer nutrients applied to cotton, as well as direct applications of fertilizer obtained on credit. Growth in millet production has come primarily from increases in area cultivated, while the area planted to sorghum has declined. The yield growth for both cereals has averaged 1.2% per annum.

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Table 1: Trends in area, production and yield of major food crops 1990/1 to 2005/6

Table 1a Area Trends

Crop	Mean Area (ha) 1990/1 – 92/3	Mean Area (ha) 2004/5 - 06/7	% change 1990/1 - 2006/7	% annual Growth
Millet	1,116,202	1,388,220	24.4%	1.6%
Sorghum	816,379	746,082	-8.6%	-0.6%
Maize	182,423	363,219	99.1%	5.0%
Rice	230,948	379,144	64.2%	3.6%
Fonio	44,950	40,260	-10.4%	-0.8%
Total cereals	2,392,134	2,920,019	22.1%	1.4%
Groundnuts	195,422	264,063	35.1%	2.2%

Table 1b Yield Trends

	Mean Yield (kg/ha) 1990/1 - 92/3	Mean Yield (kg/ha) 2004/5 - 06/7	% change 1990/1 - 2006/7	% annual Growth
Millet	661	786	18.8%	1.2%
Sorghum	797	945	18.6%	1.2%
Maize	1,181	1,676	41.9%	2.5%
Rice	1,641	2,381	45.1%	2.7%
Fonio	617	628	1.9%	0.1%
Total cereals	816	1,140	39.8%	2.4%
Groundnuts	856	909	6.2%	0.4%

Table 1c Production Trends

	Mean Prod (tons) 1990/1 - 92/3	Mean Prod (tons) 2004/5 - 06/7	% change 1990/1 - 2006/7	% annual Growth
Millet	736,400	1,087,085	47.6%	2.8%
Sorghum	634,577	687,630	8.4%	0.6%
Maize	215,295	600,221	178.8%	7.6%
Rice	382,244	905,715	137.0%	6.4%
Fonio	27,724	24,167	-12.9%	-1.0%
Total cereals	1,945,811	3,312,257	70.2%	3.9%
Groundnuts	163,796	238,142	45.4%	2.7%

Source: CPS Database

Approximately 325,000 hectares, just over 7% of the total cultivated area, has irrigation infrastructure in place. Only one third of the country's irrigated area has full water control, however, and only approximately half the area with irrigation infrastructure is utilised. Almost half the total irrigated area, 46%, is located in the region of Segou. With the majority of the country's cereal supply coming from rainfed agriculture, variability in production due to rainfall patterns is to be expected given the high inter-annual and spatial variability in rainfall.

In addition to human consumption maize is very important for the poultry subsector and, to a lesser extent, the emerging dairy subsector. These livestock subsectors are important potential sources of growth for agribusiness as well as child nutrition over the medium and long term. In the CMDT zone, where 60% of Mali's maize is produced, the full impacts of the collapse of the cotton sector have yet to be felt because of the extension of the fertilizer subsidy program to include maize as well as rice. For farmers to be able to produce intensive maize for the market on a sustainable basis they need a source of credit for fertilizer purchases as well as the means to manage yield and price risk. Careful attention also needs to be given to underpinning the growth of the maize subsector through soil fertility management practices and water conservation techniques adapted to different soil types that will improve productivity (and hence reduce the unit cost of purchased inputs) and reduce drought risk.

3. Trends in livestock production

The national cattle herd increased from 5.1 million head in 1990 to 7.8 million in 2006, while the sheep and goat population doubled over the same period from 11 million to 21.5 million. Non-poultry meat production was estimated at 109,000 tons in 2006, of which 52% came from beef, 36% from sheep and goats, and 10% from camels. Hides and skins are an important byproduct, with 195,000 cattle and 310,000 sheep and goat hides marketed annually.

Milk is a very important product with an estimated 1.4 billion liters produced annually. Less than 2% of this production passes through formal markets and processing capacity, notably the large-scale processing plants in Bamako, is under-utilized. Changes in the European Union's Common Agricultural Policy that resulted in much lower export subsidies for dried milk, combined with increased demand for fresh milk with rising incomes, has encouraged the rapid growth of small peri-urban dairies in recent years in Segou, Sikasso, Mopti and other towns.

Reliable estimates of egg production are difficult to come by, but the DNSI estimates annual growth in production by intensive and semi-intensive units to be 6%, amounting to approximately 200 million eggs in 2006. Both demand and supply are likely to be relatively elastic. The main drivers of the egg subsector will be the rate of growth of the urban population and median urban income levels on the demand side, and the price of maize feed and effective disease control on the supply side. Reliable estimates of poultry production are unavailable, although local chicken production is presently the major source, even for meeting demand in urban areas.

4. Fisheries and fish farming

Accurate series on the evolution of inland fishery production, estimated at about 3.5% of GDP, are hard to come by. In the short run production is pro-cyclical with rainfall and flood levels, but more importantly there has been a steadily growing gap between demand and supply of fish protein over time due to over-exploitation and environmental degradation. Given the level of poverty in urban areas, where daily family expenditures on the non-cereal component of meals may be little more than a dollar a day, few households can afford to eat meat or poultry except on rare occasions. Consequently dried fish, often in the form of ground fish heads, is a major source of protein included in the sauce that accompanies the daily cereal ration.

The high demand for fish protein in turn provides a large potential market for fish farming, which is considered to be an under-exploited resource for income generation and food security. Fish farming has the advantage of being able to use existing by-products from cereal processing and livestock production for fish feed. Infrastructure costs are significant, similar to irrigation on a per hectare basis, but potentially more scalable. An increase in the availability of fish protein could be a significant lever on nutrition indices for both the urban and rural populations, as well

as a significant source of income for women who dominate the marketing and processing stages of the value chain.

5. Development of Mali’s fertilizer sector

Fertilizer is a key input subsector because it allows for increases in food production through intensification rather than just area expansion. Increases in land and labor productivity achievable through the use of fertilizer provide opportunities for diversification of crop activities as well as diversification into non-farm activities. Fertilizer supply in Mali has been liberalized and privatized since the early 1990s. The Malian market for inorganic fertilizers has an estimated value of US\$ 85 million per year at present with a volume of approximately 200,000 metric tons—all types of fertilizer combined

(http://www.maliagriculture.org/camp_agr/intrants/index.htm).

Although the sector has been liberalized and privatized for many years, it remains highly influenced by the not-yet-liberalized cotton sector, which has accounted for as much as 70% of national fertilizer use in some years. The next largest share of the market consists of demand by irrigated rice producers in the Office du Niger and Office Riz Ségou. The remaining share of the market (roughly 10-15%) serves the growing demands of fruit and vegetable producers and sugar cane growers.

FAO statistics on values of imports suggest that total demand grew slowly over time to 2004; increased significantly from 2004 to 2005, and then declined but remained well above 2004 levels (Figure 1).

Figure 1. Evolution of the import value of fertilizer (‘000 US\$)

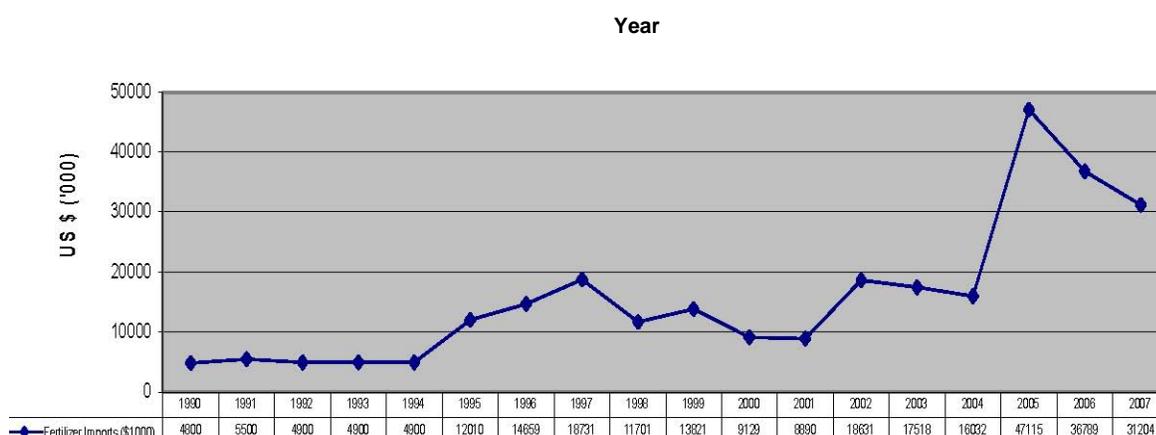


Table 2 presents the geographic distribution of fertilizer use by region for 2006/07, showing that the preponderance of the demand (67%) is in the Sikasso cotton producing region. Despite declining farmer interest in cotton production in 2007/08, a still sizeable 51% of the estimated 187,229 tons demanded for the 2007/08 campaign was attributed to the cotton zone (CPS website: <http://www.maliagriculture.org>).

Table 2: Anticipated fertilizer use by region: 2006/07

	Metric Tons
Kayes	8 540
Koulikoro	7 086
Sikasso	89 016
Ségou	25 680
Mopti	150
Tombouctou	2 778
Gao	7
Total	133 256

Source : CPS, Ministry of Agriculture, Bilan de la campagne agro-pastorale 2005-2006 et perspective de la campagne agro-pastorale 2006/2007, Marche 2006

Growth in fertilizer demand has been accompanied by growth in the number and capacity of fertilizer suppliers and distributors, though it is fair to say that the sector is dominated by four principal actors: Yara Mali (an affiliate of Yara Norway), La Cigogne associated with SCPA IVEX International, Datong Enterprises with Chinese ties, and Toguna AgroIndustries—the only firm with a Malian origin and the only one with a bulk blending operation in Mali. In addition to these firms, which are well integrated into the international fertilizer markets, there are a number of other firms that tend to participate in tenders more because they have the financial and transport resources to order and deliver fertilizer in large lots than because they have any particular expertise in the fertilizer sector per se. These firms include transporters (Agri2000, SAD/SAT), cereal traders (Grand Distributeur Céréaliier du Mali, GDCM), or specialists in agricultural chemicals (Partenaire Agricole). These firms are all linked in some way to one or more of the four major importing firms. In addition, the sector includes several distribution firms located outside Bamako such as SOMADECO-Niono, Cnoumani-Niono, and Faso Jigi-Ségou.

Despite this fairly strong and consistent growth in fertilizer sector capacity and fertilizer use by farmers, the Government of Mali became concerned about the possible consequences of sharply rising commodity prices (rice and fertilizers in particular) experienced in 2007 and 2008. This resulted in a decision to subsidize rice production through a variety of means, including a very hefty subsidy on fertilizer which was sold to rice farmers in 2008 at 12,500 FCFA per 50 kg bag while government paid suppliers 16,000/sack for urea and 22,000/sack for DAP. The program was put into place rapidly and was strongly criticized by fertilizer suppliers in general because a

single firm, Toguna, was awarded the entire market for the subsidy. There were also complaints from producer organizations and NGOs that had already placed their fertilizer orders when the subsidy was announced as it was not clear that their farmers would be able to benefit.

The GOM decided to continue the subsidy in 2009, keeping the subsidized price at the 12,500 level again but expanding the crops covered to include maize, cotton, and wheat in addition to rice. Plans are currently underway for a third year of subsidy, with the eligible crops expanding (e.g., inclusion of cowpeas). Without getting into the details of the benefits and costs of the program (a topic the GOM has not yet tried to address in a rigorous manner), it is fair to say that there are a number of implementation problems that merit attention.

- The GOM opened up participation in the subsidy program to a broad range of fertilizer suppliers in 2009, yet there was still a lack of transparency in the way the markets were allocated
 - ○ no formal bidding process
 - ○ no public information on how the price that the government pays to suppliers is determined
- The system of allocating subsidy vouchers to farmers and monitoring where the fertilizer goes and who is submitting vouchers to the government for repayment is open to numerous opportunities for fraud (kickbacks to government officials as well as diversion of fertilizer from those for whom it was intended).
- Many of the suppliers have not yet been paid for the subsidy share of their 2008 deliveries.

Several suppliers have agreed to contribute 1% of their subsidy sales to a fund that would support the introduction of an improved voucher program proposed by Accor Services, specialists in prepaid vouchers. The program uses high quality vouchers that cannot be counterfeited, tracks all movements of vouchers and fertilizers electronically to reduce the incidence of false claims and diversions, and guarantees payment of the subsidy portion of the voucher to suppliers within 4-6 weeks of voucher submission. To date, the GOM has not taken Accor Services or the suppliers up on their offer.