

POLICY BRIEF

Changes in the Milling Segment of the Rice Value Chain in Ghana

Abstract

This policy brief highlights technological and organisational transformations occurring in the rice milling segment in Ghana. It is based on surveys conducted with rice millers in the greater Accra and Volta regions in 2022. The results demonstrate that technological upgrading is occurring, particularly after 2010, and that there is increasing vertical coordination among the value chain actors. The authors highlight the factors that have contributed to these changes, as well as the key challenges that remain, and provide key recommendations as a result.

Context

Rice is one of the most important food crops in West Africa, especially in Ghana. However, the country faces a structural rice deficit in that production levels do not match growing national demand, translating into increasing import dependency. Around 60% of total rice consumed in Ghana is imported (USDA, 2022) which amounts to an import bill of 391 million dollars (OEC, 2020) and greatly increases the vulnerability of Ghana to potential external shocks. It is within this context that the country embarked on measures to increase its national production to the self-sufficiency level. Through the Coalition for African Rice Development, the country formulated a National Rice Development Strategy (NRDS) 2008-2018 and 2018-2030, aimed at increasing the capacity of the rice value chains and ensuring their resilience. Other key agricultural policies such as the Medium-Term Agricultural Sector Investment Plan (METASIP II) (2014-2017), the Planting for Food and Jobs program (2017-2022) and the Continental Investment Plan for accelerating Rice Self-Sufficiency in Africa (CIPRiSSA) (2018-2025), complement the NRDS.

Introduction

The scientific literature reports that some local value chains in sub-Saharan Africa are transforming through technical and organisational changes fuelled by the midstream segment, in particular, processors and wholesalers. This was for instance observed in the maize value chain in Nigeria (AGRA, 2019), or



in the rice value chains in west Africa (Soullier and al, 2020). Such transformations are characterized by investments in updated milling and storing technologies, and the implementation of vertical coordination, such as contract farming (Soullier & Moustier, 2020). They enable economies of scale, improvement of product quality and better competitiveness of domestic rice value chains.

We questioned whether such a transformation has occurred in the rice value chain in Ghana. Improving the quality of local rice and creating value addition aligns with one of the objectives of the NRDS which, among various measures, seeks to improve the milling equipment and infrastructure of milling facilities.

The key questions that this policy brief seeks to answer include whether millers have improved their technology. Do they use new ways of organising transactions? If so, what were the enabling factors?

Approach

In 2022, we conducted surveys with rice millers to explore the process of upgrading. The research was conducted in the Kpong irrigation scheme, the Dawhenya irrigation scheme, the South Tongu district and the Weta irrigation scheme. These areas are located in the Greater Accra and Volta regions which account for nearly 25% of the national rice production (USDA, 2019). 38 out of the 40 millers present in the study areas were interrogated.

Upgrading milling technologies

The rice milling sector in Ghana presents a wide diversity of mills, classified according to quality and capacity criteria¹. Four categories of mills are observed: monobloc mills, improved monobloc mills, medium scale mills and large-scale mills (See table 1). Prior to 2010, the milling segment was characterised by low milling technology producing poor rice quality (with stones, impurity, broken grains). The segment was composed of 85% monobloc mills and 15% improved monobloc mills. No medium scale and large-scale mill existed in the area.

Table 1: Type of rice mills according to quality and quantity in 2022

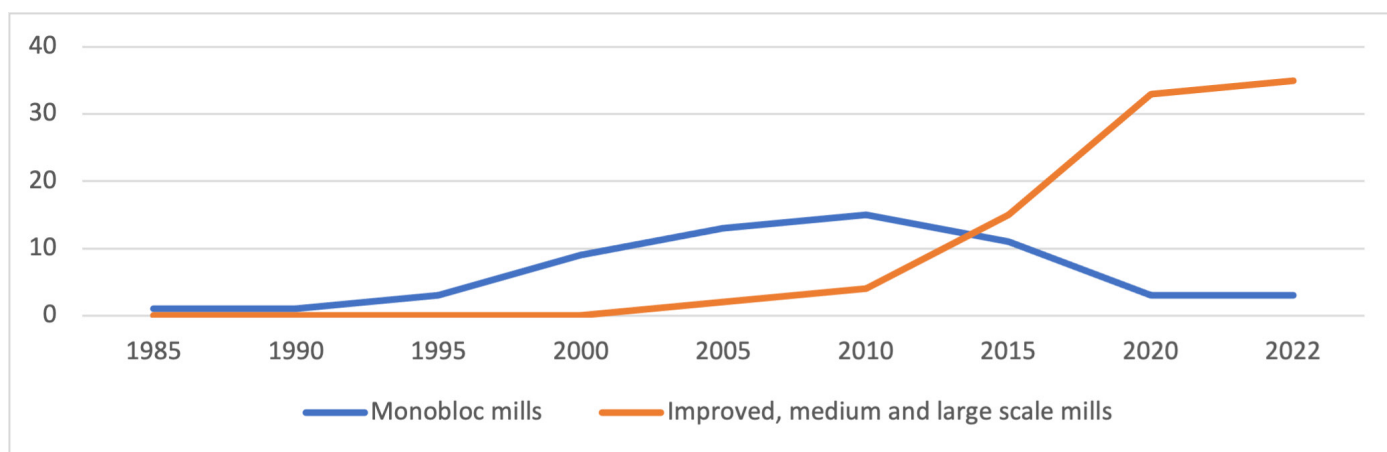
Type Of Mill	Functions	Capacity	Number of Mills	Share of Mills in the Study Area
Monobloc mill	1	< 400	3	8%
Improved monobloc mill	2 – 5	400 – 1.500	29	76%
Medium scale mill	6 - 10	1.000 – 3.000	3	8%
Large scale mill	> 8	> 3.000	3	8%
Total			38	100%

The year 2010 marked a reversal point, after which a progressive technological upgrading took place in the milling segment of the rice value chain in the study area (See figure 1). It transitioned towards more technologically advanced mills through the creation of new milling businesses (16) and through existing businesses replacing their monobloc machines (16). Overall, 88% of milling upgrades occurred from

monobloc to improved monobloc. One of the major improvements in the sector has been the establishment of 6 medium and large-scale mills. The quality of the milled rice produced by the large-scale mill is comparable to that of imported rice. All mills are private owned with the exception of one, belonging to the Volta River Authority.

¹ Quality is related to the functions performed by the mill and capacity is the quantity paddy milled per hour.

Figure 1: Type of mills in activity over time

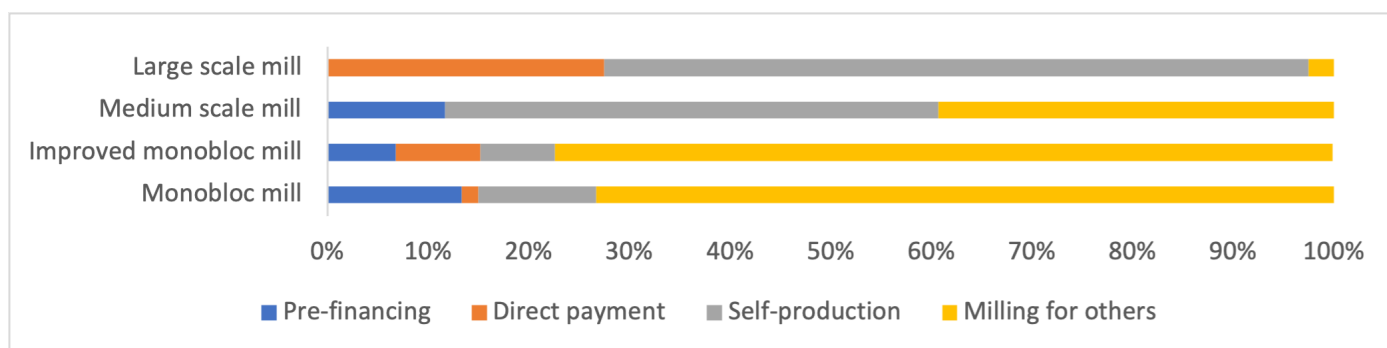


New forms of coordination

We observe different forms of coordination according to mill sizes (See Figure 2). Monobloc mills and improved monobloc mills are mostly characterised as service providers; they mill paddy for customers and charge a fee for the service. On the other hand, medium and large-scale mills are commercial mills. To control for the quality and quantity of their paddy, they tend to control the supply chain by producing

paddy themselves. Overall, there is a progressive transition whereby business models shift as the technology of the mill upgrades. Although contract farming is considered as an effective mechanism to guarantee the quantity of paddy and to control the quality of production, it is perceived as a risky venture and is therefore practised on a low scale by monobloc, improved monobloc and medium scale mills, based on trust and proximity.

Figure 2: Mode of paddy supply per type of mill



Factors contributing to the improvement of rice mills

Many interconnected factors have contributed to the improvement of rice mills:

- **Irrigated production:** It attracts millers and investors for its reliability. Irrigated rice provides a guarantee of paddy quantity and quality to millers which also represents a safety net for return on investment.
- **Increasing demand:** Changes occurring in the Ghanaian rice value chain is “demand-led”. To match the increasing demand and meet customers’ preferences, millers have adapted their technologies and business models.

- **Availability of machinery:** Two main suppliers are present in the country that have supplied the majority of the improved monobloc mills. On the other hand, the medium scale and large-scale millers imported their own equipment directly from abroad (Brazil, Germany, Thailand, China).
- **Favourable policies:** To reduce rice importation, increase production and improve the quality of Ghanaian rice, several complementary policy measures have been implemented. We present a summary below:

Table 2: Measures implemented in the rice sector

Purpose	Type of measures	Main policy / initiator
Increase demand	“Eat Ghana rice” campaign	Planting for Food and Jobs (PFJ) – The Rice Chapter
	School Feeding Programme	Comprehensive African Agricultural Development Programme (CAADP) Pillar III
Stimulate investment	Agricultural machineries are exempt from VAT under the VAT Act, 2013 (Act 870) law	Parliamentary decision Ghana Revenue Authority
	Tax incentive: Tax holiday for Agro processing business	Parliamentary decision; Ghana Revenue Authority
	One District One Factory (1D1F) policy	Industrial transformational agenda
Increase production and improve quality	Input subsidy	Planting for Food and Jobs (PFJ)
	New varieties of seeds introduced through research and development	Planting for Food and Jobs (PFJ)
	Rehabilitation of Kpong irrigation area (and other irrigation schemes)	Ghana Commercial Agricultural Project (GCAP)
Secure end-markets	National Food Buffer Stock Company	Companies Code of Ghana, 1963, Act 179
Limit importation	Banning the provision of foreign currency to import “non-critical goods”, including rice	Bank of Ghana
	20 percent quota on rice imports policy	

Challenges for rice millers

Despite the rice value chain being dynamic and showing great future prospects, a number of challenges still persist, constraining the functioning of the actors and ultimately the potential for upgrading the value chain.

- **Cost and reliability of electricity:** Many millers have difficulties coping with the increasing price of electricity, considering that it is one of their most significant running costs. Furthermore, the level of electricity provided by the Electricity Company of Ghana (ECG) cannot always cope with the electricity requirement of all mills.
- **Cost and availability of spare parts:** The supply of machinery spare parts can be scarce and expensive. Considering that mills have to regularly

change parts to guarantee the functioning of their machines, the unavailability of some spare parts has a direct effect on the quality of the rice produced and the operationality of business.

- **Quality of paddy:** Moisture is one indicator for paddy quality. When not properly dried, it affects the quality of the final product and can damage the milling machines. This is a recurrent problem due to a lack of drying equipment.
- **Access to bank credit:** Banks are still reluctant to provide loans to rice millers who operate in an uncertain context. Credits act as a leverage to investing and accessing paddy, however the majority of millers interviewed do not have access to it.

- Unreliability of contract farming: While contract farming presents advantages, it can also lead to opportunistic behaviour such as side selling or inputs diversion. As a result, contract farming presents risks for millers who, in the absence of legal contract enforcement measures, tend to rely on trust and proximity.
- Increasing costs: The recent degrading state of Ghana's economy has mainly resulted in higher production costs which have a ripple effect on the final price for consumers. This presents a major threat as it could turn consumers away from local rice consumption, and render the sector less profitable and less competitive over time, with risks of job losses and business failures.

Recommendations

Based on the research carried out and the observations made from the analysis, we recommend that the government of Ghana carry out an endogenous approach to developing the rice value chain in Ghana through policies that improve the business environment for local economic actors in the sector. More specifically, we suggest to:

- Increase irrigated areas: Irrigated rice represent only 16% of rice produced in Ghana (NRDS, 2009). Given its production reliability and attractiveness for milling investment, expanding irrigated rice production appears to be a vital element to improving the rice value chain in Ghana.
- Improve electricity services: Addressing these issues could be achieved by 1) Developing infrastructure in the long term, such as hydropower, solar panels, transformers and towers; 2) Providing subsidy to millers to reduce costs of electricity in the short/medium term
- Carry on incentive measures for investment: The VAT exemption measures, tax holidays for new business ventures and grants provided through the 1D1F have proved to be effective to stimulate investments in the rice milling sector and, ultimately, achieve technological upgrading.
- Improve access to financing: 1) Develop special credit lines for investors to modernise their rice mills through infrastructure (such as warehouses facilities, feeder roads, drying floors) and technology (such new machines, complementary equipment); 2) Facilitate operational credit to ease the procurement of rice paddy for millers; 3) Facilitate access to finance through the reduction of loan administrative protocols.
- Carry on the Eat Ghana Rice campaign: The campaign has proved effective in stimulating the demand for Ghana rice. We recommend to

continue the campaign to raise awareness about Ghanaian rice and attract consumers.

- Regulatory framework for contract farming: Such framework can facilitate securing procurement of quality paddy by millers, reduce the number of intermediaries and reduce reliance on informal markets. It is expected that better vertical coordination between actors can render rice value chains more resilient. Regulatory measures can be enforced within an interprofessional association.

Further

One question remains: are the developments observed in this study a general trend at the national level, or are they specific to the study area?

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