GHANA'S RICE MARKET

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Rice is an important staple in Ghana and is cultivated across all agroecological zones. Paddy rice output grew at around 10 percent per annum between 2008 and 2019, with an especially sharp increase of 25 percent in 2019. However, domestic production continues to fall short of demand with the import share of rice consumed remaining above 50 percent (MoFA 2018). This reflects a growing preference for rice among Ghanaian households, especially as consumers become wealthier and more urbanized. The large dependence on rice imports heightens concerns around foreign exchange imbalances and vulnerability to international rice price shocks. Hence, the National Rice Development Strategy of 2009 and the Planting for Food and Jobs (PFJ) campaign launched in 2017 not only prioritize rice but set ambitious expansion targets for domestic rice production (MOFA 2017a). Policy objectives include substituting rice imports and producing a higher-quality product that is more acceptable to Ghanaian consumers and can compete with imported rice.

POLICY ENVIRONMENT

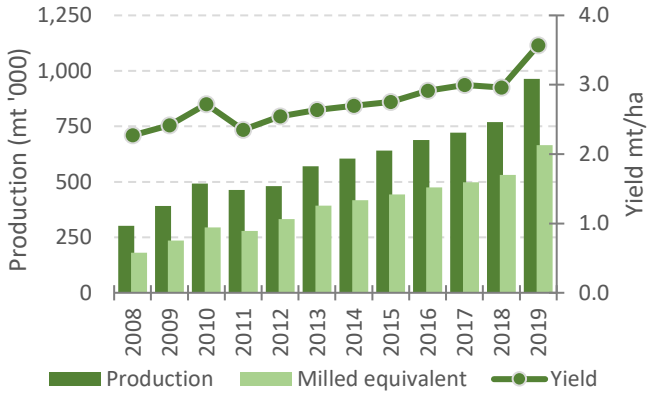
Ghana's history of rice support policies dates to the 1970s. However, with market liberalization, fiscal austerity, and the removal of fuel and fertilizer subsidies in the 1980s, rice production costs and competitiveness were adversely affected (Abdulai & Huffman 2010; Angelucci et al. 2013). Today, Ghana's Food and Agriculture Sector Development Policy guides implementation of several rice-related interventions, including the Food Security and Emergency Preparedness Program, which prioritizes rice and targets yield increases. Ghana's National Rice Development Strategy of 2009 (revised in 2015) proposes interventions in production technology research and dissemination, post-harvest handling and marketing, irrigation development, and support for rice value chain actors.

With import substitution an important policy objective, rice enjoys trade protection in the form of a 40 percent import tariff (Ragasa and Chapoto 2016). Sector policies complement trade policy by creating an enabling environment for increased investment in local rice production and improved competitiveness of domestic rice. The most prominent policy intervention, Planting for Food and Jobs (PFJ), launched in 2017, prioritizes rice, among several other crops, and has been credited for growth in rice output in recent years. The program subsidizes 50 percent of the cost of fertilizer and rice seed. It is estimated that PFJ-supplied seed was used on between 30 and 50 percent of rice lands in 2019.

PRODUCTION AND CONSUMPTION

Paddy rice production in Ghana has increased steadily at 11.1 percent per annum since 2008 (Figure 1). Production reached 963,000 tons in 2019 (equivalent to 665,000 tons of milled rice). At 6.9 percent per annum, the expansion of area cropped with rice was an important driver of output growth; by contrast, yields grew at 4.5 percent per year.

Figure 1: Rice production and yields, Ghana, 2009 to 2019



Source: MoFA (2019b)

An important dynamic in the rice sector is a gradual shift towards cultivation of more preferred aromatic varieties, with an estimated 45 percent of rice farmers now planting such varieties (Ragasa et al. 2014). While regional rice yields vary significantly due to the heterogeneity of production conditions and practices, gross margins for aromatic rice varieties are twice as high as for non-aromatic varieties (Ragasa et al. 2014).

The yield increase between 2008 and 2010 coincides with the introduction and rapid expansion of the fertilizer subsidy program. The program remained in place until 2017 when it was replaced by PFJ. Despite variable levels of subsidized fertilizer supply – and a brief suspension of the fertilizer subsidy program in 2014 – rice production and yields grew steadily over the past decade. The decline in yields in 2011 was an anomaly and has been attributed to poor seasonal rainfall in the northern regions and a 30 percent reduction in the government budget allocation to agriculture at the time (MOFA 2017b; Dzudzor 2013; FAO 2015). Another anomaly is the decline in yields between 2017 and 2018, which came about despite the expansion of the PFJ program, and which government explained as an effect of the late arrival of subsidized seed

and fertilizer, fertilizer smuggling, and excessive flooding of rice fields in some parts of the country. Such factors may explain more generally the weak correlation between rice production (or yields) and subsidized fertilizer supply ($r = 0.50$), although improved information on fertilizer application by crop is needed to assess this relationship properly.

The outlook for rice is positive. National rice seed supply under PFJ increased from 1,700 to 2,400 tons between 2017 and 2018, while the target for 2019 was 3,500 tons. At recommended seeding rates (IFDC 2014) and accounting for land expansion, PFJ seed could be utilized on between 30 and 50 percent of all rice lands in Ghana in 2019. If PFJ seed is higher yielding than rice seed currently in use, or if the subsidy permits land expansion by farmers who did not previously cultivate rice due to resource constraints, the production impact will continue to be significant as the program expands.

Rice consumption patterns and levels in Ghana have undergone a rapid transformation. Annual per capita rice consumption increased from 24 kg in 2012/13 to 35 kg in 2016/17 (GSS 2018); moreover, whereas per capita expenditure on rice was 3.3 times that of maize in 2012/13, this increased to 4.1 by 2016/17 (Andam et al. 2019). Urban consumers account for 70 percent of national consumption. Both rural and urban households reveal a preference for long grain aromatic varieties, which are mostly imported (Angelucci et al. 2013). Most imported rice is consumed in urban areas, while affordability and availability factors mean more local rice is consumed in rural areas. Raising the ability of domestic rice farmers to compete in urban markets across Ghana is a key policy objective. Doing so will require not only adopting the right varieties, but also improving harvesting and milling methods to ensure a quality product that can compete with imports.

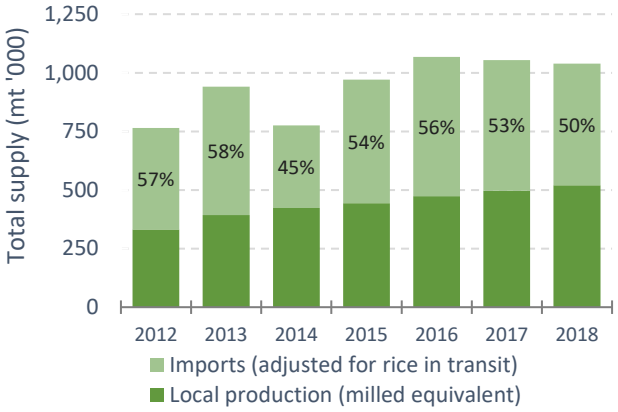
Domestic and International Trade

The market for local rice is segmented into branded and unbranded local rice. Branded varieties supplied by large-scale domestic producers and processors are typically high-quality, aromatic long grain varieties comparable to imported rice brands in terms of price and quality. They are primarily sold in supermarkets and mini-marts and have well-structured distribution channels, although supply can be seasonal. Some branded local varieties, such as Aduanehene, Champion, Copa, Royal Farmers and DUQ, are now preferred by many consumers over imported varieties (Andam et al. 2019).

Unbranded varieties are mainly sold by traders in open markets and sourced from major rice production areas in the eastern and northern parts of Ghana. Traditional processing methods are used for drying, milling, winnowing, and destoning unbranded rice before it is retailed (Ayeduvor 2018). Niche markets are also developing; for example, a more nutritious local brown rice variety is increasingly demanded by health-conscious urban consumers (Ragasa et al. 2014).

Despite steady production growth, rapid demand growth coupled with a strong preference for imported rice has meant that the share of imported rice in the domestic market has mostly remained above 50 percent during the period from 2012 to 2018 (Figure 2), even after accounting for the estimated 15 percent of imported rice that transits through Ghana and is re-exported to neighboring countries. The slight drop in the import share in 2014 likely relates to currency shortages at the time. The large dependence on rice imports has heightened concerns around foreign exchange imbalances and vulnerability to international rice price shocks. These concerns serve as justification for pursuing rice import substitution policies.

Figure 2: Sources of domestic rice supply, 2012 to 2018

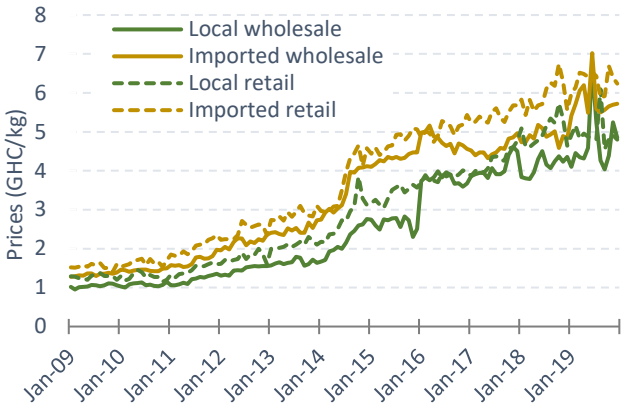


Source: MoFA (2018)

Price Trends

The Statistics, Research, and Information Directorate of the Ministry of Food and Agriculture (MoFA) collects regular price data from selected wholesale and retail markets, including for local and imported rice. Retail prices are quoted per kilogram, import wholesale prices per 50kg, and local wholesale prices per 100kg. For comparison purposes, in Figure 3 we convert all prices to price per kilogram.

Figure 3: Wholesale and retail rice prices, 2009 to 2019



Source: MoFA (2020b)

Figure 3 plots national average nominal prices in wholesale and retail markets for local and imported rice

over the period 2009 to 2019. On average, the wholesale price for imported rice is about one-third higher than the local price over this period, which mostly reflects quality differences or a willingness on the part of consumers to pay a premium for what is deemed a superior product. Whereas the retail markup is 15 percent for local rice, it is 13 percent for imported rice, most likely because imported rice comes packaged and is mostly sold in urban markets close to ports. The correlations between imported and local prices is very high, suggesting that the domestic market, although somewhat segmented in terms of quality and availability of different rice varieties, is well-integrated with the global rice market (see Cudjoe et al. 2011).

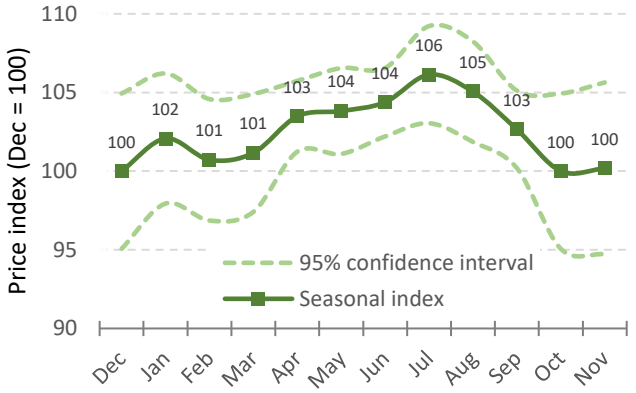
Ghana's three northernmost regions account for half of paddy rice production, with the northern towns of Bolgatanga and Tamale serving as key feeder markets. Kumasi, in the center of the country, is a key processing market for unbranded rice (Ayeduvor 2018). Both Kumasi and Accra, in the south, are major urban consumer markets. Among the wholesale market pairs, the Tamale-Accra price spread of 60 percent is significantly higher than the Tamale-Kumasi price spread of 25 percent. This reflects the higher transport cost from Tamale to Accra and the likelihood that a larger share of the rice in the Accra market is higher-quality branded rice.

Almost four-fifths of rice in Ghana is produced under lowland-rainfed production systems (Ragasa et al. 2014), which contributes to the seasonal price patterns observed, especially in more isolated markets. However, the storability and transportability of rice, which permits spatial and temporal arbitrage (i.e., storing now to sell later), and the availability of imported rice at stable prices throughout the season tempers the seasonal price pattern, especially in more integrated urban markets.

Different methods can be used to analyze price seasonality. We used the multiplicative model where price (P_t) at time t is defined as $P_t = (T_t \times C_t) \times (S_t \times R_t)$. T_t and C_t are long-term trend and cyclical components, and S_t and R_t are short-term seasonal and random (or unpredictable) components (see Tschirley 1995). The model is applied to national average wholesale rice prices for the period 2007 to 2017, i.e., prior to the launch of PFJ. Our interest is specifically in the short-term predictable (S_t) and unpredictable (R_t) variations in the local rice price. Information about the unpredictable component can be used to create a confidence interval around the anticipated seasonal price path. The size of this interval provides insights into the risk that traders might face when storing rice for later sale.

Figure 4 plots the seasonal rice price index and associated confidence interval. The rice harvest commences in September in the south and extends through November or December in the northern parts of Ghana. Drying and milling activities, therefore, are also spread out. Consequently, prices remain low from October, when the first milled rice stocks enter the market, through February and March, when late stocks arrive. The seasonal index (S_t) reveals that December prices are, on average, the lowest of the season. (In Figure 4, the December price is arbitrarily set at an index value of 100.)

Figure 4: Short-term seasonal rice price expectations (S_t)



Source: Analysis of MoFA (2019b)

Prices rise gradually throughout the marketing season to reach a peak price index value of 106 in July. This means prices in July will, on average, be 6 percent above the seasonal low in December. The interpretation of the 95 percent confidence interval for July [103, 109] is that there is a 5 percent chance that prices in July may be 9 percent higher or less than 3 percent higher than December prices. Compared to crops, such as maize, that are not traded internationally, the seasonal price pattern for rice is not pronounced. This reflects the effect of imported rice on price movements in the domestic market. Wholesale prices of imported rice are also lowest from October through December, but they peak in May, slightly earlier than local prices. However, the seasonal price spread for imported rice is only 3 percent in local currency terms, which tempers seasonal price movements in the domestic market.

The weak seasonal price pattern for local rice implies limited incentives for traders to engage in temporal arbitrage: storage costs (as quoted by the Ghana Grains Council) and interest costs on a loan (as quoted by the Agricultural Development Bank) alone would add up to 15 percent to the cost of the grain over a five-month storage period. Most rice trade in Ghana, therefore, involves moving product from feeder to consumer markets, rather than holding rice in storage at a location for later sale there.

CONCLUSIONS

Rice has been considered a priority crop in Ghana for several decades and continues to be prioritized in the Planting for Food and Jobs (PFJ) initiative. Although output growth over the last decade has exceeded 10 percent per annum, more than four times the population growth rate, demand has been expanding just as rapidly, causing the rice import share to remain above the 50 percent mark

during this period. PFJ provides significant quantities of subsidized rice seed and fertilizer, and while causality cannot be assumed without further analysis, indications are that the program is having a significant impact on domestic rice production, especially in 2019. Beyond providing production support, Ghana's rice import substitution strategy will be effective if it stimulates adoption of better on-farm management practices, investments in marketing infrastructure, and the adoption of modern post-harvest technologies and facilities.

Although there is anecdotal evidence of a revived interest from Ghanaian consumers in local branded varieties, the preference and demand for imported aromatic rice varieties remains very robust. Supply-side initiatives may not be enough. Providing marketing and branding support to build demand for the products of local rice value chain actors may help convince more consumers to switch to local varieties. Apart from the obvious price advantages – local varieties retail on average at 30 percent less than imported varieties – a starting point could be exploiting the niche consumer segment of health-conscious individuals who believe local rice to be more nutritious than imported brands.

With respect to price trends, the strong correlation between local and imported rice prices limits the extent to which traders can exploit opportunities for temporal arbitrage domestically. This means there is little to no incentive to hold rice stocks. The implication is that local rice varieties may only be available at certain times of the year, with the result that consumers may end up sticking to imported brands that are supplied throughout the year. There are, however, opportunities for spatial arbitrage and market segmentation by quality or type of rice given the price premiums that can be obtained in larger urban markets.

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