MAFAP
SPAAA

Monitoring African Food and Agricultural Policies
Suivi des politiques agricoles et alimentaires en Afrique

ANALYSIS OF INCENTIVES AND DISINCENTIVES FOR RICE IN GHANA

Draft Version

APRIL 2013

This technical note is a product of the Monitoring African Food and Agricultural Policies project (MAFAP). It is a technical document intended primarily for internal use as background for the eventual MAFAP Country Report. This technical note may be updated as new data becomes available.

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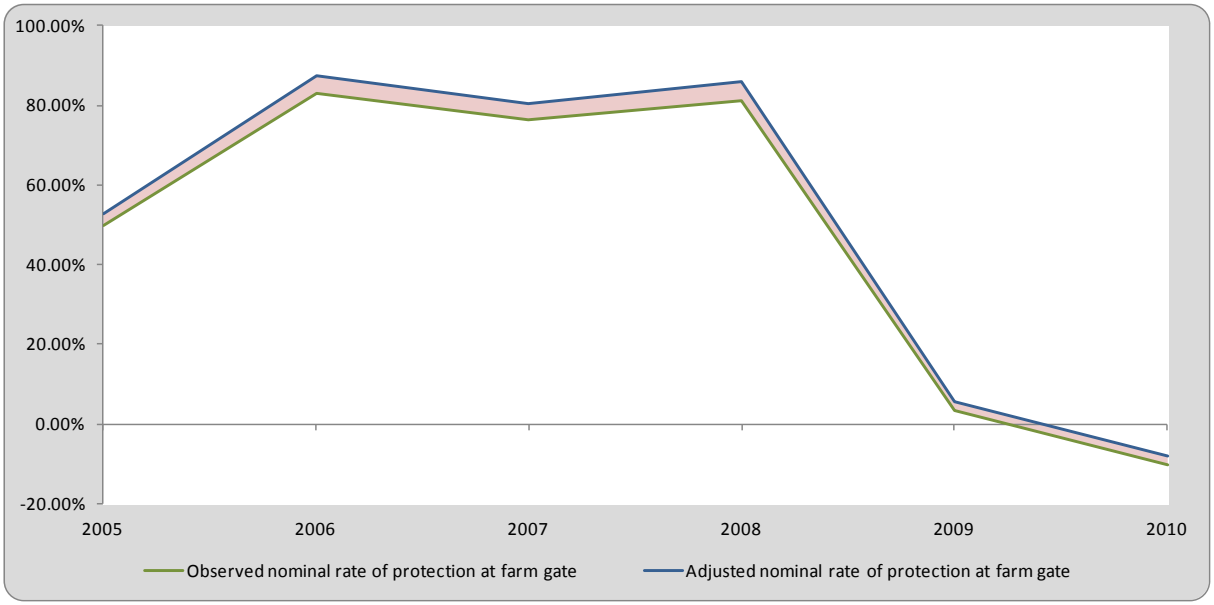
SUMMARY OF THE NOTE

Product: RICE
Period analyzed: 2005 – 2010
Trade status: Import in all years

- First most important import crop, 11 percent average share of total Agricultural imports (2005-2009)
- Total production from 300,000 tons in 2005 to almost 500,000 tons in 2010.
- Main type of rice imported is broken rice with Thailand and Viet Nam being the leading suppliers
- Rice is one of the commodities, purchased by the National Food Buffer Stock Company (NAFCO), operating since 2010, to built its operational and emergency stocks.
- Rice imports are subject to an import duty of 20% (temporarily removed in 2008 and reinstated during the course of 2009) as well as other taxes and levies.
- Policy interventions by the Government, also include input subsidies (fertilizer, machinery).



The observed Nominal Rate of Protection (NRP, green line) indicates that rice farmers have received price incentives under the prevailing cost structure in the value chain up to year 2009 to then receive disincentives in 2010. The adjusted NRP (blue line) captures the effects of market inefficiencies on farmers. The area in red shows the cost that these inefficiencies represent for producers.

- Our results show that disincentives, when they exist, arise from 1) price dynamics, 2) taxes and levies 3) transport and handling costs.
- Notwithstanding the disincentives, production has increased in most years due to high accessibility to seeds and technical assistance, as well as the farm input subsidy programme.
- Actions to be taken to reduce disincentives could include 1) carrying out a review of existing taxes, duties and levies, 2) carrying out a review on all costs affecting transport and handling for both imported and domestic rice 3) In-depth assessment of existing programmes supporting rice and coherence with policy objectives.

CONTENTS

1. PURPOSE OF THE NOTE

This technical note aims to describe the market incentives and disincentives for Rice in Ghana.

The note is a technical document and serves as input for the MAFAP Country Report.

For this purpose, yearly averages of farm-gate and wholesale prices are compared with reference prices calculated on the basis of the price of the commodity in the international market. The price gaps between the reference prices and the prices along the value chain indicate to which extent incentives (positive gaps) or disincentives (negative gaps) are present at the farm-gate and wholesale level. In relative terms, the price gaps are expressed as Nominal Rates of Protection (NRP). These key indicators are used by the Monitoring African Food and Agricultural Policies (MAFAP) project to highlight the effects of policy and market development gaps on prices.

The note starts with a brief review of the commodity's production and consumption as well as trade and policies affecting the commodity. It also provides a detailed description of how the key components of the price analysis have been obtained. Using this data, the MAFAP indicators are then calculated and interpreted in light of existing policies and market characteristics. The analysis is commodity and country specific and covers the period 2005-2010. The indicators have been calculated using available data from different sources for this period and are described in Chapter 3.

The outcomes of this analysis can be used by those stakeholders involved in policy-making for the food and agricultural sector. They can also serve as input for evidence-based policy dialogue at the country or regional level.

This technical note is not to be interpreted as an analysis of the value chain or detailed description of production, consumption or trade patterns. All information related to these areas is presented merely to provide background on the commodity under review, help understand major trends and facilitate the interpretation of the indicators.

All information is preliminary and still subject to review and validation.

2. COMMODITY CONTEXT

Rice is considered to be the second most important grain food staple in Ghana, next to maize (MoFA, 2009). Rice is also the first imported cereal in the country accounting for 58 percent of cereal imports (CARD, 2010) accounting for 5 percent of total agricultural imports in Ghana over the period 2005-2009. It should be noted that rice is only one of the sources of carbohydrates available in Ghana. Root crops such as cassava, yam, cocoyam as well as plantains and maize are also relevant food crops in terms of domestic production. Rice is the 5th most important source of energy in the diet accounting for 9 percent of total caloric intake (FAOSTAT, 2012).

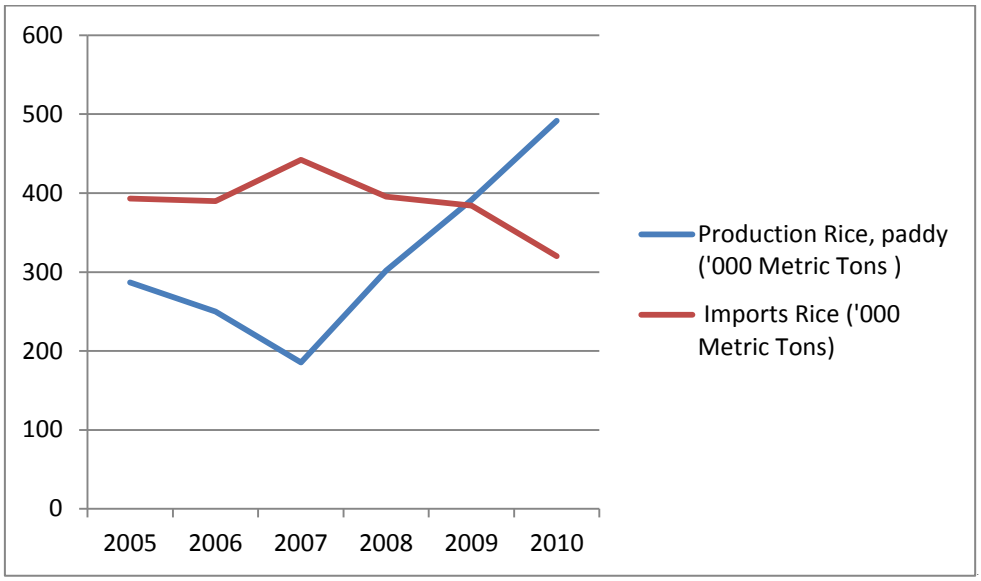
In 2010, Rice was the 10th agricultural commodity in Ghana by value of production while it ranked 8th in terms of production quantity for the period 2005-2010 (MoFA, 2010). It occupies roughly 4 percent of the total crop harvested area, although it accounts for about 45 percent of the total area planted to cereals (MoFA, 2009). In addition to being a staple food mainly for high income urban populations, rice is also an important cash crop in the communities in which it is produced. Between 2005 and 2010, Ghana ranked among the top 50 rice producers worldwide, dropping out of the list only in 2007 (FAOSTAT, 2010).

The dependency on rice imports is common to many West African countries. Following the 2008 world food crises however, the annual rate of increase of West Africa's rice production went up from 3.8 percent to 5.4 percent. Rice consumption has however stabilized at between 5 - 6 percent. However, similarly to a number of West African countries such as Benin, Guinea, Liberia and Nigeria, Ghana witnessed an increase in demand for substitutes such as cassava with evidence being offered in the increase in the production and trade of cassava flour since 2008 (WFP, 2011).

Ghana rice production satisfies around 30/40 percent of demand with a corresponding average rice import bill of USD 450 Million annually (MOFA and AGRA, 2010). The massive dependency on rice imports has always been a concern for Ghanaian policy makers especially after food prices soared in 2008. Indeed, in May 2008 Ghana was one of the first countries within the Coalition for African Rice Development (CARD) to launch its National Rice Development Strategy (NRDS) for the decade 2009-2018. The main objective of the NRDS is to double domestic production by 2018, implying a 10 percent annual production growth rate, and enhance quality to stimulate demand for domestically produced rice.

However, import duties and other taxes as well as interventions to boost productivity and quality of local rice do not seem to produce any substantial impact on Ghana import bill (Figure 1).

Figure 1: Production and imports of rice in Ghana (2005-2010, '000 MT).



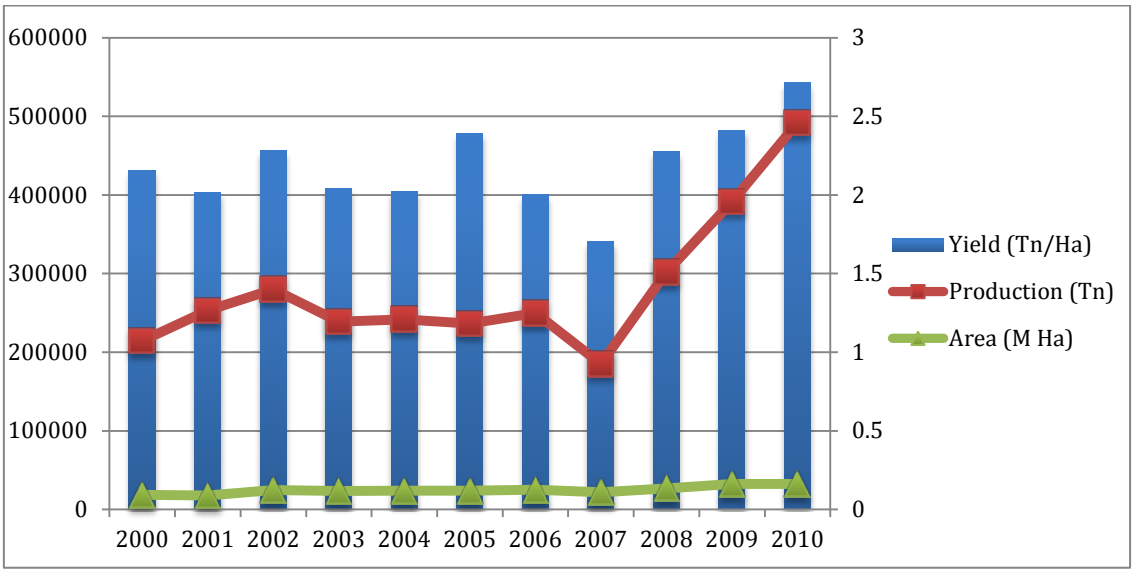
Source: FAOSTAT and UNComtrade

PRODUCTION

The main rice types produced in Ghana are Oryza Sativa and Oryza Glaberima (ODI, 2003). Figure 2 shows the evolution of production, area and yield for rice in Ghana for the period 2000-2010. As can be seen, the rice production increased from 0.09 and 0.16 million hectares while yields fluctuated between 1.7 and 2.7 tonnes per hectare. It however appears that from 2007, rice production has been on the increase with 2010 production levels being more than double 2007 levels (from 185 300 tonnes in 2007 to 491 600 tonnes in 2010) with average annual growth of more than 15 percent over the period 2005-2010, despite the production drop experienced in 2007.

Reasons for this increase could be attributed to the favourable rain patterns as well as the 2008 Fertilizer subsidy programme, the Block Farm programme of 2009 which are also contemplated in the Ghana Rice Strategy (see section on policy decisions and measures).

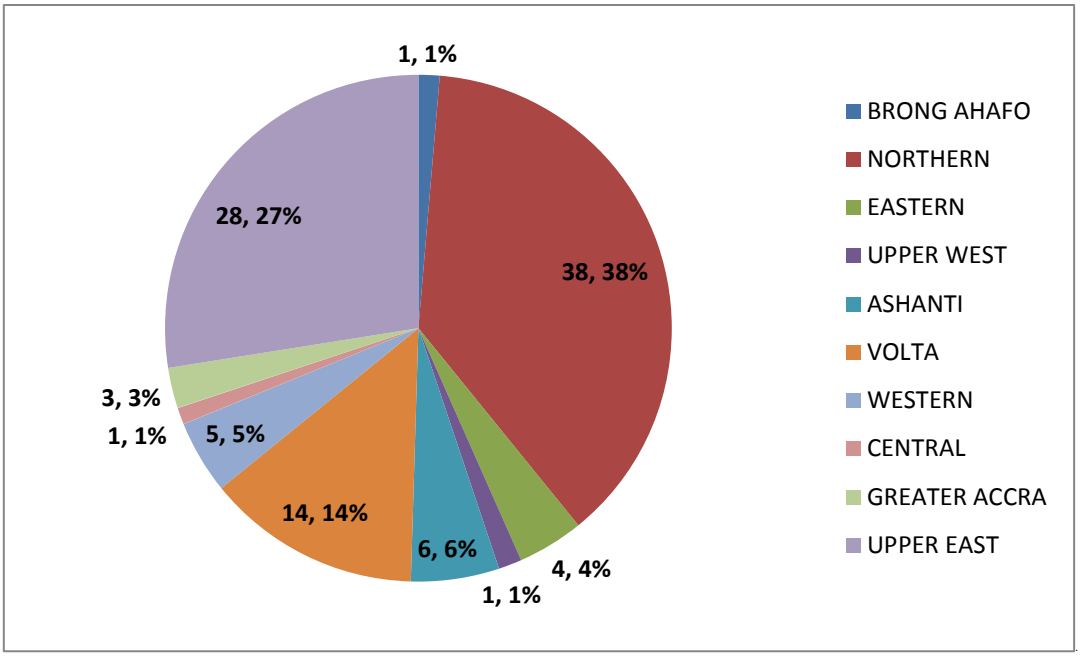
Figure 2: Main production figures for rice in Ghana (2000-2010)



Source: Production and area data are from SRID MoFA (2011); yield data is from FAOSTAT(2012)

Focusing on the period 2005-2010, rice production accounted for about 19 percent of cereal production (MoFA, 2010). According to a report by the Millennium Challenge Account (2006), rice production takes place in all the ten regions of Ghana; which also cover all the major ecological-climatic areas including the interior savannah area, the high rain forest zone, the semi-deciduous rain forest area and the coastal savannah area with peak production occurring in the Northern, Upper East, Western, Brong Ahafo and Volta Regions (ODI, 2003).

Figure 3: Rice production per region in Ghana (percentages, 2010)



Source: MOFA, SRID (2011)

Table 1: Rainfall and agro-ecological zones for rice production in Ghana

Agro-ecological zones	Average annual rainfall *(mm)*	Rainfall mode	Descending order of dominant rice ecologies
Interior Savannah	1 034- 1 100	Monomodal (May-November)	• Rain fed lowlands • Hydromorphic Drylands • Irrigated Upland
High Rain Forest	>2 000	Bimodal (March-July) (September-October)	• Rain fed • Drylands • SwampsIrrigated
Semi-deciduous Rain Forest	1 300-1 600	Bimodal (March-July) (September-October)	• Rain fed drylands • Rain fed lowlands • Inland swamps
Coastal Savannah	635-1143	Bimodal (March-July) (September-October)	• Irrigated rain fed • Lowland swamps • Rain fed drylands
Transitional	1 028-1 400	Bimodal (March-July) (September-November)	• Rain fed drylands • Rain fed lowland swamps • Irrigated

Source: FAO (2006)

The main rice producing regions, Northern, Volta and Upper East regions, produce between 45 000-60 000 tonnes per year each. The Northern region is the main producer with about 63 000 tonnes in 2009 (USAID, 2009).

In Ghana, most rice production, similarly to other crops, is done by smallholder farmers, most of them having farms of less than one hectare in size. It is estimated that more than 80 percent of agricultural production is done by smallholder farmers (AGRA, 2012). Most of the rice is cultivated from low-quality seed with mixed varieties, which brings about uneven maturity at harvest and wide variations in the size and shape of rice grains. Generally, this results in a gap between the quality of local and imported rice.

Rice production is undertaken in three different ecologies (see Table 1): lowland rain-fed ecology, which includes rice planted in the receding waters of the Volta and other rivers (78 percent of production); upland rain-fed ecology (6 percent), and irrigated ecology (16 percent) (CARD, 2010). Lowland production is mainly practiced by women in lowland areas, and is often done without supplementary irrigation. Rain-fed rice production contributes 84 percent of total current production, generating average paddy yields of 1.0 - 2.4 metric tonnes per hectare while irrigated production accounts for just about 16 percent of production but produces the highest average paddy yields of 4.5 MT per hectare (CARD, 2010 Rain fed lands and swampy areas producers are able to plant rice in two seasons as the rainfall pattern in these areas is bimodal in nature from between March to July and September to November.

There are currently 22 public irrigation schemes in Ghana. The larger schemes include the Kpong Irrigation Scheme, the Tono Irrigation Scheme, the Vea and Afife Irrigation Schemes (CARD, 2010). While most of the irrigation schemes are used for rice cultivation, the four largest schemes listed above are used for rice and vegetable cultivation. Furthermore, in addition to the 19 000 hectares of irrigated farmland in Ghana (10,900 under government run irrigation, the rest privately run); the

Millennium Development Authority also intends to develop? 5 300 additional hectares under irrigation. Most of the irrigation schemes were set up with support from bilateral cooperation of foreign countries such as China, Russia, Taiwan, Japan and Republic of Korea, or international organizations, including the Food and Agriculture Organization (FAO) and the World Bank (JICA, 2004).

Table 2: Rice Commodity Balance for Ghana[1]

	2000	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**
Production (I)	248700	274596	280000	238810	241807	287000	250000	242000
Import Quantity (II)	257271	576339	498397	1136687	733837	722321	580588	664265
Stock Variation (III)	0	-44118	-14706	-757353	-37010	-273529	65686	110294
Export Quantity (IV)	2177	2452	3139	1746	1822	4	3387	12
Domestic supply quantity (V: I+II+III+IV)	503793	804365	760552	616397	936812	735787	892886	1016547
Seed (VI)	7482	6755	6435	6567	6600	6875	6600	6600
Waste (VII)	44000	59876	56343	44233	53064	49428	44497	42611
Processing (VIII)	360	384	774	909	350	513	1209	369
Food (IX: V-VI-VII-VIII-IX)	451773	737320	696947	564687	876733	678494	840569	966599
Other Utility	176	29	54	3	65	477	10	368

Please note: the calculations for Domestic supply and Food vary by the actual figures by about 1 percent.
Source: FAOSTAT (2012)

In addition to the set up of irrigation schemes, especially during the last decade, the rice sector has benefited from a range of interventions that seek to improve yield, reduce poverty and increase incomes.

Farmers have benefited from the distribution of high-yielding varieties in addition to other complementary technologies (Jatoe, 2002; Al-hassan et al., 2004; Langyintuo and Dogbe, 2005; Faltermeier, 2007).

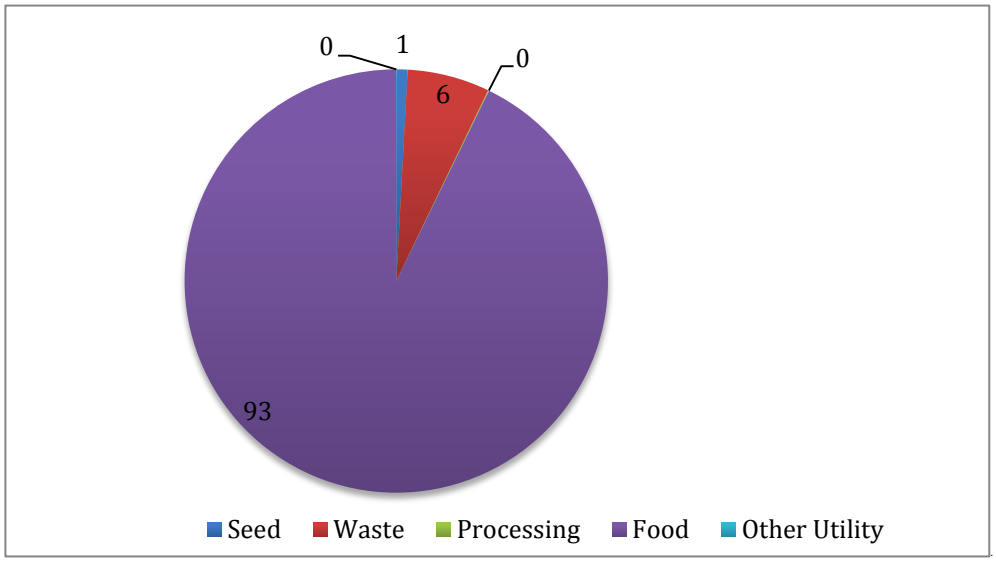
Despite the expected gains from the numerous interventions, the level of adoption of improved technologies among farmers is reportedly low. Most of these farmers use low-yielding varieties and

[1]It should be noted that production figures from FAOSTAT production and FAOSTAT Commodity Balance Sheets are not the same for 2007; production balance sheet reporting a 23 percent higher value than that of the commodity balance sheet.

poor agronomic practices. Farm households, especially those in northern Ghana, are still operating at low levels of productivity (*A.N. Wiredu, 2010*).

CONSUMPTION/UTILIZATION

Figure 4: Final use of rice in Ghana (average for 2000 to 2007)

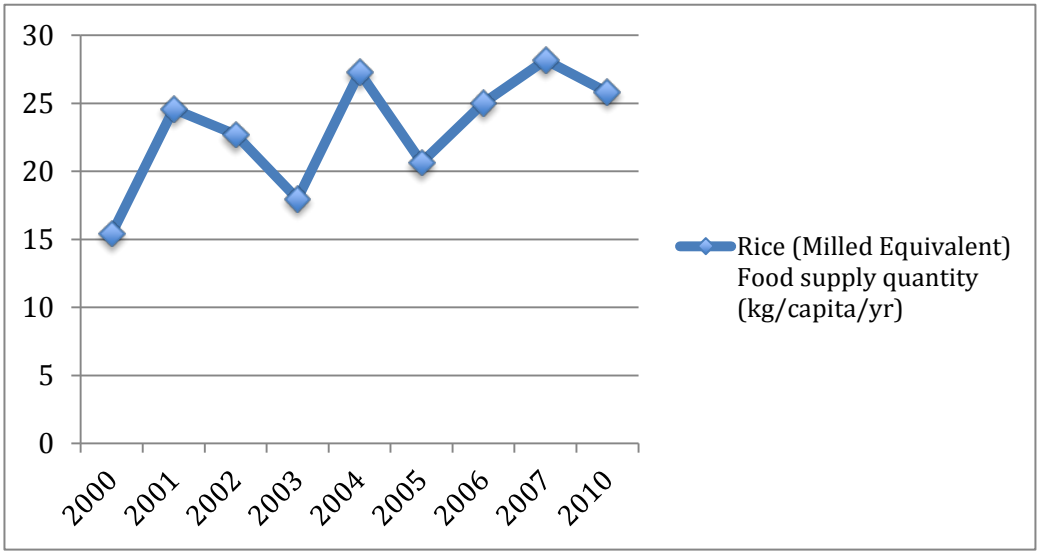


Source: FAOSTAT

According to FAOSTAT commodity food balance sheets (Table 1 and Figure 2) rice produced in Ghana (average 2000-2007) goes mainly to food consumption with an average waste of 6 percent. Less than 1 percent of rice in Ghana is processed. Rice is also not reported to be used as feed in the country.

In Ghana, rice is considered to be among the main staples with rice consumption in 2011/12 estimated to reach 62 ,000 MT (CARD, 2010). Per capita consumption of rice in 2010/2012 is pegged at about 28 kg with urban areas accounting for about 76 percent of total rice consumption (CARD, 2010). In urban areas, rice is preferred over other staples as it is easy and convenient to prepare and it allows for a wide variety of dishes. In addition, the rising number of fast food restaurants and vendors in the major cities has increased the demand for rice. Rice consumption in rural areas is much lower than in urban areas and thus less vulnerable to price fluctuations.

Figure 5: Ghana rice consumption per capita, 2000 - 2010[2] (kg/year)



Sources: The data from 2000 to 2007 was obtained from FAOSTAT Food Balance Sheets (2012) while the data for 2010 was obtained from USDA (GAIN Report 2011).

Although rice displays a high income elasticity of demand, over the last ten years, per capita rice consumption has raised by over 35 percent due to changes in food consumption patterns driven by urbanization (FAO, 2006). Rice consumption is highest around the festive seasons of Christmas and Easter.

High quality white rice is consumed on a regular basis in urban areas where the concentration of people with a stable income is higher. According to the Ministry of Food and Agriculture just about 20 percent of locally cultivated rice is consumed in urban areas due to consumer preferences for long grain aromatic rice which is principally imported from Vietnam and Thailand.

At present there are no local types of rice which can be considered as substitutes of the imported rice. Without an increase in quality, the urban population who typically consumes more rice than rural consumers due to the convenience will continue to buy imported rice.

Furthermore, in Ghana, the milling techniques applied to locally produced rice vary considerably. Most of the processing is done manually especially by small rice producers (USAID, 2009), which in turn results in end products of different quality. For instance in Tamale, in the Northern region of Ghana, the whole stem is cut and is only roughly separated from the grain when most rice is harvested . The processed rice is brown in colour and with a lot of dirt particles. In Bolgatanga, in the Upper East region, however, the panicle is severed directly and much less extraneous matter gets into the processed product. The resulting rice is white and can sometimes be passed as the imported type (Winrock International, 2011).

Quality improvement has been promoted but almost exclusively at the production and on-farm processing but significant investment in processing facilities would be needed to produce rice competitive with imported rice in quality (USAID, 2009).

[2] The data from 2000 to 2007 was obtained from FAOSTAT Food Balance Sheets (2012) while the data for 2010 was obtained from GAIN (2011).

MARKETING AND TRADE

Both local and imported rice are sold on urban markets, however due to the irregularity in supply of local rice, imported rice dominates the scene. A 2003 study conducted by the ODI in 32 rice producing villages in Ghana revealed that most farmers receive price information for rice from traders or "market women[3]", who dictate the prices. With the introduction of mobile technology in the country however, there have been pilot projects conducted by a price information company known as Esoko that allows farmers to receive both wholesale and retail market prices, thus enabling farmers to have a better bargaining power (Esoko, 2012[4]).

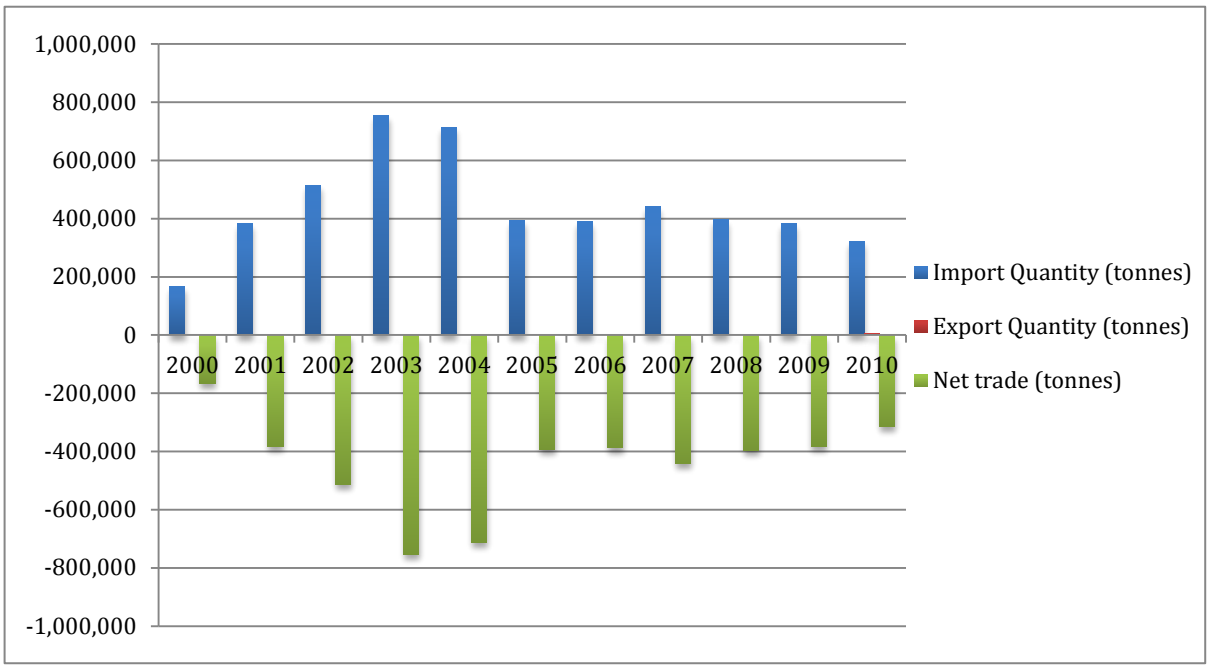
The market women, who often offer access to capital and credit for input purchase as well as transportation for farmers, operate an oligopolistic system, which constrains the market and limits innovation (ODI, 2003). Market price for rice is subject to fluctuations in the market. Market women also present another challenge to farmers; this pertains to measurement of rice. Paddy rice is sold in sacks of 82kg weights in Ghana. Due to a lack of standard measurements, market women's sometimes bring larger sacks than the standard 82kg to collect the paddy from farmers at harvest time (ODI, 2003).

Imported rice on the other hand is sold either to wholesalers, retailers, or directly to consumers for instance at the local ports in Tema and Takoradi where consumers can directly purchase goods from importers, although middle men are often used to link wholesalers to consumers. In comparison to locally produced rice, imported rice is packaged in smaller packs of 50 kg, 25 kg, 10 kg and 5kg bags. Marketing of imported rice (in particular rice from the US) is done through television, radio and print media advertisement all over the country (ODI, 2003). Grade 1 rice accounts for about 6% of total imports while grade 2 holds a share of 51% of total imports. There is no grade 1 rice produced in Ghana, while grade 2 rice represents only 4% of total production. Most of the domestic production (83%) is of grade 5 (USAID, 2009).

[3] Market women are female traders who sell on local markets. These women often dominate local agricultural trade and have been said to manipulate prices and local trade in Ghana (Owusu-Ansah, 1994).

[4] http://www.esoko.com/

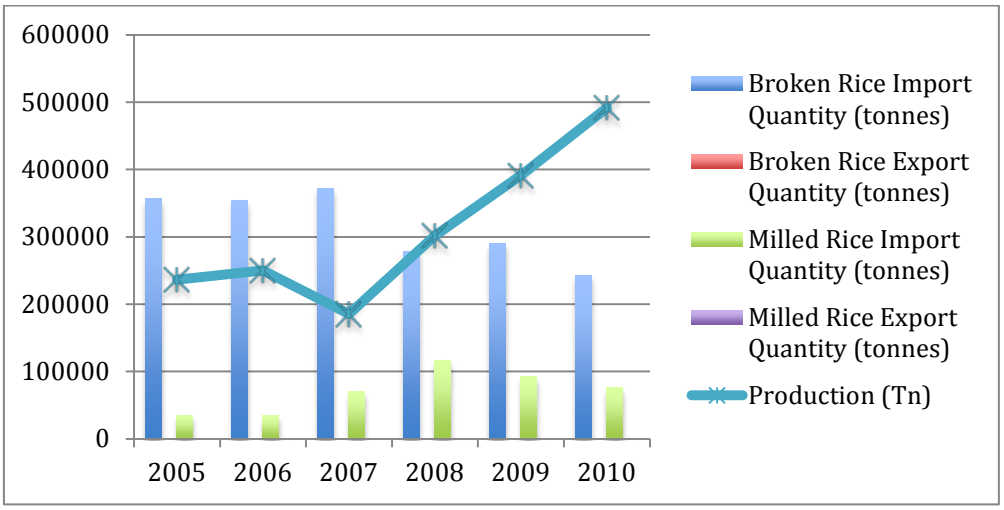
Figure 6: Total Rice trade balance (X – M) in Ghana (2000-2010)



Source: UNCOMTRADE 2012 / FAOSTAT 2012

Figure 6 shows rice import and export flows for the period 2000-2010. All values are from UNCOMTRADE except for the export figure from 2002 (which is taken from FAOSTAT) as UNCOMTRADE did not provide this information. A number of likely reasons have been offered for the import surge in 2003 and 2004. Firstly, there was a drop in world market reference prices between 2000 and 2002 due to policy decisions taken by India to release rice stocks onto the world market (FAO, 2005) . Political instability in neighbouring Côte d'Ivoire could have also led to an increase in imports, some of which was subsequently transferred to Côte d'Ivoire. There was also a slight fall in imports in 2010. A likely reason for this is the restoration of a 20 percent import duty in January 2009, which the government had earlier removed (May, 2008) to minimize the impact of the global food crisis. However, the demand for rice is increasing and this creates an opportunity for increased rice imports. The Global Agricultural Information Network (GAIN) (2011) supports this increase in rice demand by adding that the forecast for Ghana rice imports in 2011/2012 is 330,000 MT, which is an increase from its 2010/2011 level of 320,000 MT. GAIN (2011) adds that this increase is attributed to increases in demand for rice and the shortfall in local production.

Figure 7: Rice imports by type versus local production in Ghana (2005 – 2010)[5]



Source: UNCOMTRADE (2012) / FAOSTAT (2012)

Table 3. Main figures of rice trade in Ghana (2005-2010)

	2005	2006	2007	2008	2009	2010
Rice Broken						
Import Quantity (tonnes)	*357,721*	354,455	372,251	277,978	290,484	243,238
Export Quantity (tonnes)	0.04	0.00	0.00	2.12	4.84	0.06
Net trade (tonnes)	-357,721	-354,455	-372,251	-277,976	-290,479	-243,238
Import Value (1000 USD)	110,791	101,899	124,898	135,957	157,175	137,733
Export Value (1000 USD)	0.01	0.00	0.00	1.55	0.87	0.13
Net trade (1000 USD)	-110,791	-101,899	-124,898	-135,955	-157,174	-137,733
Implicit value exports (USD/t)	286	0	0	730	181	2357
Implicit value imports (USD/t)	310	287	336	489	541	566
Rice Milled						
Import Quantity (tonnes)	*35,323*	35,007	69,790	11,6269	93,385	76,888
Export Quantity (tonnes)	0.04	0.44	0.00	0.24	122.92	5.74
Net trade (tonnes)	*-35,323*	*-35,006*	*-69,790*	*-116,269*	*-93,262*	*-76,883*
Import Value (1000 USD)	18,830	16,197	33,452	77,961	67,352	63,661
Export Value (1000 USD)	0.02	0.17	0.00	0.23	104.26	7.93
Net trade (1000 USD)	-18,830	-16,196	-33,452	-77,960	-67,248	-63,653
Implicit value exports (USD/t)	465	379	0	970	848	1380
Implicit value imports (USD/t)	533	463	479	671	721	828

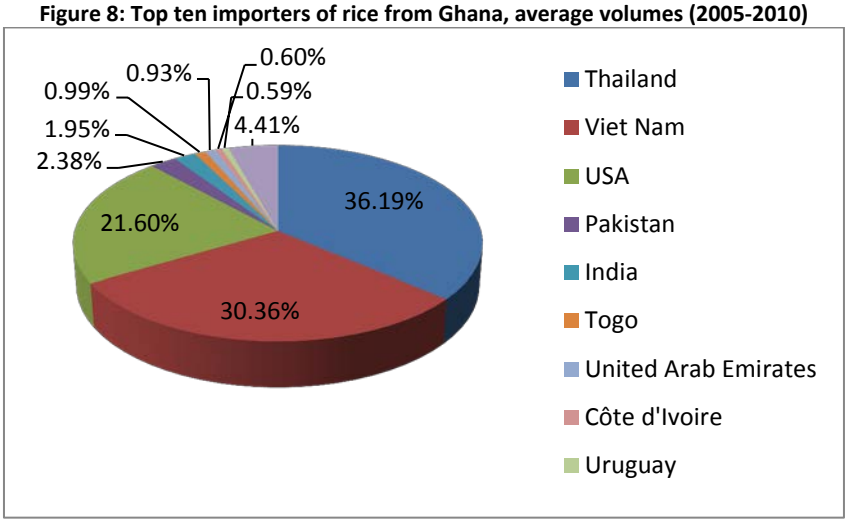
Source: UNCOMTRADE (2012)

As shown in figure 7 above, pertaining to rice, Ghana is clearly an importing country with a very low level of exports with the highest recorded export level being 1,693 tonnes in 2006 versus the highest

[5] UNCOMTRADE did not provide data for 2004. Hence FAOSTAT data was used for 2004 only while UNCOMTRADE was used for all other data.

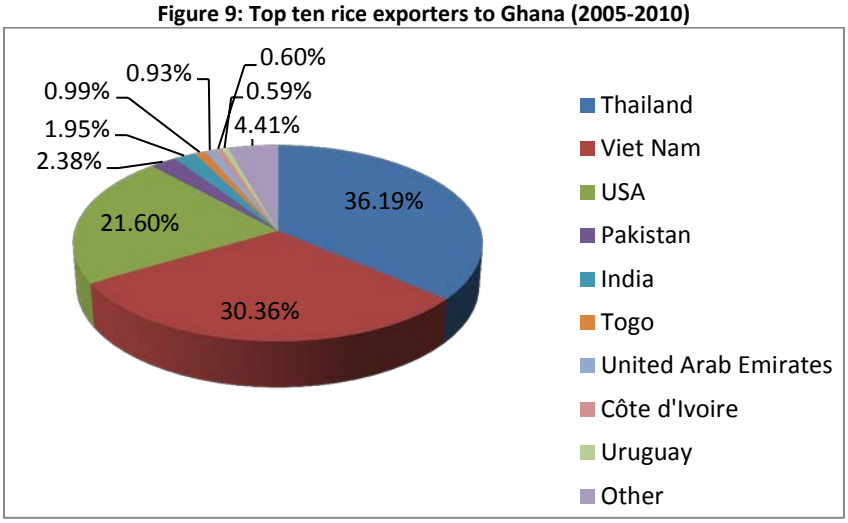
recorded import level of 797,705 tonnes in 2003. Over the period of analysis, 36 percent of rice imported is from Thailand; while 30 percent is imported from Viet Nam.

Figure 8: Top ten importers of rice from Ghana, average volumes (2005-2010)



Source: UNCOMTRADE

Figure 9: Top ten rice exporters to Ghana (2005-2010)

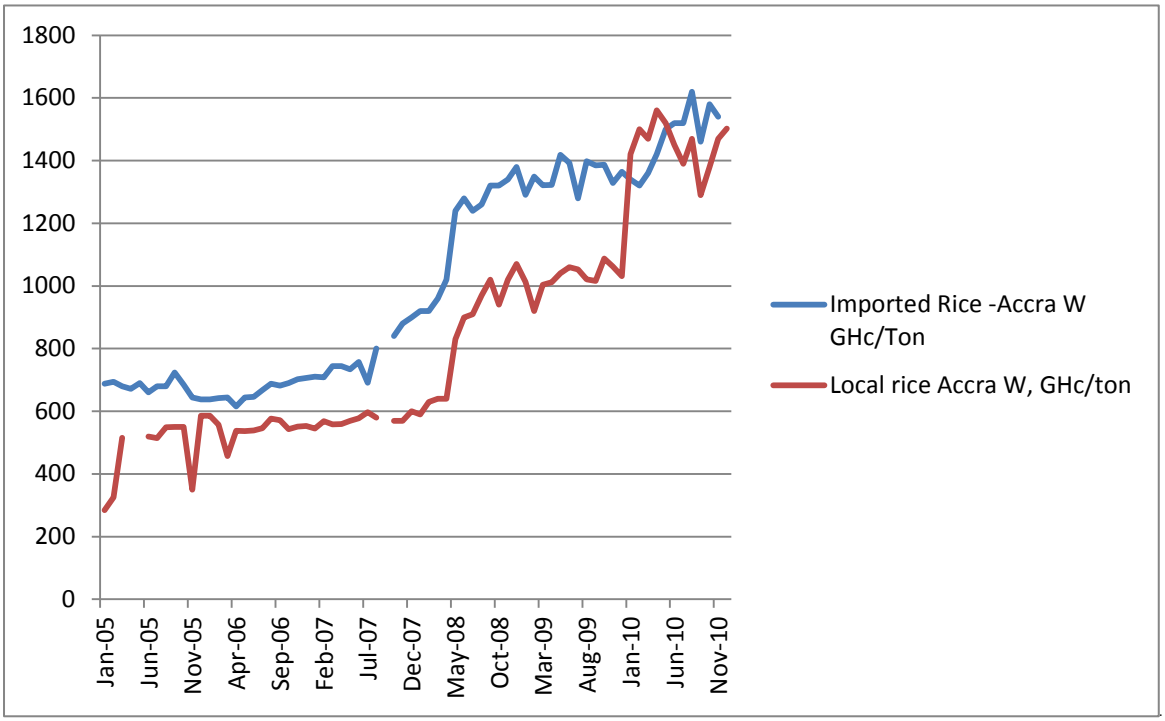


Source: UNCOMTRADE

Consumers' preference for long grain perfumed rice from Vietnam and Thailand is evident in urban areas where very few locally produced rice is marketed. The costs of taking local rice from producing areas to mills on to the urban areas are very high and discourage importers or large traders to market local rice which, also because of inefficient processing has a price higher than the imported rice (Figure 8).

In addition, the difference between wholesale prices of imported rice and that of local rice is diminishing, implying that there is very little price incentive for purchasing local and lower quality rice as opposed to the imported commodity.

Figure 10: Monthly wholesale prices in Accra, imported and local rice (GHc/tonne)



Source: MOFA/SRID

DESCRIPTION OF THE VALUE CHAIN AND PROCESSING

The value chain for rice in Ghana is divided into two main channels: the local rice and the imported rice value chain. Although both value chains are fairly simple, the import value chain is shorter and more efficient than the local value chain as the local value chain has more actors and faces higher levels of challenges (CARD, 2009).

The local rice value chain consists of a number of actors: input suppliers, producers, bulkers, processors/millers, wholesalers and retailers.

Local rice value chain

Input suppliers consist mainly of agrochemical dealers and seedling producers while producers consist mainly of smallholder farmers (about 80 percent of production) and a few large scale farm producers (AGRA, 2012). As rice production is done mainly by smallholders, bulkers act as an intermediary between individual producers and processors by collecting the rice from smallholder farmers and supplying them to the processors. A number of bulkers are also involved in milling. While some processors simply perform a commercial processing function for bulkers, others also sell to rice importers who repackage the rice for wholesale commercial activities. Some local processors who have established distribution networks also act as small-scale wholesalers. Retailers buy rice either from importers, bulkers or processors and sell directly to consumers. The locally produced rice is popularly called brown rice.

There is a small percentage of locally produced improved aromatic rice which is sold through Accra and Kumasi and competes with imported rice. This rice is grade 2 rice and represents about 4% of Ghana rice production (USAID, 2009).

The imported rice value chain

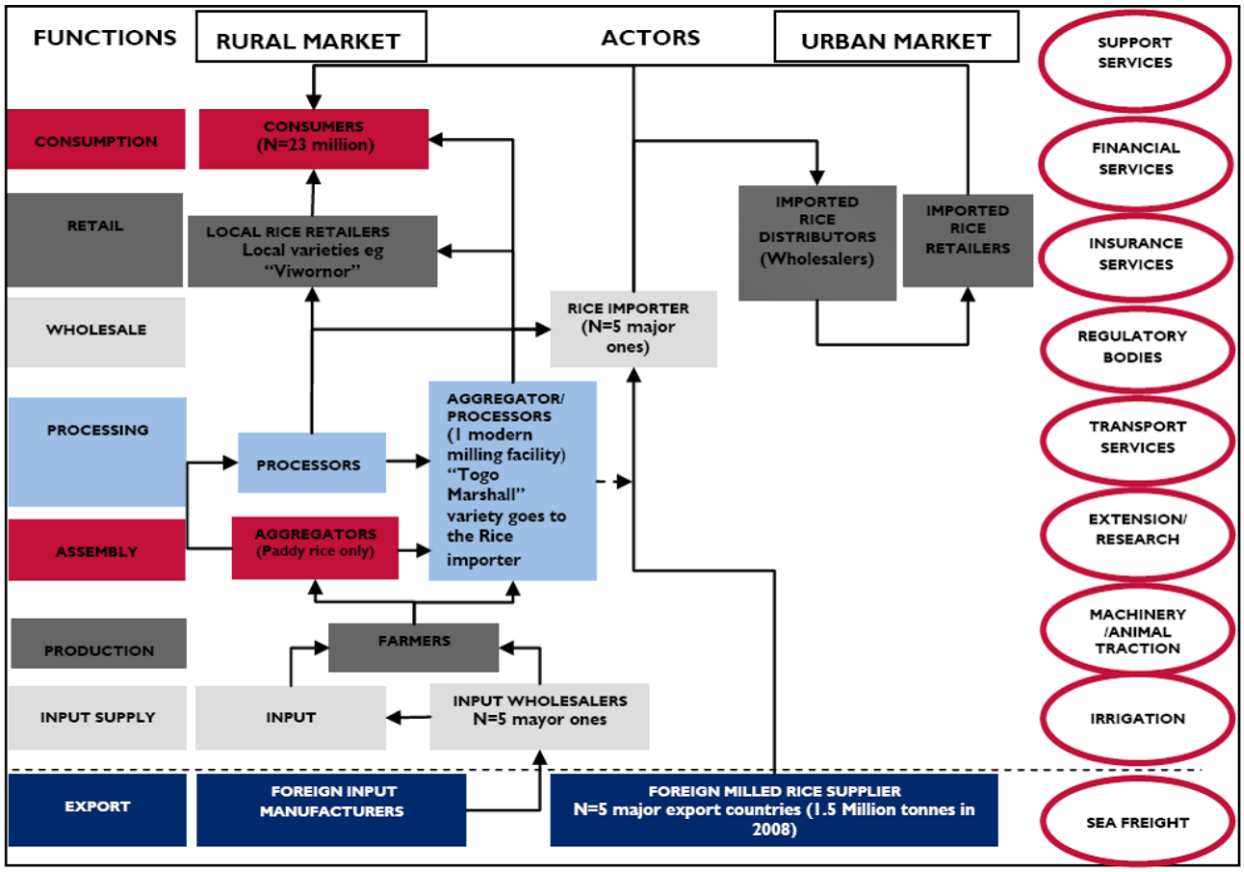
Rice imports into Ghana come mainly from 5 major suppliers (Vietnam, Thailand, the USA, Pakistan, and Togo). As indicated in figure 6 above, for the period 2005 to 2010, Thailand was the largest rice exporter to Ghana by quantity followed by Viet Nam (UNCOMTRADE, 2012).

There are five main wholesale rice importers in Ghana. These are Royal Bow Company Ltd., CCTC, Cereal Investment Co. Gh. Ltd, Olam, and Ezal Trading Gh. Ltd. Importers directly distribute to wholesalers all over the country and often sell rice on a credit basis. Wholesalers have a distribution network of retailers who in turn sell to consumers in either large bags of 50kg or in accepted units known as olonka or margarine tins (CARD, 2010).

In spite of Ghana's high potential to improve its production, several constraints limit the value chain effectiveness. Firstly, in spite of increased research efforts to improve the value chain, focus is on production, high yielding varieties and post-harvest and storage technologies at the cost of market and demand-driven research. High input costs have also severely limited production potential as they make the overall production process uncompetitive. Small holders therefore resort to cheaper methods, which in the long run produce lower yields and a higher impact of costs per hectare. Climatic unpredictability and a large dependence on rainfall for rice cultivation also make rice production expensive on a per unit of output basis. Processing of rice is also of low quality and parboiling techniques which are applied in Northern Ghana also produce undesired characteristics in rice such as the rice being harder, glassier (longer cooking time required) and firmer when cooked, which leaves the rice unappealing to a wide section of consumers (ODI, 2003). Local rice producers also cite that current trade policies favour rice importation and due to the high cost of production of local rice, local producers are unable to compete with the lower prices of imported rice (ODI, 2003).

The current financial system in Ghana is also unfavourable for farmers who want to expand as it is known for high costs of borrowing and lack of support to agriculture given its risky nature if compared to other sectors (ODI, 2003).

Figure 11: Simplified Value Chain for rice in Ghana



Source: USAID, GFSR (2009)

POLICY DECISIONS AND MEASURES

Agricultural policies to develop the rice industry in Ghana date back to the 1970's. However, the removal of input subsidies as part of the Structural Adjustments Programmes in the 1980's brought about a decline in local rice production. Since then, several programmes have been developed to boost the industry.

General agricultural policies to boost the rice sector

The first **Food and Agricultural Sector Development Policy (FASDEP I)**, formulated in 2002, was designed to provide a policy framework for modernizing agriculture and promoting rural growth. FASDEP I especially sought to decrease rice imports by 30 percent by 2004 by boosting domestic production levels to 370,000 tonnes. This target was however not reached. The second **Food and Agricultural Sector Development Policy (FASDEP II)** was then developed in 2007 but implemented in 2009 (CARD, 2010).

FASDEP II intends to achieve food security via the promotion of five staple food crops (cassava, cowpea, maize, rice and yam). Pertaining to rice production, FASDEP II pays particular attention to developments along the rice value chain. In contrast to FASDEP I however, FASDEP II seeks to control agricultural imports by applying standards instead of quotas and import tariffs (CARD, 2010). As part of FASDEP II, four initiatives were put forward. These are:

- subsidization of agricultural mechanization services by supporting the establishment and

operation of Agricultural Mechanization Service Centers (AMSEC);

- subsidization of fertilizers through the National Fertilizer Subsidy Programme;
- establishment and management of Block Farms through subsidies for mechanization services and inputs (fertilizers, improved seed, and pesticides) as well as extension services;
- stabilization of output prices via the establishment and operation of the National Food Buffer Stock Company (NAFCO).

Fertilizer Subsidy Programme

In response to sharp increases in food and fertilizer prices, the Government of Ghana introduced a fertilizer subsidy programme. The programme sought to return the price farmers paid for fertilizer to the previous July, 2007 levels, create a pan-territorial pricing for fertilizer in the country, and to ultimately encourage fertilizer use so as to prevent a fall in food production levels below the levels experienced in 2007. The government also realized that Ghana had one of the lowest fertilizer use rates in the Sub- Saharan African region (8 kg per hectare), and could be one of the reasons for low productivity and output of crops, high food prices, as well as low income and increasing poverty level of small scale farmers (MOFA 2007). As such, a target was put forward to increase the national average rate of fertilizer use from 8 kg per hectare to 20 kg per hectare. The programme targeted four types of inorganic fertilizers which are: NPK 15:15:15, NPK 23:10:05, urea, and sulphate of ammonia (IFPRI, 2009). The subsidies were given in the form of vouchers to purchase fertilizer from any retailer willing to accept the vouchers (IFPRI, 2009). Of note, Ghana's fertilizer market is liberalized with prices set by fertilizer retailers (IFPRI, 2009). However, for the subsidy programme, the government negotiated fertilizer prices per 50 kg bag with private fertilizer importers. The vouchers had face values of about 50 percent of these negotiated prices (IFPRI, 2009).

The planned total number of vouchers for the entire programme was 600,000, which covered 30 000 metric tonnes of fertilizer, with the total value of the subsidy offered coming to approximately USD 15 million (IFPRI, 2009). The total number of vouchers printed was however 1,140,850. Less than 50 percent of the vouchers had been redeemed by the end of the planting seasons (IFPRI, 2009). There was also significant regional variation with regions in northern Ghana achieving higher rates of voucher redemption. Reasons offered for the low redemption rates include poor timing, shortage of fertilizer and a small network of fertilizer retailers participating in the programme (IFPRI, 2009).

To make the scheme more affordable for small scale farmers and to ensure fertilizer price equality in all regions, the voucher system was replaced by a waybill system in 2010 and 2011 (IFPRI, 2011). In this system, the government proposed paying for actual costs of port handling, loading and transport costs as well as agents'commission and margins (IFPRI, 2011). Under the way-bill system, receipts must be countersigned by the District Director of Agriculture (who would in turn inform the District Coordinating Director) and then submitted for payment (IFPRI, 2011). The allowed duration for the sale of subsidized fertilizer was 6-7 months of the year which lasted over the production season (usually May through October) (IFPRI, 2011).

Under the waybill system in 2010, a total of 91,244 MT of subsidized fertilizer was sold, with nearly 80 percent reaching farmers directly through market purchases while another 18 percent was made available through the block farm programme, and the remaining 2 percent sold to cotton farmers

(IFPRI, 2011). The total cost of the fertilizer subsidy programme to the government is detailed in Table 4 below.

Table 4: Cost of fertilizer subsidy programme to the Government of Ghana

Programme year	Cost to Government (in million GHC)
2008	20.6
2009	34.4
2010	32.0
2011	69.8

Source: MoFA 2010

It was discovered that as a result of the programme, farmers who used fertilizer obtained higher yields as well as positive net income versus those who did not apply fertilizer. There was also an increase in the volume of trade and the number of private-sector players in the fertilizer market (IFPRI, 2011).

However, similar to the voucher system, farmers and retailers were dissatisfied with the timeliness of the subsidy (IFPRI, 2011). There was an overall perception that the subsidy prices were announced late and as such subsidized fertilizer was unavailable at the onset of the cropping season when it was needed most. Thus, the system typically benefitted farmers in the northern and middle belt of the country where the season commenced later (Banful, 2009).

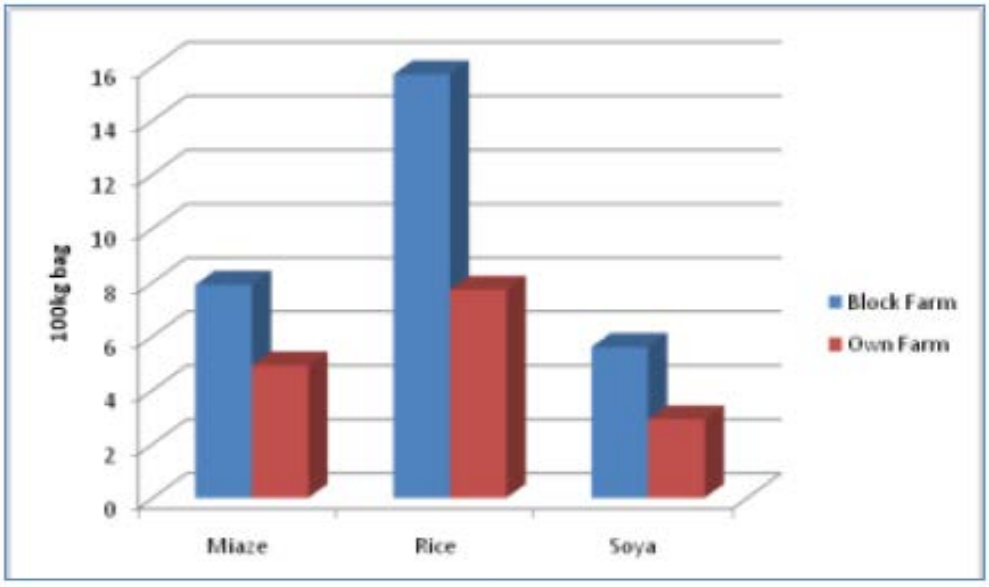
The Block Farm Programme (BFP)

Launched in 2009 in six regions of Ghana, the Block Farm Program (BFP) aims at providing large quantities of arable land in blocks for the production of a number of selected commodities as well as to generate employment among the poor in rural areas, improve farm incomes by a minimum of 50 percent, enhance food security via the use of science and technology and improve the commercialization of farming (IFPRI, 2011). In selecting locations for the programme, two factors were taken into consideration. These are the suitability of the location to one of the four agro-ecological zones of Ghana; and comparative advantage the district/region has on the selected crop (IFPRI, 2011).

The block farms will receive a bundle of subsidized mechanization services and inputs (includes improved seed varieties, chemical inputs and credit), in addition to extension services (IFPRI, 2011). Together with agricultural extension services, farmers are expected to increase yields. Following harvesting, the programme aims at recovering its cost from farmers in kind (IFPRI, 2011).

The Ashanti, Brong-Ahafo, Central, Northern, Upper East and Upper West were initially selected for pilot phase in 2009, although by 2010, all ten regions joined. Crops included in the programme are maize seed and grain, rice seed and grain, soybean sorghum, tomato, and onions (IFPRI, 2011).

Figure 12: Average crop yields of Block Farms (no. of 100 kg bags per hectare)



Source: IFPRI 2011

While overall, the programme has been rated as successful with rice farmers appearing to benefit most from the programme (evidence offered in figure 9 above), a number of challenges such as the timeliness of inputs and adequacy of land as well as engagement of youth were cited. Other challenges mentioned include cost recovery, increased demand for post-harvest technologies and services, and lack of commensurate support by agricultural extension officers (IFPRI, 2011).

The National Buffer Stock Company (NAFCO) Programme

Following the recommendation of the National Post Harvest Committee the National Buffer Stock Company was established and incorporated. The rationale given was the anticipated increase in the production of farm produce due to the introduction of the block farm and the fertilizer subsidy programmes, for funding post-harvest management of the Youth in Employment Block Farm Programme in 2009.

The company was mandated, or authorized, to carry out the following activities: (IFPRI, 2011):

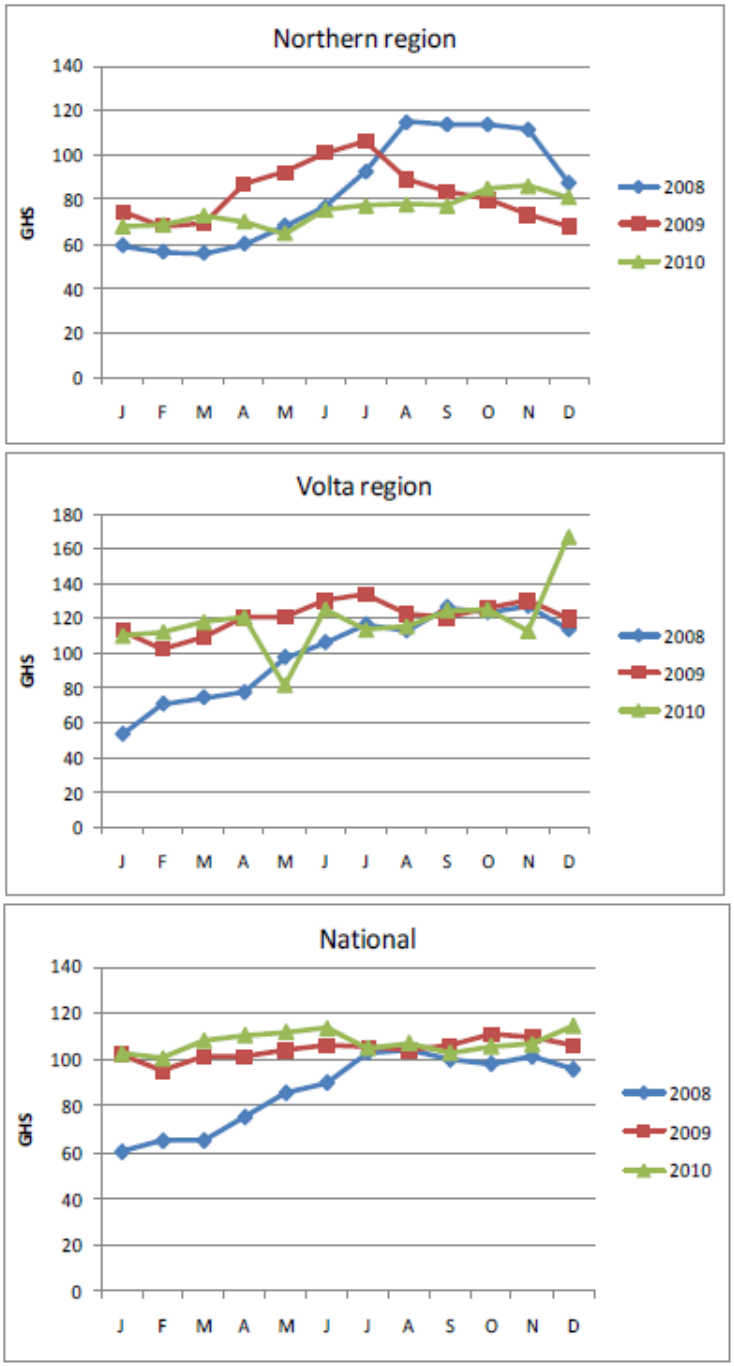
- to guarantee farmers an assured income by offering a minimum guaranteed price and market access;
- to absorb excess produce so as to reduce post-harvest losses and hence protect farm incomes;
- to purchase, sell, preserve and distribute food stuff;
- to ensure stability in demand and supply via the use of a buffer stock mechanism;
- to increase demand for food grown in Ghana by selling to state institutions such as the military, schools, hospitals, prisons, among others;
- to manage government's emergency food security;
- to facilitate the export of excess stock.

As one of the key aims of NAFCO was to buy and sell grains (mainly rice and maize, while soya bean was to be added in the future) all over the country, it was also expected that NAFCO would set a standard for marketing agricultural commodities and control food quality (IFPRI, 2011). As of 2010, NAFCO is only operating in selected regions, in view of adding new regions by the end of 2011 (IFPRI, 2011).

The purchasing process was formerly done by NAFCO, although, licensed buying companies (LBCs) (private sector entities) have now been mandated to take over the function (IFPRI, 2011). The LBCs go to villages to purchase maize and rice from farmers at a minimum purchasing price (i.e. floor price) determined by NAFCO (IFPRI, 2011). Floor price levels were set based on the report by the post harvest committee within MOFA on the analysis of the production cost of different farm products (NAFCO 2011).The purchasing prices were set such that they included the total cost of production plus a determined profit margin for farmers (IFPRI, 2011). In spite of the fact that spatial differences in the cost of productions may exist due to differences in the local production and market conditions, spatial differentiation in the floor prices were non-existent (IFPRI, 2011).

One of the main effects of NAFCO was the stabilization of grain prices. This was most evident in the Northern region in 2010 where activities of NAFCO for rice was very extensive compared to all the othe regions (see Figure 8 below) (IFPRI, 2011).

Figure 13: Wholesale price trends of paddy rice in Ghana: 2008 – 2010



Source: MoFA

NAFCO also enhanced income security among youth who signed up for the programme. For instance casual work was created for 150 labourers in Kumasi and Tamale who assisted in the loading and offloading of maize and rice at warehouses. The programme is also reported to have improved the status of work for women as well (IFPRI, 2011).

In the case of the substitution of imported rice for local rice, the substitution effect was observed, although imports were still high. However the substitution effect could be explained by the increase in production from 2007 to 2010 as displayed in figure 1 (IFPRI, 2011) and a contraction in the trade deficit as depicted in Figure 4 above.

The Agricultural Mechanization Services Enterprise Centers (AMSECs) programme

In an effort to promote sustainable agricultural production and to reduce entry barriers into the mechanized services sector, the Agricultural Mechanization Services Enterprise Centres (AMSECs) programme was set up as a credit facility to assist the private sector players purchase agricultural machinery and set up commercially viable AMSECs in key locations (IFPRI, 2011). The private sector is in turn expected to help farmers, who historically relied on labour intensive methods of production , and agro-processors have widespread access to mechanization services at affordable prices and to increase effectiveness and efficiency in farming and processing operations (IFPRI, 2011).

AMSEC was initially set up in twelve centres in eight regions. The two key objectives of AMSEC are to increase the ratio of tractors to farmers and to gradually reduce the number of out-dated tractors (over 15 years old). Other objectives include: timely access to mechanized services; better usage of agricultural machinery; reduction in drudgery and tedium linked with agriculture; increased yield and production; increased rural employment opportunities; and overall reduction in post-harvest losses (IFPRI, 2011).

The credit facility is open to all registered companies in the private (with the ability to pay-back) through an application process in response to an expression of interest by the government that is published in the national daily newspapers. Interested parties are also expected to have the technical requirements for operating a mechanization centre (IFPRI, 2011).

Overall, the repayment of the loans taken by the AMSECs was lower than expected especially in 2007. However, recovery rates improved with those for 2009 and 2010 exceeding the target while the expected rate for 2011 being pegged at 68 percent. The project has encountered challenges related to the lack of skilled tractor operators and mechanics and in transporting operators to required locations in some farming areas (IFPRI, 2011).

Specific measures for the rice sub-sector

As part of FASDEP II, the **Ghana's Medium Term Agriculture Sector Investment Plan (METASIP)** 20092015, and the **Food Security and Emergency Preparedness Programme**, have been initiated to increase agricultural productivity (including increasing rice yields) by 50 percent.

The productivity of irrigation schemes as well as the intensification of irrigation is to be increased by 25 percent and 50 percent respectively by the end of 2012 (MOFA, 2007). In support of FASDEP II, over 20 rice-related projects have been implemented or are in process of being implemented. A list of these projects can be found in Annex III.

Trade Policy

Presently in Ghana, rice imports attract the following duties and levies: 20 percent import duty; 12.5 percent Value Added Tax (VAT); 2.5 percent National Health Insurance Levy (NHIL) to be collected by the VAT Secretariat; 0.5 percent Export Development and Investment Fund Levy (EDIF); 1 percent Inspection fee; 0.5 percent ECOWAS Levy; and 0.4 percent Ghana Customs Network (CARD, 2010). These add to 37.4% which is a substantial barrier since domestic firms do not face part of these charges.

In June 2008, the Government of Ghana removed the 20 percent import duty on food imports to minimize the impact of the global food crisis. This was however later restored in 2009.

A range of import duties are applied on rice by the majority of western Africa countries. Duties are also considered as one of the causes for import prices variability and hence one of the determinants of informal cross border trade occurring between surplus areas in the North-east Ghana which export rice to the neighbouring countries, Togo and Burkina Faso (USAID, 2009).

National programmes for rice development

As part of an initiative to boost the development of the rice subsector, the Ministry of Food and MoFA together with the Alliance for Green Revolution in Africa (AGRA), CARD, and JICA have developed a rice sub- sector strategic plan in collaboration with stakeholders in 2008. This **National Rice Development Strategy** focuses on seven thematic areas, namely: Seed production system; Fertilizer marketing and distribution; Post-harvest handling and marketing; Irrigation and water control investment; Equipment access and maintenance; Research and technology dissemination; as well as Community mobilization, farmer-based organizations and microcredit management.

Ghana's National Rice Development Strategy (G-NRDS) (2009-2018) aims to contribute to national food security, increased income, and reduced poverty. The objectives of the NRDS include:

- increasing domestic production by 10 percent annually using gender-sensitive and productivity-enhancing innovations for small holders, commercial rice producers, and entrepreneurs along the value chain;
- promoting consumption of local rice through quality improvement by targeting both domestic and sub-regional markets;
- enhancing capacity of stakeholders to utilize rice by-products, thus contributing to sound environmental management practices;
- promoting dialogue among rice stakeholders within the value chain towards building efficient information sharing and linkages.

In implementing this programme, MoFA will be responsible for setting up and facilitating a National Rice Committee. Stakeholders from research institutions, farmer-based organizations, private sector, NGOs and development partners were included as members of the committee. The focus of the strategy includes the development of water control structures, integrated soil fertility management and improvement in rice varieties as well as post-harvest handling and value addition. The expertise of organisations such as GRATIS, ITTU and CSIR has been incorporated in the fabrication of equipment, branding and packaging of rice. The government will also focus policies on areas such as improvement in research, extension delivery (with an emphasis on innovation systems), promotion of micro-finance for agricultural production, capacity building for rice stakeholders, improvement in inter- and intra-regional communication and collaboration, development of a rice information system (via the employment of ICT), improvement in seed supply, promoting public-private partnership, addressing gender mainstreaming, promoting human health and ensuring sound environment management.

3. DATA REQUIREMENTS, DESCRIPTION AND CALCULATION OF INDICATORS

TRADE STATUS OF THE PRODUCTS

To calculate the indicators to estimate incentives or disincentives to production (NRP, NRA)[6] as well as the Market Development Gaps (MDGs), several types of data are required. These data were collected and are presented and explained hereafter.

Ghana is a net importer of rice for the entire period under review (2005-2010), with a net deficit balance, from high import flows and very low export flows (see also part 2.c). Rice imports represent on average 55 percent of the total domestic supply over the period 2005-2010. Imports are dominated by milled (broken) rice.

BENCHMARK PRICES

Observed

As most of the rice consumed is imported, the analysis starts with the CIF price of rice imported into Ghana as the benchmark price.

Thailand is the main supplier of unbroken milled rice accounting for 90 percent of Ghana's imports while Viet Nam is the main country supplying broken rice with an average share of 37 percent over the period 2005-2010. This differentiation has also implications on the choice of the benchmark price as average implicit CIF prices (or unit value of imports) of unbroken milled rice are significantly higher than average implicit prices (or unit value of imports) of broken rice.

Table 6: Average annual c.i.f. import prices for unbroken milled and broken rice in Ghana (USD/tonne)

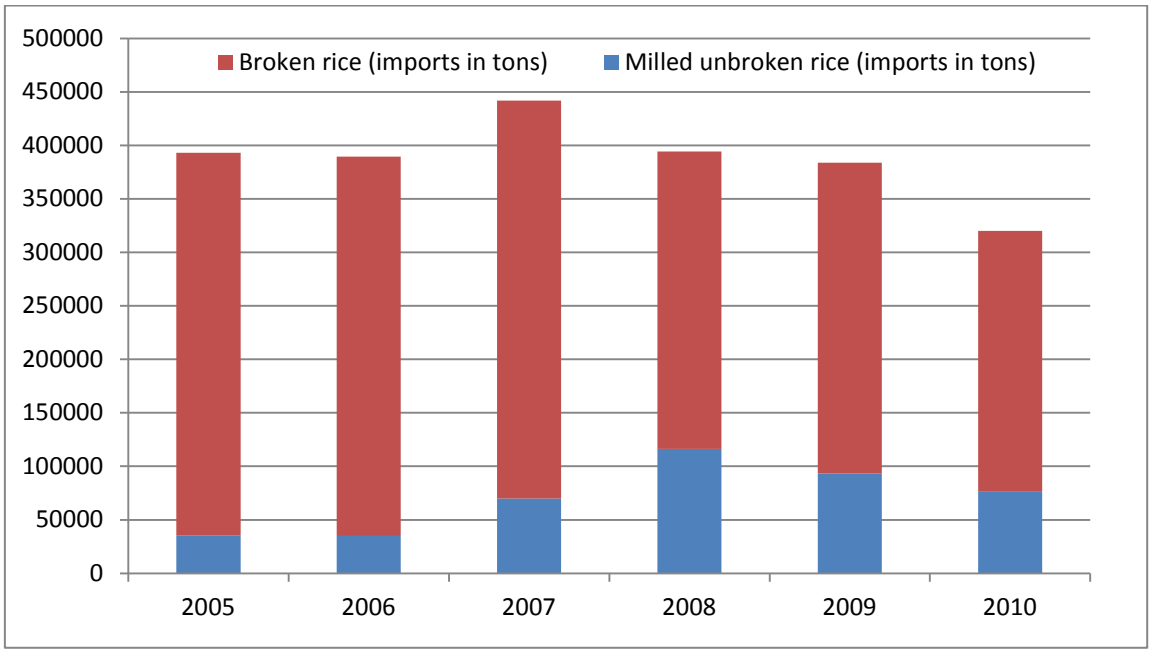
	2005	2006	2007	2008	2009	2010
Unbroken Milled rice CIF import price (USD per tonne)	533.10	462.67	479.33	670.52	721.24	827.97
Broken rice CIF import price (USD per tonne)	309.71	287.48	335.50	489.09	541.08	566.25

Source: own calculations based on UN Comtrade data

As far as the type of imported rice is concerned imported quantities of broken rice are higher compared to imports of unbroken milled rice.

[6] NRP - Nominal Rate of Protection, and NRA - Nominal Rate of Assistance

Figure 14: Ghana imported volumes of broken and milled rice over the period 2005-2010 (MT)



Source: UNComtrade, 2012

According to consumer surveys undertaken in Ghana the quality of local/brown rice is very low. One of the main reasons why the majority of urban consumers do not buy local rice is the bad threshing, which makes local rice not fully clean from stones, and also the scattered availability on the market. The local rice includes parboiled, white rice and brown rice and each has a market niche due to peculiar flavor and perceived nutritional qualities. The particularly low quality of domestically produced brown rice does not make it fully comparable to any of the two types of rice that are mainly imported in Ghana, broken and milled unbroken rice. Consequentially, the choice between CIF import prices for milled broken rice or milled rice as the benchmark prices for the analysis is based on the higher quantities of broken rice imported, and consumed, as opposed to milled rice.

In this context, the benchmark price selected for the analysis is the Ghana broken rice CIF price calculated as the unit value of total Ghana broken rice imports (Table 5). The CIF prices were calculated on data extracted from the UN Comtrade database by dividing trade values by trade quantities (table 6).

DOMESTIC PRICES

Observed

Two domestic prices are needed, the price at the point of competition and the farm gate price.

In determining the domestic price at the point of competition, it is essential to identify the wholesale market where the domestic rice produced competes with the imported rice. Ghana has several wholesale market channels, from the south to the northern part of the country. In this context and for the purpose of this study, Accra is picked as the point of competition because it is the main consuming area where the domestic rice competes with imported rice.

Table 7: Urban Accra yearly wholesale prices of local rice GHC/MT

	2005	2006	2007	2008	2009	2010
Accra Wholesale prices of local rice (GHC/MT)	474.30	546.30	572.30	846.70	1026.50	1451.80

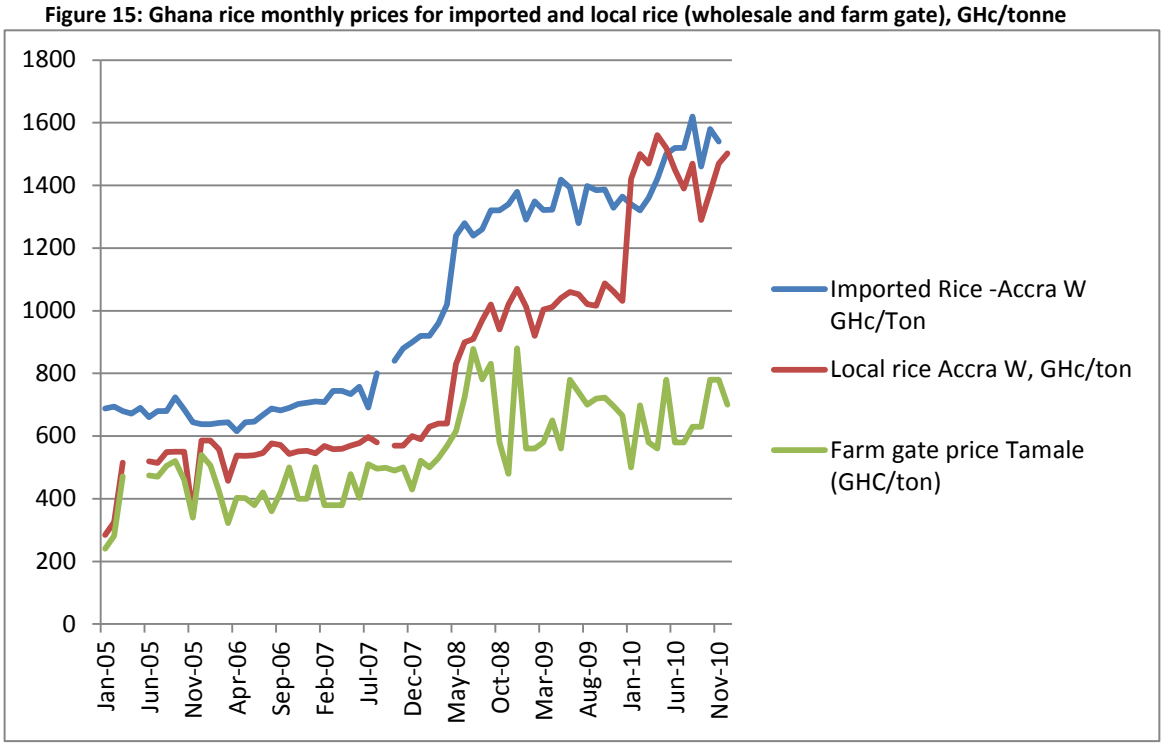
Farm gate prices for the period 2005-2010 were obtained from the Ministry of Food and Agriculture. Farm gate prices used for the calculations refer to producing areas in the region around Tamale as it is most likely that the local rice marketed in Accra originates from the surplus producing areas in the Northern region. However, in Accra very little local rice is actually flowing from the two main producing areas, Northern and Western region. It is estimated that only 20 percent of rice consumed in urban areas in Ghana is local rice.(GAIN reports, 2005, 2010).

Table 8: Farm gate price in Tamale (2005-2010), GHC/MT)

	2005	2006	2007	2008	2009	2010
Farm gate price (Tamale) GHC/MT	430.30	411.30	453.90	745.60	661.20	649.80

In 2010, wholesale prices of local rice show comparable prices to those of international prices. (Figure 16).

Figure 15: Ghana rice monthly prices for imported and local rice (wholesale and farm gate), GHc/tonne



Data Source: MOFA Ghana

EXCHANGE RATES

Observed

Ghana has a floating exchange rate regime for its currency, the Ghana cedi. With the 2006 Foreign Exchange Act Ghana shifted away from exchange controls. In July 2007, the national currency was re-denominated by setting 10 000 cedis to 1 new Ghana cedi.

The exchange rate between the Ghanaian Cedi and the United State Dollar is taken from the IMF database on exchange rates. The average of the exchange rate for each year has been calculated from the monthly data reported in the database.

Table 9: Nominal exchange rate CHC/USD

Year	2005	2006	2007	2008	2009	2010
Nominal Exchange Rate	0.91	0.92	0.94	1.06	1.41	1.43

Source: IMF

Table 9 above shows a relatively stable Cedi over the period 2005-2007. Between 2007 and 2010, it depreciated by over 50% against the dollar. According to the IMF country report (IMF Country Report No. 11/131) the aftermath of the global crises led to a decelerated GDP growth and the inflow from portfolio capital and remittance also declined. This eventually led to the depreciation in the exchange rate.

Adjusted

No exchange rate adjustment was needed.

MARKET ACCESS COSTS

Transport costs have been considered for two different segments of the rice value chain, from the farm gate (Northern parts of the country, mainly Tamale) to the point of competition (Accra) for a distance of 645 km and from the port of entry (port of Tema) to Accra (wholesale) for imported rice for a distance of 25 km. In both routes, rice is transported to point of competition through road transport.

Data on transport costs per MT of rice for the imported and locally produced commodity were provided by the Ministry of Agriculture. However, data could not be used due to the significant gaps and inconsistencies which did not allow for sound estimates of transport costs for the whole period under analysis.

From border to wholesale

Observed access costs have been calculated on the basis of IFPRI estimates of access costs for imported rice from the border to the wholesale market (IFPRI, 2012). As IFPRI data refers to year 2011, the share of each cost item on the c.i.f. price of rice in 2011, was then applied to each year of the period under analysis 2005-2010. Access costs include the VAT (12.5 percent); the Insurance Levy (2.5 percent), the destination and inspection fee (1 percent), the ECOWAS levy (0.5 percent);

the Export Development and Investment Levy (EDFL) (0.5 percent); handling and transport of the imported commodity up to the urban wholesale markets in Accra.

These costs have been adjusted by deducting taxes and levies such as the EFDL, the ECOWAS levy and the processing fee which are considered as excessive if compared to taxes and levies applied on the domestic rice (WB, 2008).

Table 10. Calculation of observed access costs (GHC/Ton, 2005-2010)

	2005	***2006***	***2007***	***2008***	***2009***	***2010***	***2011***
Ecowas Levy (0.5%)	1.4	1.3	1.4	2.6	3.8	4.0	4.0
EDFL (0.5%)	1.4	1.3	1.4	2.6	3.8	4.0	4.0
Processing fee (1%)	2.8	2.6	2.9	5.2	7.6	8.1	8.0
VAT (12.5%)	42.3	39.7	42.8	64.8	95.4	121.5	119.3
NHIL (2.5%)	8.5	7.9	8.6	13.0	19.1	24.3	23.9
Port Charges	116.4	109.2	117.8	178.9	263.3	334.4	328.4
Transport to Wh market	46.0	43.2	46.5	70.7	104.0	132.1	129.8
Total Observed access costs (A+B+C+D+E+F+G)	**218.8**	**205.3**	**221.4**	**337.8**	**497.1**	**628.5**	**617.2**
Total adjusted access costs (D+E+F+G)	**213.1**	**200.0**	**215.7**	**327.4**	**481.8**	**612.3**	**601.3**

Source: Author's calculations based on IFPRI data (2011)

From Farm Gate to Wholesale

Due to the lack of specific information on rice access costs from farm gate to point of competition, access costs estimated for maize by IFPRI in 2007 were used as a proxy. The percentage shares of these costs calculated as a share of the rice wholesale price were applied to years 2005, 2006, 2008, 2009, 2010.

There was no sufficient evidence on the existence of excessive access costs to allow for any adjustments.

Table 11. Observed access costs for rice in Ghana from farm gate to point of competition (GHC/MT)

	2005	2006	2007	2008	2009	2010
Handling and other costs	19.5	22.4	23.5	34.8	42.2	59.6
Transport	17.9	20.6	21.6	32.0	38.8	54.8
commission and Marketing fee	2.3	2.7	2.8	4.2	5.1	7.2
Storage interest and losses	15.6	17.9	18.8	27.8	33.7	47.7
wholesale agent fee	2.3	2.7	2.8	4.2	5.1	7.2
Wholesaler profit	17.1	19.7	20.7	30.6	37.1	52.5
Total Observed costs	74.8	86.1	90.2	133.5	161.9	228.9

Source: Author's calculations based on data from IFPRI (2007)

EXTERNALITIES

We are not aware of any positive or negative externalities associated with rice production in Ghana and have therefore not considered this in our analysis

BUDGET AND OTHER TRANSFERS

With regards to budgets and other transfers, specific government policies directly or indirectly related to budgets transfer to farmers - fertilizer subsidy programme; mechanization programme, block farms programme and procurement operations - are also targeting the rice sub-sector. However, estimates on the specific amount of budget transfers to the rice sector will have to be provided by the Ministry of Agriculture.

QUALITY AND QUANTITY ADJUSTMENTS

A quality adjustment was made between the imported and domestically produced rice. The ratio was estimated by comparing international prices of grade 2 rice, which accounts for more than 50% of the imported rice in Ghana against international prices for grade 5 rice which represents 83% of the rice produced in Ghana. The comparison between wholesale prices in urban Accra of "imported rice "and "local rice" would have been misleading given the high transaction and processing costs which determine the price of local rice which is generally lower in quality. Only 4% of Ghanaian production can be considered of Grade 2.

A quality adjustment of -60% was factored in the analysis to account for the lower quality of Ghanaian rice as opposed to the imported one.

DATA OVERVIEW

		Description	
Concept		***Observed***	***Adjusted***
Benchmark price		▪ CIF unit values of imported broken rice calculated using data from UN Comtrade	*N.A.*
Domestic price at point of competition		▪ Wholesale prices for local rice in Accra provided by the Ministry of Food and Agriculture	*N.A.*
Domestic price at farm gate		▪ Farm gate prices in Tamale provided by the Ministry of Food and Agriculture.	*N.A.*
Exchange rate		▪ Annual average of exchange rate as reported by IMF	*N.A.*
Access cost to point of competition		▪ *Estimated using IFPRI data collected in 2011 on rice access costs*	*Adjusted by subtracting excessive levies and taxes charged on imported rice*
Access costs to farm gate		▪ Estimated using IFPRI data on the maize value chain access costs (2007)	*N.A.*
QT adjustment	Bor-Wh	N.A	*N.A.*
	Wh-FG	*N.A.*	*N.A.*
QL adjustment	Bor-Wh	*Estimated on the basis of the price difference between grade 2 and grade 5 rice on international markets.*	*N.A.*
	Wh-FG	*N.A.*	*N.A.*

The data used for the analysis is summarized in the following table:

		Year	*2005*	*2006*	*2007*	*2008*	*2009*	*2010*
		trade status	*m*	*m*	*m*	*m*	*m*	*m*
DATA	*Unit*	*Symbol*						
Benchmark Price								
Observed	USD/TONNE	$P_{b(int\$)}$	309.71	287.48	335.50	489.09	541.08	566.25
Adjusted	USD/TONNE	P_{ba}						
Exchange Rate								
Observed	GHc/USD	ER_o	0.91	0.92	0.94	1.06	1.41	1.43
Adjusted	GHc/USD	ER_a						
Access costs border - point of competition								
Observed	GHc/TONNE	AC_{owh}	218.75	205.28	221.37	337.77	497.05	628.49
Adjusted	GHc /TONNE	AC_{awh}	213.12	199.99	215.66	327.40	481.80	612.30
Domestic price at point of competition	GHc /TONNE	P_{dwh}	474.30	546.30	572.30	846.70	1026.50	1451.80
Access costs point of competition - farm gate								
Observed	GHc /TONNE	AC_{ofg}	44.00	86.14	90.24	133.51	161.86	228.92
Adjusted	GHc /TONNE	AC_{afg}						
Farm gate price	GHc /TONNE	P_{dfg}	430.30	411.30	453.90	745.60	661.20	649.80
Externalities associated with production	GHc /TONNE	E						
Budget and other product related transfers	GHc /TONNE	BOT						
Quantity conversion factor (border - point of competition)	Fraction	QT_{wh}						
Quality conversion factor (border - point of competition)	Fraction	QL_{wh}	0.40	0.40	0.40	0.40	0.40	0.40
Quantity conversion factor (point of competition – farm gate)	Fraction	QT_{fg}						
Quality conversion factor (point of competition – farm gate)	Fraction	QL_{fg}						

CALCULATION OF INDICATORS

The indicators and the calculation methodology used is described in Box 1. A detailed description of the calculations and data requirements is available on the MAFAP website or by clicking here.

Following the discussions above here is a summary of the main sources and methodological decisions taken for the analysis of price incentives and disincentives for rice in Ghana

Box 1: MAFAP POLICY INDICATORS

MAFAP analysis uses four measures of market price incentives or disincentives. First, are the two observed nominal rates of protection, one at the wholesale level and one at the farm level. These compare observed prices to reference prices free from domestic policy interventions.

Reference prices are calculated from a benchmark price, such as an import or export price, expressed in local currency and brought to the wholesale and farm levels with adjustments for quality, shrinkage and loss and market access costs.

The Nominal Rates of Protection - observed (NRPo) is the price gap between the domestic market price and the reference price divided by the reference price at both the farm and wholesale levels:

$$NRPo_{fg} = {(P_{fg} - RPo_{fg})}/{RPo_{fg}}; \quad NRPo_{wh} = {(P_{wh} - RPo_{wh})}/{RPo_{wh}};$$

The NRPofg captures all trade and domestic policies, as well as other factors affecting market incentives and disincentives for the farmer. The NRPowh helps identify where incentives and disincentives may be distributed in the commodity market chain.

Second, are the Nominal Rates of Protection - adjusted (NRPa) in which the reference prices are adjusted to eliminate distortions found in developing country market supply chains. The equations to estimate the adjusted rates of protection follow the same general pattern:

$$NRPa_{fg} = {(P_{fg} - RPa_{fg})}/{RPa_{fg}}; \quad NRPa_{wh} = {(P_{wh} - RPa_{wh})}/{RPa_{wh}};$$

MAFAP analyzes market development gaps caused by market power, exchange rate misalignments, and excessive domestic market costs, which contribute to the NRPo and NRPa indicators. Comparison of the different rates of protection identifies where market development gaps can be found and reduced.

With the data described above we obtain the price gaps summarized in Table 8, nominal rates of protection in Table 9 and Market Development Gaps in Table 10 for the period 2005-2010.

Table 12: MAFAP price gaps for Rice in Ghana 2005-2010 (GHC per Mt)

	2005	2006	2007	2008	2009	2010
Trade status for the year	m	m	m	m	m	m
Observed price gap at wholesale	142.8	235.2	224.78	301.6	224.3	499.4
Adjusted price gap at wholesale	148.4	240.5	230.49	311.9	239.5	515.6
Observed price gap at farm gate	142.8	186.4	196.62	334.0	20.8	-73.7
Adjusted price gap at farm gate	148.4	191.7	202.33	344.3	36.1	-57.5

Source: Own calculations using data as described above.

Table 13: MAFAP nominal rates of protection (NRP) for Rice in Ghana 2005-2010 (%)

	2005	2006	2007	2008	2009	2010
Trade status for the year	m	m	m	m	m	m
Observed NRP at wholesale	43.08%	75.62%	64.68%	55.32%	27.96%	52.44%
Adjusted NRP at wholesale	45.56%	78.65%	67.43%	58.33%	30.44%	55.07%
Observed NRP at farm gate	49.68%	82.85%	76.43%	81.13%	3.25%	-10.18%
Adjusted NRP at farm gate	52.67%	87.26%	80.43%	85.81%	5.77%	-8.13%

Source: Own calculations using data as described above.

Table 14: MAFAP Market Development Gaps for Rice in Ghana 2005-2010 (GHC/Mt)

	2005	2006	2007	2008	2009	2010
Trade status for the year	m	m	m	m	m	m
International markets gap (IRG)	0	0	0	0	0	0
Exchange policy gap (ERPG)	0	0	0	0	0	0
Access costs gap to point of competition (ACG_{wh})	5.64	5.29	5.70	10.37	15.26	16.19
Access costs gap to farm gate (ACG_{fg})						

ND: No data available for calculation

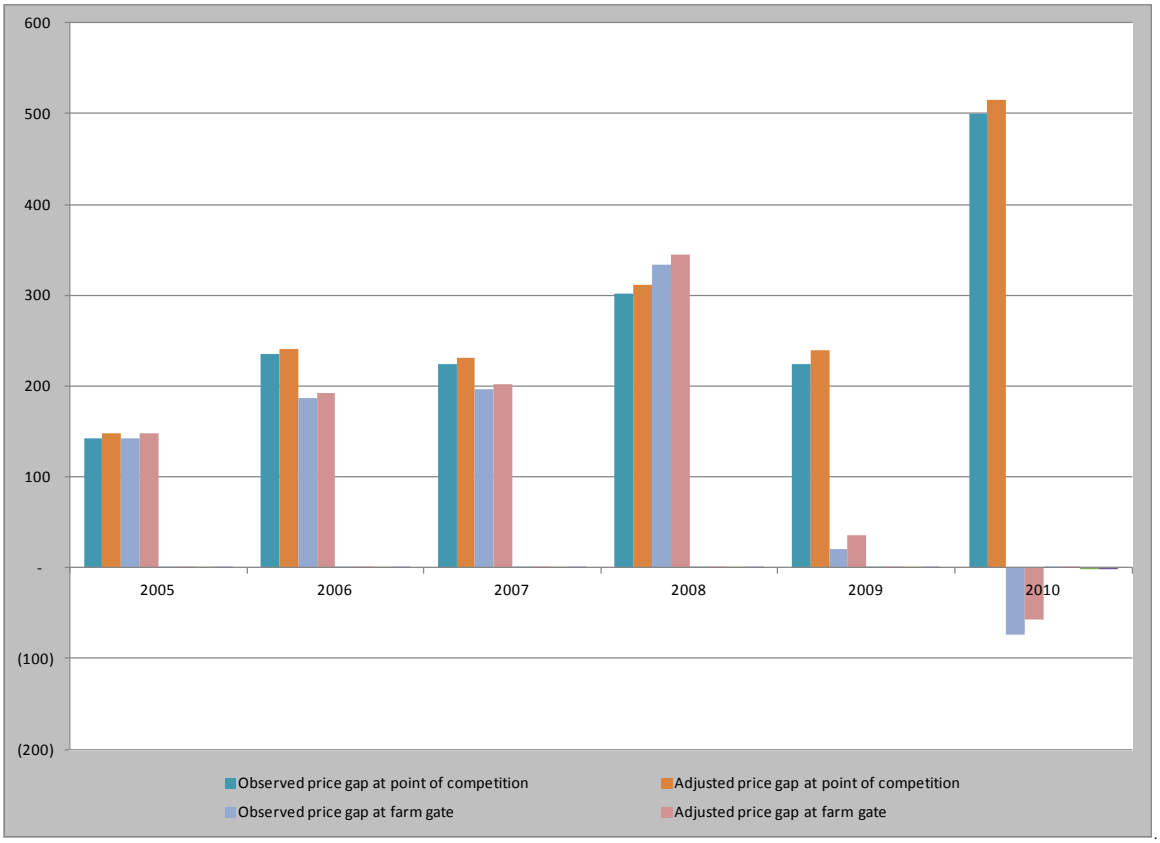
Source: Own calculations using data as described above.

4. INTERPRETATION OF THE INDICATORS

Observed price gaps at the wholesale level are positive for the whole period under analysis for an average value of 273 GHC and a pick value of 500 GHC in 2010. This pick is the result of the divergent trend between wholesale and reference prices which sees wholesale prices increasing dramatically against a stabilization of the reference price between 2009 and 2010. Adjusted values which account for the excessive taxes and levies charged on the imported rice follow the same trend.

Observed price gaps at farm gate are positive and following an increasing trend up to 2008 to then drop dramatically in 2009 up to registering a negative price gap of -73 GHC in 2010. 2008 and 2009 are the years in which import duties for rice were temporarily removed. This seems to have penalized farmers but not traders. The negative gap in 2010 is again a result of divergent price dynamics at the point of competition and the farm gate.

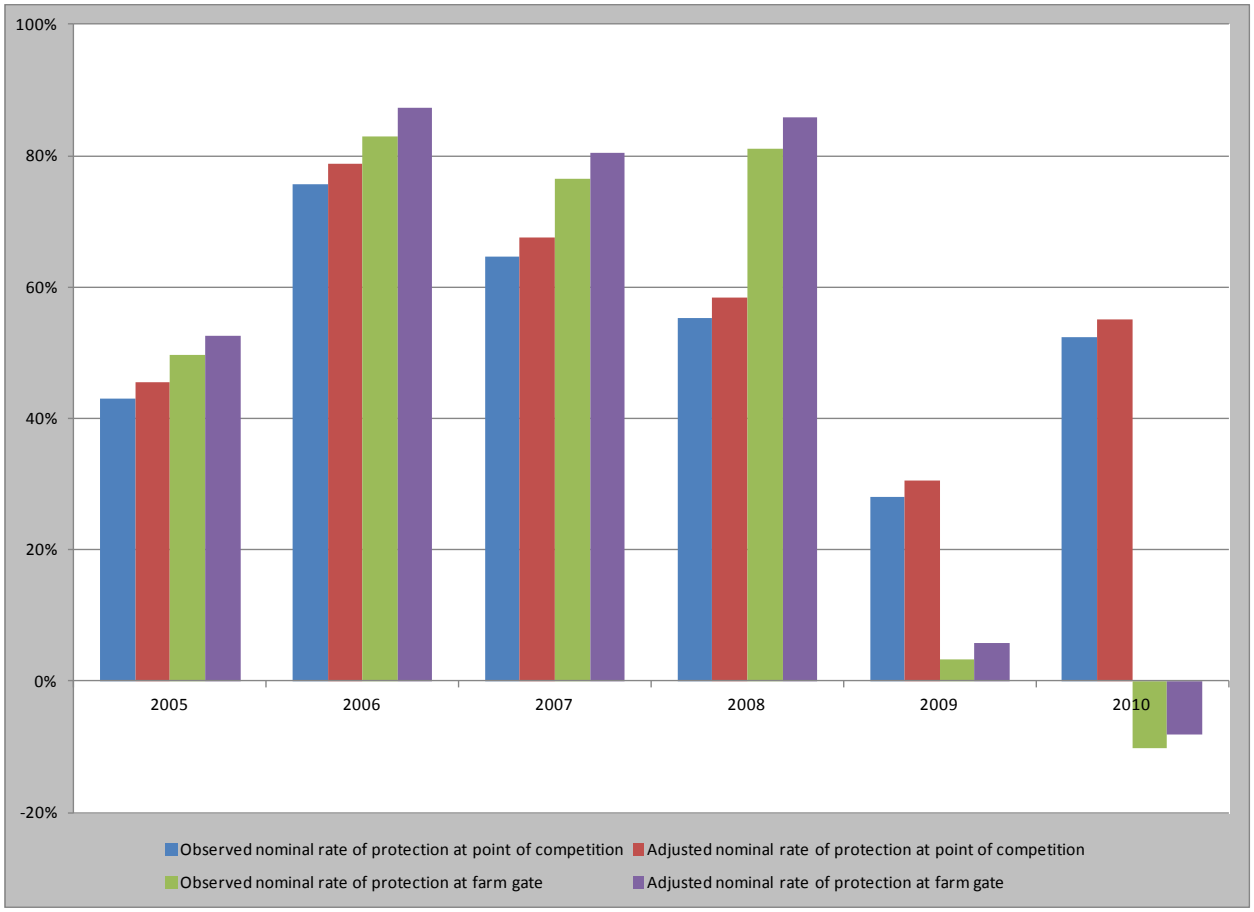
Figure 16: Observed and adjusted prices gaps for rice at wholesale and farm gate in Ghana (2005-2010)



The observed NRPs show a different trend to that of price gaps for both the point of competition and the farm gate. Observed NRPs at point of competition show a decreasing trend between 2006 and 2010 with the lowest positive value registered in 2009.

Farm gate NRPs show stable values between 2006 and 2008 to then drop dramatically in 2009 and turn negative in 2010.

Figure 17: Observed and adjusted rates of protection for rice at wholesale and farm gate in Ghana (2005-2010)

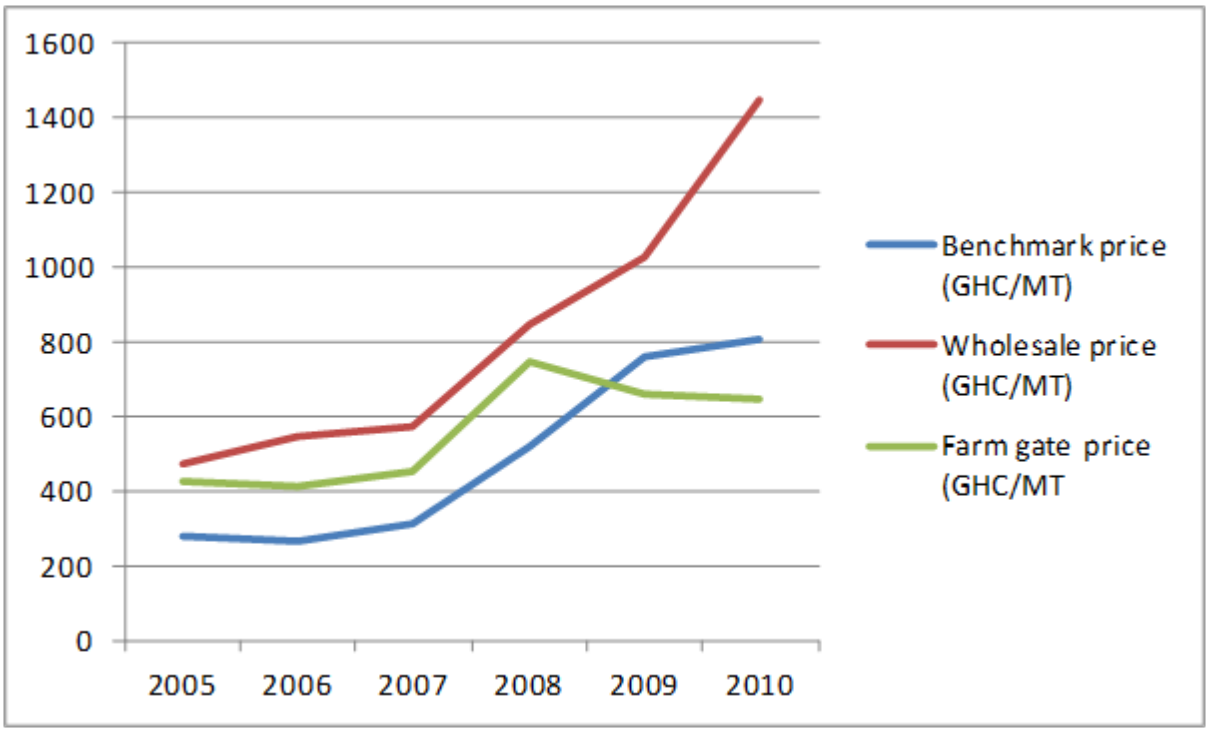


5. PRELIMINARY CONCLUSIONS AND RECOMMENDATIONS

MAIN MESSAGE

The indicators obtained from the analysis on incentives and disincentives for the rice sector in Ghana are mainly determined by the price dynamics which characterized reference, wholesale and farm gate prices during the period under analysis (Figure 18).

Figure 18. Yearly average prices (GHC/MT), 2005-2010



Source: MOFA for farm gate and wholesale prices. UN Comtrade for Ghana rice cif price

As a draft preliminary version of the technical note, the main idea is to present the general key message with anticipation to further carry out an in-depth analysis. In general the price gaps and the corresponding rates of protection suggest a positive rate of protection and assistance for rice wholesalers although with decreasing rates of protection in 2009 and 2010 . This is mainly due to the fact that prices at wholesale level are above the correspondent reference price. As a consequence it is possible to conclude that coherence exist between the policy objective stated by the government to support rice production and the policy measures and their effects on production during the last two years of analysis.

On the other hand, the picture seems dramatically different for the farmers who after a period of positive incentives experience negative values in 2010. However, disincentives and incentives generated through policies should be evaluated against the actual evolution of local rice and the profitability of local rice production (comparing crop budget with actual farm gate prices) to verify whether the situation of producers has deteriorated or not during the period as a result. An analysis of margins at farm level would be necessary to conclude on the profitability of rice production.

While our analysis shows that traders have been supported it should also be mentioned that consumers and farmers during the last two years are penalized. This should also be a concern for

policy makers as rice has globally increased and our figures (see figure 5) tend to show that consumers are sensitive to price with a high income elasticity of demand. Any persistent disincentive to consumers may also affect the performance of the country in terms of food security particularly in urban areas where 76 percent of the rice is consumed.

More support to the agricultural sector through market-oriented training, favourable policies and an introduction of better processing methods as well as market-favoured aromatic rice varieties will go a long way to improve the competitiveness and demand for locally produced rice. Should Ghana strive to increase the competitiveness of rice, the efficiency of production of locally produced rice has to increase via the increase of yields, so as to be able to compete with imported rice. A tariff on imported rice could also aid in increasing the competitiveness of locally produced rice, although a high tariff without an increase in the quality of locally produced rice would only increase the price burden on consumers at the detriment of food security.

PRELIMINARY RECOMMENDATIONS

The Government of Ghana, through its FASDEP II, fertilizer subsidy programme, and block farm programme and national buffer stock company programme in particular, has committed to supporting domestic rice production (among other staple crops) by implementing strategies that address many of the issues highlighted in this analysis. In general, these strategies include providing financial and technical support to farmers, increasing the adoption of yield enhancing technologies, investing in irrigation and improved seeds, seeking private investment to improve mills and removing tariffs levied on agricultural inputs.

Aside from the government's input subsidy program, which was introduced in 2008, there is little evidence that the expected progress has been made in implementing these strategies. This is particularly visible in the negative trend that incentives to farmers have assumed in 2009 and primarily in 2010. Therefore, to incentivize rice production, the government will need to follow through with its stated commitments. In doing so, it will need to cut production and transportation costs for farmers and increase yields by continuing, and possibly expanding, its current input subsidy program. This program could also ensure that new variety seeds are provided to farmers to improve the quality and quantity of outputs. It is also recommended that the government commits to investing in its roadways in order to reduce excessive access costs, which currently limit the marketability of domestic rice.

Furthermore, while considering the effects and benefits for the society of protection for farmers, the government should also measure the effects of such a policy environment on food security and poverty for consumers especially in urban areas.

LIMITATIONS

Data Issues:

- The complexity in accessing and obtaining the right data from the harbour to Accra and from the farm gate to Accra, hampers the calculation of indicators;
- Inconsistencies of data, as data sources vary from one another; it has been quite difficult to sometimes determine right data to be used. This in a way has limited our calculation on some indicators;
- The calculation is based on a single wholesale market in Ghana; perhaps the analysis could be further extended to the Techiman or Kumasi market.

FURTHER INVESTIGATION AND RESEARCH:

- The analysis focuses on Accra Market (Ghana) which has linkages to the rest of the country. However, Accra consumes little local rice and therefore might not be the best point of competition. There are other important markets in Ghana such as the Kumasi Market as second consumption market consuming both imported and local rice, or Techiman market (Northern than Kumasi) being a real exchange market serving as another wholesale for the northern parts of the country. A similar analysis could be carried out considering Techiman as our wholesale market instead of Accra since imported rice sometimes is transported directly to Techiman;
- The analysis has also highlighted some difficulties in understanding what types of rice are included in the "local rice" category and to what extent this reflects the different processing techniques at the farm level to increase value addition;
- There is the need to further disaggregate the access costs as this will provide a better understanding of market gaps.

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ANNEX I: Methodology Used

A guide to the methodology used by MAFAP can be downloaded from the MAFAP website or by clicking here.

ANNEX II: Data and calculations used in the analysis

Name of product	RICE
International currency	USD

Local currency	GHÇ

	DATA		Unit	Symbol	Year trade status	2005 m	2006 m	2007 m	2008 m	2009 m	2010 m	Notes
	Benchmark Price											
1		*Observed*	USD/TON	$P_{b(int\$)}$		309.71	287.48	335.50	489.09	541.08	566.25	CIF Price
1b		*Adjusted*	USD/TON	P_{ba}								
	Exchange Rate											
2		*Observed*	GHÇ/USD	ER_o		0.91	0.92	0.94	1.06	1.41	1.43	
2b		*Adjusted*	GHÇ/USD	ER_a								
	Access costs border - point of competition											
3		*Observed*	GHÇ/TON	ACo_{wh}		218.75	205.28	221.37	337.77	497.05	628.49	
3b		*Adjusted*	GHÇ/TON	ACa_{wh}		213.12	199.99	215.66	327.40	481.80	612.30	
4	**Domestic price at point of competition**		GHÇ/TON	P_{dwh}		474.30	546.30	572.30	846.70	1026.50	1451.80	
	Access costs point of competition - farm gate											
5		*Observed*	GHÇ/TON	ACo_{fg}		44.00	86.14	90.24	133.51	161.86	228.92	
5b		*Adjusted*	GHÇ/TON	ACa_{fg}								
6	**Farm gate price**		GHÇ/TON	P_{afg}		430.30	411.30	453.90	745.60	661.20	649.80	
7	Externalities associated with production		GHÇ/TON	E								
8	Budget and other product related transfers		GHÇ/TON	BOT								From PE Analysis
	Quantity conversion factor (border - point of competition)		Fraction	QT_{wh}								
	Quality conversion factor (border - point of competition)		Fraction	QL_{wh}		0.40	0.40	0.40	0.40	0.40	0.40	
	Quantity conversion factor (point of competition - farm gate)		Fraction	QT_{fg}								
	Quality conversion factor (point of competition - farm gate)		Fraction	QL_{fg}								

	CALCULATED PRICES		Unit	Symbol	2005	2006	2007	2008	2009	2010	Formula
	Benchmark price in local currency										
9		*Observed*	GHÇ/TON	$P_{b(loc\$)}$	281.84	264.48	315.37	518.44	762.92	809.74	[1]*[2]
10		*Adjusted*	GHÇ/TON	$P_{b(loc\$)a}$	281.84	264.48	315.37	518.44	762.92	809.74	[1]*[2]
	Reference Price at point of competition										
11		*Observed*	GHÇ/TON	RPo_{wh}	331.49	311.08	347.52	545.14	802.22	952.39	([9]*[QLw h])+[3]
12		*Adjusted*	GHÇ/TON	RPa_{wh}	325.85	305.79	341.81	534.77	786.97	936.19	([10]*[QLw h])+[3b]
	Reference Price at Farm Gate										
13		*Observed*	GHÇ/TON	RPo_{fg}	287.49	224.93	257.28	411.63	640.37	723.47	[11]-[5]
14		*Adjusted*	GHÇ/TON	RPa_{fg}	281.85	219.65	251.57	401.27	625.11	707.28	[12]-[5]

	INDICATORS		Unit	Symbol	2005	2006	2007	2008	2009	2010	Formula
	Price gap at point of competition										
15		*Observed*	GHÇ/TON	PGo_{wh}	142.81	235.22	224.78	301.56	224.28	499.41	[4]-[11]
16		*Adjusted*	GHÇ/TON	PGa_{wh}	148.45	240.51	230.49	311.93	239.53	515.61	[4]-[12]
	Price gap at farm gate										
17		*Observed*	GHÇ/TON	PGo_{fg}	142.81	186.37	196.62	333.97	20.83	(73.67)	[6]-[13]
18		*Adjusted*	GHÇ/TON	PGa_{fg}	148.45	191.65	202.33	344.33	36.09	(57.48)	[6]-[14]
	Nominal rate of protection at point of competition										
19		*Observed*	%	$NRPo_{wh}$	43.08%	75.62%	64.68%	55.32%	27.96%	52.44%	[15]/[11]
20		*Adjusted*	%	$NRPa_{wh}$	45.56%	78.65%	67.43%	58.33%	30.44%	55.07%	[16]/[12]
	Nominal rate of protection at farm gate										
21		*Observed*	%	$NRPo_{fg}$	49.68%	82.85%	76.43%	81.13%	3.25%	-10.18%	[17]/[13]
22		*Adjusted*	%	$NRPa_{fg}$	52.67%	87.26%	80.43%	85.81%	5.77%	-8.13%	[18]/[14]
	Nominal rate of assistance										
23		*Observed*	%	NRAo	50%	0.82852831	0.76425403	0.81131537	0.0325352	-0.10182844	([17]+[8])/[13]
24		*Adjusted*	%	NRAa	52.67%	87.26%	80.43%	85.81%	5.77%	-8.13%	([18]+[8])/[14]

	Decomposition of PWAfg	Unit	Symbol	2005	2006	2007	2008	2009	2010	Formula
25	International markets gap	GHÇ/TON	IRG	-	-	-	-	-	-	
26	Exchange policy gap	GHÇ/TON	ERPG	-	-	-	-	-	-	
27	Access costs gap to point of competition	GHÇ/TON	ACG_{wh}	5.64	5.29	5.70	10.37	15.26	16.19	[3]-[3b]
28	Access costs gap to farm gate	GHÇ/TON	ACG_{fg}	-	-	-	-	-	-	
29	Externality gap	GHÇ/TON	EG	-	-	-	-	-	-	
	Market Development Gap	GHÇ/TON	MDG	5.64	5.29	5.70	10.37	15.26	16.19	[25]+[26]+[27]+[28]+[29]
	Market Development Gap	%	MDG	0.02	0.02	0.02	0.03	0.02	0.02	MDG/RPafg

ANNEX III: On-going and completed rice-related development projects implemented by mofa and some donor partners

1. Food Security and Rice Producers Organization Project (2003-2008)

2. Special Programme for Food Security in Ghana (2002-2007)

3. Project for Promotion of Farmers' Participation in Irrigation Management (FAPIM) (2004-2006)

4. The Study on the Promotion of Domestic Rice in the Republic of Ghana (2006-2008)

5. Small Scale Irrigation Development Project (2001-2009)

6. Inland Valleys Rice Development Project (2004-2009). May be extended to 2011

7. Improvement of Drought Tolerance of Rice through Within-Species Gene Transfer (2007-2009)

8. Small Farms Irrigation Project (2003-2009)

9. NERICA Rice Dissemination Project (2005-2010)

10. Rice Seed Production (2008-2010)

11. Ghana Rice Inter-professional Body (2008-2012)

12. Rice Sector Support Project (2008-2014)

13. Project for Sustainable Development of Rain-fed Lowland Rice Production (2009-2014)

14. Development of low-input rice cultivation system in wetland in Africa (2009-2015)

15.Development of rice varieties with enhanced nitrogen use efficiency and salt tolerance (2010-??)

16. Improving yield, quality and adaptability of upland and rain-fed lowland rice varieties in Ghana to reduce dependency on imported rice (2010-2012)

17. An Emergency Initiative to Boost Rice Production (USAID – SARI) (2008-2010)

18. Improving Organic Matter content of soil for increased yield of NERICA (2006-2011)

19. Development of Rice Varieties with Enhanced Nitrogen-Use Efficiency and Salt Tolerance (NUE EST-AATF) (2010-2015)

20. Improving Yield, Quality and Adaptability of Upland and Rain fed Lowland Rice

Varieties in Ghana to Reduce Dependency on Imported Rice (CRI-AGRA) (2009-2012)

21. Expanded Rice Programme (2008-on-going)

22. Dissemination of Improved Rice Production Systems with Emphasis on Nerica to Reduce Food Deficit and Improve Farmers Income in Ghana (2011-2014)

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