MAFAP
SPAAA

Monitoring African Food and Agricultural Policies

Suivi des politiques agricoles et alimentaires en Afrique

ANALYSIS OF INCENTIVES AND DISINCENTIVES FOR TOBACCO IN MOZAMBIQUE

FEBRUARY 2013

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

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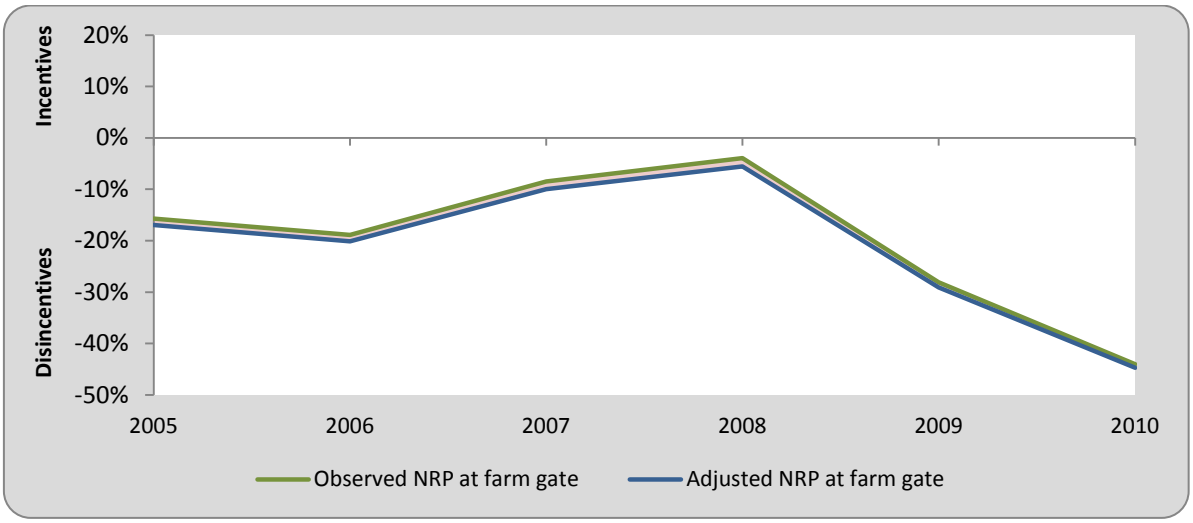
SUMMARY OF THE NOTE

Product: Tobacco
Period analyzed: 2005 – 2010
Trade status: Export in all years

- Tobacco is one of the most important agricultural export crops in Mozambique and one of the major sources of income for 129 755 farmers in central and northern Mozambique. On average, obacco sub-sector contributes close to 34 percent of total agricultural exports and almost 4 percent of total exports of goods and services;
- Production has increased rapidly over the past ten years, reaching its maximum of 86 000 tonnes in 2010, compared to the historic minimum of less than 3,000 tonnes achieved in the 80's and 90's (FAOSTAT, 2012). Production of tobacco covered 73 630 ha out of 321 314 ha of the total cultivated area of cash crops, corresponding to almost 1.3 percent of the entire cultivated area in Mozambique (Agricultural CENSUS, 2009/2010);
- Similar to the cotton industry, the tobacco sub-sector operates in a concessionary system of production (since 2002), where the government grants tobacco companies closed concessions as exclusive buyers for tobacco in a specific geographical area.



The observed Nominal Rate of Protection (NRP, green line) indicates that tobacco farmers have not received price incentives under the prevailing cost structure in the value chain. The adjusted NRP (blue line) captures the effects of market inefficiencies on farmers. The area in red shows the cost that these inefficiencies represent for producers.

Overall our indicators (observed) shows that the effect of policy and regulation, i.e. the government policy of fixation of the minimum producer price of tobacco and the concession of monopsony to tobacco millers has created disincentives to tobacco producers, suggesting that these government policies are more supportive to millers than tobacco growers. However, as in the cotton sub-sector, the introduction of reforms to eliminate the monopsony system which constitutes a barrier for competition in the sector, would contribute to increasing the price paid to farmers and reducing the deviation of the farm gate price from the reference price. Also, similar to the sugarcane sector, the tobacco chain is vertically integrated and therefore profit margins are generally captured at the marketing level and not at production level.

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1. PURPOSE OF THE NOTE

This technical note aims to describe the market incentives and disincentives for tobacco in Mozambique. The note is a technical document and serves as input for the MAFAP Country Report.

For this purpose, yearly averages of farm gate and wholesale prices are compared with reference prices calculated on the basis of the price of the commodity in the international market. The price gaps between the reference prices and the prices along the value chain indicate to which extent incentives (positive gaps) or disincentives (negative gaps) are present at 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 2005-2010. The indicators have been calculated using available data from different sources for this period and are described in Part 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

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2. COMMODITY CONTEXT

Tobacco is one of the most important agricultural export crops in Mozambique, along with cotton, sugarcane, cashew and tea. Small-scale farming is the dominant mode of tobacco production; roughly 98 percent of tobacco is produced by small-scale farmers in the central and northern Mozambique (Agricultural CENSUS, 2009/2010). Similar to the cotton industry, the tobacco sub-sector operates in a concessionary system of production (since 2002), where the government grants tobacco companies closed concessions as exclusive buyers for tobacco in a specific geographical area.

The high significance of tobacco in the Mozambican economy goes back to the colonial period when it was one of the most important agricultural export crops. During this time, its production was dominated by small-scale farmers which supplied their production to the concessionaire companies specialized in production and marketing of commercial crops (such as *cotton*). The sector was heavily affected by the civil war as well as by the economic system and policies adopted by the Mozambican Government in the 80's which contributed to fluctuations in production and yields. Following the end of the civil war in 1992 and after the introduction of economic reforms in the early 90's, the tobacco industry continues to play an important role in the Mozambican economy. It has also been one of the fastest growing agricultural sub-sectors (Figure 1).

In the recent years, a new strategy of development has emerged which focuses on creating an environment conducive for attracting foreign direct investments (FDI) in mining and gas sectors. These sectors provide more than 80 per cent of Mozambique's total export earnings, compared to 2.48 percent of the tobacco sector in 2010 (National Institute of Statistics, 2012). Despite the importance of the mining and gas sector in the Mozambican economy, the tobacco sub-sector continues to play an important role as a main source of income for more than 129 755 farmers, out of which; 49 450 farmers are associated to the Mozambique Leaf Tobacco (MLT) Company, the biggest tobacco's company operating in Mozambique.

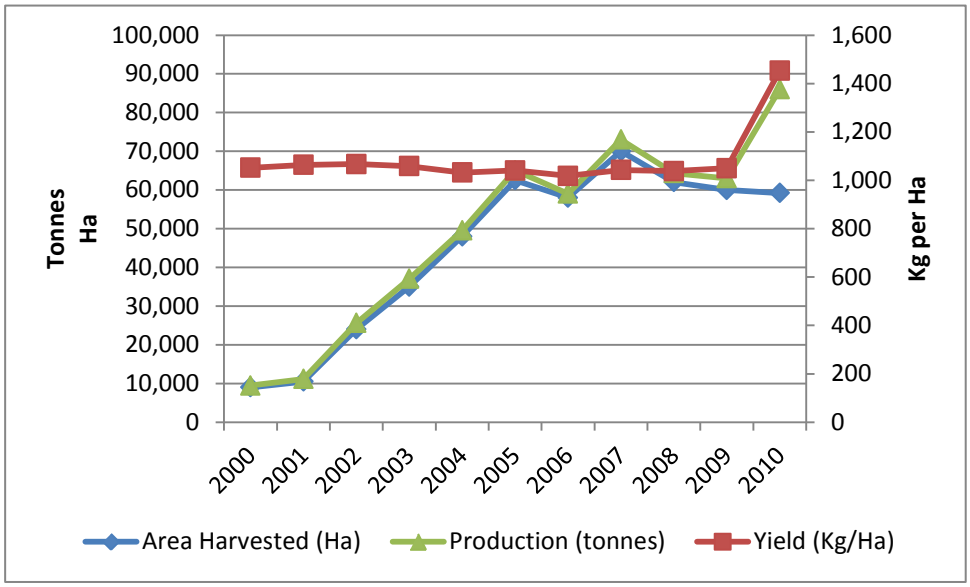
PRODUCTION

As shown in Figure 1, tobacco production has increased rapidly over the past ten years, reaching its maximum of 86 000 tonnes in 2010, compared to the historic minimum of less than 3 000 tonnes achieved in the 80's and 90's (FAOSTAT, 2012). Yields were relatively stable over the period of analysis and reached a maximum of 1 453 kg/ha in 2010 compared to 1 018 kg/ha achieved in 2006 (Figure 1). The increase of tobacco production since 2001 was partly driven by the economic and political stability in the country after the end of the civil war in 1992, which attracted domestic and FDI to the sector. The Mozambican tobacco sector also benefited from the collapse of tobacco production in Zimbabwe[1] in the early 2000's - due to the political instability in the country related to the land reform which forced many Zimbabwean's tobacco companies to relocate their investments to Mozambique. This contributed to increasing domestic production. Additionally, the construction of the tobacco processing plant in Tete province by the Mozambican Leaf Tobacco Company in 2005, partly contributed to stimulating tobacco producers to increase their production. Prior to

[1] One of the biggest tobacco producer country in Africa

development of the processing plant, the producers were exporting most of their raw tobacco to Malawi due to the inexistence of processing facilities in the country. According to the agricultural CENSUS 2009/2010, production of tobacco covered 73 630 ha out of 321 314 ha of the total cultivated area of cash crops, corresponding to almost 1.3 percent of the entire cultivated area in Mozambique (5.3 million ha)[2]. The increase of cultivated area in the period of analysis is also attributed to the increase of investments as mentioned above.

Figure 1: Unmanufactured tobacco production, area harvested and yield trends in Mozambique



Source: FAOSTAT

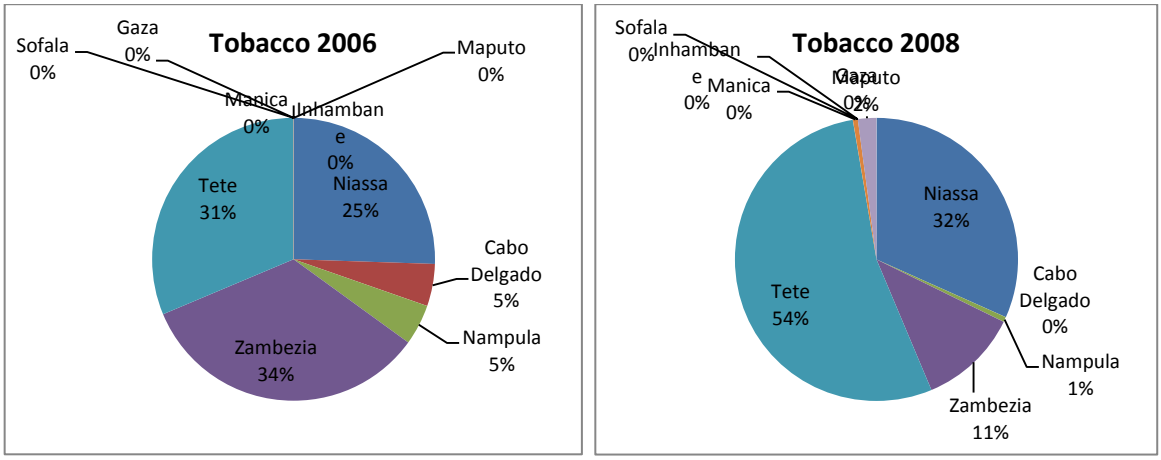
Similarly to cotton, tobacco is entirely dependent on smallholder farming, its production is based on intercrop and crop rotation systems of production which include staple crops (such as maize, cassava and sorghum). The average size of cultivated area by farmers is around 1.5 ha, with many farms operating on one ha or less[3]. Crop portfolio diversification (intercrop production) is an effective on-farm strategy adopted by farmers for coping with production risks. Under this system, farmers mostly grow tobacco together with other staple crops, using the inputs received from the concession company to grow tobacco in the production of such staples. While this may aide in increasing the productivity of the staples and may have a positive impact on food security, on the other hand, this also contributes to reducing the productivity of tobacco as the farmers would tend to use less quantity of inputs in the production of tobacco. The productivity (yield) of tobacco increased strongly from 2009, which can be partly attributed to the investment in technology and use of new variety of seeds and extension services, more specifically, after the construction of the tobacco processing plant in the country in 2005. Further research on the impact of the crop portfolio diversification on the tobacco yields would be helpful to better understand this situation.

As illustrated in Figure 2, cultivation of tobacco is mainly carried out in three provinces (Tete, Niassa and Zambézia), altogether accounting for over 90 percent of the country's tobacco production in the years 2006 and 2008. For instance, the share of total tobacco production in Tete increased by 23 percent between 2006 and 2008, partly attributed to the construction of the tobacco processing plant in the province in 2005, which could have contributed to promoting production of tobacco by

[2] Source: TIA, 2008.
[3] Source: Mozambican Cotton Institute (IAM).

local farmers, as well as producers from others provinces (notably Zambézia) to relocate their production to Tete to take advantage of the new processing facilities. Additionally, the good agro-ecological conditions to grow tobacco in Tete compared to other provinces and its strategic geographical location (located along the Beira corridor and close to Malawi and Zimbabwe[4]), could also likely have contributed to increasing the concentration of tobacco production in the province.

Figure 2: Distribution of tobacco production in Mozambique by provinces



Source: TIA (2006/2008)

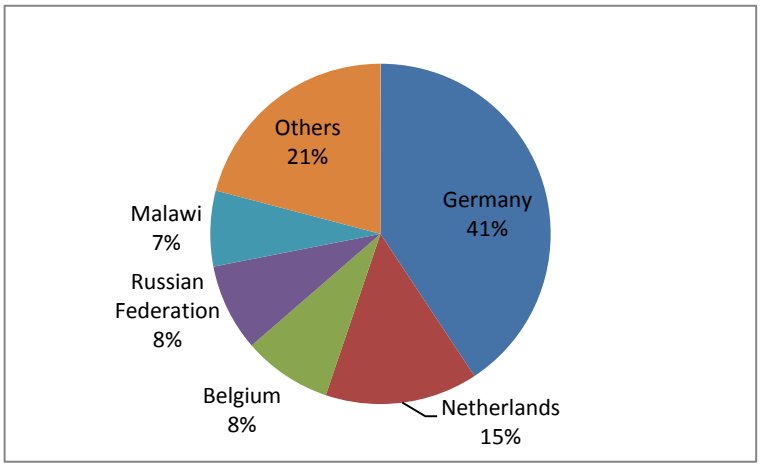
CONSUMPTION/UTILIZATION

After harvesting, a small percentage of dried tobacco leaf is retained by farmers for their own consumption and also sold in the local market. The remaining part is sold to the processing factories under the concessionary system of production. Poor rural households (mostly elderly people) prefer smoking unprocessed tobacco - to accommodate taste preferences in line with cultural and historical patterns of consumption and affordability. Cigarette is more expensive than unprocessed tobacco. After the processing of tobacco, a significant part of the crop is exported to the international market (for example 67 percent in 2010), mainly in Europe (Figure 3). The remaining part (very small part) is processed by the local companies into cigarettes and sold in the local market.

Figure 3 below shows the major buyers of Mozambican unmanufactured tobacco in 2011. Germany emerges as the largest buyer, accounting for 41 percent of total exports in 2011, followed by the Netherlands (15 percent), Belgium and Russia (8 percent each) and Malawi (7 percent). In contrast, before 2005, Mozambique was mainly exporting unprocessed tobacco to Malawi and Zimbabwe (UN COMTRADE, 2012), due to the inexistence of processing facilities in the country. After the construction of the processing plant in 2005, the exports of the raw tobacco to Malawi and Zimbabwe were gradually replaced by the exports of the high value added unmanufactured tobacco to the European market. From 2010, the country is mainly exporting processed tobacco because of existence processing facilities in the country (Figure 4).

[4] Countries with very good processing facilities and where part of the Mozambican raw tobacco is processed

Figure 3: Main trade partners of Mozambique for unmanufactured tobacco in 2011



Source: UN COMTRADE

MARKETING AND TRADE

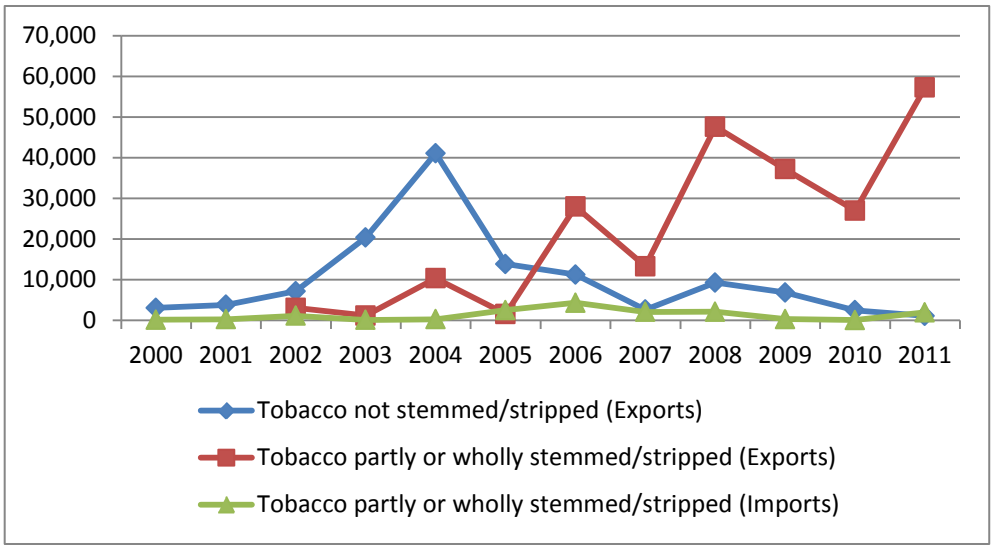
During the colonial period, the Mozambican economy was structured mainly as a service economy for neighbouring states, and integrated into a region dominated by South Africa. Geographical and historical factors between the regions also contribute to the large differences in tobacco production and trade in Mozambique. In terms of regional distribution of economic activities, the country was divided into two regions: the southern region specialized in providing labour to the mining industry in South Africa, while central and northern regions were dedicated to agriculture. This economic structure still exists, but with some changes due to foreign direct investment in a number of large industrial projects (the so-called "mega-projects") in the central and southern regions (notably Maputo and Tete).

Figure 4 below shows the recent trends in Mozambican tobacco exports to the international market. As can be seen, unmanufactured/processed tobacco exports increased significantly under the period of analysis, reaching a maximum of 57 248 tonnes in 2011 compared to 1 600 tonnes in 2005. While the export of unprocessed tobacco reduced drastically in the same period of analysis, reaching its minimum of 1 127 tonnes in 2011 compared to 41,090 tonnes in 2004. The change of the patterns of tobacco exports, i.e. from unprocessed to unmanufactured/processed, was partly driven by the construction of the tobacco processing plant in Tete province in 2005, as the country did not have the processing facilities and was exporting most of its raw tobacco to the neighbouring countries, such as Malawi. Additionally, Malawi is a landlocked country and is connected to the international market though Mozambican ports, Mozambican raw tobacco were exported to Malawi and re-exported after processing to the international market through Mozambicans ports with high transaction costs (notably transport cost), penalizing the Mozambican companies in terms of reduction of their profit margins, as the export price of tobacco is endogenous, i.e. is fixed according to supply and demand conditions in the international market.

Overall, the increase on exports of unmanufactured/processed tobacco from 2005 is in line with increased domestic production (Figure 1) and with the increase of international prices (Table 1) which incentivized farmers to increase their production. Imports on the other hand were very low; this is partly attributed to the fact that the Mozambican tobacco industry is not specialized on cigarette manufacturing.

Additionally, the majority of Mozambican tobacco companies are subsidiaries of multinational tobacco corporations who operate in economies of scale by concentrating cigarette manufacturing in a determined geographical location.

Figure 4: Tobacco exports



Source: UN COMTRADE

For the purpose of this study, we will focus our analysis on price incentives and disincentives in the Tete province, because it is where the majority of producers and processing industries are located. The analyzed flows are further explained in the chapter on Data Requirements and Calculation of Indicators.

DESCRIPTION OF THE VALUE CHAIN AND PROCESSING

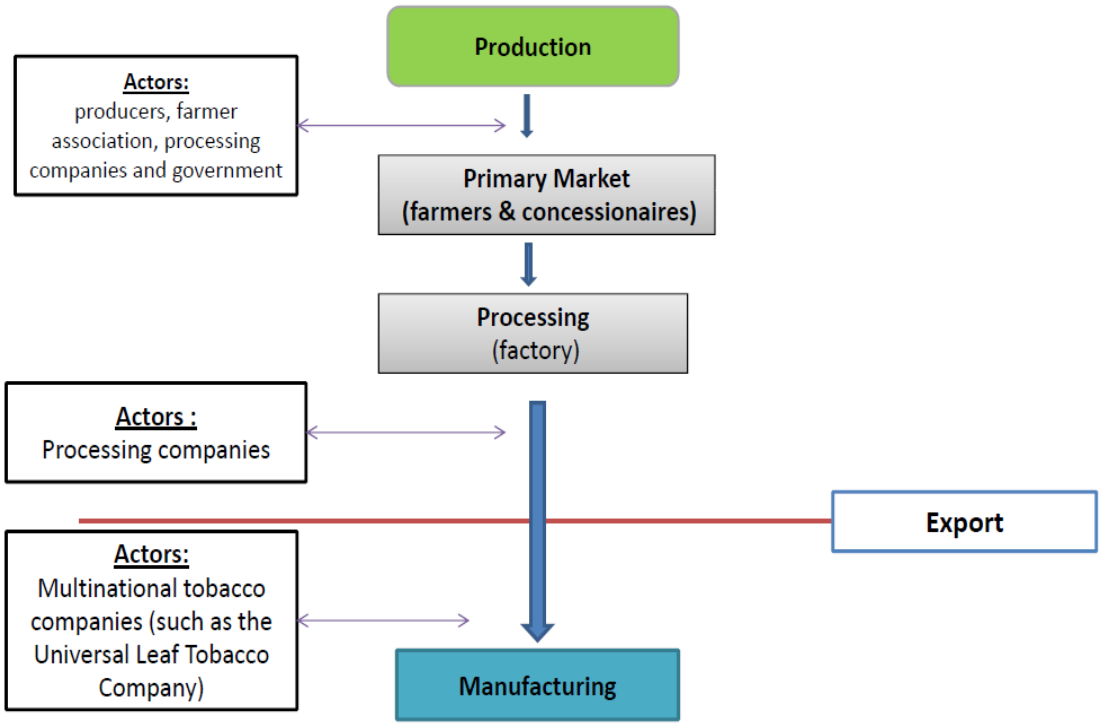
Similar to the cotton industry, tobacco processors have the responsibility to distribute free inputs (seed and fertilizer) and provide technical support to tobacco growers during each cropping season[5]. In order to have access to the inputs above mentioned, smallholder farmers are required to be registered in farmer associations, this also ensure access to output market to farmers.

After harvesting, a small part of dried tobacco leaf is sold directly by farmers in the local market; the rest is weighed, cured and placed in silos in the producing villages. The cured bales are sold to the tobacco companies under the minimum price fixed by the government in agreement with the farmer's association and tobacco companies. Processors have the responsibility to transport the cured bales from the farm gate to the factories (at their expense) - as part of the contractual arrangements between farmers and processors, which is associated to the concessionary system (monopsone) prevailing in the tobacco subsector. After processing and classifying, the unmanufactured tobacco is transported by road transport to Beira Port, where it is exported to the international market (notably in Europe). The processing results in weight losses of approximately 10 to 25 percent, depending on the technology used by the factory. Regarding the exports, the tobacco companies are the largest buyers of raw tobacco and exporters of unmanufactured tobacco in Mozambique, they export directly to the international market through the international tobacco corporations which they are associated with.

[5] Source: Universal Leaf Tobacco Company

Differently from the cotton sub-sector, the role of the government as the official entity with the responsibility to regulate the production and marketing of tobacco is not clear, i.e., in Mozambique the regulatory entity for tobacco sub-sector, such as the Cotton Institute and the National Distributor of Sugar in the cotton and sugar sub-sectors, respectively, doesn't exist.

Figure 5: Simplified market chain for tobacco in Mozambique



Source: authors

POLICY DECISIONS AND MEASURES

International and Regional Trade Policy Measures

In the last two decades, trade reforms such as the elimination of exchange controls and quantitative restriction on imports and exports have been implemented by the Mozambican Government in compliance with the Washington consensus which was based on market liberalization, fiscal discipline and privatization. Under these reforms, the prices of agricultural commodities and services were liberalized. However there are exceptions – the government fixes the minimum producer prices for tobacco, cotton, sugar and petroleum products (MozSAKSS, 2012).

At the international level, Mozambique is a member of the World Trade Organization (WTO) and the African Caribbean and Pacific Group of States (ACP), with preferential trade agreements with member countries. At the regional level, Mozambique is a member of the Southern African Development Community (SADC) which commits its members to the removal of trade barriers. This should also include the elimination of the application of VAT (value-added tax) on trade among the SADC countries.

World Health Organization (WHO) Framework Convention on Tobacco Control

Mozambique is a signatory of the WHO convention on the restriction of tobacco consumption and trade. The main objective of the convention and its protocols is to protect present and future generations from the severe health, social, environmental and economic consequences of tobacco consumption and exposure to tobacco smoke by providing a framework for tobacco control measures to be implemented by the Parties at the national, regional and international levels in order to reduce continually and substantially the prevalence of tobacco use and exposure to tobacco smoke. Differently from developed countries, such as in Europe and North America, the WHO measures appear to not have impact in the Mozambican market, as the country does not have the capacity to enforce the regulation. As such, our indicators are expected to reflect price gaps resulting from market functioning and other government policies, such as the minimum pricing system for producer price, rather than WHO convention impact.

However, despite the low impact of the WFO measures on the tobacco market in African countries, including Mozambique, the measure in part represents a big challenge for tobacco producers and traders, as the international demand of tobacco is declining over the past years, and this is directly transmitted to farmers. Tobacco producers from the SADC region promoted in August 2012 a regional meeting in Maputo to discuss the challenges and seek for government support, because the WHO convention is affecting negatively the income of tobacco producers and traders, due to reduction of demand in international markets.

Price policies, marketing, regulation and licensing activities

Despite the liberalization of most products, tobacco production in Mozambique is based on the concession scheme. The Mozambican government granted tobacco companies closed concessions (for up to ten years) as exclusive buyers for tobacco leafs in a specific geographical area. These companies are mostly located in the central and northern Mozambique.

Similarly to the cotton sub-sector, Mozambique has a minimum pricing system for producer price of tobacco and the tobacco sub-sector operates in a concessionary system of production, where the government grants tobacco companies closed concessions as exclusive buyers for tobacco in a specific geographical area. The main objective of the indicative minimum purchase price for leaf tobacco is to minimize the risk of discrepancy between the minimum price and the international prices; as well as to assist farmers in deciding on their tobacco producing plans and also as an incentive to minimize crop substitution. Tschirley et al. (2008) argues that, when producer prices are fixed before planting, processing companies take on great risk. In the cotton sub-sector, the extent of this risk was fully manifested in the 2010/2011 season, when the IAM[6] intervened to buy seed cotton in Inhambane, due to the incapacity of the ginning company (*Algodâo de Moçambique*) to buy the production because of financial problems.

Export tax

Similar to other export crops (such as cotton); unmanufactured tobacco is exempt from export taxes in order to incentivize the domestic industry to export to the lucrative markets, notably in Europe. As

[6] Mozambican Cotton Institute

there are no explicit taxes on export of tobacco, the only tax is the 2.5 percent of export price paid to Tobacco Authority which serves to finance its activities as the regulator of the tobacco sub-sector.

The processors export directly unmanufactured tobacco to the international market and they receive the full export price which is based on the price of unmanufactured tobacco in the world market minus the 2.5 percent tax paid to the regulator.

Import tariff

The local tobacco industry is protected with a tariff fixed at 2.5 percent for both raw and unmanufactured (but processed) tobacco, respectively. Import of cigarettes, cigars and tobacco attracts a maximum 20 percent import tariff. In addition, both imported and domestic produced cigarettes are subject to a VAT of 17 percent, and an excise duty of 65 percent.

Agriculture inputs subsidies and support services

As mentioned before, tobacco is produced under the concession scheme in Mozambique. Under this system, the concessionaires companies distribute free inputs (seed and fertilizer) during each cropping season as well as technical support to farmers during the critical period in the tobacco growing cycle – before and soon after the sowing period and in the yield formation period. This is part of the contractual arrangements between farmers (129,755 families) – government – processors. This also comprises the transportation of leaf tobacco from the farm gate to the factory. This support serves to incentivize smallholder farmers engaging in production of tobacco and reduce the risk of crop substitution. For the concession companies, it is more cost effective to provide support to the farmers and guarantee good quality of production, and concentrate their efforts in processing, which requires more complex curing process.

It is important to note that in practice, the subsidies provided by processors are not completely free, as the price paid to farmers (which is very low) is subject to a flat rate levy deducted by the processors from the payment they make to farmers at the end of the season, partly to recover the cost of supplying fertilizer, seeds, sprays and chemicals to all tobacco farmers. The difficulty to access data on a specific amount of subsidies received by farmers hampers the identification of the real impact of agricultural policy on smallholder farmers and to determine the exact level of budgetary transfers to tobacco farmers that were realized. This problem can be solved by public expenditure analysis, which is expected to take place under MAFAP in the future.

Regarding the government subsidies, the Mozambican government introduced in 2010 a production subsidies consisting of a 10 percent reduction of electricity price per kilowatt-hour aiming to incentivize the domestic industry, notably farmers which use electricity for food production. Tobacco producers and processors also benefited from this government subsidy.

3. DATA REQUIREMENTS, DESCRIPTION AND CALCULATION OF INDICATORS

To calculate the indicators to estimate incentives or disincentives to production (NRP)[7] as well as the Market Development Gaps (MDGs), several types of data are required. These data were collected and are presented and explained hereafter.

TRADE STATUS OF THE PRODUCTS

Unmanufactured tobacco is an export commodity in Mozambique for the whole period under analysis. Therefore, in our analysis, the trade status of the country is exporter for all years.

BENCHMARK PRICES

Observed

Calculating a reference parity price to determine whether Mozambique tobacco producers receive market incentives or disincentives requires establishing a benchmark border price. Since unmanufactured tobacco is an export commodity in Mozambique, a FOB price was calculated based on the unit value using data from UN COMTRADE. The FOB price is the average annual unit value of the unmanufactured tobacco and is shown in Table 1 below.

Table 1: Estimating the benchmark price of unmanufactured tobacco with unit value of Mozambican exports

Unmanufactured tobacco	2005	2006	2007	2008	2009	2010
FOB prices (USD/tonnes)	2,797	2,797	2,726	3,042	3,604	4,181

Source: UN COMTRADE

Table 1 above also shows that the export price of unmanufactured tobacco increased significantly under the period of analysis, reaching its maximum of USD 4,181 per ton in 2005, compared to 2,726 USD/ton in 2007.

Adjusted

No adjustments to the benchmark price have been made.

DOMESTIC PRICES

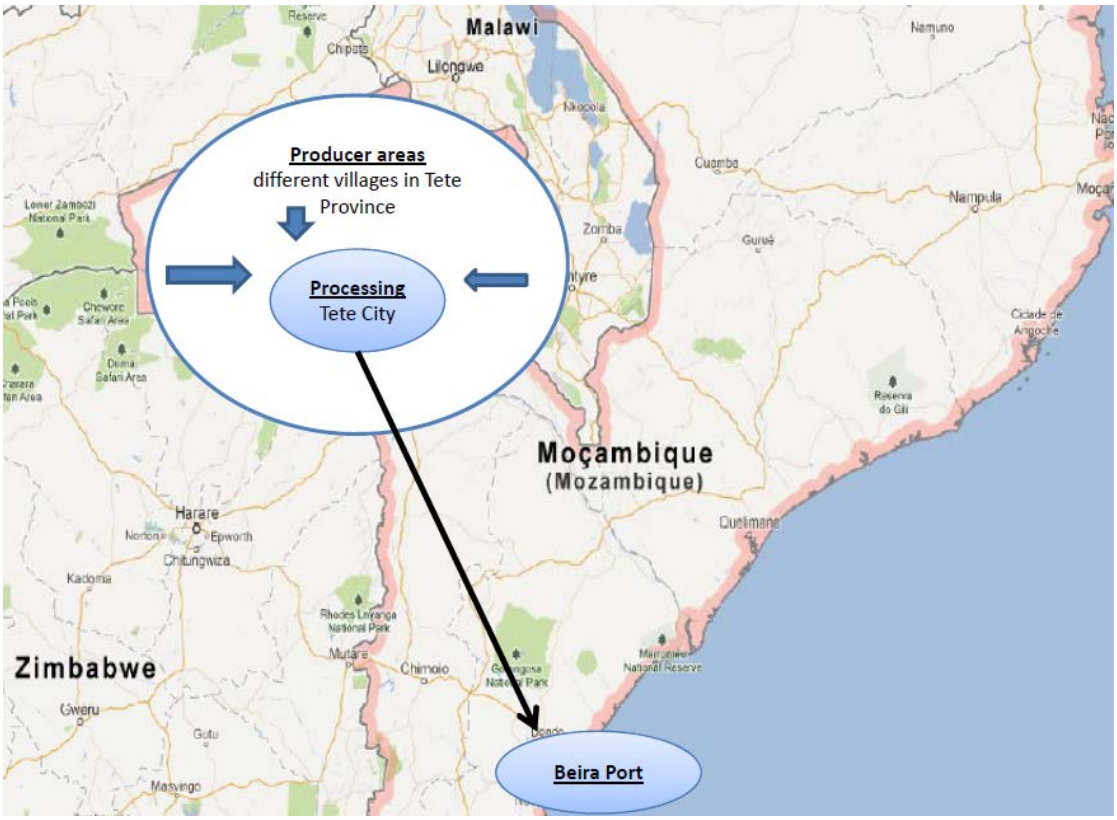
Observed

The industrial structure of tobacco in Mozambique means that processors are direct exporters and no price at the gate of the factory is reported, as a result. The market flow is between farm gate and border (Beira Port), where the Mozambican unmanufactured tobacco competes with the international tobacco. Therefore we only have one domestic price (farm gate price). We have constructed an artificial factory gate price by deducting the observed access costs from border to

[7] NRP - Nominal Rate of Protection.

factory which leads to a zero nominal rate of protection at ex-factory level. An overview of the analyzed product flow is given in Figure 6 below.

Figure 6: Overview of analyzed tobacco flows from Tete to Beira port



Source: Authors

Table 2 below shows that producer price of tobacco increased significantly over the period of analysis, reaching its maximum of 56 420 tonnes in 2010, compared to 37 875 tonnes in 2005. Similarly to the cotton sub-sector, producer price of tobacco is driven by the export prices (Table 1), evidencing that the volatility of prices and demand conditions in the international market are directly transmitted to producers. The data source for the producer price is the FAOSTAT.

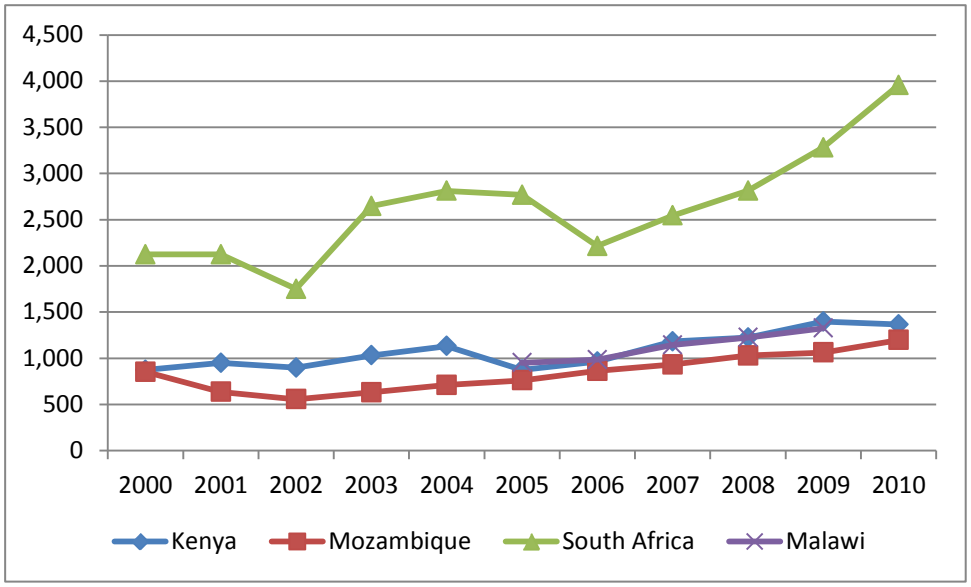
Table 2: Producer price of unmanufactured tobacco

Tobacco	2005	2006	2007	2008	2009	2010
Producer price (MT/ton)	37,875	40,110	44,599	49,098	50,061	56,420

Source FAOSTAT

As shown in the Figure 7, the price paid to farmers in Mozambique is lower compared to the prices of the other countries. This is partly attributed to the monopsonystic characteristic of the Mozambican tobacco sector, and the unbalanced bargaining power between concessionaires companies and farmers. Also the lack of competition between processor contributes to increasing their power in deciding the producer prices in the concession areas.

Figure 7: Price differences (unprocessed tobacco) between Mozambique, Kenya, Malawi and South Africa (USD/tonne)



Source: FAOSTAT

Adjusted

No adjustment to the benchmark prices has been made.

EXCHANGE RATES

Observed

The exchange rate between the Mozambican Metical and the United States Dollar has been taken from the IMF database on exchange rates. The average of the exchange rate for each year has been calculated from the monthly data reported in that database.

Table 3: Nominal exchange rate tonne/USD

Year	2005	2006	2007	2008	2009	2010
Nominal Exchange Rate	23.06	25.40	25.84	24.30	27.52	33.96

Source: IMF

As shown in Table 3, from 2006 to 2008 the nominal exchange rate was stable, with slight reduction in 2008. The stability of Metical against the dollar (from 2006 to 2008) was due to the good performance of the Mozambican economy as well as the results of monetary reforms introduced by the Central Bank of Mozambique during this period. From 2008, the nominal exchange rate increased slightly reaching its maximum of 33.96 tonne/USD in 2010 compared to 23.06 tonne/USD in 2005. This was driven largely by the discovery of new vast reserves of coal and natural gas in 2008/2009, which prompted several billion dollar investments by the world's largest mining and oil companies, contributing to real exchange rate appreciation, with negative impact on the real economy (notably export sector), including tobacco sub-sector. Official projection indicates that the nominal exchange rate is expected to continue appreciating as Foreign Direct Investment (as well as foreign aid) rise.

Adjusted

As there is neither explicit exchange rate policy nor foreign currency controls there is no justification to consider an adjusted exchange rate.

ACCESS COSTS

Unlike the other agricultural export crops, production and marketing of tobacco is mainly controlled by the private companies, who are both processors and exporters of tobacco. This partly constitutes a challenge in terms of data collection, such as costs and profit margins, as the companies are not incentivized to declare this information because of government taxes on profit margins. For example the unavailability of data on access costs from farm gate to factory constituted a challenge in the calculation of the ex-factory price -efforts are being made with government partners to collect accurate data on access cost.

Access cost are calculated for two different segments of the tobacco value chain, namely: i) the access cost from the farm gate (different villages in Tete province) to the factory (Tete city); and ii) from Tete city to Beira port in Sofala Province. In both routes, tobacco is shipped through road transport. It is important to note that; due to the unavailability of data on transport cost as well as on other components of the access cost for both segments of the tobacco value chain, the transport cost from farm gate to the factory was estimated using the costs of cotton. Because the unit of measure of the transport cost for both crops is MT/ton/km. Additionally, both sectors operate in a concessionaire system of production and the transport from the farm gate to the factory is provided by the concessionaire company. Regarding the access cost (notably transport and handling costs) for the segment of the tobacco factory - port; it was calculated using the costs provided by the DNA[8] for the sugar sub-sector. The costs provided by the DNA are related to the Beira corridor and the unmanufactured tobacco is mainly transported by road though the Beira corridor.

Observed

The observed access cost for both segments of the tobacco value chain (notably transport) was calculated using the average (tonne) provided by SIMA and the DNA. In both routes, tobacco is mainly shipped through road transport.

Farm gate to factory:

The distance between production villages and the factory is approximately 500 km. The main producing villages are located in the provinces of Tete, Niassa, Zambezia and Nampula (Figure 2). The processing factory is located in Tete province, is owned by the MLT Company and is operational since 2005[9]. The transport is provided by the concessionaire companies, as a result of the contractual arrangements between farmers association and concessionaires. The total observed access cost from the farm gate to factory ranges from 2 185 to 4 155 tonnes in 2005 and 2010, respectively - as shown in Table 4 below. The costs in this segment of the tobacco value chain are relatively low (compared to the costs factory - port). This is due to the fact that the majority of costs (notably transport cost)

[8] Distribuidora Nacional de Açúcar

[9] Prior to 2005, Mozambican tobacco was processed in the neighboring Malawi and Zimbabwe, due to the inexistence of processing facilities, according to what we mentioned before.

from farm gate to the factory are borne by concessionaire companies and they use economy of scale in their operations which reduces the costs.

Factory/Tete to border/Beira port:

The unmanufactured tobacco is mainly transported by road though the Beira corridor, the distance between Tete (processing factory) to Beira Port is 583 km and the infrastructure are relatively good. The processing cost is the main component of the access cost in this segment of tobacco value chain; it ranges from 6,451 tonnes in 2005 to 14 198 tonnes in 2010, as sown in Table 4 below. The other relevant components of access cost are profit margins, handling and transport cost.

Table 4: Observed access cost from farm gate – factory – Beira port (MT/tonne)

Access cost (tonne)	2005	2006	2007	2008	2009	2010
Farm gate to factory (Tete province)						
Estimated average distance (farmers - factory)	Operating within the distance of 500 km					
Transport cost (tonne)	572	600	687	620	594	605
Transaction fee (2.5% of export price)	1,613	1,776	1,761	1,848	2,479	3,549
Total	2,185	2,377	2,448	2,468	3,074	4,155
Factory (Tete province) - Beira port (exports to the EU market)						
Distance (processing factory - Beira port)	Approximately 583 Km					
Transport cost (tonne)	756	856	926	1,021	1,055	1,189
Handling cost (tonne)	1,404	1,590	1,719	1,897	1,959	2,207
Processing cost (10% of export price)	6,451	7,105	7,044	7,392	9,917	14,198
Margin (5% of export price)	3,225	3,553	3,522	3,696	4,959	7,099
Customs brokers (0.5% of FOB price)	323	355	352	370	496	710
Total	12,158	13,459	13,563	14,376	18,385	25,403

Source: SIMA, DNA and own calculation

Adjusted

We adjusted the access cost in the segment farm gate to factory by taking out the 2.5 percent transaction fees from the total access cost farm gate - factory. Regarding the segment factory - border, we adjusted the access cost by reducing 20 percent from both transport and handling cost, for the following reason: i) the rout Tete – Beira is in the Beira corridor, the transport cost (tonne) in this corridor is almost twice as expensive as in Maputo corridor (in tonne), and ii) the handling cost in the Beira port is also almost twice as expensive as in Maputo port (DNA, 2012). It is important to note that, the Beira corridor is a road and rail network linking large parts of Zambia, Malawi, Zimbabwe and Mozambique to the port of Beira on the Indian Ocean. The corridor is managed by private investors who control all the business along the corridor, i.e. they operate as a monopoly which leads to high transport and service costs in the corridor compared to the Maputo corridor, as the Beira port is the only viable alternative for exports by the majority of countries above mentioned. This penalizes domestic producers/companies who use the corridor for exports, including the tobacco subsector. In order to take into account this issue, we assume that in the absence of monopolies, the transport and handling costs should be approximately 20 percent less than the official costs reported by the authorities. This information was collected through interviews with transporters operating in Maputo and Beira corridors, and was confirmed by the experts from the National Distributor of Sugar (DNA).

However, the high access costs (notably transport and handling) in the Beira corridor could have contributed to the inefficiencies along the tobacco value chain (factory – Beira port), which is explained by the difference between the observed and adjusted access cost, as shown in the Annex II.

EXTERNALITIES

No externalities have been taken into account in the analysis.

BUDGET AND OTHER TRANSFERS

Although we are aware of the existence of some specific budget transfer to producers of tobacco as a result of subsidies on agricultural inputs to tobacco farmers, no specific data on the expenditures targeted towards tobacco production are currently available. As a consequence, we will only calculate NRPs and not NRAs at this stage.

QUALITY AND QUANTITY ADJUSTMENTS

A quantity adjustment of 0.9 has been applied because of weight losses during leaf processing. A quantity adjustment is justified as the weight loss is not the result of a natural process, but of factory processing to remove stalks and prepare the leaf for export (seem MAFAP technician note on tobacco in Malawi). It is important to note that, the quantity adjustment in Malawi is about 0.76. The lower level of the quantity adjustment in Mozambique (compared to Malawi) is partly attributed to the fact that the Mozambican processing factory is relatively new (was inaugurated in 2005), and is supposed to use modern technology which minimize weight losses during leaf processing.

DATA OVERVIEW

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

Table A1: Sources of data used in the calculations of indicators

		Description	
Concept		***Observed***	***Adjusted***
Benchmark price		*FOB price calculated as unit value from export data reported in UN COMTRADE (see Table 1)*	*N.A.*
Domestic price at point of competition		*Constructed by deducting from price difference between the benchmark price in local currency and observed access costs from Beira port to Tete (location of processing).*	*N.A.*
Domestic price at farm gate		*Annual average of producer price as reported by FAOSTAT (see Table 2)*	*N.A.*
Exchange rate		*Annual average of exchange rate as reported by IMF (see Table3)*	*N.A.*
Access cost to point of competition		*Handling and transport cost, processing cost, customs brokers, and 5% margin profit (see Table 4)*	*80% Handling and transport cost, processing cost, and 5% margin profit (see Table 4)*
Access costs to farm gate		*2.5 percent transaction fees and transport cost from farm to factory (see Table 4)*	*Transport cost (see Table 4)*
QT adjustment	Bor-Wh	*N.A.*	*N.A.*
	Wh-FG	*0.9 quantity adjustment was applied because of weight losses during leaf processing*	*N.A.*
QL adjustment	Bor-Wh	*N.A*	*N.A.*
	Wh-FG	*N.A.*	*N.A.*

Source: authors

The data used for this analysis is summarized below.

Table A2: Data and values used in the calculations of indicators

		Year	2005	2006	2007	2008	2009	2010
DATA	**Unit**	**Trade status**	**x**	**x**	**x**	**x**	**x**	**x**
Benchmark Price		Symbol						
Observed	USD/TONNE	Pb(int$)	2,797.26	2,797.26	2,725.90	3,041.95	3,603.85	4,180.72
Adjusted	USD/TONNE	Pba						
Exchange Rate								
Observed	MT/USD	ERo	23.06	25.4	25.84	24.3	27.52	33.96
Adjusted	MT/USD	ERa						
Access costs border - point of competition								
Observed	MT/TONNE	ACowh	12,158.32	13,458.72	13,563.12	14,376.21	18,384.91	25,402.54
Adjusted	MT/TONNE	ACawh	11,403.85	12,614.34	12,681.89	13,422.93	17,286.39	24,013.45
Domestic price at point of competition	MT/TONNE	Pdwh	52,349.12	57,593.80	56,875.11	59,545.23	80,786.86	116,575.05
Access costs point of competition - farm gate								
Observed	MT/TONNE	ACofg	2,184.54	2,376.61	2,447.71	2,468.27	3,073.69	4,154.91
Adjusted	MT/TONNE	ACafg	571.85	600.29	686.75	620.23	594.4	605.47
Farm gate price	MT/TONNE	Pdfg	37,875.21	40,109.70	44,599.10	49,097.90	50,061.20	56,419.59
Externalities associated with production	MT/TONNE	E						
Budget and other product related transfers	MT/TONNE	BOT						
Quantity conversion factor (border - point of competition)	Fraction	QTwh	0.9	0.9	0.9	0.9	0.9	0.9
Quality conversion factor (border - point of competition)	Fraction	QLwh						
Quantity conversion factor (point of competition - farm gate)	Fraction	QTfg						
Quality conversion factor (point of competition - farm gate)	Fraction	QLfg						

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.

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 NRP*o* generate the NRP*a* indicators. Comparison of the different rates of protection identifies where market development gaps can be found and reduced.

In this analysis, only Nominal Rates of Protection were calculated and the results are presented in Tables 5 and 6 below.

Table 5: MAFAP price gaps for tobacco in Mozambique (MT/tonne)

	2005	2006	2007	2008	2009	2010
Trade status for the year	x	x	x	x	x	x
Observed price gap at farm gate	(5,839)	(8,002)	(2,784.48)	(587)	(17,735)	(41,803)
Adjusted price gap at farm gate	(8,206)	(10,623)	(5,427)	(3,388)	(21,313)	(46,741)

Source: Own calculations using data as described above.

Table 6: MAFAP nominal rates of protection (NRP) for tobacco in Mozambique

	2005	2006	2007	2008	2009	2010
Trade status for the year	x	x	x	x	x	x
Observed NRP at farm gate	-13.36%	-16.63%	-5.88%	-1.18%	-26.16%	-42.56%
Adjusted NRP at farm gate	-17.81%	-20.94%	-10.85%	-6.46%	-29.86%	-45.31%

Source: Own calculations using data as described above.

Table 7: MAFAP Market Development Gaps for tobacco in Mozambique (MT/tonne)

	2005	2006	2007	2008	2009	2010
Trade status for the year	x	x	x	x	x	x
International markets gap (IRG)	-	-	-	-	-	-
Exchange policy gap (ERPG)	-	-	-	-	-	-
Access costs gap to wholesale (ACGwh)	-754	-844	-881	-953	-1,099	-1,389
Access costs gap to farm gate (ACG_{fg})	-1,613	-1,776	-1,761	-1,848	-2,479	-3,549
Externality gap	-	-	-	-	-	-

Source: Own calculations using data as described above.

4. INTERPRETATION OF THE INDICATORS

Figures 8 and 9 below shows price gaps and nominal rate of protection for tobacco producers in central and northern Mozambique. The price gaps provide an absolute measure of the deviation of domestic price from the comparable export price, while the nominal rate of protection is the price gap in relative terms. The market development gap measures the deviation between the observed and adjusted access costs from farm gate to wholesale, which is important to identify potential inefficiencies along the value chain. In this analysis, only the farm gate indicators were considered, because there is no wholesale market in the segment of the unmanufactured tobacco value chain in Mozambique, and the market flow is between farm gate and border – where the domestic unmanufactured tobacco competes with the international unmanufactured tobacco.

Similar to other export crops, such as tobacco and sugarcane, there are no explicit taxes or subsidies on exports of tobacco except the 2.5 percent of export price paid to Tobacco Authority to finance its activities. The processors export directly unmanufactured tobacco to the international market and they receive the full export price which is based on the price of unmanufactured tobacco in the world market minus the 2.5 percent tax paid to the regulator. Consequently, the estimated observed NRPs at the point of competition by definition should be zero while the adjusted NRP is -2.5 percent. This represents the minimum support provided to tobacco exporters through elimination of all potential policy distortions at the point of competition.

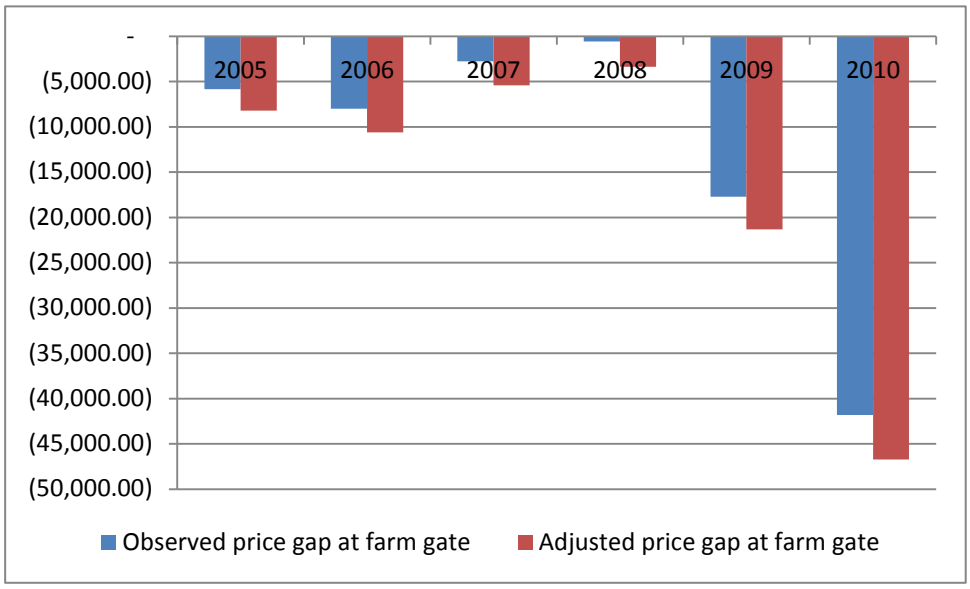
The observed and adjusted price gaps at farm gate are negative in all years analyzed, with substantial increase in absolute value in 2009 and 2010, indicating a strong deviation of producer price from the reference price in all years under analysis. The price gaps (observed) range from -5 838 MT/tonnes in 2005 to -41 803 MT/tonnes in 2010. Regarding the NRP, it is negative in all years under analysis and ranges (observed) from -1.2 percent in 2008 to -43 percent in 2010, indicating disincentives to tobacco producers (Figure 9), suggesting that they are receiving prices below the reference price.

Similar to other export crops (such as cotton), the disincentive at farm level need to be attributed to factors other than government policies as there are no explicit taxes or subsidies on the export of tobacco. This factor includes the functioning of the tobacco market and lack of competition due to monopsony (processors) in the tobacco sub-sector. Additionally, tobacco marketing and trade is entirely controlled by the private companies, which are not incentivized to share any kind of information related to the sector (costs and profit margins) to avoid government taxes on profit margins. In this regard, we suspect the existence of excessive profit margins at the processor level resulting from asymmetric information and unbalanced market power between processors and farmers, which may also explain the disincentive at farm level. The indicative price is set low at the beginning of the cropping season, while the export price is based on prices after harvesting, which tends to benefit processors as they are direct exporters.

In 2007 and 2008, peak of the international food price crisis, the incentive on tobacco producers improved significantly, in line with the increase of producer price as a result of increase of international prices (Table 1 and Table 2), which was translated into incentive to producers, even if it was not sufficient enough to contribute to positive NRPs.

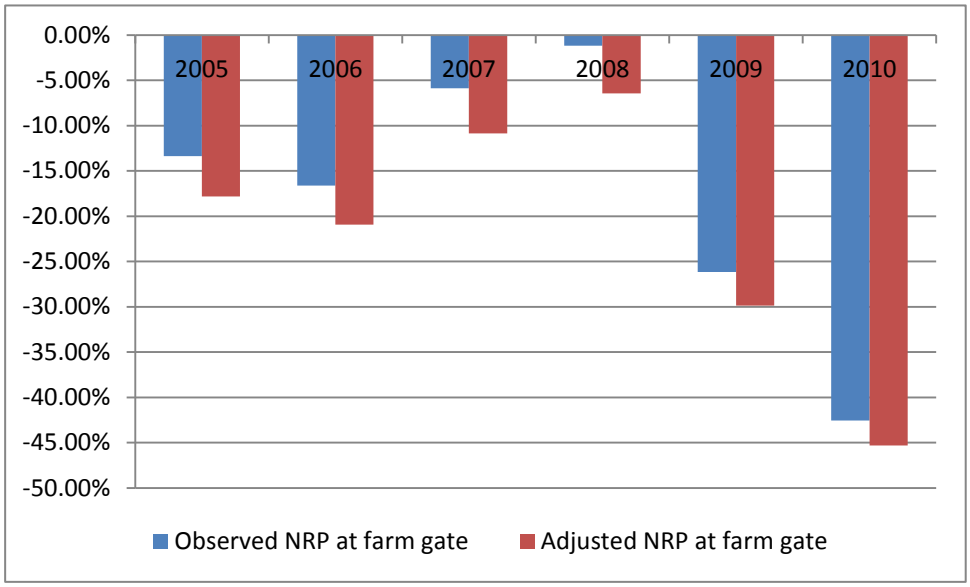
Regarding the difference between observed and adjusted NRP (Figure 10); it suggests limited efficiency gains along the value chain. A better value chain functioning from farm gate to the point of competition should address the excessive indirect tariffs (such as excise tax) and asymmetrical distribution of market power between processors and farmers due to the concessionary system in place. This difference (observed Vs. adjusted NRP) constitutes a market development gap, as shown by the negative access cost to farm gate in Figure 10, which means that through investment and increased competition, notably abolition of monopsony on tobacco sub-sector, the market access costs gap to farm gate could be reduced by up to 3 549 MT/ton, for example in 2010 (Figure 10).

Figure 8: Observed and adjusted price gaps for cotton at wholesale and farm gate in Mozambique (MT/tonne)



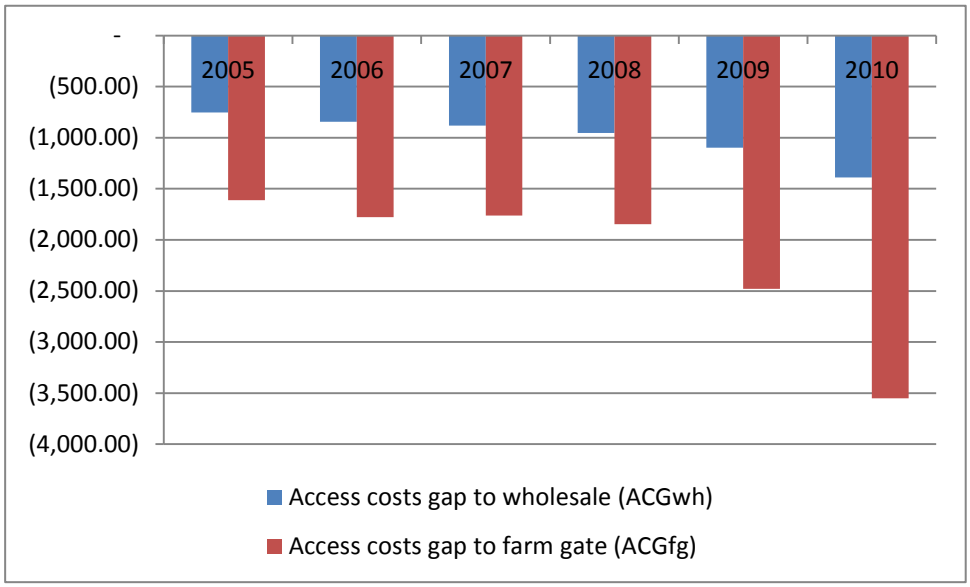
Source: MAFAP

Figure 9: Observed and adjusted NRP for cotton at wholesale and farm gate in Mozambique (2005 - 2010)



Source: MAFAP

Figure 10: Market Development Gap for cotton in Mozambique (MT/tonne)



Source: MAFAP

5. PRELIMINARY CONCLUSIONS AND RECOMMENDATIONS

MAIN MESSAGE

Overall our indicators (observed) shows that the effect of policy and regulation, i.e. the government policy of fixation of the minimum producer price of tobacco and the concession of monopsony to tobacco millers has created disincentives to tobacco producers, suggesting that these government policies are more supportive to millers than tobacco growers. However, as in the cotton sub-sector, the introduction of reforms to eliminate the monopsony system which constitutes a barrier for competition in the sector, would contribute to increasing the price paid to farmers and reducing the deviation of the farm gate price from the reference price. Also, similar to the sugar-cane sector, the tobacco chain is vertically integrated and therefore profit margins are generally captured at the marketing level and not at production level.

PRELIMINARY RECOMMENDATIONS

Given the growth in tobacco production and the capacity of processing in recent years, there is a need to adopt/develop specific policies targeting the tobacco subsector, such as the elimination of monopsony in order to increase the competiveness in the sector. Overall the suggested policy reforms could include the following measures:

- Liberalization of the tobacco sector, which will eliminate the monopsony. Costs can drop significantly when the power of monopolistic structures is constrained. This could lead to higher producer prices that benefit growers directly as the price paid to farmers is generally very low after deducting all costs including handling and profit margins;
- Policy measures to empower farmers association will be important for example in the negotiation of the minimum price. According to the World Bank (2010), the Mozambican farmers association is one of the weakest in Africa, this is visible by the low producer prices in Figure 6 compared to other countries;
- Collaboration with local consultants will be helpful in collecting data directly from the processing companies, as the data (notably access costs) is not easy to obtain from the official data sources;

Policies aiming to lower access costs in the Beira corridor (notably transport and handling costs), would contribute to improving the competitiveness of the Mozambican tobacco industry.

LIMITATIONS

Data issues:

- the unavailability of value chain analysis on tobacco sub-sector in Mozambique, created problems in accessing data on access cost and in the calculation of indicators;
- the inexistence of association of tobacco processors and official government entity with the responsibility to regulate the tobacco sub-sector (such as Cotton Institute in the cotton sub-sector), created limitations on data collection and difficulties for deeper analysis to better understand the real costs in the sector;
- quality of data constitutes a limitation in the calculation of indicators.

Other issues:

- the unavailability of data on input subsidies desegregated by commodity, as well as data on other Government measures creates problems in identification of the real impact of the policies.

FURTHER INVESTIGATION AND RESEARCH

Further analysis to better understand the components of the access cost (notably processing costs and profit margins) will be helpful to strengthen our understanding of the market development gap in the value chain analysis.

Conduct an analysis of the input subsidies to the tobacco sector in order to estimate the level of budgetary transfers and the Nominal Rates of Assistance; will be important to better understand the real impact of the government policies on tobacco producers.

Further analysis on the impact of diverting inputs meant for production of tobacco to produce other staple crops on the production and productivity of the tobacco sector.

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ANNEX I: Methodology Used

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

ANNEX II: Data and calculations used in the analysis

	Name of product		Tobacco								
	International currency		US Dollars (USD)			Local currency		Meticals (MT)			
					Year	2005	2006	2007	2008	2009	2010
	DATA		Unit	Symbol	trade status	x	x	x	x	x	x
	Benchmark Price										
1		*Observed*	USD/TONNE	$P_{b(int\$)}$		2,797.26	2,797.26	2,725.90	3,041.95	3,603.85	4,180.72
1b		*Adjusted*	USD/TONNE	P_{ba}							
	Exchange Rate										
2		*Observed*	MT/USD	ER_o		23.06	25.40	25.84	24.30	27.52	33.96
2b		*Adjusted*	MT/USD	ER_a							
	Access costs border - point of competition										
3		*Observed*	MT/TONNE	ACo_{wh}		12,158.32	13,458.72	13,563.12	14,376.21	18,384.91	25,402.54
3b		*Adjusted*	MT/TONNE	ACa_{wh}		11,403.85	12,614.34	12,681.89	13,422.93	17,286.39	24,013.45
4	**Domestic price at point of competition**		MT/TONNE	P_{dwh}		52,349.12	57,593.80	56,875.11	59,545.23	80,786.86	116,575.05
	Access costs point of competition - farm gate										
5		*Observed*	MT/TONNE	ACo_{fg}		2,184.54	2,376.61	2,447.71	2,468.27	3,073.69	4,154.91
5b		*Adjusted*	MT/TONNE	ACa_{fg}		571.85	600.29	686.75	620.23	594.40	605.47
6	**Farm gate price**		MT/TONNE	P_{dfg}		37,875.21	40,109.70	44,599.10	49,097.90	50,061.20	56,419.59
7	Externalities associated with production		MT/TONNE	E							
8	Budget and other product related transfers		MT/TONNE	BOT							
	Quantity conversion factor (border - point of competition)		Fraction	QT_{wh}		0.90	0.90	0.90	0.90	0.90	0.90
	Quality conversion factor (border - point of competition)		Fraction	QL_{wh}							
	Quantity conversion factor (point of competition - farm gate)		Fraction	QT_{fg}							
	Quality conversion factor (point of competition - farm gate)		Fraction	QL_{fg}							
	CALCULATED PRICES		*Unit*	*Symbol*		*2005*	*2006*	*2007*	*2008*	*2009*	*2010*
	Benchmark price in local currency										
9		*Observed*	MT/TONNE	$P_{b(loc\$)}$		64,507.44	71,052.51	70,438.24	73,921.44	99,171.77	141,977.59
10		*Adjusted*	MT/TONNE	$P_{b(loc\$)a}$		64,507.44	71,052.51	70,438.24	73,921.44	99,171.77	141,977.59
	Reference Price at point of competition										
11		*Observed*	MT/TONNE	RPo_{wh}		45,898.38	50,488.54	49,831.29	52,153.09	70,869.68	102,377.29
12		*Adjusted*	MT/TONNE	RPa_{wh}		46,652.85	51,332.92	50,712.52	53,106.37	71,968.20	103,766.38
	Reference Price at Farm Gate										
13		*Observed*	MT/TONNE	RPo_{fg}		43,713.84	48,111.94	47,383.58	49,684.82	67,795.99	98,222.38
14		*Adjusted*	MT/TONNE	RPa_{fg}		46,081.00	50,732.63	50,025.77	52,486.14	71,373.80	103,160.91
	INDICATORS		*Unit*	*Symbol*		*2005*	*2006*	*2007*	*2008*	*2009*	*2010*
	Price gap at point of competition										
15		*Observed*	MT/TONNE	PGo_{wh}		6,450.74	7,105.25	7,043.82	7,392.14	9,917.18	14,197.76
16		*Adjusted*	MT/TONNE	PGa_{wh}		5,696.27	6,260.87	6,162.59	6,438.86	8,818.66	12,808.67
	Price gap at farm gate										
17		*Observed*	MT/TONNE	PGo_{fg}		(5,838.63)	(8,002.24)	(2,784.48)	(586.92)	(17,734.79)	(41,802.79)
18		*Adjusted*	MT/TONNE	PGa_{fg}		(8,205.79)	(10,622.93)	(5,426.67)	(3,388.24)	(21,312.60)	(46,741.32)
	Nominal rate of protection at point of competition										
19		*Observed*	%	$NRPo_{wh}$		14.1%	14.1%	14.1%	14.2%	14.0%	13.9%
20		*Adjusted*	%	$NRPa_{wh}$		12.2%	12.2%	12.2%	12.1%	12.3%	12.3%
	Nominal rate of protection at farm gate										
21		*Observed*	%	$NRPo_{fg}$		-13.4%	-16.6%	-5.9%	-1.2%	-26.2%	-42.6%
22		*Adjusted*	%	$NRPa_{fg}$		-17.8%	-20.9%	-10.8%	-6.5%	-29.9%	-45.3%
	Nominal rate of assistance										
23		*Observed*	%	NRAo		-13.4%	-16.6%	-5.9%	-1.2%	-26.2%	-42.6%
24		*Adjusted*	%	NRAa		-17.8%	-20.9%	-10.8%	-6.5%	-29.9%	-45.3%

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