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The role of small and medium agrifood enterprises in food systems transformation

The case of rice processors in Senegal



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Preface

International development debate increasingly emphasizes the importance of small and medium agro-enterprises (SMAEs) for pro-poor and sustainable growth in developing countries. Unlike companies in the non-food manufacturing industry, SMAEs are often embedded in rural communities. As such, they are familiar with local income levels, livelihoods needs and dietary habits, and are able to offer a variety of affordable local food products. In this way, they can add value to agricultural produce and create important ‘close-to-farm’ market outlets for small farmers. As they grow, SMAEs can also provide non-farm employment opportunities to young people who might otherwise move abroad or migrate to already overcrowded cities.

Despite their pivotal role, evidence shows that these important actors tend to fall through the public sector policy crevices of agricultural, trade, health and industry support, not only in the sub-Saharan Africa region but in all regions. They are also constrained by many of the same challenges that smallholders face: lack of access to credit and investment, weak infrastructure and capacity, unclear regulatory governance, and an absence of adequate support services, particularly in food safety, business development, marketing, and processing technologies. Given these challenges, SMAEs risk exclusion from rapid market growth for agricultural produce, propelled by the regional surge in population, increasing incomes and urbanization. This prospect also means that demand will continue to be served by rising imports, placing pressure on national balance of payments’ deficits and overall economic development.

Against this background, several important questions arise. Without the advantage of scale, how do SMAEs survive and grow in challenging environments? How is their business shaped by changing trends in food markets? How does the way they arrange their business model impact the community in which they operate? Given the sector’s potential to alleviate poverty, how can policymakers and development actors better support SMAEs in African food value chains?

This objective of this publication is therefore to learn from African SMAEs and, more specifically, from Senegalese rice millers, based on their day-to-day realities, constraints and business creativity in dealing with difficult circumstances. The methodology employed to analyze these enterprises is the output of a multidisciplinary team whose objective is to develop evidence for policy makers on how to better support SMAEs in order to unleash their potential as actors in food systems transformation.

This technical study aims to share ideas about innovations related to procurement, operations, logistics, finance, marketing and sales, human resources, and strategic partnerships with a wide range of stakeholders, including business service providers, NGOs and project teams providing support to SMAEs or smallholder-based business models. The paper includes links to the literature and theoretical concepts in order to allow researchers to build on evidence from the field. Implications for policymakers are also drawn from the analysis and summarized in a separate forthcoming policy brief.

A major contribution of this study is to showcase the multidimensional and complex, heterogeneous nature of SMAEs, which is often oversimplified or underestimated. By understanding their intricate business set-up and its two-way interaction with the external environment, including the policy and institutional climate, consumers and suppliers, and the local community, policy measures can be better customized to their needs.

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Acronyms

ADEPME	Development Agency and Supervision of Small and Medium Enterprises
AEME	Agency for Energy Efficiency
AGRA	Alliance for a Green Revolution in Africa
ANCAR	National Agency for Agricultural and Rural Advice
ANIDA	National Agency for Agricultural Development
ANPEJ	National Youth Employment Agency
APIX	Agency for Investment Promotion and Major Projects
ARN	Association of Northern Rice Processors
ASEPEX	Senegalese Export Promotion Agency
ASER	Senegalese Agency of Rural Electrification
ASN	Senegalese Association for Standardization
ATCL	Association of Local Cereals Processors
BMN	Industrial Upgrading and Modernization Office
BNDE	National Bank for Economic Development
BOAD	West African Development Bank
CET	common external tariff
CF	contract farming
CFA	West African franc
CIRIZ	Interprofessional Committee on Rice
CLM	Cell Against Malnutrition
CNCAS	National Agricultural Credit Fund of Senegal
CNCR	National Council for Rural Coordination and Cooperation
CSS	Senegalese Sugar Company
DEM	Operation and Maintenance Directorate
DPME	Direction Small and Medium Enterprises
ECOWAS	Economic Community of West African States
FAO	Food and Agricultural Organization of the United Nations
FIARA	International Fair for Agricultural and Animal Resources
FIDAC	International Fair of Dakar
FNRAA	National Agricultural and Agro-Alimentary Research Fund
FO	farmer organization
FONGIP	Priority Investment Guarantee Fund
FONSIS	Sovereign Fund for Strategic Investments
GAIN	Global Alliance for Improved Nutrition
GAP	good agricultural practices
GCER	<i>Centre de Gestion et d'Économie Rurale</i> (Centre for Rural Economy)

GIE	Group of Economic Interest
GIZ	German Development Cooperation
GOANA	Grand Agricultural Offensive for Food and Abundance
IFAD	International Fund for Agricultural Development
IFC	International Finance Corporation
ILO	International Labour Organization
IMF	International Monetary Fund
IPTS	Industrial Property and Technology Service Office
IRRI	International Rice Research Institute
ISO	International Organization for Standardization
ISRA	Senegalese Agricultural Research Institute
ITA	Institute of Food Technology
JECFA	FAO/WHO Expert Committee on Food Additives
JICA	Japan International Cooperation Agency
OAPI	African Intellectual Property Organization
PCE	Economic Growth Project (USAID)
PINORD	Oxfam-funded Platform of Farmer Organizations
PNAR	National Programme for Self-Sufficiency of Rice
PRACAS	Accelerated Programme for Agriculture in Senegal
RBV	resource-based view of the firm
SAED	Organization for the Equipping and Development of the Senegal Delta and Senegal and Faleme Rivers
SDE	<i>Sénégalaise Des Eaux</i> (water distribution company)
SENELEC	National Electricity Company of Senegal
SMAE	small and medium agro-enterprise
SME	small and medium enterprise
SODAGIRI	Agricultural Development Agency of Senegal
SONES	Senegalese National Society of Water Usage
SRV	Senegal River Valley
UNACOIS	National Union of Traders and Industrialists in Senegal
USAID	United States Agency for International Development
USAAF	United States Development Fund in Africa
USD	United States dollar
VAT	value-added tax
WAEMU	West African Economic and Monetary Union
WHO	World Health Organisation
WRS	Warehouse Receipt System

◆ Executive summary

Senegal's rice sector presents a valuable opportunity for illustrating how the business enabling environment affects different business components of small and medium agro-enterprises (SMAE's): procurement, finance, operations, human resources and management, marketing and sales. The government has historically focused on augmenting production at the farm-level by dedicating large scale investments to infrastructure. More recently, however, development actors have joined efforts with local institutions to extend their support beyond the farm and production activities.

The adaptation of Porter's value chain framework has facilitated a food systems analysis of SMAE business models from a range of policy entry points. The case does not pretend to be a comprehensive food systems review of the rice sector or even for the milling sub-sector, but in drawing upon different policy angles and how they impact on a sub-set of actors in the chain, it highlights the importance of coordination across public institutions and development partners so that the opportunities for cross-fertilizing policy processes and investments underpinning the business enabling environment for food manufacturers are seized and gaps addressed.

The discussion tracks, across time, the impact that external environment factors have had on rice millers, providing analytical reflections on the circumstances that propelled their inception and medium-term growth.

The three firms interviewed for this study are focused on growth trajectories reflected in their annual turnovers. All firms began their business operations in response to the government's investments in infrastructure, which gave way to more consistent supplies of paddy, and which has allowed the small entrepreneurs to seize a market opportunity incentivized by increasing demand for rice. The case highlights several lessons for business enabling environment reforms for food systems transformation from the vantage points of SMAEs related to farmer-market linkages and rural livelihoods; nutrition; food safety and quality; decent work; and access to finance and investment.

Diversified procurement mechanisms, including contract farming and vertical integration, allow millers to better manage supply constraints related to intense competition for paddy. Compared to high-value crops, which typically see processors pursue vertical integration to monitor quality control, rice millers vertically integrate own-farm production activities to ensure sufficient and consistent quantities of supply. More research on the effects of vertical integration on farm-labour markets and smallholders to juxtapose the advantages and disadvantages for rural livelihoods is needed to inform government policy in this respect. The case also reveals a number of success factors that enable the application of contract farming for rice and other staple crop models.

Inbound logistics are an important node in the millers' business model, and for the entire chain, but are overlooked by public and donor support. Important investments in rural infrastructure, in particular in irrigation, coupled with on-farm training and contract farming have seen significant improvements in rice production. The research confirms important investment gaps (in capacity and infrastructure) post-farm-to-factory-gate, which if addressed could see a marked reduction in losses, while also contributing to improving off-farm income of people dependent on post-farm activities, (farm-scouts, manual dryers, truck-drivers, donkey transporters, female traders) in addition to millers. Ultimately more concerted investments in the middle-segment of the rice chain, including between the hinterland and the factory, would ensure farm investments are not lost, and would also contribute to building the quality required for national brands to compete on the retail

shelves with imports. Currently millers are struggling to address this gap organizing logistics and providing other services (mostly transport, drying and storage) as feasible. Government and donor support that taps into existing services in the middle-segment of the chain, would most likely result in a consolidation of players and an upgrade across the system.

Milling operations coupled with inbound logistics are important avenues through which millers can influence the safety and quality of the final product, with implications for consumer health and the strengthening of the national rice brand. Under the aegis of government food safety policies, millers strive to comply with often costly food safety practices. Using the business case for building a competitive national brand that is reliant on strong food safety and quality controls to win over the domestic market would act as a strong lever against which miller associations and cooperatives, supported by public authorities, could engage with their members on food safety compliance.

Millers ranked access to short-term capital, over asset financing, as their main barrier to growth. The launch of a government cash-flow improvement scheme unleashed the ability of millers to expand their production and include more farmers in their procurement strategy. The recognition of paddy as collateral or payment also eased the cash flow burden for processors. The improvements in short-term capital also meant that millers were able to offer credit to farmers otherwise not eligible for bank loans. Asset leasing initiatives led by development actors, in partnership with local institutions, also saw millers expand the provision of agricultural services to farmers. Ongoing public sector engagement with the financial services sector, including sensitization of the commercial banking sector to agribusiness opportunities and trends can expand the range of finance products offered to small food companies.

Despite the scope for niche products that respond to increasing consumer awareness for better nutrition and government nutrition objectives, opportunities for product differentiation remain largely untapped. The future investment plans of millers will continue to focus on increasing the supply of white milled rice to the market. This is despite the rise in non-communicable diseases and the role the milling industry could play in offering more diversified and healthier options to consumers. While positive market research indicate opportunities for products such as brown rice, rice bran, rice milk, rice bran oil, par-boiled rice, market development remains underdeveloped. Cross-institutional collaboration between for instance, consumer associations, the Ministries of Health, Agriculture and Trade, millers' associations, financial institutions, and market research agencies to support both product and market development could enable the sector to contribute to the growth of the industry, in addition to government nutrition objectives.

The human resource practices of millers reveal that these companies offer important contractual opportunities for trained professionals in particular accountants, technical engineers, and administrative managers, including women. Labour intensive and casual work is also offered but without contractual benefits. Companies also invest in on-the-job training and mainly promote from within. The research also shows that there is an oversupply of high-level tertiary graduates but a shortage of graduates from mainstream vocational training streams that agrifood manufacturers can avail of (food science, food safety, food engineering; marketing and business admin) with donors and NGOs supplementing with relevant, but ad-hoc, capacity building in agribusiness skills. The main lesson here is the mismatch between standard education and training programmes and labour market requirements inferring a need for more dialogue between the private sector, and the institutions responsible for training actors on curricula design.





1 Introduction

1.1 Background

Recent years have brought increasing evidence as to the importance that agrifood small and medium enterprises (SMEs) have in driving rural transformation and linking farmers to markets. More specifically, small and medium businesses in the middle of the agricultural value chain (i.e. performing processing, logistics/wholesale, or distribution activities) have been found to be “the biggest investors (and the lion’s share of the private sector’s volume) in creating markets for farmers in Africa” and will continue to play a key role over the next 10–20 years (Reardon *et al.*, 2019).

Rural non-farm employment nowadays constitutes an estimated 60 percent of full-time equivalent rural employment in sub-Saharan Africa and about 40 percent of this is generated by agrifood businesses, mostly through self-employment in small and medium enterprises (Dolislager *et al.*, 2019). This contribution is anticipated to increase even further given that rural businesses will be needed to support the expanding labour market, with around 200 million workers expected to live in the rural areas of sub-Saharan Africa by 2025 (Losch, 2012). It is also these small actors that are more likely to hire vulnerable groups such as women or young people (Dolislager *et al.*, 2019).

With respect to SME food processors¹ specifically, these receive 95 percent of total small farm supply in Africa, either directly or through other SME wholesalers (Reardon *et al.*, 2019b). The food processing sector is of great strategic importance for developing economies, with implications for export earnings, industry restructuring and dietary issues (Wilkinson, 2004). The availability of processed food can also substitute for home food preparation, allowing women to free up time to engage in non-farm employment and ultimately contribute to household welfare (Liverpool-Tasie, Adjognon and Reardon, 2016). Currently, food processors in Africa, and agrifood businesses in general, have important market opportunities which, if seized, could enable them to grow and fulfill their potential to contribute to rural transformation. Not only are foreign markets growing more accessible due to increasing trade liberalization (Wilkinson, 2004), but the domestic markets in which they operate have expanded six-to eightfold over the past few decades and will continue to enlarge considerably in the future (Reardon *et al.*, 2015).

So far, the proliferation of SMEs, including processors, in the middle segment of agricultural value chains has been driven by changes up and down the supply chain, as well as by shifts in policy. These include: i) urbanization and infrastructure development leading to longer chains; ii) dietary changes in both urban and rural areas such as increase in demand for processed food; iii) the intensification and diversification of production at the farm level; and iv) increasing liberalization and privatization of the supply chain.

To further enable the growth of agrifood processors, the government should now focus on identifying and removing constraints in their enabling environment (Reardon *et al.*, 2019b). Overall, the performance, survival and exit of the enterprises that make up Africa’s rural non-farm economy has received little attention (Nagler and Naude, 2017). Such studies could help identify the factors enabling the growth of the sector and thus ensure more inclusive rural transformation. While the public and the development community have generally addressed

¹ Food processing refers to the post-harvest activities that add value to a product, such as manufacturing, preparation and packaging.

growing demand for food by focusing investments on farm-level production, “equally critical are the supply chains that connect farmers to urban markets (Reardon, 2016).”

It is against this background that the Food and Agriculture Organization of the United Nations (FAO) is examining the business models of small and medium agrifood processors in different contexts of sub-Saharan Africa. This includes an analysis of internal firm dynamics to identify the challenges and opportunities they face, in order to identify policy recommendations that can ultimately contribute to a business environment conducive to the growth of rural economies. This study describes the findings of research conducted on three rice processors in Senegal.

The report is organized as follows: Section 2 presents the methodology of the study and its limitations; Section 3 lays out the findings concerning the policy and institutional environment in which Senegalese rice processing SMEs operate; Section 3 provides an overview of the rice millers interviewed for the study, places them in the industry context and describes their growth trajectory. The following sections cover each business component described in the methodology section, comparing the practices of the companies with the literature that is relevant for each topic. As such, the third, fourth, and fifth sections will follow the flow of products within the company, looking at procurement, logistics and operations. The final sections of the report will discuss management practices related to finance, marketing and sales, human resources, and partnerships. The sections will explain what each practice entails, provide a background discussion for a better understanding of the analysis, and then delve into the various themes which emerge from the research. Finally, the last section of the report will present conclusions, showcase the internal business dynamics of an agrifood processor and highlight areas for further research.

1.2 Research objective and methodology

The overall objective of this study is to examine rice processors in Senegal and the business environment in which they operate in order to provide lessons for policymakers and development actors in terms of enabling factors that could facilitate their growth and enhance their contribution to development objectives, including rural investment, decent employment, nutrition, food safety and quality, as well as farmer-market linkages. While the main aim of the study is to identify suggestions for better practices, the findings can also contribute ideas for further research.

The methodology is based on the Porter’s value chain framework, which was adapted to better reflect the business model of an agrifood SME processor in sub-Saharan Africa and to include the FAO priority areas linked to the activities undertaken by these enterprises. The research process consisted of three complementary phases conducted for each individual country in the study; each phase was guided by and structured according to the adjusted Porter’s value chain framework, which is described in Box 1.

In the first phase, the policy and institutional environment for agrifood SME processors was assessed through desk research and an examination of various national policy papers and reports from development agencies operating in the country (see Ilie and Kelly, forthcoming).

In the second phase, researchers interviewed the owners or managers of three selected enterprises in each country to collect data on the business model components described in Table 1. The data collection technique consists of semi-structured, in-depth interviews to facilitate a guided discussion on each topic, to allow participants to introduce issues they feel that are important and to investigate their opinions on a diverse range of business experiences. The overall research protocol, including the interview guide for primary data collection, will be published as a stand-alone paper (Kelly and Ilie, forthcoming).

The sampling method was based on several criteria. First, we purposefully selected rice millers that have transitioned from informal or micro-operations to formal and profitable medium-sized enterprises. It is this type of growth-oriented companies that have successfully dealt with challenges in the business environment and adequately managed risks, thus being able to provide lessons to the micro-processors that comprise the majority of businesses in the rice sector. SME growth is a key engine for economic development, since growth indicates that the company is successfully responding and adapting to the market (Ngek, 2014). It thus makes sense that public and donor initiatives target growth-oriented companies in their pursuit of enabling local development. However, little research has been conducted to identify the features that characterize growth-oriented or well-established SMEs, and how entrepreneurs strategize to enable the growth of their companies (Dobbs and Hamilton, 2007; Ngek, 2014).

Second, given the need to obtain rich and detailed information, the three Senegalese enterprises were chosen by national experts that were familiar with the industry and knowledgeable about the willingness of the companies to share their experiences. However, it does tend to bias the exercise toward companies that have generally been more vocal and active in their communication with external parties. Future research should aim to include enterprises that have received less attention, especially those that have operated for a long time without external support.

Data retrieved from the three companies was then categorized according to the business components identified in the framework (see Table 1) in order to draw out patterns and themes from the interviewees' insights, as well as cause and effect relationships in their business life cycle. The analysis has been inductive in nature since the aim of the research is to explore the business environment from a new perspective – that of an agrifood SME – and to derive information that could ultimately contribute to new theory in relation to the topic.

In the third phase, World Bank Enterprise Surveys Data were employed to derive descriptive statistics on the SME food sector in each country, and to determine how the overall figures compare with the experiences of the interviewed processors (see Box 2 for more detail). However, given the small sample and the lack of questions that are relevant for agrifood SMEs, figures derived from World Bank Enterprise Surveys have scarcely been used.

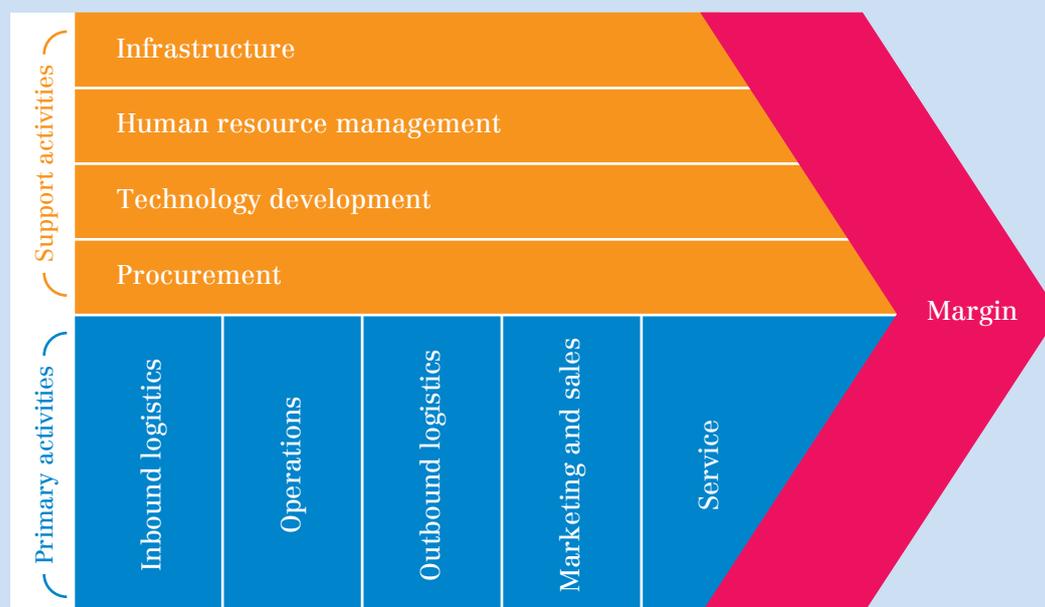
Finally, the primary data were compared with findings from the literature review and the World Bank Enterprise Surveys. This paper brings together all three stages of the research, namely the policy assessment, the business model analysis, and statistical microdata, to provide descriptive information, and derive lessons, recommendations and ideas for further research.

◆ **BOX 1 Business model analysis based on Porter’s value chain framework**

The subject of the study is the enterprise and, as such, a theoretical framework is required to enable firm-level analysis. Based on a literature review, the Porter’s value chain framework (1985)* was selected as the basis for firm analysis as it allows for insights on interdependent activities from raw material acquisition through production and the sale of a product to a customer. In *The Competitive Advantage of Nations*, published in 1989, Michael Porter concluded that “firms gain competitive advantage from conceiving of new ways to conduct activities, employing new procedures, new technologies, or different inputs.”

Porter’s value chain involves five primary activities: inbound logistics, operations, outbound logistics, marketing and sales, and service. Support activities are illustrated in a horizontal column across all of the primary activities. These are procurement, human resources, technology development, and firm infrastructure as shown in Figure 1.

◆ **FIGURE 1 Original Porter’s value chain framework**



Source: Porter, 1985.

From a corporate perspective, the objective of a value chain model analysis is to identify cost reductions, competitive differentiation, increased profitability and business success factors, increased efficiency, decreased waste and, ultimately, higher-quality products at lower costs.

Under FAO’s programme of work on food systems, the authors have adopted Porter’s model in order to facilitate firm-level business analysis of small and medium sized food manufacturers in order to inform the enabling environment for business. A second aim is to link relevant sections of the model to public sector policy areas (nutrition, employment, food safety, farmer-market linkages, access to finance, and so forth) in order to understand the policies required to enhance the role of SMAEs in the transformation to sustainable food systems.

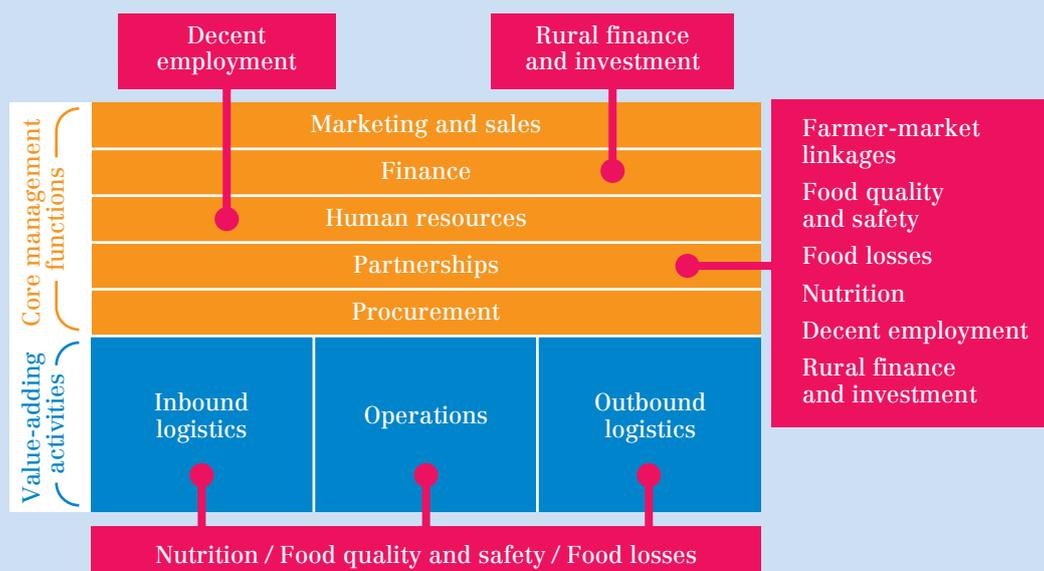


BOX 1 (cont.) Business model analysis based on Porter's value chain framework

The adaptation of the model is a 'work-in-progress' and can be further exploited to encompass additional priority areas for food systems development, including environmental sustainability considerations, digitalization, and the role of consumers in food systems transformation. Infrastructure has been also left out because African SMAEs generally do not have a sophisticated internal infrastructure nor do they create specific divisions such as for legal matters or quality management. Finance, originally an infrastructure sub-activity, will be treated independently as a business component since the way in which SMAEs access, use and manage financial resources is such an important aspect of their business model and a critical priority in their day-to-day practices. Services has also been removed from the adapted version, given the lack of relevance of this aspect of the business to food manufacturing firms, particularly less sophisticated small firms in emerging economies. Additionally, partnerships have been introduced as a component in the adapted framework since many SMAEs in sub-Saharan Africa dedicate important efforts to developing relationships with various actors to compensate for weaknesses in inputs or support service markets.

The adapted model (see Figure 2) also diverges with the clustering of procurement, finance, marketing and sales, human resources and partnerships under core management functions; some of these were labelled support activities in the original framework. Logistics (inbound and outbound), and operations, which are clustered under value-adding activities, were originally labelled primary activities. Table 1 provides an overview of each segment of the adapted framework and its relevance to food manufacturing and food systems policymaking.

FIGURE 2 Adjusted Porter's value chain framework to reflect the business model of a small and medium agrifood enterprise and links to FAO priority areas



Source: Authors' own elaboration.



BOX 1 (cont.) **Business model analysis based on Porter's
value chain framework**

The adaptation of the model to the food sector presents challenges in the analysis of activities related to nutrition, food safety and quality as these are not limited to one aspect but depend on activities across the supply chain.

For instance, ensuring the safety of food starts at the farm and ends with the consumer, depending not only on the value-adding activities of a food manufacturer but also on all of the suppliers and buyers across the value chain. In addition to the other actors involved in the commodity's broader chain, processors can help manage risks by adhering to good food safety practices and controlling critical points across their own value chain to prevent and eliminate food hazards. This is to prevent the market release of unsafe food, which is often not detectable by human senses.

Food quality, on the other hand, refers to those attributes of a product that affect its value to the customer or consumer, including colour, origin, flavour and presentation (FAO and WHO, 2003). Like safe food, high-quality food is at the base of a nutritious diet (FAO, 2019a). A nutritious diet provides protection against malnutrition as well as non-communicable diseases (NCD) such as diabetes (WHO, 2018). Rising incomes and urbanization have led to changes in diet, which now includes more animal-sourced foods, sugar, fats and oils, refined grains and processed foods. This creates a whole new set of challenges for policy since this 'nutritional transition' can cause increases in obesity, and NCDs (Hawkes, Harris and Gillspie, 2017).

Food manufacturing has a major impact on the content of food, having the potential to retain, add or deplete nutritional value. The nutritional content of food can be affected on-farm through the planting of specific varieties, and will also be influenced by how a product is handled as it moves through the commodity and the firm's value chain. Ensuring nutritional food thus requires commitment from all actors across the chain, including food manufacturers. Policy and institutional actors can intervene when incentives for producers to invest in nutritious food are missing, or when demand for food does not coincide with a healthy diet (FAO, 2019b; WHO, 2018). Similar to food safety and quality, logistics and processing activities by millers can determine the nutritional content of a product. Investments in this area are influenced by demand and consumer awareness around diet quality.

Since investments by food businesses in food safety and quality, including nutrition, implies costs, voluntary practices as well as government oversight to ensure adherence to regulations, policy and interventions are key tools for ensuring the supply of competitive, affordable, high-quality, safe and nutritional food products by SMAEs onto the market.

Source: Adapted from Kelly and Ilie (forthcoming), the methodological paper upon which this study is based.

◆ **TABLE 1** Description of the business model components of agrifood small and medium enterprises

Procurement
<p>Procurement involves a series of activities and processes that are necessary for an organization or firm, large or small, to acquire the necessary products or services from the best suppliers at the best price. For a food manufacturer, such products and services include agriculture food commodities, packaging, storage equipment, such as crates, technical equipment for processing, and technical maintenance. Processes related to procurement include developing contracts, both informal and formal, with farmers or traders supplying agriculture commodities; identifying the best prices, and conducting research and/or tendering for the acquisition of processing technology or other machinery needed by the food processor.</p> <p>Insights on the procurement practices of food manufacturers in developing countries is an important area of research for FAO since it informs several priority areas related to the integration of small farmers and small enterprises into agriculture and food value chains. For example, how and why companies choose particular procurement strategies (e.g. procuring directly from farmers or through traders or farmer organizations or a combination of strategies) and the types of related services they provide, such as credit advances or inputs through contract farming, can shed light on the farm-level or close-to-farm support that the public sector can provide to improve farmer-to buyer-linkages. Related activities and insights are also important for food safety, nutrition and rural finance. For instance, farm-level production, as well as post-harvest and procurement practices, will have implications for eventual food safety standards and the nutritional content of the final product. In addition, information on the challenges faced by companies in relation to their suppliers, be they farmers, trader or farmer organizations, can also inform rural, business enabling, or agro-industries' policy reforms.</p>
Finance
<p>Access to finance is a long-standing and oft-cited obstacle to the growth of SMEs across all types of economies. In sub-Saharan Africa, the problem is compounded by a general lack of financial resources for SMEs. An absence of a reliable stream of affordable finance can inhibit innovations, growth and employment generation. Financial planning and management are related issues. The extent to which rural-based companies are equipped to manage short-term finance and allocate funding on a weekly, monthly and annual basis plays a major part in long-term business success. These insights are also important for understanding the role of small food manufacturers in upstream and downstream value chain finance, and how food value chains are financed beyond formal financing institutions. Examining access to finance and the financial management capacities of SMEs is important to understand the type of financial support and capacity building that small companies need to start-up, grow and effectively manage their resources, ultimately enhancing their ability to invest in rural areas and contribute to poverty reduction.</p>
Marketing and sales
<p>A company's marketing and sales strategy is key to bridging the gap between consumer needs and food products, competing for market share and enhancing relationships with customers. Marketing tools include, for example, intelligence to understand market trends and needs; product advertising (branding, publicity, business-to-business networking)</p>



TABLE 1 (cont.) Description of the business model components of agrifood small and medium enterprises

and marketing strategies (the 4 P's – product, place, price and promotion). Marketing ultimately drives sales by raising awareness of a company's value proposition.

The characteristics of SMEs force these smaller companies to promote their business in a way that is significantly different than that of larger companies. SMEs often lack strong branding, market intelligence and the power to influence consumers due to modest marketing expenditures. However, they can often respond more quickly to changing market circumstances due to their inherent flexibility and small size. Marketing by SMEs is generally arbitrary, informal and more likely to be shaped by the firm's internal culture, such as the managerial style of the entrepreneur.

Person-to-person relationships and networking, for example, are often employed by SME owners to build contacts and initiate business contracts. Small companies often do not have the resources to carry out big market intelligence activities or campaigns to develop markets for their products; they are primarily engaged in responding to market demand. This is important, for instance, when considering market development for more nutritional foods. Large companies will have the resources to create market demand for these products, while SMEs will need to rely on public sector collaboration to create demand.

A better understanding of the internal and external factors shaping the day-to-day marketing and sales strategies of agrifood SMEs can assist in the identification of best practices and bottlenecks related to capturing market share and strengthening the competitiveness of the domestic food market relative to imports or developing markets for more nutritional or sustainably-produced food products.

Human resources

Human resources (HR) is the management division whose purpose is to ensure that a company or organization utilizes its employees to their fullest potential. The management of human resources is primarily concerned with the company's policies and strategies related to employee-benefits and wellbeing, taxes and social insurance, employee recruitment, training and performance appraisal. The extent and range of human resources activities depend on the size and formality of the company. Human resources in larger companies, for example, also concern themselves with organizational change and industrial relations.

Human resources are considered a source of competitive advantage when the knowledge and skills of employees are applied to the company's activities. The HR component of a company is not only reliant on internal procedures but is also largely influenced by public policies around social welfare and national education standards.

Given that SMEs collectively employ a significant number of people in rural areas, the design, scope and implementation of human resource policies at the enterprise level can have a significant influence on the creation of decent employment opportunities. Decent employment is defined by FAO as "work that provides a living income and reasonable working conditions (FAO, 2019c)," and is built on four main pillars: full and productive employment, rights at work, social protection and the promotion of social dialogue (ILO, 2019).

Rural areas in particular are subject to poor working conditions as jobs are mostly informal, with no contracts or protection and requiring long working hours with low



TABLE 1 (cont.) Description of the business model components of agrifood small and medium enterprises

and unstable incomes. These issues are compounded for the most vulnerable people: children, women, migrant labourers, the elderly and disabled. For these reasons, examining HR issues, can support the identification of current weaknesses or strengths related to decent employment practices, and provide cues on what can be done to improve human resources practices for better rural employment opportunities.

Partnerships

Partnerships are not included as an activity in Porter's value chain framework but they have been added to the adapted framework for this study due to the efforts that SMAEs in Africa invest in developing relationships with various actors in the absence of adequate business and rural services. In the context of a poor enabling environment, partners, such as development agencies, bilateral donors and foundations, NGOs or government institutions, can compensate for various weaknesses by providing training, access to finance or can act as mediators in transactions. Partnerships may, for instance, focus on improving procurement linkages to farmers, with partners allocating resources towards building smallholders capacity to supply consistent quality supply.

Operations

Operations is a term often used in management literature to describe a wide range of activities that are relevant to manufacturing, including supply and distribution, maintenance and production processes. In this paper, the term will strictly cover those 'in-house' activities that add value to the final product, such as primary and secondary food processing. Equipment, automation, technology, employee skills, plant layout and adherence to operational protocols, including bio-security (e.g. hazard analysis and critical control points or HACCP and employee task assignments) are the main factors influencing these activities. As in the case of logistics, operational activities are highly dependent on infrastructure, level of technology and appropriateness, which are especially weak in rural food manufacturing companies. Operations are also one of the main channels through which SMAEs influence the safety and quality of food, and the nutritional content of the final product. The design of factory operations will also impact occupational health and the safety of staff. Operations are highly pertinent for assessing energy consumption and sustainability aspects, which have not yet been integrated into the study.

Logistics

Logistics refer to activities related to the flow of materials and information such as transportation, warehousing, procurement, packaging and inventory management. The efficacy of logistics is critical for the development of the agrifood sector because it has a direct impact on the quality, freshness and safety of the products, as well as access to markets. Logistical activities largely depend on infrastructure, which is typically weak in the rural areas of developing countries. However, supplier-to-buyer capacities and ingenuity in designing and managing logistical processes can address shortcomings and be reinforced through the integration of public and private sector services such as training in post-harvest handling for farmers and traders. Food safety compliance, certification and other enabling environment processes controlled by the private sector, for instance, on quality assurance related services (pest control or transport), will all have an impact on the end value of a food product.

Source: Kelly and Ilie, forthcoming.

◆ **BOX 2** World Bank Enterprise Surveys database

The World Bank Enterprise Surveys database covers randomly-selected firms in non-agricultural sectors, classified according to the International Standard Industrial Classification of All Economic Activities (ISIC) Revision 3.1; the database captures a wide range of topics, exploring business operations and perceptions on the external environment. Information includes, for instance, annual sales, access to finance, infrastructure, trade, capacity utilization, performance measures and obstacles to growth (World Bank, 2019).

The surveys in Senegal were conducted in 2014. The sample consists in 601 firms, of which only those with more than two years of operation were selected for this study. There are 383 SMEs fitting this criterion, and about 50 percent of these operate in the agrifood sector as manufacturers, distributors, wholesalers, or retailers.

1.3 Limitations

This study has several limitations, which vary according to each stage of research.

The first phase of the study – the policy and institutions assessment of Senegal – largely depends on the availability and quality of relevant documentation on the internet. It is also difficult for the authors to assess the objectivity and validity of these papers since there is always a risk of bias in data collection and analysis.

This holds true as well for the second stage of the research, which uses interviews to examine the firms' business models. In this case, the authors had control over the techniques used to collect the data in the field; however, the analysis involves continuous judgements on the relevance of the information extracted, which can also be subject to unintentional bias. The subjects' responses can also be affected by the presence of the researchers. Any figures provided are only indicative, and financial books were not accessed to check their validity, which at times was questionable and lacked consistency. In these cases, responses were rechecked or not considered in the analysis. A major limitation of qualitative research is that findings cannot be extended to larger populations. As such, any conclusion derived from the analysis will only be relevant to firms in comparable contexts and with similar characteristics.

The third stage of the research – descriptive statistics resulting from the World Bank Enterprise Surveys – is least likely to result in subjective assessments. However, the database oversamples large firms and dedicates attention to companies located close to urban centres, making responses less relevant to agrifood SMEs in rural areas (World Bank, 2019). In addition, samples were sometimes too small to allow the formulation of statistically-significant findings, especially when disaggregating the data by sector or size of firm. Lastly, most issues pertaining to agrifood SMEs could not be cross-checked statistically due to the lack of relevant questions in the surveys, highlighting the need to develop quantitative studies in future that are more relevant to the sector.

Nonetheless, it is hoped that by combining all three types of research, the limitations of each will be reduced and more customized findings can be derived.

Senegal is a special case in the sense that its rice sector has historically been the recipient of important investments and interventions from both the government and development

actors. Thus, the country can provide cues as to the effects of these external initiatives on the business models of rice processors. However, since most notable initiatives targeting actors further down the chain have been implemented quite recently, the long-term impact of such interventions is yet to be known.

1.4 The business enabling environment in Senegal – policy and institutional assessment²

Senegal is noted for its active commitment to private sector development; the country is considered a top reformer in enabling the environment for business (World Bank, 2016), which is reflected in various initiatives, such as the establishment of the SME support agency and guarantee fund (Wellen and van Melle, 2017). Despite progress, the country continues to face several constraints common to countries in sub-Saharan Africa, ranging from poor infrastructure and rural feeder roads, to difficulties importing and maintaining machinery, to access to appropriate skills and services.

In its national development strategy, Senegal prioritizes the industrial sector, SMEs, and rural entrepreneurship, especially for women and young people, as well as agriculture and post-harvest activities (Senegal Ministry of Economy and Finance, 2014). Since small and medium agrifood processors are at the crossroads of these sectors, support for these enterprises can emerge from a variety of interventions. However, the fragmented nature of these interventions means that rural SMAE processors often do not benefit from the kind of support that would target all aspects of their operations. Interventions focused on industrial growth, for example, mainly benefits companies in urban centres. Action plans aimed at the development of the agricultural sector, such as investments in value-added activities, often target farmers or producer organizations, and not established processors. And most mid-sized firms remain underserved by financial providers because these only cater to better-off businesses, which need larger amounts of investment (Wellen and van Melle, 2017). Overall, enterprises with high potential can slip through these policy gaps if they do not qualify for various reasons. This holds true also for cross-cutting issues such as nutrition or environmental protection, where policy does not adopt a pro-SME or agrifood business perspective, thus overlooking important potential for mainstreaming these aspects.

The development of more customized support for agrifood manufacturing enterprises with respect to the different business model components described in the methodology could help address the specific needs of agrifood processors in general.

The rice sector is a notable exception, due to the significant support it receives from development agencies. Their efforts consist in a wide range of initiatives that are relevant for rice processors, including activities related to production, processing and equipment, financing, corporate-level capacity-building, marketing, and so forth. This will be discussed in more detail below.

² See Ilie and Kelly (forthcoming) for a more comprehensive overview of the business enabling environment for agrifood processors in Senegal.

1.5 The rice sector

Historically, the rice sector in Senegal has benefitted from large investments aimed at augmenting production and achieving self-sufficiency (see Box 3). As such, the country's commercial rice-growing region – the Senegal River Valley (SRV) – has seen notable investments in infrastructure (see Box 4 for an overview of rice production in Senegal). One of the first investments in the region was the construction of the Diama dam in 1986 through an African Development Bank loan to expand irrigated land (AfDB, 1988). The main connecting road in the SRV was also constructed with financing from the Millennium Challenge Corporation (IMPAQ International, 2014). In addition to infrastructure, credit mechanisms have been established and farmers have been trained in good agricultural practices. Three important actors leading these initiatives have been the United States Agency for International Development (USAID) through its 'Feed the Future' programme, together with the National Agricultural Credit Fund of Senegal (CNCAS) – and the National Company of Development and Exploitation of Land in the Delta of Senegal River (SAED). Figure 3 depicts the main institutional actors that play a role in enabling the business environment for agrifood SMEs processors in the country.

◆ BOX 3 Rice sector national strategies

The rice sector in Senegal has been subject to numerous government interventions aimed at augmenting production, especially after the 2008 food crisis, which was caused in part by the country's dependence on imports. The National Programme for Self-Sufficiency in Rice (PNAR) was specifically formulated to increase production. Along with the Grand Agricultural Offensive for Food and Abundance programme (GOANA), the PNAR aimed to boost rice production through the following actions: increasing cropping area and encouraging double-cropping; providing input subsidies; facilitating financing for production and equipment; providing capacity building to producers; and facilitating commercialization (Takahashi, 2011).

The Accelerated Programme for Agriculture in Senegal (PRACAS), which is the country's current agricultural development strategy, also prioritizes the development of the rice sector, mainly through mechanization, input subsidies and financing mechanisms, as well as by placing strong controls on imported rice, which is under the remit of the Ministry of Commerce. The main agencies carrying out the policies for achieving rice self-sufficiency are the national agriculture bank (CNCAS, see financial management section) and the national agricultural irrigation company (SAED). The Agricultural Development Agency of Senegal (SODAGRI) also promotes irrigated agriculture, mainly rice in southern Senegal (Franzel, Ndiaye and Tata, 2018).

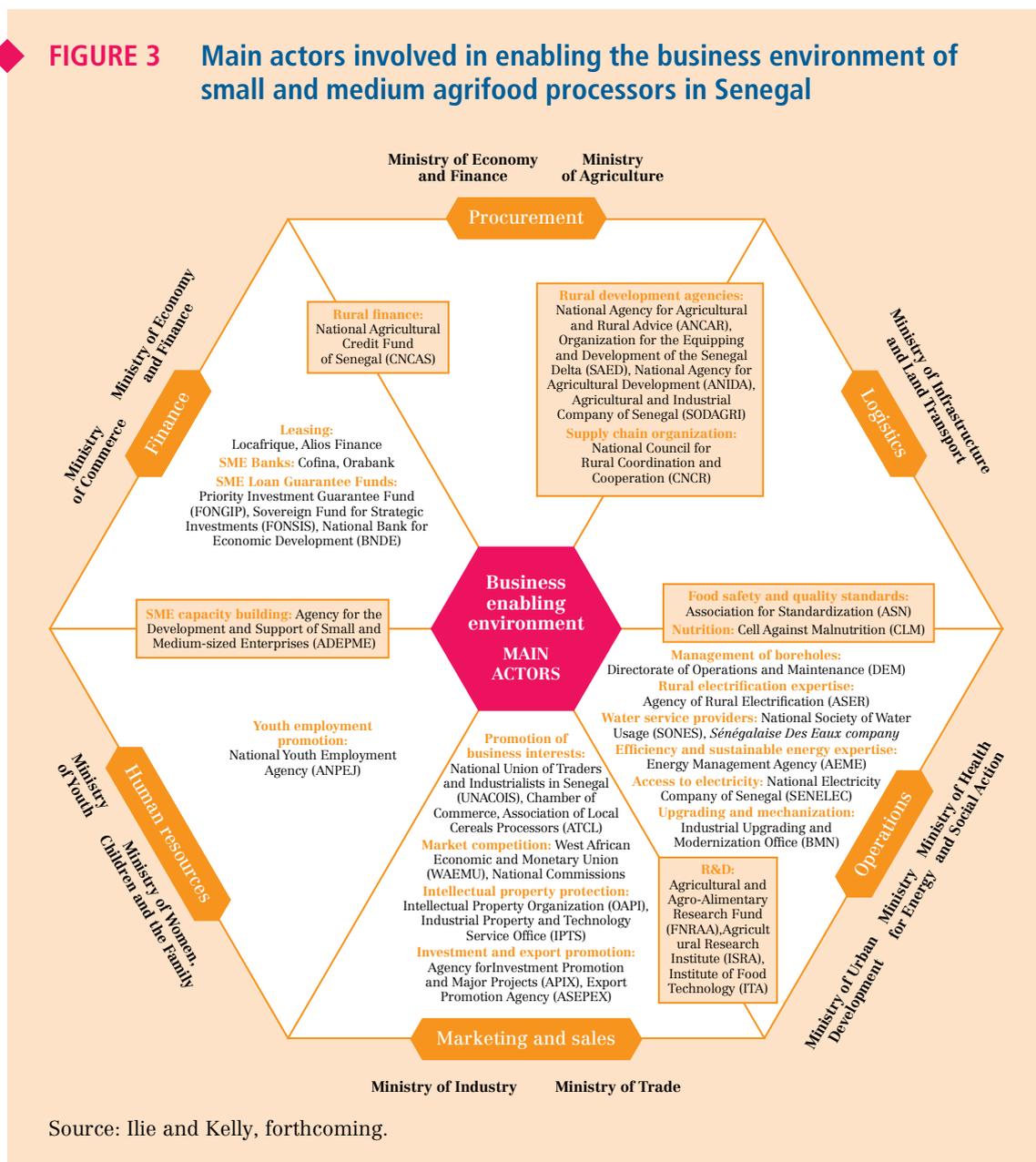
Due to the numerous initiatives and investments described in Box 3, notable progress has been made in terms of rice production, which increased by 160 percent from 2013 to 2017 (World Bank, 2018a). Nonetheless, the country still experiences a large and growing demand for rice, which is mainly addressed by imports (Osinski and Sylla, 2018).

A lack of competition and inefficient service and input supply are the most notable factors causing high operational costs for rice processors and food manufacturers in general. Heavy regulation means that the supply of electricity, water and sanitation, and transportation is expensive, often making local food more costly than imports (World Bank, 2018b). Food tastes and preferences have developed for imported food, particularly rice, which is perceived as higher quality than locally-produced foodstuffs. It is notable that imports

consist almost entirely of cheap, broken rice – this is because the urban population has developed a preference for this type of grain, which has been imported in large quantities since colonial times. Senegal’s national dish – *thieboudienne* – also features broken rice (Demont *et al.*, 2013).

Local rice millers operate in a triply threatened environment because they incur high operational costs, encounter competition from cheap imports, and face the urban population’s bias for broken rice. However, there is a large and growing rural demand for rice that the millers can exploit if properly enabled. It should be noted, however, the extensive support provided to the rice sector by the government and donors along the years has resulted in market distortions, making it imperative for these actors to develop an exit strategy that gradually allows farmers to engage in agricultural activities with little or no external assistance (Miklyaev, Hashemi and Schultz, 2017).

◆ **FIGURE 3** Main actors involved in enabling the business environment of small and medium agrifood processors in Senegal



◆ **BOX 4** Overview of rice production in Senegal

Local rice production is characterized by smallholder farming mainly based in two regions – the Senegal River Valley (SRV) which is located on the northern side of the country, and the Casamance in southern Senegal, where rice is mostly produced for subsistence. While the latter is mainly rainfed, the former is irrigated over about 50 percent of its rice area. The main season is from June-July, when planting takes place, to October-December. The off-season runs from February-March to June-July. Most farmers in the Casamance grow only during the rainy season (June/July to November/December); in the SRV, the rice area is around 30 to 35 percent smaller during the rainy season because of credit unavailability or pest and wildlife problems (Osinski and Sylla, 2018a).

It is estimated that about 60 percent of the rice-growing area in the SRV is farmed using mechanized equipment. Tools for land preparation and harvest can be provided by rental companies; the costs of renting a combine harvester can be either in-kind (18 percent of the total harvest) or CFA 125 000 (approximately USD 206) per hectare. Sahel seed rice varieties are planted on 80 percent of total rice area, and Nerica on the rest. While the latter are drought resistant and used in the uplands, the former are suitable for lowland areas, require irrigation and have a short growing duration of 100 to 120 days (Osinski and Sylla, 2018).

The rice sector in Senegal operates through two value chains – a traditional and a modern chain. The first is characterized by spot transactions, artisanal mills with simple husking techniques and producing low-quality rice. In 2014, the traditional value chain accounted for 87 percent of paddy production in the SRV. The second comprises modern mills with more advanced husking techniques that are able to generate rice with no impurities and with the right moisture content (Soullier and Moustier, 2015, 2018).

1.6 Overview of the three millers

Senegal defines SMEs as companies with 5 to 100 employees that have an annual turnover of CFA 50 million to 200 million, about USD 84 700 to 339 000 (DPME, 2010 in Wellen and van Melle, 2017). While the three companies examined for this report fit this category in terms of employment, their annual revenue is higher, with one even reaching CFA 2.5 billion (USD 4 234 000). Wellen and van Melle (2017) provide a more detailed picture of the Senegalese SME sector, identifying six segments, as follows:

1. Small-necessity entrepreneurs who initiate business activities to earn an income for themselves and their family. They maintain consistent volumes but fail to obtain funding because of weak financial management and business practices.
2. Moderate-growth entrepreneurs or traditional firms offering a product or service with a stable demand; these are often family-businesses that are on the verge of being able to access commercial financing.
3. High-growth start-ups, led by young people usually in the IT or technology sector, and often hindered by a lack of financing opportunities for start-ups.
4. Opportunity-driven enterprises, often replicating successful business models and switching or adding activities; their entrepreneurs may run several businesses at once, and their lack of long-term business vision leads to limited knowledge of the market.

5. Parallel entrepreneurs who share the same characteristics with the opportunity-driven SMEs but operate in different sectors simultaneously.
6. ‘Gazelles’, which are usually formal enterprises with at least 20 employees and over CFA 500 million (USD 847 000) in annual turnover; they are helmed by a strong leader and seek larger amounts of long-term financing.

Most Senegalese SMEs fall into the first category and only a very small number can be characterized as gazelles. From a turnover perspective, two of the companies studied currently belong to the gazelle category, while the third fits into the moderate-growth segment (see Table 1 for an overview of their revenue, production and employees).

◆ **TABLE 2** Brief overview of the three interviewed millers

Company*	Revenue breakdown**	Annual turnover (CFA billion)	Amount of rice processed in a year (tonnes)	No. of permanent employees	No. of casual employees (including farm labour)
Khady Riz	<ul style="list-style-type: none"> ◆ Paddy production: 30% ◆ Irrigation services: 15% ◆ Rice processing: 26% ◆ Agricultural services: 15% ◆ Seeds multiplication: 14% 	2.5	5 680	20	Up to 340
RizElle	<ul style="list-style-type: none"> ◆ Paddy production: 10% ◆ Agricultural services: 20% ◆ Rice processing: 70% 	0.25	5 000	23	Up to 34
Savoureux	<ul style="list-style-type: none"> ◆ Agricultural services: 60% ◆ Rice processing: 40% 	1	11 000	10	Up to 27

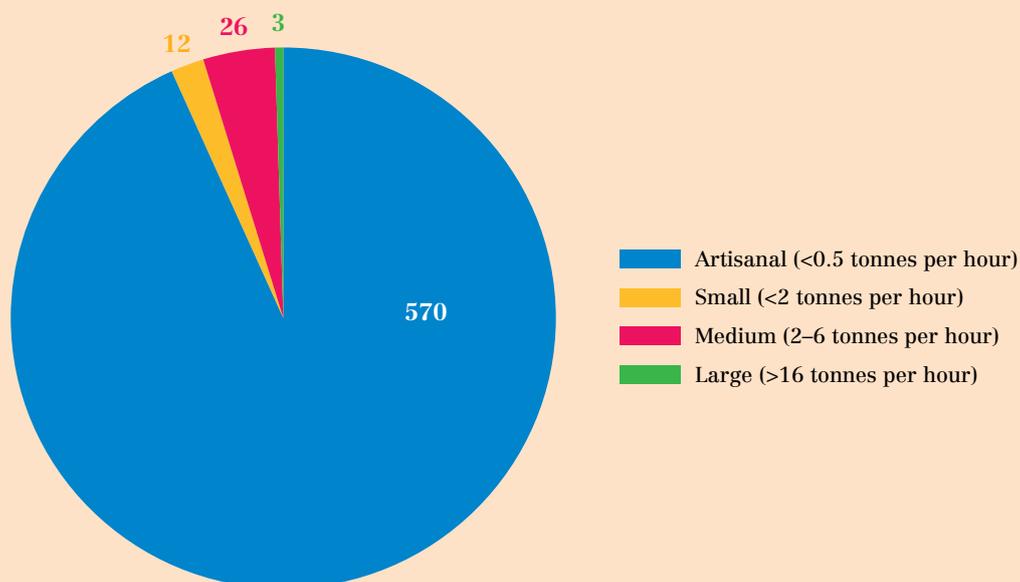
Notes: * Pseudonyms are used throughout the study to preserve anonymity and confidentiality. ** Figures are estimates, based on the owners’ recollection.

Source: Authors’ own elaboration based on interviews with the millers.

Looking at the rice sector specifically, the three processors fit into the medium-sized category in terms of hourly processing capacity, as the pie chart below shows. The industry is highly fragmented, with hundreds of micro-scale or artisanal mills, which have a processing capacity of less than 1 tonne per hour and provide rice of lower quality than the more commercially-oriented millers.³

³ Based on interviews with a local rice value chain expert.

◆ **FIGURE 4** Number of mills in the Senegal River Valley



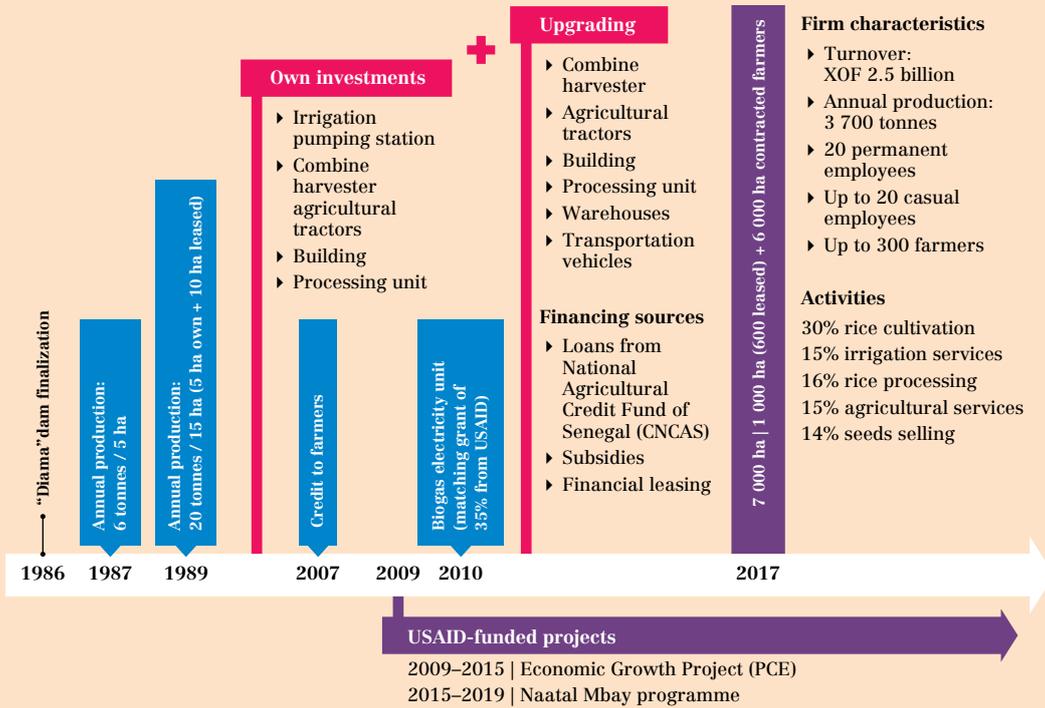
Source: Interviews with a local rice value chain expert.

1.7 Firm profile and growth trajectory

The three companies studied for this report have followed a similar growth pathway, growing from modest activities requiring little investment to a large portfolio of agricultural services (see Table 1 for a breakdown of their current revenues). Common to highly-performing enterprises (USAID, 2005), all three firms seized upon business opportunities as they arose. At the beginning of their growth trajectory, the enterprises created a business model around externally-supported investments in improved infrastructure and capacity in rice production. Tapping into increasing demand for rice, and improved paddy production, and coupled with their entrepreneurial drive, the enterprises were able to engage in the ‘start-up’ phases of their respective operations in rice milling.

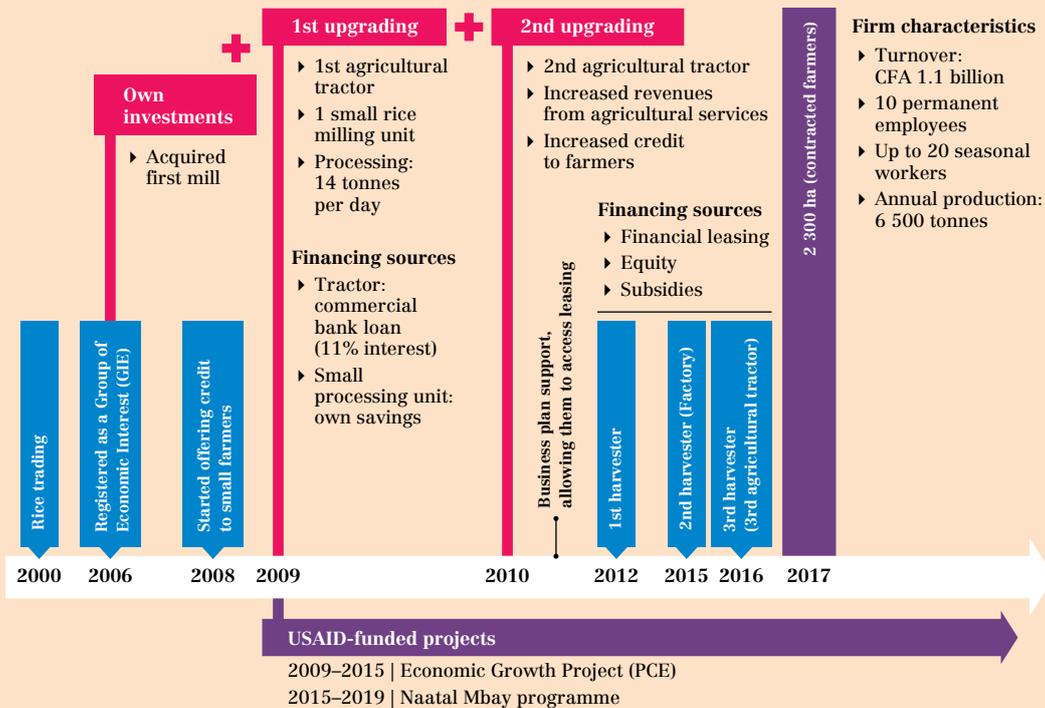
The growth trajectory and milestones for the companies are depicted in the timelines of Figures 5, 6 and 7.

◆ **FIGURE 5** Growth trajectory of Khady Riz



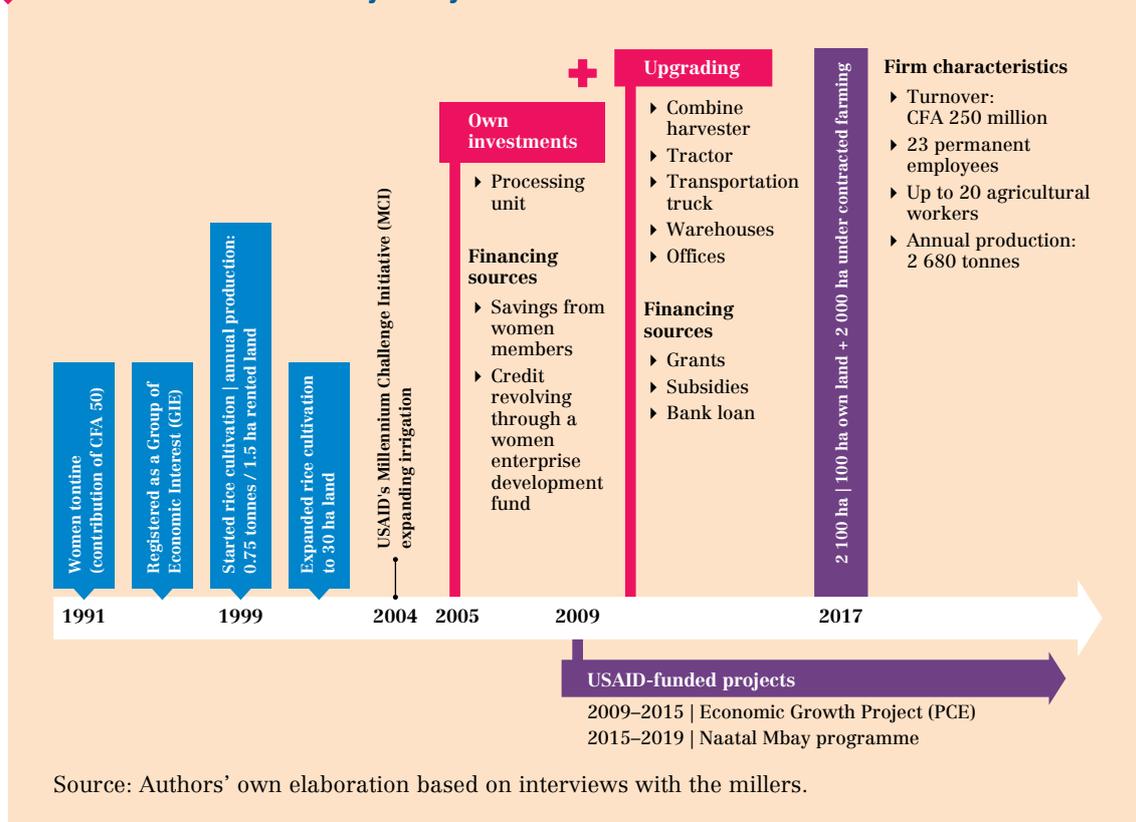
Source: Authors' own elaboration based on interviews with the millers.

◆ **FIGURE 6** Growth trajectory of Savoureux



Source: Authors' own elaboration based on interviews with the millers.

◆ **FIGURE 7** Growth trajectory of RizElle



Source: Authors' own elaboration based on interviews with the millers.

The longest-running business operation, entering production in 1989, Khady Riz is also the largest of the three companies, having expanded from rice production on its own five hectares to milling paddy from contracted farmers on 6 000 hectares, its own production on 600 hectares of leased land, and 400 hectares of its own land. In addition to milling, the company has developed a vast portfolio of agricultural support services and auxiliary products, such as certified rice seed, from which they derive 14 percent of their revenue. The company was formally registered at its inception.

RizElle grew from a women's savings and loan group that was established in 1991 and operated initially on a modest buy-in of CFA 50 (USD .83). The group, made up of 27 women with a chairwoman at the helm, started their rice growing on one and a half hectares of rented land. Their opportunities increased with the arrival of USAID's Millennium Challenge project which extended irrigation infrastructure into their area. Registered as a Group of Economic Interest (GIE) – the company now grows paddy on 100 hectares and sources from an additional 2 000 hectares cultivated by smallholder outgrowers. Comparatively more of their revenue comes from selling processed rice – 70 percent, with the remaining 20 percent coming from the hire of agricultural services and 10 percent from sales of paddy.

Savoureux is the most recently established business, launching its operations as a GIE in 2006. Unlike the other two millers, the company does not take on production itself, instead mainly working with unaffiliated smallholder farmers.

It is important to note that two of the three companies had already shown a commitment to grow their enterprises before any development or public initiatives reached them. RizElle, however, is a family-run business, with only female members; for this reason, the group has been able to capitalize on donor gender-equality priorities and receive needed support. This will be discussed further in the sections below.

The orientation of all three firms towards growth is illustrated by their investment plans. Khady Riz’s strategy includes the purchase of ten storage silos with a capacity of five tonnes each, the increase of agricultural land from 7 000 to 10 000 hectares, as well as supplementing their processing capacity. The company also aims to purchase a water-based rice whitening system to replace the current air-based procedure. This will yield a higher rice to paddy ratio – 70 percent instead of the current ratio of 60 percent. A formal business plan was developed with the help of potential investors from Brazil. However, the investors withdrew, and Khady Riz is currently looking for partners to operationalize its plan. The company claims that the collaboration did not unfold because of difficulties in accessing credit, such as the lack of collateral.

RizElle also has a very ambitious five-year plan. This includes the upgrade of the processing facility through a government support mechanism for a total cost of CFA 120 million (USD 203 230). This investment is divided into 112 million francs in tangible assets (subsidized at 40 percent), and 8 million in intangible assets⁴ (subsidized at 70 percent). The company also aims to purchase drying silos to improve the quality of its raw material and reduce storage costs. Finally, RizElle plans to expand its land holdings to 3 000 hectares land under direct farming. The total investment planned is around 5 billion francs and will be financed through the West African Development Bank (BOAD). This will require many structural changes, such as transitioning from GIE status to a Limited Responsibility Company.

Savoureux has a more prudent approach but is also oriented towards growing the business. Its short-term business plan is mostly focused mostly on immediate needs. Thus, the company plans to purchase new, upgraded equipment to expand its agricultural services to farmers; acquire storage silos; and relocate the factory to larger premises. Savoureux prefers to self-finance their growth but is also considering applying for credit from Root Capital, a non-profit social investment fund that offers credit to agricultural companies in amounts ranging from about USD 200 000 to USD 2 million (Root Capital, 2019).

⁴ Intangible assets can include, for example, trademarks, patents, franchises or copyright.



2 Procurement

KEY MESSAGES

- ◆ The contract farming tool, originally developed for high-value crops, can also be adapted for smallholders producing rice, with important lessons for application in other food chains.
- ◆ Success factors identified for contract farming were the continuous presence of skilled millers' employees in the rural space building relationships with farmers in order to manage quality and credit control, and to reduce side-selling and contract breaches.
- ◆ Diversified procurement mechanisms allow millers to manage supply and cash flow constraints, with positive spillover effects for the community, such as employment creation, and the inclusion of more vulnerable smallholders.
- ◆ More research is needed on the effects of; vertical integration on labour markets; the impact of diversifying the supply base on liquidity, revenue, smallholder inclusion; and employment generation.

An SMAE's procurement approach can be shaped by two set of external factors; these relate to production-related issues and the legislation and structure of the supply chain (see Figure 8). The acquisition of raw materials will thus depend on these factors. For instance, weak legislation on contract farming might lead SMAEs to prefer spot transactions or integrated farm production. Similarly, farmers' lack of inputs or resources might lead to low-quality produce, which will affect the final processed product.

◆ **FIGURE 8** External factors affecting the procurement strategy of a small and medium agrifood enterprise



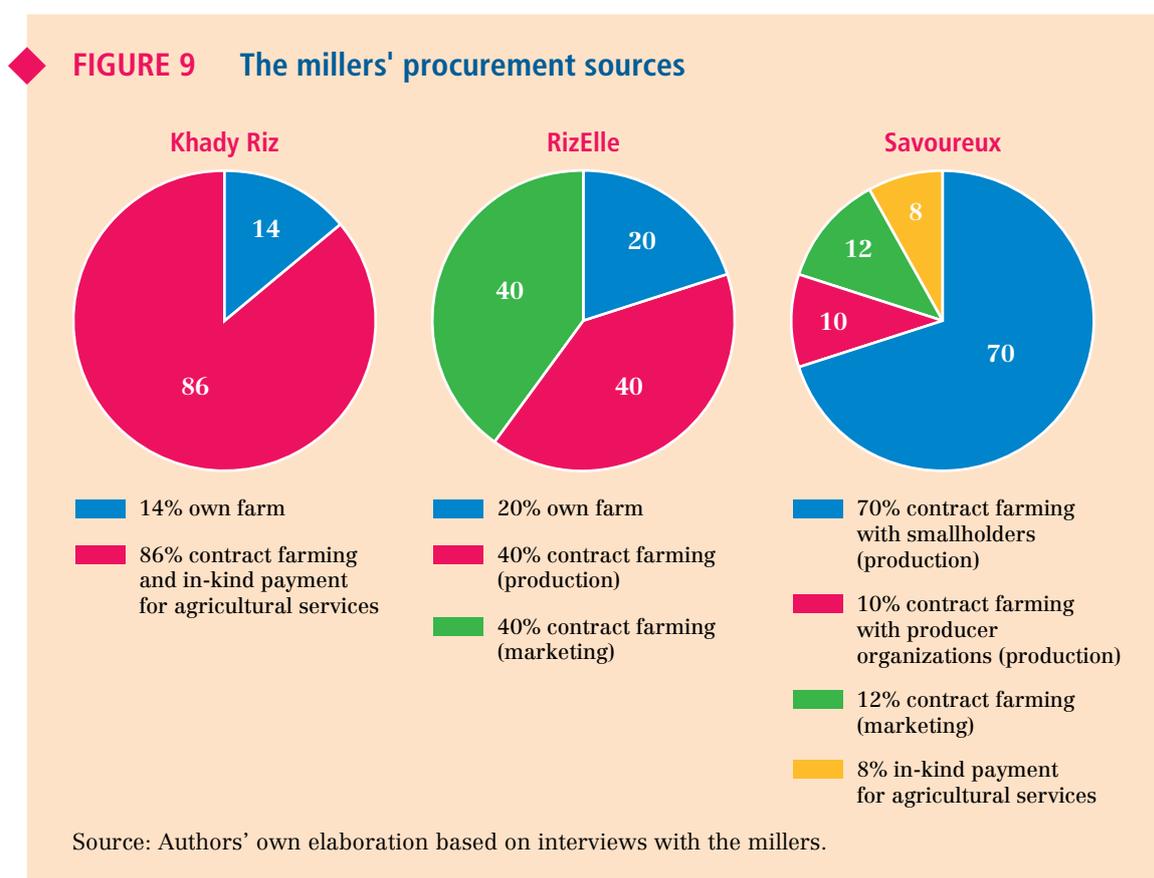
Source: Authors' own elaboration.

This section will look at the supply options in the Senegal River Valley where the three millers are located, and explain the decisions behind their procurement choices. It will also discuss the implications that these options have for the millers' business model, as well as their potential to provide spillover benefits to the local community.

2.1 Background

Contract farming has been significantly promoted in the Senegal River Valley (SRV) and is an important part of the processors' business model. There are only few studies on contract farming in staple food chains and these mainly focus on the supply-side and rather than on the buyers engaged in such schemes. Our study complements this earlier research and brings in the perspective of the millers to understand what works for them when procuring produce through contract farming. This is important because the long-term viability of any commercialization arrangement requires that both parties be satisfied.

The three processors interviewed for the study make use of a combination of procurement sources as shown in Figure 9.



All three firms mainly procure from smallholders or farmer organizations (FOs) through contract farming, which provides 86 percent (Khady Riz), 40 percent (RizElle) and 70 percent (Savoureux) of their total supply. However, the shortage of supply and growing competition for paddy has made it necessary for the millers to diversify their supply sources, with the result that they now derive part of their supply from their own production and as an in-kind⁵ payment for agricultural services.

⁵ In-kind payment refers to the use of a good or service (in our case, paddy) as payment instead of cash.

2.2 Contract farming in the Senegal River Valley

The commercial rice-growing region of Senegal is found in the Senegal River Valley, which produces about 60 percent of paddy in the country (see Box 4 for a more detailed overview of rice production in Senegal). The SRV has received important investments from both donors and the government.

A notable intervention, driven by USAID, CNCAS and SAED, was the introduction of marketing contracts in the region. Through these contracts, farmers – through producer organizations – receive credit from CNCAS upon fulfilling certain criteria, which is then repaid in paddy through a Warehouse Receipt System. Millers pay the farmer organizations and get hold of the paddy from the warehouses. To access credit, farmers must be a member of such an organization, must be farming irrigated land, must have paid off previous credit, and must be certified by SAED in terms of technical specifications. Marketing contracts take into consideration the suggested price determined by an inter-professional committee⁶ before each season; the price might vary according to the moisture content, level of impurity, and consistency in variety (see Logistics and Operations section for a discussion on what good quality rice entails). If quality requirements are not met, millers can either reduce the price or refuse the paddy (Soullier and Moustier, 2018).

Alternatively, production contracts are provided directly by millers and are mainly utilized by farmers that are indebted to CNCAS and cannot access marketing contracts. To be eligible for production contracts, farmers must be located within 50 kilometres of the miller, harvest at least 2.5 ha of irrigated rice, and belong to an FO. Quality stipulations are the same as in marketing contracts and the price is negotiated before each season; however, farmers observe that they have little power over the price since most of the farmers that access production contracts cannot obtain credit through marketing contracts (Soullier and Moustier, 2018).

In principle, CF has been extensively covered in the transaction costs economics (TCE)⁷ literature. Rural areas are particularly subject to high transaction costs, which arise not only from weak input or service markets and information asymmetries in output markets, but also from the often fragmented nature of the farming sector (FAO, 2013). In this context, CF has emerged as an ‘institutional response’ to mitigating these high transaction costs and ensuring that the right quality and quantity of produce is available for buyers (FAO, 2013). More recently, however, CF has also been seen as an effective way to strengthen vertical coordination in the chain; this may be necessary to “reduce food safety risks, prove compliance with corporate social responsibility criteria, and comply with statutory requirements of tracking and tracing (Jia and Bijman, 2014),” aspects that are of growing importance in increasingly globalized food systems.

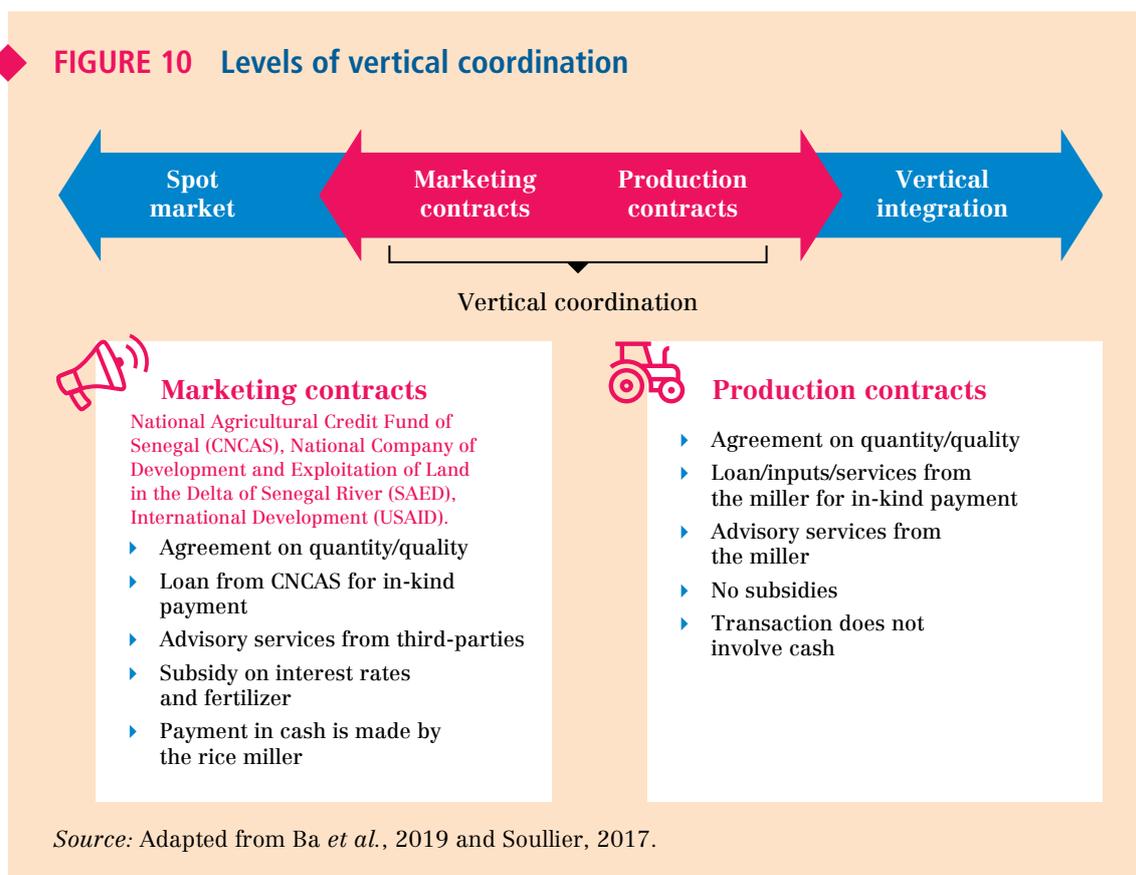
Figure 10 depicts the four options for procuring paddy in the SRV and the degree to which the miller controls production (i.e. the level of vertical coordination). Full vertical coordination (also known as vertical integration) – as opposed to procuring from spot markets – means that the miller oversees the entire production process, which takes place as an in-house activity. Contract farming is a form of vertical coordination, which involves internalizing transaction costs within the firm, eliminating the need for contracts or market

⁶ *Comité Inter-professionnel du Riz*, also known as CIRIZ, is a committee of farmers, farmer organizations, CNCAS and SAED representatives.

⁷ Transaction costs refers to costs arising from transactions between economic actors. They can relate to negotiations, market searches, initiation of contracts, control of contract compliance or lost opportunities, and are mostly caused by uncertainty and asymmetric information (i.e. one party possesses more or better knowledge than the other party to the transaction, allowing the former to make more informed decisions than the latter) (FAO, 2013).

exchanges (Perry, 1989 in FAO, 2013). Actors involved in transactions will choose among these governance structures in such a way as to minimize production and transaction costs (Williamson, 1985 in FAO, 2013).

◆ **FIGURE 10 Levels of vertical coordination**



2.3 Developing a good practice framework for contract farming

While contract farming has been extensively examined in relation to high-value and export commodities, studies on staples and domestic food chains have been sparse, possibly due to the lack of successful CF schemes in those sectors (Maertens and Vande Velde, 2017; Soullier and Moustier, 2018). There are a number of challenges that make contract farming difficult to apply in staple food chains. First, price premiums cannot be employed as an enforcement tool due to the limited quality and value-upgrading nature of staples. Second, the low perishability of staples makes them easy to store and transport, rendering contract breach more likely. Third, the presence of many small buyers leads to more opportunistic sales and reduces their financial ability to engage in contract farming (Maertens and Vande Velde, 2017).

Despite these challenges, contract farming in domestic grain chains has started to emerge in sub-Saharan Africa, with schemes being sustained by the demand for high-quality cereals, national policies aimed at the modernization of domestic chains, and support from development organizations (Soullier and Moustier, 2018). The impact of CF on smallholders generally yields mixed results (Freguin-Gresh, d’Haese and Anseeuw, 2012). Concerning the rice sector specifically, however, CF is emerging as an effective tool for value-chain development that is inclusive of smallholders, as demonstrated through research conducted in Benin, Togo, Madagascar, and Vietnam (Adabe, 2017; Ba et al., 2019; Bellemare, 2012; Maertens and Vande Velde, 2017).

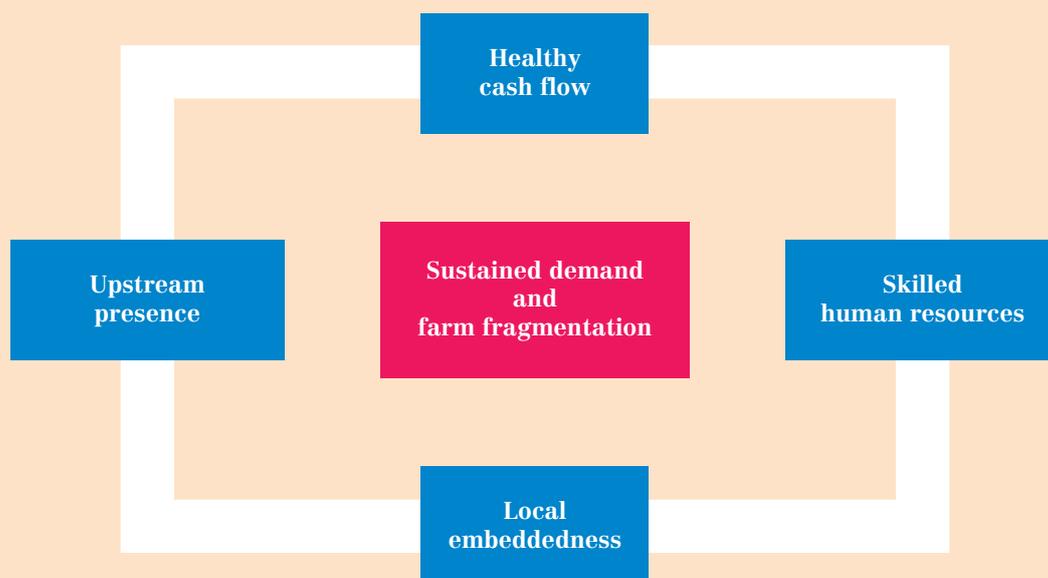
In Senegal, Soullier and Moustier (2018) studied the effects of marketing and production contracts, finding that marketing contracts, as compared to spot transactions, have no impact on agricultural practices, quality, or income but only increase food security. The effects of production contracts were studied in relation to farmers who were excluded from bank financing and only had access to firm credit. While such contracts had a positive impact on incomes, they resulted in lower profits for the farmers because of interest and insurance costs.

The three companies interviewed for our study asserted that most of their suppliers are smallholders who are contracted either as individuals or as part of a cooperative. While one miller specifically prefers to work with farmers' organizations in order to secure large amounts of paddy, the other two are keen to work with smallholders, regardless of their organizational structure, since they can provide long-lasting relationships. Savoureux, for instance, only derives 10 percent of its total supply from FOs, while 70 percent comes from individual small farmers. It is not known whether farmers' profits are affected by this specific supply channel. It is important to mention, however, that producer organizations in Senegal are rather more active in terms of credit and input provision, and less in the aggregation of produce (Bernard *et al.*, 2015).

According to Eaton and Shepherd (2001), several basic preconditions should be in place for CF to be successful. The investment must be made in a market that is likely to be profitable for both parties; the physical environment should be suitable for production; the local social circumstances should not be in conflict with the obligations of the parties; and the government should provide a conducive environment, including efficient legal systems and regulations and necessary support services. Box 6 provides a more comprehensive overview of these preconditions and other principles that should be followed in order to ensure successful CF partnerships.

In addition to these underlying conditions and principles, several factors have made contract farming with smallholders a viable and constructive supply option for the three processors in Senegal, as shown in Figure 11.

♦ **FIGURE 11** Enabling factors for contract farming with smallholders in the Senegal River Valley



Source: Authors' own elaboration.

It is important to note that any procurement mechanisms have been sustained by the large and increasing demand for rice; additionally, the fact that farming in Senegal is highly fragmented means that processors do not have alternatives to working with smallholders. These two characteristics of the sector have provided the basis for CF that includes small farmers. Building on these two characteristics are the following enabling factors.

First, public sector institutions and donors have created a supportive environment that allows processors to direct their resources to strengthening their presence in the upstream segment. For example, most field machinery (i.e. combine harvesters, tractors) has been acquired either through a financial lease system supported by USAID's Nataal Mbay (see Box 5), a government subsidy programme for agricultural equipment,⁸ or subsidized loans from CNCAS with interest rates at 7.5 percent as opposed to the usual 11–12 percent, or a combination of these options. These financial tools have allowed the development of a business activity that has had a **threefold benefit for the millers: it has diversified revenues, secured supply as in-kind payment, and enhanced their role as contractors through the offer of mechanized services, which has enabled them to better control quality and monitor the agreement.**

◆ **BOX 5** Leasing scheme

USAID has promoted agricultural mechanization in the SRV through a private financing institution called Locafrique. The scheme involves the acquisition of heavy equipment, with the possibility of transferring property rights at the end of the lease. Leasing fees are collected every month by Locafrique and the lease maturity date is usually calculated in a way that amortizes more than 90 percent of the equipment value and the cost of financing. The conditions required for businesses to lease the equipment include factoring its value into the business plan, the proper maintenance of the equipment and the purchase of an insurance policy (see USAID, 2019 for a more comprehensive overview of the scheme and its impact).

Access to skilled human capital (see the Human resources section for a more detailed overview) has also allowed the millers to better engage in contract farming. Two companies mentioned that they make use of an internal finance committee, which is charged with reviewing credit applications received from smallholders in the community. Based on the committee's report, eligible farmers are then chosen as suppliers. A low default rate has also been made possible by the millers' agronomists who are working in the field to ensure that farmers comply and are able to provide a good quality supply of produce. Additionally, the employees of all three mills have received training from USAID on quality measurement methods, including the use of a paddy moisture meter. **This practice improves the millers' capacity to enforce the terms of the contract and ensures the proper use of quality premiums.** While the price for rice is set each season by the various stakeholders involved in the value chain, processors state that this is only indicative and that the price they offer varies according to market price and quality.

Various financial tools aimed at improving cash flow have also been a decisive factor in the ability of the firms to contract out work to smallholders. This was mainly made possible through the recognition of paddy as collateral or payment. For example, through the hybrid Warehouse Receipt Systems (WRS), processors engage with farmers' organizations

⁸ The government supports 60 percent of the cost of light equipment and 40 percent of the cost of heavy equipment as part of a programme aimed at upgrading medium-sized rice mills, as indicated by the millers and confirmed by a local rice consultant.

that deliver the paddy to warehouses where it is stocked and monitored by a third party. Banks then offer credit in paddy, which the millers can repay after commercialization (IFAD, 2017). Similarly, the millers can access credit from banks to provide farmers with inputs; farmers repay the loan and an interest in paddy to the millers who repay the bank after commercialization (Miklyayev, Hashemi and Schultz, 2017). The millers confirm that these strategies have allowed them better to control their cash flow and tender to any arrangements, such as the pre-financing of inputs for farmers through production contracts (the Finance section will provide a more detailed discussion on working capital and cash flow).

The millers have also been able to create an advantage by capitalizing on their embeddedness in rural communities. It is due to their frequent contact with suppliers that two of the enterprises have managed to maintain low default rates, despite the presence of many buyers that favour opportunistic sales. In order to manage the risk of default, Savoureux has an agent in each village to do close follow-up, and a manager visits each smallholder at least twice during each season to provide them with support. As a result, their default rate is constantly improving: defaults were 5 percent in 2017, down from 9 percent in 2016. Additionally, the depth of the company's networks in the rural hinterland and villages has allowed it to recruit good farmers into the contract scheme. Buying directly from the field is also recognized as a key advantage by the company. Khady Riz's contract farmers are also technically monitored and offered advice by the company on a regular basis. Khady Riz reports that this system works very well with a very low level of default. Last year, only USD 4 240 were not repaid out of a total purchase of USD 3 400 000 paddy.

♦ **BOX 6** Preconditions and guiding principles for successful and responsible contract farming

Key preconditions for successful CF, as identified by Eaton and Shepherd (2001) include:

- ♦ A profitable market: The buyer must be sure that the market can be profitable on a long-term basis, and the farmer must envision higher income from engaging in the CF than from alternatives.
- ♦ An enabling physical environment: The environment must exhibit suitable conditions favouring good production yields and quality (e.g. topography, climate, etc.); adequate utilities and communication systems, including road and transportation, supply of energy and water, and other support services; adequate access to land and efficient land tenure administration; and adequate availability of inputs.
- ♦ Awareness of cultural attitudes and traditional practices: Before developing a partnership, the buyer needs to consider any possible differences in values between parties to ensure that there are no conflicting obligations.
- ♦ Government support: The government needs to back contractual arrangements by establishing appropriate laws and an efficient legal system; ensure the right institutional support for production, processing and marketing; and promote CF by bringing together the relevant parties.

Da Silva and Pultrone (2012) identify several principles that provide the basis for responsible CF operations and good business practices, as follows:

- ♦ Arrangements should support the parties in executing their roles and protect them from risks that may arise during the fulfilment of obligations.



BOX 6 (cont.) **Preconditions and guiding principles for successful and responsible contract farming**

- ◆ Contracts should adhere to a legal framework. For example, parties should be able to give their informed consent and have the legal capacity to contract; responsibilities should be explicitly specified and the obligations of the farmer and buyers should be based around a good or a service.
- ◆ Obligations and rights should be clearly documented, and witnesses should be present in the case of verbal agreements.
- ◆ The language used in contracts should be clear, legible, coherent and comprehensible to parties with an average education or experience.
- ◆ Parties should make full disclosure of any information that is necessary for the equitable conclusion of the agreement.
- ◆ Prices and payments should be transparently and carefully determined and ensure the satisfaction of both parties.
- ◆ Clauses related to the quality of produce, as well as to input supply and use, should be transparently and fairly determined.
- ◆ The contract should ensure fair risk management, such as through a provision for renegotiation to ensure that no party is liable for non-performance resulting from uncontrollable circumstances (e.g. weather).
- ◆ The parties should engage in correct conduct, behave ethically and honorably, and be loyal to each other.

In conclusion, the enabling factors for contract farming should not be seen as a panacea for staple food sectors, but rather as means to prepare the groundwork for a good practice model for buyers engaging in CF. While these factors have sustained contract farming with smallholders in the medium-term, their impact in the long-term is not yet known. USAID (2016) reports that “all actors expressed satisfaction with the contract farming model” initiated by the Feed the Future programme; however, millers and farmers also expect support to continue, which may present challenges for the long-term sustainability of the model once the project ends (USAID, 2016). To fully grasp the results of specific CF schemes, assessments of the long-term financial performance of both farmers and buyers are needed (FAO, 2013). As mentioned above, Soullier and Moustier (2018) have examined the impact of contracts on farmers in the SRV and have found that marketing contracts made a positive difference in terms of food security but not in terms of profits.

2.4 Diversification of procurement sources

The millers diversify their procurement to mitigate supply-related constraints and, more specifically, the shortage of paddy, which has been an incentive, not only for CF but also for fully integrated production activities. Two of the companies interviewed for the study (Khady Riz and RizElle) engage in upstream vertical integration: 20 percent of RizElle’s supply comes from its own farms of 100 hectares, and part of Khady Riz’s paddy comes from its 1 000-hectare farm.

Previous research on high-value crops in Senegal indicates that the choice to increasingly internalize production has been determined by the need to improve quality in order to

match competition from trade and to respond to tightening food standards (Maertens and Swinnen, 2009). In this case, the strategy of processors has been to gradually move away from contracting to vertical integration.

In the case of rice, however, quantity was the reason behind the decision of Khady Riz and RizElle to increasingly vertically integrate. According to the companies, quality has been successfully ensured through contract farming schemes.⁹ **Unlike their high-value commodities counterparts, the strategy of these companies is not to abandon CF altogether, but rather to expand vertical integration alongside contracting to be able to respond to increasing demand.**

For example, while RizElle started with only 1.5 hectares of land for its own production, the company has gradually expanded its production sources to 100 hectares and a network of contract producers on 2 000 hectares, which the company aims to further increase to 3 000 hectares. Khady Riz has also grown from an initial five hectares to the current 1 000 hectares (including 600 hectares of leased land), and 6 000 hectares under contract farming. Indeed, both contract farming and vertical integration have increased in the region, but the former has occurred at a more rapid pace than the latter. Vertical integration has expanded in the SRV as millers seek to secure supply, but it has been hindered so far by access to land (Soullier and Moustier, 2015).

The legal framework for land rights in rural Senegal is highly outdated. The granting of rights is exclusively reserved for the State; as such, no direct land transaction, including inheritance, sale or rental is technically legal. This, together with the fact that the rural areas have undergone significant development through irrigation projects or the expansion of agribusiness, means that rural land rights are largely undocumented, limiting private and public investment. The government is now prioritizing land reform and implementing measures such as:

(i) the gradual transformation of the current occupancy rights of rural inhabitants into real rights (...); (ii) investment in land management instruments by land administration services; (iii) the search for a fair balance between municipal management and the supervision of land transactions by the central government; and (iv) the pursuit of the streamlining of registration in the urban land register (World Bank, 2017a).

In the case of high-value commodity sectors in Senegal, it has been found that the poorest people benefit relatively more from working in large-scale integrated production than from contract farming (Maertens and Swinnen, 2009). Given the shortage of supply in the rice sector and the government's efforts to address land tenure constraints, it is highly likely that milling companies will look further at vertical integration.

The effects of the labour market on rural livelihoods have been neglected in general, and even more in the case of staples; this could be because working with smallholders is generally perceived as “more politically and socially acceptable” (Shepherd, 2007). In this context, it is important to determine whether the poor benefit more from labour markets or from product markets in order to understand how company growth strategies and government external incentives can be balanced with rural development objectives for employment generation. In order to conduct a more thorough assessment, future studies in this regard should adopt a gender and age-sensitive perspective and compare not only

⁹ We cannot assess the validity of this statement as it was outside of the scope of this study to examine farm-level practices. However, Section 4.3.3 gives a more in-depth discussion on food safety and quality, and how production activities can have implications for the produce as it advances further down the chain, highlighting the need for a food safety system that encompasses not only authorities but all actors in the sector.

eventual increases in the income of the poor, but also broader multidimensional poverty aspects, food security and working conditions.

While farmers and employees were not interviewed for our research, preliminary findings indicate that the smallest farmers could benefit more from working on integrated estate land, in terms of income. The Global Agricultural Information Network (GAIN) reports that the average annual income of paddy-producing households (1 hectare) is CFA 223 465 (USD 378). The lowest cited wage for agricultural workers on the millers' farm was CFA 250 per hour (USD 0.2), which is higher than the minimum wage of CFA 182.95 (USD 0.3)¹⁰ and yields a potential salary of 192 000 in a season (USD 325) assuming six work days in a week and eight hours in a day. Along with other possible employment perks, such as performance bonuses, working on integrated estate farms could be a better alternative for the smallest of the smallholders. In Senegal, rice farms vary in size from 0.25 to 2 hectares (Osinski and Sylla, 2018).

However, it is important to mention that, at the moment, agricultural labourers are required to work six days a week and twelve hours a day. While the job delivers a fair income, this exceeds the decent working time of 48 hours established by the ILO (2013). In addition, this kind of work is mainly seasonal and not necessarily continuous or reliable – see Human resources section for more details on the various types of labour required by the millers and their respective compensation.

2.5 Conclusions

Principle lessons arising from this section refer to the roles of contract farming and vertical integration in rice value chains, with the potential implications for smallholder procurement of other staple crops. High-end value chains, such as fruits and vegetables for export, require compliance with stringent standards, which will lead companies to vertically integrate. For food commodities that are more difficult to differentiate through value addition, such as rice in Senegal, integration is motivated by a shortage of supply, rather than the need to control quality (see the Operations and Logistics section for a more detailed overview of food quality and safety aspects). It is thus important to understand whether vertical integration is a trend for processors operating in the staples sector for domestic consumption, and to assess its effects on both labour and product markets. This would allow us to make business recommendations that are inclusive of smallholders and the poor.

In line with other assessments (Fuglie *et al.*, 2019), the three rice millers in our study make use of a combination of supply sources to mitigate constraints, such as the shortage of paddy. The diversification of procurement mechanisms (i.e. production and marketing contracts, in-kind payment, integrated farm production) also helps to improve cash flow and allows companies to expand their network of contracted farmers and include more smallholders in their operations. The effects of diversifying the supply base on business liquidity and revenue, as well as on smallholder inclusion are also areas needing further investigation.

This section of the report has provided a framework for best practices in contract farming in the staple crops sector. Key success factors include the presence of the buyers in the upstream segment, which has allowed them to better control quality; their embeddedness in the rural community, which helps to reduce side-selling or contract breaches; the existence of skilled employees who support quality and credit control; and cash-flow improvement schemes that facilitate the pre-financing of inputs.

¹⁰ At the time of the interview in 2017.

The section has also highlighted the role of government and the development community in building business-level capacity, for example, in the human and financial skills required to manage contract farming, as well as creating an adequate enabling environment and supportive law system, all of which are prerequisites of a successful contract farming operation (Eaton and Shepherd, 2001). Longstanding relationships within the farming community should not be underestimated, as discussed above.



3 Logistics

KEY MESSAGES

- ◆ Millers role in providing auxiliary inbound services (i.e. transportation, drying, storage), is instrumental for maintaining the quality of paddy for processing. This role is impeded by a weak regulatory environment supporting this service provision and inadequate infrastructure; translating into higher priced milled rice compared to imports.
- ◆ Investments in irrigation infrastructure has led to important gains in production, which has motivated entrepreneurs to take up milling. A balance in off-farm downstream investment is also required to ensure the infrastructure and capacity is available in rural towns to add value to supply, including control systems for food safety compliance.

Logistics are a key factor in achieving competitiveness in the agrifood sector since efficiency can have major implications for the quality of the final product and the profitability of the manufacturer (Gebresenbet and Mpagalile, 2015; van der Vorst, Da Silva and Trienekens, 2007). SMAEs are disadvantaged because their lack of economies of scale translates into higher costs for logistical activities. Even more, poor infrastructure in developing countries often pose additional constraints augmenting the already high costs of logistics.

External factors affecting the logistics of an agrifood enterprise relate to infrastructure and the availability of support services, including transportation, storage, cold chain facilities, and packaging and traceability mechanisms – as Figure 12 shows. Identifying the enabling factors needed to improve logistical efficiency is important, especially given the often perishable nature of agrifood products. This section will examine how enterprises design their logistics (distinguishing between inbound and outbound activities), the costs behind these activities and the external factors limiting efficiency. Special attention will be given to food safety and quality issues since inbound logistics, together with operations, represent the main areas through which millers can influence, positively or negatively, these important aspects.

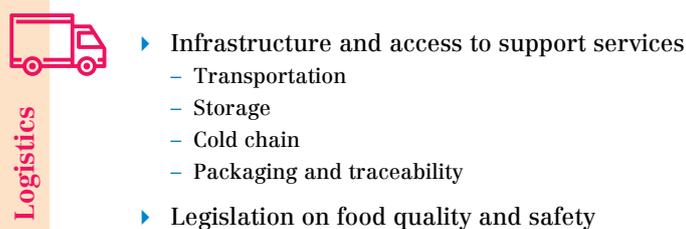
3.1 Background

Logistics can be split into inbound (related to the inflow of raw materials to the production plant) and outbound (related to the flow of products from the company to its customers) activities; the former has greater influence over the millers' business decisions, as will be discussed in this section. Three very important interrelated logistical activities that affect the final quality of milled rice are the drying, transportation and storage of paddy. Despite the fact that inbound logistics are a key strategic focus for the three companies in our study, none of them have a dedicated position to manage these activities. Indeed, most small and medium agrifood firms in developing countries do not have a logistics manager; such activities are

overseen by the general manager, procurement or production manager (Gebresenbet and Mpagalile, 2015). Two of the processors in our study rely on a software called ‘Sally’ to record stock movements, while RizElle prefers to use Excel sheets.

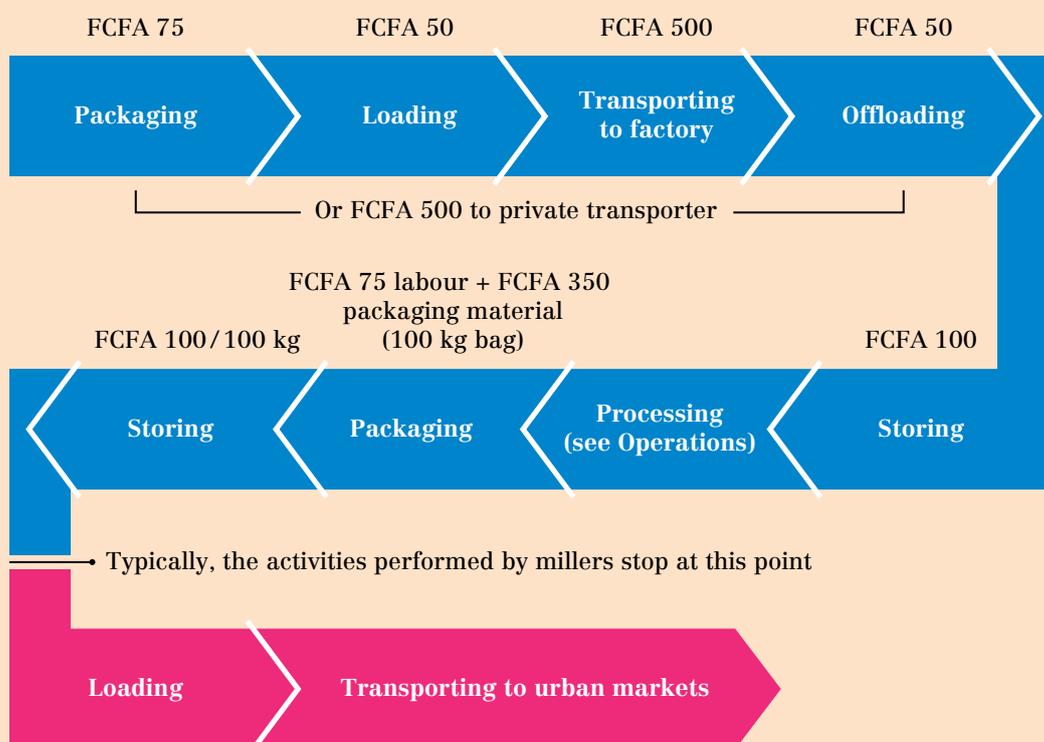
To have some control over quality assurance the three millers undertake – to varying degrees – logistical activities related to drying, transportation and storage, before paddy reaches the mill, with important cost implications, as shown in Figure 13.

◆ **FIGURE 12** External factors affecting the logistics of a small and medium agrifood enterprise



Source: Authors’ own elaboration.

◆ **FIGURE 13** Costs of activities performed by the millers when procuring from contracted farmers for a 80 kg bag of paddy at an average distance of 25 km



Source: Authors’ own elaboration based on interviews with the millers.

Food safety issues specific to rice include contamination at unsafe levels by aflatoxins, pesticide residues (see Box 7) and arsenic. Rice can absorb heavy metals that are present in the soil or in ground water, either because they are naturally present or due to leaching from landfills. There is currently only limited data available from the Sahel region and the level of risk from such absorption would thus require further study. The concern is known, however, and Codex has developed a standard for the prevention and reduction of arsenic contamination in rice (CXC 77-2017). Similar to pesticides, human exposure to arsenic can be high when rice is a staple food. There is not much evidence as to the presence of heavy metals in Senegal waters or its accumulation in rice grains; one study, however, has found that it is below the recommended maximum content (Ndong *et al.*, 2018).

◆ **BOX 7** Use of pesticides in the rice sector

Pesticide use can negatively impact the environment, become a health problem for people who apply them without adhering to safety practices (e.g. wearing the correct equipment), and create food safety concerns when residues of banned pesticides or above-limit residues are present.

While the risks related to the use of pesticides are mainly related to practices at the production stage, activities performed by millers – such as storage – can also have an impact on the levels of contamination.

Previous studies show that there have been large-scale incidents of illness and hospitalization due to pesticides poisoning in the Sahel region, including in Senegal (Sow *et al.*, 2008). Research conducted in 2014 revealed that risk of uncontrolled use of pesticides in crops still existed at the time of the study (Jepson *et al.*, 2014).

The USAID-led Naatal Mbay programme in Senegal has addressed the use of pesticides through close follow-up on agricultural practices (Bonilla Findji *et al.*, 2016). Additionally, poisoning data is collected by a poison centre established at the University Hospital in Dakar (Jepson *et al.*, 2014). However, there have been no recent studies to assess the current situation of pesticides use practices on rice in Senegal, so it is not clear whether the issue is still of concern.

Rice is one of several commodities responsible for human exposure to aflatoxin (JECFA, 2018), a toxin produced by certain fungi that thrive in warm and humid environments (WHO, 2018b). The published data on aflatoxin contamination of rice is from developed countries; there is a great need to assess the risk in developing countries, especially countries with a high per capita consumption of rice (WHO and FAO, 2017). The control of aflatoxins is a complex process and requires an integrated approach across the whole value chain (JECFA, 2018; WHO, 2018b).

The prevention of food safety and quality issues relies on good agricultural practices (GAP), including harvesting, drying and storage.¹¹ Timely harvesting, threshing, drying and storage all influence the quality and safety of paddy as well as milled rice.

¹¹ Only the activities performed by the millers were assessed in this study, namely drying and storage.

3.2 Inbound activities

From the perspective of the three millers in this study, the need to be close to farmers to deal with supply-related constraints (see the Procurement section) and quality assurance outweighs the costs arising from operating in rural areas (see Section 5.3 for a more comprehensive analysis of the distribution of costs along the value chain for one operational cycle). The millers' most distant suppliers are located 5, 25 and 50 kilometres away. All of the companies own trucks, which are used to collect the paddy at the farm gate. These trucks might be supplemented with outsourced services during the high season, when there is too much to be delivered by a single truck. Private service providers charge about CFA 500 (USD 0.85) per 80-kilogram bag, which includes the costs of packing, fuel, driver, loading and offloading. The bags are bought by the farmers. When transportation is done by the company, the CFA 500 includes the fuel and the amortization of the vehicle, while all the other inbound activities are carried out by company employees.

A lack of adequate infrastructure limits the role that the millers can play in providing auxiliary services in the absence of a competitive service provision market in rural areas. The millers, because they are close to the community, can leverage relationships to build innovative services around their core businesses, and compensate for inefficiencies in the rural market; this has been perfectly demonstrated by the provision of agricultural services to farmers, which has been enabled by leasing schemes with support from development actors (see Finance section as well as Box 5, which provides more details about leasing). Indeed, food processors in West Africa are becoming increasingly involved in providing agricultural services, such as mechanization (Zhou, 2016). **The fact that service provision directly impacts the quality of their supply means that they have a vested interest in making it work.**

Government and development actors should take the opportunity to support millers in offering auxiliary services on the inbound logistics side. While so far this has been accomplished in production-related services, there is room to improve transportation and storage activities. **For example, poor infrastructure during rainy season means that at times paddy is lost because it cannot be brought to a proper storage area soon enough after harvest.** One company was able to quantify the costs of losses due to weak infrastructure, estimating a total loss of CFA 600 million (USD 1 million) since 1989. During the rainy season, feeder roads to the farms become washed out and impassable. Managing the flooded areas with proper drainage affects the salinity of the soils, damaging the quality and quantity of paddy and resulting in losses, in addition to increasing the costs of transport and vehicle maintenance. The government also collects taxes on fuel which, together with the import duty and VAT charged for transport vehicles, adds to already high logistical costs (Miklyayev *et al.*, 2017).

Coupled with high transport costs, the millers' ability to take advantage of economies of scale is hindered by the lack of storage silos. This means higher handling costs and makes bags necessary. One company has to rent an additional eight storage areas and eleven empty classrooms to cover their needs. Another estimates that the savings generated by storage silos could reach CFA 575 (USD 1) per 80-kilogram bag of paddy. Storage is a challenge across the SRV: while investments in warehouses by the Spanish Agency for International Development Cooperation has benefitted a couple of mills and facilitated a reduction of transportation costs, there is still not enough storage capacity in the region to deal with the large amount of paddy that is produced (Miklyayev, Hashemi and Schultz, 2017).

The investments or losses incurred by millers related to the transport and storage of paddy, while significant, also needs to be coupled with the added value, or lack thereof, of quality assurance and food safety.

3.3 Food safety and quality aspects

While safety refers to any hazards that might make food harmful to the health of the consumer, quality is related to the other attributes that might impact a product's value, such as origin, color, flavor, texture or processing method (FAO and WHO, 2003). Good quality paddy is characterized by uniformly mature kernels, uniform size and shape, no fissures, and no contaminants such as stones or dirt. Good quality rice generally has a high milling recovery, high head rice recovery and no discoloration. Senegalese consumers value the quality characteristics of rice, and especially, the taste, swelling capacity, ease of cooking and the form of grains (Fall and Diagne, 2008).

Rice quality is visible or detectable and thus can be assessed by buyers and consumers. This means that farmers and processors have a direct stake in ensuring that quality characteristics respond to demand. Indeed, studies conducted in Senegal reveal that urban, high-income consumers are willing to pay a premium for local rice of good quality (having the above-mentioned characteristics) (Demont *et al.*, 2013); this provides a good rationale for the millers' strategy to differentiate themselves from their competition by focusing on quality aspects (see Marketing and Sales).

Unlike quality, safety cannot be assessed visually by consumers and thus does not influence the motivation of producers or millers to comply to standards, especially since doing so often imposes high additional investments. Indeed, research in developing countries finds that small food manufacturers lack the incentive to invest in quality and safety aspects as they believe this will not be rewarded by consumers (FAO, 2016).

As discussed in the background to this section, food safety risks that millers might face at this stage include the procurement and handling of paddy with unsafe levels of pesticides, aflatoxins or heavy metals; confirming this requires analytical techniques and expert know-how, neither of which is readily available to small rice millers. The only viable option open to a business owner is to ensure they have a thorough knowledge of the business practices of their supplier and the origins of the raw material. Chemical analysis of residues is costly and thus would optimally be done through collaborative efforts between business owners, and/or by the government.

In Senegal, husked, milled and parboiled rice falls under the obligatory standard NS ECOSTAND 001:2013, introduced by ECOWAS in 2013.¹² While regular oversight from authorities has been reported by the three millers, there are discrepancies, and signs that compliance with food safety and quality standards does not take place on an ongoing basis.

Paddy should be dried as soon as possible after threshing in order to reach the ideal moisture of 14 percent. Improper drying can cause the formation of moulds or the development of fissures in the grain, leading to higher breakage during milling. Drying can be done either manually, such as by spreading grains under the sun on pavements or mats, or mechanically by using solar dryers or drying equipment using heated air or low temperatures. In-store drying can be done using ambient air or slightly pre-heated air at high relative humidity (IRRI, 2013).

Currently, the three companies under study dry their rice manually on tarpaulins far from the road. Proper sun-drying is labour-intensive and requires capital investments in land and waterproof flooring. The greatest constraint, however, lies in its dependency on weather. Drying the paddy manually also poses higher food safety and quality concerns because of an increased risk of contamination with stones, dust or dirt. Greater losses can also occur because of scattering or pests (Samaddar *et al.*, 2017). This was also observed by

¹² Currently not publicly available.

the research team in Senegal, where the workers hired by the three millers – most of them casual – placed the paddy in the sun without protection.

In addition to drying, the storage of paddy is another challenge. None of the processors we studied have storage silos, but all three have plans to invest in this equipment. However, storage silos are expensive and the millers should be made aware of other options such as hermetic storage systems which are more affordable. These systems are also more flexible and can be set up both inside or outside when needed. As opposed to silos, fumigation for insect control is not needed – see IRRI (2019a) for more information on hermetic storage systems, including their advantages and costs.

Currently, bags of paddy are stored on the company premises (or in rented classrooms or other spaces in the case of Savoureux) for a maximum of one month before being processed; the research team observed that the millers lack knowledge about storing techniques, storing the paddy in poor conditions that could lead to its contamination. Good storage practices requires monitoring a number of factors, such as moisture, temperature, mechanical or insect damage, aeration and the presence of fungi (JECFA, 2018). Visits to the companies' storage facilities suggest that this is not being done. For example, in addition to reports that paddy had been spoiled by moisture, one company also had rice infestation problems in the stocks. To prevent the infestation, they spread around rat-repellent pills, which could be a potential safety hazard.

As previously noted, the three processors consider their main investment needs to be drying and storage silos; however, their motivation for seeking funding for the silos is to protect quality characteristics, such as color or level of brokenness, rather than ensure the safety of rice. This indicates gaps in the effectiveness of safety training delivered by various agencies (see Section 7.2). Khady Riz observed that they could access food safety expertise through development agencies operating in the rice sector, such as USAID or JICA, which had previously trained them on safety and quality aspects; however, they did not see the need for this consultation at present.

Concerning private (voluntary) standards, RizElle noted that obtaining an ISO requires many costly inspections and investments in the plant and so they are not interested in pursuing certification. Savoureux expressed an interest in receiving an ISO certificate but the perceived advantages were not related to accessing higher volume or higher-value markets, but rather to helping them access better bank financing since the ISO bolsters lender confidence in their business. The company, along with seven other businesses, is currently being assisted by a governmental programme to obtain its ISO¹³ certificate.

3.4 Outbound activities

While inbound logistics are affected by a company's their business model, outbound logistics are of less concern to the processors since most rice is sold at the factory gate, putting the buyers in charge of transportation (see Figure 13). Occasionally, the companies handle the transport to their own warehouse (Khady Riz) or to small outlets (RizElle) located in big cities such as Dakar, Thiès or Mbour.

Currently, the companies store their processed rice in bags on their premises which, as opposed to paddy, they do not consider an issue since the rice does not stay in stock for long. Khady Riz also has storage space in Dakar, which facilitates distribution. Transportation costs from Saint Louis (where Khady Riz is located) to Dakar are estimated at CFA 8 000 (USD 15.09) per tonne (Osinski and Sylla, 2018), the distance being around 260 kilometres.

¹³ Relevant certificates are ISO 9001 on quality management systems and ISO 22000 on food safety and quality. It is not clear what type of support is provided by the government.

Including the costs incurred from loading and offloading (CFA 100 or USD 0.17 for a 50-kilogram bag), this adds up to about CFA 10 000 for 260 kilometres or approximately 960 (USD 1.63) for 25 kilometres. This is significantly lower than the CFA 6 250 (USD 10) per tonne per 25 kilometres to transport paddy from the farm to the mill.

While bags for paddy are purchased by farmers, the millers buy their own labeled bags from Dakar to package processed rice. A bag that holds 25 kilograms costs CFA 130 (USD 0.22), a bag for 50 kilograms costs CFA 170 (USD 0.29) and a bag for 100 kilograms costs CFA 350 (USD 0.59).

3.5 Conclusions

Inbound logistics play an important role in how the millers choose to establish their business models; their stake in the availability, quality and efficiency of inbound activities could provide an opportunity for the government to develop markets in rural areas by enabling millers to expand and improve the support services they can offer. For example, in addition to reducing the health risks from aflatoxins, strengthening the role of millers in transporting paddy from the production zones, as well as in drying and storing the produce, will have spillover benefits for the quality and market price, of milled rice; this will be further discussed in the Operations section.

Investments in infrastructure (i.e. dams and main roads) have yielded many benefits in Senegal as discussed throughout this report. The study does, nonetheless, reveal that more investments in feeder roads, for instance, are still required in the hinterland regions of the valley so that isolated farms can be better connected to buyers, especially during the rainy season. Currently, transportation represents the highest logistics cost for the millers.

Large investments in infrastructure have tended to be based on the needs of farmers. Yet significant challenges arise once the produce leaves the farm; these mainly affect the inbound logistics of millers and affect the safety and quality of paddy, and thus of rice. Along with poor hinterland roads, weaknesses include inefficient drying systems and the lack of proper storage.

Importantly, the high costs of inbound logistics, combined with increased availability of supply, has led to the emergence of micro-scale mills close to the farmers, further contributing to a fragmented sector filled with inefficient players (Miklyaev, Hashemi and Schultz, 2017). This reiterates that attention to the production side should be combined with efforts to address constraints further down the chain.



4 Operations

KEY MESSAGES

- ◆ The efficacy of factory operations, and product quality, including safety, are reliant on the efficacy of preceding value chain activities (i.e. production, post-harvest and inbound logistics), highlighting the need for a systematic approach across the entire chain.
- ◆ Food safety in the rice sector requires investments in control systems from pre-production (soil quality, inputs) overseen by competent authorities, with incentives in place to ensure compliance between actors. Once compromised paddy leaves the farm, or store, it needs to be discarded as it is not possible to recover standards during downstream processes.
- ◆ Consumer preferences and product knowledge drive millers' decisions on aspects such as rice varieties and the extent of attention given to food safety and quality control. Lessons indicate that more public sector engagement with consumers can drive access to more diversified, nutritious, and sustainably produced food.
- ◆ The extent of value added to rice during operations is influenced by the type, and age, of technology employed and the reliability, and quality, of electricity and water utilities. The state of public infrastructure and legislation on environmental compliance, nutrition, and food safety influences how millers design and carry out their operations, also affecting the quality and final cost of rice at retail.

◆ **FIGURE 14** External factors affecting the operations (processing activities) of a small and medium agrifood enterprise



Source: Authors' own elaboration.

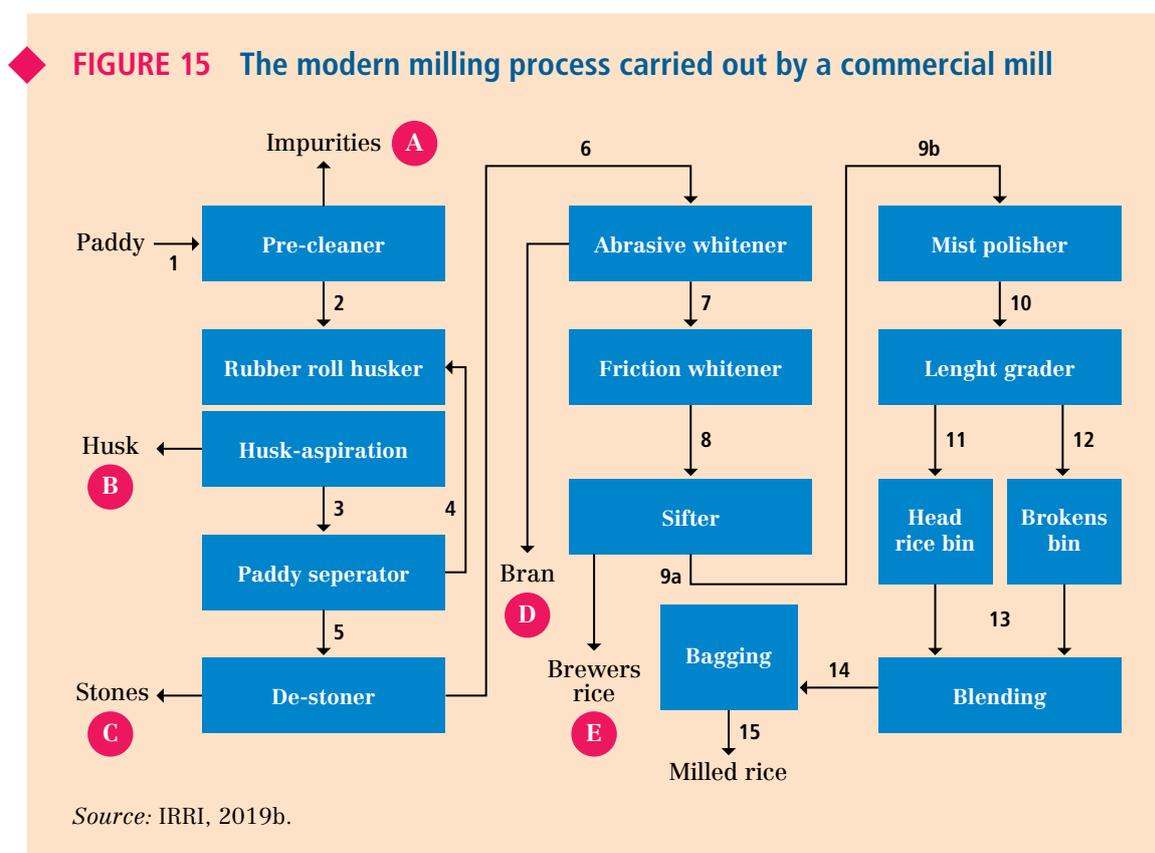
This section will provide a description of the milling process and the operational practices (and costs) of the companies in the study. Food safety and quality will again receive special attention as it is an important aspect of the millers' business model with significant implications for the community.

4.1 Background

As previously discussed, the rice sector in the SRV is populated by hundreds of micro mills, also known as village mills.¹⁴ These are mainly found in rural areas and are used by the local community as a paddy milling service for home consumption. The service involves a one-step milling process that removes the husk and bran together, or a two-step process in which the husk and bran are removed separately. The single process mills generally yield rice of lower quality since both the milling recovery and head rice recovery are low, estimated at 53 percent and 30 percent respectively. The two-stage village mills, on the other hand, have an input capacity of 0.5 to 1 tonne per hour and are able to provide a recovery rate above 60 percent.

Commercial rice mills can have a capacity of 1 to 16 tonnes per hour and yield rice of higher quality than village mills, due to a more sophisticated processing method that comprises multiple stages: husking, whitening-polishing, and grading, blending and packaging.

The modern milling process generally includes up to 11 functions and has the objectives to produce edible rice that is appealing to the consumer (i.e. free of husks and foreign matter), to maximize milled rice recovery and minimize grain breakage. Figure 15 depicts the flow of paddy and processes undertaken by a modern mill.



¹⁴ All technical specifications in this section are drawn from IRRI's Rice Knowledge Bank (2019b) unless otherwise stated.

The produce is first unloaded into the pre-cleaner (1), which removes impurities such as straws or empty grains. The paddy then moves to the rubber roll (2) where the husk (B) is removed from the grains and then separated by an aspirator. A mixture of brown rice and up to 10 percent unhusked paddy passes to the paddy separator (3) where the latter is returned to the husker (4) and the former is forwarded to the de-stoner (5), which removes stones (C). Following this, the bran (D) is removed from the paddy in two or more stages – in this example, first by abrasion (6), and second by friction (7), resulting in white rice (generally implying 8–10 percent bran removal), which moves to the sifter (8) where small fragments of grains are removed, a by-product known as brewer’s rice (E). While simple mills will then move the white rice directly to the bagging station (9a), more sophisticated machines will pass it to the mist polisher (9b) – there can be various degrees of polishing. Polished rice is moved to the grader (10), which sorts the grains by length, separating broken grains (12) and head rice (11) into different bins. These are then blended (13) according to the customer’s specifications pre-set by the miller. The custom-made blend is finally bagged (14) and sent to the market (15).

4.2 The milling process and its role in providing a good quality, safe and nutritious product

As discussed in the section on inbound logistics, production-related practices and pre-milling activities, such as drying and storage, can significantly impact the safety and quality of paddy; in this context, safe and good quality paddy is a prerequisite for safe and good quality milled rice.¹⁵ To obtain good quality rice, the paddy used in the milling process should have uniformly mature kernels, uniform size and shape, no fissures, and no contaminants, and the right moisture content of 14 percent (see Section 3.3 for a discussion on safety and quality). The millers thus have a strong interest in controlling procurement inbound logistics to ensure that the value of paddy is maximized in terms of both quality and quantity (see Inbound Logistics section).

Following the inbound stage, the quality and safety characteristics of the final product are also determined by ‘in-house’ conditions, including the equipment, which should be clean and well-maintained, as well as by the staff operating the machines – see the Human Resources section for a more detailed analysis of the skillset needed by millers. According to IRRI (2019b), an efficient milling machine will yield 50 to 60 percent whole kernels, 5–10 percent large broken grains and 10–15 percent small broken grains. A multi-stage mill will produce an even higher ratio of 65 to 70 percent. Against this benchmark, the three millers in the study utilize upper-end processing units with a transformation ratio of around 60 to 65 percent. During the low seasons, the companies interrupt their production cycles for cleaning and maintenance. Khady Riz, for example, closes for two months, and Savoureux, a smaller operation, closes for two weeks.

It bears repeating that the companies are mainly concerned with quality, rather than safety, which is too complex to be adequately measured by farmers, millers or consumers (see the Inbound Logistics section for a more thorough discussion of issues such as aflatoxins), providing the rationale for the involvement of the government and other authorities in ensuring safety aspects are being addressed across the whole value chain.

Operational activities not only affect food safety and quality, but also the nutritional value of the final product. In addition to being a rich source of dietary energy, rice is also a good source of thiamine, riboflavin, and niacin (FAO, 2004), which are essential micronutrients

¹⁵ All technical specifications in this section are drawn from IRRI’s Rice Knowledge Bank (2019b), unless otherwise stated.

involved in energy metabolism and which may also prevent development abnormalities or certain diseases (Mielgo-Ayuso *et al.*, 2018). As discussed in Section 4.1, milled rice is polished or whitened, which means that about 8–10 percent of the bran is removed. In general, the more bran that is removed from the grain during milling, the more vitamins and minerals are lost (Kennedy, Burlingame and Nguyen, 2002). In short, the whiter the rice, the fewer nutrients it has. Table 2 shows how the nutritional value of rice varies with different levels of polishing. Some notable differences can be seen for Potassium, Vitamin B and Magnesium.

◆ **TABLE 3** Brief overview of the three interviewed millers

Nutrients	White rice	70% polished	50% polished	Brown rice	Germ rice
Protein (g)	2.5	2.6	2.7	2.8	2.7
Lipid/ fat (g)	0.3	0.5	0.6	1.0	0.6
Carbohydrate (g)	37.1	36.7	36.4	35.6	36.4
Potassium (mg)	29	35	43	95	51
Calcium (mg)	3	4	4	7	5
Magnesium (mg)	7	13	22	49	24
Phosphorus (mg)	34	44	53	130	68
Vitamin B1 (mg)	0.02	0.06	0.08	0.16	0.08
Niacin (mg)	0.2	0.8	1.6	2.9	0.8
Vitamin B6 (mg)	0.02	0.03	0.07	0.21	0.09
Folic acid (µg)	3	5	6	10	6
Saturated fatty acid (g)	0.1	0.16	0.19	0.23	0.16
Monounsaturated fatty acid	0.07	0.12	0.14	0.3	0.15
Dietary fiber (g)	0.3	0.5	0.8	1.4	0.8

Source: Standards tables of food composition in Japan (MEXT, 2015).

Millers are willing to provide the market with healthier options but only with a confirmation of demand. The companies in our study understand the nutritional benefits of less processed rice but are unsure whether the market would respond positively to brown or parboiled rice (see Box 8 for an overview of the parboiling process). The millers focus on the quality of the grains, asserting that consumers care more about quality characteristics (specifically, taste, swelling capacity, ease of cooking and the form of grains, as revealed by Fall and Diagne, 2008) than they do about nutritional qualities. The quality characteristics of the Sahel 108 variety make it the preferred choice of consumers.

◆ BOX 8 Parboiled rice

Parboiling is the process of soaking rice in warm water, steaming and drying it; this takes place prior to milling or storing. The process yields grains that are more transparent and less sticky than normal rice. The process allows some nutritional content to be transferred from the hull into the grain, thus making parboiled rice more nutritionally-dense than untreated rice.

Source: Kennedy, Burlingame and Nguyen, 2002.

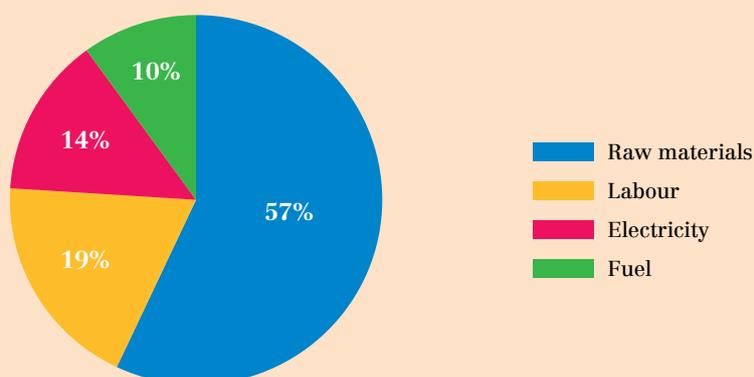
Evidence shows, however, that there is a market in Senegal for both brown and parboiled rice (see the Marketing and Sales section). Responding to this opportunity could also represent a chance to address the side effects resulting from the government and donors' large investments in the production and promotion of rice. Miklyaev, Hashemi and Schultz (2017) found, for example, that these investments encouraged farmers to consume only rice throughout the day, which has negative health implications. Over-nutrition and non-communicable diseases are on the rise in Senegal, and studies reveal that diabetes is becoming a pressing public concern, even in rural areas (Duboz *et al.*, 2017). As such, expanding the availability of rice options to include more nutritional types could help to address the negative effects of Senegal's overconsumption of rice.

However, this suggestion should be taken with caution as more nutritional and financial assessments are needed to understand whether developing the parboiled or brown rice sector would be an effective measure for reducing non-communicable diseases that also makes financial sense. Brown rice, for example, has a very short shelf life under tropical conditions (approximately two weeks), adding to the already difficult logistical burdens with respect to maintaining quality and safety. Brown rice involves less processing costs but extra efforts to protect its quality, along with lower market demand, make it difficult for processors to take advantage of economies of scale.

4.3 Distribution of direct costs for milling

The normal distribution of costs for agrifood manufacturers is indicated by World Bank Surveys, as depicted in the pie chart (Figure 16).

◆ FIGURE 16 Distribution of costs for a small and medium agrifood processor

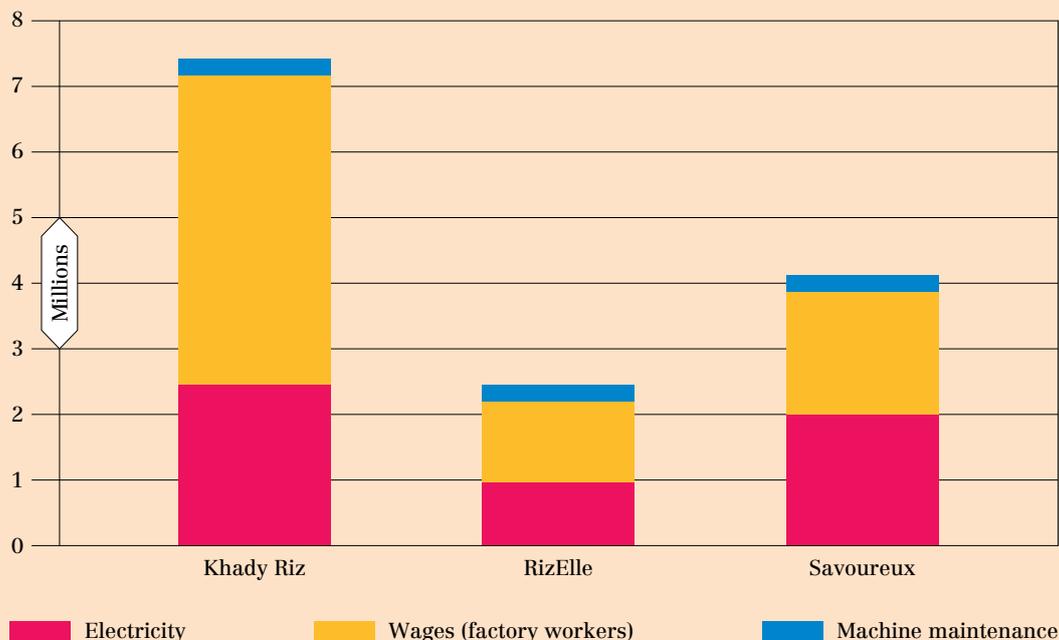


Source: Authors' calculations based on World Bank Enterprise Surveys conducted in Senegal.

Our calculations, based on the owners' recollection of costs, reveal that, in line with World Bank Enterprise Surveys, paddy is the main cost and among costs of processing only, labour is the highest, followed by electricity (see Figure 17).¹⁶

◆ **FIGURE 17** Costs of processing for the three millers

MONTHLY COSTS OF PROCESSING (CFA) DURING THE HIGH SEASON



Source: Authors' own elaboration based on interviews with the millers.

While wages are the second highest cost factor in processing, the millers in the study were more concerned with the high costs of electricity. Nonetheless, access to electricity is considered relatively reliable for every processor, confirming the improvements noted in the literature, such as the cutoff time decreasing from 912 hours in 2011 to 72 hours in 2017 (Ba, 2018). All companies have access to grid electricity; Khady Riz reported only a few power outages, while RizElle mentioned only half an hour of outages per month, and Savoureux mentioned two hours per month.

The lack of pro-competition policies in network industries translates into high electricity costs (World Bank, 2018b). RizElle and Savoureux are thus considering the possibility of acquiring a biogas power unit to work on rice husking, or even solar energy. Khady Riz owns such a unit, which was provided by USAID through a matching grant of 35 percent. However, the machine needs a large number of husks to operate, which can only be gathered during the peak season, with the result that the unit is not operational for about seven months of the year.

Repair and up-keep of equipment is an important cost for all three companies, with an average cost of about CFA 3 million (USD 1 700) a year.

¹⁶ Figures are estimates, based on the owners' recollection. The graph (Figure 17) only illustrates rice-processing related costs. However, casual employees or factory workers are often used not only in processing but in other business activities as well (such as carrying bags or drying the paddy). This could explain the higher operational costs of Khady Riz, which engages in more business activities than the other two companies.

4.4 Conclusions

Along with inbound logistics, operational activities are a main channel through which millers can influence the safety and quality of their final product. However, it is the quality of the product that is of greatest interest to the millers because this can easily be assessed by consumers whose preferences directly impact the business. Safety may be overlooked, even though demand is implicit, because its measurement is a challenge. Safety also requires important investments and supportive policies that include both oversight and incentives for compliance by food chain actors. There is room for further engagement by the government, trade organizations and development agencies.

Similarly, millers are not willing to invest in nutrition since they are not convinced that the market would reward their investment; this will be further discussed in the Marketing and Sales section. As rice is a staple food in Senegal, the government could improve nutrition nationally by assisting millers to expand their rice product line with healthier alternatives. Parboiling, for example, involves capital investment and additional costs for drying (Kumar *et al.*, 2018), thus it is important for the government to inform the millers as to its market value and educate consumers on the benefits. Targeting the right operational scale is also essential since modern parboiling is too energy and capital-intensive for micro operations (Roy *et al.*, 2006). Additional investments in production will be needed, according to the variety of paddy that is suitable for such type of processing. Regarding brown rice, its production involves less processing costs but lower demand than white rice along with additional resources needed to control safety and quality, means that processors cannot take advantage of economies of scale. Thus, it is important that any initiative is preceded by nutritional assessments and financial studies to ensure the maximization of the value of such investments.

Introducing incentives for millers to dedicate attention to food safety, as well as nutrition, which might require additional investments, is especially important since manufacturers already experience high operational and inbound logistics costs that challenge their ability to make their product affordable to the local population.



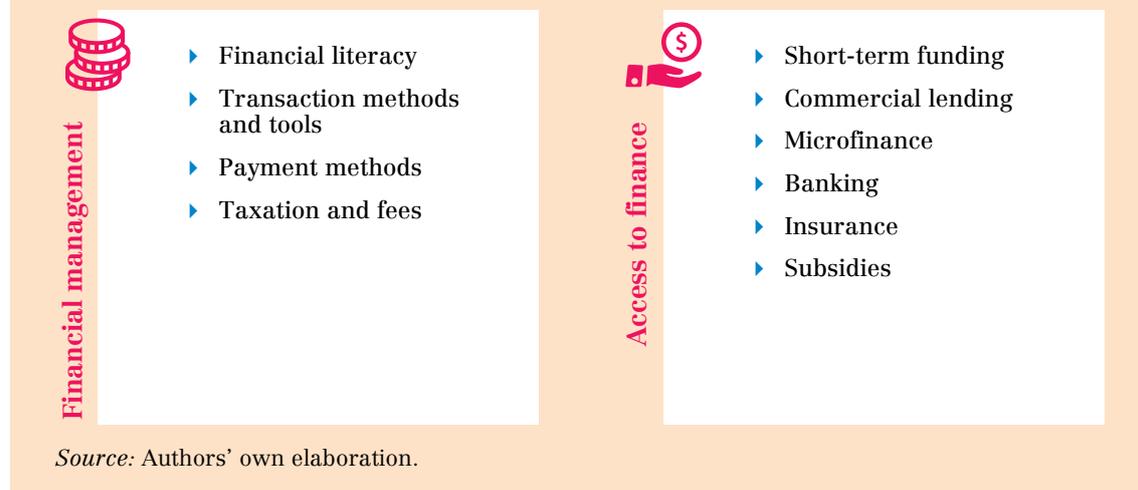
5 Finance

KEY MESSAGES

- ◆ Millers ranked access to working capital as more important to survival and long-term growth over investment capital, indicating a role for the public sector to engage with the commercial banking institutions on improving the flow of affordable short-term cash facilities to small businesses.
- ◆ Managing diversified procurement and sales contracts impacted millers' cash flow and working capital available during disruptions. Financial literacy and bookkeeping skills were also vital to demonstrate sound business models to potential investors and banks. The cases demonstrate that a variety of enterprise skills are needed for firm survival, highlighting the importance of good quality business management training courses for small companies.
- ◆ Government and donor grants and priorities influence the business model direction of recipients, with the risk that 'growth-traps' are created and/or that firm decisions are influenced in a way that is not conducive to business sustainability.

A company's financial component is shaped by two sets of factors, related to access to credit and the way the business manages its finances. As such, access to finance can be assessed by looking at the status of commercial lending, microfinance or subsidies in the country and sector, as well as the availability of short-term funding, which impacts a company's cash flow. Once finance has been secured, the way it is managed can further determine its value to the company. This depends on the financial literacy of the company, the use of financial tools, methods used for payments (i.e. to staff, suppliers or from customers) and financial protocols, such as taxation and insurance contributions.

◆ **FIGURE 18** External factors affecting the finance activities of an SMAE

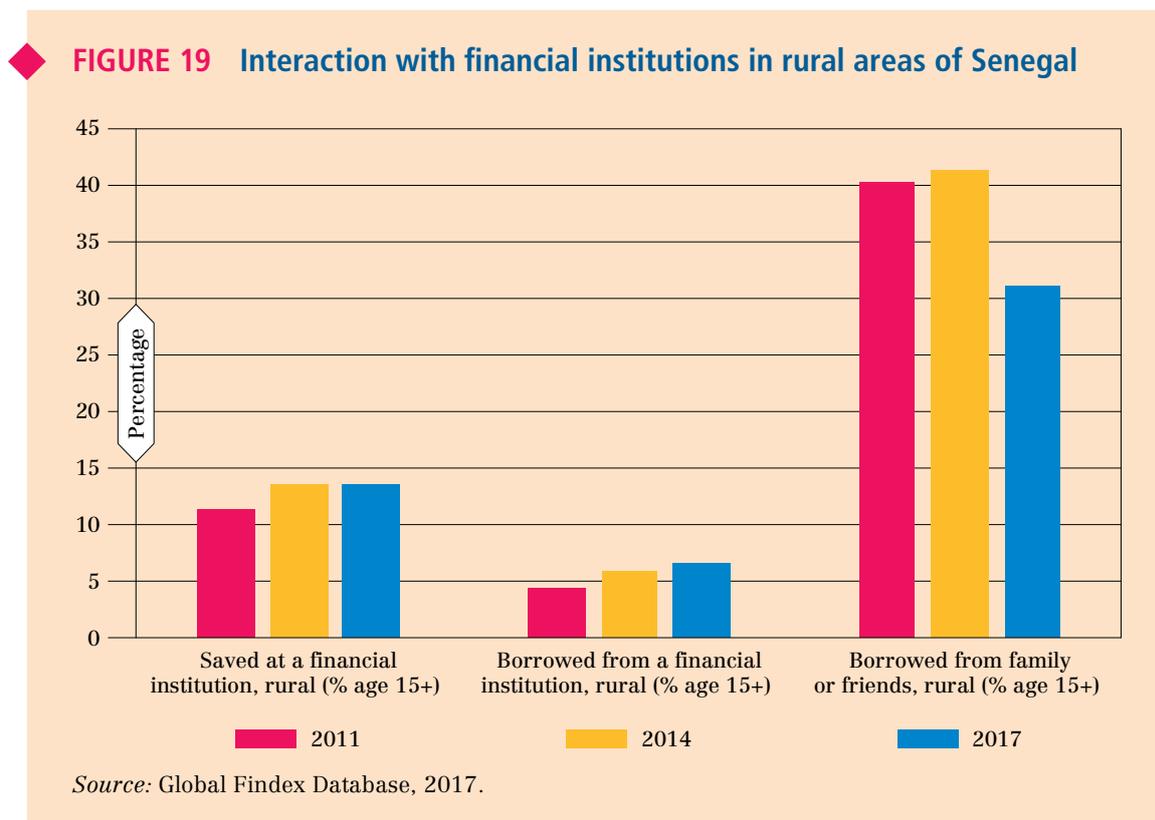


This section will examine how the finance component of the millers’ business model is shaped, focusing on the start-up phase, the growth stage, and day-to-day operations including working capital, tax payments and financial bookkeeping. The legal structure of the companies also emerges as an important point of discussion that is influenced by the above-mentioned circumstances.

5.1 Background

Financing is perhaps the most examined business issue related to SMEs in developing countries, and particularly in sub-Saharan Africa, often as part of the growing literature on the ‘hidden’ or ‘missing middle’ (see, for instance, Beck and Cull, 2014; Hansen *et al.*, 2012; Quartey *et al.*, 2017). Scholars now agree that access to financing generally drives firm performance and can be facilitated by creating the right enabling environment or addressed by innovative financing tools in the absence of adequate institutional support (White, Steel and Larquemin, 2017).

Rural areas in Senegal generally have minimal interaction with financial institutions, with communities relying on family and friends for loans as Figure 19 shows. There has been only slight progress as the percentage of rural population borrowing from financial institutions has increased from about 4 percent in 2011 to 6 percent in 2017, while the percentage of people borrowing from family and friends has decreased by almost 10 percent.



Most interventions to improve access to finance focus on providing financial services without considering other factors that could affect the long-term sustainability of these solutions, such as the financial practices of the enterprise. Despite extensive research on financial challenges and SME-directed schemes, there is still no compelling evidence as to “the sustained effect of financial services on small enterprise growth and transition,” making it difficult to assess what works and what does not (White, Steel and Larquemin, 2017).

In this context, the Senegal case provides an opportunity to examine the financial ‘triggers’ that have allowed rice millers in the country to grow and expand their operations (see Section 1.7 for an overview of this growth).

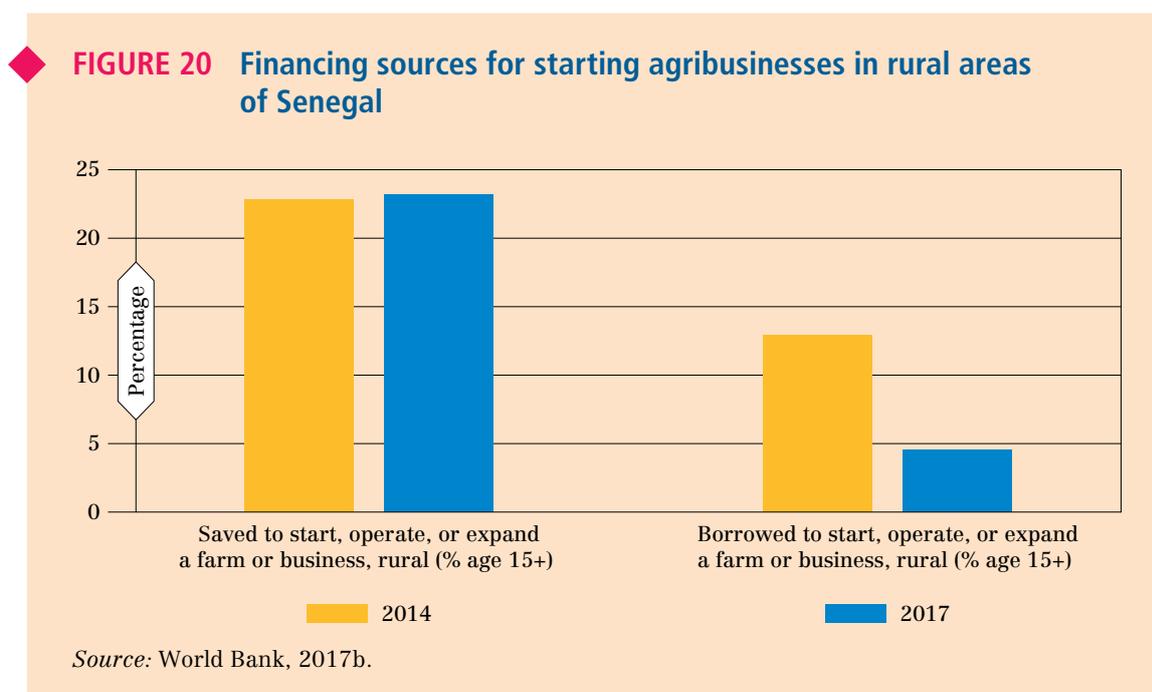
An enterprise’s financial success requires the ability to derive sufficient revenue to satisfy all financial obligations in a timely manner, adequate working capital for continued operations, and a satisfactory rate of return on capital (FAO, 1991). Managing these aspects requires financial literacy.

In simple terms, companies employ two types of budget: a working capital budget to finance its day-to-day operations, and a capital expenditure budget to grow the business by, for example, acquiring new assets. This section will examine how the three enterprises in our study got their start, and then delve into their operational expenditures and growth funds, identifying key factors that have contributed to accessing or employing these funds. The last part of this section will examine several other aspects that have influenced the firms’ financial management, such as financial literacy, bookkeeping and engagement with tax authorities.

5.2 Start-up phase

All three companies interviewed for the study were initiated through the effort and resourcefulness of their owners, who chose to dedicate their savings from previous employment to entering the rice industry, which was showing great potential due to growing demand and improved infrastructure.

All of the companies started off modestly, with activities mainly funded by the owner or by member savings¹⁷ in the case of RizElle; this is the standard start-up phase for an SME in Senegal (Wellen and van Melle, 2017). Indeed, as Figure 20 shows, agribusinesses in rural Senegal are more likely to be initiated with savings than with borrowings, either from financial institutions, family or friends.



¹⁷ GIE RizElle started as a women’s savings group – also known as ‘tontine’ – based on a modest contribution of CFA 50 (USD 0.85) per person, which allowed members carry out income-generating activities.

The owner of Khady Riz originally grew five hectares of rice on his land. The expansion became possible when he was offered the possibility to lease an additional 40 hectares from a youth centre. The agreement was that three quarters of the harvest would go back to the centre, while a quarter would be kept by the owner. Further farming operations were financed by the owners' savings from a previous job in a sugar cane company. Eventually, credit was accessed through CNCAS to finance a processing unit, tractors, and warehouse. RizElle, the women's cooperative, started with only 0.5 hectares and was financed by the modest savings of its 50 members (CFA 50 each, the equivalent of USD 0.85). Similarly, Savoureux's startup costs were financed by the founder's savings. The company started by buying paddy, milling it in the community, and then trading it; CFA 400 000 (USD 677) was then invested in buying the first milling machine.

5.3 Working capital

Working capital is the amount of money that a firm has at its disposal to pay immediate expenses. In other words, working capital is the portion of a firm's budget that is used to finance its operating cycle: production, production and distribution. The term is closely related to cash flow, which refers to the movement of money in and out of the business (FAO, 1991). An agribusiness company, for example, will use its working capital to purchase raw materials from farmers; this is possible only if the company has sufficient liquidity (i.e. the ability to generate sufficient cash flow to pay its expenses as they come due in the near term) (Gunderson *et al.*, 2014). Inefficient working capital and a lack of liquidity have often been cited as the main reasons for small business closure, and their proper management is considered a key factor in survival and progress (Ekanem, 2010; Mead and Liedholm, 1998; Vuckovic, Veselinovic and Drobnjakovic, 2017). Properly managing working capital is critical in Senegal, given the high operational costs that manufacturers here incur, as discussed in the Operations section. Operations do pose important costs but nonetheless, most expenses relate to supply, specifically inbound logistics as shown in Figure 21.¹⁸ See Logistics for a more in-depth discussion about costs and inefficiencies related to this stage of the value chain.

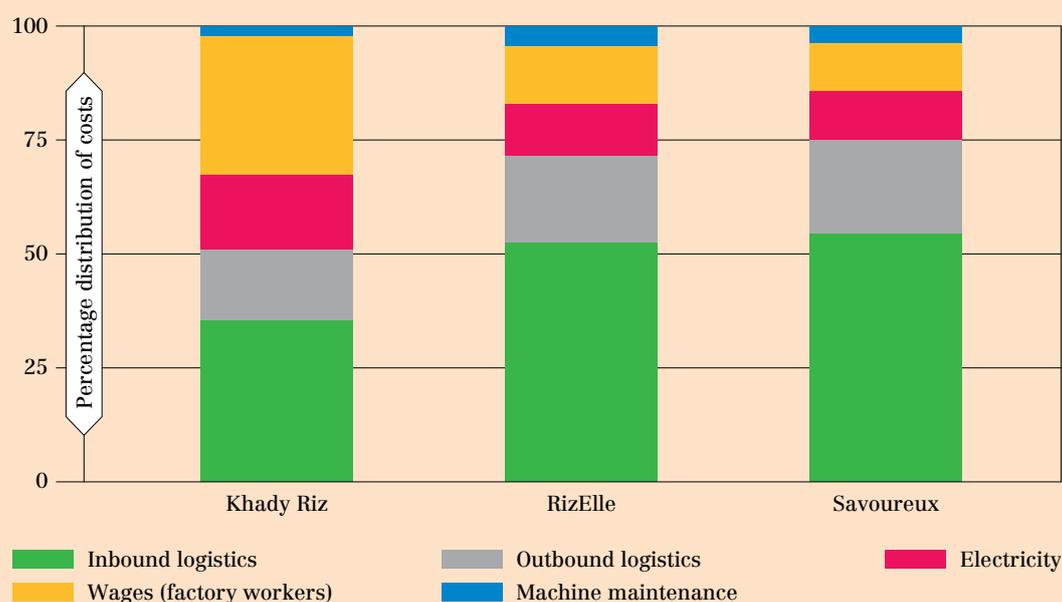
The three companies interviewed for our study reported that liquidity was the greatest obstruction to procuring paddy; once cash-flow improvement systems were put in place, the companies could increase their supply and expand their own production contracts.

The recognition of paddy as payment or collateral has contributed the most to greater financial fluidity. CNCAS considers that a loan has been repaid when paddy – tracked by a digital system – is delivered at agreed aggregation points or warehouses (Poublanc, 2018). Box 9 provides more detail on the status of Warehouse Receipt Systems in Senegal. Millers can also get loans of paddy from the bank and repay them after the sale of the milled rice.

The leasing scheme described in the Procurement section above (see Box 5) has particularly contributed improvements in cash flow because it has permitted the diversification of procurement mechanisms. **Expanding their service portfolio to match the production needs of farmers, has allowed the companies to undertake reimbursement in-kind, reducing the need to make payments before the sale of the rice.** The value of the payment is established in advance under the contract; for harvesting and threshing, for example, the farmer would pay 18–19 percent of total production.

¹⁸ Figures are only indicative and were not cross-checked with financial books.

◆ **FIGURE 21** Costs related to the operational cycle, based on owners' estimations



Note: The high percentage of costs attributed to labour in the case of Khady Riz is due to its diversification of products and services, activities which might be undertaken by the same employees who work in the rice factory.

Source: Authors' own elaboration based on interviews with the millers.

◆ **BOX 9** Improving access to finance through Warehouse Receipt Systems (WRS)

The regulatory framework for WRS was developed by a task force consisting of representatives from financial institutions, ministries and collateral management companies. Initiated in 2017, the framework is being piloted in the rice sector as part of a wider marketing contract scheme designed by USAID, SAED and CNCAS. The model involves the recognition of agricultural products as collateral and includes building the capacity of producer organizations (POs) to ensure consistent supply of good quality and engage in commercialization. USAID has established two monitoring and tracking systems to support the WRS; the systems help POs and banks to monitor yields, quality of produce, and repayment of loans.

Source: World Bank, 2017c; USAID, 2017b.

Cash flow is generally affected not only by payments to suppliers, but also by payments from buyers. The millers in our study are satisfied with the arrangements provided by their clients. Khady Riz observed that payments are normally made upon delivery. In some cases, 50 percent is paid on order and 50 percent upon delivery, or (in rare cases) 50 percent upon delivery and 50 percent after the products are sold. (RizElle usually requires payment on delivery. In rare cases, they allow for 50 percent to be paid on delivery, and 50 percent to be paid once products are sold. Savoureux is usually paid in advance, either the full amount, or 50 percent in advance and 50 percent upon delivery. The company has a contract with several customers, but not with all of them.

5.4 Financing growth

There are limited opportunities for SMEs in Senegal to enter the growth stage; retained earnings are the main source of growth capital until a company can access commercial loans (Wellen and van Melle, 2017).

Aid from development agencies and government subsidies played a large part in helping the three companies interviewed for our study transition to other agricultural activities and diversify their revenue. With leasing support subsidized by the government, Savoureux bought a harvester and a tractor, and RizElle purchased a combine harvester and a tractor. RizElle also took advantage of a revolving credit facility from a governmental women's development fund to finance the remaining amount of the lease not covered by the subsidy. RizElle's office and storage facilities were financed by the US Development Fund in Africa (USAAF). The company received a grant worth 80 million CFA; in return, RizElle agreed to provide loans worth a million CFA to four other GIEs. Khady Riz's main investments in assets were also funded with help from government subsidies, as well as through grants from USAID, JICA and GIZ. The timelines in the first section of this document (Figures 5–7) provide a comprehensive overview of the asset endowment evolution of the three companies. It is important to mention that the support for Khady Riz and Savoureux came *after* they had already committed to growing their companies, either by using their savings to fund their first large investments or by accessing commercial loans to upgrade the equipment and increase their sales.

All three companies accessed commercial loans – at an average interest rate of 11–12 percent – at least once during their operations but all prefer self-financing. In general, the millers expressed reluctance to source loans from banks, citing their lack of knowledge and experience in dealing with agriculture-related financial products. The World Bank Enterprise Surveys also indicate that agribusiness SMEs tend to seek loans at a lower rate than their non-agribusiness counterparts: out of 49 SMEs reported to have a credit line, almost 60 percent do not operate in the agrifood sector.

The good practice of channeling investment from development agencies through local financial institutions addresses this issue because it fosters a relationship between agro-enterprises and the commercial banking sector, increasing the likelihood that the linkage will continue beyond the end of external support. This is important: research has found that companies who interact with financial institutions have significantly higher profits and are more productive than those who do not (White, Steel and Larquemin, 2017).

Agricultural leasing through the private financing institution Locafrique, described in Box 5, is perhaps the most notable case for adaptation and expansion introduced by the Naatal Mbay project (see USAID, 2016 for a more in-depth overview of the initiative). It is important to mention that the government in some cases subsidized 60 percent of the cost of light equipment or 40 percent of the cost of heavy equipment that was bought through leasing. Future studies should thus investigate the return on such investments for both the government and the business, taking into account characteristics such as size and sophistication of machinery, to be able to identify good practices that make financial sense.

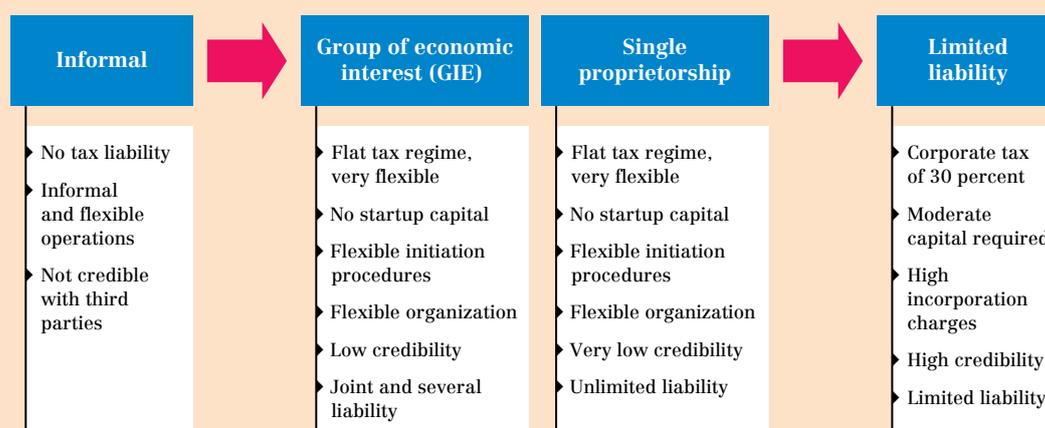
5.5 Legal structure

The Senegalese legal framework provides entrepreneurs with the option to register their business as a group of economic interest (GIE). Only one of the businesses in our study is a limited liability company, while the other two are GIEs that transitioned to this status from informal activities. The impact a legal status has on a business has not been extensively researched, with most studies focusing on the transition between informal and formal without considering the different structures involved.

In Senegal, the GIE has emerged as an alternative to a cooperative, the latter being more difficult to establish. Being a member of a GIE in Senegal is required to be able to access loans from CNCAS. Our research suggests that this legal status can be a transition point between an informal enterprise and more complex types of business establishments. A GIE needs to have at least two members, does not need start-up capital and does not have to pay corporate taxes, although the members are liable for income tax. Members are also jointly responsible for the group's debts (Journal du Net, 2019). GIEs generally do not engage in significant processing or marketing of rice (European Research Institute on Cooperative and Social Enterprises, 2017).

Both RizElle and Savoureux are family-run businesses; as such, the companies have been able to capitalize on the GIE structure which, in addition to benefitting from targeted support, also offers relatively more credibility with third parties – including financial institutions – than does a single proprietorship (see Figure 22). CNCAS was established to engage with family and producer organizations (IMF, 2002) and is currently the main source of financing for GIEs (Paglietti, 2016). The CNCAS bank offers the lowest interest rate option on the market (7.5 percent) and is therefore the preferred option for SMAEs, closer to the 7 percent maximum rate considered feasible by small and medium enterprises in Senegal as found by Wellen and van Melle (2017). It is not clear, however, to what extent other types of business structures are part of the CNCAS bank's clientele portfolio.

◆ **FIGURE 22** Types of business structures in Senegal



Source: Adapted from APIX (2015).

As discussed, all three companies were initiated with the owners' personal savings. This is a typical scenario for SMEs in Senegal, which tend to start off with activities requiring low levels of investment, and little interaction with financial institutions. Savoureux, for example, set up its processing activity with only a CFA 400 000 (USD 677) initial investment, while the minimum capital required for a limited liability company is CFA 1 000 000. Although there is not much research on the topic, one study has shown that companies are more likely to choose less complex legal structures when their owners use personal savings for business financing (Cole, 2011).

RizElle has been reluctant until now to consider changing their legal structure to a limited liability company in order not to lose out on the public sector and donor-related benefits associated with the GIE structure. However, currently facing (at the time of the interview) the possibility of a low interest loan of CFA 5 billion (USD 8 500 000) from the West African Development Bank, which requires limited liability, RizElle is now considering restructuring.

This has several implications in terms of increasing the complexity of the business, including the requirement to recruit a registered accountant. A seeming policy preference for small enterprises has tended to create ‘growth traps’ that impede firms from growing beyond a certain threshold, leading to unfair competition and creating other negative externalities (Reinecke and White, 2004; White, 2018).

Despite the fact that a business’ legal structure affects many aspects of its operations (i.e. interactions with third parties, financial management, credit options), its impact on firm growth has not been extensively studied, and research on GIEs is particularly limited. World Bank Enterprise Surveys include only six GIEs, meaning that the environment around this type of SME cannot yet be assessed quantitatively.

5.6 Taxes and bookkeeping

As noted above, the tax regime for GIEs is fairly flexible. For example, the members GIEs can choose between paying a corporate tax or income tax (Journal du Net, 2019). At the moment, the two GIEs in our study are paying the 30 percent corporate tax, as does the other miller. The companies deposit their annual financial statements with the fiscal authorities every year before the end of March. In Senegal, tax rates are perceived as the second most important constraint to doing business (World Economic Forum, 2017).

In addition to the corporate tax, the three firms also pay an employer tax of three percent, social security contributions of 10 percent, and a business license tax (also known as ‘patente’), which consists of a contribution based on property and value added. In total, Savoureux pays CFA 200 000 (USD 339) in taxes per month, and RizElle CFA 150 000 (USD 254); Khady Riz did not disclose its payments.

Khady Riz has been audited annually by the fiscal authorities and states that they have never had any issues. The two GIEs have never been audited due to their fiscal structure, which does not require annual audited accounts. Annual audited accounts are mandatory for limited companies with a turnover exceeding CFA 250 million (circa USD 423 390) (APIX, 2015). The World Bank Surveys indicate that agrifood SMEs receive slightly more visits from tax officials than do non-agrifood SMEs (54 percent versus 46 percent). They are also more likely to have a bank account (54 percent versus 46 percent). However, agrifood SMEs have significantly lower sales, with an average of CFA 315 million (USD 533 470) as opposed to CFA 511 million (USD 865 410) for non-agrifood SMEs.

While not mandatory, USAID is encouraging and financing, RizElle and similar GIEs to undergo an audit process with the objective of improving the quality of their financial reporting systems and overall business credibility. The Centre for Rural Economy (*Centre de Gestion et d’Économie Rurale* or GCER), is for example, a GIE with the role of auditor for other GIEs that want to engage in financing agreements. GCER also trains SMEs in financial management and its operations are partly funded by the fees charged to its GIE clients (European Commission, 2016).

The literature reveals that business owners in Senegal can with, relative ease, access capacity building in business management-related fields, such as accounting and bookkeeping. In the case of the three companies under study, training was provided by USAID-funded projects, such as Economic Growth Project (PCE) or Naatal Mbay programme (see Human resources section). Most capacity-building support is generally provided to high-growth enterprises (Wellen and van Melle, 2017). Having demonstrated a commitment to enterprise growth, USAID designs its capacity-building interventions to further stimulate this growth, and in the case of the companies interviewed for our study, enabled their access to equipment on lease from Locafrique.

5.7 Conclusions

This section demonstrates a number of lessons related to the complex relationship between a company's business model and its financial implications, in particular the interlinkages between input and output markets and cash flow; the impact that legal and tax structures can have on entrepreneurial drive and growth opportunities; and the importance of skills in accountancy and bookkeeping for managing a company's transition through its life cycle.

This study highlights the close relationship between a company's procurement activities and working capital. Working capital is often cited as one of the main reasons for small business closure and its management is a key factor to prosperity and survival (Ekanem, 2010; Mead and Liedholm, 1998) and Section 4.2.3 demonstrates the impact of the broader enabling environment on company cash flows. For instance, the WRS and leasing services facilitated by government policy reforms and USAID, enabled the companies to access formal financial services under the WRS and offer a portfolio of mechanized hire services to farmers; these were paid for in-kind with rice, freeing up the need for cash payments and improving cash flow. Similarly, how a company manages its payment patterns for sales is also central to short-term cash flow and a company's long-term survival; the three companies all indicated having secured reliable payment arrangements with their buyers.

Another important lesson emerging from the enabling environment analysis of SMEs in Senegal shows how entrepreneurs adjust their business models in order to take advantage of opportunities presented by the government or aid agencies. However, policies supporting the GIE structure may be having unintended consequences on companies' incentives to grow, as seen in the case of RizElle. Nevertheless, the GIE system provides an important enabling environment to the start-up and small-firm business community, as well as women's groups, since it allows microfirms to transition from informal to more complex business structures, and entrepreneurs with little need for major investments.

Finally, the importance of bookkeeping and accountancy skills, internally managed or outsourced, cannot be overemphasized. The capacity of a firm to manage its books in order to avoid problems with working capital is closely related to the management of input and output market payments and cash flow. Having access to well-maintained company books and financial records is also a prerequisite for a firm to attract investors and move forward in its life cycle.



6 Marketing and sales

KEY MESSAGES

- ◆ Intense competition from imports and village mills providing cheap and low-quality rice, along with high operational costs, have encouraged industrial mills in Senegal to differentiate themselves based on quality and unite their efforts to persuade consumers to buy locally.
- ◆ Key factors leading to improved quality as a competitive advantage for domestic rice brands have been contract farming and vertical integration for improved paddy, linked to modern machinery and skilled staff for upgraded milled rice.
- ◆ Investments in product marketing and branding has received little attention by those millers faced with the need to prioritize the quality of rice available on the retail market. While government and donor support with market surveys, and trade shows have helped, the development of a sector-wide national marketing strategy would also strengthen the competitiveness of domestic producers and millers vis-à-vis cheaper imports. Equally important is the marketing skills of millers and retailers to be able to promote their own brands and compete with one another on supermarket shelves.

◆ FIGURE 23 External factors impacting the marketing and sales of a small and medium agrifood enterprise



Source: Authors' own elaboration.

This section will explore the effects of market competition on the millers and consider how external factors – such as infrastructure – can impact their sales strategy and determine the type of market they reach. The section will also analyse how internal resources can create competitive advantage and further value. Finally, we will look at what kind of marketing activities are implemented to secure or gain market share.

6.1 Background

Rice is a staple for Senegalese consumers, accounting for 30 percent of dietary energy (Arsenault, Hijmans and Brown, 2015). In rural areas, consumers prefer whole grains and imports account for less than 10 percent of total rice consumption. Urban consumers, on the other hand, associate quality with pure and homogenous broken rice. Contrarily, the local rice offered on the domestic market is generally known for its heterogeneity (mix of varieties, often Sahel 108 and 201) and high level of impurities (Demont *et al.*, 2012). It is for this reason that urban consumers have developed a preference for imported rice, which is perceived as higher quality than the local variety. It should be noted that rice imports almost entirely consist of cheap broken rice, which in international markets is considered inferior. Senegal’s national dish – *thieboudienne* – is based on broken rice and these grains have been imported in large quantities ever since colonial times to keep food prices under control, leading urban consumers to be biased towards broken rice (Demont *et al.*, 2013).

Historical experience suggests that consumers in Senegal do not see local and imported rice as substitutes for each other. An increase in the international price for rice during the 2007–2008 crisis did not translate into higher prices for Senegalese local rice, which actually decreased, further widening the gap between the two (Demont and Rizzotto, 2012). Local rice is generally more expensive than imports due to factors such as high processing or transportation costs, and the presence of many intermediaries in the chain (Osinski and Sylla, 2018).

Present-day studies reveal that there is also a large segment of Senegalese urban consumers who are willing to pay a price premium of 35 percent for quality local rice, and even 44 percent for branded quality rice (Demont *et al.*, 2013; Demont and Rizzotto, 2012). Richer and more educated Senegalese value parboiled rice, which is much more expensive than ordinary rice, with a premium estimated at 71 percent for parboiled Sahel 108 and 134, and 129 percent for parboiled Sahel 177 (Fiamohe *et al.*, 2018).

◆ **TABLE 4** Brief overview of the millers' main market

Company	Market			
	Wholesalers	Retail	Institutions	Sales through own outlet/premises
Khady Riz	Yes	No	Army, cooperatives	Yes
RizElle	Yes	No	Yes, cooperatives	Yes
Savoureux	Yes	No	No	No

Source: Authors' own elaboration.

The main market for Senegalese companies consists of urban wholesalers as well as the army, and cooperatives under the Senegalese Sugar Company (Compagnie Sucrière Sénégalaise or CSS). One of the companies interviewed for our study has outlets in two major cities, and another sells small amounts of rice on its own premises. As such, despite being located in a predominantly rural region, almost all rice provided by the three processors ends up in urban areas, where consumers are willing to pay the higher price associated with locally produced, whole grain rice.

Evidence suggests that locally-milled rice does not reach the ‘corner kiosks,’ which are the main providers of foodstuffs for the low-income urban population. The preference of urban consumers for broken imported rice makes these traditional outlets unwilling to buy local whole-grain rice, which is often more expensive; as such, it is most likely that the products of the three millers in our study are sold in supermarkets that can afford to pay the premium for local whole-grain rice.

6.2 Market competition

There is a strong collaboration within the industry, which is sustained by a large and growing demand for rice in the country. All industrial and semi-industrial processors in the valley belong to the Northern Association of Rice Millers (ARN). Members share market information, refer extra orders, coordinate with financial institutions for loan disbursements, and conduct lobbying activities. They are also members of the Inter-professional Committee on Rice (*Comité Inter-professionnel du Riz*, also known as CIRIZ). This association represents the millers during seasonal price negotiations for paddy rice with the government and other stakeholders.

The Senegalese rice sector is a good example of how a sustained market can encourage actors to collaborate and make the necessary investments to respond to demand. This response was supported by the government and development agencies, which took on responsibility for promoting the industry (Box 10 provides details on the legislation aimed at helping local processors to compete with imports), thus allowing processors to focus their efforts on strengthening other aspects of their business (i.e. their relationships with suppliers, investment in equipment).

The three millers interviewed for our study observed that, due to high demand, distribution has not yet become an issue, even though they have to compete with cheap imported broken rice, which is preferred by urban consumers as discussed above.

◆ BOX 10 Competition with rice imports

In 2017, the government introduced an import ban on whole grain and semi-broken aromatic and non-aromatic rice.

To purchase broken rice, the importer must obtain authorization from the Ministry of Commerce, which decides on the quantity; the importer must also agree to buy a specified quantity of locally-produced rice. Since 2015, Senegal has applied the Common External Tariff (CET) for the Economic Community of West African States (ECOWAS), which varies from zero to 35 percent for imported products; for milled rice, the figure is 10 percent.

Since 2013, the government has imposed a price ceiling on imported non-aromatic broken rice for importers, wholesalers, and the retail sector. This is CFA 240 000 (USD 452.83) per million tonnes for importers, CFA 245 000 (USD 462.27) per million tonnes for wholesalers, and CFA 260 (USD 0.49) per kilogram for retailers in the region of Dakar.

Source: Osinski and Sylla, 2018a.

6.3 Strategy and competitive advantage

Porter's Generic Strategies model holds that a company can choose to pursue a competitive advantage based on either differentiation or lower cost within a broad or narrow scope (see Figure 24). According to Porter, a firm must choose only one strategy; otherwise it will be 'stuck in the middle' and will perform poorly. Since the introduction of the model, however, a growing body of literature has revealed that businesses can successfully engage in 'mixed' or 'hybrid' strategies; this includes companies operating in the food processing industry (as shown by Mutunga and Minja, 2014).

◆ **FIGURE 24** Porter's Generic Strategies model



Source: Porter, 1985.

The three companies are currently pursuing a broad differentiation strategy based on quality because they must compete with cheap imports, which are seen as better quality by local consumers (see the background to this section), as well as with thousands of local micro-scale mills offering cheap rice of poor quality. Nonetheless, the companies perceive the intensity of local competition as a threat to their procurement rather than to their market share because the industry is characterized by strong, growing demand and a shortage of local produce. The choice to compete (i.e. with importers and micro-scale mills) on differentiation rather than low costs makes sense given the high operational costs incurred by the millers. In addition, SMEs generally have limited possibilities to take advantage of economies of scale, and the shortage of paddy in the country also means that these processors often cannot use their machines at full capacity.

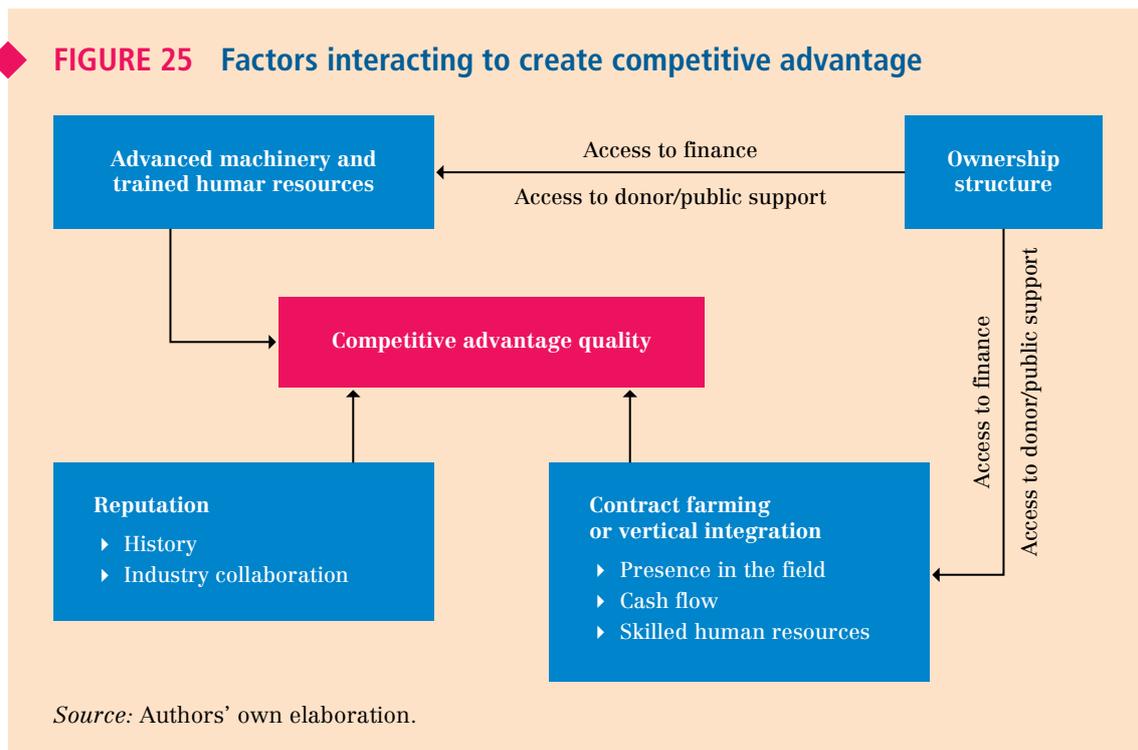
Complementing Porter's Generic Strategies model is the Resource Based View (RBV), which acknowledges that companies are heterogeneous in terms of resources and capabilities (i.e. physical, human, financial, organizational and social capital), and aims to explain how these resources are utilized to create competitive advantage (Barney, 2001). Naturally, the strategy that a firm chooses to pursue should be in line with its resource base.

The academic and donor communities have increasingly emphasized the contribution of SMAEs to rural development. It is thus important to understand how these firms recognize market opportunities and employ their resources in order to exploit demand. This phenomenon has not been studied extensively in relation to rural, small enterprises. The few studies that exist, however, have highlighted the importance of resources as sources of competitive advantage and performance for SMEs (Arthur, Berko and Damoah, 2015).

Figure 25 shows a simplified synthesis of the interactions among the three companies' resources and capabilities that have made their competitive advantage possible. There are three factors directly linked to this competitive advantage: contract farming or vertical integration, ensuring quality at the production-level; advanced machinery and trained staff, ensuring quality at the processing level; and reputation, which enhances the customers' perception of quality. Indirectly linked is the ownership structure, which has allowed RizElle and Savoureux to tap into public and donor support that prioritizes family or women's groups, and probably (not confirmed by our interviews) provides them with greater credibility when accessing commercial loans; Khady Riz inherently benefits from more credibility with banks, and perhaps with donors and public institutions, due to its limited liability structure. This has facilitated the development of constructive contract farming and the procurement of advanced processing equipment. Each of the main factors contributing to competitive advantage are discussed in detail in their respective sections.

All three of the companies in our study stated that the fact that they are well-known in the community has allowed them to secure long-lasting relationships with customers. In the case of Khady Riz, this has been reinforced by their historic presence. Strong collaboration in the sector has also enabled the millers to maintain a reputation for reliability, such as by referring extra orders when needed.

◆ **FIGURE 25** Factors interacting to create competitive advantage



According to the RBV, the factors cited above are not sufficient sources of sustainable competitive advantage, as there are several firms who pursue similar strategies using similar resources. In this case we do not agree. First, the analysis above relates strictly to the three companies' main competition, which include imported rice and micro-scale village mills; as previously stated, the companies do not see each other as rivals but rather as collaborators in a quest to crowd out low-quality rice and persuade clients to buy locally.

Second, it has been argued that in the food industry, and particularly for small enterprises, redeveloping temporary advantages (rather than a long-term, unchanged advantage) according to market changes and opportunities is very relevant. The growth strategy of the three companies has been based on proving to customers that there is good quality local rice

available. Indeed, as already discussed, research shows that urban consumers in Senegal are willing to pay a premium for good quality local rice.

There is scope for further differentiation, but the three millers are not aware of this opportunity. Interviews with other local cooperatives, for example, indicate that there is a niche market for healthier alternatives. Another GIE cooperative interviewed for our study sells parboiled rice at commercial fairs in Dakar at much higher than regular prices (almost three times as high) and manages to sell out their stocks during these events. The cooperative is considering creating a specific packaging that displays the nutritional benefits of such products and selling them in stores. This confirms previous research (Fiamohe *et al.*, 2018) that found that high-income consumers in Senegal are willing to pay a premium of between 71 and 129 percent for parboiled rice.

Responding to this market opportunity, however, might require the intervention of authorities. Millers must be made aware that such demand exists, and consumers need to be further educated on the nutritional aspects of parboiled rice. Diversifying the rice market to include more nutritional alternatives offers the government an important opportunity to address health issues, such as the rise of non-communicable diseases in the country (see the Operations section for a more detailed discussion of nutritional aspects).

6.4 Marketing activities

Marketing activities are often overlooked by SMEs, which have to direct their resources to more pressing issues, such as finance, and production-related challenges in the case of agrifood companies.

The three processors interviewed for our study do not undertake marketing activities mainly because they consider them to be overly expensive. Securing customers so far has been relatively easy, due to the government, extension and research agencies, and technical partners, such as USAID and JICA, who support local rice promotion through agricultural fairs,¹⁹ or by establishing rules around the import of rice, e.g. obliging buyers to buy a certain amount of local rice before importing (see Box 10). This has allowed processors to establish strong relationships with buyers and to benefit from stable demand. One company noted that their first large customer was secured at an agricultural fair where their participation was funded by USAID and this was recognized as a key factor in enabling their growth. The reliability of the customers is also reflected in payment patterns, as described in the Finance section.

Workshops have been organized to connect rice millers, distributors and retailers in urban areas, and this has led to an increase in sales channels (JICA, 2014). Currently, there is limited use of television and billboards to advertise rice; however, packaging has become more elaborate over the past few years in order to attract consumers (Osinski and Sylla, 2018a). Another initiative has seen the introduction of a high-quality SRV broken-rice brand 'Rival' (Riz de la Vallée) by local producers, with quality and microfinancing overseen by the Oxfam-funded platform PINORD. This experience has shown that it is possible to produce and market local rice varieties that respond to domestic urban demand (Colen, Demont and Swinnen, 2013). Nonetheless, greater efforts are needed to promote local rice to consumers, especially given the growing demand and persistent preference for imports. Box 11 provides more information on the kind of initiatives that could further support the promotion of rice.

¹⁹ The International Fair for Agricultural and Animal Resources (FIARA) takes place in Dakar every year, providing the opportunity for participants to exchange and promote innovations in agriculture and animal rearing and to sample Senegalese products. A similar event is the Dakar International Trade Fair (FIDAK), which exposes businesses from multiple sectors to subregional markets.

◆ BOX 11 Market research on rice

Surveys on consumer awareness in Senegal have noted an important lack of marketing of local rice (Demont *et al.*, 2010 in Demont and Rizzotto, 2012). In this context, several important findings could help improve the promotion of Senegalese rice.

First, consumers who are familiar with the characteristics of a product are significantly more likely to buy the product. Second, younger and better educated women are more likely to try a new product than are older and less educated people. Third, consumers who live close to production areas are significantly more likely to become aware of the local rice available in the markets. Finally, both word-of-mouth and traditional media (TV, radio, newspaper) are important when sharing information on rice (Demont *et al.*, 2012, 2013).

6.5 Conclusions

This section has shown that the companies interviewed for this study do not see one another as competitors, but rather as partners in a mission to showcase the quality of processed Senegalese rice and to persuade people to buy locally. Their competitors are rice imports and village mills that can provide cheaper rice than the industrial processors whose expenses are higher. Their need to cover the high costs of logistics and operations also means that industrial processors mainly offer whole-grain rice in order to obtain higher returns, and not the broken type that is preferred by consumers.

The analysis of the millers' business strategies in this section provides ideas for how processors in the staple food sector might be able to gain competitive advantage over imports, thus offering cues for policies that enable them to do so. Justifiably, the three millers have chosen to differentiate themselves from imports and local village mills based on the quality of their products. They have created this advantage by using contract farming or vertical integration to ensure the quality of paddy, modern machinery and skilled employees to control the quality of milled rice; and business reputation, which has enhanced the consumer's perception of quality. It is important to note, though, that quality of rice is not synonymous with safety, an area that needs to be further addressed, including through the involvement of authorities (see the Inbound Logistics and Operations sections for a more thorough discussion).

The Marketing and Sales section has also revealed that expanding their product line to include more nutritious types of rice could also provide an opportunity for the millers to further differentiate themselves and capture a niche market. This, however, would require important additional investments and the involvement of the authorities (as detailed in the Operations and Logistics sections). Given the segmented nature of the rice market in Senegal, the millers could adopt a strategy that caters to different consumers and preferences, which could also help them to balance costs and value.

Given the priority the three companies assign to operational costs and investments dedicated to ensuring quality, the activities of government or and others to promote local rice have been a valuable intervention, somewhat making up for the lack of marketing activities by the companies which consider them to be overly expensive.



7 Human resources

KEY MESSAGES

- ◆ Rice millers offer important off-farm casual and seasonal employment in the factory and at the factory gates, with more stable contracts offered to administrative and managerial staff. Formalizing contracts for informal labour is key for upgrading wide-spread decent work opportunities (including gender equality), but requires the right employment regulations so that it is enforceable and affordable for employers.
- ◆ The absence of local vocational training programmes, means that employees become skilled through on-the-job training in conjunction with one-off programmes delivered by various development agencies. Upgrading national vocational technical skills would provide a stable flow of skilled staff to small enterprises improving the overall foundation of business growth across all sectors.

◆ FIGURE 26 External factors affecting the human resources strategy of a small and medium agrifood enterprise

- 
- Human resources**
- ▶ Welfare of employees
 - Employment regulations (e.g. gender equality)
 - ▶ Knowledge and know-how
 - Availability of skills
 - Corporate-level capacity-building initiatives

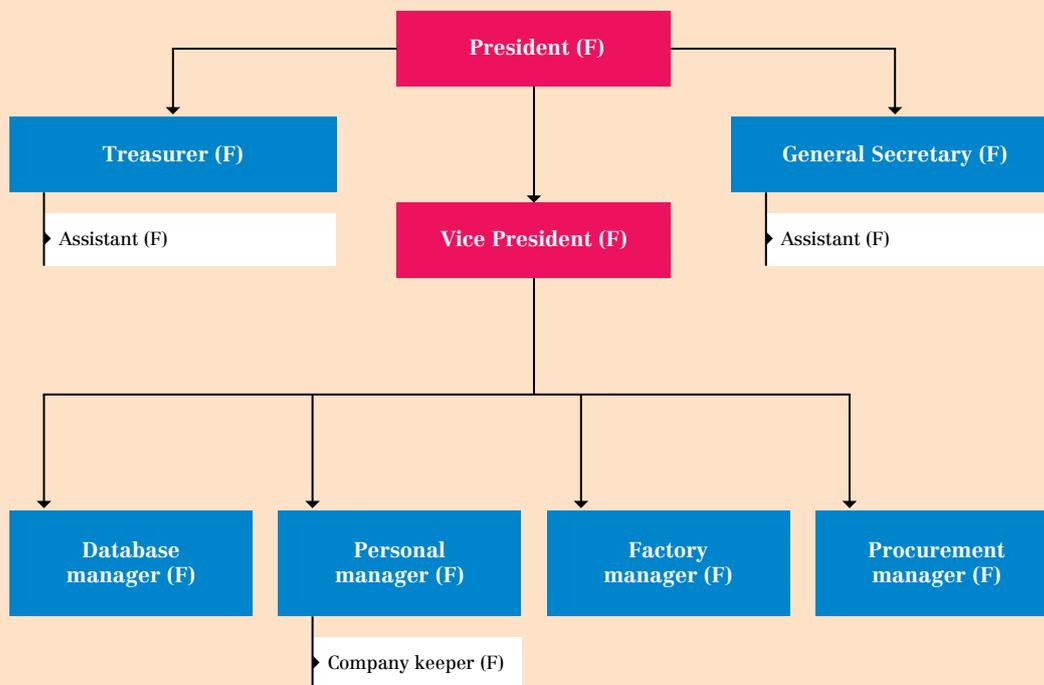
Source: Authors' own elaboration.

This section will first discuss the human resource structure of three companies examined in this study, focusing on gender equality aspects. The strategies used by the millers to make use of their human capital will be explored, as will the business challenges arising from Senegal's weak educational sector and the way this is currently being addressed. The three entrepreneurs' characteristics will also be discussed, as this is a topic extensively researched in the literature and a key factor shaping their growth pathways. The section will then examine the contribution of the three business to creating decent employment opportunities, and lastly, will discuss their relationships with the local community to identify any social contributions that might occur outside the business.

7.1 Background

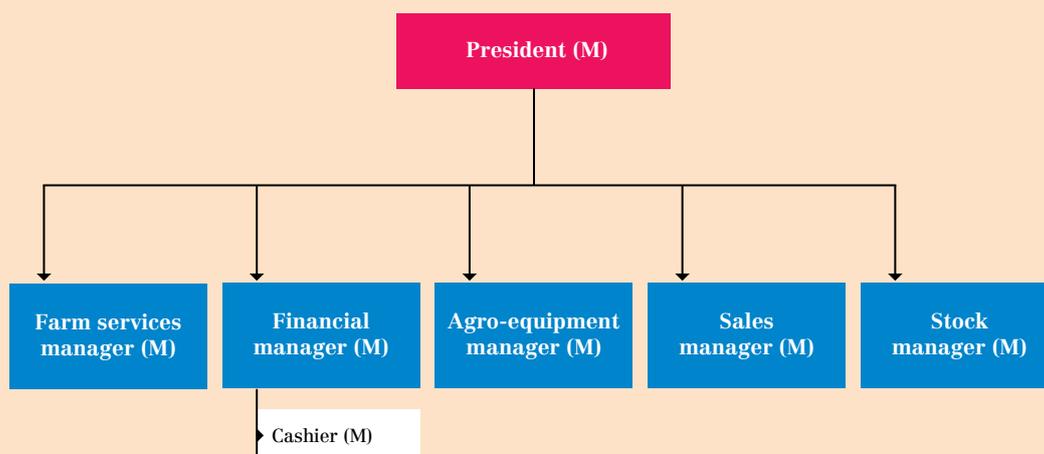
The organizational structures of the three enterprises are shown below.

◆ **FIGURE 27 Organigramme of RizElle**



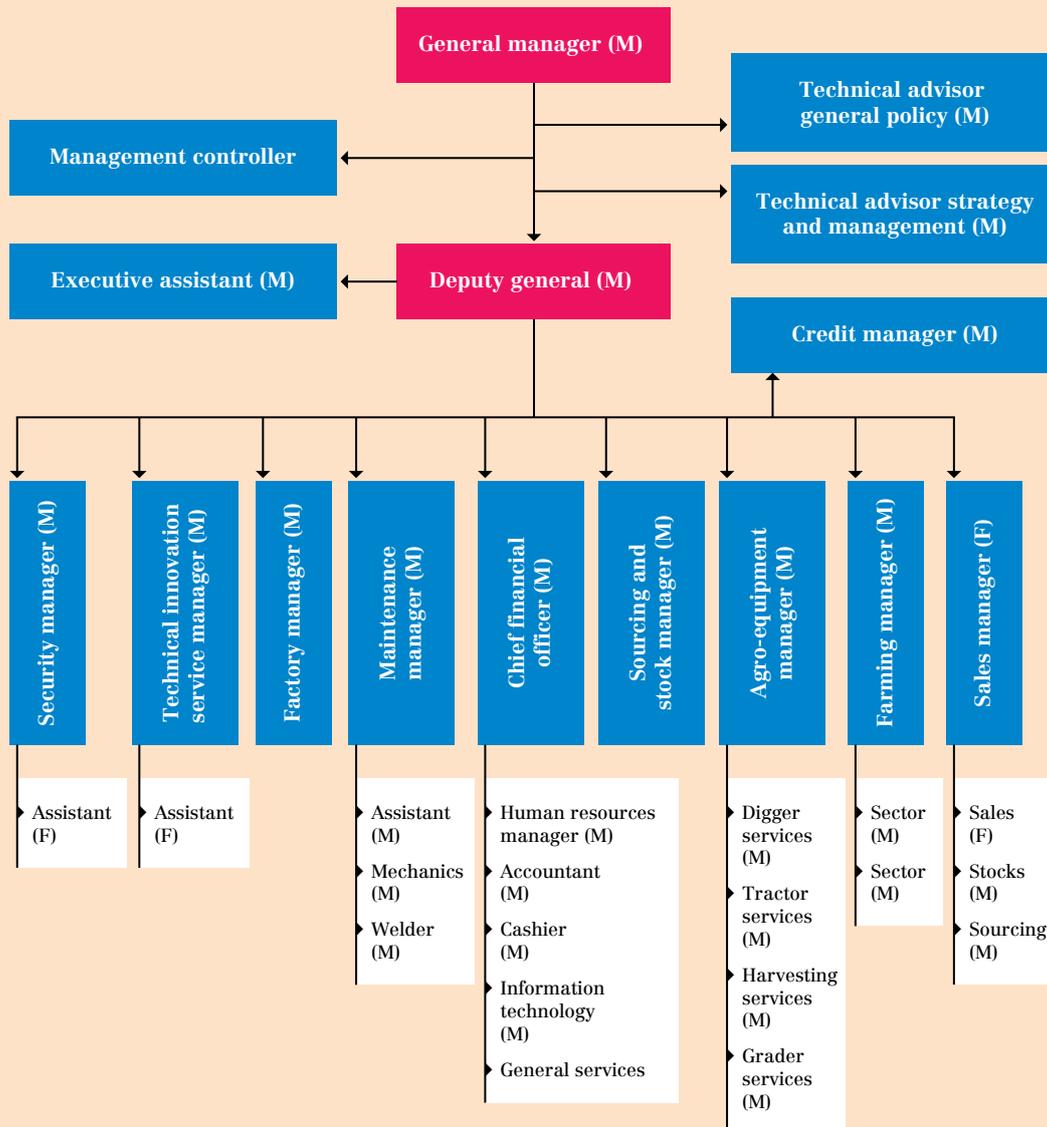
Source: Authors' own elaboration based on interviews with the millers.

◆ **FIGURE 28 Organigramme of Savoureux**



Source: Authors' own elaboration based on interviews with the millers.

◆ **FIGURE 29** Organigramme of Khady Riz



Source: Authors' own elaboration based on interviews with the millers.

All of the processors have a clear structure, with key activities being led by skilled managers, most of whom have been promoted internally.

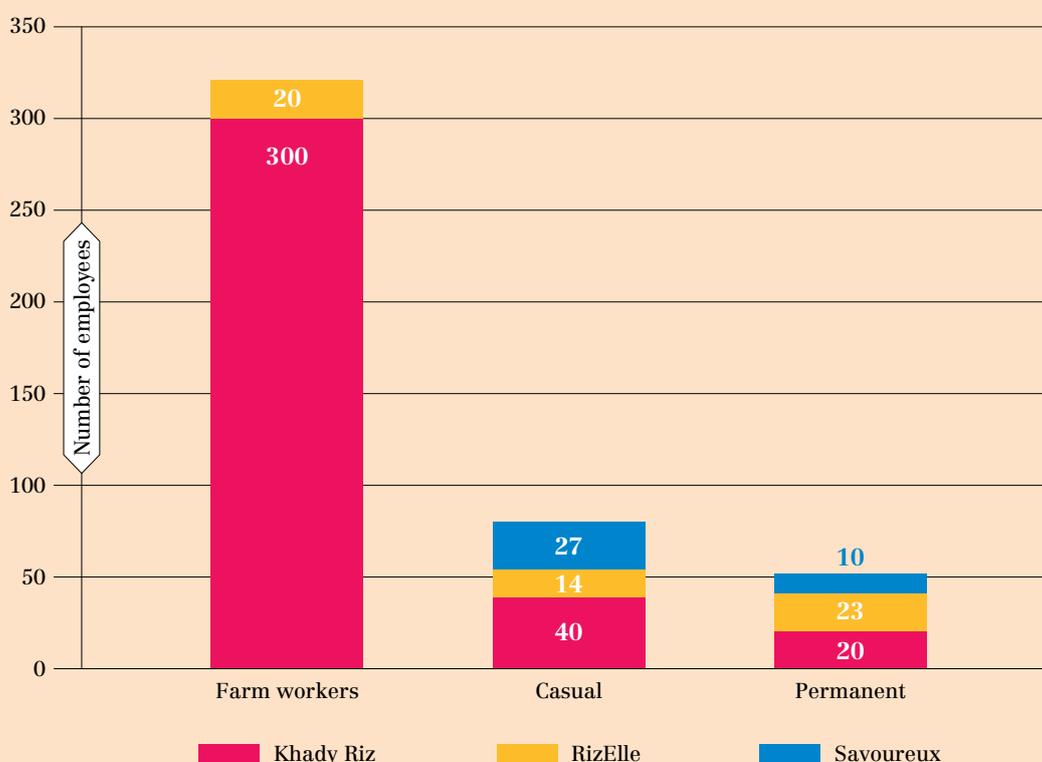
In Senegal, women play a significant role in post-harvest activities, especially in the processing of cereals and small-scale marketing (Poulsen, 2015), with 80 percent of SME food processors owned by female entrepreneurs (Anwer and Senghor, 2005 in Matsumoto-Izadifar, 2008). Women are mostly involved in micro-scale mills and their presence in two of the three companies interviewed for the study is quite limited. At Savoureux, for example, all of the managers are men, and at Khady Riz, the permanent staff includes 17 men and only three women, who serve as executive assistant, assistant, and secretary. However, among non-permanent workers, Khady Riz has recruited 38 women out of a total of 65 workers.

Women are more active in rain-fed than in irrigated production where 92.1 percent of crops are harvested by men (Republic of Senegal, 2016), and this seems to be the norm in the processing industry in the Senegal River Valley, a region characterized by irrigated rice.

RizElle is an exceptional case as all the mill workers are women, honouring its roots as a women’s GIE. RizElle is also the only company of the three whose first large investments were supported by external agencies. Generally, measures aimed at improving labour market outcomes for women are important, given that rural transformation implies a shift from self-employment, which characterizes most women’s labour, to wage employment, which is dominated by men (Dolislager *et al.*, 2019; Reardon *et al.*, 2019a).

The three companies rely extensively on non-permanent workers during the high season (see Figure 30); these include agricultural labourers on integrated farms and casual employees who help with day-to-day activities. Each category of workers receives different pay and benefits, as will be discussed later.

◆ **FIGURE 30** Number of employees hired during the high season by type of labour



Source: Authors’ own elaboration based on interviews with the millers.

7.2 Use of human capital

The links between learning, knowledge and enterprise performance have been explored in a range of studies on knowledge management, organizational learning and learning organizations. All of these studies identify the need for more analysis of these dynamics within small and medium enterprises (Desouza and Awazu, 2006; Durst and Runar Edvardsson, 2012; Gomes and Wojahn, 2017; Wang *et al.*, 2015).

Capturing knowledge and exploiting learning are pivotal processes for SMEs, allowing them to compensate for an inherent lack of assets (Desouza and Awazu, 2006), or even to deal with the market inefficiencies that are often prevalent in developing countries. A distinction should be made between explorative and exploitative learning; the former is an

approach most often employed by large enterprises to generate new knowledge (i.e. R&D) and gain competitive advantage. The latter involves tapping into existing knowledge to create moderate value for the company but with more certain returns. The exploitative approach is often more suitable for SMEs since it requires fewer resources and involves less risk (Wang *et al.*, 2015), and this kind of learning is employed by the three rice processors. Exploiting existing external learning from various sources requires certain competencies and the skills necessary to transfer individual knowledge to the collective. This issue has been studied extensively under the knowledge transfer concept (mostly in developed countries, and R&D-intensive industries), concluding that the transfer of knowledge within the firm can provide the basis for competitive advantage (Argote and Ingram, 2000).

The three companies interviewed for our study have benefitted from external learning facilitation, with training being provided by development organizations, such as USAID or JICA as part of the wider goal of developing the rice sector. This often occurs in African countries, where enterprises cannot afford the costs of in-house training and have to rely on public support to build the capacity of their employees (FAO, 2019e).

The companies rely heavily on these external programmes to counter the lack of formal education on their management teams. Curricula include a variety of topics, ranging from processing to financial recording and business planning. The companies report that training is only provided to managers, probably based on the justifiable assumption that they will transfer their new knowledge to their teams. However, there has been no follow-up to determine whether, and to what extent, the learning has reached lower-skilled or casual employees.

The companies would prefer to use internal promotion to fill skilled positions. For cooperative GIEs specifically this is a rational strategy, given that its initial employees are the founding members, as in the case of RizElle. However, the companies are not sufficiently satisfied with the performance of their employees to promote them to management positions, leading the owners to consider external recruitment instead. While technical knowledge (i.e. of processing) is more likely to reach the lower staff levels since it directly affects the quality of the final product, investing in the development of soft skills for lower-level employees does not have immediate or easy-to-measure returns. Past performance is also not a valid indicator of future performance in the case of highly technical workers who are considered for promotion in management positions that require a different set of skills.

The choice between external hiring and internal promotion is critical since managerial capability can affect the profitability of the organization. Studies around this issue have mostly focused on large enterprises or multinationals or on developed countries, and have made the case for internal promotion (Bidwell, 2012). The question is equally if not more important for SMEs in developing countries, where these decisions can affect not only firm performance, but also incentives for young workers to remain in rural areas where most of these enterprises are located. Even more, while internal promotion is not a feasible strategy for the three enterprises at the moment, it is not clear whether external hiring would be a more viable solution since the Senegalese education system is regarded as not practical or business-oriented. In addition, those few highly trained graduates that exist are seen as too costly and risky in terms of staff turnover (Wellen and van Melle, 2017).

Research has shown that the continuous training and education of employees significantly improves firm performance (Ngek, 2014), especially since most of the workers hired by agrifood SMEs are unskilled or semiskilled (see Figure 30). At the same time, one company observed that due to the current level of automation in rice milling, the demands for skilled labour have been greatly reduced in the industry. Nevertheless, the one-off nature of the training programmes delivered by development or public agencies does not promote long-term business performance and nor improve prospects for internal advancement, especially

since training mostly benefits more skilled employees, who do not represent the norm. Enabling SMEs to reach their potential for generating rural employment while ensuring that impact does not occur on an ad hoc basis requires embedding capacity-building initiatives into local organizations. In addition, as the company grows and increases the number of managerial positions, business training should be offered not only to current managers but also to lower-level employees with the potential to contribute more to the quality and performance of the company. Investing in young people, in particular, could be a winning strategy for the company's future.

7.3 Entrepreneur characteristics

The links between entrepreneurial characteristics and SME growth have often been analysed, but no definitive conclusion has yet been reached concerning the effects of owner education on firm performance. Indeed, the studies have found both positive and negative as well as neutral impacts (Isaga, 2015). None of the managers in the three companies have an advanced degree; one of the owners (Savoureux) did not take part in the formal education system, instead completing completed the Koranic school. It was only after the initiation of milling activities that they received training in both business and technical areas.

Previous business or industry experience has also been widely explored in the context of company performance, and studies indicate evidence of a positive relationship between these two factors (Isaga, 2015). Two of the company owners had previous indirect experience in the processing industry: Khady Riz's owner worked for the Senegalese Sugar Company as a driver, and Savoureux's owner oversaw the finances for a small milling business, while RizElle's owner undertook trading activities.

All three of the company owners initiated business activities to seize an opportunity, rather than out of personal necessity for employment. Opportunity entrepreneurship has been found to create more growth-oriented enterprises (Fairlie and Fossen, 2017), a characteristic that also defines the three millers in our study, as seen in Section 1.7.

The construction of the Diama dam on the Senegal River brought the opportunity for large-scale irrigation and thus, opened up the possibilities for industrial rice cultivation in the valley. The owner of Khady Riz saw this as an opportunity and resigned from his position with the Senegalese Sugar Company (CSS) to start cultivating paddy on the five hectares he owned. To grow the business, he rented 40 hectares from a youth centre. His farming and trading activities eventually expanded into milling, seed production and agricultural services.

The owner of GIE RizElle was working as a trader when she noticed the prevalence of unemployment among women in Richard Toll. Recognizing this as underutilized human capital, in 1991, she initiated the women's savings group – also known as 'tontine' – based on a modest contribution of CFA 50 (USD 0.85) per person, which allowed members carry out income-generating activities. Once the women group became active in farming, the owner noticed the absence of quality services for milling paddy, incentivizing the group to embark on processing and marketing activities. As seen above, this was made possible due to support from development agencies prioritizing women-led entrepreneurial activities.

Savoureux is a particularly interesting case. As banks rolled back their financing of agricultural inputs to smallholder farmers following the financial crisis of 2008, the mill saw an opportunity to gain guaranteed paddy for their operation by providing financing and services to farmers directly – to be paid in paddy upon harvest. Savoureux is now the second largest input-purchase supporting institution after the CNCAS. In 2016, the company offered 9.36 percent of the total credits given to rice producers in the valley, while CNCAS granted 36 percent of the total credits.

7.4 Decent employment aspects

Off-farm employment can be a driving force for inclusive rural development and women's empowerment if it is accompanied by job contracts, decent wages, and non-wage benefits (Van den Broeck, Van Hoyweghen and Maertens, 2016; Kabeer, 2012).

Permanent positions in the three companies in our study seem to be a lucrative opportunity for job seekers in rural areas. The use of employment contracts for permanent employees is in place at all three enterprises. Salaries at the most established mill, Khady Riz, are higher, particularly for the executives, who report a monthly income of CFA 300 000 (USD 508). The average management salary at the other two companies was reported as CFA 150 000 (USD 254), which is the minimum salary for a managerial position at Khady Riz. This is just slightly higher than the average salary paid by SMAEs in Senegal, which is estimated at CFA 113 000 (USD 191) based on World Bank Enterprise Surveys responses. Salaries offered by manufacturing SMAEs and their non-agribusiness counterparts are comparable at CFA 102 000 and 106 000 respectively (or approximately USD 180).

All of the companies report withholding social security; two companies (RizElle and Savoureux) contribute to health insurance ('mutuelle), and RizElle provides an additional pension scheme. Bonuses for good performance are used by all companies as a means of motivating workers; these are paid in-kind by two companies, meaning that they receive rice as compensation for performance.

Our research indicates that millers provide a good off-farm income alternative for unskilled non-permanent workers. Unskilled casual labour will earn CFA 55 000–75 000 a month (USD 93 to 128) working for the millers, which is significantly higher than the minimum wage for agricultural workers in Senegal (CFA 213.39 or USD 0.36 per hour). Additionally, as discussed above, the millers prefer to promote internally for managerial positions. As such, higher salaries, coupled with the prospects of internal promotion, means that the millers offer a worthy off-farm employment for unskilled workers, especially for young people in the context of increasing urban migration.

Nonetheless, evidence shows that casual workers, who provide the majority of labour, do not benefit from the perks offered to permanent employees, including contracts and benefits. Enhancing their working conditions and opportunities to access training, for example, could be a positive medium- to long-term strategy, enabling SMEs to enhance their pool of human resources while increasing their overall sustainability.

Finally, an overall assessment of employment arrangements and working conditions of both smallholders and casual workers is needed to better understand the effects of different SME business models on decent job creation and internal migration movements. The importance of developing such studies was also highlighted in the Procurement section, where it was noted that millers increasingly adopt vertical integration to ensure either quality or quantity of supply, a strategy that has implications for the rural labour market. Such studies would also inform the development of strategies and policy advice on SME support in the agrifood sector.

7.5 Relationships with the community

Khady Riz is the most active of the companies in terms of initiating social activities initiated, providing financing to mosques and other community institutions (e.g. high school events, construction of toilets); reserving 30 hectares of land for young people to grow tomatoes with the purpose of providing income opportunities; or exploring the possibility to work with a women's cooperative by conducting tests on briquettes and pellets production. The company

also leads a training course for mostly young people: every year, five to six local students – aged 25 to 40 – are given an internship to learn about processing techniques, agricultural practices and to explore the manufacturing of briquettes from rice husk.

While Savoureux donates every year to mosques, RizElle conducts social activities with local women. In addition, under an agreement made with the United States Development Fund in Africa (USAAF), RizElle provided a million francs in loans to four other GIEs after they had received a grant of 80 million francs from the fund.

7.6 Conclusions

While none of the owners we interviewed had previous experience in the sector, they were able to recognize a business opportunity and grab it, proof of their entrepreneurial spirit. It was only after the establishment of milling activities, that they were able to amass gain technical knowledge related to management and rice processing.

The millers all aim to professionalize their businesses, but neither internal promotion, nor external recruitment are viable strategies at the moment. On the one hand, basic education in Senegal does not provide skills that the sector needs. On the other hand, the soft skills needed in management positions are not transferred to lower-level employees who might have potential to advance.

The three companies have become a channel through rural labourers have received relevant training. However, continuous training of employees contributes significantly more to firm performance than do the one-off initiatives provided by donors. Future interventions should thus consider embedding sector-specific training into local educational institutions to ensure sustainability.

A great deal remains to be done in terms of improving gender equality and working conditions for casual labourers, especially as the companies have great potential to contribute to rural employment through vertical integration (see the Procurement section), and the expansion of agricultural and logistics support services (see the Operations and Logistics sections), activities that mostly require non-skilled or semi-skilled employees.

8 Partnerships

KEY MESSAGES

- ◆ Donor activities play an important role in addressing public sector gaps related to investment and capacity building. Some companies are more strategic than others in tapping into these opportunities. Donor opportunities need to ensure that opportunities are available, also through competitive grants, across a sub-sector and do not create an uneven playing field for some businesses over others.

Business networking and relationships form an important component of any business model. The millers in the case study have strategically used partnerships, in particular with donor and government agencies as documented throughout the case, in order to address external constraints.

As documented in each section of the report, USAID has been an important partner, alongside the Government, for the millers in the rice production zone under the study, with the donor investments leading to important gains for all value chain actors and in particular farmers and millers. For instance, addressing production constraints has been a focus of both USAID and the Senegalese government through various activities and investments, such as farmer training, expansion of irrigation infrastructure and provision of subsidies. This has ensured a supply base of good quality paddy for the millers and has allowed them to direct their resources towards growing their businesses.

Together with CNCAS and SAED, USAID has also initiated credit schemes that allow paddy to be used as collateral or payment and this has greatly helped both farmers and the millers, relieving pressure on cash flow, perceived as an important constraint to growth.

Human resources capacity building is also an area in which partners have had an impact, with managers trained on a wide range of topics, including food safety and quality both on-farm and in the factory.

It is clear that interventions, such as the leasing scheme and support with marketing contracts, have improved the millers' growth in terms of supply, and revenue-generating activities.

It is important to note that providing support for so many aspects of a business potentially poses sustainability issues, especially if the support does not result in direct commercial value (as in the case of the biogas unit delivered to Khady Riz) or if a clear exit strategy does not exist for when support is withdrawn.

Lastly, it should be said that the collaborative spirit – in terms of lobbying, referring extra orders to competitors and sharing market information – has been highly supportive of the industry. The millers perceive themselves as partners in an effort to fight competition from imports and cheap, low-quality rice.

8.1 Conclusions

To conclude, the three millers interviewed for this study have all significantly benefitted from supportive partners and it is doubtful they would have had the same growth pathway without that support. It is particularly clear that external support has allowed the millers to expand their service portfolio by providing financial opportunities they otherwise would not have had. Nevertheless, all three companies recognized a business opportunity in the rice sector and responded accordingly, and two of the companies had already made sizeable investments in their businesses before the arrival of the development initiatives. This perhaps points to a good practice framework where agencies customize their support according to the characteristics and life cycle of the SME.

9 Overall conclusions

This study shows us that analyzing the business model of a mid-value chain processor can reveal a 360-degree view of the agrifood ecosystem. The examination of procurement provides insights on the status of production in the SRV and the quality of farmer-market linkages created through, for example, contract farming. The assessment of finance offers an overview of the financial landscape with respect to the availability of credit and its suitability to the needs of the agrifood sector. The review of human resources uncovers the key to decent employment, the availability of appropriate skills and weaknesses in the education sector and training programmes. The analysis of operations and logistics reveals weaknesses and strengths in infrastructure, as well as the status of the inputs and services market. The review of marketing and sales provides cues on competition, customer demand, and other downstream-related topics. Food safety and quality, as well as nutrition, are cross-cutting issues that can be affected by operations, logistics, and marketing and sales. The status and enforcement of regulations emerge from analyzing relevant components, such as taxation policies and the financial management component.

This document demonstrates how societal value is created by enabling various business components to bring commercial value to SMAEs. For example, cash-flow mechanisms allowed the enterprises in our study to expand their sourcing, become more inclusive of smallholders and even to involve indebted farmers in their operations. Agricultural leasing schemes that cater to farmers' needs have led to an expansion in the rural services market. Creating greater awareness of the value of nutritious food could stimulate companies to invest in this area and capture new clients who will pay a premium for healthier options. Addressing uncompetitive market practices in network industries, such as electricity, could help reduce operational costs making companies better able to provide affordable local food. If companies do well, they are able to initiate social action in their community, such as donating to schools or providing internships to young people.

The study helps to close gaps in research on the middle segment of the value chain, particularly with regard to rural firms in the staple foods sector. Using business concepts to examine three medium-sized rice millers reveals complex entities that need to be considered from multiple perspectives (e.g. strategic management, supply chain management, transaction costs, organizational knowledge) to properly understand their decisions and contribution to rural transformation.

9.1 Directions for further research

Meeting the production and market needs of the rapidly evolving rural agriculture sector requires the establishment of a new research agenda for SMAEs. The use of textbook business concepts is mostly associated with multinationals or large enterprises. We need to understand how and to what extent these theoretical notions apply to agrifood SMEs specifically.

This study has uncovered various issues that need to be further tackled by researchers. We have seen that the millers diversify their supply base to deal with various constraints, for example, when a shortage of produce triggered two processors to vertically integrate to keep up with increased national demand for rice. Additionally, the millers have been able to improve cash flow by receiving agricultural produce as in-kind payment for the field

services they provide to farmers. The effects that a hybrid procurement strategy has on processors and their growth has received very little research attention and needs further study to understand the sustainability of commercial operations that aim to link farmers to markets. The impact that a varied buyer base has on farmers has also been explored to a limited extent, especially in the case of domestic grain chains. In the case of Senegal's rice sector, Soullier and Moustier (2018) have found that by combining production contracts and spot transactions, farmers can increase their profits.

In addition, the fact that vertical integration is increasingly considered by processors – in both high-value and staple chains – as they grow, calls for more studies on the impact of this business strategy on farmers. Working directly with smallholders is generally perceived as more politically acceptable. However, considering that vertical integration might be a good option for companies and a good income opportunity for farmers (depending on employment policies, payments, rewards, etc.), it is important to determine the threshold at which farmers are better-off as employees than as contractors.

The study of finance also revealed important areas needing further attention. More research is needed to assess the linkages between working capital/cash flow and business growth. The connection between cash flow and procurement, which is the main cost in the operational cycle, also needs to be acknowledged and explored. External initiatives around investments in asset endowment aim to respond to the needs of farmers which has allowed for in-kind payment. There is *prima facie* evidence that this practice is lucrative for the millers because it reduces the burden of making payments to suppliers before commercialization. However, more financial assessments are needed to better appreciate the impact of such initiatives on both buyers and farmers.

As we have seen with RizElle and Savoureux, the government or donors' priority towards certain groups or types of businesses have become an incentive for entrepreneurs to arrange their business model to take advantage of these preferences. More research is needed to understand when this kind of opportunity becomes a disincentive for businesses to grow and to determine how this negative effect can be avoided. The study also reveals that the legal structure of an enterprise matters in terms of finance and growth, and so, a better understanding is needed on the ownership arrangements that are most suitable to different enterprises and contexts.

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The objective of this publication is multifold. First, it aims to learn from small and medium sized agrifood manufacturers about the role they play in food systems transformation in Senegal and the policy reforms required to harness their potential. Second, and more specifically, it gleans lessons from structured interviews with Senegalese rice millers, based on their day-to-day realities, highlighting the business creativity used by these firms in order to deal with difficult enabling environments. Third, the methodology adopts a food systems approach to analyze the target enterprises; cross fertilizing different disciplinary perspectives in order to develop evidence for the public sector on integrated policy making that better supports the role of small agrifood enterprises in sustainable transformation. Finally, the study shares ideas about innovations related to procurement, operations, logistics, finance, marketing and sales, human resources, and strategic partnerships. An important contribution of this work is to demonstrate the multidimensional and complex nature of the environment within which agrifood manufacturers do business, and the need for the public sector to harness their potential to reduce poverty through off-farm employment generation and to improve food security through the sustainable supply of affordable and nutritious food to domestic and export markets.

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