

Introduction

Low fertilizer use is one factor that helps explain the lag in agricultural productivity growth in Africa.¹ Farmers in Sub-Saharan Africa (SSA) use less fertilizer per capita than farmers in any other region in the world.² Governments in SSA have often intervened in the fertilizer sector to promote more optimal levels of fertilizer use. Many West African nations, in particular, have inherited a legacy of government involvement, stemming from French colonial policies that encouraged state participation in the agricultural sector. Senegal, a former French colony located on the western coast of Africa, achieved independence from France in 1960. Its colonial past has influenced much of its present economy from its principal export crop (peanuts) to its major food import (rice).

The colonial legacy includes a relatively high degree of urbanization; limited domestic industrial capacity; institutions, policies, and agricultural networks focused on supporting a single export crop; and a history of state intervention into markets.³ After years of government intervention in the 1960s and 1970s, followed by a period of liberalization in the 1980s and 1990s, Senegal is again trying to determine what its agricultural policy will be.

In 2007, the FAO reported that food prices rose by nearly 40 percent in Africa.⁴ Senegal was hit hard by the food crisis in 2006 and 2007 and many consumers were unable to afford staple foods such as rice. To quell the civil unrest stemming from high food prices, the government of Senegal (GOS) embarked on several new government programs focused on increasing the domestic food supply. A major component of the new agricultural programs is increasing the domestic

Table 1. Senegal at a Glance

Total population (2003-2005)	11.4 million
Percentage of population in rural areas (2005)	58.6
Percentage of rural individuals below poverty line (2002)⁵	65.2
Hectares per capita (2005)	0.3
Important crops	Groundnuts (peanuts), cotton, millet, and rice
Kgs of nutrients used per ha of arable and permanent crop land (2000-2002)	22
Net cereal imports (2003-2005)	\$395 million USD
Percentage of arable land ⁶	12
Total area harvested in Senegal by crop (2007) (ha)⁷	Millet - 686,692 Groundnuts - 607,195 Paddy Rice - 80,312

Source: World Development Report, 2008

production of rice, Senegal's most important staple food.

Agriculture in Senegal

Climate, Crop Production, and Demographics

Senegalese agriculture is unusually specialized in just three products: groundnuts (peanuts), rice and millet.⁸ Groundnuts are Senegal's premier export, while rice is the most important staple food crop and biggest food import.⁹

These crops are grown in three distinct agro-ecological zones, each specializing in one of the three major products. The Northern Crop Zone supports millet, the swampy Southern Crop Zone supports rice, and in between, the Groundnut Basin (where the majority of rural farmers live) is devoted to peanuts. Rainfall in all three of these regions is highly variable, posing a significant constraint on agriculture.¹⁰

Millet

Until the 1970s, millet was the staple food crop for many Senegalese. While millet is still grown in Senegal it has fallen out of favor as urbanization and lifestyle changes have altered food preferences. Millet remains an important crop for many Senegalese. While its share of arable land has been declining over the past decade, in 2007 more cropland was devoted to millet than either peanuts or rice (see Table 1).¹¹

Groundnuts

From colonial times to the current day, groundnuts have been the dominant export crop in Senegal. While groundnuts are one of the largest export crops, they make up a very small percentage of the daily calories for most Senegalese. In 1961, groundnuts made up 3.4 percent of total calories; by 2003 this had declined to 2.1 percent.¹²

Rice

Rice is the staple food crop in Senegal. Senegalese consume 93 kg per capita per year.¹³ Rice makes up a large and increasing portion of daily calories. In 1961, rice provided 20.4 percent of total calories. By 2003 that figure had risen to 32 percent.¹⁴

Rice production in Senegal, as in most of SSA, is primarily limited to subsistence, smallholder farmers with limited access to inputs and mechanized labor.¹⁵ Senegal experiences the highest rice deficit in West Africa, with domestic production covering only 15 percent of domestic demand.¹⁶ Currently, Senegal is the world's eight-largest rice importer.¹⁷ Most of the rice consumed in Senegal is imported from Southeast Asia, continuing trade patterns originally established under colonial rule. After a century of rice importation from Asia, many Senegalese have developed a preference for Asian rice (which is typically broken rice), and prefer it to the whole rice that is grown domestically.

Scholars have also speculated that urbanization patterns have affected the demand for rice. In 1960, 32 percent of the population lived in urban areas, twice the average in SSA at the time. In 2005, roughly 42 percent of the population was living in urban areas, similar to the average in West Africa.¹⁸ The transformation of the Senegalese society into a more urban population has likely affected food consumption patterns. Preparation of

rice dishes takes far less time, fuel, and labor than Senegal's traditional millet dishes.¹⁹

This preference for rice has increased rice imports and led to renewed calls for Senegal to work toward greater food self-sufficiency. However, Senegal has had limited access to irrigation technology making expansion of rice production difficult. Most rice is grown in the Casamance region in southern Senegal. Historically, this region has relied upon rain-fed rice production.

History of Senegalese Agricultural Policy

The structure of Senegal's agricultural sector is part of its colonial legacy. During the colonial period, France required its colonies to be self-financing. In Senegal, this meant that the colonial government promoted the production and export of peanuts.

Colonial policies resulted in a mercantilist triangular trade in which Senegal shipped peanuts and peanut oil to France and then imported rice from France's colonies in Southeast Asia in order to cover the food deficit.²⁰ This triangular pattern of trade persists to the present day, with Senegal continuing to import the majority of its rice from Vietnam and Thailand and the majority of its groundnuts destined for Europe.

The colonial government maintained a monopoly on groundnut marketing, promoting exports by offering licenses to French trading firms and establishing state-run marketing boards and cooperatives to encourage greater peanut production. Although the colonial government did not explicitly prohibit the production of crops other than groundnuts, such production was discouraged by the importation of cheap rice from Southeast Asia and high taxes on rice exports. After independence, the new government of Senegal (GOS) retained most of these parastatal bodies.

Unique among African countries, Senegal has significant phosphorus deposits and began exporting phosphates in 1960 through the *Compagnie des Phosphates de Taïba* (CSPT), a parastatal mining company. Exports are primarily destined for other West African countries, and phosphoric acid is exported to India.²¹ A second company, the *Société des Industries Chimiques du Sénégal* (ICS), started operations in 1976.

Fertilizer subsidies were used in the 1960s and 1970s to encourage domestic consumption. The government also

sought to increase phosphate exports by nationalizing the country's phosphorus deposits. In 1975, fertilizer use reached an all-time high of 87,000 tons with 80 percent of all fertilizer going towards groundnut and millet production.²² In the 1970s, the groundnut sector was taxed to help pay for fertilizer subsidies and support the domestic rice sector, in an attempt to increase food security. As a result of these policies, rice production increased, but not enough to keep up with population growth. Government subsidies throughout the 1960s and 1970s helped ensure that Senegal had one of the highest fertilizer consumption rates in SSA, though this represented an average application of only 11 kgs per hectare.²³

Structural Adjustment 1980-1995

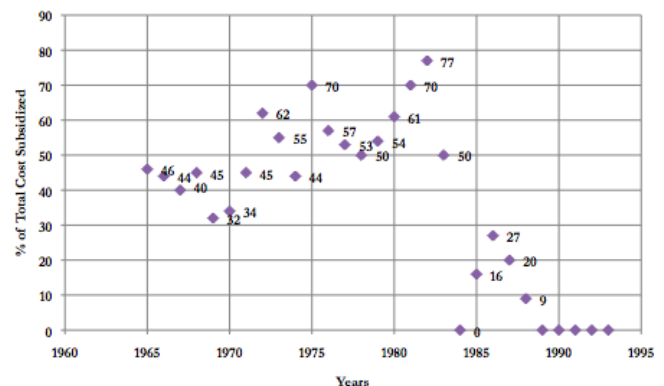
In the 1980s, Senegal faced mounting levels of debt due to a combination of rising oil prices, falling global groundnut prices, and two decades of government interventions. The *Commercialisation et d'Assistance pour le Développement* (ONCAD), a parastatal organization, had been formed to take over all groundnut marketing for the state in 1965. For two decades, ONCAD was the most powerful Senegalese parastatal institution. ONCAD dissolved in 1980, as Senegal became the first country in the world to undergo a World Bank sponsored structural adjustment.²⁴ The dissolution of ONCAD signaled the limited role the GOS would play in agricultural markets after decades of interventionist policies.

Studies of Senegal's rice markets in 1979, just before undergoing structural adjustment, revealed that across the 12 West African countries, Senegal had the highest levels of agricultural distortion from government interference, earning a 0.5 out of 9 with 9 representing a competitive marketplace.²⁵ In 1984, the Senegalese government began the *Nouvelle Politique Agricole* (NPA), a program designed to decrease direct government financing of agriculture and stimulate private sector agricultural initiatives as part of the structural adjustment process.

Prior to starting structural adjustment, the *Société Nationale d'Approvisionnement du Monde Rural* (SONAR) had been the parastatal responsible for input distribution through subsidized credit. Now SONAR and other parastatal institutions were to be eliminated. The structural adjustment process affected nearly every part of the Senegalese economy. Fertilizer subsidies were no

exception; subsidy rates declined rapidly starting in 1984, and were abandoned altogether in 1990 (see Figure 1). Input distribution and output marketing were privatized, and direct subsidies for fertilizer, credit, and seed eliminated.²⁶ This led to a dramatic increase in the price of fertilizer.²⁷ From 1981 to 1996, there was a corresponding 21 percent decline in overall fertilizer use in Senegal.²⁸

Figure 1. Fertilizer Subsidy Levels in Senegal 1974-1994



Source: Kelly et al. (1996)

With ONCAD gone and the GOS exiting from the fertilizer market, fertilizer became increasingly difficult to obtain. Many poor households and rural banks were reluctant to engage in lending activities for fear of defaults. Senegal became a cash economy. With their limited cash, smallholder farmers often chose to purchase seeds rather than fertilizer.²⁹

Currency devaluations during the 1990s continued to make imported fertilizer more expensive and fertilizer use continued to decline. Senegal uses the CFA Franc currency, which is pegged through a fixed exchange rate to the French Franc (now the Euro). In 1994, France devalued the CFA Franc, effectively doubling the price of fertilizer for many Senegalese while making export crops more profitable.³⁰

Smallholders needed to find alternative methods of marketing crops, obtaining inputs, and accessing credit.³¹ Previously, all of these activities had been done through government programs and state cooperatives. The formation of producer organizations (POs) was a common response. From 1982-2002, the percentage of villages with a PO grew from 8 percent to 65 percent.³² Currently, 69 percent of Senegal's rural households are members of a producer organization.³³

Current Conditions: 1995-Present

From the mid-1990s until 2005, Senegal had one of the best economic performances in Sub-Saharan Africa with real GDP growing at about 5 percent annually.³⁴ In the late 1990s, a combination of well-distributed rainfall and increased fertilizer use helped the agricultural sector to grow. In 2000, agriculture contributed 1.8 percent of the 5.5 GDP growth experienced that year.³⁵ In 1999, Senegal joined the West African Economic and Monetary Union (WAEMU), which helped Senegal control tariff levels and coordinate regional trade policy.

During the early 1990s, the government reformed the fertilizer industry as well. In 1996, ICS and CSPT were privatized and merged under ICS. ICS is now the only company producing fertilizer in Senegal.³⁶ *Sénégol Chimie* (SENCHIM) formed as the commercial branch of ICS, marketing phosphate fertilizer and pesticides.³⁷

The rice sector was liberalized as well. From 1960-1995, the GOS had controlled all rice importation, but the GOS loosened these restrictions in 1995.³⁸ By the late 1990s, rice had replaced millet as the staple food in Senegal.³⁹

Since 1995, domestic rice production has been stable, without significant gains or declines (see Figure 2) while imports of rice have continued to climb. The expansion of domestic production has been hampered by a number of factors including a low input adoption rate.

Figure 2. Total Rice Produced Domestically and Total Rice Imported in Senegal (tons)



Source: FAOSTAT, 2009.

Organizations like the Africa Rice Center (WARDA),

have been working to find new methods of raising rice productivity primarily through new irrigation technologies and improved variety rice seed. The USAID-funded *Emergency Initiative to Boost Rice Production in Ghana, Mali, Nigeria, and Senegal* is a 4-country pilot program designed to increase rice production through improved seed, fertilizer use, and technical assistance.⁴⁰

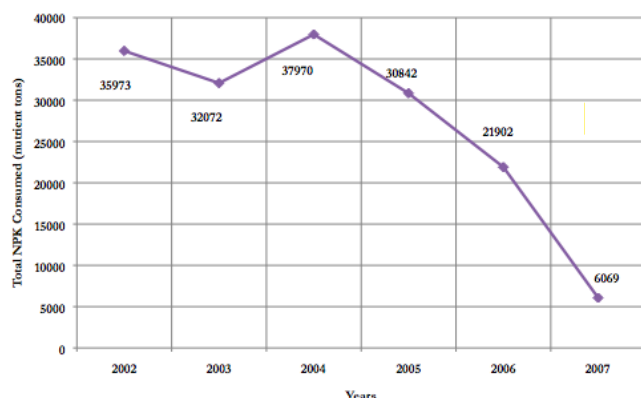
Over the past decade, Senegal's producer organizations have continued to grow in importance politically. In 1993, the POs in Senegal formed a national lobbying organization, the *Conseil National de Concertation et de Coopération des Ruraux* (CNCR). The CNCR is an umbrella organization coordinating the numerous producer organizations in negotiations with the state in order to serve the interests of smallholder rural farmers.

In March 2000, Senegal elected a new president, Abdoulaye Wade. Wade announced that Senegal needed a new vision for its agricultural future. Incorporating the concerns of CNCR, Senegal passed the *Loi d'Orientation Agro-Sylvo-Pastorale* (Agro-Silvo-Pastoral Law) (LOASP) in 2004, forming the foundation for modernizing Senegal's agricultural sector, improving food security, and achieving food sovereignty.⁴¹

The LOASP attempts to find a balance between free markets and the government's ability to maintain its food sovereignty. LOASP states in Article 5 that the main priority of the State will now be the alleviation of poverty.⁴² Through LOASP, the GOS also committed to alleviate environmental and economic risks by managing water systems, diversifying the economy, training rural populations to improve food security, and attaining food sovereignty. After years of liberalization efforts, the LOASP signaled GOS intent to become more involved in national food policy. Through the law, the GOS reserves the right to "take any protective measures or grant subsidies to reduce or eradicate distortions in external economic exchanges..."⁴³

The National Assembly unanimously approved LOASP in 2004.⁴⁴ According to Senegalese practice, however, the law could not be implemented until the President issued an executive order. Despite the Assembly's approval, President Wade did not sign LOASP until after his re-election in 2007-- three years after its passage, most likely to avoid offending constituents before an election.⁴⁵

Figure 3. Total NPK Consumption in Senegal (nutrient tons)



Source: FAOSTAT, 2009

Beginning in 2006, Senegal experienced a food crisis, stemming from the steep rise in world food prices. Senegal imports all of its oil and currently imports between 80-100 percent of its wheat and rice.⁴⁶ Domestic price increases during 2006-2007 led to significant civil unrest and food riots mainly in Dakar. Senegal also experienced a major drought in 2006-07 resulting in a 15 percent decline in domestic agricultural output each year. Total fertilizer consumption has also continued to decline (Figure 3).

Today, many scholars doubt the ability of the GOS to implement LOASP. Competing agricultural initiatives also hold the potential to undermine LOASP. For example, in response to the food riots in 2006-7 President Wade announced the *Grande Offensive Agricole pour la Nourriture et l'Abondance* (GOANA) in 2008. GOANA is another program designed to improve Senegal's food self-sufficiency, but with a more interventionist approach. In recent years, President Wade has been publicly critical of food aid and the FAO, which also happens to be lead by former political rival Jacques Diouf.⁴⁷

GOANA is designed to achieve self-sufficiency in food production by 2015. One of GOANA's objectives is to increase annual domestic rice production to 500,000 tons, a huge increase from the current production level of 200,000 tons. GOANA provides subsidies for the purchasing of seed and fertilizer inputs, agricultural loans for equipment, and other tax incentives to increase domestic production.⁴⁸ President Wade has also offered

foreign entrepreneurs tax breaks to grow food in Senegal and the ability to take profits slowly out of Senegal without being taxed.⁴⁹

As a part of GOANA, the government is looking to increase the productivity of existing lands by increasing fertilizer use and improved seed varieties. The plan also aims to expand the area under rice cultivation by increasing irrigation, which would allow two growing seasons compared to just a single season for rain-fed rice.⁵⁰ The government is also offering fertilizer subsidies as part of the new program. Subsidies during the dry season will be 70 percent of market price, while farmers can obtain subsidies of 50 percent during the rainy season.⁵¹

Conclusion

Senegal continues to experience a high level of food price fluctuations as it imports increasing amounts of rice to cover its food deficit. Increased use of fertilizer, along with irrigation technology may help improve rice production and increase food security. To achieve this goal, the GOS has embarked on several initiatives, notably LOASP and GOANA, employing subsidies to increase fertilizer demand and making food sovereignty a national priority. In the coming years, Senegal will need to determine what role the government should play in the agricultural sector, and what level of intervention ultimately can be sustained in the long-term.

Please direct comments or questions about this research to the Evans Policy Analysis & Research (EPAR) PI, Leigh Anderson, at eparx@u.washington.edu.

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