24 Tailoring African Rice Value Chains to Consumers

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Introduction

The global financial crisis of 2009 onwards and the preceding food price crisis (2007–2008) exacerbated the food insecurity of the rural and urban poor in developing countries. The question of how national, regional and global agri-food systems can effectively respond to these crises and improve food security is once again at the top of the development agenda. This chapter explores potential response strategies for the private and public sectors, and the donor community in West Africa. Merging two new studies on rice in West Africa, this objective is analysed through a value-chain lens from two angles. First, a supply-side perspective based on an extensive, regional value-chain analysis. We present the results of a major study conducted for the Global Food Security Response programme of the United States Agency for International Development (USAID, 2009). Second, a demand-side perspective based on consumer experiments carried out by Africa Rice Center (AfricaRice) in Senegal (Demont *et al.*, 2013a,b).

In most of West Africa, rice production has not been able to meet the increases in demand triggered by population growth, rapid urbanization, increasing incomes, and shifting urban consumer preferences. As a result, the sub-region relies on imports to supply half of its demand for rice. In May 2008, world rice prices tripled in just a few months to reach 30-year, inflation-adjusted highs. With these dramatic price-spikes, combined with an overall import level into West Africa that over time had swelled to 6 million tonnes (Mt) (i.e. 20% of the world's rice imports) (USAID, 2009), governments could no longer afford traditional price interventions to protect domestic rice consumers from the volatility of the global rice market. Although the 2008 rice price crisis may in part have been driven by temporary speculation and a weak US dollar, there are underlying structural trends that have caused an increase in the price of rice (and other staple foods) to a higher plateau.

The comparative advantage of local rice production has been one of the key issues in the food-policy debate in Africa since the early 1980s (Pearson *et al.*, 1981). However, policies for increasing competitiveness have mainly focused on productivity and prices. The 1994 devaluation of the CFA franc – a failed attempt to reverse the historical urban bias and divert African consumers from imported to local grains – clearly illustrated that price policies do not work well in the context of the African rice sector due to a low price response by rice consumers and producers (Diagana *et al.*, 1999). This suggests that

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non-price strategies may be needed to enhance the competitiveness of the sector. Establishing efficient value chains is cited by the World Bank (2008) as a first policy objective in making agriculture more effective in supporting sustainable growth and reducing poverty. Therefore, taking a value-chain perspective, we identify some systemic key constraints and challenges to competitiveness and explore opportunities for upgrading African rice value chains and tailoring them to consumers in end-markets with the aim of simultaneously increasing food security and reducing poverty.

Value Chains

'Value chains' are defined as strategic vertical alliances of non-adversarial relationships between stakeholders within a product's supply chain (Hobbs *et al.*, 2000). Unlike a traditional economic analysis of food staples that assumes a homogeneous product, homogeneous agents, and perfectly competitive markets at various stages along the supply chain, the value-chain approach is a holistic and systemic methodology that takes into account a wide range of factors in assessing agent behaviour and competitiveness (Kaplinsky and Morris, 2001; Neven, 2009). Most notably, the approach takes into account: (i) the heterogeneity of the end-markets and the critical success factors that drive competitiveness (the end-markets are the starting point, i.e. a strategy is developed to take advantage of some identified opportunity in an end-market, which has implications all along the value chain); (ii) the heterogeneity of stakeholders in terms of their capacities and incentives, and how this influences the nature of their interactions vertically (along the chain) and horizontally (at a certain stage of the chain); (iii) the nature of service provision (logistics, extension, finance, etc.); and (iv) the broader environment in which they operate (policies, regulations, infrastructure). Furthermore, value-chain analysis takes a dynamic perspective as it aims to expose the key drivers of change that are present in the system, such as changes in policy, introduction of new technologies, and the behaviour of large firms. In other words, value-chain analysis explicitly recognizes that the value of the end-product to the end-consumer has many components (price, taste, convenience, image, etc.) and is the cumulative outcome of every value-adding activity along the value chain (value can be added or lost at each link in the chain) – this is especially important for staple-food value chains in developing countries that have to become more competitive at every stage.

When domestic production-based staple-food value chains become more competitive they will contribute to food security and income growth. Moreover, by linking producers to consumers through a shared objective, value chains present a more sustainable approach to consumption and production than segmented and adversarial production chains (Demont, 2010). The market demand-driven strategy upon which value chains are based distinguishes them from traditional business relationships. Value chains are built on cooperation rather than adversarial business relationships; their members recognize that participants must create a win–win situation whereby they all benefit financially and all are part of the information-sharing and decision-making process.

A critical challenge in the development of African rice value chains is the governance of quality throughout the supply chain, whereby quality should be tailored to the food preferences of end-market consumers (Rizzotto and Demont, 2011; Demont and Rizzotto, 2012). Sorting by quality is necessary to capture rents in West Africa's highly segmented rice markets, where most consumers want a product of consistent quality. In some cases, however, consumers may prefer to buy mixed quality rice and sort it themselves as this is cheaper and gives them different rice types for different meal types (Demont *et al.*, 2013a,b). In some cases, rice processors or traders may mix different rice varieties to cater to the specific preferences of particular consumers. For example, they may blend a small quantity of aromatic rice into cheaper broken rice to produce a rice blend that is both affordable and aromatic.

Evidence from across the world shows that market forces alone are sub-optimal in achieving governance of quality throughout the supply chain, and other governance mechanisms (long-term contracts, alliances, vertical integration, etc.) are needed to compensate for this market failure and to ensure that suppliers develop the capability

to comply with changing consumer demands as rapidly as possible (Swinnen *et al.*, 2010). In high-value markets in developing countries, there has been an evolution towards increasing levels of coordination between different actors in the supply chain and the question is whether similar patterns of supply-chain governance could arise in staple-food supply chains, which typically have lower value added over the chain. Swinnen *et al.* (2010) formally show that the development of chain governance is less obvious in the staple-food sector. Staple crops such as rice are characterized by low value and high storability, and there are a large number of small traders, which increases the possibility of contract breach (Colen *et al.*, 2013). These characteristics make it very unlikely for chain governance to arise spontaneously. They conclude that interlinked contracts or other non-market governance mechanisms might develop, but only if the value of staple crops can be increased and contract enforcement is improved.

The existence of systematic price discounts for local rice relative to imported rice in some African countries suggests that there is underinvestment in upgrading product quality and consumer focus (Demont and Rizzotto, 2012). Evidence from poor Asian countries shows that research on quality has a high payoff (Unnevehr, 1986), which is consistent with the finding that even the very poor have more income elastic demand for food quality than for food quantity (Shah, 1983). Evidence from Africa similarly reveals that quality is an important factor in the demand for rice, even in rural areas (Erhabor and Ojogho, 2011; Demont *et al.*, 2012). The central importance of quality for competitiveness in West Africa's rice markets is demonstrated in several studies (e.g. Boughton and Reardon, 1997; Lançon *et al.*, 2003, 2004; Tomlins *et al.*, 2005; Balasubramanian *et al.*, 2007; Fall *et al.*, 2007; Opoku and Akorli, 2009; USAID, 2009).

The market provision of quality, however, is notoriously fraught with difficulties under asymmetric information: when producers cannot credibly signal the quality of their products, consumers' choices are predicated on the perceived average quality on the market, and this pooling equilibrium leads to market failures (Akerlof, 1970). Therefore, any quality upgrade needs to be accompanied by a credible certification system (Moschini *et al.*, 2008). Quality standards, certification and quality control become more relevant as the value chain moves from being supplier driven to increasingly buyer driven (ACI, 2005). Branding and labelling increase visibility and trust in rice consumption and are an integral part of value-chain upgrading and innovation, as will be illustrated through our case study.

The nature of milling equipment also greatly impacts rice quality. Although large-scale rice milling equipment provides the highest quality of rice most efficiently, it is rare in post-structural adjustment West Africa where it is difficult to aggregate sufficient volumes to operate such facilities economically. Most rice in West Africa is milled using small, sometimes portable, milling machines that largely produce low-quality rice with significant levels of impurities and mixed whole and broken grains. Where development of the value chain for quality rice can generate sufficiently large margins for upgrading, intermediate-scale operations may perhaps provide the best milling option. For example, in Mali, for-hire mini rice mills operate with polishers and graders capable of presenting a clean, polished product and sorting it into homogeneous lots by kernel size.

Methodology

As indicated above, this chapter is derived from two studies on rice in West Africa. The first is a regional rice value-chain study based on three components that build on and inform each other (USAID, 2009). First, a desk study captured and codified a breadth of data on rice value chains in West Africa, comprising a review of over 300 documents as well as key-informant interviews. Second, a field-study component using USAID's (2006) value-chain analysis methodology resulted in detailed value-chain studies on rice in Ghana, Liberia, Mali, Nigeria and Senegal. This component also included a regional market study that entailed further fieldwork in Benin, Côte d'Ivoire, Ghana and Senegal. Third, a 3-day online e-consultation with leading experts on rice in West Africa helped validate the results.

The second study is a Senegal rice-consumer experimental study that used Vickrey second price auctions to elicit consumers' willingness-to-pay (WTP) a price premium, relative to conventional Senegal River valley (SRV) rice as the benchmark, for three rice products of higher quality: labelled and unlabelled high-quality SRV rice and imported Thai 100% broken rice (Demont *et al.*, 2013a,b). The conventional SRV rice type which is commonly available on the market consists of a mix of varieties and has mediocre grain quality. Enhanced-quality SRV broken rice is purified and homogenized through one or two sifting operations and is currently marketed under the Rival® brand name by the Oxfam-funded PINORD (Platforme d'appui aux Initiatives du Nord).[1] Imported Thai 100% broken rice has a grain quality somewhere between the conventional and the enhanced-quality SRV broken rice and contains some impurities. Twenty experimental auctions were conducted in two important urban rice markets (Saint-Louis and Dakar); for each auction, ten women were randomly recruited on the market. Participants were given one kilogram of conventional SRV rice and were offered the opportunity to upgrade it by bidding simultaneously on the alternative rice types during two trials – before and after a sensory test. The experiments thus allowed for a comparison in WTP between imported rice (which dominates urban rice markets) and high-quality local rice.

Findings

The US$10 billion West African rice market is not a single, homogeneous commodity market where competition is driven solely by price (Rutsaert *et al.*, Chapter 23, this volume). Rather there is a wide range of rice products on offer (brown, broken, parboiled, round, aromatic, etc.) and consumer preferences vary greatly among and within countries. Although typically one rice product dominates in a given market, there is often a wide range of rice products available. No matter what the importance of rice in the diet or the income category is, consumers set minimum quality standards and are unlikely to buy lower quality, cheaper rice that does not meet their standards.

West African rice is, in most cases, less competitive than imported rice, but it has the potential to become competitive (USAID, 2009). Local rice is less competitive than imported rice, especially in urban markets, in terms of two main sets of key success factors: (i) local rice in many cases is perceived to be of a lower quality than the comparable imported product that sets the benchmark (The Gambia, Guinea and Mali are notable exceptions); (ii) the absence of trade credit and aggregation in value chains for locally produced rice makes it difficult for the existing urban market distribution system to tap into domestic production. As a result, local rice is largely absent from urban markets and thus not an option for consumers, even if they want to buy it. This largely explains the lack of awareness of the existence of local rice in those markets (Fall *et al.*, 2007; Demont *et al.*, 2013a,b). Nevertheless, in the five country studies conducted in the context of this value-chain analysis, local rice is or can become competitive with imported rice. Margins appear to be sufficiently high to maintain price competitiveness even after taking into account the costs of necessary quality improvements.

A third observation is that rice value chains in West Africa have failed to achieve their considerable potential due to systemic constraints. The latter are related to the **business-enabling environment** (e.g. fickle rice policies[2] that deter private-sector investment, insecure land titles that impede investments by farmers, poor road conditions and corruption that block the linkage between production zones and markets), **vertical linkages** (e.g. the history of government and donor intervention in rice – including input-subsidy programmes – that has generated a mistrust[3] of commercial relationships), **horizontal linkages** (e.g. aggregators or brokers that compete to secure paddy from farmers, who too often engage in side-selling often encouraged by the aggregator/broker), and **support markets** (e.g. years of government and donor interventions that have crowded out private-sector investment in input supply, processing services, extension provision, and finance). Progress through upgrading is needed on many fronts, such as improvements in rice quality, increased efficiency through the uptake of appropriate technology, decreased postharvest losses, and consumer acceptance of local rice as a quality product. For any of these

upgrades to take hold, however, supportive government policies and sustainable business-development service provision are needed, as well as strengthened horizontal and vertical partnerships based on trust, transparency and mutual benefits. The widespread absence of these factors represents a key systemic constraint to development.

A fourth observation relates to the critical importance of quality governance. The Senegal experimental auctions show that, while Senegalese consumers were willing to pay an 18% price premium for imported Thai 100% broken rice relative to conventional SRV rice, they were willing to pay a 35% price premium to obtain unlabelled enhanced-quality SRV broken rice, and a 41% price premium to obtain PINORD's Rival-branded enhanced-quality SRV broken rice (Demont *et al.*, 2013b). These findings suggest that Senegalese consumers are willing to pay for intrinsic quality attributes and quality certification and – as the price premiums largely cover the costs of quality improvements and certification – that SRV rice is able to compete against imported rice if its quality is tailored to consumer preferences. However, the experiments also revealed the existence of an important awareness gap: 18% of consumers in Saint-Louis and 47% of those in Dakar were unaware of the existence of quality SRV rice. Quality upgrading of rice in combination with generic promotion programmes that extend the reach of SRV rice might therefore create some opportunities for the development of a certain degree of coordination along the value chain and could have a real impact on urban markets (Rizzotto and Demont, 2011; Demont and Rizzotto, 2012). However, while PINORD's model for the increased commercialization of quality SRV rice is certainly a good preliminary step towards competitiveness, their operational scale is currently too small to significantly impact the market.[4]

The final observation is that the reaction of donors and West African governments to the increased risk of rice price spikes has been to launch programmes and policies to promote local production (AfricaRice, 2011). The impacts of these programmes are still being realized, though forecasts of the results of some of these actions are mixed. While investment in the rice sector is clearly needed, many of the government rice initiatives focus almost exclusively on production to the exclusion of complementary initiatives in processing and marketing, which are critical to match supply to demand. The experimental study findings reported above suggest that supply and demand strategies need to be synchronized in order to tailor the quality of local rice to consumer preferences in urban end-markets (Demont and Rizzotto, 2012). In this example, Rival-labelled rice is produced and marketed in line with the buying behaviour of Senegalese rice consumers. For African policy makers, researchers and donors, this translates into the challenge of finding the optimal mix between both areas of investment (see Tollens *et al.*, Chapter 1, this volume).

Conclusions and Recommendations

Rice production in West Africa can be competitive with imported rice in a far broader range of markets than is currently the case, so it could drastically reduce import dependency and thus food insecurity. The 2008 rice price crisis could provide the jolt needed to unlock this potential, but only if the response strategy is well designed, strikes the right balance between public, private and donor activity, and is implemented with ongoing investment of time and other resources. Governance of quality and clear marketing strategies are crucial for increasing the awareness of urban consumers and strengthening emerging value chains of quality rice, such as the PINORD initiative in Senegal.

A food-security strategy for rice in West Africa needs to satisfy multiple aspects of food security. It must foster the supply of rice to meet the demands of urban and peri-urban populations that currently consume large quantities of imported rice (in most West African countries). At the same time, it must address food access by rural populations, many of whom cultivate rice for subsistence. In addition, trade is essential to the efficient distribution of food to deficit areas from surplus areas that have a competitive advantage to grow large amounts of rice. Although recommended national rice value-chain development plans will differ between countries depending on their unique characteristics,[5] a food-security strategy for

rice in West Africa will have three general, distinct but complementary components that need to be balanced in a resource-constrained environment (Fig. 24.1).

First, national value-chain (VC) competitiveness strategies are required to ensure the supply of rice in the quantity and quality needed to effectively compete with imported rice in West Africa's urban markets. While differing in detail by country, national competitiveness strategies will largely be based on the creation of commercial networks characterized by concentrated areas of production (mostly irrigated), market-oriented farmers, and significant investments in storage, processing and marketing. The establishment of these commercial networks implies a time-consuming process of building trust among value-chain stakeholders so that mutually beneficial business models emerge. It also implies a government policy shift to a more market-based approach to food security in which competitive local farms and firms ensure the supply of quality staple foods at the most competitive consumer prices.

Second, national rural rice food-security strategies focused on access to food are needed to improve productivity for the majority of the widely dispersed subsistence rice producers, mainly operating under rainfed production systems. At its core, this strategy takes an incremental and partially subsidized approach to the introduction of basic production and postharvest handling technologies – providing a demonstration effect for replication. It also takes non-distortive approaches to developing links between subsistence farmers and a commercial input-distribution system. Current disincentives to improved rice production will also need to be addressed, including insecure land tenure, dependency on government or donor assistance, and adverse cultural norms such as mistrust of the private sector. A combination of increased sales of cash crops and capital-asset building (savings) will positively affect sustainability and the graduation of farmers from subsistence to market-oriented production. Such rural food-security strategies should focus on a number of different food crops important for nutrition and calorie intake, rather than on rice (or any other staple food) in isolation.

Third, a regional food-security strategy focused on distribution is needed to facilitate rice flows and learning throughout the sub-region. This facilitation will initially increase flows for imported rice that is already in the market and thus create a more competitive environment for local rice. However, regional improvements will eventually be needed to facilitate trade within West Africa from centres of excellence (characterized by comparative advantages) to the major deficit areas in the region. Moreover, shared learning (rather than just information exchange) will ensure that lessons learned in one country will be applied elsewhere.

Finally, the goals of food security and food self-sufficiency should not be pursued to the point that they undermine economic incentives – they may need to be rationalized within the design of many current government and donor investments. Many post-crisis government interventions have undermined rather than built upon private-sector efforts. Even in countries where liberalization policies have been in place for years, there remains a fundamental lack of trust in markets. At the same time, governments in the sub-region have neither the resources nor the capabilities (as demonstrated by past efforts) to achieve substantial reductions in the need and demand for imported rice. Most donors and researchers would argue that working through the private sector is the most cost-effective strategy for generating the surpluses needed to replace imports. This strategy will have to be demonstrated before many governments in the region will be ready to adopt it.

Fig. 24.1. Rice in a regional food-security strategy. VC, value chain.

Notes

[1] Launched in 2006, PINORD introduced and governs the quality of a new enhanced-quality SRV broken rice brand Rival® (Riz de la Vallée) during production (through a quality contract detailing recommended production practices), processing (sifting, cleaning and packaging) and promotion. PINORD also provides microfinancing (PINORD, 2007, 2009).

[2] For example, in 2005, the Nigerian government encouraged large multinational rice companies to invest in rice processing by granting them licences to import brown rice at a preferential tariff rate. Two importers invested in new full-service rice mills, but this investment was undermined when the Nigerian government abandoned the exclusive licensing scheme within 2 years of its introduction (USAID, 2009).

[3] The ubiquitous lack of trust works in all directions. For example, farmers do not trust that processors will pay them a fair price, processors do not trust that farmers will deliver in the promised quantity and quality, and processors do not trust that governments will stick to their policies.

[4] PINORD marketed 500 tonnes of milled Rival rice on the Saint-Louis market in 2007, 5000–6000 t in 2008, 7000–8000 t in 2009, and 12,000 t in 2010. However, the latter still represents only 3% of total SRV rice production in 2010–2011 (Demont *et al.*, 2013b).

[5] This is well illustrated in the country-specific value-chain studies that are attachments to USAID (2009).

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