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ATTACHMENT V

TO THE

GLOBAL FOOD SECURITY RESPONSE WEST AFRICA RICE VALUE CHAIN ANALYSIS

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GLOBAL FOOD SECURITY RESPONSE: SENEGAL RICE STUDY

microREPORT #160

OCTOBER 2009

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ABBREVIATIONS

ANCAR	Agence Nationale de Conseil Agricole et Rurale *National Agency for Agricultural and Rural Extension*
BAMTAARE	Base d'Appui aux Méthodes et Techniques pour l'Agriculture, Les Autres Activités et l'Environnement (*"Bamtaaré" also means "development" in the local language of Pulaar*) *Support Base for Methods and Techniques for Agriculture, Other Rural Activities, and the Environment*
CAADP	Comprehensive Africa Agriculture Development Programme
CNCAS	Caisse Nationale de Crédit Agricole du Sénégal *National Agricultural Credit Bank of Senegal*
CTS	Centre de Triage de Semences *Seed Sorting Center*
DISEM	Division de Semences *Seed Division of the Ministry of Agriculture*
DRDR	Direction Régionale de Développement Rural *Regional Directorate for Rural Development*
DSRP	Document de Stratégie de Réduction de la Pauvreté *National Poverty Reduction Strategy*
ECOWAS	Economic Community of West African States
EU	European Union
GA	Grande Aménagement *Large-Scale Irrigation Scheme*
GIE	Groupement d'Intérêt Économique *Economic Interest Group*
GOANA	Grande Offensive Agricole pour la Nourriture et l'Abondance *Grand Agricultural Offensive for Food and Abundance*
GoS	Government of Senegal
ICT	Information and Communication Technology
ISRA	Institut Sénégalais de Recherches Agricoles *Senegalese Institute for Agricultural Research*
LDC	Least Developed Country
LOASP	Loi d'Orientation Agro-Sylvo-Pastorale *Law on Agroforestry and Pastoral Orientation*
MOU	Memorandum of understanding
NEPAD	New Partnership for Africa's Development

NERICA	New Rice for Africa
PASR	Programme d'Adjustement Structurel de la Filière Rizicole *Structural Adjustment Program for the Rice Sector*
PINORD	Programme d'appui aux Initiatives du Nord *Market Access Support Programme to Rice Farmers in Northern Senegal*
PIP	Périmètre Irrigué Privé *Private Irrigation Scheme*
PIV	Périmètre Irrigué Villageois *Village Irrigation Scheme*
PNAR	Programme National d'Autosuffisance en Riz *National Program for Self-Sufficiency in Rice*
SAED	Société Nationale d'Aménagement et d'Exploitation des Terres du Delta du Fleuve Sénégal et des Vallées du Fleuve Sénégal et de la Falémé *Society for the Development and Exploitation of the Senegal River Delta and the Valleys of the Senegal and Falémé Rivers*
SAGIC	Senegal Accelerated Growth and Increased Competitiveness Indefinite Quantity Contract
SCA	Stratégie de Croissance Accélérée *Accelerated Growth Strategy*
SNDR	Stratégie Nationale du Développement de la Riziculture *National Strategy for the Development of Rice Cultivation*
SODAGRI	Société de Développement Agricole et Industriel *Society for Agricultural and Industrial Development*
SODEFITEX	Société de Développement et des Fibres Textiles *Society for the Development of Textile Fibers*
SOENA	Société d'Encadrement Agricole *Society for Agricultural Organization*
SRV	Senegal River Valley
SV	Section Villageoise *Village Section (village-level sub-cooperative)*
USAID	United States Agency for International Development
WAEMU	West African Economic and Monetary Union
WARDA	West Africa Rice Development Association (*formerly known as the Africa Rice Center*)
WTO	World Trade Organization

EXECUTIVE SUMMARY

Rice is the core staple of the Senegalese diet, averaging as much as 93 kg per capita per year. Aggregate rice consumption in Senegal stood at 400,000 MT in 1995 and rose to 800,000 MT in 2007. However, the majority of Senegal's rice comes from outside the country: rice imports have steadily increased since the 1970s and now account for around 80 percent of total rice supply. In fact, with a population of only 13 million, Senegal is the world's tenth largest rice importer. This dependency on international rice markets makes Senegal's population exceedingly vulnerable to the price spikes and supply shortages experienced during 2008-2009.

The Government of Senegal has prioritized achieving self-sufficiency in rice production as a cornerstone of its food security policies, such as the Grand Offensive for Food and Abundance (GOANA), the National Program for Rice Self-Sufficiency (PNAR), and the National Strategy for the Development of Rice Cultivation (SNDR). Domestic rice production has averaged around 200,000 metric tons in recent years. An estimated 85,037 hectares were under cultivation in 2006, almost exclusively by smallholder farmers, and expanding at an annual rate of 3.02 percent. The principal zones of production are in the Senegal River Valley for irrigated rice and the Casamance region for rain-fed cultivation. Yields vary significantly across regions, particularly as a result of the production system used.

Irrigated rice represents 70 percent of national production. Concentrated on 50,469 hectares in the Saint-Louis and Matam regions bordering the Senegal River, irrigated perimeters achieve consistently high yields of 5 to 6 metric tons per hectare. The Government of Senegal played a central role in developing and, until 1994, managing most of the extensive irrigation infrastructure in the Senegal River Valley. The liberalization of the rice industry in the 1990s transferred these perimeters to farmer groups organized by the government, stimulated a surge of private investment in irrigated rice production, and turned over most commercial functions to the private sector.

Rain-fed cultivation supplies only 30 percent of national rice production, yet roughly 90 percent of Senegal's population lives in these production zones. Two production systems predominate: cultivating in seasonally flooded lowlands and growing in uplands dependent solely on rainwater. Rain-fed rice yields average 1 to 2 metric tons per hectare. These low yields are driven by little to no water management, use and retention of traditional seed varieties, low application of inputs, and predominantly manual operations. Women tend to shoulder the greatest responsibility for rice cultivation in most rain-fed systems, although men may also play a prominent role in some areas.

For both production systems, farmers produce rice predominantly for subsistence and consumption smoothing. This is not to say that local rice does not enter commercial market channels but, rather, that farmers have a primarily non-commercial motivation for producing rice. Local irrigated rice production exceeds home consumption needs and enters commercial market channels in two main ways: (1) in comparatively large transactions following each harvest (one-third of total yield) to pay back production credit, and (2) in comparatively smaller and more irregular transactions throughout the year when farm households are short of cash (one-third of total yield). Local rain-fed rice production tends to match household consumption needs and rarely enters commercial market channels.

ANALYSIS

Senegalese policies recognize that rice self-sufficiency requires greater commercial viability and competitiveness of its domestic rice sector to maintain the availability and affordability of rice in the face of an increasingly volatile international market. Yet the strategies these policies emphasize government commitment and leadership for supporting, maintaining and replicating public irrigation perimeters with insufficient consideration for engaging the private sector. Government strategy does not include incentives for existing commercially-minded Senegal River Valley farmers to scale-up production nor does it encourage subsistence-oriented farmers to become more commercial. The commercial

market channel for local rice faces the following key constraints, which are not adequately addressed by prevailing government policy:

- The rice value chain is fragmented and informal, characterized by a high degree of uncertainty, informality and risk as well as a lack of production planning, despite the profitability and high yields of irrigated rice.
- While many irrigated rice producers cooperate to manage common resources and receive government assistance, collective marketing is the weakest function carried out by most of these associations.
- Agglomeration strategies are generally weak throughout the irrigated rice industry: traders and processors have limited working capital and tend to deal in smaller quantities that introduce significant inefficiencies into the system.
- The complex process for supplying certified rice seed constrains its timely availability for farmer purchase.
- Credit for agricultural production is limited to a single, formerly government-run, financial service provider.

Rain-fed rice producers are most likely to invest in measures to upgrade their productivity when they involve minimal cash expense and show tangible benefits within a growing season. As subsistence producers, these farmers are less motivated by profit or direct monetary gains. Rather, they will be looking for non-monetary benefits that generate greater rice stocks for the household and decrease the amount of labor and other household resources devoted to rice production. These producers are likely to also respond to strong pressures of conformity to adopt prevailing practices among their peers or improved practices advocated by recognized leaders in their communities. As rice production is frequently delegated to women and considered a supplementary, non-commercial activity, any increased commercial orientation may provoke gender-based conflicts and could provide strong disincentives for these types of upgrading.

The majority of irrigated rice smallholders demonstrate a similar orientation towards subsistence behaviors. The main difference, however, is the uniformly high level of upgrading that has already occurred. With decades of intensive governmental support, these producers have achieved high levels of production knowledge, skills and practices that generate consistently high yields and marketable surpluses. Yet their commercial incentives are aligned towards minimizing risk at the expense of realizing maximum revenues and win-win relationships with private buyers. They are likely to invest in better commercial strategies if they can find new ways of managing risk, both within their household and within their farming enterprise, that are consistent with the risk-sharing motivations of the private sector.

STRATEGY

The Government of Senegal envisions the rice value chain producing 1,000,000 metric tons of white rice annually by 2012, a five-fold increase over 2007 levels, to achieve complete self-sufficiency in rice. Existing strategies call for a US $390 million investment in public irrigation infrastructure, input subsidies and farmer extension and training. Such rapid growth may not be realistically achievable, and such a high level of government subsidy is likely to be unsustainable. An alternative vision is needed to support GoS objectives but also maximize the catalytic and sustainable impact of US government programming decisions and investments. Such a vision follows.

By 2020, Senegal will have reduced its dependency on rice imports to achieve a self-sufficiency level of 40-50 percent, or roughly double the 2007 level. These gains will come primarily from expanded irrigated rice production led by significant growth in private-sector investment in infrastructure, services and capacity to sustain these advancements. Although it will contribute less to overall growth, rain-fed cultivation will experience a 30 percent rise in productivity due to higher-yielding varieties and increased mechanization. Reduced dependence on imports and greater consumer access to domestic rice will ensure greater food security in the event of renewed instability in the international market for rice.

An industry upgrading strategy for Senegalese rice oriented towards food security should have two distinct components: commercial (irrigated) rice and subsistence (primarily rain-fed) rice:

- The commercial component is centered on primary production zones in the Senegal River Valley and market centers in Saint-Louis, Touba and Dakar. Short- to medium-term priorities will target an increased share of the domestic market by addressing three main areas: enabling conditions, market development and operational efficiencies.

- Rain-fed zones are concentrated in lower Senegal: parts of Tambacounda region and throughout the Casamance. Priorities over the short- to medium-term include investments in expanded productivity, labor savings and household risk management.

RECOMMENDATIONS

USAID has a strong comparative advantage among other donors in strengthening the commercial market for domestic rice and enhancing the role of the private sector in Senegal's rice self-sufficiency strategies. USAID should play a leading role in advancing a market-driven and growth-oriented agenda for food security while collaborating closely with other donors in the areas of infrastructure development, agricultural research and assistance to highly vulnerable households. The following recommendations will guide USAID in operationalizing the strategies outlined above to strengthen the rice value chain:

- USAID should initiate dialogue with its Senegalese counterparts to define a clearer priority and role for the private sector in Senegal's agricultural policies, which notably omit a meaningful role for the domestic private sector. Commercial investment would accelerate and sustain the productivity advancements pursued by Senegalese policies, and private-sector innovation would continue driving future growth.

- USAID's ongoing Senegal Accelerated Growth and Increased Competitiveness (SAGIC) should lead USAID's efforts to develop commercial rice markets and supply chains focused on two complementary strategies: (1) supporting lead firms to invest in market development and more supportive relationships in their supply chains and (2) strengthening service markets to foster producer upgrading. USAID should ensure that SAGIC acts as a facilitator in its commercial rice interventions to achieve catalytic and sustainable growth.

- USAID's second-phase Wula Nafaa project should lead initiatives with subsistence rice producers, particularly with rain-fed rice, that are clustered around two different objectives: (1) increasing productivity of rain-fed rice farmers and (2) integrating subsistence farmers into new market opportunities. USAID should ensure that Wula Nafaa acts as a facilitator in its commercial rice interventions to achieve catalytic and sustainable growth.

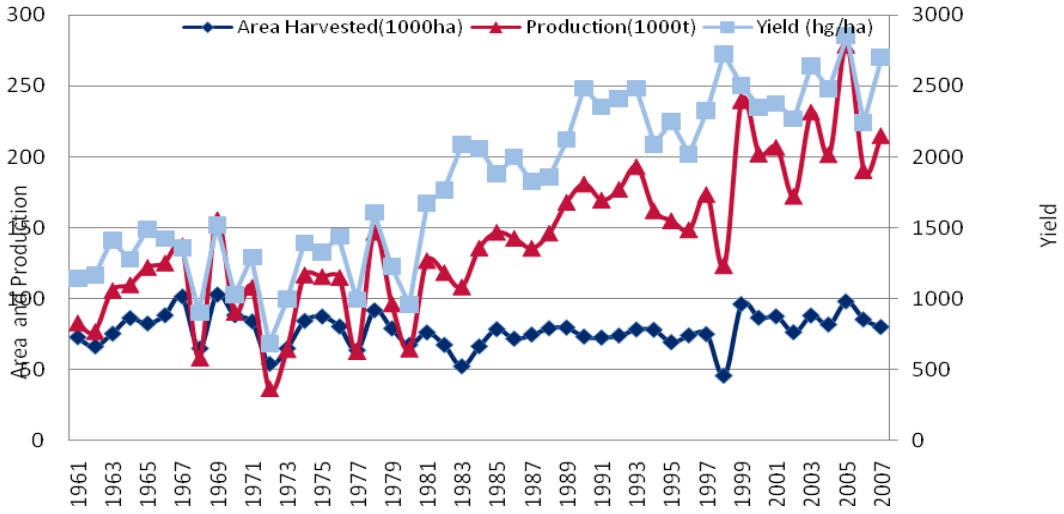
- USAID should prioritize support for research into consumer demand and preferences for local rice, particularly with WARDA, by helping to define actionable research questions that will guide policy formulation and project strategies and by mobilizing resources to carry out research activities.

I. INTRODUCTION

A. PRODUCTION OVERVIEW

Total rice production in Senegal has averaged around 200,000 metric tons (MT) in recent years—an annual average of 214,403 MT during the period 2001-2005[1] and 193,379 MT during the 2007/08 season.[2] By contrast, the Ministry of Agriculture reported a record level of 500,000 MT for the 2008/09 season. Gains in production are attributed by the ministry to both increases in land under cultivation and advances in productivity, although these claims could not be verified during the field research for this assessment. This dramatic production increase is in line with the ambitious targets for Grand Agricultural Offensive for Food and Abundance (*Grande Offensive Agricole pour la Nourriture et l'Abondance,* GOANA)—the Government's new and highly visible food security initiative, which is discussed further in the Business Enabling Environment section beginning on page 8. Given the unsubstantiated accuracy of data reported under GOANA, this assessment will refer to data that have been collected or vetted by non-governmental researchers. Figure 1 illustrates production trends since 1961.

Figure 1. Senegal Rice Production, 1961-2007



Source: Food and Agriculture Organization of the United Nations. FAOSTAT. http://faostat.fao.org. Accessed May 2009.

An estimated 85,037 hectares were under cultivation in 2006 and expanding at an annual rate of 3.02 percent.[3] The principal zones of production are the Senegal River Valley (Saint-Louis, Matam, and Tambacounda regions), Upper and Middle Casamance (Kolda region), Lower Casamance (Ziguinchor region), and small amounts from Fatick and Koalack (see Figure 1). Rice production is undertaken almost exclusively by smallholder farmers. Yields vary significantly across regions, particularly as a result of the production system used (see Figure 1 and Table 1).

[1] WARDA. "Africa Rice Trends: Overview of recent developments in the sub-Saharan African rice sector."

[2] Ministere de l'Agriculture, Republique du Sénégal, "Stratégie Nationale de Développement de la Riziculture."

[3] WARDA. "Africa Rice Trends: Overview of recent developments in the sub-Saharan African rice sector."

Figure 2. Rice Area Harvested by Region

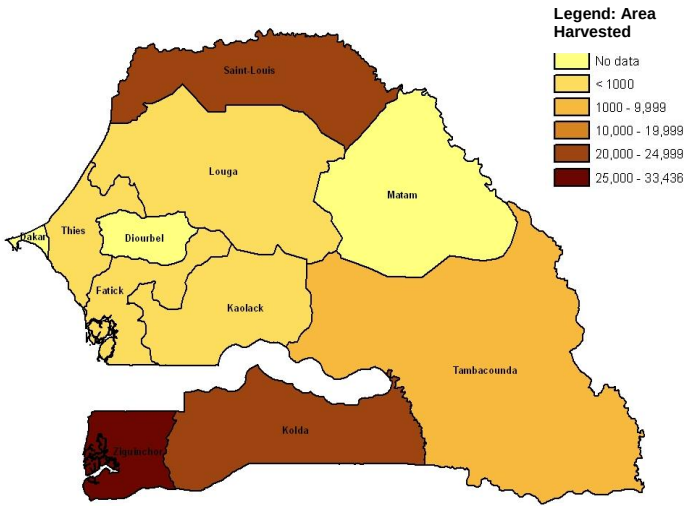
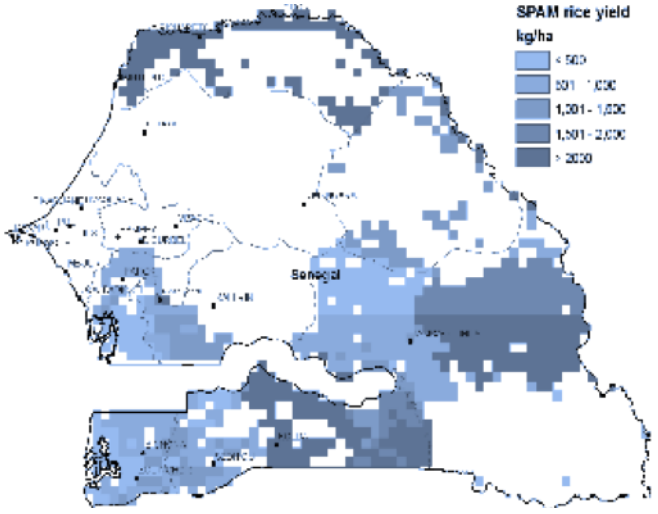


Figure 3. Rice Yields by Region



Source: Rice area harvest data are from the Centre Régional Agrhymet, 2000. Rice yield data are from the International Food Policy Research Institute (2009).

Table 1. Estimated Production by Region, 2008/2009

Region	Rice			All Cereals	
	Area (ha)	Yield (kg/ha)	Production (MT)	Area (ha)	Production (MT)
Dakar				1,000	400
Diourbel				139,100	92,134
Fatick	2,411	2,414	5,820	190,456	219,224
Kaolack	867	1,944	1,685	344,907	396,204
Kolda	20,085	1,606	32,257	182,792	267,848
Louga				145,374	94,493
Saint-Louis	31,931	6,000	191,586	40,436	195,546
Tambacounda	1,553	1,877	2,915	191,024	238,709
Thiès	800	1,200	960	125,150	87,756
Ziguinchor	52,950	2,000	105,900	83,559	138,901
Matam	4,500	6,000	27,000	53,799	57,887
SAED				5,105	18,421
SODAGRI	1,750	6,000	10,500	1,815	10,760
Total	116,847	3,290	378,623	1,504,517	1,818,283
Results 2007/2008	80,312	2,408	193,379	1,068,876	772,239
Increase	43%	37%	96%	41%	136%

Source: Ministry of Agriculture, "Estimation des recoltes de la campagne agricole 2008."

B. PRODUCTION SYSTEMS

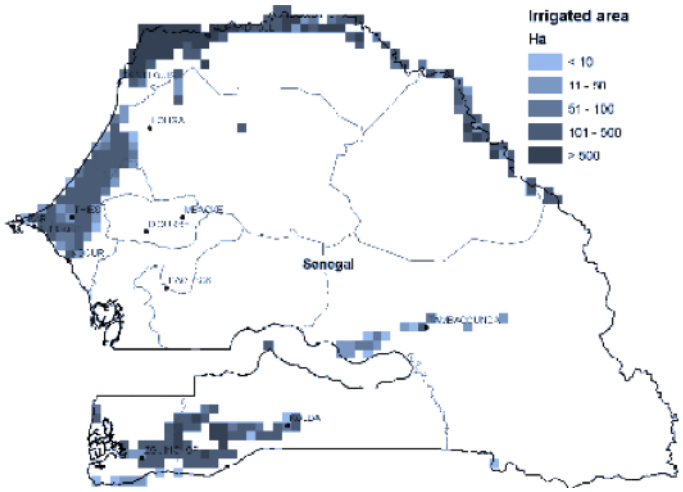
1. IRRIGATED PRODUCTION SYSTEMS

Irrigated rice represents 70 percent of national production. Irrigated cultivation is concentrated primarily in the Senegal River Valley, with 50,469 hectares under cultivation in the Saint-Louis and Matam regions. The Anambé Basin in Kolda region hosts an additional 2,810 hectares of irrigated rice production (see Figure Figure 1).

Irrigated rice yields are consistently high, averaging 5 to 6 MT/hectare. Such strong yields are due to consistent, predictable water levels supplied by irrigation networks, use of improved seed, application of fertilizers and herbicides, and the prevalence of mechanized operations. Intensive cultivation practices also permit two-cycle cropping in many parts of the upper and middle Senegal River Valley.

The Government of Senegal (GoS) has played a central role in developing and, until 1994, managing most of the extensive irrigation infrastructure in the Senegal River Valley, in particular, the Large-Scale Irrigation Schemes (*Grande Aménagement*, GA) and the Village Irrigation Schemes (*Périmètre Irrigué Villageois*, PIV). Various non-governmental structures have been established by the GoS to manage the infrastructure. The Society for the Development and Exploitation of the Senegal River Delta and the Valleys of the Senegal and Falémé Rivers (*Society Société Nationale d'Aménagement et d'Exploitation des Terres du Delta du Fleuve Sénégal et des Vallées du Fleuve Sénégal et de la Falémé*, SAED)[4] was established to provide ongoing technical assistance. A surge of private investment in irrigated rice production followed the GoS's disengagement from the rice industry in the 1990s, and these investments formed the so-called Private Irrigation Schemes (*Périmètre Irrigué Privé*, PIP). **Error! Reference source not found.** compares and contrasts these different structures.

Figure 4. Irrigated Rice Areas



Source: Food and Agriculture Organization of the United Nations and University of Frankfurt (2008).

[4] SAED is further described in the E. Supporting Market Actors section beginning on page 17.

Table 5. Types of Irrigation Management Schemes

	Large-scale (GA)	Village (PIV)	Private (PIP)
Funding Sources	Government	Government	Private Sector
Zone of development	Lower SRV	Middle and upper SRV	Lower SRV
Period of development	Since 1960s	1970s-1980s	Mainly 1989-1993
Scale of development	> 1,000 ha	15-50 ha	< 500 ha
Level of investment	High	Low	Low
Facilities	Electric pumps, canal &drainage networks	Mainly diesel pumps, canal network	Mainly diesel pumps, canal network
Management	Union	GIE[5], SV[6]	GIE
Production problems	Aging of facilities	Salinization, aging of facilities	Salinization, difficult management of facilities

Source: Japan International Cooperation Agency and Government of Senegal, Ministry of Agriculture, Rural Hydraulic and Food Security, Department of Analysis, Prediction and Statistics. (2006) "The Study of the Reorganization of the Production of Rice: Final Report." Nippon Koei Co., Ltd., Earth & Human Corporation: October 2006.

WARDA estimates that production costs for irrigated rice(including family labor, land and financial outlay)range from 68 CFA/kg (US $0.15/kg) in the Saint-Louis region to 112 CFA/kg (US $0.25/kg) in the Anambé Basin.[7]

2. RAIN-FED PRODUCTION SYSTEMS

While only 30 percent of national rice production comes from rain-fed cultivation, roughly 90 percent of Senegal's population lives in these production zones. Traditional rain-fed rice farming is concentrated in the Casamance (Ziguinchor and Kolda regions), which account for 95 percent of rain-fed production. Fatick, Kaolack, and Tambacounda regions account for the rest, where women are typically responsible for rice cultivation.[8] Two production systems predominate: cultivating in seasonally flooded lowlands and growing in uplands dependent solely on rainwater.

Rain-fed rice yields average 1-2 MT/hectare. These low yields are driven by little to no water management, use and retention of traditional seed varieties, low application of inputs, and predominantly manual operations. Women tend to shoulder the greatest responsibility for rice cultivation in most rain-fed systems, although men may also play a prominent role in some areas.[9]

Table 3 summarizes the characteristics of the main rice-growing regions in Senegal, both irrigated and rain-fed.

[5] Economic Interest Group (*Groupement d'Intérêt Économique*)—a common and basic business structure in francophone West Africa.

[6] Village-level sub-cooperative (*Section Villageoise*).

[7] WARDA, "Rice Policy and Development Program."

[8] JICA, "The Study of the Reorganization of the Production of Rice," 3-21.

[9] Ministry of Agriculture, National Strategy for the Development of the Rice Sector 2009.

Table 6. Comparison of Farming Practices among Rice-Producing Areas

	Saint-Louis & Dagana	Podor & Matam	Fatick	Kolda	Ziguinchor
Rice as staple food	Primary	Primary	Secondary	Secondary	Primary
Season	Jun/Aug–Oct/Dec Jan/Feb–Apr/May	Jun/Aug–Oct/Dec	Jul/Aug–Sep/Oct	Jul–Oct	Jul–Oct
Varieties	High-yielding (improved)	High-yielding (improved)	Local varieties (partly improved)	Local varieties	Local varieties
Farming environment	Irrigated lowland	Irrigated lowland	Rain-fed lowland	Rain-fed lowland	Rain-fed lowland/upland
Parcel size	Large (>1 ha)	Medium (>0.25 ha)	Small (<0.1 ha)	Small (<0.1 ha)	Small (<0.1 ha)
Main cultivators	Men	Men & women	Women	Women	Men & women
Land preparation	Mechanized	Mechanized	Manual	Manual	Manual
Fertilizer dosage	High	High	None to minimum	Low	None to minimum
Herbicide use	Common	Common/None	None	None	None
Harvesting	Mechanized, manual	Manual, mechanized	Manual	Manual	Manual
Threshing	Mechanized	Manual, mechanized	Manual	Manual	Manual
Average yield	>5 MT/ha	>4 MT/ha	1-2 MT/ha	1-2 MT/ha	1-2 MT/ha
Destination	Consumption, sale	Consumption, sale	Consumption	Consumption	Consumption

Source: JICA 2006, "Study Reorganization Rice Senegal."

C. CONSUMPTION

Rice is the core staple of the Senegalese diet, averaging between 74 kg[10] and 93 kg[11] per capita per year depending on the data source. Aggregate rice consumption in Senegal stood at 400,000 MT in 1995 and rose to 800,000 MT in 2007.[12] As of 2007, rice comprised 32 percent of total caloric consumption.[13] In urban areas, rice accounts for 54 percent of cereal consumption and 18 percent of total household expenditures. In rural areas, rice is 24 percent of cereal consumption and as much as 25 percent of total household spending.[14]

The self-sufficiency ratio for rice during the years 2001-2006 was 18 percent[15] but reportedly rose to 40 percent in 2008,[16] the first year of GOANA. Regardless of the reliability of the 2008 data, imports remain the dominant source of rice for local consumption.

[10] Ministry of Agriculture, National Strategy for the Development of the Rice Sector 2009.

[11] Lançon, "Rice Imports in West Africa."

[12] Ministry of Agriculture, National Strategy for the Development of the Rice Sector 2009, 7.

[13] Masters, "Distortions to Agricultural Incentives in Senegal," 4.

[14] Fall and Diagne, "Etude de Relation Qualité-Prix du Riz Produit dans la Vallée du Fleuve Sénégal." 10-11.

[15] WARDA, "Rice Policy and Development Program."

[16] Ministry of Agriculture, National Strategy for the Development of the Rice Sector, 2009.

Outside of Saint-Louis and Matam regions, most if not all of paddy production is used for home consumption (see table 4). Most local rice is purchased by traders during June and July and sold at retailer shops by October. From November to January, local rice is rarely available in domestic markets.[17]

Table 7. Household Uses of Local Rice Production

Region	Production	Consumed	Sold
Saint-Louis & Matam	84,700 MT	35%	65%
Kolda	24,900 MT	100%	
Ziguinchor	26,300 MT	100%	
Others	3,100 MT	100%	
Total	139,100 MT	60%	40%

Source: MoA, National Strategy for the Development of the Rice Sector, 2009.

D. POVERTY

Senegal's National Poverty Reduction Strategy (*Document de Stratégie de Réduction de la Pauvreté*, DSRP) is the most reliable source of data and analysis on poverty, as updated household survey data are not available.[18] The prevalence of poverty is estimated at 57 percent, continuing a declining trend since 1994. However, absolute numbers of poor households have increased and poverty remains concentrated in rural areas. Poverty is also highly correlated with access to basic infrastructure and services and the vulnerability to external shocks. Ziguinchor, Kolda, Kaolack and Djourbel are the regions with highest levels of poverty as well as the worst levels of water and power access, highest mortality rates and lowest educational attainment. Overall, four out of ten potential workers in Senegal are unemployed or underemployed. Rural populations are highly vulnerable to climatic conditions and other shocks, leading to increased migration to urban areas, especially Dakar.

E. TRADE PATTERNS

Despite its population of only 13 million, Senegal is the world's tenth largest rice importer. Rice imports have steadily increased since the 1970s and now account for around 80 percent of total rice supply. Thailand has been the main source of Senegal's rice, followed by India, Vietnam, Pakistan and Latin America (Argentina, Brazil and Uruguay). Table 5 shows the consistently high level of imports since 2001 and the dominance of broken rice among rice imports. Notably, Senegal represents about 22 percent of the world market for broken rice.[19]

Table 8. Senegal Rice Imports, 2001-2007

	2001	2002	2003	2004	2005	2006	2007
Paddy (MT)	20	0	0	0	0	0	1,570
Brown rice (MT)	46	21	125	18,552	1,069	1	6
Milled rice (MT)	2,392	1,876	3,697	4,130	1,450	4,668	36,127
Broken rice (MT)	679,621	854,372	886,222	799,863	1,249,021	701,218	1,018,729
Total (MT)	682,079	856,269	890,044	822,545	1,251,540	705,887	1,056,432
Value (000 US$)	142,137	184,446	217,849	242,400	368,595	209,270	363,904

Source: International Trade Center (ITC) calculations based on COMTRADE data; accessed using ITC's TradeMap

Rice exports from Senegal are minimal, not exceeding 133,000 MT in the past eight years as shown in table 6. This quantity typically represents re-exports of imported rice to neighboring Guinea-Bissau, Mali and the Gambia. The GoS estimates that 20-30 percent of total rice exports flow informally to neighboring countries, presumably locally produced rice crossing the Senegal River to Mauritania in small transactions.

[17] JICA, "The Study of the Reorganization of the Production of Rice," 3-5.

[18] Government of Senegal. "Second Poverty Reduction Strategy Paper."

[19] Ministry of Agriculture, National Strategy for the Development of the Rice Sector, 2009, 7.

Table 9. Senegal Rice Exports, 2001-2007

	2001	2002	2003	2004	2005	2006	2007
Brown rice (MT)	0	0	0	2,669	5,428	0	0
Milled rice (MT)	5	5	4,809	143	3,013	21	978
Broken rice (MT)	20	20,127	27,978	76,207	123,915	100,181	73,139
Total (MT)	25	20,132	32,787	79,019	132,356	100,202	74,117
Value (000 US$)	4	4,355	8,571	22,854	38,851	29,528	25,064

Source: International Trade Center (ITC) calculations based on COMTRADE data; accessed using ITC's TradeMap www.trademap.org

II. BUSINESS ENABLING ENVIRONMENT

A. GLOBAL

Global rice prices have been rising since early 2003. Moderate increases of 9 percent in 2006 and 17 percent in 2007 escalated to record highs for international prices in 2008. From November 2007 to late April 2008, Thailand's rice prices almost tripled. This volatility has had particularly negative impacts for Senegal, which is so dependent on rice imports. In addition to international price spikes, which are inevitably passed along to consumers, some of Senegal's traditional import partners (most notably, India) suspended exports during this period to protect their own populations.

Senegal has been a member of the WTO since 1995. Senegal is also categorized as a Least Developed Country (LDC) and as such has had preferential trade access to EU markets since 2008 under the Everything But Arms initiative. But as a net importer of rice, the country has not been able to leverage its WTO or its LDC status to increase rice exports.

B. REGIONAL

As a member of the West Africa Economic and Monetary Union (WAEMU), Senegal shares a common currency (the CFA franc) with seven other West African countries. Under its Common External Tariff, WAEMU countries have a 10 percent tariff on "category two" broken rice. Senegal is also a member of the Economic Community of West African States (ECOWAS) which shares a Common External Tariff for preferential intra-regional trade among other ECOWAS member-states. Despite these preferential trade agreements between Senegal and its fellow members of ECOWAS and WAEMU, all of Senegal's rice imports come from outside the region and as much as one-third of its small exports flow informally to Mauritania, Mali and Guinea-Bissau.

Senegal has yet to sign a CAADP (Comprehensive Africa Agriculture Development Programme) Compact under NEPAD (the New Partnership for Africa's Development).

C. NATIONAL

1. GOVERNMENT STRATEGIES

Following a period of intensive state involvement, Senegal began liberalizing its rice sector in 1994 when implementing its Structural Adjustment Program for the Agriculture Sector. Under the *Programme d'Adjustement Structurel de la Filière Rizicole*, the Government enacted several steps to disengage from the sector. In 1994, it withdrew from processing and marketing responsibilities for paddy rice. In 1995, the Policy Paper on Agricultural Development reaffirmed the State's desire to remove itself from importing and distributing rice by transferring these responsibilities to the private sector. Senegal also discontinued setting prices for paddy and processed rice that same year.

Since 2000, the GoS has implemented major programs to improve and strengthen agricultural productivity. These strategies include the National Poverty Reduction Strategy (*Document de Stratégie de Réduction de la Pauvreté*), the Law on Agro-Forestry and Pastoral Orientation(*Loi d'Orientation Agro-Sylvo-Pastorale*), the Accelerated Growth Strategy (*Stratégie de Croissance Accélérée*,SCA), GOANA and the National Program for Self-Sufficiency in Rice (*Programme National d'Autosuffisance en Riz*, PNAR). The three most influential initiatives—SCA, GOANA and PNAR—are discussed in further detail below.

SCA

In 2007 Senegal initiated its Accelerated Growth Strategy to boost pro-poor economic growth primarily by reforming the business environment and promoting competitive economic clusters. The SCA targets five clusters: agriculture/agribusiness, fish and seafood, textiles, ICT and tourism. The agriculture/agribusiness cluster may include the domestic rice industry in its final selection of priority sectors, which is currently underway.

GOANA

Launched in April 2008, the Grand Agricultural Offensive for Food and Abundances a strategic emergency program to achieve complete food self-sufficiency by 2015. Expanding irrigation and rice cultivation on unused land in the Senegal River Valley are strategic priorities under GOANA. The GoS has further elaborated its operational strategies to achieve GOANA's ambitious goals for rice self-sufficiency in the PNAR.

PNAR

In 2005 the President's Council set a production target of 1.5 million MT of paddy rice (equivalent to 1 million MT of white rice) by 2012 in its National Program for Rice Self Sufficiency. The GoS developed a National Strategy for the Development of Rice Cultivation (*Stratégie Nationale du Développement de la Riziculture*, SNDR) to meet the demands of PNAR. With a budget of 174 billion CFA (US $390 million) over the next three years, Senegal expects to achieve the ambitious annual targets specified in Table 7.

Table 10. Rice Production Targets

Year	Paddy Rice	White Rice
2008	535,000 MT	364,000 MT
2010	916,320 MT	623,000 MT
2012	1,500,000 MT	1,000,000 MT

Source: Government of Senegal. "*Programme Nationale d'Autosuffisance en Riz.*" Febuary 2009.

To achieve these results, the Government of Senegal plans to undertake the following activities:

- Rehabilitate 22,000 hectares in the Senegal River Valley and 4,180 hectares in the Anambé Basin
- Repair existing and construct new rice mills
- Facilitate access to and financing of equipment and material for tilling, harvesting, threshing, processing and packaging of seeds
- Extend fertilizer and pesticide subsidies
- Encourage and facilitate crop intensification
- Support and research for improved rice varieties
- Strengthen the capacity of producers through training and coaching via SAED

It is notable that this strategy does not indicate a clear role for the private sector and suggests a great degree of public subsidy direct to farmers through new infrastructure investments, input and equipment provision, and technical assistance and extension.

The Ministry of Agriculture reported that the SNDR achieved 94 percent of its target for the first year, representing a 150 percent increase in national production in a single year. The accuracy of this achievement was not verifiable during the fieldwork for this assessment, and the high visibility of GOANA and PNAR presents substantial incentives for inflated reporting.

2. POLITICAL AND REGULATORY ENVIRONMENT

LAND AND ZONING LAWS

Laws governing land tenure in Senegal are somewhat difficult to understand and navigate. The Law on National Domain, adopted in 1964, stipulates that the State is the sole trustee of land in the country and is responsible for its management. The law also categorizes land into four groups:

- Urban zones

- Agricultural zones
- Special zones
- Development zones

Agricultural zones provide an example of where written and practiced laws are sometimes contradictory. In rural areas (mostly classified as agricultural zones), rural councils have authority to allocate land to those who prove they can develop it. These rural councils frequently apply customary practices when allocating land, resulting in informal rents and sale arrangements that are confusing and often illegal. Investors, especially those from urban centers, are typically turned away by local authorities because they perceive such land to be reserved for local farmers. The prevalence of these practices creates a sense of uncertainty and insecurity among landholders and provides few incentives to make long-term, private investments in land improvements, such as those required for irrigated rice production.

Senegal's Law on Agro-Forestry and Pastoral Orientation, while well conceived, is not enforced properly because of a lack of GoS resources. As such, land designated as protected forests or national parks may harbor squatters who farm using "slash and burn" techniques, contributing to deforestation and soil erosion.

INPUT SUBSIDIZATION

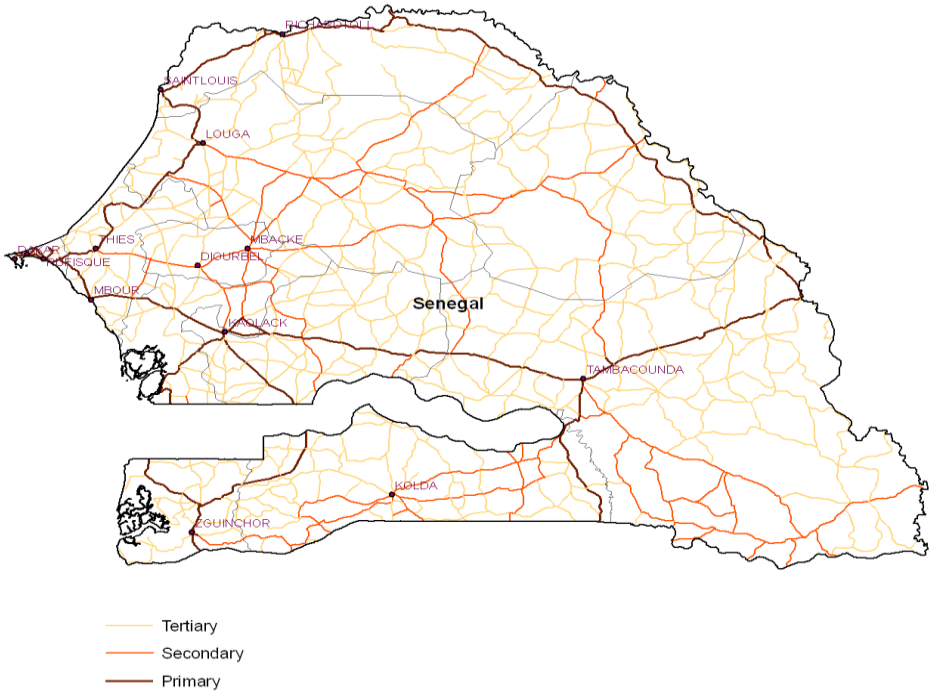
The GoS supports an explicit, subsidized retail price for fertilizer distributed through the indigenous agrochemicals industry headed by a former state-run monopoly. Currently the level of subsidy stands at 40 percent and, in theory, is on track to be incrementally phased out. In reality, public support and farmer appreciation for the subsidy are likely to justify its continuation.

3. PHYSICAL INFRASTRUCTURE

ROADS

Senegal has a network of major all-weather roads connecting the ports of Dakar and Saint-Louis to smaller cities throughout Senegal and onwards to Mali. Secondary roads vary greatly in quality. Current government programs call for improving this transit route, especially the rural feeder roads.

Figure 11. Senegal Road Network



DAMS

The Diama and Manantali dams, completed in the 1980s, facilitate irrigation schemes throughout the Senegal River Valley. The Diama dam prevents saltwater intrusion and maintains water levels to support irrigation. Further inland on the Bafing River, the Manantali dam generates electric power and guards against extreme floods.

STORAGE

Refrigerated storage facilities exist only in Dakar at the port and the airport. Adequate dry-goods storage has a broader reach but is still confined to major population centers on or very near to tarmac roads in the Senegal River Valley.

III. END MARKETS

Consumers value taste, a high rate of swelling, ease of preparation and the absence of foreign objects (food safety) when purchasing rice; additionally, urban consumers value the cleanliness and visual presentation of rice. Consumers generally recognize that cheaper prices correspond with lower quality and tend to remain loyal to their preferences when prices increase, as long as it is still within their means. Historically imports have split equally between fragrant and non-fragrant rice, indicating some socioeconomic segmentation among urban consumers, but this phenomenon is not well understood.

Clear segmentation of the domestic market for rice is complicated by a number of overlapping characteristics. Three product types (broken, whole and ungraded rice) are commonly found in most markets and are used for different purposes. Socioeconomic factors, such as urban/rural location and income bracket, also play a role in consumer preferences. Finally, familiarity with local rice has also proven a strong factor in consumer choice.

The Senegalese as a whole have a strong preference for broken rice, which makes up 95 percent of its imports. Indeed, Senegal is the largest importer of broken rice in the international rice trade. However, this preference is far more concentrated in urban areas, particularly in Dakar, where there is a history of imports of cheap broken rice from French Indochina. Even in urban areas, most consumers regularly purchase both broken and whole-grain rice. Demand for product type is often determined by recipe, with *thièboudienne* using broken rice and *mafé* using whole grain. Lower-income and more rural households often prefer to purchase ungraded rice because they perceive it as a better value; when they sort it themselves at home, it feels like they get two bags (whole and broken grains) for the price of one unsorted bag.

In rural areas, the preference is generally for whole grains, and imports compose less than 10 percent of total rural rice consumption. This leads to a mismatch between urban demand preferences and the supply of rural rice.[20] A regional breakdown of demand preferences is provided in Table 8. Local rice is not well-known outside of rice-producing areas, with only 60 percent of Dakar consumers aware of local rice.[21] Nevertheless, recent studies confirm a willingness to pay a higher premium for labeled quality local rice (*Rival*) in the Saint-Louis market.[22]

Table 12. Regional Differences in Demand Preferences for Rice

Rice Type	Ross-Béthio	Podor	Saint-Louis	Dakar
Local whole	60%	54%	35%	4%
Local intermediate	21%	19%	8%	1%
Local Broken	19%	6%	35%	1%
Total Local	**100%**	**79%**	**78%**	**6%**
Imported whole	0%	4%	1%	6%
Imported intermediate	0%	9%	0%	1%
Imported broken	0%	8%	21%	88%
Total imported	**0%**	**21%**	**22%**	**95%**

Source: Rutsaert, "Willingness to pay for quality rice in the Senegal River Valley," 19-24.

[20] Rutsaert, "Willingness to pay for quality rice in the Senegal River Valley," 19-24.

[21] Ibid.

[22] Ibid, 2-3.

While government initiatives focus on production, stakeholders interviewed in 2007[23] differ on the reasons for the weak position and consumption of Senegal River Valley rice. Producers blame unfair competition from Thailand broken rice imports and the lack of protection for local rice, while householders and sellers barely mention this argument. All three sets of stakeholders mention marketing as a bottleneck, as well as quality (see Table 9).

Table 13. Reasons for the Weak Consumption of Senegal River Valley Rice

Reasons	Sellers	Household Heads	Producers
Competition	0.4	1.1	56.6
Lack of marketing	40.7	39.5	53.7
Lack of quality	38.9	25.6	41.4
Preparation difficulties	0.4	24.3	10.6
Availability on the market	6.2	35.2	4.5
Weakness of the offer	26.1	1.8	1.0
Weakness of the production	.0	9.3	25.3
Consumer taste	0.0	1.8	0.0
Consumer habits	1.8	5.5	1.0
Price	0.4	3.0	2.5

Source: Fall, Amadou, Cheikh Fall, Rokhaya Gningue, Babacar Ndir and Maimouna Ndour. "*Etude sur les Critères de Qualité et les Modes de Consommation du Riz au Sénégal,*" 2007.

Note: The results are given as percentages.

A recent Oxfam-funded initiative, the Market Access Support Programme to Rice Farmers in Northern Senegal (*Programme d'appui aux Initiatives du Nord*, PINORD) has developed a new enhanced-quality Senegal River Valley rice brand "Rival" (*Riz de la Vallée*). The role of PINORD is to govern quality through processing, cleaning and packaging, to provide microfinance, and to develop a commercially oriented mentality among producers. While this initiative is relatively small-scale and potentially limited by its reliance on an NGO for market access, it has succeeded in demonstrating the local market potential for quality local rice.

A good portion of production from Saint-Louis and Matam flows through Touba in the region of Diourbel on the way to the center and south of the country.[24] Within the Senegal River Valley, primary weekly collection points exist close to the grand perimeters, roads and mills at Boundoum, Débi-Tiguet, Thiagar/Rossso, Thillé Boubacar, Dioum and Bokidiawé. Secondary markets in Saint-Loius include Sor, Pikine, Ndar Toute, and also Ross-Bethio and Richard Toll.[25]

[23] Fall, et al, "*Etude sur les Critères de Qualité et les Modes de Consommation du Riz au Sénégal.*"

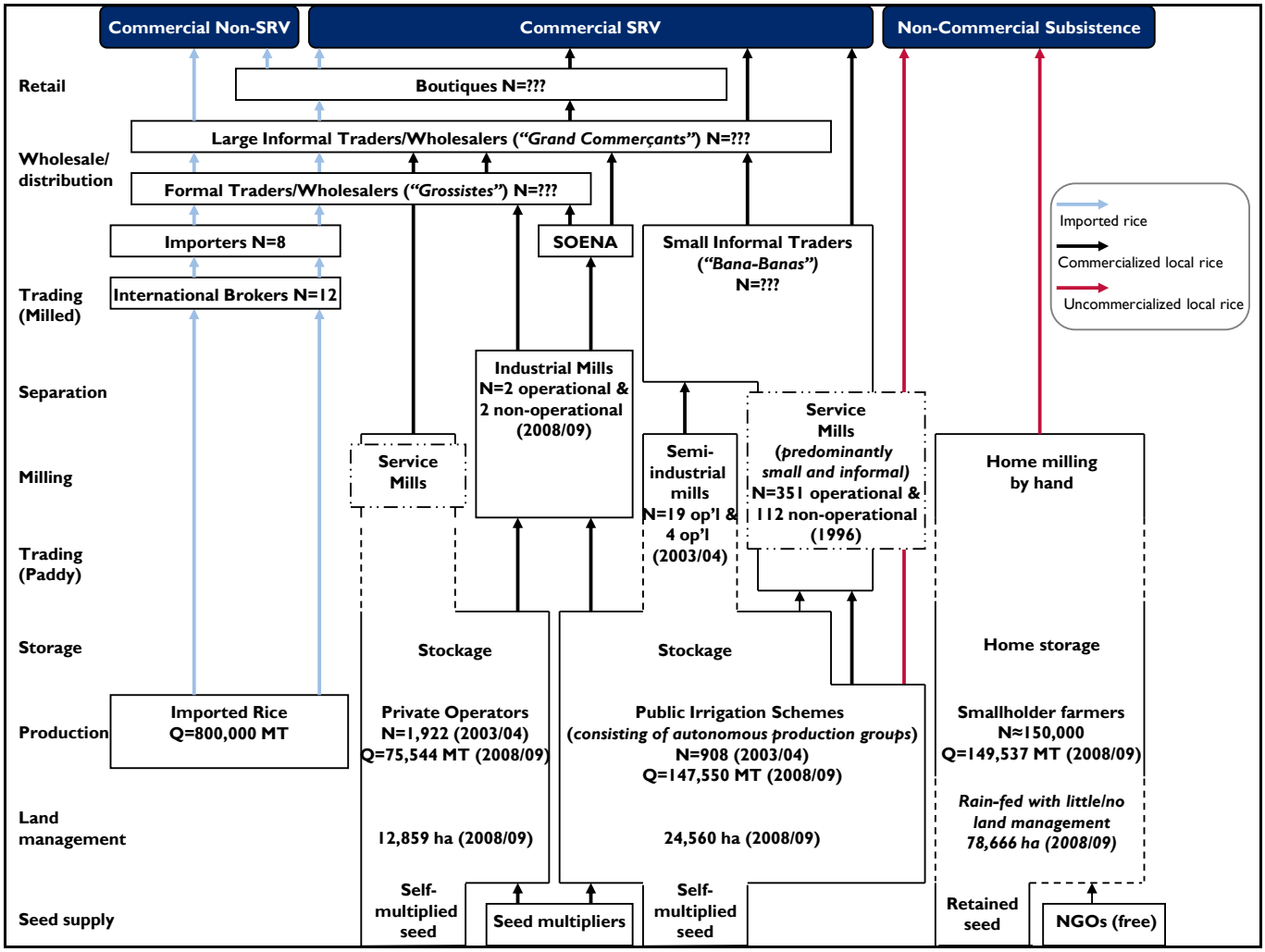
[24] JICA, "The Study of the Reorganization of the Production of Rice," 3-6.

[25] Sen Ingénierie Consult, "Etude portant sur un système performant de commercialisation des produits agricoles," 21.

IV. CHAIN ANALYSIS

A. STRUCTURE OF THE RICE VALUE CHAIN

Figure 14. Senegal Rice Value Chain Map



B. END MARKET CONSUMERS

The two main divisions of rice consumers are those who mainly obtain rice from the market ("commercial") and those who principally obtain rice from their own production ("subsistence"). These broad categories also generally correspond to urban and rural households, respectively. Moreover, it is useful to distinguish between those consumers who have exposure and frequent access to local rice and those who are accustomed to only seeing imported rice on the market. As local rice rarely penetrates beyond the Senegal River Valley ("SRV"), the "commercial" category can be further disaggregated into "commercial SRV" and "commercial non-SRV." Consumers in Dakar are likely the most significant segment of the commercial non-SRV end market.

Import statistics suggest that the commercial non-SRV market may be further segmented into wealthier households, who more regularly purchase expensive fragrant rice, and poorer households, who regularly purchase cheaper ordinary white rice. Recognizing this potential market segmentation is helpful for understanding that the rice market is not driven exclusively by price, however this detailed level of segmentation was not deemed useful for characterizing the current structure of the rice industry in Senegal.

C. MARKET CHANNELS

Product currently flows to these consumer segments through three main channels; each channel moves about one-third of irrigated rice production.

Channel 1: The first, and most dominant, channel involves a network of wholesalers (*grossistes* and *demi-grossistes*) and retailers who primarily distribute imported rice but also take in about one-third of domestic irrigated production. This retail network is most active in urban and peri-urban markets due to the concentration of purchasing power.

Channel 2: In poorer and more rural areas, organized retail is less common and a second market channel dominated by small, informal traders (known as *bana-banas*) becomes more prominent. This second market channel deals primarily in local rice (roughly one-third of total irrigated production) and is characterized by smaller and more intermittent sales by producers and purchases by consumers. Most producers and consumers who define this market channel acquire a large part of their household rice requirements through subsistence production and sell small quantities of their rice stocks throughout the year when cash is needed or, similarly, purchase rice when their stocks are insufficient.

Channel 3: The third market channel represents subsistence production/consumption and rarely involves commercial actors except for the purchase of some inputs and for occasional service-milling. While virtually all of Senegal's rain-fed rice production flows into this channel, most irrigated rice farmers retain about one-third of their production for home use.

D. VALUE CHAIN ACTORS

Importers: While 43 importers were active in 1996, 66 percent of all imports now flow through only 4 importers, with approximately 4 others responsible for the remainder.[26] Importers buy shipload quantities of rice through a cluster of 12 brokers located in Switzerland rather than directly from exporting countries, which they then store in their own warehouses in Dakar. By contrast, the smaller importers deal in container-sized transactions that they tend to distribute quickly upon arrival. Although these smaller quantities are not much of a threat to the dominant importers' market share, the sudden arrival of new inventory can cause some price volatility that can jeopardize their small margins. The major importers reported that their business became markedly unprofitable during the 2008 price crisis, as they were forced to buy inventory at relatively high prices but were under substantial political pressure to maintain lower retail prices.

Semi-wholesalers (demi-grossistes): Semi-wholesalers trade in a variety of foodstuffs and other products. They buy imported rice from wholesalers or from *bana-banas*, but rarely from large Dakar-based importers. There are 15 semi-wholesalers in Saint-Louis, most of whom sell local rice and imported rice. Semi-wholesalers purchase local rice from *bana-banas* (50 percent), from producers (18 percent) and the rest from wholesalers.[27]

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[26] World Food Program, "Rapport sur l'analyse de marché Sénégal: commerce du riz," 24-30.

[27] Sen Ingénierie Consult, "Etude portant sur un système performant de commercialisation des produits agricoles," 21.

Saint-Louis provides the majority of commercial SRV. In the three major markets of Sor, Pikine and Ndar Toute, there are 89 major traders, including wholesalers (8), semi-wholesalers (15) and retailers (66). Four of the eight wholesalers sell local rice, supplied by *bana-banas* or directly from rice mills.[28]

SOENA: The *Société d'Encadrement Agricole* (SOENA) was created in 2008 to provide market access for priority agricultural products supported by GOANA. While SOENA is structured as a private institution, an estimated 20 percent of its capitalization comes from the GoS. In the rice sector, SOENA intends to act as both an intermediary (buying paddy rice directly from farmers and milling it through service processors) and a distributor (retailer directly to urban consumers). Its plans call for purchasing 10 percent of the total 2009 SRV production and 20 percent in 2010 as well as establishing 43 boutiques in Dakar. With ambitious objectives and a political mandate, SOENA may alter the dynamics of commercial market channels for domestic rice. However, it is still a nascent player with no track record, so it is still too early to tell what its real role and impact will ultimately be.

Retailers: Retailers obtain rice from wholesalers (62 percent), *bana-banas* (23 percent) or directly from producers. Of the 66 retailers in the Saint-Louis markets, 86 percent sell local rice, compared to 63 percent selling imported rice.[29]

Bana-banas: Small informal traders known locally as *bana-banas* buy SRV rice in relatively small quantities at the farmgate. The lack of long-term relationships between traders and producers and the shortage of working capital makes it hard for these traders to accumulate significant or consistent inventories. As a result, this large network of traders engages in very short-term, transaction-oriented behavior that has as strong influence on the performance of the entire industry.

Industrial and semi-industrial mills: Prior to liberalization, the State operated large rice mills and was the only buyer of rice. After privatization, the value chain has become fragmented and informal, decreasing profitability and increasing risk for the two industrial mills still in operation. With collection and processing of rice dispersed in small quantities and transactions, the industrial mills are over-capitalized with out-dated equipment, and are not operating at full-capacity. Processed rice is sorted into broken, mixed, and whole grain rice, unlike at smaller service mills.

Service mills: High rice production areas are well served by small service mills *(petites décortiqueuses*), which clean and de-hull rice. Constrained by the lack of working capital, the mill operators do not buy paddy themselves; instead they process on behalf of *bana-banas* or for individual farmers. Due to the function of rice as a means of smoothing household cash flow, small-scale processors play a hidden but important brokerage function in the value chain between buyers and sellers. Traders approach a local *décortiqueuse* to find out which farmers are ready to sell, and have paddy processed at the same facility. Millers express interest in playing a stronger role in the value chain and may be an interesting leverage point.

E. SUPPORTING MARKET ACTORS

CNCAS: The National Agricultural Credit Bank of Senegal (*Caisse National de Crédit Agricole du Sénégal*, CNCAS) began operations in 1986 to deliver agricultural input and output credit in place of state-run development agencies that had recently shut down. From its beginning, CNCAS has relied on government and donor subsidies to support its initiatives and, as a result, has frequently adopted their priorities for targeting loans and minimizing interest rates at the expense of its own financial health.[30] CNCAS lends roughly $27.5 million per year for agricultural production at an interest rate of 7.5 percent. With 19 branches nationwide, CNCAS is virtually the only bank operating in rural areas; 7

[28] Sen Ingénierie Consult, "Etude portant sur un système performant de commercialisation des produits agricoles," 21.

[29] Ibid.

[30] Biteye, "Outreach and Sustainability of Rural Financial Institutions in Sub-Saharan Africa."

of its branches are located in the Senegal River Valley, where it finances nearly all irrigated rice production. CNCAS maintains a very close relationship with SAED in its risk assessment procedures: SAED is required to verify the production potential of loan applicants from irrigated rice producers. Additionally, input financing from CNCAS can only be used to purchase certified seed.

SAED: Originally a parastatal agency charged with managing conditions for irrigated rice production and commercialization in the Senegal River Valley, SAED is now an independent nongovernmental organization financed chiefly by the GoS to provide technical assistance and advisory services to irrigated rice farmers. SAED's primarily role is in the development, maintenance and management of irrigation infrastructure. Its previous functions in supplying agricultural inputs, guaranteeing credit repayments, purchasing rice production and operating industrial rice mills were transferred to other actors or completely privatized during the mid-1990s liberalization of the rice sector. **SODEFITEX** (*Société de Développement et des Fibres Textiles*, or the Society for the Development of Textile Fibers) plays a similar role as SAED but for the cotton sector; its technical assistance arm, known as BAMTAARE, promotes rain-fed rice production in Kolda, Tambacounda, and Kedougou regions.

ANCAR: The National Agency for Agricultural and Rural Extension (*Agence Nationale de Conseil Agricole et Rurale*, ANCAR) provides no support to irrigated rice production in the Senegal River Valley, which is the domain of SAED. Rice farmers in other regions of Senegal, especially in rain-fed areas, are within ANCAR's mandate. However, limited staff capacity, funding and motivation have kept ANCAR's role in rice extension to a bare minimum.

Certified Seed Suppliers: Certified seed indicates an improved variety coming from reliable genetic stock that has been properly multiplied, verified and conditioned to ensure its purity and quality. Senegal's system for producing certified seed is fundamental to the performance of the domestic rice sector: irrigated rice production relies on such certified seed for its high yields, and improved rain-fed varieties (such as NERICA) would need to navigate this system to reach farmers. Base genetic stock is tested by **ISRA** (*Institut Sénégalais de Recherches Agricoles* or the Senegalese Institute for Agricultural Research), approved by the government for use in Senegal, and then furnished by ISRA for multiplication. Seed multiplication is undertaken by the private-sector actors (*producteurs agréés*) authorized by **DISEM** *(Division de Semences* or the Seed Division of the Ministry of Agriculture) under the oversight and with the support of **DRDR** (*Direction Régionale de Développement Rural* or the Regional Directorate for Rural Development). Multiplied seed must be tested and verified by a specialized DISEM laboratory and conditioned by one of the two contracted **CTS** (*Centres de Triage de Semences* or Seed Sorting Centers) in the country. It is then returned to the multiplier for sale and distribution. Certified seed is typically self-multiplied by larger farmers or farmer groups or, alternatively, sold directly from multiplier to farmer; rarely does it enter the inventories of private input dealers. The complex division of responsibilities and intensive government oversight provide multiple bottlenecks and limited supply response for furnishing certified rice seed in Senegal.

Fertilizer Suppliers: Fertilizer is supplied through the formerly state-run agrochemical monopoly, with a subsidized retail price currently set at 40 percent of the market price. While this subsidy is expected to be withdrawn incrementally over the course of GOANA, widespread political support will likely justify its continuation in some form.

V. SYSTEMIC CONSTRAINTS AND OPPORTUNITIES IN THE VALUE CHAIN

A. CONSTRAINTS

1. BUSINESS ENABLING ENVIRONMENT

The government's high profile PNAR is primarily a welfare approach to facilitate subsistence production and does not necessarily encourage private-sector engagement. The pre-liberalization mentality that the government should play a heavy-handed role in providing farmers the means for production still predominates. The government plan emphasizes commitment to supporting, maintaining and expanding public irrigation perimeters. There is no coordinated plan to match the location of new public irrigation schemes with excess processing capacity. Government involvement in seed certification and the government subsidies of fertilizer through virtual monopolies on fertilizer import and distribution are seen as key constraints to value chain upgrading.

The current unprofitability of imported rice creates an opportunity for large importers to invest in local rice production, but the government attitude that "the land in the north is for farmers in the north" undermines the ability of private investors to access land for commercial rice production. Government strategy does not include incentives for existing commercially-minded Senegal River Valley farmers to scale-up production nor does it encourage subsistence-oriented farmers to become more commercial.

2. END MARKET ACCESS

Imported rice commands the Senegalese market and has little difficulty in reaching urban and peri-urban consumers. Retailers frequently offer rice in a variety of packaging and grades to cater to the needs and preferences of most socio-economic groups. Importers and wholesalers also offer a range of payment terms to smaller retailers to facilitate consistent inventories and respond to cash flows.

Rice is produced locally (both irrigated and rain-fed), predominantly for subsistence and consumption smoothing. This is not to say that local rice does not enter commercial market channels but, rather, that farmers have a primarily non-commercial motivation for producing rice. Local irrigated rice production exceeds home consumption needs and enters commercial market channels in two main ways: (1) in comparatively large transactions following each harvest (one-third of total yield) to pay back production credit extended by CNCAS, and (2) in comparatively smaller and more irregular transactions throughout the year when farm households are short of cash (one-third of total yield). Local rain-fed rice production tends to match household consumption needs and rarely enters commercial market channels.

Market signals are highly obscured in local rice market channels, meaning that indications of demand fluctuations or changing preferences among consumers do not reach actors closer to the base of the chain. The highly fragmented organization of the local rice chain limits the effective transfer of information, such as market signals, and provides poor incentives for agglomeration strategies and improved product quality. This fragmentation and weak upgrading also limits engagement with larger buyers, such as those actively involved with imported rice.

3. VERTICAL LINKAGES

The rice value chain is fragmented and informal, characterized by a high degree of uncertainty, informality and risk as well as a lack of production planning, despite the profitability and high yields of irrigated rice. Before liberalization the GoS shouldered all production and marketing risk, and there as a general expectation that private-sector intermediaries should play the same role. Most producers are not commercially oriented and prefer to make small, intermittent sales to mitigate household risk and smooth consumption. Such transactions significantly constrain processors needing larger supplies. Even if rice traders or mills had sufficient working capital to purchase large quantities of paddy post-harvest, they would find it difficult to find farmers willing to sell in bulk. The more commercially-oriented private producers sell a higher-proportion of their harvest but cultivate smaller plots resulting in lower volumes.

Intermittent transactions also prevent long-term relationships between buyers and sellers. Transactions are primarily arms-length with a complete lack of forward contracting and embedded services. A degree of vertical coordination held-over from pre-liberalization is the annual meeting in Saint-Louis of all industry players to discuss current production costs to set a benchmark farmgate price. However, this does not in practice influence production planning or market prices.

4. HORIZONTAL LINKAGES

While there is a high degree of vertical fragmentation in the local rice industry, horizontal linkages are frequently stronger at certain functional levels. The most prominent is among producers on irrigated perimeters established by the State in the Senegal River Valley. Operation of these perimeters was transferred to farmers after liberalization, and farmers were mobilized into various formal structures for managing the land. Producers cooperate most frequently to manage land, operate irrigation infrastructure, make bulk purchases of key inputs, and undertake collective marketing to repay production credit. Less frequent cooperative functions include the storage and processing of harvested rice. These horizontal structures have been largely effective for managing common resources and receiving various forms of assistance from the state.

However, collective marketing is the weakest function carried out by most of these associations. Their efforts are almost exclusively restricted to selling an agreed portion of each farmer's harvest calculated to repay their individual loans from CNCAS (usually about one-third of average yields). Association members leading this function are frequently selected for their social status rather than any relevant commercial knowledge or skills. The function itself is geared to generating a minimum level of revenue sufficient to repay credit rather than to maximize individual farmer profit. Each producer is customarily responsible for any additional sales they may wish to undertake for household income. Given the range of functions these associations carry out, and which may be more appropriate to this mode of collective decision-making, it is unclear whether there is scope to improve the commercial orientation of the groups' collective marketing efforts.

Agglomeration strategies are generally weak throughout the irrigated rice industry. Collective marketing is weak among public irrigation associations. Little cooperation has been observed among private operators. Though they also tend to market a higher proportion of their overall production, private operators generally produce smaller volumes. Natural agglomeration points in the value chain, such as traders and processors, have limited working capital and tend to deal in smaller quantities that introduce significant inefficiencies into the system. However, many informal service-processors facilitate agglomeration by helping to broker the frequent small, intermittent transactions between producers and traders.

5. SUPPORTING MARKETS

Input supply: Although the government is not directly involved in input supply markets (except fertilizer) there are many hidden influences and subsidies which prevent the involvement of private-sector retailers. The biggest bottle-

neck is the supply of certified seeds, which are needed in order to qualify for a CNCAS loan. The complexity of the certification process has led to a limited number of retail certified seed multipliers. Farmers either become certified producers themselves or obtain certified seeds through personal relationships with such farmers. Fertilizer does have an official subsidy of 40 percent, which allegedly decreases yearly, although it is unclear how it works in practice. Urea seems to be the only input that is easily available through private retailers.

Equipment: No private retailers of agricultural equipment serve the rice value chain despite the need for mechanized threshers and land preparation equipment. Large farmers who have purchased equipment will rent out after prioritizing their own land, but the limited window of opportunity for cultivation and harvest decreases overall efficiency. Donor involvement has been limited to heavily subsidizing or providing equipment to producer groups in public irrigation schemes, without paying attention to incentivizing private actors to unclog this bottleneck.

Processing: The government is not currently involved in processing. Increasingly specialized production and harvest services are available in zones of intensive cultivation, but supply is still inadequate in these areas and virtually unavailable in other zones. The lack of working capital also creates a bottleneck for processors wishing to play a stronger role in terms of buying, milling, storing and selling rice themselves. Currently mills process on the behalf of others, either producers or traders, who themselves are limited to small and intermittent transactions. Although there is a limited USAID-backed credit guarantee scheme, local bank branch offices are not aware of the program and its requirements.

Extension: Knowledge dissemination to irrigated rice producers through SAED has been successful, contributing to high yields in the Senegal River Valley. With a mandate for managing land and water management and not agricultural production, SAED is still the primary point of contact with farmers of public irrigation schemes and is thus able to effectively channel appropriate extension services. This success has crowded out information provision from any private-sector actors such as buyers or input suppliers. However, for subsistence or rain-fed farmers that are solely served by government extension providers, knowledge dissemination is much less efficient.

Financing: Credit for agricultural production is exclusively provided by CNCAS, a private bank, but nevertheless highly political. SAED facilitates access to credit by validating loan applications. Loans are disbursed in 9-month cycles with a government-subsidized interest rate of 7.5 percent (average market rates are actually around 12.5 percent). Although the performance and operations of CNCAS has improved over the years, it still suffers from many of the financial sustainability, risk management and loan recovery issues common to other government-influenced agricultural banks in the region. Continued dependence on CNCAS for financing rice production is likely to be problematic. Other types of financial services, for production as well as other functions in the value chain, are virtually non-existent and a further drag on the sector's efficiency and competitiveness.

B. OPPORTUNITIES AND INCENTIVES FOR UPGRADING

Rain-fed rice producers are most likely to invest in measures to upgrade their productivity when they involve minimal cash expense and show tangible benefits within a growing season. As subsistence producers, these farmers are less motivated by profit or direct monetary gains. Rather, they will be looking for non-monetary benefits that generate greater rice stocks for the household and decrease the amount of labor and other household resources devoted to rice production. These producers are likely to also respond to strong pressures of conformity to adopt prevailing practices among their peers or improved practices advocated by recognized leaders in their communities. As rice production is frequently delegated to women and considered a supplementary, non-commercial activity, any increased commercial orientation may provoke gender-based conflicts and could provide strong disincentives for these types of upgrading.

The majority of irrigated rice smallholders demonstrate a similar orientation towards subsistence behaviors. The main difference, however, is the uniformly high level of upgrading that has already occurred. With decades of intensive

governmental support, these producers have achieved high levels of production knowledge, skills and practices that generate consistently high yields and marketable surpluses. Yet their commercial incentives are aligned towards minimizing risk at the expense of realizing maximum revenues and win-win relationships with private buyers. They are likely to invest in better commercial strategies if they can find new ways of managing risk, both within their household and within their farming enterprise, that are consistent with the risk-sharing motivations of the private sector.

By contrast the PIPs, who operate in conjunction with or completely independent of the large public perimeters, have much stronger commercial incentives. They have invested their own resources in developing and managing their irrigation schemes and, accordingly, have better resources and appreciation for managing risk. These private producers have the capacity and incentives to both expand their operations and also undertake a variety of functional upgrading. They have the potential to play a more significant role in deepening their relationships with buyers, aggregating smallholder production, augmenting local processing capacity and providing support services to other producers.

Within most functional levels of the private sector, an inability to comprehend and cope with producer behavior provides a substantial disincentive to upgrading. Most traders, wholesalers and processors expressed a desire for more formalized and longer-term relationships with producers but were certain that farmers would not agree to such arrangements, even if they were also in their best interest. Private-sector actors expect their business partners to share some degree of risk in their transactions, which tends to conflict with farmers' collective aversion for risk in rice production and marketing. These actors seem willing to invest in closer relationships with farmers (as well as elements such as embedded services that help to drive such relationships) if mutually acceptable models can be found.

SOENA presents a unique case distinct from the rest of the private sector. It has strong incentives to cultivate relationships with smallholders, and its government mandate gives SOENA solid credibility with the farmers. The rest of the private sector is monitoring its performance closely to ascertain whether it is a serious competitor and also to understand whether it can change the farmer-buyer dynamic.

The importers controlling the imported rice market may have some emerging incentives to invest in the domestic rice industry. Perhaps the strongest motivation is the threat to their import business due to fluctuating prices and export policies, which have introduced a new element of uncertainty and, reportedly, unprofitability into their traditional business model. Domestic rice may present an opportunity to diversify their inventories and business models against this uncertainty. However, this glimmer of opportunity is currently balanced by some strong disincentives: not knowing how to source from smallholder farmers, questions of product quality and quantity, and the expectation that a pro-farmer government may undermine any investments they make in the sector.

Government agencies, and the institutions they directly support, have played a heavy-handed role in the rice sector. At a high level, they are motivated by the national plan for self-sufficiency in rice and will do whatever it takes to achieve the ambitious, primarily production-oriented targets set by the plan. At a lower level, they very much see their role as supporting the smallholder farmer, especially in the state-led welfare role of the pre-liberalization period. The farmers trust the front-line government specialists who interact with them and have grown to expect the state to mitigate or assume virtually all risk in the rice sector. The government has little experience in engaging and supporting the private sector and tends to view them as predatory.

VI. STRATEGY FOR THE RICE VALUE CHAIN

A. VISION FOR THE VALUE CHAIN AND FOOD SECURITY

The GoS vision is for the rice value chain to produce 1,000,000 MT of white rice annually by 2012, a 5-fold increase over 2007 levels, to achieve complete self-sufficiency in rice. Existing strategies call for a US $390 million investment in public irrigation infrastructure, input subsidies and farmer extension and training. Such rapid growth may not be realistically achievable, and such a high level of government subsidy is likely to be unsustainable. An alternative vision is needed to support GoS objectives but also maximize the catalytic and sustainable impact of US government programming decisions and investments. Such a vision follows.

By 2020, Senegal will have reduced its dependency on rice imports to achieve a self-sufficiency level of 40-50 percent, or roughly double the 2007 level. These gains will come primarily from expanded irrigated rice production led by significant growth in private-sector investment in infrastructure, services and capacity to sustain these advancements. Although it will contribute less to overall growth, rain-fed cultivation will experience a 30 percent rise in productivity due to higher-yielding varieties and increased mechanization. Reduced dependence on imports and greater consumer access to domestic rice will ensure greater food security in the event of renewed instability in the international market for rice.

B. COMPETITIVENESS STRATEGY

Imported rice does not have deep market penetration in areas of rain-fed rice production for the following reasons: (1) households have little disposable income and prefer to allocate labor to produce rice themselves rather than cash to purchase rice, (2) rice production is a traditional activity in many areas that is strongly linked to local culture and pride, and (3) households generally prefer the characteristics of local rice over imported rice. In this non-market context, strategies over the short to medium term are less relevant for bolstering the competitiveness of domestic rice. Instead they should focus on enhancing the value rice production brings to producer households. By pursuing increased productivity, reduced labor requirements and improved household risk management, these strategies can free up household resources to be re-allocated to more remunerative activities.

In commercial market channels, local rice can compete with imported rice as long as it does not have to compete *solely* on the basis of cost. Senegalese rice has a number of product attributes—both tangible (e.g., taste, freshness, swelling capacity) and intangible (e.g., perception of food safety, Senegalese pride)—that are valued by consumers. However, the commercial market channel of the domestic rice industry is currently too fragmented and risk-averse to perceive and act on any upswing in market demand. Local irrigated rice must improve its awareness among consumers and make significant advances in operations and efficiency to compete more effectively with imported rice. This two-pronged strategy of demand-creation and supply-response can create a mutually reinforcing feedback loop that accelerates growth and competitiveness if sufficient enabling conditions are introduced that stimulate an increased commercial orientation in the local rice industry.

An industry upgrading strategy for Senegalese rice oriented towards food security should have two distinct components: commercial (irrigated) rice and subsistence (primarily rain-fed) rice.

C. UPGRADING STRATEGY FOR COMMERCIAL / IRRIGATED RICE

The commercial component is centered on primary production zones in the Senegal River Valley and market centers in Saint-Louis, Touba and Dakar. Short- to medium-term priorities will target an increased share of the domestic market by addressing three main areas: enabling conditions, market development and operational efficiencies.

1. ENABLING CONDITIONS

Irrigated rice production in Senegal demonstrates a remarkable paradox of outstanding productivity yet poor market penetration. An underlying factor influencing this situation is the low level of commercial orientation in rice production. Most irrigated rice farmers produce for household use and market their surplus primarily to repay production credit and secondarily to smooth household cash flow throughout the year; their objective is to mitigate risk rather than to maximize profit. Yet irrigated rice production is widely known to be a highly profitable enterprise.

GoS initiatives promote rice for self-sufficiency at the household and national levels, which has instilled a welfare-oriented view of rice production with the state assuming much of the risk. Commercial players have been shut out or crowded out of opportunities. Insufficient mechanisms exist for managing relationships and risk in the system, creating a highly fragile and volatile industry. This is evidenced by the proliferation of buyers who deal exclusively in relatively small, informal and short-term transactions. Much of this seems to stem from an incomplete transition from a state-run production and marketing monopoly in the 1990s that effectively maintains the same production systems but seeks to liberalize marketing functions.

Improved industry competitiveness will require upgraded enabling conditions that are more favorable to the interests of commercial actors. They require reduced barriers to entry and means of managing risk that are not dependent on the direct involvement of government institutions. Farmers also require more differentiated levels of assistance that can incentivize less risk-averse producers to become more commercially oriented. Such upgrading might include the following:

- Enhanced government view of and clear role for the private sector in GoS rice strategies
- Reformed land concession procedures with clear criteria for granting land to new and existing producers willing to invest in land preparation and irrigation infrastructure
- Greater confidence in market mechanisms, such as MOUs and contracts, to manage risk and resolve conflicts
- Support services that are more transparent and widely available, especially for basic inputs, extension services, finance and equipment leasing

2. MARKET DEVELOPMENT

Domestic rice is relatively unknown as a consumer product in Senegal's dominant urban markets, which are accustomed to buying imported rice. Preliminary research conducted by WARDA suggests that urban consumers appreciate the taste, freshness and swelling capacity of domestic rice. However, appearance, packaging and cleanliness are important characteristics that influence buying decisions. These findings are consistent with pilot efforts undertaken by PINORD to develop a brand for high-quality local rice. Branding strategies emphasizing the unique selling points of domestic rice and incorporating appropriate and attractive packaging are fundamental for penetrating urban markets.

SOENA has plans to launch its own brand and network of urban retail shops for domestic rice. However, it will be important to encourage a range of competing brands to build aggregate market demand for local rice as well to ensure that the success of this effort is not solely dependent on the performance of a single firm. Two strategies can support the development of market demand and brand identity for local rice; the appeal and ultimate success of either strategy is a function of the motivations and resources demonstrated by leading local actors as well as the risk deemed acceptable by USAID and its implementing partners.

- **Private sector-led brand development and promotion:** The ideal strategy is to support local actors to execute their own brand development and marketing strategies. Firms such as SOENA and the major importers demonstrate some incentives or initial actions that suggest this strategy may be viable. However, effectively supporting this strategy (which relies so heavily on local ownership, leadership and investment) will require clear expectations for modest and gradual progress but guarantee greater prospects for sustainability.

- **Project-led brand development and promotion:** If local actors perceive too much initial risk to invest in their own brands, a USAID project could develop an umbrella branding strategy for local rice that individual firms could exploit or buy into (through a sort of licensing arrangement) if they meet certain criteria. This strategy offers the potential for accelerated progress but presents significant risks of over-subsidization, project dependency and lack of local ownership if the strategy is not well conceived, implemented and deliberately transferred to the private sector.

3. OPERATIONAL EFFICIENCIES

The supply response to existing and future market demand is largely dependent on the ability of the chain to deliver adequate quantities of quality local rice in a timely and affordable manner. The present low and *ad hoc* levels of operational coordination are symptomatic of antagonistic relationships among firms, which only permit short-term transactions to occur. A longer-term view of business opportunities and commercial relationships is the foundation for more supportive relationships between firms, which facilitate more efficient transactions through improved agglomeration strategies, inventory management, risk mitigation and investment in production. A variety of strategies should be tested to identify the most viable entry points and sequence of interventions that can change this dynamic.

The high level of risk endemic in the domestic rice sector seems to originate with the disengagement of the GoS from rice production and marketing. Farmers still expect most of their risk to be borne by other parties, while private-sector actors are reluctant to become entangled in lop-sided relationships where their risk is higher than their returns. Enhanced interaction among different actors can improve their appreciation for each other's motivations and operational tactics, providing a strong foundation for win-win relationships to develop. Past efforts in other sectors have shown that buyer/seller events can provide the structure for this interaction to occur. These events may be more social in nature, for instance combined with local cultural events, or organized for more explicitly commercial purposes, such as a buying day or *bourse*. Thereafter, other interventions can help to provide the building blocks for ongoing risk sharing and management. Production planning among farmers is a critical starting point for them to negotiate and deliver on longer-term contracts. Strategic alliances among producers, buyers or processors, and service providers can facilitate a range of forward contracting, embedded services and predictable inventory levels with acceptable levels of risk shared among all parties.

Developing trust, win-win relationships and enhanced risk management mechanisms is a critical though somewhat slow and gradual process. In the meantime, other strategies focused on service markets can be helpful in expanding operational efficiencies over the short term. These strategies leverage existing consumer behavior among farmers and other actors, which tends to be well developed even if their entrepreneurial acumen is less effective or advanced. The following services can improve overall efficiencies; many are already provided by a small number of operators or could be offered by larger producer associations with excess capacity.

- Land preparation and harvesting services provided by larger producers or third-party operators who already own appropriate equipment
- Service milling (for producers or buyers) provided by semi-industrial mills operated by large associations or independent entrepreneurs
- Storage facilities for bulking production from multiple farmers and/or retaining inventory in expectation of higher prices

- Brokering transactions between farmers and traders, coordinated initially by service millers, which could evolve into more formal collection centers

Finally, access to appropriate finance is a common constraint throughout the industry that severely affects efficiency. Financial products and services common to other industries, such as supplier and inventory financing, are completely absent in the domestic rice sector, which is largely due to the lack of long-term, supportive business relationships. However, CNCAS is essentially the only financial institution serving the sector, and any upgrading strategy should prioritize introducing new banks to the industry.

D. UPGRADING STRATEGY FOR SUBSISTENCE / RAIN-FED RICE

Rain-fed zones are concentrated in lower Senegal: parts of Tambacounda region and throughout the Casamance. Priorities over the short- to medium-term include investments in expanded productivity, labor savings and household risk management.

1. EXPANDING PRODUCTIVITY

Productivity tends to be low among rain-fed smallholders because they do not use proper planting seed or fertilizer and other soil enhancements. The availability of these inputs is low: rice seed is not available among commercial input providers and fertilizer is only available in blends optimized for other crops (such as maize). Farmers are unaccustomed to purchasing inputs for rice production, primarily because they do not value investments in this activity as they do for other, more market-oriented activities. Farmers may be willing to adjust their behavior if they are able to access key inputs at minimal cost and realize a tangible benefit from their use within a single growing season. While direct subsidies may achieve quick results in this area, they will not be sustainable unless investments are made in strengthening the commercial input supply market. These advancements are also likely to increase the productivity of a range of agricultural crops beyond rice.

Initial upgrading strategies are most likely to find traction if they leverage existing social networks within and between communities, particularly since farmers are not well integrated with commercial networks. Community-based seed banks and/or seed exchanges reinforce the communal behavior of most rural households, require no cash outlays, and refresh the genetic seed stock used by farmers. This community mechanism can then be leveraged to introduce other services and behaviors.

Demonstration plots on community land or with community-recognized lead farmers can showcase promising practices and new varieties. Input suppliers can also be introduced to the community to build mutual familiarity and explore opportunities for retailing new inputs that are useful to rice farmers and retailed in ways that are acceptable to both the community and the input supplier. Building greater contact between input suppliers and rain-fed rice farmers is also a strong foundation for the future introduction of NERICA varieties that are approved and certified by Senegalese authorities.

2. REDUCING LABOR

The exclusive use of manual labor for cultivating and processing rain-fed rice is a significant drag on productivity. Labor-intensive tasks, such as land preparation and harvesting, restrict the area that can be cultivated. WARDA has developed or tested appropriate equipment for land preparation and harvesting in Senegal. While economic returns do not justify individual farmers investing in such equipment, there appears to be a potential market for entrepreneurs to hire out the equipment or offer such services to farmers. Introducing and promoting these new services would require demonstrating the equipment, identifying lead farmers or other businesses to invest in the equipment, promoting the market for the new service, and then scaling up the model through increased commercial availability of the equipment and demonstration effect from successful service providers.

The low availability of mechanized rice mills in rain-fed areas also ties up household labor in the daily preparation of rice for consumption. To the extent that there is little competition or opportunity cost for household labor, there is likely to be little interest in changing this situation. However, in areas where more productive or remunerative opportunities exist for household labor, there may be good market potential to introduce small-scale service mills that can process small quantities of rice for a fee. Introducing these service mills would follow the same approach as labor-saving equipment for rice production. Moreover, many types of mills appropriate for rice processing are already commercially available in Senegal, especially in irrigated production areas.

3. HOUSEHOLD RISK MANAGEMENT

Since rain-fed farmers generally produce rice as a means of managing household risk rather than as an income-generating activity, promoting alternative ways of managing household risk may be an important strategy for moving these farmers into more productive rice farming or into other, more commercial activities. Subsistence households manage risk in ways that seem counterintuitive to outside observers. Because these households can employ their limited assets for both production and consumption activities, any decision to allocate resources for production activities will also consider the impact on consumption activities. Since households also tend to prioritize maintaining their consumption levels in the face of shocks, they frequently select low-risk (and accordingly low-return) activities to generate predictable, though often marginal, income flows. Successfully introducing new options for reducing household risk exposure and expanding income needs to take this behavior into account.

Building self-insurance mechanisms (the stock of reversible and relatively liquid assets it has to draw upon in the event of a shock) is an important foundation for households to make less risk-averse decisions about allocating their resources for both consumption and production. Strategies that promote savings have proven highly effective in strengthening households' abilities to insure themselves against future shocks. Expanding the network of existing savings-led financial institutions are the best starting point; however, more informal methodologies that build on traditional structures (e.g., *tontines*) may be more effective in areas with limited outreach from microfinance institutions. Accessing and employing stronger mechanisms to manage household cash flow and even out consumption is also a necessary prerequisite to engaging in more growth-oriented activities, and these strategies also offer loan products that will support this outcome. It is important to note that credit for smoothing consumption is typically a more successful entry point than credit for starting or expanding business activities.

Mechanisms for saving other kinds of assets can be equally important. Promoting community-based seed or grain banks can be a useful strategy to bolster household self-insurance strategies. Similarly, social networks are a vital self-insurance strategy for virtually every vulnerable household, and any activity that serves to strengthen social ties and mutual support within a community will contribute to this outcome.

When households have adequate means to accumulate savings and manage consumption, they can prioritize investing in productive, income-generating activities. Multiple, diversified, reliable and frequent income streams tend to receive higher priority than simply maximizing profit from an individual activity. Moreover, household will tend to seek activities that require a low investment and have a low risk of failure, although such activities will also feature relatively low returns. Some households will be interested in investing in the productivity-enhancing improvements described above for expanding the income-generating potential of rice production. Others, however, will be looking for other options to diversify their off-farm income, and commensurate strategies should be employed to identify and support other appropriate value chains in which they can participate.

VII. RECOMMENDATIONS

USAID has a strong comparative advantage among other donors in strengthening the commercial market for domestic rice and enhancing the role of the private sector in Senegal's rice self-sufficiency strategies. USAID should play a leading role in advancing a market-driven and growth-oriented agenda for food security while collaborating closely with other donors in the areas of infrastructure development, agricultural research and assistance to highly vulnerable households. The following recommendations will guide USAID in operationalizing the strategies outlined above to strengthen the rice value chain.

A. ENGAGE WITH GOVERNMENT ON PRIVATE SECTOR INVOLVEMENT

GOANA, and the set of rice strategies that support it, articulates the GoS priorities and commitments for reducing Senegal's reliance on imports and ensuring a greater degree of food security for its population. This bold initiative is notable for omitting a meaningful role for the domestic private sector, which has advanced considerably since structural adjustment in the mid-1990s. Commercial investment would accelerate and sustain the productivity advancements pursued by GOANA, and private-sector innovation would continue driving future growth. USAID should initiate dialogue with its GoS counterparts to define a clearer priority and role for the private sector in Senegal's agricultural policies. While USAID's implementing partners have an important role to play in supporting this dialogue (for instance in helping to bring the private sector's voice to the table, generating evidence-based policy analysis, and implementing any recommendations), it is important for the US government to establish and maintain direct relationships with key GoS stakeholders. This ensures that such discussions are perceived as high-level, represent inter-agency US government positions, and leverage the full weight and credibility of the US government with the GoS.

B. FACILITATE INVESTMENT AND INNOVATION IN COMMERCIAL RICE

USAID's ongoing Senegal Accelerated Growth and Increased Competitiveness(SAGIC) program has already devoted several years to developing high-value agricultural value chains and now has a new mandate to focus on staple crops. SAGIC should lead USAID's efforts to develop commercial rice markets and supply chains, consistent with the strategies outlined in the previous section. The mix and sequencing of specific interventions remain to be defined, as they are largely dependent on the incentives and motivations of the private businesses who will be key partners in the effort. Two types of leverage points are evident, where complementary strategies are likely to find traction: (1) supporting lead firms to invest in market development and more supportive relationships in their supply chains and (2) strengthening service markets to foster producer upgrading.

Lead firms, who are willing and able to drive upgrading in the chain, are the most ideal partners. There are currently few lead firms in the domestic rice sector to work with, but SAGIC should pursue pilot efforts with a range of firms to continually identify promising opportunities. Potential partners may include:

- Major rice importers, who have extensive reach into retail networks and have expressed some interest in investing in local rice to diversify their product portfolios
- SOENA, which is conducting a commercial pilot to introduce high-quality domestic rice to the Dakar market
- Industrial and semi-industrial processors, who can play an important agglomeration and brokering role

SAGIC should simultaneously work to strengthen service markets as a means of stimulating upgrading at the farmer level and generating a critical mass of suitable, commercially oriented partners for emerging lead firms. This line of

intervention can advance productivity and efficiency in commercial market channels independently of longer-term efforts to improve vertical coordination and market linkages in the rice industry.

To achieve catalytic and sustainable growth, USAID should ensure that SAGIC acts as a facilitator in its commercial rice interventions. The specific tactics employed by facilitators are identical to those used by other implementers: they provide training, technical assistance, subsidies and a range of possible support services. The difference is *why* facilitators engage in certain activities and *how* they conduct them. Specific interventions are selected by a facilitator only if they move the industry towards being more competitive and broad-based. Each and every intervention should lead to one or more of the following:

- Concentration of new actors that broaden and deepen commercial networks
- Competition based on upgrading and innovation
- Credibility of and confidence in market mechanisms by all market actors through transparent and reasonable benefit flows
- Business strategies that will increase firm or industry competitiveness with regard to end-market factors: e.g., product, operations and branding

Three central principles guide how a facilitator conducts its interventions:

- **Intensity** refers to the magnitude of resources and visibility that a project employs when intervening. The intensity can range from light-touch (i.e., very little resources or involvement and a limited public presence) to more heavy-handed approaches (i.e., greater allocation of resources and an active pubic presence). The default should always be light-touch unless there are compelling reasons that increased intensity is needed to achieve outcomes. However, as interventions become more heavy-handed, the prospects for sustainability reduce drastically because the project artificially shields market actors from actual risks—and withdrawing such project assistance once begun is very difficult.

- **Relationships** among local stakeholders are critical for sustaining outcomes, unlike the relationships between them and the project. Building strong relationships between local actors and the project always creates dependency and weakens sustainability. SAGIC should address the underlying factors that prevent or discourage stakeholders from forming and sustaining relationships with other firms by encouraging them to develop on their own. An effective project tactic is using project assistance to briefly mitigate the perceived risks of engaging in new relationships until stakeholders learn such risk is unfounded or easily managed. Known by many as "buying down risk," this practice encourages sustainable, supporting relationships and limits dependency of stakeholders on the project.

- **Ownership** refers to who actually drives the changes along the economic strengthening pathway. If target actors are already adopting needed changes on their own, the project should avoid engagement. Otherwise, SAGIC must seek ways to catalyze, but not own, the needed changes. "Self-selection" is an effective project tactic that requires stakeholders to invest their own time or resources before being able to access project support. Self-selection becomes an especially effective tactic when employed continuously so that stakeholders take on ownership of each progressive change sought and supported by the project.

C. STIMULATE GROWTH OPTIONS FOR RAIN-FED RICE FARMERS

USAID's second-phase Wula Nafaa project has a mandate to work in agriculture and natural resource management with an explicit focus on wealth creation. It is well placed to lead initiatives with subsistence rice producers, particularly with rain-fed rice, that are consistent with the strategies outlined in the previous section. Interventions should be clustered around two different objectives: (1) increasing productivity of rain-fed rice farmers and (2) integrating subsistence farmers into new market opportunities.

Advancing productivity among subsistence farmers will come from increased use of higher-yielding varieties and labor-saving technologies. Introducing such improvements is best accomplished by strengthening service markets for inputs, equipment and priority services such as land preparation, harvesting and processing. While rain-fed farmers are generally not producing for commercial markets, they are already discerning consumers of various products and services for their household. Leveraging this behavior to introduce rice productivity enhancements is expected to gain more traction and achieve more sustainability than alternative approaches.

Diversifying agricultural and other income-generating activities for subsistence farmers is key for generating greater rural economic growth, household wealth and a new class of consumers for domestic goods and services (such as locally grown rice). Specific strategies remain to be defined, as they are logically dependent on the geographic areas and value chains that Wula Nafaa intends to target. Savings-led microfinance interventions will also support this outcome. While it is not clear whether Wula Nafaa has the mandate to undertake such interventions itself, it should actively partner and link with ongoing institutions and initiatives engaged in these activities.

For both clusters of activities, USAID should ensure that Wula Nafaa employs the same facilitative tactics that have been recommended for SAGIC. Unlike activities for commercial rice, Wula Nafaa will need to focus most intensely on identifying and assisting supporting market actors, rather than lead firms oriented towards output markets. Moreover, Wula Nafaa should actively target community and other social networks as key leverage points for introducing new behaviors and commercial relationships with these service providers.

D. SUPPORT RESEARCH ON CONSUMER DEMAND AND PREFERENCES

In the course of the fieldwork for this analysis, it became clear that stakeholders have very clear preconceived notions about domestic end market preferences for rice in Senegal. However, very few of these claims can be substantiated with credible evidence. The little research that has been conducted to date, almost exclusively by a small agricultural economics team from WARDA's local research station, suggests opportunities and trends that contradict many long-held beliefs about Senegalese consumer behavior with respect to rice. Since any successful rice vale chain development initiative must begin with a strong appreciation for end market characteristics, there is a clear need for further and more targeted research in this area. USAID should prioritize support for such research, particularly with WARDA, by helping to define actionable research questions that will guide policy formulation and project strategies and by mobilizing resources to carry out research activities. This line of research would seem to fit within both the SAGIC and Wula Nafaa mandates and could be supported under either of their projects.

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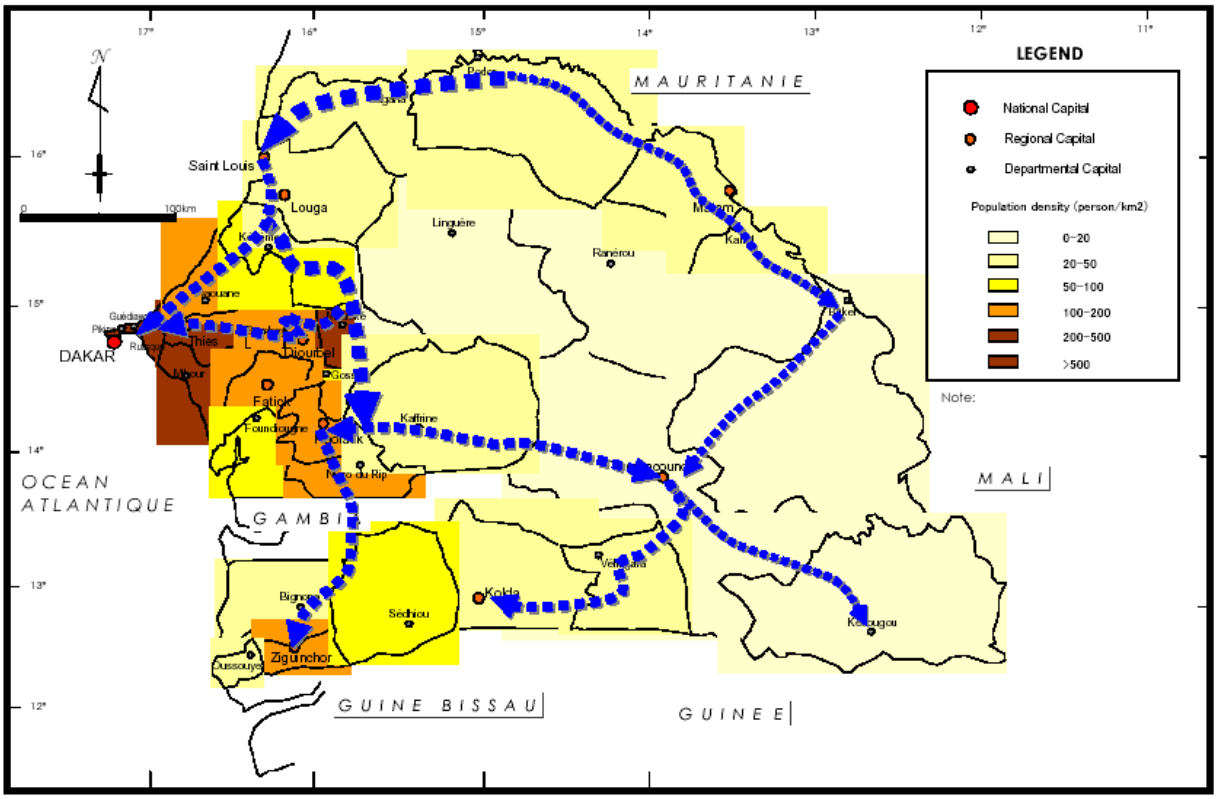
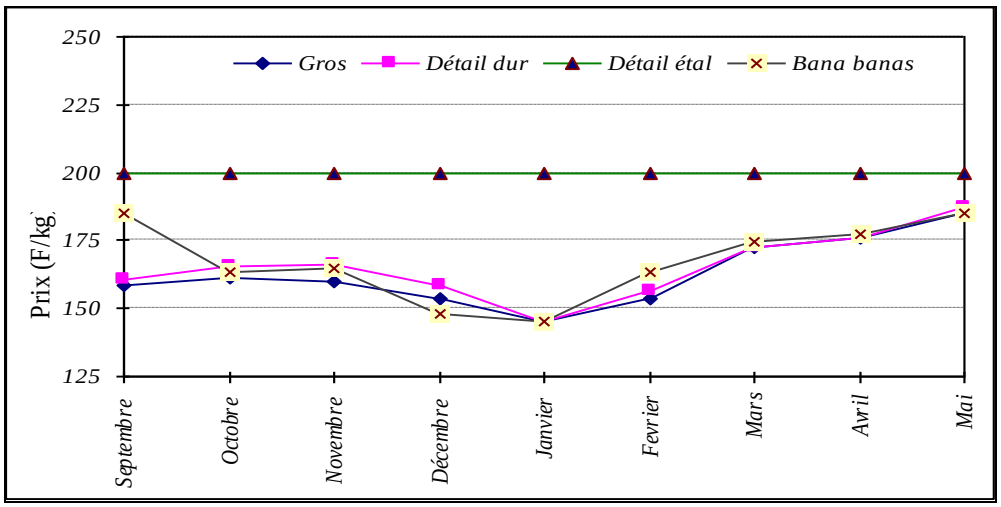
ANNEX B. ADDITIONAL DATA AND FIGURES

Distribution Channels of Local Rice



Source: JICA, "The Study of the Reorganization of the Production of Rice," 3-6.

Pattern of Price Fluctuation



Source: Sen-Ingenierie Consult, "Etude portant sur un système performant de commercialisation des produits agricoles," 24.