MAFAP
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Monitoring African Food and Agricultural Policies

Suivi des politiques agricoles et alimentaires en Afrique

ANALYSIS OF INCENTIVES AND DISINCENTIVES

FOR RICE IN UGANDA

DECEMBER 2012

SUMMARY OF THE NOTE

Product: rice
Period analyzed: 2005 – 2011
Trade status: import in all years

- Rice production has increased successfully in the past seven years due to many factors including the promotion of upland rice resulting in upland rice being grown on a wider scale;
- Rice has become a major food security crop as well as a cash crop in a number of districts in Uganda and its cultivation is increasing, especially with the introduction of upland varieties;
- The production deficit is met through imports. Uganda imports rice mainly from Viet Nam, Pakistan and Tanzania, and Thailand;
- The most important policy measure affecting rice markets in Uganda is the East African Community (EAC) common external tariff (CET). This CET on rice is set at 75 percent ad-valorem duty or USD 200 per tonne, whichever is higher on rice imported from outside the region.

The estimated price gaps and associated nominal rates of protection for rice in Uganda indicate substantial incentives to producers and wholesalers. This support is due to adoption of the common external tariff on rice imports from mainly Asian countries. Although the level of support at the farm gate level is close to tariff rate on average, it is declining notably in recent years. This is due to the observed expansion of rice production and decline of rice imports in recent years. As domestic production continues to grow and imports shrinks, the protection to rice production due to tariff will continue to decrease.

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1. PURPOSE OF THE NOTE

This technical note is an attempt to describe the market incentives and disincentives for rice in Uganda.

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 farm gate and wholesale level. In relative terms, the price gaps are expressed as Nominal Rates of Protection. These key indicators are used by MAFAP to highlight the effects of policy and market development gaps on prices.

The note starts with a brief review of the production, consumption, trade and policies affecting the commodity and then provides a detailed description of how the key components of the price analysis have been obtained. The MAFAP indicators are then calculated with these data and interpreted in the light of existing policies and market characteristics. The analysis that has been carried out is commodity and country specific and covers the period 2005-2011. 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 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 was introduced in Uganda by Indian traders as early as 1904 but did not gain popularity until the late 1940s (Wilfred, 2006). During the initial years, Indian traders imported paddy rice and milled it using Indian traditional stone mills. This increased its costs making it almost inaccessible to indigenous communities. Its consumption was limited to the top earning class. After the 1940s, rice cultivation started taking root at subsistence level by a few farmers sourcing seeds from Tanzania (Tanganyika), where rice growing was more developed than in Uganda. Rice production in Uganda picked up during 1950s, mostly focusing at feeding schools, prisons and hospitals and the Second World War veterans. Today rice has become a major food security crop as well as a cash crop in a number of districts in Uganda and its cultivation is increasing, especially with the introduction of upland varieties.

PRODUCTION

Rice is mainly grown almost throughout the country but mainly in the Eastern and Western Uganda due to availability of lowlands with high moisture contents throughout the growing season. Major rice growing districts include Apac, Pallisa, Lira, Tororo, Kamwenga, Bugiri, Jinga and Iganga (Figure 1). Other producing districts include Amuru, Gulu Kitgum, and Pader in Eastern and Northern Uganda, and Hoima, Kibaale, Masindi, Kabarole, Runkungiri, and Kanugu in Western Uganda.

Figure 1: Major rice producing areas in Uganda
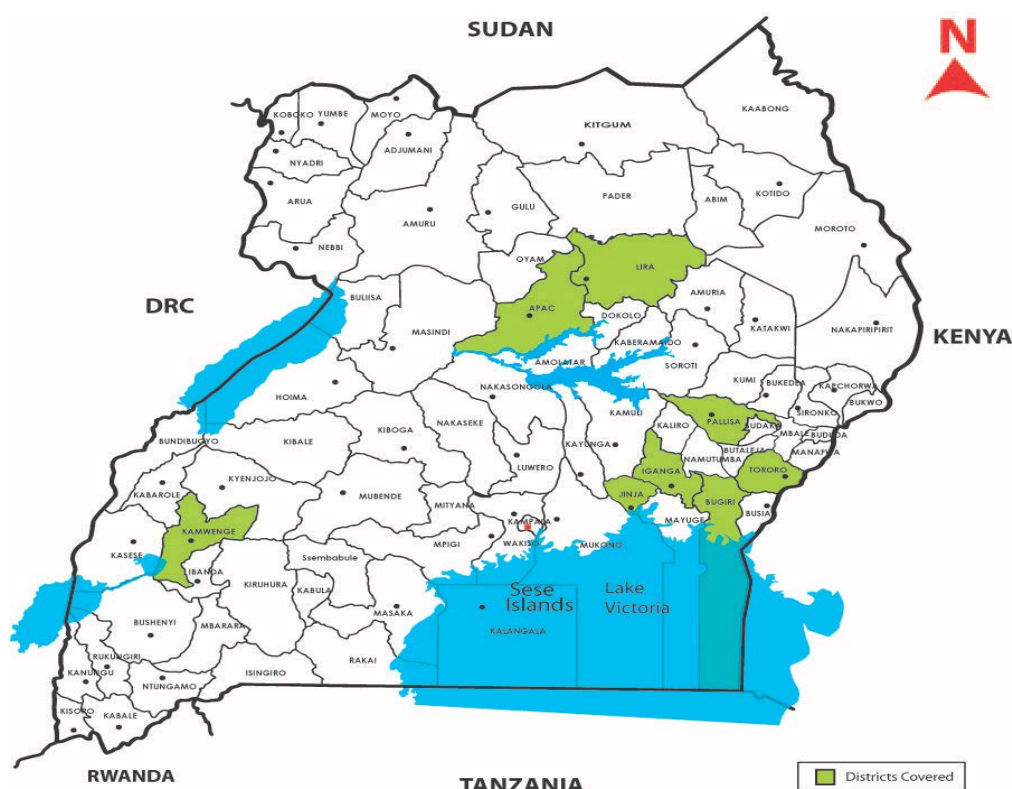
Source: FIT Uganda (2012)

In 2003, the Government of Uganda introduced NERICA, a high yielding upland variety, as one of the strategies to eradicate poverty and increase food security. NERICA yields as high as 2.5 tonnes per ha

under low input and 5.0 tonnes per ha or more under high input production system (PMA, 2009). Uganda has fully embraced NERICA rice production and a few studies of its performance have been done. Kijima et al. (2008) indicates that although NERICA was developed as a stress tolerant variety, it was still susceptible to drought in Uganda. The use of chemical fertilizers was shown to significantly enhance production, although over two thirds of farmers did not apply chemical fertilizer (Gitau et al, 2011).

Rice production has increased successfully in the past seven years due to many factors including the promotion of upland rice resulting in upland rice being grown on a wider scale[1]. Currently area under upland rice production in Uganda constitutes 71 percent of total area under rice production (Gitau, et al, 2011). Since the introduction of NERICA, rice production has shown an upward trend both in acreage and in the volume of production (Figure 2). From 1990 to 2010, rice production and area increased at an annual growth rate of 4.02 and 3.71 percent, respectively. Most of the growth in production was the result of the area expansion rather than an increase in yield as annual growth rate of yield was limited (0.3 percent). According to WARDA (2007) most of the increases in rice production come from extensive rather than intensive farming activities.

Uganda's rice cultivated area and production have almost doubled since 2000 (Table 1). Cultivated area expanded from 72 000 ha in 2000 to about 113 000 ha in 2006 reaching 140 000 ha in 2010 (Table 1). Production has increased by almost 42 percent since 2006. Rice production has increased from 109 000 tonnes in 2000 to 162 000 ha in 2007 and 218 000 tonnes in 2010 (Figure 2).

About 80 percent of rice farmers in Uganda are small scale farmers with acreage of less than two hectares using simple technologies including use of rudimentary tools, little or no fertilizer use, poor quality seed, with little or no irrigation and poor water management practices among others (MAAIF, 2007). About 5 percent rice farmers are large scale with land under cultivation over six ha. Among the large scale farmers are rice schemes with acreage of over 1 000 ha (Gitau, et al, 2011).

Table 1: Cultivated area, production, demand trends of rice in Uganda (2000-2010)

Year	Acreage (000' ha)	Production (000' tonne)	Demand (000' tonne)	Exports (000' tonne)	Imports (000' tonne)	Net imports (000' tonne)
2000	72	109	171	2.35	77.59	75.24
2001	76	114	133	1.34	33.85	32.51
2002	80	120	169	1.21	64.69	63.48
2003	86	132	165	1.43	72.71	71.28
2004	93	121	168	12.15	83.72	71.57
2005	102	153	184	0.00	4.00	4.00
2006	113	154	200	0.00	15.09	15.09
2007	119	162		0.12	24.74	24.62
2008	128	191		0.03	25.43	25.40
2009	138	206		0.16	38.29	38.13
2010	140	218		0.00	33.32	33.32

Note: Units are per tonne of milled rice
Source: PMA (2009), MAAIF (2011).

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[1] The global increase in rice prices transmitted to farmers is another important factor.

Figure 2: Rice area, production and consumption trends in Uganda (1990-2010)
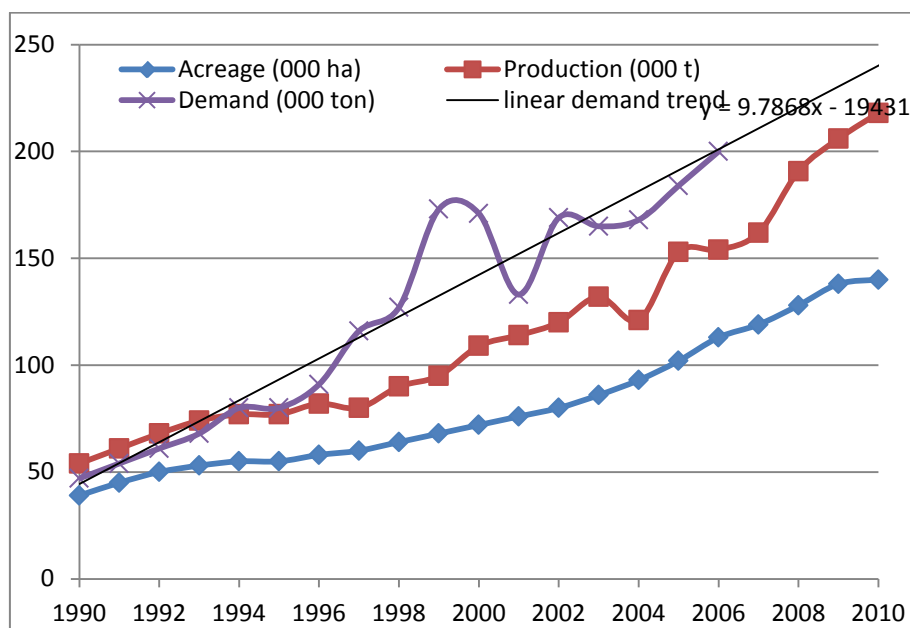
Note: Units are per tonne of milled rice
Source: PMA (2009), MAAIF (2011).

CONSUMPTION

Currently, rice has become a major food security crop as well as a cash crop in a number of districts in Uganda and its cultivation is increasing, especially with the introduction of upland varieties. Much of this demand comes from the urban markets that look for quality rice that competes with imported rice. Unlike most of the food crops grown to satisfy household consumption and food security requirements, rice is consumed more in urban areas, where it is one of the major foodstuffs at homes, schools, hospitals and the army.

The demand for rice in Uganda increased significantly from 47 000 tonnes in 1990 to 200 000 tonnes in 2006 (PMA, 2009) at an average rate of about 9.5 percent per year (Figure 2; Table 1). If the demand continues to grow at this rate, the estimated demand for rice in 2010 may have reached about 250 000 tonnes in 2011. Since domestic production is still below the demand, Uganda may continue to be a net importer of rice in short to medium term. The increase in consumption of rice in Uganda is mainly attributed to changes in consumption patterns, population growth and urbanization.

MARKETING AND TRADE

The domestic markets is dominated by farmers who consume 40 percent of their produced rice, either as seed or food and barter trade with neighbours. The rest (60 percent) is sold directly to middle men or milled by farmers and sold to traders or consumers. The major domestic market out let for rice is Kampala (PMA, 2009).

Most Ugandan millers do not have destoners, and this contributes to poor quality of local rice and hence its rejection by the top segment of the Ugandan market (super markets in Kampala). Despite the lower quality and high costs, local rice still has a significant market share. The Ugandan market is

more responsive to prices than to quality and this enables local millers to sell their rice even when the quality is poor (PMA, 2009).

Trading of rice in Uganda is completely under the private sector. Most of the trading is done by middle men who buy threshed rice from the farmers at the farm. The price of rice varies from place to place between USh 1 500 = per kg to USh 2 500 per kg of locally produced rice (MAAIF, 2007). This rice is usually packed in 50 and 100 kg bags. Some medium and large scale processors however process, package and brand their rice thereby fetching higher market prices ranging from USh 5 000 to USh 7 500 per kg in 2007.

Figure 2 shows Uganda's national production and consumption of rice for the period 1990-2010. Except during the early 1990s, Uganda is a net importer of rice and rice exports were insignificant. UBOS estimated local production at 58 percent and imports 42-48 percent of the national rice consumption (PMA, 2009). However, Uganda's rice imports dropped from 77 600 tonnes in 2000 to 33 000 tonnes in 2010 (Table 1). This is a remarkable achievement, considering that 40 percent of sub-Saharan Africa's (SSA) demand for rice is met by imports (Mohapatra, 2009). The production deficit is met through imports.

Uganda imports rice mainly from Viet Nam, Pakistan and Tanzania, and Thailand. Figure 3 presents average percentage share of rice imports to Uganda from its trade partners (2005-2010). Viet Nam and Pakistan supply almost three-quarters of Uganda imports of rice during this period. Together with Tanzania, the three countries supply 87.5 percent of Uganda rice imports. Small quantities are imported from United Arab Emirates (2.8 percent), Thailand (2.1 percent) and the rest of the world (7.6 percent).

Of the total milled rice that Uganda imports annually, 45 percent may be classified as "broken rice", due to its low cost (Wilfred, 2006). However, based on data from UN COMTRADE, this percentage is currently significantly higher as broken rice accounts for 56.5 percent of the imported rice in 2010. Though such broken rice grain is (in Asian countries) normally turned into instant noodles and snacks, in Uganda it is used as direct human food.

The CIF price of imported rice varies considerably depending on the origin of the imports. From 2000 to 2007, the price of rice imports from Viet Nam and Pakistan is very similar but since then the price of Viet Nam rice is much higher (Figure 4). Rice imported from UAE and Thailand is much more expensive due to the limited quantity imported. In contrast, the price of rice from Tanzania is the least expensive due to the low cost of transportation (Figure 4).

Figure 3: Percentage share of rice exports to Uganda (2005-2010)
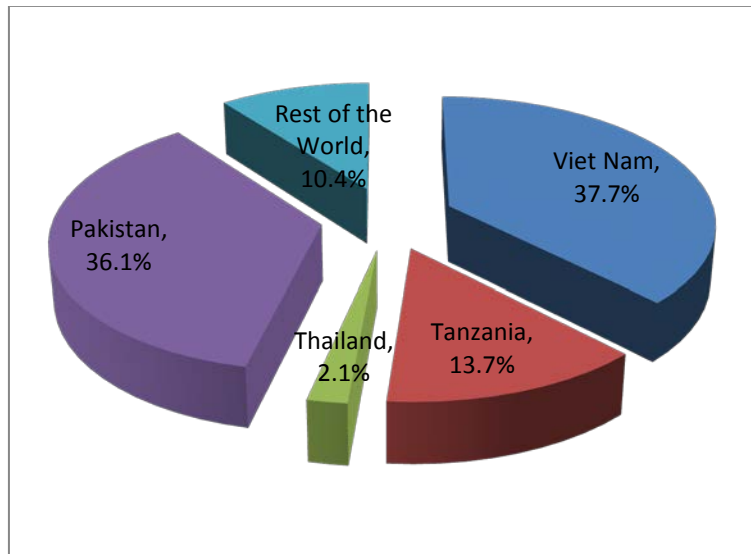
Source: data compiled from UN COMTRADE at http://comtrade.un.org

DESCRIPTION OF THE VALUE CHAIN AND PROCESSING

Figure 5 depicts the typical supply chain of rice in Uganda. The rice marketing chain can be categorized in three levels. The primary stage involves farmers selling to village traders, millers or milling their rice at a fee for either sale, own consumption or for planting seed. The secondary stage consists of millers and urban traders, while the tertiary stage consists of urban wholesalers, importers and consumers. The tertiary stage also consists of rural or travelling consumers who buy from roadside markets and urban traders. Different market outlets charge a variety of prices, which differ a lot depending on processing, quantities offered, distances, and other factors (Wilfred, 2006). These factors tend to constrain efficient market exchanges among rice market participants.

The primary stage of marketing involves transactions and negotiations between the farmers with either rural traders or processor agents. Most often, farmers with small acreages (usually less than 0.5 ha) sell paddy rice to either rural traders or processors' agents who collect it from their farm stead, while farmers with landholdings of more than 0.5 ha transport the paddy to the mills and mill the paddy prior to actual sale (Wilfred, 2006). This stage is characterized by minimal competition.

Figure 4: CIF price (USD/tonne) of imported rice to Uganda (2000-2010)
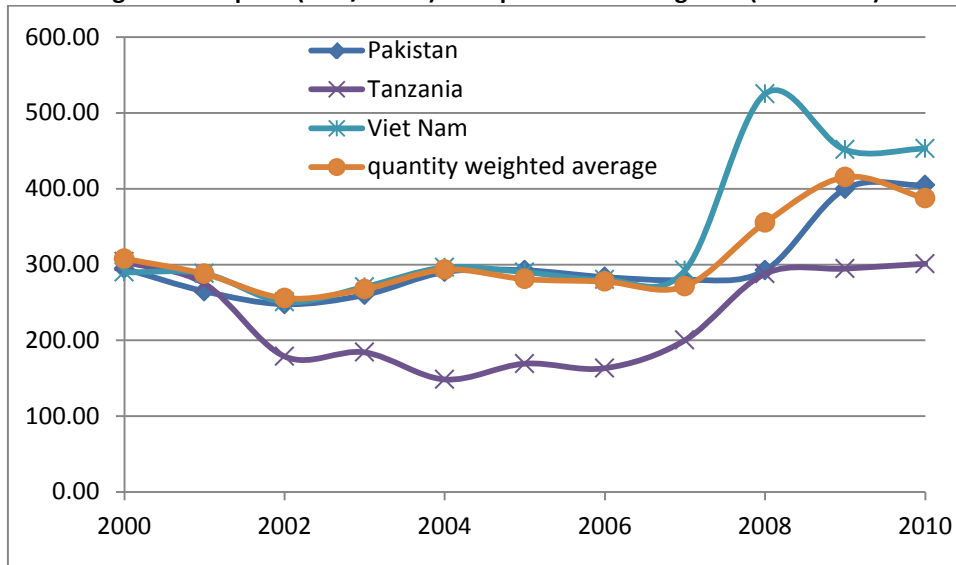
At the secondary stage of marketing, processing takes place. All rice millers are private businesses, and all milled rice is bulked in 100 kg sacks. Apart from milling for their own businesses, millers also offer milling services to traders and farmers. Rice mills are most often located in trading centres of the main rice growing districts. The mills are also marketing centres where negotiations and deals are concluded between rural, traders' processors and urban traders. This stage involves mainly assembling of milled rice and storage as well as selling of processors to the urban traders. Large scale farmers often prefer to absorb transport costs to milling centres and pay for milling charges prior to selling their rice. Also, rural traders who collect threshed rice from farmers typically mill it prior to actual sale to urban traders.

The tertiary stage involves large-scale urban traders who are mainly wholesalers and importers who either purchase the milled rice from the processors and farmers on one hand, or import it. These traders are mainly based in Kampala while a few are from other urban centres. Apart from actual purchase of the milled rice these urban traders often engage in rice cleaning, consolidation and bulking. It is after this process that milled rice is passed to retailers for sale to consumers.

Processing

Moisture content of paddy is important from the time it is harvested (at between 20-24 percent) until it is milled. Open sun drying was the traditional rice drying method. In large scale rice production units such as those at Olweny, Doho and Kibimba rice schemes, drying facilities are used. Although the open-sun drying method increases the percentage of broken grains during milling, it is inexpensive and will therefore continue to be a major drying procedure in Uganda for some time to come.

Using open sun drying, the crop is manually raked several times a day to ensure uniform drying. Paddy should be dried soon to prevent deterioration, however not too fast to result in the development of internal cracks which would cause serious breakage of the grain during milling.

The basic objective of a rice milling system is to remove the husk and the bran layers, and produce an edible, white rice kernel that appeals to the customer: is sufficiently milled with maximum total

milled rice recovery out of paddy, with a minimum of broken kernels and free of husks, stones, and other non-grain materials. Rice farmers have rapidly moved into using motorized commercial mills for their better operations and efficiency. In such mills, husk and bran are removed separately and brown rice is produced as an intermediate product. This is further polished to obtain white rice with bye products discharged through separate outlets of the machine. In highly efficient milling machine, 26 percent of the yield will be broken rice, with the remaining 39 percent whole head rice, 11 percent bran, and 24 percent husks.

Figure 5: Typical supply chain for rice in Uganda
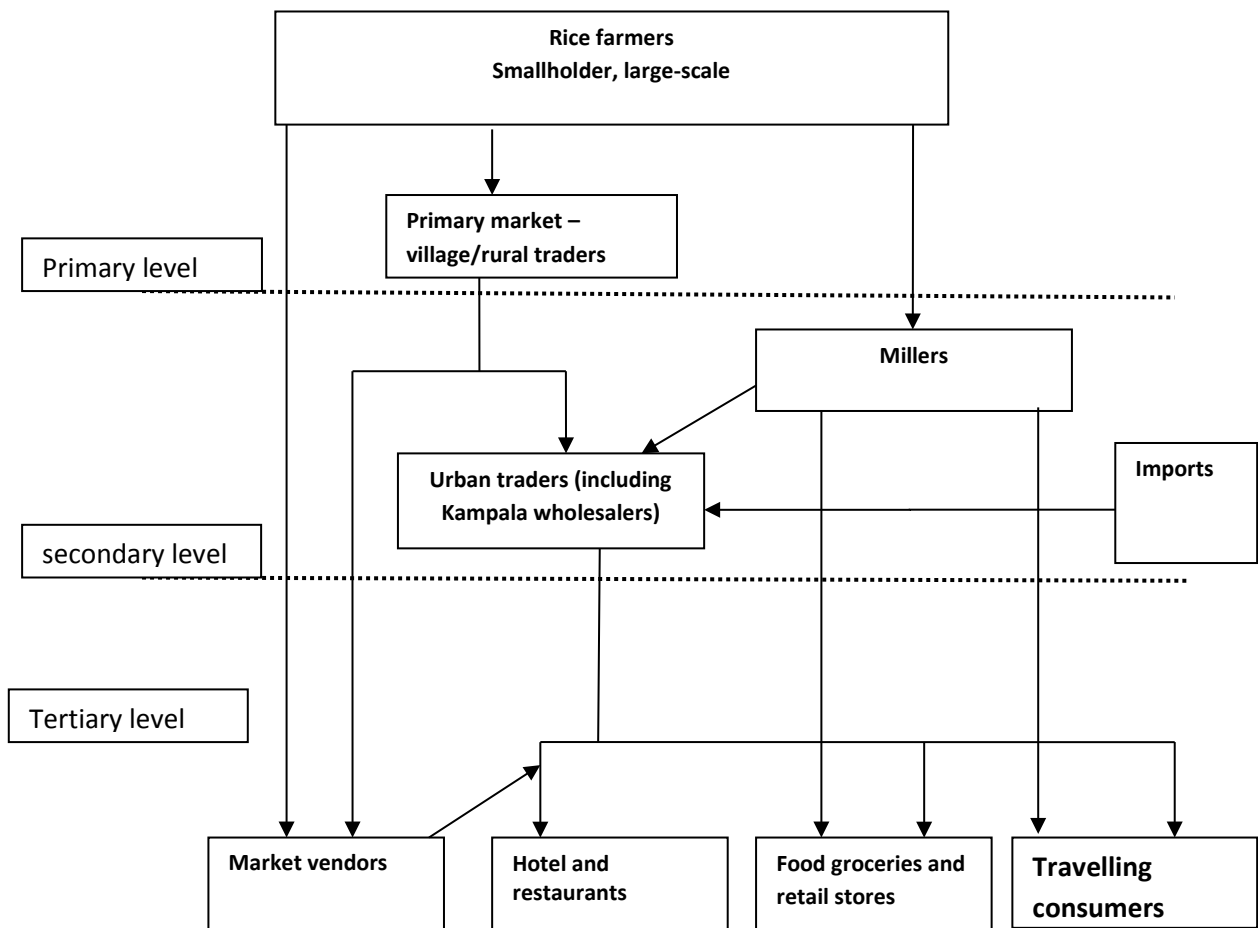
Source: Adapted from PMA (2009)

POLICY DECISIONS AND MEASURES

The Uganda National Rice Development strategy (NRDS) lays out Uganda's strategy for promotion of rice production between 2009/10 - 2017/18 with the aim of increasing household food security and reduce household poverty through increased production of high quality rice (MAAIF, 2009). The major strategies identified include strengthening the institutional framework; research, technology dissemination and capacity building; production, multiplication and dissemination of certified seed; improve irrigation and water management; increase utilization of agro-inputs and sustainable soil management; post harvest handling, processing and marketing; mechanization; access to agricultural finance; and, policy development. NRDS aims to more than tripling rice production in Uganda from about 165 000 tonnes to an anticipated 334 250 tonnes in 2013 and later to an anticipated 499 200 tonnes in 2018. MAAIF will take the lead in coordination, monitoring and evaluation of efforts in the implementation of the NRDS.

The most important policy measure affecting rice markets in Uganda is the East African Community (EAC) common external tariff (CET). This CET on rice is set at 75 percent ad-valorem duty or USD 200 per tonne, whichever is higher on rice imported from outside the region (PMA, 2009). The CET was supposed to be effected from 2005. Before CET, the tariff on rice imports was 25 percent in Uganda, 37.75 percent in Kenya and 27.75 percent in Tanzania. The CET would impact prices of imported rice highest in Kenya. Kenya has particularly dragged the implementation of the CET because of its tea exports to Pakistan, which in turn is the major exporter of rice into Kenya.

3. DATA REQUIREMENTS, DESCRIPTION AND INDICATORS

The analysis of price incentives/disincentives is carried out for the period of 2005-2011 and aims at estimating price gaps, nominal rates of protection at farm gate and wholesale levels and market development gap at the farm gate. This analysis requires the following variables.

BENCHMARK PRICES

Observed

The average unit value of rice imports with all trade partners is considered as the most relevant observed benchmark price for Ugandan rice imports. This price data, computed by dividing value of rice imports by its quantity, is obtained from MAAIF (2011) and UBos (2012). The benchmark price ranges from USD 280 (in 2005) to USD 563 per tonne during 2011 (Table 2). This unit value of import, CIF price, is almost equal to the estimated FOB price ex-Pakistan, one of the major exporters of rice to Uganda, adjusted for freight and insurance (CIF Mombasa). This comparison of the estimated FOB price and the reported import unit value implies that the rice import value reported by MAAIF is CIF Mombasa as this is the value for which the import tariff is applied.

Adjusted

As indicated above, the import unit value of rice is identical to the estimated FOB price Ex Pakistan adjusted for insurance and freight and, therefore, there is no need to use an adjusted benchmark price as the observed benchmark price seems to reflect the opportunity cost of rice imports satisfactorily.

DOMESTIC PRICES

Domestic wholesale and farm gate prices are needed for the analysis. Only wholesale price of rice at Kampala market, reported by Regional Agricultural Trade Integration Network (RATIN) for 2005-11 is available and is used here (Table 2). Kampala, the major wholesale market, is assumed to be the point of competition. Producers' prices are approximated with the average wholesale prices in Kampala minus the access costs between farm gate and wholesale market. This is strong assumption and, therefore, the indicators computed here should be interpreted cautiously. However, when compared to few quotations from the value chain analysis (e.g., PMA, 2009), the calculated farm gate prices appear to be very close.

Table 2:Benchmark, farm gate and wholesale prices of rice and market exchange rate in Uganda (2005-2011)

	2005	2006	2007	2008	2009	2010	2011
Benchmark price (USD/tonne)	285.81	332.31	293.16	438.68	430.53	460.05	534.92
Wholesale prices (USh/tonne)	**911,872**	**1,157,497**	**1,054,476**	**1,480,490**	**1,646,637**	**1,588,307**	**2,173,418**
Farm gate prices (USh/tonne)	270,278	420,882	373,471	650,923	704,605	638,086	976,406
Exchange rate (USh/USD)	1,781.00	1,831.00	1,723.00	1,720.00	2,020.00	2,178.00	2,410.00

Source: MAAIF (2011), UBoS (2012), RATIN (2012)

EXCHANGE RATES

Observed exchange rate: The exchange rate between the Ugandan shilling and US dollars has been taken from the IMF database on exchange rates (Table 2). The average of the exchange rate for each year has been calculated from the monthly data reported in that database. These represent the observed exchange rate.

Adjusted exchange rate: Since Uganda is adopting free market foreign currency market, real (equilibrium) exchange rate is assumed to be equal to the observed exchange rate. For the years considered, this assumption is close to reality as exchange rate misalignment is likely to be minimal since the foreign exchange market in Uganda has been fairly liberal.

ACCESS COSTS

Access costs between farm gate and wholesale market and between the wholesale market and the country's border are needed to compute the reference price parities at these respective points along the value chain. The estimation of the access costs from the farm gate to wholesale markets is based on marketing costs reported by PMA (2009) collected in 2008 from Acholi and Lango production regions.

Observed access costs

The observed access costs between the farm gate and wholesale markets in Kampala are presented in Table 3. These costs include transportation from the farm gate to milling centres, milling costs, local taxes and municipal dues, costs of loading/unloading and transportation to Kampala. For 2008, access costs between farm gate to wholesale markets are estimated at USD 278.53 per tonne of milled rice. Transportation costs represent 16.6 percent of total access costs. In the case of rice, traders' and wholesale margins are substantial and amounts to USD 150.19 per tonne or 54 percent of the observed access cost.

The above estimates are used to extrapolate access costs for 2005-2011. This is done by converting the above access costs for 2008 into domestic currency using the official exchange rates for each year in the analysis (2005-2011). This implies that access costs in real terms did not change over the period of analysis and only affected by inflation reflected in exchange rate.

Observed access costs between border (Mombasa port) and Kampala wholesale market to adjust CIF price at Mombasa are obtained from estimates reported by Regional Agricultural Trade Integration Network (RATIN). The estimated observed access costs amount to USD 146 per tonne of which USD 26 is the port handling costs and USD 120 is the cost of transportation from Mombasa to Kampala.

Adjusted access costs

To estimate the adjusted access costs, the estimates of observed access costs were adjusted to remove direct taxes (cess). The estimated adjusted access costs between farm gate to wholesale markets (Kampala) are USD 266.67 per tonne. The direct tax represent is slight adjustment is due to the fact that direct taxes and non-tariff measures represent minimal contribution to access cost in Uganda.

EXTERNALITIES

Estimates of production externalities are unavailable and thus externalities were not accounted for. Also, estimates of budget and other transfers to producers are unavailable and were not considered in this analysis. As such, nominal rate of assistance is not estimated. These will be included in the analysis as data becomes available.

QUALITY AND QUANTITY ADJUSTMENT

Benchmark and wholesale prices and access costs are based on milled rice while paddy rice is traded at the farm gate. A quantity conversion factor at of 0.65 (ratio of milled rice to paddy) is used to standardize the comparison of reference price and farm gate price. Uganda rice is assumed to have the same quality as that of imported rice and therefore no quality adjustment is needed.

Table 3: Estimated market access costs of rice between farm gate and wholesale market (2008)

Cost item	Acholi region USh/kg	Lango (USh/kg)	Average (USh/tonne)	Average USD/tonne
Bagging/sacks	2.0	2.0	2,000	1.16
Loading	10.2	10.2	10,200	5.93
Transport to Urban centre	30.6	30.6	30,600	17.79
Taxes - municipal dues	20.4	20.4	20,400	11.86
trader's Margin	184.3	184.3	184,330	107.17
Drying	3.4	3.4	3,400	1.98
Milling	105.1	105.1	105,140	61.13
Transport to Kampala	58.0	49.0	49,000	28.49
wholesale margin	74.0	74.0	74,000	43.02
Total access costs	413.7	404.7	479,070	278.53

Source: Author's calculation based on PMA (2009**)**

DATA OVERVIEW

Sources of the data variables used in the analysis of the policy and market indicators of rice at the household and wholesale levels are summarized in Table 4. Table 5 presents the data used in the calculation of the indicators as described above. The data and the computation of the various indicators is presented in Annex 2.

Table 4: Description of the data used in the estimation of policy indicators for rice in Uganda

data	Description	
	Observed	*Adjusted*
Benchmark price	*Unit import prices of rice computed from value and quantity of rice imports based on data reported in MAAIF (2011) and UBoS (2012) (see Table 2)*	*N.A.*
Domestic price at point of competition (auction)	*Annual average wholesale prices in Kampala reported by RATIN (2012) (see Table 2).*	*N.A.*
Domestic price at the farm gate	*Annual average wholesale price in Kampala reported by RATIN (2012) adjusted by the observed access costs from the farm gate to the wholesale market in Kampala (see Table 2)*	*N.A.*
Exchange rate	*Annual average of exchange rate as reported by IMF (2012) (See Table 2)*	*NA*
Access cost to point of competition (auction)	*All observed marketing costs involved in transportation and marketing of rice from Mombasa port in Kenya to Kampala based on estimates from RATIN (2012) (see table 3)*	*Adjusted access costs are assumed to be the same as observed access costs*
Access costs to farm gate	*All costs involved in moving rice from the farm gate to the wholesale market including transportation, milling, packaging, taxes and traders' margins as reported by PMA (2009)*	*All costs involved in moving rice from the farm gate to the wholesale market including transportation, milling, packaging and traders' margins as reported by PMA (2009).*
Quantity conversion factor	*The ratio of milled rice produced from baddy rice of 0.65 is used.*	*The ratio of milled rice produced from baddy rice of 0.65 is used*

Source: compiled from the data described above.

Table 5: Summary of the data used in computation of rice indicators

Variables	Unit	2005	2006	2007	2008	2009	2010	2011
Trade status		m	m	m	m	m	m	m
Benchmark Price								
Observed	USD/tonne	286	332	293	439	431	460	535
Adjusted	USD/tone							
Exchange Rate								
Observed	USh/USD	1,781	1,831	1,723	1,720	2,020	2,178	2,410
Adjusted	USh/USD							
Access costs border - point of competition								
Observed	USh/tonne	260,026	267,326	251,558	251,120	294,920	317,988	351,860
Adjusted	USh/tonne	260,026	267,326	251,558	251,120	294,920	317,988	351,860
Domestic price at point of competition	USh/tonne	911,872	1,157,497	1,054,476	1,480,490	1,646,637	1,588,307	2,173,418
Access costs point of competition - farm gate	USh/tonne							
Observed	USh/tonne	322,439	331,491	311,939	311,396	365,709	394,314	436,316
Adjusted	USh/tonne	258,677	265,939	250,253	249,817	293,390	316,338	350,034
Farm gate price	USh/tonne	270,278	420,882	373,471	650,923	704,605	638,086	976,406
Externalities associated with production	USh/tonne							
Budget and other product related transfers	USh/tonne							
Quantity conversion factor (border - point of competition)	Fraction							
Quality conversion factor (border - point of competition)	Fraction							
Quantity conversion factor (point of competition - farm gate)	Fraction	0.65	0.65	0.65	0.65	0.65	0.65	0.65
Quality conversion factor (point of competition - farm gate)	Fraction							

CALCULATION OF INDICATORS

The indicators and the calculation methodology used are described in Box 1. A detailed description of the calculations and data requirements is available on the MAFAP website or by clicking here. Indicators computed here include observed and adjusted price gaps, observed and adjusted nominal rates of protection and access cost gaps at wholesale and farm gate. Exchange rate gap and reference price gaps are not considered here since we assume that observed exchange rate represents the equilibrium exchange rate and no reference price adjustment is considered.

The estimated price gap indicators are presented in Table 6 and Figure 7 and the estimated nominal rates of protection are presented in Table 7 and Figure 8. Table 8 presents the relevant market development gaps.

Box 1: MAFAP METHODOLOGY AND POLICY INDICATORS

Calculation of the policy indicators

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

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

$$PGo_{fg} = P_{fg} - RPo_{fg}; \quad NRPo_{fg} = \frac{P_{fg} - RPo_{fg}}{RPo_{fg}}$$

$$PGo_{wh} = P_{wh} - RPo_{wh}; \quad NRPo_{wh} = \frac{P_{wh} - RPo_{wh}}{RPo_{wh}}$$

The $NRPo_{fg}$ captures all trade and domestic policies, as well as other factors which impact on the incentive or disincentive for the farmer. The $NRPo_{wh}$ helps identify where incentives and disincentives may be distributed in the commodity market chain.

Second are the **Nominal Rates of Protection - adjusted (NRPa)** at both the wholesale and farm levels. The reference prices for these calculations are adjusted to eliminate distortions that are specific market supply change in developing countries. In particular MAFAP allows incorporating into the analysis distortions caused by market power, overvalued exchange rates, extraordinary levies and charges and excessive marketing costs. The equations to estimate the adjusted rates of protection, however, follow the same general pattern:

$$PGa_{fg} = P_{fg} - RPa_{fg}; \quad NRPa_{fg} = \frac{P_{fg} - RPa_{fg}}{RPa_{fg}}$$

$$PGa_{wh} = P_{wh} - RPa_{wh}; \quad NRPa_{wh} = \frac{P_{wh} - RPa_{wh}}{RPa_{wh}}$$

Comparison of the observed and adjusted rates of protection makes it possible to explain the incentives and disincentives due to market development gaps in developing country supply chains.

4. INTERPRETATION OF THE INDICATORS

The most important policy measure affecting rice markets in Uganda is the East African Community (EAC) common external tariff (CET). This CET on rice is set at 75 percent ad-valorem duty or USD 200 per tonne, whichever is higher on rice imported from outside the region (PMA, 2009). The immediate impact of the above tariff structure is depicted in Figure 6.

The tariff creates a wedge between the CIF price of imported rice and the landed cost of imported rice in Kampala. Due to the transportation cost from Mombasa to Kampala and other associated cost, this price wedge amounts to more than 100 percent of the CIF price (ranging from 102 to 126 percent between 2005 and 2011). The wholesale market prices of rice, which is an average of imported and locally produced rice, adjust close to the landed cost of imported rice. The wedge between the wholesale price and landed cost depends on the share of imports in total supply of rice in the market. With the significant increase in domestic production and consequently reduced imports since 2005 (Table 1), this latter wedge started to widen. Therefore, the tariff, the cost of importation and the total quantity imported are the major determinants of the wholesale prices of rice in Uganda. Ultimately, these may be transmitted totally or partially to other markets, i.e., farm gate and retail markets.

At the wholesale, the duty imposed on rice imports in Uganda provides significant incentives to rice traders. This protection translates in significant deviation of the wholesale price in Kampala from the reference price: positive price gap at the point of competition (Table 6). The observed price gap ranges from USh 142 816 (USD 80.2) in 2005 and increased progressively to USh 532 412 (USD 298.94) per tonne in 2011. Consequently, the observed nominal rates of protection at wholesale are significant and positive ranging from 18.6 to 32.4 percent and average 33.2 percent. The decreasing trends of the nominal rate of protection in the recent two years may reflect the decreasing impact of the tariff as imports are progressively declining.

Figure 6: The impact of tariff on wholesale price and landed costs of imported of rice in Uganda
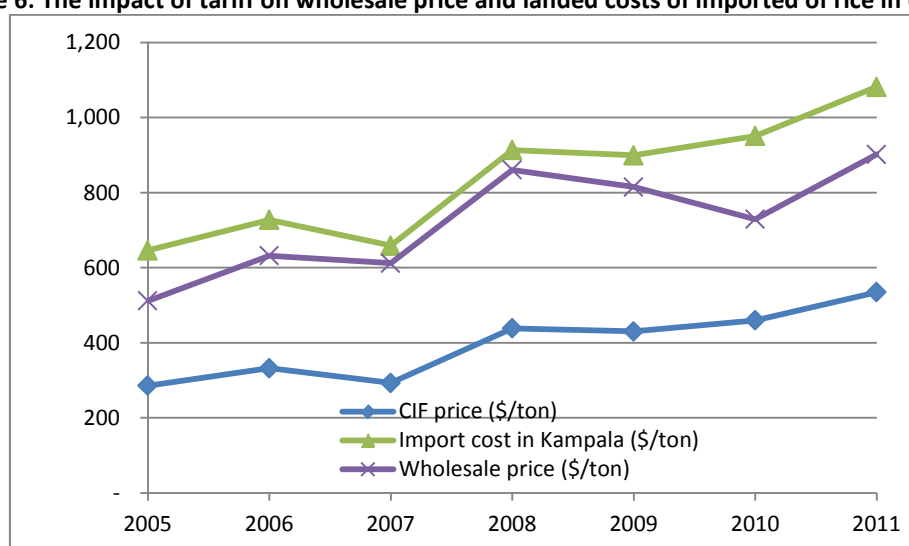
Note. Import cost is estimated as the CIF price plus the estimated tariff and import costs
Source: RATIN (2012), MAAIF (2011) and UBoS (2012)

Table 6: MAFAP price gaps for rice in Uganda 2005-2011 (USh per tonne)

	2005	2006	2007	2008	2009	2010	2011
Trade status for the year	m	m	m	m	m	m	m
Observed price gap at wholesale	142,816	281,720	297,807	474,848	482,047	268,326	532,412
Adjusted price gap at wholesale	142,816	281,720	297,807	474,848	482,047	268,326	532,412
Observed price gap at farm gate	92,831	183,118	193,575	308,651	313,331	174,412	346,068
Adjusted price gap at farm gate	29,068	117,566	131,889	247,073	241,012	96,437	259,786

Source: Own calculations using data as described above and presented in Annex II.

Table 7: MAFAP nominal rates of protection for rice in Uganda 2005-2011 (%)

	2005	2006	2007	2008	2009	2010	2011
Trade status for the year	m	m	m	m	m	m	m
Observed NRP at wholesale	18.6%	32.2%	39.4%	47.2%	41.4%	20.3%	32.4%
Adjusted NRP at wholesale	18.6%	32.2%	39.4%	47.2%	41.4%	20.3%	32.4%
Observed NRP at farm gate	52.3%	77.0%	107.6%	90.2%	80.1%	37.6%	54.9%
Adjusted NRP at farm gate	12.1%	38.8%	54.6%	61.2%	52.0%	17.8%	36.3%

Source: Own calculations using data as described above and presented in Annex II.

Table 4: MAFAP market development gap for rice in Uganda 2005-2011 (%)

	2005	2006	2007	2008	2009	2010	2011
International markets gap	-	-	-	-	-	-	-
Exchange policy gap	-	-	-	-	-	-	-
Access costs gap to point of competition	-	-	-	-	-	-	-
Access costs gap to farm gate	(41,445)	(42,609)	(40,096)	(40,026)	(47,007)	(50,684)	(56,083)
Externality gap	-	-	-	-	-	-	-
Market Development Gap	-17.2%	-14.0%	-16.6%	-9.9%	-10.1%	-9.4%	-7.8%

Source: Own calculations using data as described above and presented in Annex II.

The protection at the wholesale level appears to be transmitted effectively for paddy rice at the farm gate. Both observed and adjusted price gaps are positive and represent significant deviation from reference prices at the farm gate. The observed price gap ranges from USh 92 831 (USD 52.12) to USh 346 068 (USD 194.31) per tonne with a notable decline in recent years (Figure 7). The adjusted price gap follows similar trend but is much lower reflecting the excessive profit margins earned by the various participants in rice trading.

As a result of the positive profit gaps, the observed nominal rate of protection for paddy rice is also positive and significant. The observed indicator ranges from 37.6 to 107.6 percent and averages 74.1 percent over the six-year period (Table 7). The adjusted nominal rate of protection is much lower. It ranges from 12.1 to 61.2 percent and averages 39.40 percent over the same period. Unlike the wholesale level, the nominal rate of protection appears to follow a U-shape with a considerable decline since 2007. This suggests that the current tariff will not be a sustainable policy for producer protection as the domestic production continues to expand and imports shrinks.

According to the estimated indicators, rice producers and traders receive substantial support (incentives) and policy transfers. The support is mainly a transfer from consumers as the government is not pursuing any type of subsidies to consumers offset the impact of high rice prices. The observed nominal rate of protection at the farm gate compares favorably, on average, with the tariff rate but observed NRP at the wholesale is much lower. This indicates that the tariff benefits

rice producers more than traders. This may be due to the favorable prices received by rice producers selling directly to consumers and retailers in producing regions.

The incentives to rice producers may explain the progressive expansion of rice production in Uganda especially during the period of 2005-2010 (Figure 1). Over this period, rice production increased by 42.5 percent. Combining this support with increased utilization of agro-inputs and sustainable soil management may help realize the ambitions of the NRDS to triple rice production in Uganda by 2016.

The variability of the level of support indicated by the nominal rate of protection suggests that the domestic rice markets are weakly connected to the international markets and further the wholesale prices are not fully transmitted to the farm gate prices. Domestic prices in any given year tend to be related to international prices in the previous year. This may be due to the time lag between the marketing season of domestic rice and the arrival of imports in the country and lack of information on current world market price trends. This may result in significant uncertainty for both producers and wholesale/importers of rice. In addition, domestic rice markets are characterized by considerable market development gap resulting from an access cost gap of excessive profit margins and local taxes ranging from USh 40,026 to 56 083 per tonne of paddy (Table 8). This market development gap represents 7.8 to 17.2 percent of the reference price.

Figure 7: MAFAP price gaps for rice in Uganda 2005-2011 (USh per tonne)
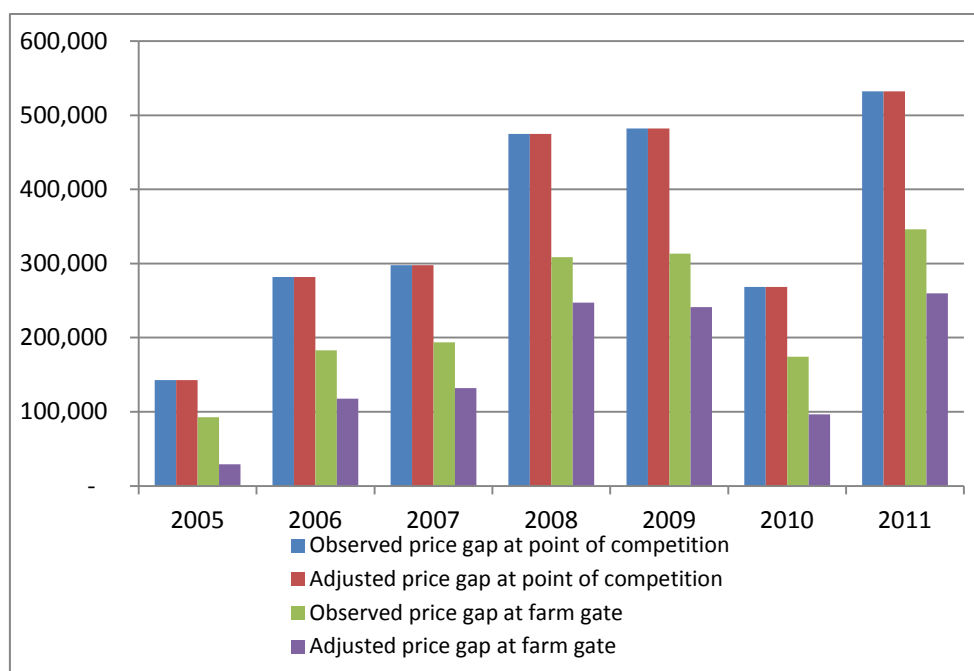
Source: Own calculations using data as described above and presented in Annex II.

Figure 8: MAFAP nominal rates of protection for rice in Uganda 2005-2011 (%)
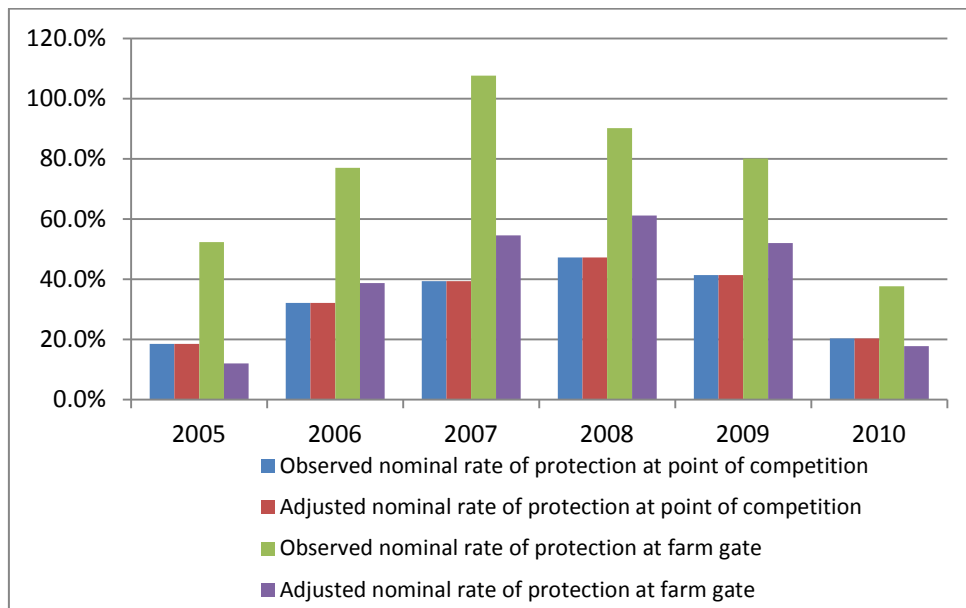
Source: Own calculations using data as described above and presented in Annex II.

5. CONCLUSIONS AND RECOMMENDATIONS

MAIN MESSAGE

The estimated price gaps and associated nominal rates of protection for rice in Uganda indicate substantial incentives to producers and wholesalers. This support is due to adoption of the common external tariff on rice imports from mainly Asian countries. Although the level of support at the farm gate level is close to tariff rate on average, it is declining notably in recent years. This is due to the observed expansion of rice production and decline of rice imports in recent years. As domestic production continues to grow and imports shrinks, the protection to rice production due to tariff will continue to decrease.

RECOMMENDATIONS

The Government of Uganda developed ambitious strategy for the development of the rice sector. The NRDS aims to more than tripling rice production in Uganda by 2018. The market incentives to rice producers have encouraged remarkable increase in rice production over the last decade but mainly through area expansion. As domestic production increases, imports will decline and the impact of tariff on market prices diminishes reducing the level of protection currently enjoyed by rice producers. This would be good for consumers, including net-consuming farmers who absorb 40 percent of rice. To compensate farmers for reduced level of price incentives, the Government of Uganda needs to improve the functioning of input markets, development of extension services, and improvements in infrastructure to encourage increased utilization of agro-inputs and sustainable soil management, to raise the currently low rice yields of 1.38-1.56 tonne/ha.

LIMITATIONS

The major limitation of the above results and conclusions is unavailability of accurate time-series data on producers' prices of rice. The data used in this analysis is approximation based on wholesale prices and marketing costs.

FURTHER INVESTIGATIONS AND RESEARCH

Kenya, Uganda and Tanzania are members of the EAC adopting the common external tariff. The three countries are rice producers but only Tanzania is an exporter. A comparison of price incentives and for rice producers in the three countries would probably provide interesting additional insights.

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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.

DATA	Unit	Symbol	Year trade status	2005 m	2006 m	2007 m	2008 m	2009 m	2010 m	2011 m
Benchmark Price										
Observed	US $/TON	$P_{b(int\$)}$		285.81	332.31	293.16	438.68	430.53	460.05	534.92
Adjusted	US $/TON	P_{ba}								
Exchange Rate										
Observed	USh/US $	ER_o		1,781.00	1,831.00	1,723.00	1,720.00	2,020.00	2,178.00	2,410.00
Adjusted	USh/US $	ER_a								
Access costs border - point of competition										
Observed	USh/TON	ACo_{wh}		260,026.00	267,326.00	251,558.00	251,120.00	294,920.00	317,988.00	351,860.00
Adjusted	USh/TON	ACa_{wh}		260,026.00	267,326.00	251,558.00	251,120.00	294,920.00	317,988.00	351,860.00
Domestic price at point of competition	USh/TON	P_{dwh}		**911,872**	**1,157,497**	**1,054,476**	**1,480,490**	**1,646,637**	**1,588,307**	**2,173,418**
Access costs point of competition - farm gate										
Observed	USh/TON	ACo_{fg}		322,439.18	331,491.37	311,938.63	311,395.50	365,708.67	394,313.60	436,315.79
Adjusted	USh/TON	ACa_{fg}		258,676.89	265,939.02	250,252.83	249,817.10	293,389.85	316,338.17	350,034.43
Farm gate price	USh/TON	P_{dfg}		270,278	420,882	373,471	650,923	704,605	638,086	976,406
Externalities associated with production	USh/TON	E								
Budget and other product related transfers	USh/TON	BOT								
Quantity conversion factor (border - point of competition)	Fraction	QT_{wh}								
Quality conversion factor (border - point of competition)	Fraction	QL_{wh}								
Quantity conversion factor (point of competition - farm gate)	Fraction	QT_{fg}		0.65	0.65	0.65	0.65	0.65	0.65	0.65
Quality conversion factor (point of competition - farm gate)	Fraction	QL_{fg}								

CALCULATED PRICES	Unit	Symbol	2005	2006	2007	2008	2009	2010	2011
Benchmark price in local currency									
Observed	USh/TON	$P_{b(loc\$)}$	509,029.64	608,450.74	505,110.82	754,521.92	869,669.22	1,001,992.33	1,289,146.69
Adjusted	USh/TON	$P_{b(loc\$)a}$	509,029.64	608,450.74	505,110.82	754,521.92	869,669.22	1,001,992.33	1,289,146.69
Reference Price at point of competition									
Observed	USh/TON	RPo_{wh}	769,055.64	875,776.74	756,668.82	1,005,641.92	1,164,589.22	1,319,980.33	1,641,006.69
Adjusted	USh/TON	RPa_{wh}	769,055.64	875,776.74	756,668.82	1,005,641.92	1,164,589.22	1,319,980.33	1,641,006.69
Reference Price at Farm Gate									
Observed	USh/TON	RPo_{fg}	177,446.99	237,763.51	179,896.10	342,271.75	391,274.33	463,673.61	630,338.56
Adjusted	USh/TON	RPa_{fg}	241,209.27	303,315.86	241,581.91	403,850.15	463,593.15	541,649.05	716,619.92

INDICATORS	Unit	Symbol	2005	2006	2007	2008	2009	2010	2011
Price gap at point of competition									
Observed	USh/TON	PGo_{wh}	142,816.36	281,720.42	297,807.18	474,848.08	482,047.44	268,326.17	532,411.65
Adjusted	USh/TON	PGa_{wh}	142,816.36	281,720.42	297,807.18	474,848.08	482,047.44	268,326.17	532,411.65
Price gap at farm gate									
Observed	USh/TON	PGo_{fg}	92,830.63	183,118.28	193,574.67	308,651.25	313,330.84	174,412.01	346,067.57
Adjusted	USh/TON	PGa_{fg}	29,068.35	117,565.92	131,888.86	247,072.85	241,012.02	96,436.57	259,786.21
Nominal rate of protection at point of competition									
Observed	%	$NRPo_{wh}$	18.57%	32.17%	39.36%	47.22%	41.39%	20.33%	32.44%
Adjusted	%	$NRPa_{wh}$	18.57%	32.17%	39.36%	47.22%	41.39%	20.33%	32.44%
Nominal rate of protection at farm gate									
Observed	%	$NRPo_{fg}$	52.31%	77.02%	107.60%	90.18%	80.08%	37.62%	54.90%
Adjusted	%	$NRPa_{fg}$	12.05%	38.76%	54.59%	61.18%	51.99%	17.80%	36.25%
Nominal rate of assistance									
Observed	%	NRAo	52.31%	77.02%	107.60%	90.18%	80.08%	37.62%	54.90%
Adjusted	%	NRAa	12.05%	38.76%	54.59%	61.18%	51.99%	17.80%	36.25%

Decomposition of PWAfg	Unit	Symbol	2005	2006	2007	2008	2009	2010	2011
International markets gap	USh/TON	IRG	-	-	-	-	-	-	-
Exchange policy gap	USh/TON	ERPG	-	-	-	-	-	-	-
Access costs gap to point of competition	USh/TON	ACG_{wh}	-	-	-	-	-	-	-
Access costs gap to farm gate	USh/TON	ACG_{fg}	(41,445.49)	(42,609.03)	(40,095.77)	(40,025.96)	(47,007.23)	(50,684.04)	(56,082.89)
Externality gap	USh/TON	EG	-	-	-	-	-	-	-
Market Development Gap	USh/TON	MDG	(41,445.49)	(42,609.03)	(40,095.77)	(40,025.96)	(47,007.23)	(50,684.04)	(56,082.89)
Market Development Gap	%	MDG	-17.18%	-14.05%	-16.60%	-9.91%	-10.14%	-9.36%	-7.83%