



MAFAP SPAAA

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

ANALYSIS OF INCENTIVES AND DISINCENTIVES FOR TEA IN UGANDA

DECEMBER 2012



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For more information: <http://www.fao.org/mafap>

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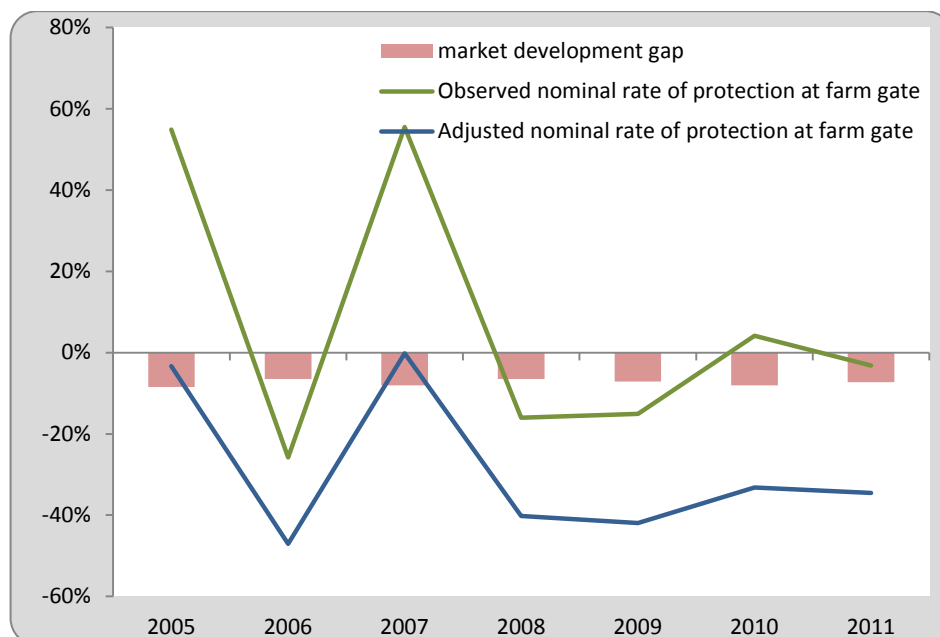
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SUMMARY OF THE NOTE

Product: Tea
 Period analyzed: 2005 – 2011
 Trade status: Export in all years

- Uganda is the third leading producer and exporter of tea in Africa (45,000MT) after Kenya (295,000MT) and Malawi (55,000MT) (MAAIF, 2010) but tea produced in Uganda is of a medium quality tea primarily used in blends with premium quality teas, such as those from Kenya.
- Tea being an important export product, the Government of Uganda considers it as one key area through which the country's export earnings could be boosted.
- During the last decade, Uganda tea exports have been growing steadily by more than 40 percent from 30,477 ton in 2001 to 53,178 ton in 2010. Tea is now the third foreign exchange earner after coffee and fish and is one of the crops under the strategic export program.
- The tea value chain in Uganda, generally similar to tea value chains in other countries, is characterized by many producers but few downstream players. About 70 per cent of Uganda's tea is sold through auction in Mombasa, and 20 per cent through direct sales, while the remainder is sold locally.
- Uganda's tea export sector remains as open as possible consistent with the country's liberal trade policy. Uganda has no tea export taxes, charges or levies.



Although the tea market at the upper level of the value chain is fully liberalized, producers' prices deviate significantly from the reference prices as the negative observed nominal rate of protection suggests (green line) except in 2005 and 2007 with extremely low world prices. When profit margins are adjusted to normal levels (10 percent), the adjusted nominal rate of protection is negative throughout the period of analysis. On average, prices paid to tea leave producers were 27.73 percent below the reference price. The observed indicators suggest that while tea factories are able to receive the full reference price, these incentives are not shared equally along the value chain.

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1. PURPOSE OF THE NOTE

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

For this purpose, yearly averages of farm gate and auction prices are compared with reference prices calculated on the basis of the price of the commodity in the international market for an observed and adjusted scenarios. The price gaps between the reference prices and the prices along the value chain indicate the extent to which incentives (positive gaps) or disincentives (negative gaps) are present at farm gate 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.

Although tea is one of the major traditional exports of Uganda, limited literature is available on the commodity production, processing and marketing. The limited information/data available are scattered in many published and unpublished documents. Therefore, the major aim of this note is to review, validate and amalgamate all the data available on tea commodity in Uganda regarding; production, consumption, marketing and trade, value chain and processing and policy decisions and processing into one general report to help understand the major trends and facilitate interpretation of the indicators.

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 are 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

For a long time, Uganda has been known to be favorable for Tea growing. The tea plant was introduced in the country by 1900. By mid 1950's, tea had become Uganda's Estate crop, owned by mainly Asians and Europeans, with a very Small number of African Growers. At the time of Uganda's independence in 1962, the country was still a long way from realizing the full potential in the development of its Tea industry (UGATEA, 2011).

Tea being an important export product, the Government of Uganda considers it as one key area through which the country's export earnings could be boosted, and people's social-economic conditions improved. So in 1988, the government of Uganda with the support from the European Union began the Smallholder Tea Rehabilitation Project (STRP). The implementation was highly successful and Uganda exported 10,971 metric tons in 1994 as compared to 500 metric tons in 1980. Marketing was liberalized in the early 1990s and Government owned factories were privatized in 1994 have stimulated production to record highs. Smallholder tea rehabilitation and development programs assisted smallholders to rehabilitate their tea gardens and factories prior to the sale of 4 smallholder factories to farmers in 1995. Policy reforms including the removal of the Uganda Tea Authority monopoly on exports, valuation of export proceeds at the market exchange rate, liberalization of export marketing, and permission for foreign exchange retention accounts (MTTI, 2006)

To consolidate the achievements of the STRP, EU extended another grant (1994 to 1999) to support the Smallholder Tea Development Programme. The programme saw the rehabilitation of the tea factories in the country and eventually privatized with ownership passing to smallholder tea farmers. This was followed by other government interventions such as the Strategic Intervention Programme to promote, production, processing and marketing of selected strategic exports of which tea is one. Uganda Tea Association still believes that there is to tap the yet unexploited potential for tea production in Uganda through expansion of investment (UGTA, 2012).

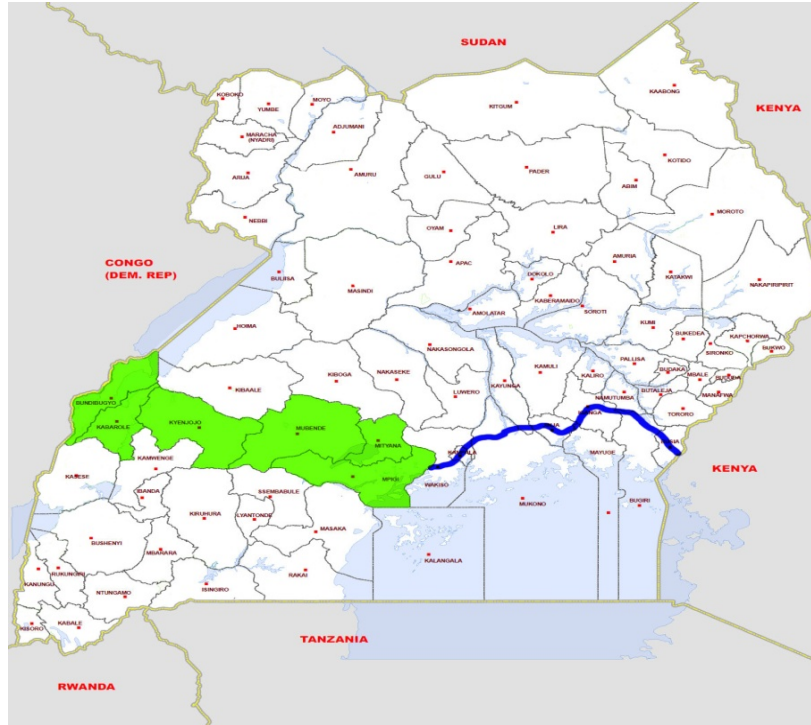
Production

In Africa, Uganda is the third leading producer and exporter of tea (45,000MT) after Kenya (295,000MT) and Malawi (55,000MT) (MAAIF, 2010). Tea produced in Uganda is of a medium quality tea primarily used in blends with premium quality teas, such as those from Kenya (MTTI, 2006). The crop is grown by large estates (46 percent of production) and small growers organized as either small estates affiliated with particular tea factory or small scale outgrowers producing 54 percent of the tea. Approximately the out growers produce 28 percent of the total production of tea with the remaining 72 percent produced by the tea estates. Presently, out growers have increased from 11,000 to 14,000 with tea growing expanded to Kabale in western Uganda (Figure 1) in 2008 (MAAIF, 2010). The current trend in Uganda is for growth in the number of smallholders. Tea appears to be very attractive to smallholders providing work and income throughout the year, requires little investment, and the risk of disastrous crop failure is fairly low (Oxfam, 2002). The tea industry employs over 62,000 people, supporting more than 500,000 dependants in Uganda. The country has 12 tea processing and exporting companies operating 21 processing factories (Bank of Uganda, 2011).

Tea covers an area of about 10 percent of the suitable fertile land for tea estimated at over 200,000 ha countrywide (UGTA, 2012). The favorable areas for tea growing requires temperatures between 20°C- 25°C, annual average rainfall of between 1000mm and 1500mm for at least 150 days a year and altitude of

over 1500m above the sea (MAAIF, 2007). Some of the areas identified are in the districts of Kabarole, Bushenyi, Kanungu, Rukungiri, Mityana, Kibaale, Hoima, Kisoro, Wakiso, Mbarara, and Nebbi /Zewu. Tea is largely grown along the Lake Victoria Crescent and lower slopes of the Rwenzori Mountains as well as above the Western Rift Valley (Figure 1).

Figure 1. Map of Uganda with key tea production areas



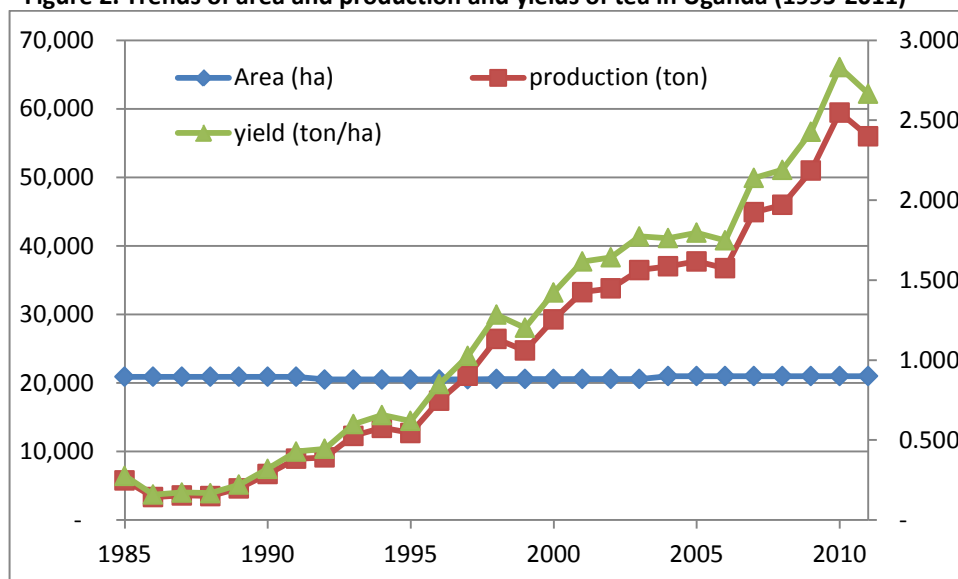
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Tea production in Uganda has fluctuated considerably over time. In the early 1970s, Uganda produced about 23,400 tons of tea from its 19,000 ha of with a productivity exceeding 1.2 ton/ha. Since then, production began to decline rapidly to as low as 1,533 ton by 1980 and 3,500 ton in 1988 when the government began the implementation of the Smallholder Tea Rehabilitation Project (STRP). Since then, the tea sector appears to slowly recover in terms of production resulting primarily from increasingly rising productivity (Figure 2) as area under tea production is relatively stable. Production reached a record high of 25,900 metric tons in 1998, surpassing for the first time the 1972 level of 23,400 metric tons. Production increased from 37,700 tons in 2005 to reach 48,663 tons in 2009 before declining to about 40,800 tons in 2010.

While this performance is commendable, the production must be seen from a national or global perspective. According to Uganda Tea Association (2012), about 200,000 hectares of land have been identified as suitable for tea production in Uganda, but recorded tea area planted or under production is only about 21,000 ha, which is only 10 percent of the reported potential area. In terms of output, Uganda's current levels compares poorly with neighboring Kenya with which it started almost on the same comparative footing in the 1960s.

Despite the success recovery of the tea industry, there are a number of challenges facing the tea industry in Uganda including lack of active tea research, increasing cost of energy, labor shortage, high cost of transportation to Mombasa and the auction price fluctuations (Independent, 2010). Clearly these challenges lead to inferior tea quality and consequently low export prices, high cost of production and price uncertainty. These will erode profitability and incentives to producers and investors.

Figure 2. Trends of area and production and yields of tea in Uganda (1995-2011)



Source: Data from UGTDA (2012).

Consumption

Tea is consumed by the majority of Ugandan population as hot beverage alone or with milk. The tea consumed domestically is either branded by the respective processing factories or by private buyers who purchase the made tea and brand it for local consumption. Small quantity of mostly branded imported specialty tea is also sold in supermarkets.

Data on domestic consumption, i.e. domestic production that is consumed domestically, of tea in Uganda is unavailable. However, estimating domestic consumption of nationally produced tea as the difference between annual production and export reveals that domestic consumption is only small fraction of total production (Table 1). On average (2000-2010), Ugandans consume about 3,000 tons of tea annually which represents 7.5 percent of the average production.

Marketing and Trade

Tea is the third foreign exchange earner after coffee and fish and is one of the crops under the strategic export program started in 2001/2. Uganda is the third leading producer and exporter of tea in Africa after Kenya and Malawi. According to MAAIF (2010), Uganda's share of tea exports on the global market is 2.8 percent and needs to increase to 5 percent (80,000MT). The percentage contribution of tea to total export earnings in 2009/10 stood at 2.5 percent or US\$70.9 million which was a 41 percent increment from US\$ 50.2 million in 2008/09 (Bank of Uganda, 2011). In 2010, tea attained a market share of 4.2 percent of the total export earnings, with a significant increase in export receipts estimated at US\$ 68.3 million (MAAIF, 2011).

Table 1: Trends in tea production, exports and domestic consumption in Uganda, 2000-2010

Year	Production (ton)	Export (ton)	Domestic consumption (ton)	Consumption as percent of production
2000	29,282	26,338	2,944	10.1
2001	33,255	30,477	2,778	8.4
2002	33,789	31,109	2,680	7.9
2003	36,475	34,069	2,406	6.6
2004	37,018	35,000	2,018	5.5
2005	37,734	33,071	4,663	12.4
2006	36,726	32,699	4,027	11.0
2007	44,913	43,638	1,275	2.8
2008	45,978	45,158	820	1.8
2009	50,982	47,920	3,062	6.0
2010	59,449	53,178	6,271	10.5
average	40,509	37,514	2,995	7.5

a. Domestic consumption is estimated as the difference between production and export.

Source: UGTA (2012)

During the last decade, Uganda tea exports have been growing steadily by more than 40 percent from 30,477 ton in 2001 to 53,178 ton in 2010 (Table 2). This growth trend is apparently stimulated by the implementation of the liberalization policy reforms including the removal of the Uganda Tea Authority monopoly on exports, valuation of export proceeds at the market exchange rate and liberalization of export marketing. Ugandan tea is exported through the Mombasa auction, which markets to worldwide destinations. Ugandan tea auctioned through Mombasa is branded and re-exported as Kenyan tea according to Bank of Uganda (2011). In fact, the dependency of Uganda on the Mombasa auction is often cited as one of the factors constraining the development of the tea sector. According to Bank of Uganda (2008), Uganda tea, one of Uganda major export commodities, has to brace for a less premium price because of the indirect exports through Kenyan middlemen who have denied Uganda a brand name in the foreign market. However, the low price of Uganda tea cannot possibly be attributed to lack of a brand name but rather to its quality.

Description of the Value Chain and Processing

The tea chain can be characterized as a vertically integrated production chain, in which direct links between manufacturers and producers are common, most obvious in the plantation sector (Odoch, 2008). Tea value chain can also be described as buyer-driven value chains where tea producers have few options for selling their goods or services (Webber and Labaste, 2010). These chains typically have locational/logistics limitations to whom the producer can sell, e.g. tea producers for a tea estate or a factory. Figure 3 depicts the typical commodity flow from producers to consumers.

The tea value chain in Uganda, generally similar to tea value chains in other countries, is characterized by many producers but few downstream players. The tea supply chain begins in a smallholder farm or a plantation, where the tea leaves are grown and plucked. Small farmers sell their crop to middlemen, plantations and or to 'bought leaf' factories i.e. factories that buy up the raw tea (Oxfam 2002). According to Odoch, 2008, once tea leaves are harvested, they are then either transported to a bought-leaf factory, in the case of smallholders, or processed in the factory on-site in the case of large plantations as delays in processing lowers quality or lead to spoilage. In most cases it is the factory that collects the leaf directly from the smallholder, with whom there is usually a contract. Compared to the coffee where middlemen play a major role in commodity flow from producers to processors, the tea middle men are a recent development in the industry (Odoch, 2008). The buyer collects the tea from designated leaf collection

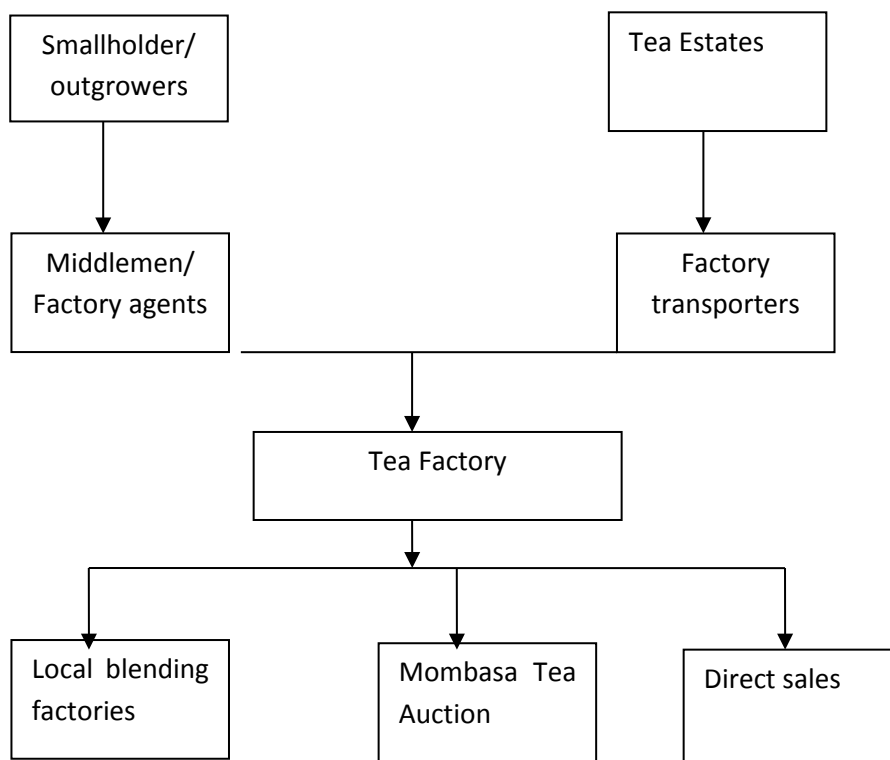
sheds. The farmers are not charged directly for the leaf collection service but buyers factor this cost in the price paid to smallholder farmers.

Tea factories are owned by the estates owners or farmers' cooperatives. On a smaller scale, many Ugandan farmers associations own their own factory (Oxfam, 2002) as a result of the government sale of its factories to growers in the 1990s. Processing starts with oxidization or fermentation of the green leaves. After fermentation the leaves are taken into a drying process to lower the moisture content between 3.0 and 3.3 percent. Tea is then sorted into the four primary grades and three secondary grades according to size and fiber content. Teas are taken for tasting which marks the end of the processing in the factory.

About 70 per cent of Uganda's tea is sold through auction in Mombasa, and 20 per cent through direct sales, while the remainder is sold locally. Mombasa auction, the major tea auction in Africa, was initiated in 1956 in Nairobi on a very small scale under the auspices of the East African Tea Trade Association (EATTA) and moved to Mombasa in 1969 (EATTA, 2012). The auction system is still the main price discovery point for tea trade, however, significantly, there are no future markets for tea (Foodnet, 2002). At the auction, the selling broker announces the line of tea on sale, and invites bids in US Dollars per kilogram. The buyers announce their bid, which advances by at least one US cent per kg. Through ports in Kenya, tea is shipped to various tea consuming countries where it is blended and packed into various brands.

In addition to the conventional tea value chain described above, tea is also marketed through a fair trade value chain by four tea factories namely Kayonza, Mabale, Mpanga and Igara Growers Tea Factories. Uganda Tea Development Agency, the manager of Kayonza Igara Growers Tea factory, described its mission as to produce high quality tea that fetches a premium price on the world market in a sustainable manner (UGTDA, 2012). The fair trade terms of trading consist of a price that cover the cost of production, social premium to be used by producers to improve their living and working condition an advanced payment and contracts that allow long term sustainable production practices (Oxfam, 2002). As yet, however, fair trade tea constitutes only a very small proportion of the market and demand will need to expand before this practice can be more widespread in producing countries.

Figure 3. Typical value chain of tea



Source: Adapted from Odoch, 2008

Tea Pricing

Relevant tea prices include farm gate prices for smallholder and tea plantations and the prices received for the wholesale of Uganda tea at Mombasa tea auction. Farmgate prices are determined by tea factories in this buyer-driven value chain. Compared to large plantations that are often run by multinationals with access to the latest technical information, smallholders lack the knowledge of how to pick and store the leaves properly, and how best to treat the bushes and the land (Odoch, 2008). Smallholder farmgate tea prices tend to be lower than prices for plantation tea because of the generally lower quality (Figure 4). Over the period of 2005-2011, estate tea received a quality premium of up to 10 percent above the price received by smallholder growers. However, this quality premium appears to be recently declining (Figure 4) perhaps due to improvement in the quality of the tea produced by smallholder farmers as a result of better handling.

Tea is unusual among the major agricultural commodities in that it is sold through auctions or in private deals and unlike coffee or cocoa, there is no futures market for tea (Odoch, 2008). As such, there is no single world price for tea, but rather differing prices at different auctions (Agritrade, 2008). The price received at the auction depends on the quality of tea. Uganda produces a medium quality tea that is primarily used in blends with premium quality teas, such as those from Kenya and the quality of Ugandan tea is comparable to tea from Tanzania. Thus, Ugandan tea receives a lower price than Kenyan tea at the Mombasa auction, where 70 percent of the Ugandan tea is sold. The price discount averaged 24.8 percent during 1994-97 and slightly declined to 22.5 percent during 2001-05 (MTTI, 2006).

Figure 5 presents the average auction prices for Ugandan tea in contrast to Kenyan tea for 2005-2011. The Ugandan tea received an auction price of US \$1.16-1.84 per kg during this period as compared to US \$1.56-2.72 per kg for Kenya tea during the period of 2005-2011. Apparently, the price discount, averaging 29.56

percent, increased compared to 2001-2005. This is due to the declining trend of the Ugandan tea prices since 2008. The Mombasa auction price can accurately reflect the FOB price for the tea exported from Uganda.

International prices of tea

Tea price trend until recently has been downward. Between 1970 and 2002, the price trend was downward with tea prices fell by 44 percent in real terms over these years (Odoch, 2008). Prices have since bounced back, more than doubling between 2002 and September 2009 (Agritrade, 2012). The FAO Tea Composite Price increased significantly from 2006 to 2009 and reached a record USD 3.18 per kg in September 2009 to continue in 2010 averaging USD 2.81 per kg for the year and in 2011 when the price was USD 2.85 per Kg (FAO, 2012).

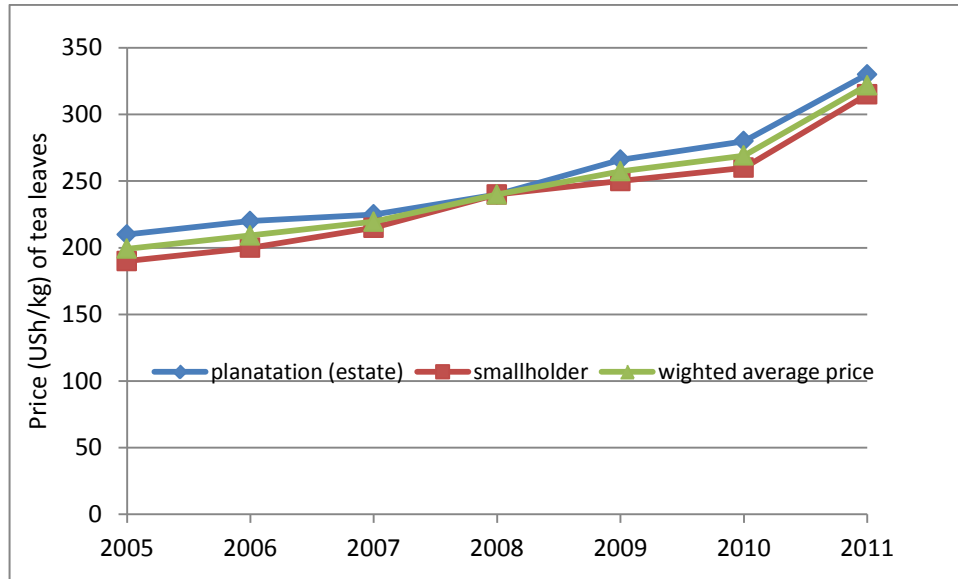
The rise was due to droughts in Sri Lanka and Kenya and also to increased demand (Agritrade, 2008). However, the average price hides important variations between countries. For example, average auction tea prices in 2009 at the main Sri Lankan tea auction were 332 US cents/kg, in India 290 US cents/kg and in Mombasa 272 US cents/kg. Prices reflect quality and specialty.

Projections for the ten years to 2017 indicate that tea production could substantially exceed growth in consumption, with the current situation of market balance being transformed into one of growing surplus production (Agritrade, 2008). This could serve both to depress prices and reduce returns to producers in developing countries.

Policy Decisions and Measures

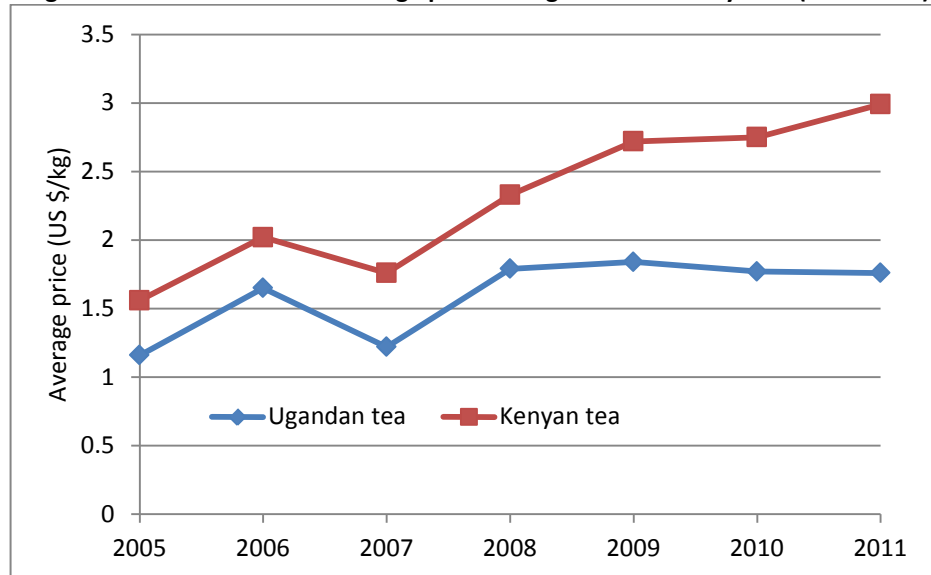
Before liberalization reforms of the early 1994, tea production, marketing and export was controlled by the government through a number of measures including ownership of processing factories, marketing and export monopoly by the Uganda Tea Authority. After liberalization, tea marketing is completely liberalized, the export monopoly ended and the government sold the factories to private sector including smallholder producers. In addition, a number of projects were implemented to rehabilitate the tea sector including the Emergency Tea Rehabilitation Programme (1987-89), the Smallholder Tea Rehabilitation Project (1989-94) and Smallholder Tea Development Programme (1994-99). These policy reforms were often cited as the major driver of the current revival of the tea sector in Uganda. As the Government's role was substantially reduced by the marketing liberalization and privatization of factories in the early 1990s, the private-sector led industry flourished.

Figure 4: Farmgate prices of tea leaves for smallholder and estate producers in Uganda (2005-2011)



Source: Mabale Growers Tea Factory Ltd through personal communication

Figure 5: Mombasa auction average prices of Ugandan and Kenya tea (2005-2011)



Source: Data from Africa tea Brokers Limited (2012).

Unlike the case for coffee, Uganda apparently has yet to approve a national tea development policy. MTI (2006) in its Diagnostic Trade Integration Study argued that the Government now has suggested a larger role for itself with its Draft National Tea Development Policy. According to MTI (2006), this larger role is not consistent with a private sector-led industry and would be a partial return to policies of the past. The Government should have regulatory authority when issues of health, environment, and safety are concerned, but not on the normal operations and business decisions. The Draft Policy calls for the development of an information database for the industry and this would be an appropriate role for the Government

According to MTI (2006), some of the Draft policy proposals seem to encourage labor-based technology to create employment, and encouraging farmers using fertilizers and chemicals to apply them according to regulations governing their use, and ensuring tea factories continue to establish ample woodlots for tea processing. Other proposals suggest a larger role for the public sector than is appropriate for a liberalized sector. For example, the Draft Policy proposes that “Both government and the private sector shall support

tea research activities” which could be interpreted to mean that the private sector will be required to support tea research whether they chose to or not. The Draft Policy states that “An institutional framework, clearly defining the roles of stakeholders involved in the tea industry is a pre-requisite for the successful implementation of the tea-subsector programmes”, and that “The implementation of the Tea Development Policy shall be the responsibility of both public and private sectors.” If approved, the Draft Policy would give the Government new authority over the industry and would partially reverse the liberalization which has allowed the industry to recover from the lows of the 1980s.

Trade policies

Since 1995, Uganda trade policies are defined in the context of its overall economic development strategy. The government of Uganda adopted an economic Recovery Program (ERP) in 1987. The focus of the ERP shifted in the late 1980’s and early 1990’s from economic growth and macroeconomic stabilization to Structural reforms. Following a consultative conference organized by the government in 1994 to discuss the state of the economy, foreign trade has been viewed as an engine of economic growth. There has been intensification of export promotion effort since 1995.

Uganda’s trade policy has been aimed at poverty reduction, promoting employment, economic growth and export diversification and promotion (particularly non-traditional exports). Vertical diversification is to be achieved through further processing of primary export product incentive scheme (e.g. duty and tax concessions) were made available to producers and exporters to promote the competitiveness of local products. It was envisaged that trade among developing countries was to be promoted through regional integration (e.g. COMESA, EAC)

Consistent with its commitment to all liberal trade policy, Uganda has emphasized that tea export sector remains as open as possible. Uganda has no Tea export taxes, charges or levies. Given this observation, it is imperative to argue that exporters of Uganda’s tea are largely regulated by the importing countries.

Many developed countries impose no, or only slight, restrictions on bulk and packaged black tea imports. According to Oxfam (2002), an important issue in tariffs is the difference in rates applied to packaged tea and bulk tea. Exports of packaged tea allow the producing countries to add more value to their product, but packaged tea is often subject to higher tariffs than bulk tea, which makes such exports difficult. Since almost all Uganda tea export are bulk, importing countries tariffs may have little or no impact on the country.

In 2011, Kenya introduced a plant-health certificate requirement for tea exports via Mombasa port. According to the Exporters are charged \$5.3 for every truckload of tea as Plant Import Permit (PIP) by the Kenya Plant Health Inspectorate Service (Kephis) at the Malaba border post with Uganda (AllAfrica.com, 2011). Kephis is of the view that it has to issue a phytosanitary certificate for re-export of Ugandan tea in line with international standards. Uganda Tea Association (UTA) argued that Ugandan tea was a finished product that met good manufacturing practices and packaging and planned to raise these concerns with the East African Community.

Of relevance to tea production is the exchange rate policy addressed by Bank of Uganda (BOU). Uganda’s BOU continued to pursue a flexible exchange rate policy regime, whereby it intervenes in the foreign exchange market primarily to dampen short term volatility in the exchange rate (BOU, 2011). Dampening short term volatility is important to avoid its possible adverse impact on trade. Net sales of foreign exchange amounted to US\$ 37.7 million over the review period. Overall the shilling depreciated against the US dollar by 5.1 percent in 2009/10, from an average rate of US\$ 1,903.03 per US\$ in 2008/09 to US\$ 410

per US\$ in 2011. Since 1994, tea exporters are permitted to retain foreign exchange retention accounts (MTTI, 2006).

3. DATA REQUIREMENTS, DESCRIPTION AND CALCULATION OF INDICATORS

To calculate the indicators needed to estimate incentives or disincentives to production (NRP, NRA) as well as the Market Development Gaps (MDGs), several types of data are needed. They were collected and are presented and explained hereafter. The analysis focuses on the period of 2005-2011.

The tea value chain consists of limited movement of the commodity from the farm gate to the factory to the Auction in Mombasa. In this analysis, the MAFAP indicators are estimated at the farm gate and at the factory gate. In this analysis, we consider two options. First, the factory gate is considered as the point of competition where tea sales for exports take place at the factory gate. The alternative is that the auction is the point of competition for Uganda tea exports.

TRADE STATUS OF THE PRODUCTS

Uganda exports more than 90 percent of the produced tea (Table 1). Imports are limited to small quantities of packaged tea. Therefore, Uganda is a net exporter of tea.

BENCHMARK PRICES

Observed

Uganda exports tea of different qualities and the majority is exported through Mombasa auction in Kenya. Therefore, the average auction price of Uganda tea is an appropriate benchmark price for Ugandan tea export delivered *FOT to Mombasa*. The price series is obtained from published data by Africa Tea Borkers Limited (2012). An alternative benchmark prices is the average export unit value of tea export derived from the value and quantity of tea export reported in the official statistics of UBoS and MAAIF (2010, 2011). Actual export prices were slightly different since they may include direct tea sales by factories at a price lower than the auction price (Figure 7).

Although both price series are close in 2005-07, the two series diverge considerably in subsequent years with the unit export price much lower than the auction price. Although more than 70 percent of the tea exports are auctioned, the low export unit price suggests that the value of tea export recorded is net of shipping cost from Uganda to Mombasa (net value). As delivery point of tea recorded for export cannot accurately determined, Average auction price is considered a more accurate benchmark price in this analysis.

Adjusted

In this analysis, adjusted benchmark prices are not used assuming that the Mombasa auction price reflects the opportunity costs of tea export.

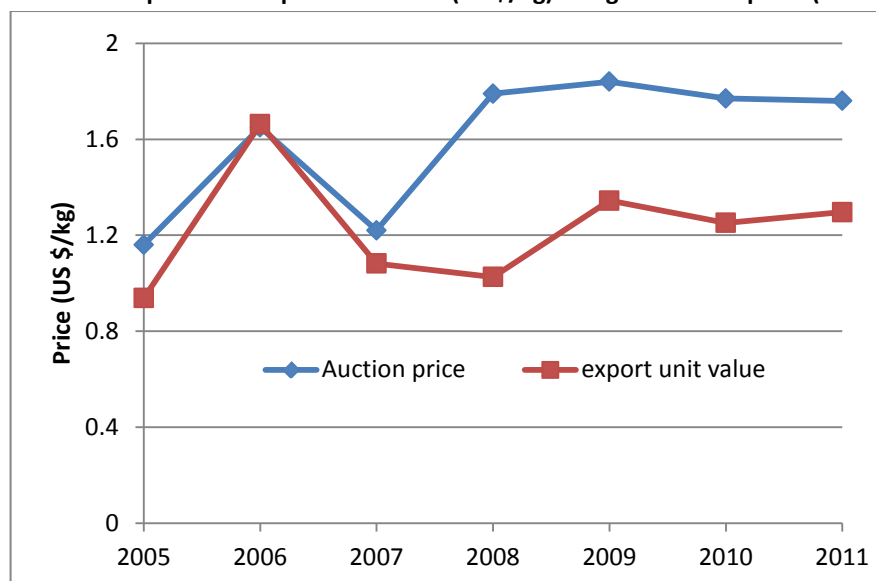
DOMESTIC PRICES

Observed

Tea is produced by smallholders (54 percent) and large scale estates with direct links to tea factory (46 percent). The average farmgate price for both producer groups is available from Mabale Growers Tea Factory Ltd through personal communication (Figure 4). Although the prices paid to both producers are very close, the weighted average of the two price series is considered a representative farmgate price of tea in Uganda and presented in Table 2. The weighted price is shown in Figure 4. This price reflects the

price received by producers for tea leaves delivered at the factory gate as the transportation is arranged by the buyer and its cost is factored in the price offered.

Figure 6. Auction price and export unit value (US \$/kg) of Uganda tea exports (2005-2011)



Source: Data from UBOS (2012) and Africa Tea Brokers Limited (2012).

Figure 7. Domestic wholesale price at the point of competition and Mombasa auction price of Ugandan tea (2005-2011)



Source: Africa Tea Brokers Limited (2012) and. Mabale Growers Tea Factory Ltd.

Although tea factories have the option to either sell at the factory gate to exporters and domestic buyers or at the auction in Mombasa, the analysis here assumes the Mombasa auction as most factories sell directly at the auction to be the point of competition since over 70 percent of Uganda tea is sold directly at this auction. This reflects the vertical integration of production, processing and marketing activities in the tea industry. In this case, the factories receive the auction price less the transportation cost to Mombasa, warehouse rent and auction fee. This represents the domestic price at the point of competition in this scenario. The indicators estimated here reflect the impact of policy and marketing function to the integrated tea processing industry (including export marketing). Table 2 compares the farmgate price of tea leaves and the domestic price at the point of competition.

Table 2. Farmgate price of tea leaves and the domestic price at the point of competition (USh/ton).

	2005	2006	2007	2008	2009	2010	2011
Farmgate price ^a	199,200	209,200	219,600	240,000	257,360	269,200	321,900
domestic price at the point of competition ^b	1,921,585	2,840,961	1,958,727	2,870,054	3,478,673	3,580,196	3,946,847

a. Farmgate prices are given in U Sh per ton of tea leaves.

b. Domestic price at the point of competition is given in U Sh per ton of processed tea.

Source: Mabale Growers Tea Factory Ltd (2012) through personal communications.

EXCHANGE RATES

Observed

This data is used to convert the benchmark price in domestic currency and therefore plays an important role in determining the level of incentives for producers and wholesalers. Year-average exchange rate observed in the free foreign exchange market in Uganda is obtained from UBoS (2012).

Adjusted

The exchange rate during the period covered in the analysis has been free and floating. There is no evidence of exchange rate misalignment and therefore we assume that the observed exchange rate measures the equilibrium exchange accurately.

MARKET ACCESS COSTS

To correctly be compared with the domestic prices, the benchmark (auction) price must be adjusted for marketing costs incurred between the farmgate and the border (OECD, 2010). Tea marketing costs in Uganda are quite simple and involve cost incurred by the factory in transporting green tea leaves from the farm to the factory (already factored in the farmgate price), tea processing and packaging, transportation of processed tea from the factory to the auction and other auction related costs including Busia border costs (the recently imposed KEPHIS), warehouse costs and auction fees.

Observed

Detailed time series data of marketing costs of Ugandan tea is obtained through personal communication from Mabale Growers Tea Factory Ltd and Bank of Uganda (2011). Processing costs at the factory are extrapolated from data reported by Bank of Uganda (2011) estimating factory processing and packing costs for 2009 and 2010 and processing, packaging and marketing (export) costs for 2007 and 2008. Table 3 summarizes the observed access costs of tea processing, marketing and export. Notably, tea is not subject to local taxes, levies or export tax except the recently introduced KEPHIS fee by the Kenyan authorities.

Observed access costs from the farmgate to the point of competition include collection and processing costs, marketing costs and profit margins. Observed access costs to the point of competition include all costs from the factory to the auction: loading costs at the factory, transportation from the factory to the auction, KEPHIS fees, warehouse cost in Mombasa and auction fees. Table 3 shows the details of the observed access costs for the two market segments.

It is to be noted here that tea is mainly exported (sold) by the factory itself at Mombasa auction. In reality, the profit margins for factory and exporters are all attributed to the factory since tea processing and marketing is an integrated business. For the industry as a whole, the combined profit margin is estimated as the difference between the auction sale price and costs (raw material, processing and packaging and marketing costs). Based on these estimates, profit margin ranges from 11.5 to 37.9 percent of the factory

revenue and averages 26.7 percent. Thus, observed profit margin is assumed to be 26.7 percent of tea price at the point of competition.

Adjusted

Adjusted access costs are calculated on the basis of the opportunity cost of marketing services. As the tea industry is not subject to any taxation or export restrictions, observed and adjusted access costs are identical except for profit margin for the factory. Profit margins are set at 10 percent of tea price at the point of competition. Observed and adjusted access costs at the point of competition are the same. The adjusted access costs for the two segments are presented in Table 3.

Table 3: Observed access costs of tea (USh/kg) from wholesale markets to border in Uganda (2005-2011)

Market segment	Cost element	2005	2006	2007	2008	2009	2010	2011
Farmgate to factory	Processing and packaging cost	766,441	766,481	740,762	734,274	1,086,378	1,346,956	1,274,852
	Observed profit margin	550,785	805,439	560,409	820,808	995,804	1,027,759	1,130,811
	Adjusted profit margin ^a	206,596	302,115	210,206	307,880	373,520	385,506	424,160
	Marketing cost	72,740	74,740	70,420	104,700	123,300	132,180	146,643
	Observed Access costs	1,348,647	1,586,237	1,329,550	1,598,206	2,130,778	2,429,794	2,467,473
	Adjusted Access costs	1,004,458	1,082,913	979,347	1,085,278	1,508,494	1,787,541	1,760,822
factory to border (Mombasa)	Loading at the factory	1,500	1,500	1,500	1,500	1,500	1,500	1,500
	Transportation to Mombasa	71,240	73,240	68,920	103,200	121,800	130,680	144,600
	KEPHIS ^b							542.25
	Warehouse costs ^c	31,816	46,526	32,372	47,414	57,522	59,368	65,321
	Auction fee ^c	41,319	60,423	42,041	61,576	74,704	77,101	84,832
	Observed Access costs	145,875	181,689	144,833	210,246	258,027	276,364	296,253
	Adjusted Access costs	145,875	181,689	144,833	210,246	258,027	276,364	296,253

a. A 10 percent adjusted profit margin is assumed

b. KEPHIS was introduced last year at \$4.5 per truck load (20 ton).

c. Warehouse cost for storage of tea in Mombasa is 1.54 percent of auction price of tea.

d. Auction fee is 2 percent of sale price.

Source: Mabale Growers Tea Factory Ltd (2012), Bank of Uganda (2008) and Bank of Uganda (2011).

EXTERNALITIES

The major source of externalities is the possible impact of expanding tea plantations on forest cover in Uganda. However, this appears to be limited given the slow increase in tea area during the last decade (Figure 2). In this analysis, externality costs are ignored.

BUDGET AND OTHER TRANSFERS

This data is expected to be computed in the expenditure analysis, an integral part of this analysis. This is on-going work and will be included as it becomes available.

QUALITY AND QUANTITY ADJUSTMENTS

Tea is processed at a rate of 0.225 kg of black tea per unit of tea leaves (Odoch, 2008). This quantity conversion factor is used to adjust for quantity differences of the product between the factory and the farmgate. All access costs and the auction and domestic wholesale prices are on the basis of processed black tea while the farmgate prices refer to the price of tea leaves. Therefore, the quantity conversion factor applies to converting the reference price of processed tea at the point of competition to the equivalent green tea leaves. As prices and access costs are based on the average tea quality, quality adjustment is not needed.

DATA Overview

Table 4 summarizes the sources of the data described above and Table 5 lists the data used in the calculations of the indicators, as described above.

Table 4: Summary of the description of the data used in the estimation of policy indicators for tea in Uganda

<i>data</i>	<i>Description</i>	
	<i>Observed</i>	<i>Adjusted</i>
Benchmark price	<i>Mombasa auction prices for Uganda tea obtained from Africa Tea brokers Limited (2012) (see Figure 6)</i>	N.A.
Domestic price at point of competition (auction)	<i>Annual average of auction price adjusted by transportation and marketing cost of tea at Mombasa auction (see Table 2).</i>	N.A.
Domestic price at the farm gate	<i>Annual weighted average price received by Estate and smallholder tea producers obtained from Mabale Tea Factory (2012) through personal communication (see Figure 4)</i>	N.A.
Exchange rate	<i>Annual average of exchange rate as reported by UBoS (2012)</i>	NA
Access cost to point of competition (auction)	<i>All observed marketing costs involved in transportation and marketing of tea at Mombasa auction obtained from Mabale Tea Factory (2012) through personal communication plus an estimated export margin of 15.7 percent (see table 2)</i>	<i>All observed marketing costs involved in transportation and marketing of tea at Mombasa auction obtained from Mabale Tea Factory (2012) through personal communication plus an export margin of 10 percent (see table 2)</i>
Access costs to farm gate	<i>Processing costs extrapolated from Bank of Uganda (2008) and (2011) plus an estimated average profit margin of 4.5 percent (see table 2)</i>	<i>Processing costs extrapolated from Bank of Uganda (2008) and (2011) plus an estimated average profit margin of 4.5 percent (see table 2)</i>
Quantity conversion factor	<i>The retention rate of 0.225 for processing tea leaves into black tea</i>	

Source: compiled from the data described above.

Table 5. Data used in the analysis of MAFAP policy indicators for tea in Uganda

				Year	2005	2006	2007	2008	2009	2010	2011
DATA		Unit	Symbol	trade status	x	x	x	x	x	x	x
Benchmark Price											
	Observed	US \$/TON	P _{b(int\$)}		1160	1650	1220	1790	1840	1770	1760
	Adjusted	US \$/TON	P _{ba}								
Exchange Rate											
	Observed	US\$/US \$	ER _o		1781	1831	1723	1720	2030	2178	2410
	Adjusted	US\$/US \$	ER _a								
Access costs border - point of competition											
	Observed	US\$/TON	AC _{o_{wh}}		145875	181689	144833	210246	258027	276364	296253
	Adjusted	US\$/TON	AC _{a_{wh}}		145875	181689	144833	210246	258027	276364	296253
Domestic price at point of competition											
		US\$/TON	P _{dwh}		1920085	2839461	1957227	2868554	3477173	3578696	3945347
Access costs point of competition - farm gate											
	Observed	US\$/TON	AC _{o_{fg}}		303446	356903	299149	359596	479425	546704	555181
	Adjusted	US\$/TON	AC _{a_{fg}}		226003	243656	220353	244188	339411	402197	396185
Farm gate price											
		US\$/TON	P _{d_{fg}}		199200	209200	219600	240000	257360	269200	321900
Externalities associated with production											
		US\$/TON	E								
Budget and other product related transfers											
		US\$/TON	BOT								
Quantity conversion factor (border - point of competition)											
		Fraction	QT _{wh}		1	1	1	1	1	1	1
Quality conversion factor (border - point of competition)											
		Fraction	QL _{wh}		1	1	1	1	1	1	1
Quantity conversion factor (point of competition - farm gate)											
		Fraction	QT _{fg}		0.225	0.225	0.225	0.225	0.225	0.225	0.225
Quality conversion factor (point of competition - farm gate)											
		Fraction	QL _{fg}								

Source:

compiled from the data described above.

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 (www.fao.org/mafap). The estimated indicators include the observed and adjusted price gaps and the associated observed and adjusted nominal rate of protection at the farmgate and the point of competition. Table 6 presents the estimated price gaps at the two markets for 2005-2011 while Table 7 presents the estimated rates of protection for the same period. Table 8 presents the relevant components of the market development gap.

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 each at the wholesale and 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 $NRPo_{fg}$ 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)** 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, however, 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 added to the $NRPo$ generate the $NRPa$ indicators.

4. INTERPRETATION OF THE INDICATORS

The tea sector in Uganda is characterized by minimum government intervention in terms of pricing and trade policies. Government role is mainly restricted to quality regulations and production. As such, MAFAP indicators are expected to reflect price gaps resulting from market functioning and the impact of international price fluctuations rather than policy impacts. While nominal domestic farmgate and wholesale factory prices for tea in Uganda has been increasing slowly over the period of 2005-2011, auction prices have been fluctuating considerably (Figure 4 and Figure 7). In particular, Mombasa auction prices of Uganda tea which is used as the benchmark prices in 2005 and 2007 were quite low averaging \$1.16 and 1.22/kg, respectively. All the estimated indicators for these two years are positive. This is caused by the exceptionally low Mombasa auction prices in these two years averaging \$1.16 and 1.22/kg, respectively. These indicators are considered here as exceptional cases unrelated to neither domestic market functioning or government policies but rather these are related to fluctuation to the world market for tea. The interpretation will focus on the indicators in other years.

More than 70 percent of Uganda tea exports are marketed directly by tea processors at the tea auction in Mombasa, Kenya. Therefore, the Mombasa auction represents the point of competition. Thus, the nominal rate of protection for all years approaches zero since processors receive the full price at the auction and taking into account the marketing costs at the auction. This explains the tendency of the tea industry to be vertically integrates tea production, processing and marketing activities. Indeed, the analysis suggests that marketing tea at the Mombasa auction provides much higher incentives to tea factories compared to direct sale at the factory since export profit margins will be captured as an additional return to the factory.

Although the tea market at the upper level of the value chain appears to fully liberalized, producers' prices deviate significantly from the reference prices as the generally negative price gaps and nominal rates of protection suggest (Figure 7 and Figure 8). With the exception of 2005 and 2007, the observed nominal rate of protection ranges from -25.8 percent to 4.1 percent (Table 7). When profit margins are adjusted to normal levels (10 percent), the adjusted nominal rate of protection is negative throughout the period of analysis. On average, prices paid to tea leave producers were 28.62 percent below the adjusted reference price. The indicators suggest that while tea factories are able to earning high profit margins by selling at the auction, these incentives are not shared equally along the value chain.

Tea is considered to be a buyer-driven value chain, where tea producers have few options for selling their product. Analysis suggests that factories are able to transfer price disincentives to producers. However, tea factories face considerable market risk resulting from the normal price fluctuations at the auction. Besides, tea factories can determine farmgate prices in any season purely based on price expectations at the time of sale of the processed tea. In addition, the tea processing industry is facing increasing costs of processing and transportation due mainly to the rising cost of energy in Uganda. Since for a given auction price, the increasing costs means lower profit margins for factories, factories have chosen to remain competitive by lowering or resisting increases in farmgate prices.

Table 6: MAFAP price gaps for Tea in Uganda 2005-2011 (U Sh per Mt)

	2005	2006	2007	2008	2009	2010	2011
Trade status for the year	x	x	x	x	x	x	x
Observed price gap at the point of competition	0	0	0	0	0	0	0
Adjusted price gap at the point of competition	0	0	0	0	0	0	0
Observed price gap at farmgate	70,626	-72,775	78,373	-45,828	-45,579	10,697	-10,622
Adjusted price gap at farmgate	-6,816	-186,023	-423	-161,237	-185,593	-133,810	-169,618

Note the indicators at the point of competition are zero by definition.

Source: Authors' calculations using data as described above.

Table 7: MAFAP nominal rates of protection (NRP) for Tea Uganda 2005-2011 (percent)

	2005	2006	2007	2008	2009	2010	2011
Trade status for the year	x	x	x	x	x	x	x
Observed NRP at the point of competition	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Adjusted NRP at the point of competition	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Observed NRP at farmgate	54.93	-25.81	55.49	-16.03	-15.05	4.14	-3.19
Adjusted NRP at farmgate	-3.31	-47.07	-0.19	-40.18	-41.90	-33.20	-34.51

Note the indicators at the point of competition are zero by definition

Source: Authors' calculations using data as described above.

Table 8: Market development gap for tea in Uganda 2005-2011 (USD per Mt)

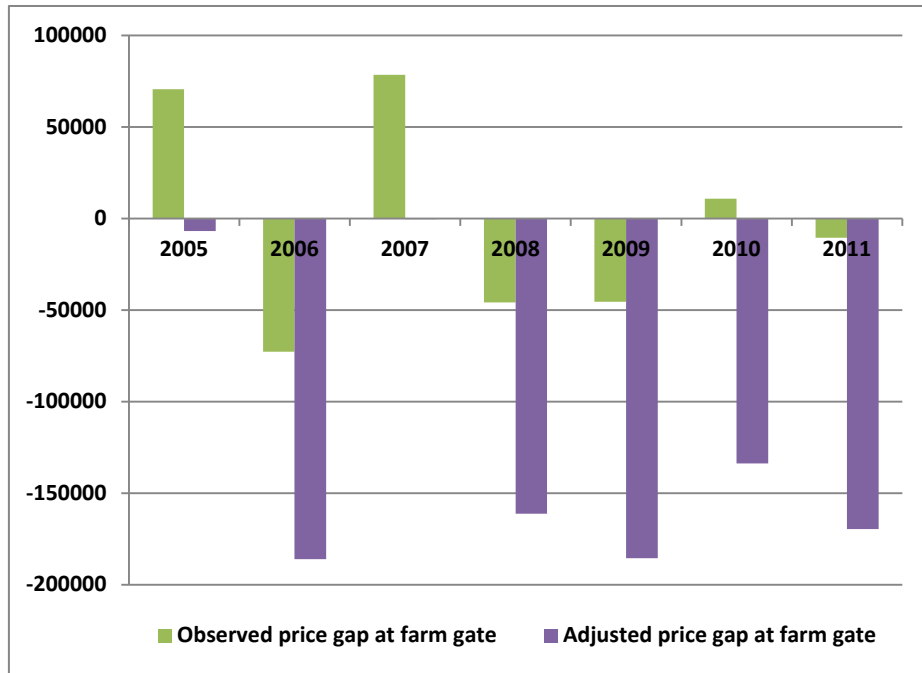
	2005	2006	2007	2008	2009	2010	2011
International markets gap	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Exchange policy gap	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Access costs gap to point of competition	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Access costs gap to farm gate	-17424.56	25480.76	-17729.04	-25966.98	-31503.14	-32514.06	-35774.18
Externality gap	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Market Development Gap	-8.5%	-6.4%	-8.1%	-6.5%	-7.1%	-8.1%	-7.3%

Note: This analysis is based on the assumption that observed and adjusted access costs are identical and hence, access cost gap at the point of competition is zero.

Source: Own calculations using data as described above.

The above results need to be viewed within the policy context in Uganda. Uganda's international trade regime is very liberal, and most products are imported or exported without quantitative or origin restrictions (Chemonics International, 2010). There are no known formal charges that are directly levied on tea apart from the costs of certain services/documentations that the exportation process may require, including costs for verifying conformity with the quality standards. As such, the estimated price gaps and nominal rates of protection at the farm gate cannot be related to government intervention or policy but rather as a result of the functioning of the market. The price gaps are partly attributed to the existence of market development gaps. Table 8 presents estimates of the market development gaps due to access costs at the wholesale and farmgate. The market development gap at the farmgate ranges from 6.4 to 8.5 percent of the reference price at the farmgate. This represents potential gains to tea growers that could result from improving the efficiency of the value chain, particularly the excessive profit margin earned by tea factories.

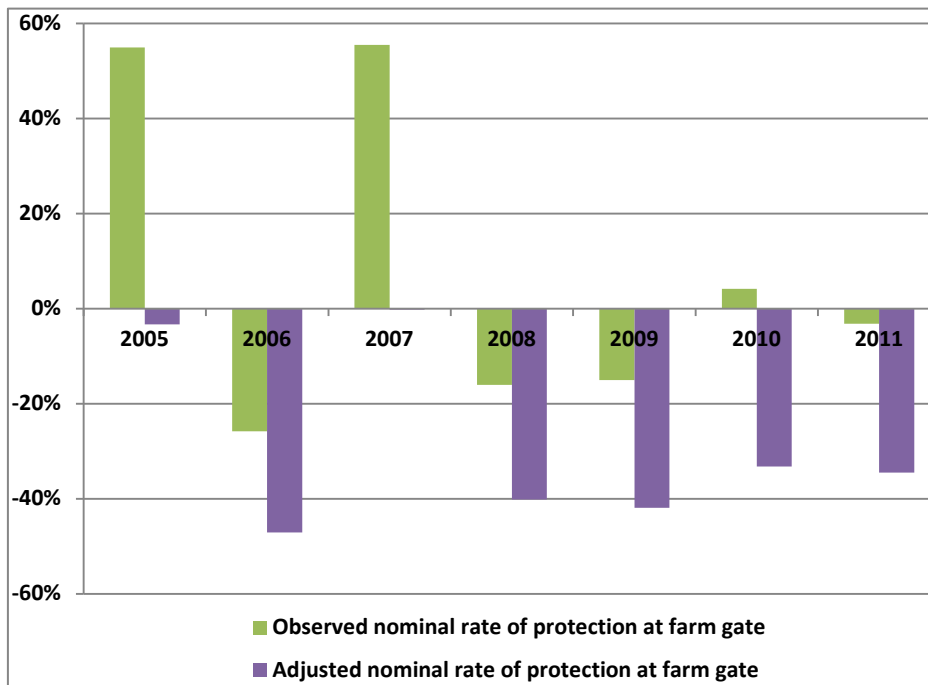
Figure 8. Observed and adjusted price gaps (US \$ per ton) at the farmgate and wholesale for tea in Uganda (2005-2011)



Note the indicators at the point of competition are zero by definition

Source: Authors' estimation.

Figure 8. Observed and adjusted nominal rates of protection (percent) at the farmgate and wholesale for tea in Uganda (2005-2011)



Note the indicators at the point of competition are zero by definition

Source: Authors' estimation.

5. PRELIMINARY CONCLUSIONS AND RECOMMENDATIONS

MAIN MESSAGE

Due to the liberal international trade regime in Uganda with minimum quantitative restrictions or direct levies on export, the tea industry in Uganda appears to avoid market disincentives by selling directly at tea auction in Mombasa. As such, the industry receives a price that reflects the value of Uganda's tea in the world market at a minimum costs given the current cost of processing and marketing (exportation) cost. As the tea industry does not receive any form of policy support (incentives), such situation is likely to encourage efficient functioning toward cost reduction and improved product quality to increase profitability.

However, the tea industry appears to pass its rising costs and risks to tea growers in order to maintain competitiveness. Due to low producer prices compared to reference prices, the estimated indicators suggest considerable disincentives at the farm gate. This is equally true whether tea is exported through Mombasa auction or through direct sale at the factory. These disincentives are detrimental to tea production in Uganda leading to low productivity and quality and reduce incentives to growers for adopting new technologies. This will, in turn, impact the tea industry negatively.

While government intervention to support tea growers through pricing intervention is unlikely given the current policy in Uganda, the government may consider some measures to support smallholder producers. This is especially important given that potential expansion in tea production from these producers. Among the measures to support smallholders includes strengthening growers organizations and the establishment of institution to disseminate market information and indicative price for producers similar to Uganda Coffee Development Authority. Improvement in rural transportation infrastructure and feeder roads will reduce transportation costs and consequently may improve producers' prices.

PRELIMINARY RECOMMENDATIONS

With the country well-advanced in its plan for liberalizing the economy and commercialization of agriculture and adoption of policies geared towards increasing and diversifying exports, the Government of Uganda may need to focus on ensuring that benefits from the recovery of the tea sector trickle down to smallholder growers. While this is unlikely to be achieved through regulations and direct interventions, among the measures to support smallholders includes strengthening growers' organizations and the establishment of institution to disseminate market information and indicative price for producers similar to coffee.

LIMITATIONS

Despite the significance of tea as the third traditional export commodity in Uganda, very limited studies and data on crop production, prices and marketing is available through official means. Data used in this study is high quality data but mostly obtained from limited number of sources through personal communication. The analysis will benefit substantially from additional sources of data to confirm its findings.

FURTHER INVESTIGATION AND RESEARCH

This research may benefit substantially from a comparison of the indicators for tea with similar analysis in other countries in the region e.g. Kenya and Tanzania.

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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 of the MAFAP indicators

DATA	Unit	Symbol	Year trade status	2005	2006	2007	2008	2009	2010	2011
				x	x	x	x	x	x	x
Benchmark Price	Observed	US \$/TON	P _{b(int\$)}	1160	1650	1220	1790	1840	1770	1760
	Adjusted	US \$/TON	P _{ba}							
Exchange Rate	Observed	US\$/US \$	ER _o	1781	1831	1723	1720	2030	2178	2410
	Adjusted	US\$/US \$	ER _a							
Access costs border - point of competition										
	Observed	US\$/TON	ACo _{wh}	145875	181689	144833	210246	258027	276364	296253
	Adjusted	US\$/TON	ACa _{wh}	145875	181689	144833	210246	258027	276364	296253
Domestic price at point of competition		US\$/TON	P _{dwh}	1920085	2839461	1957227	2868554	3477173	3578696	3945347
Access costs point of competition - farm gate										
	Observed	US\$/TON	ACOf _g	303446	356903	299149	359596	479425	546704	555181
	Adjusted	US\$/TON	ACa _{f_g}	226003	243656	220353	244188	339411	402197	396185
Farm gate price		US\$/TON	P _{d_{f_g}}	199200	209200	219600	240000	257360	269200	321900
Externalities associated with production		US\$/TON	E							
Budget and other product related transfers		US\$/TON	BOT							
Quantity conversion factor (border - point of competition)		Fraction	QT _{wh}	1	1	1	1	1	1	1
Quantity conversion factor (border - point of competition)		Fraction	QL _{wh}	1	1	1	1	1	1	1
Quantity conversion factor (point of competition - farm gate)		Fraction	QT _{f_g}	0.225	0.225	0.225	0.225	0.225	0.225	0.225
Quantity conversion factor (point of competition - farm gate)		Fraction	QL _{f_g}							

CALCULATED PRICES		Unit	Symbol	2005	2006	2007	2008	2009	2010	2011
Benchmark price in local currency	Observed	US\$/TON	P _{b(loc\$)}	2,065,960	3,021,150	2,102,060	3,078,800	3,735,200	3,855,060	4,241,600
	Adjusted	US\$/TON	P _{b(loc\$)a}	2,065,960	3,021,150	2,102,060	3,078,800	3,735,200	3,855,060	4,241,600
Reference Price at point of competition	Observed	US\$/TON	RPO _{wh}	1,920,085	2,839,461	1,957,227	2,868,554	3,477,173	3,578,696	3,945,347
	Adjusted	US\$/TON	RPa _{wh}	1,920,085	2,839,461	1,957,227	2,868,554	3,477,173	3,578,696	3,945,347
Reference Price at Farm Gate	Observed	US\$/TON	RPO _{f_g}	128,574	281,975	141,227	285,828	302,939	258,503	332,522
	Adjusted	US\$/TON	RPa _{f_g}	206,016	395,223	220,023	401,237	442,953	403,010	491,518

INDICATORS		Unit	Symbol	2005	2006	2007	2008	2009	2010	2011
Price gap at point of competition	Observed	US\$/TON	PGO _{wh}	-	-	-	-	-	-	-
	Adjusted	US\$/TON	PGa _{wh}	-	-	-	-	-	-	-
Price gap at farm gate	Observed	US\$/TON	PGOf _g	70,626	(72,775)	78,373	(45,828)	(45,579)	10,697	(10,622)
	Adjusted	US\$/TON	PGa _{f_g}	(6,816)	(186,023)	(423)	(161,237)	(185,593)	(133,810)	(169,618)
Nominal rate of protection at point of competition	Observed	%	NRPO _{wh}	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	Adjusted	%	NRPa _{wh}	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Nominal rate of protection at farm gate	Observed	%	NRPO _{f_g}	54.93%	-25.81%	55.49%	-16.03%	-15.05%	4.14%	-3.19%
	Adjusted	%	NRPa _{f_g}	-3.31%	-47.07%	-0.19%	-40.18%	-41.90%	-33.20%	-34.51%
Nominal rate of assistance	Observed	%	NRAo	54.93%	-25.81%	55.49%	-16.03%	-15.05%	4.14%	-3.19%
	Adjusted	%	NRAa	-3.31%	-47.07%	-0.19%	-40.18%	-41.90%	-33.20%	-34.51%



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