MAFAP
SPAAA

Monitoring African Food and Agricultural Policies

Suivi des politiques agricoles et alimentaires en Afrique

ANALYSIS OF INCENTIVES AND DISINCENTIVES FOR MAIZE IN MALAWI

OCTOBER 2012

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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CONTENTS

1. PURPOSE OF THE NOTE

This technical note aims to describe the market incentives and disincentives for maize in Malawi. 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 Chapter 3.

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

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

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

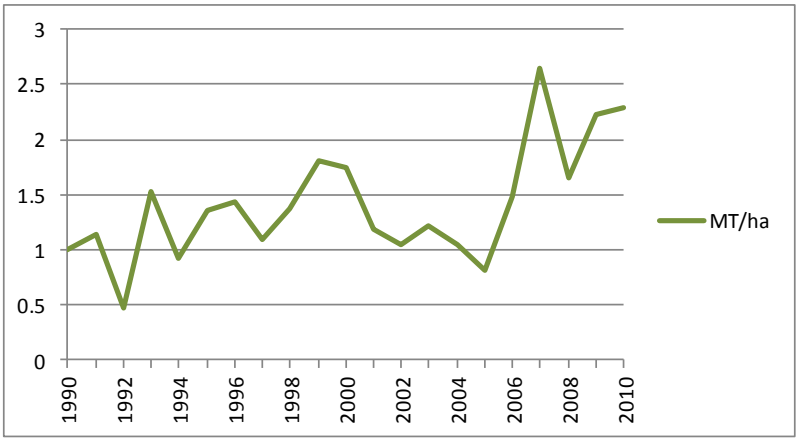
2. COMMODITY CONTEXT

White maize is Malawi's main staple crop and of great strategic importance. The country's food security is generally defined in terms of adequate availability of and access to maize and per capita maize consumption is among the highest in Africa. The crop is almost exclusively produced by small farmers, and it is estimated that 97 percent of small producers cultivate maize. The need to ensure low maize prices for consumers while at the same time improving income for small farmers constitutes a constant food price dilemma for policy makers in Malawi. For that reason, the maize market has been the primary target of food and agricultural policy interventions in Malawi. Therefore, government policy in this area needs to tread a fine line between providing attractive incentives to producers and keeping cereals prices low enough to guarantee access to maize for poor consumers. A well-functioning maize market is a key condition for reducing food insecurity in Malawi.

PRODUCTION

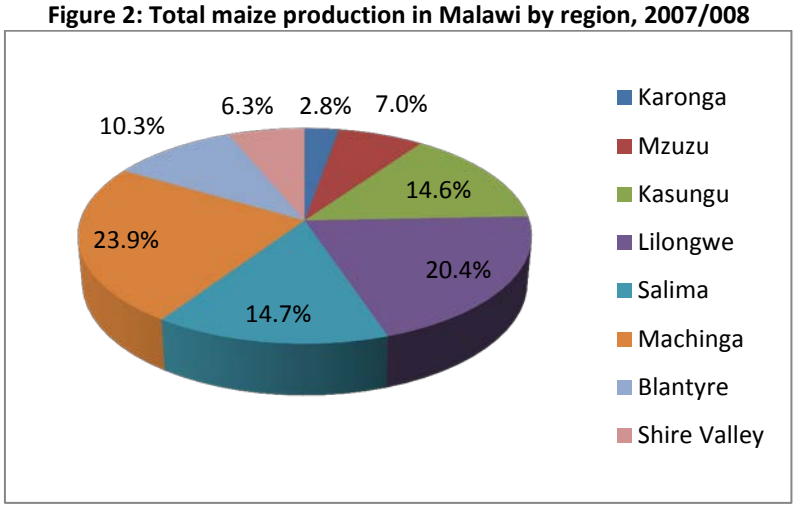
In contrast to other countries in Sub-Saharan Africa, where maize production growth generally has been below the level of total cereal production increases, Malawi has witnessed a 77 percent growth in total maize production since 1985. From 1980 to 2010, the total harvested area for maize in Malawi increased from 1.14 million to 1.65 million hectares. In the same period however, production more than tripled from 1.2 million to 3.8 million tons. In the period 1990 to 2010, yields have increased from 0.99 to 2.3 tons per hectare, as shown in Figure 1. When taking a closer look, this strong increase in production and yields has largely been realized since 2006 and is generally considered to be related to the Farm Input Subsidy programme that is in effect since the 2005/2006 harvest season, as well as favorable weather conditions (USAID Staple Foods Value Chain Analysis, 2009)

Figure 1: Average maize yields in Malawi 1990 - 2010, MT/ha



Source: FAOSTAT

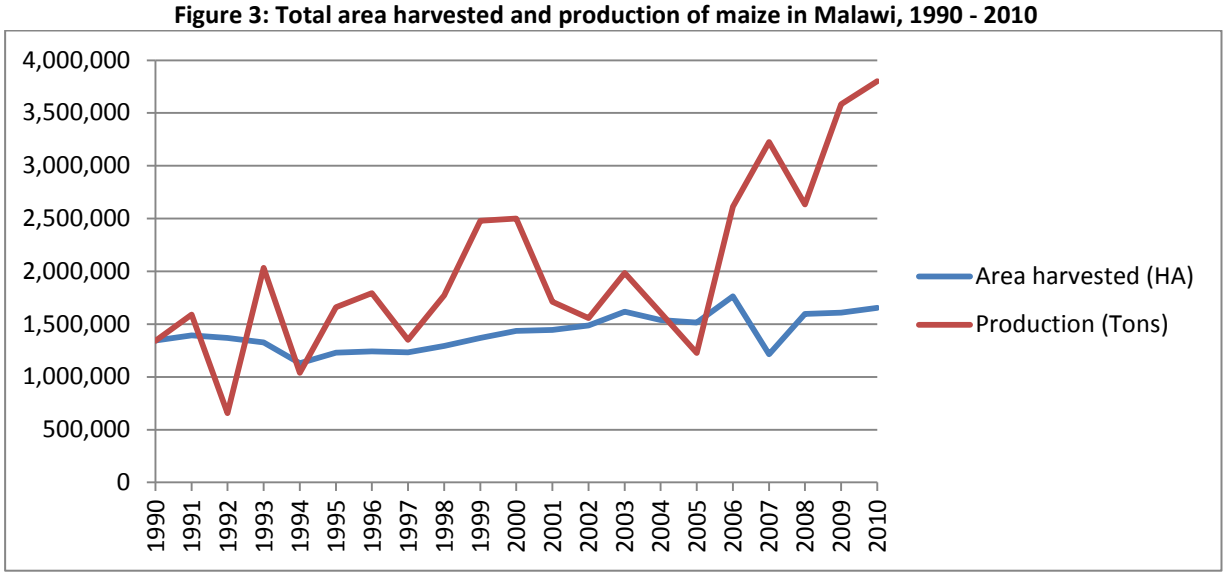
Figure 2: Total maize production in Malawi by region, 2007/008



Source: USAID, 2009

The distribution of maize production by region is shown in Figure 2. The central region of Malawi is the main production area. In 2007/8, it represented 59 percent of total production. The Southern Region counts with 45 percent of the country's population but only 17 percent of total maize production in 2007/8. As indicated by FEWSNET reports, it is also the main deficit area. Almost all maize production is rain-fed and produced by small farmers, occupying 54 percent of small producers' cultivated land. The average farm size of smallholder producers in Malawi amounts to 0.5-0.8 hectare. The smallest farms are located in the southern region, where population density is higher.

Figure 3: Total area harvested and production of maize in Malawi, 1990 - 2010



Source: FAOSTAT

The considerable growth of total maize production has resulted in some maize surpluses notably in 2007 when exports amounted to 391,225 tons (12 percent of total production). Up until 2005 however, maize production generally showed only marginal increases (total maize production in 2005 was only 3.3 percent above production in 1980) and a high volatility in total production volume. A number of factors can be identified as key constraints to increased production levels, including (1) the continual cultivation of maize on the same land without addition of fertilizers leading to low

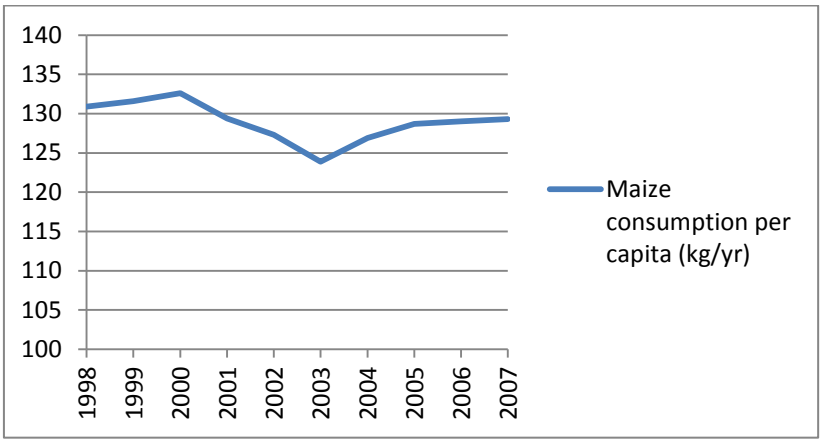
yields, which on their turn lead to inability to afford the purchase of inputs, (2) high input prices and access costs due to low volumes of demand and poor infrastructure, (3) reduced investment in production as a result of low traded volumes and thin markets (as between 85-90 percent of maize is consumed within households and villages) and (4) high price variability for maize sellers, buyers and traders due to ad-hoc government intervention (Dorward and Chirwa, 2011).

CONSUMPTION/UTILIZATION

Chimanga ndi moyo – maize is life – is a famous Malawian saying, and underlines the importance of maize as the main staple food for Malawians. According to FAOSTAT Food Balance Sheets, the annual maize consumption per head in Malawi in 2007 amounted to 129.3 kilograms. As such, it makes up almost 90 percent of the total intake of cereals and 54 percent of the total caloric intake per capita.

Total maize consumption has grown primarily as a result of population growth. The population of Malawi has grown on average 2.8 percent per year in the period 1998-2008 (National Statistics Office, 2008). As shown in Figure 2, per capita maize consumption remained stable throughout that period, averaging 129 kg per year.

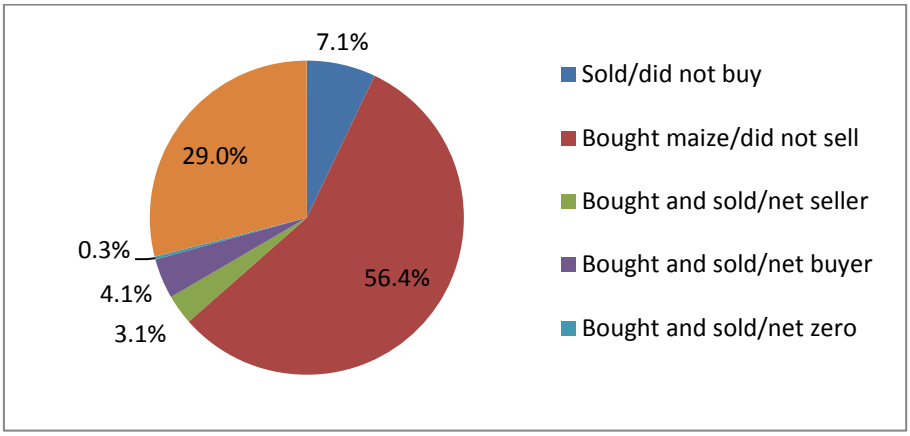
Figure 3: Malawi maize consumption per capita, 1998 - 2007 (kg/year)



Source: FAOSTAT Food Balance Sheets

Since maize is Malawi's main food crop, it should be noted that a large share of smallholder maize production is not traded but consumed by producer households. In the period 2003 – 2009, it is estimated that only 10-15 percent of maize produced by smallholder farms was marketed (Jayne et al, 2010). As shown in Figure 4, roughly 7 to 10 percent of rural households buy and sell grain in the same year. These largely consist of relatively poor households that make distress sales of grain after harvest in order to meet immediate cash needs, only to buy back later in the season at higher prices.

Figure 4: Maize market positions of rural households in Malawi, 2007/8

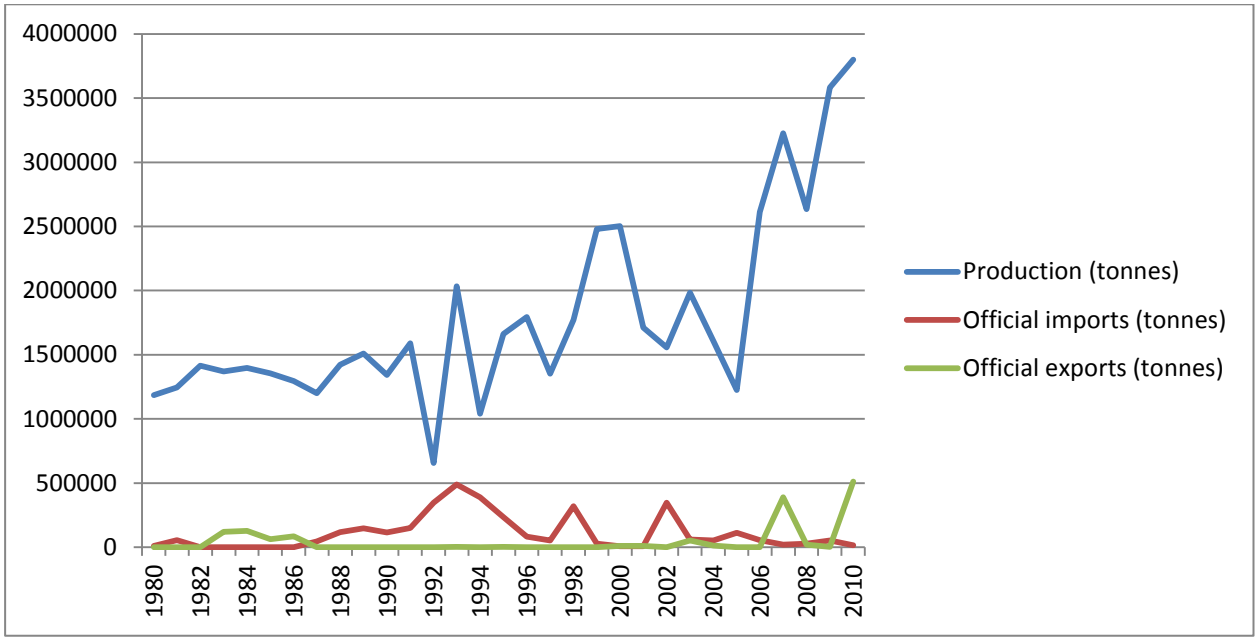


Source: Jayne et al, 2010

MARKETING AND TRADE

As demonstrated in Table 1, Malawi is practically self-sufficient in its production of maize and traded volumes are relatively limited in comparison to total production. In terms of volume, COMTRADE data shows that Malawi was a net importer of maize in four of the six years under review. In 2007 and 2010, the country was a net exporter of maize.

Figure 5: Malawi maize production and trade between 1980 and 2010



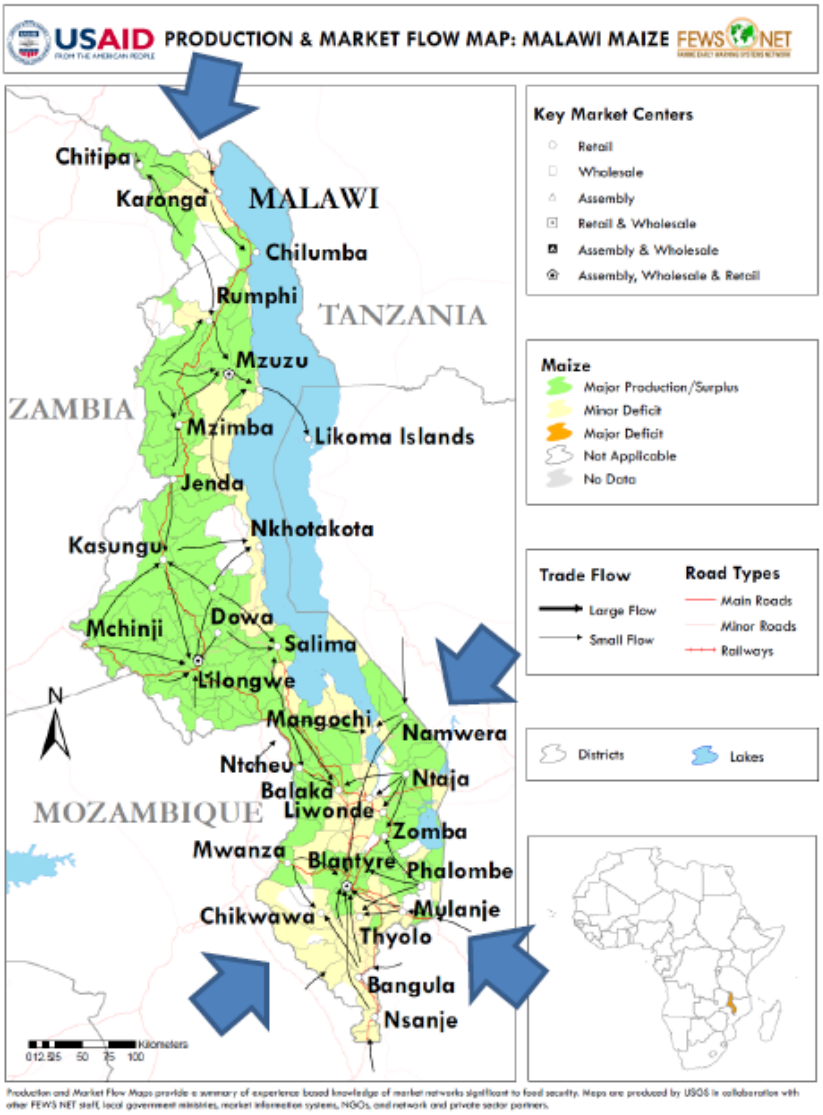
Source: FAOSTAT, UN COMTRADE

Table 1: Malawi maize production and trade in tons

	2005	2006	2007	2008	2009	2010
Production	1,225,230	2,611,490	3,226,420	2,634,700	3,767,410	3,800,000
Imports	113,300	55,808	20,180	28,176	54,416	15,395
Exports	467	1,160	391,255	21,438	3,665	511,369
Self-sufficiency ratio	91.6%	98.0%	113.0%	99.7%	98.7%	115.0%

Sources: FAOSTAT, UN COMTRADE

A closer look at the data demonstrates that these exports were largely based on government-to-government export agreements, carried out by the private Grain Traders Association of Malawi and monitored by the National Food Reserve Agency (NFRA). After a record harvest in 2007, the Malawi Government concluded an export agreement to supply food-deficit Zimbabwe with almost 400,000 tonnes of maize. In 2010, a total of 511,369 tonnes were exported, mainly to Zimbabwe and Kenya that were affected by drought and increased food shortages. These exports took place with special authorization from the Ministry of Agriculture and Food Security.



Source: FEWSNET with author's adjustments

In other years (2005, 2006, 2008, 2009), COMTRADE data indicates that Malawi was a net importer of maize in terms of volume. Surpluses from Mozambique were imported to supply Malawi's main maize deficit region in the south, while imports from Tanzania supplied the Northern Region. Imports were largest during the food crisis of 2005, when the official imported volume of maize amounted to 113 300 tonnes.

Besides these official trade figures and as shown in Table 2, significant informal cross-border trade takes place between Malawi and Mozambique and, to a lesser extent, Tanzania and Zambia. According to FEWSNET reports on cross-border trade, in 2005/2006 informal imports of maize into Malawi are estimated to amount to 156 499 tonnes. Though the 2007-2009 crop seasons have generally witnessed good harvests, FEWSNET reports indicate that informal imports significantly exceeded exports throughout the entire period under review. This could suggest that the price of Malawi maize is not competitive in neighboring countries' markets. It also suggests that the official exports to Zimbabwe and Kenya mainly consisted of produce from the surplus region in Central

Malawi, while at the same time maize was imported from Mozambique and Tanzania to supply structural maize deficit areas in Northern and Southern Malawi. The reason that informal exports did not surge in the bumper harvest years could be due to the fact that Malawi's surplus regions are situated near high production areas in Zambia and Tanzania (USAID Staple Food Value Chain Analysis, 2009).

Table 2: Informal cross-border trade between Malawi, Tanzania, Mozambique, 2005/6 – 2009/10

in MT		2005/6	2006/7	2007/8	2008/9	2009/10
export to	Mozambique	133	591	3755	203	6124
export to	Tanzania	944	2928	1581	239	6031
import from	Mozambique	71218	77394	56078	54223	60399
import from	Tanzania	84862	1888	1073	2910	89

Source: FEWSNET

Since the official exports mainly consist of a limited number of government-brokered and authorized agreements with neighboring countries facing food crises and the volume of informal imports is structurally higher than exports throughout the entire period under review, the market incentives and disincentives analysis will consider maize an import crop for the purpose of the calculation of a benchmark price.

International trade agreements

Malawi was one of the founding members of the Common Market for Eastern and Southern Africa (COMESA), established in 1994 and followed by the establishment of the COMESA Free Trade Area in 2000. Since 2009, a Customs Union is in effect with one common external tariff, which consists of zero percent for capital goods and raw materials, 10 percent for intermediate goods and 25 percent for finished products (WTO Malawi Trade Policy Review, 2010). Malawi is also a member of the South African Development Community (SADC), under which a Free Trade Area is in effect since 2008. According to authorities, Malawi's dual participation in both free trade regimes has so far not caused any conflicts.

Though quantitative restrictions may be imposed, maize grain is tax-free in the tariff schedule. This is consistent with the 'maize without borders' policy of COMESA. Imports of maize (grain) from other origins are also duty-free. Maize meal is imported duty-free from COMESA member countries, but a customs duty of 10 percent is applied when imported from SADC countries and 10-15 from elsewhere.

Exports of maize grain are restricted through a system of export licensing requirements and intermittent export bans.

Figure 6: Maps of COMESA (left) and SADC member countries

DESCRIPTION OF VALUE CHAIN AND PROCESSING

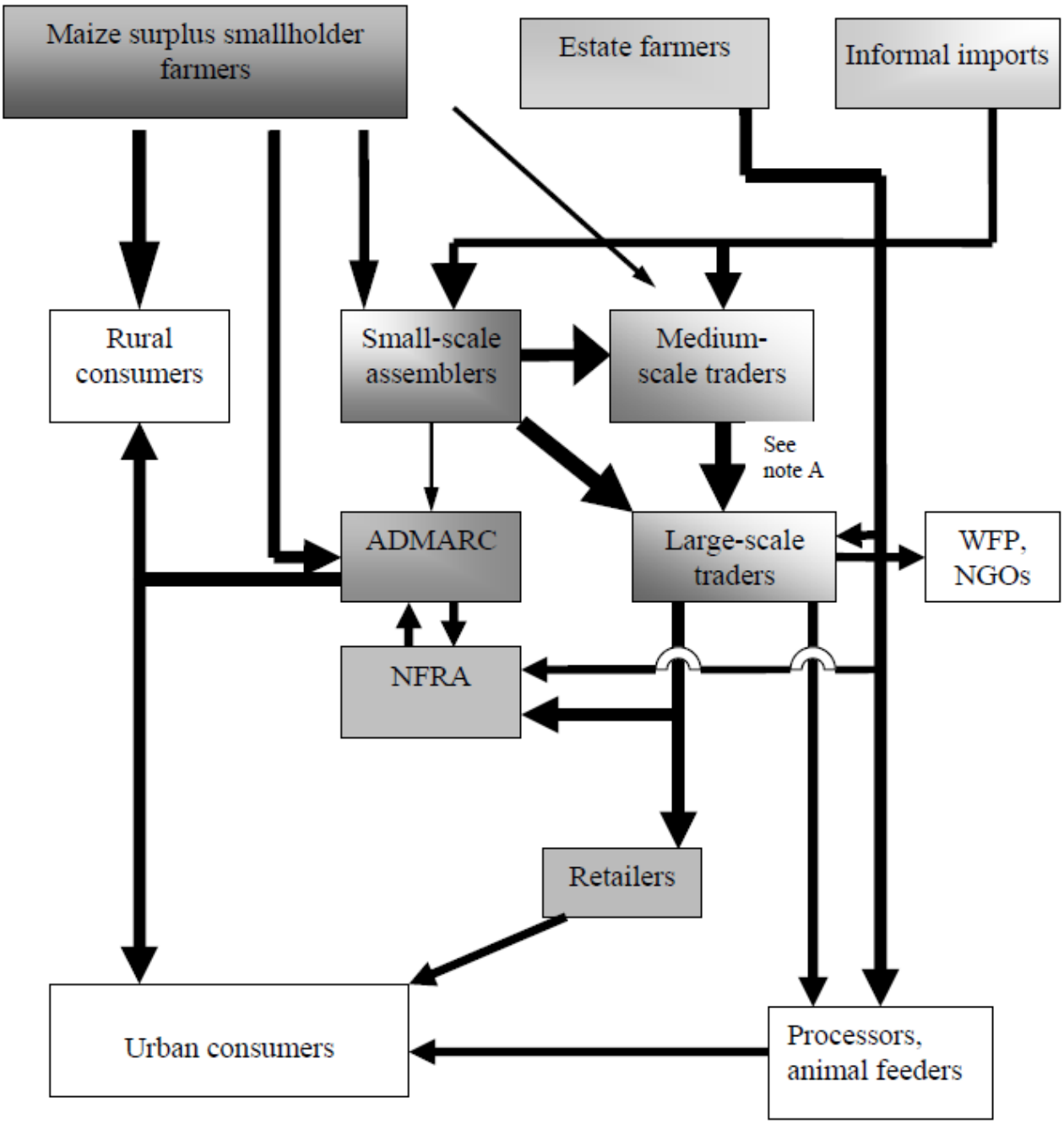
The 10-15 percent of total maize production that is traded is marketed through different channels. While before liberalization maize was exclusively marketed through the parastatal Agricultural Development and Marketing Corporation (ADMARC), farmers now also conduct direct sales to households, or sell their produce to small traders, medium/large traders, as demonstrated in the diagram of Figure 7. In 2008, approximately only 8 percent of the maize sold by farmers was marketed through ADMARC, while roughly 75 percent was marketed through private traders. The remainder is sold directly on the local market.

Private traders usually have a vehicle and access to storage facilities. This enables them to buy from producers when the price is low, immediately pre or post harvest, and to sell stocks when prices are higher from December to March. A high number of operators act at the primary assembly level and the market is characterized by a high degree of competition. Large scale traders often buy from small-scale traders and not directly from producers. This allows them to obtain larger volumes and reduce transaction costs (USAID Staple Foods Value Chain Analysis, 2009). These large traders also supply the National Food Reserve Agency and contract requirements with the World Food Program,

Non-Governmental Organizations and institutions. As shown in Figure 6, large traders and farms also supply maize to processing companies that produce maize flour and animal feeds.

It is important to note that a two-way flow of grain between wholesalers and small traders exists. Early in the harvesting season small-traders sell their assembled maize to larger traders who are generally known as wholesalers and have access to better storage facilities. When prices increase later in the season, wholesalers sell maize to small-traders who sell to consumers in rural markets (Jayne et al, 2010).

Figure 7: Marketing chain for maize



Source: Jayne et al, 2010

POLICY DECISIONS AND MEASURES

The Government of Malawi, in its Agriculture Sector Wide Approach (ASWAp), expresses the following key current priorities for agriculture and food security:

Long and Medium Term Goals
Increase agriculture productivity
No food shortages even in times of disasters
Increased exports of food staples
Increase the contribution of agro-processing to economic growth, move up the value chain in key crops, increase export of processed products
Open up the linkages to the sea

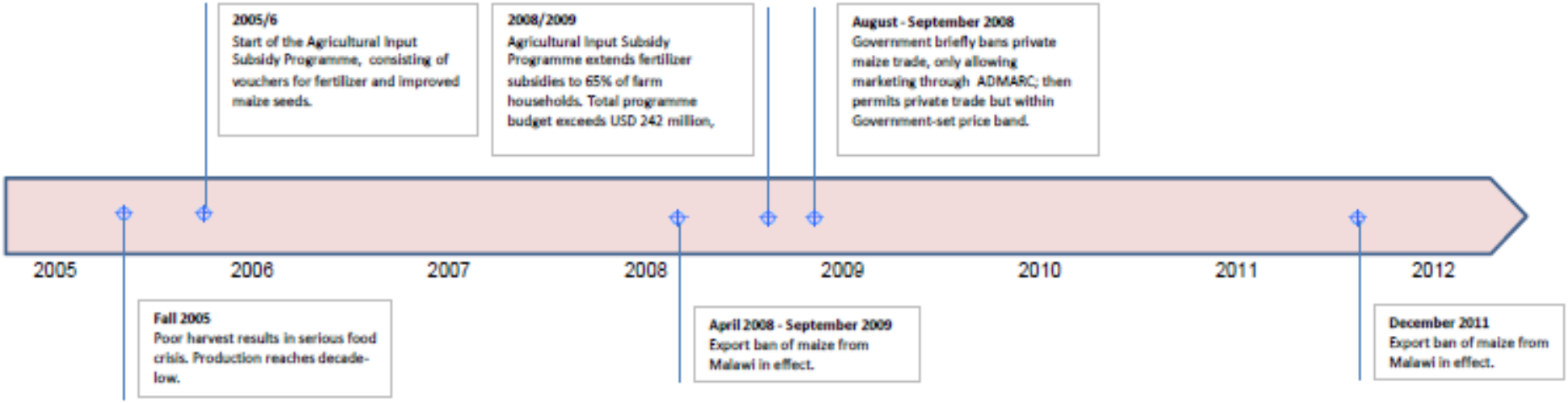
Expected Outcomes
Increased value added to agricultural products by rural farmers and orient smallholder sub-sector to greater commercialization and international competitiveness.
Food is available in sufficient quantities and qualities and supplied through domestic production or imports.
All Malawians have at all times physical and economic access to sufficient nutritious food required for leading a healthy and active life.
Increased contribution of agri-processing to GDP.
An active inland network in local and international shipping that facilitates trade and tourism in a safe manner.

International trade policy measures

From 1981 to 1986, Malawi implemented the first wave of structural adjustment and deregulation programmes in collaboration with the Bretton Woods institutions. These programmes included periodic devaluation of the Malawi Kwacha and by the end of the 1980s the existing export licensing systems for agricultural products were reduced, with the exception of maize. In 1997, again with the exception of maize, all import and export licensing requirements were removed.

Since the 2000s agricultural markets were further liberalized but maize, as main pillar of the country's food security, was consistently excluded from these measures. In the early 2000s, Malawi faced two food crises. In 2001-2002, maize production was 28 percent lower than the five-year average and retail prices spiked. In 2005, maize production again fell sharply and a national disaster was declared by the Government on October 15, 2005. As a result of these crises, government control of maize imports and exports remained firm. Formal maize imports were only carried out through a government tender system that licensed the private sector's to procure maize abroad. Though Malawi generally maintains a liberal export policy for agricultural products, official maize exports only took place under specific government licenses monitored by the NFRA. As shown in Figure 7, maize export bans were declared both in 2008-2009 and in 2011.

Figure 8: Timeline of key marketing and trade policy measures, 2005 -2011



Sources: Dorward, Chirwa, 2009;

Marketing and price policies

Under the structural adjustment programmes that started in the 1980s, marketing and price policies were also gradually liberalized, and the maize market moved from a domain controlled by the state marketing agency ADMARC and fixed pan-territorial and pan-seasonal pricing in 1980, to a market in which private traders operated within the limits of a government-set price band for producer prices by the end of the 1990s.

However, following the critical situations in the availability of and access to maize in 2002 and 2005, several measures to liberalize the maize market implemented in the 1990s were partially or wholly reversed. Apart from the establishment of an extensive input subsidy programme primarily targeted at maize producers in 2005 (see below), the government introduced both minimum producer prices as well as price ceilings at retail, which were to be enforced by ADMARC. This pricing policy has been pursued since 2006 even though ADMARC has failed to defend the price policy and private trade has taken place outside of the price bands set by the government. In August 2008 private trade was banned altogether and ADMARC was re-established as exclusive legal buyer and seller of maize, but the ban was removed a month later and replaced by a new price band within which private trade was allowed.

Agricultural Input Subsidy Programme

Input subsidies have been an important feature of Malawi's agricultural sector for decades, until they were largely abolished in the 1990s. Following the Malawi food crisis of 2005 however, a large-scale input subsidy programme was re-introduced during the 2005/6 crop season to tackle some of the key constraints to increased maize production faced by Malawian small farmers, including low yields and high costs of inputs. The Agricultural Input Subsidy Programme was established with its main feature being the provision of vouchers to target approximately 50 percent of small farmers to receive fertilizers for maize production. Additional vouchers were provided for maize seeds and tobacco fertilizer.

Vouchers entitle the beneficiaries to purchase two bags of 50kg fertilizer at a subsidized price. This quantity is to be considered sufficient for 0.4 hectares of land. In the first two years, farmers were required to purchase subsidized maize seed; from the 2008/9 season onwards, these (mainly hybrid) seeds were provided free of charge.

Annually, between 50 and 65 percent of farmers received vouchers through the Agricultural Input Subsidy Programme. The total volume of subsidized maize fertilizer varied between 108,986 MT in 2005/2006 to 192,976 MT in 2007/2008. The percentage of subsidy on purchased inputs has risen from 64 percent of the value of inputs in 2005/6, to 88 percent in the 2009/10 season. After removing the effect of above-average rainfall, it is estimated that the impact of the programme on the national maize harvest amounts to 300 000-400 000 tonnes in 2006 to 60 000-70 000 tonnes in 2007.

Figure 9: Principal features of the Agricultural Input Subsidy Programme, 2005/6 – 2009/10

	2005/6	2006/7	2007/8	2008/9	2009/10
Fertiliser voucher distribution (mt equivalent)	166,156	200,128	216,000	195,369	160.000
Households receiving one or more fertiliser coupons	n/a	54%	59%*	65%	n/a
Subsidised 'maize' fertiliser (mt)	108,986	152,989	192,976	182,309	161,495
Subsidised 'tobacco' fertiliser (mt)	22,402	21,699	23,578	19,969	0
Total subsidised planned	137,006	150,000	170,000	170,000	160,000
fertiliser sales (mt) actual	131,388	174,688	216,553	202,278	161,495
Redemption price (MK/50 kg bag)	950**	950	900	800	500
Voucher value, approx (MK/bag)	1,750	2,480	3,299	7,951	3,841
Subsidy % (approx)	64%	72%	79%	91%	88%
Subsidised maize seed (MT)	n/a	4,524	5,541	5,365	8,652
% Hybrid seed	0%	61%	53%	84%	88%
Cotton seed (mt)	0	0	390	435	0
Legume seed (mt)	0	0	24	n/a	1,551
Cotton chemicals vouchers	0	0	131,848	n/a	0
Total programme planned	5,100	7,500	11,500	19,480	n/a
cost (MK million) actual	7,200	12,729	16,346	39,847	17,140

Sources: Dorward and Chirwa, 2009; WTO Malawi Trade Policy Review 2010.

As shown in Figure 9, total programme costs have risen to an actual spending of MWK 39,847 million (USD 283 million) in 2008/9, equal to 74 percent of the Government's agricultural public expenditures and 6.6 percent of GDP.

As the policy review has not been completed yet, we do not have more detailed information on policies that have been implemented during the analyzed period. However, in our analysis we mention the policies that might have been in place as to justify the price differences.

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.

TRADE STATUS OF THE PRODUCTS

As mentioned above, Malawi's international trade in maize is limited in comparison to its total production. The significant exports in 2007 and 2010 can be related directly to specific government-negotiated export agreements to supply markets in Zimbabwe and Kenya with surplus maize from Malawi's Central Region. Even in these years, however, significant informal imports from neighboring countries continue, while almost no informal exports take place. For that reason, our analysis considers Malawi to be an importer of maize for the entire period under review.

BENCHMARK PRICES

Observed

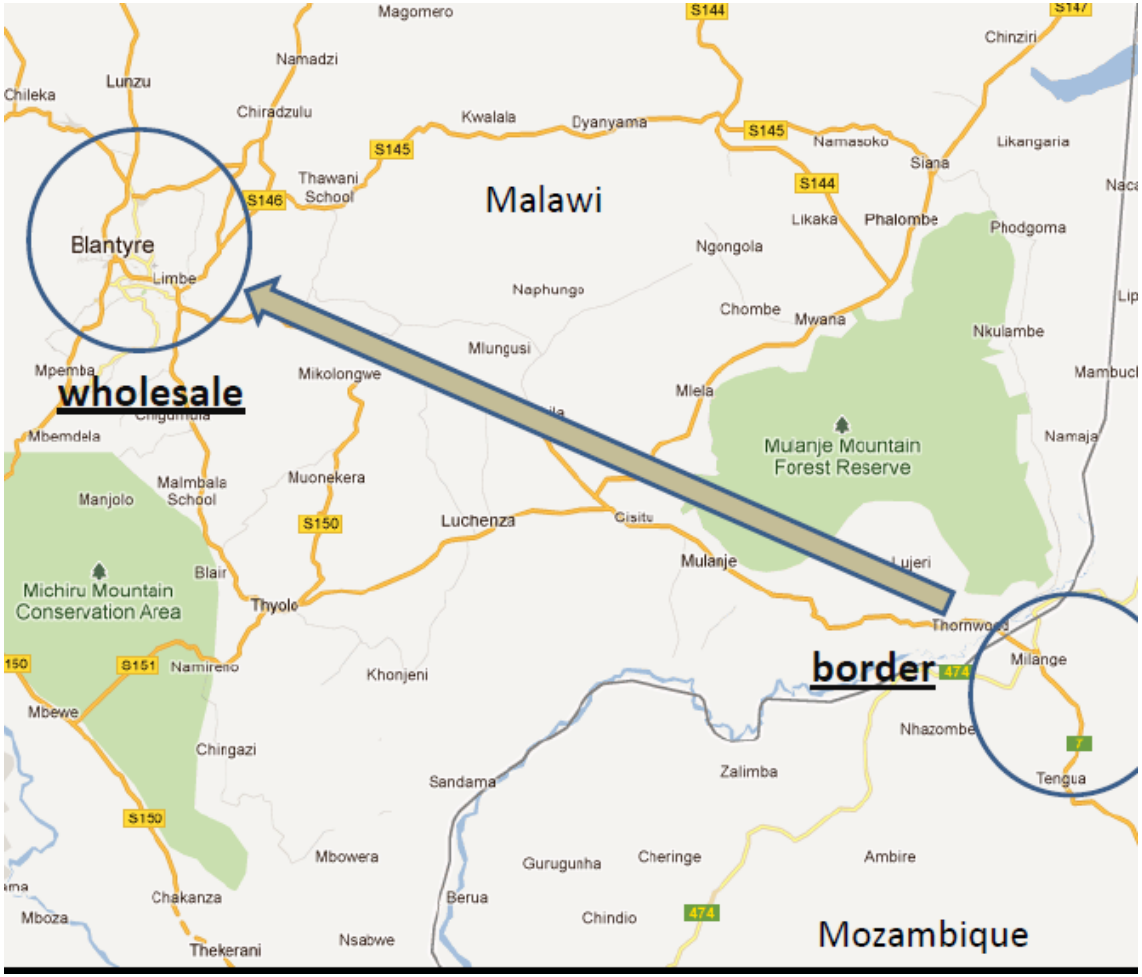
The basis for calculating a reference parity price to determine whether Malawian maize farmers receive market incentives or disincentives is to establish a benchmark border price. Since Malawi is considered an importer of maize, a CIF price of maize is taken. Both data on official imports as well as reports on informal cross-border trade indicate that neighboring Mozambique and Tanzania are Malawi's main origins of maize grain imports. These markets supply areas in Northern and Southern Malawi where structural production deficits occur. Due to the landlocked nature of Malawi, maize trade is not integrated with the world market but rather with production and price levels in the region. Therefore, a regional benchmark price has been constructed on the basis of trade flows from Tanzania and Mozambique. An overview of the trade flow that is analyzed in this technical note is provided in figures 10 and 11 below.

This regional benchmark price is based on the average wholesale prices in the Mbeya, Tanzania and Milange, Mozambique – being the primary market towns in the regions from where official and informal cross-border trade take place. These wholesale prices were converted into benchmark border prices by adding market access and transaction costs to the Malawi border. Wholesale price data for these towns in Tanzania and Mozambique is only available from 2006. Therefore, the benchmark border price has only been determined for the period 2006 – 2010. Additional research is needed to determine the benchmark price in 2005.

Adjusted

No adjustments to the benchmark price have been made.

Figure 10 and 11: Overview of analyzed maize flows from Mbeya, Tanzania and Milange, Mozambique to wholesale markets in Northern (Mzuzu, left) and Southern (Blantyre, right) regions of Malawi



Source: author's own elaboration

DOMESTIC PRICES

In order to determine the domestic prices it is important to define the point of competition where imported produce will compete with maize of local farmers. On the basis of the analysis and figures 10 and 11 above, it should be concluded that the main target for imported maize are the wholesale and retail market in the largest cities of the maize deficit areas in Northern and Southern Malawi. For that purpose, Mzuzu and Blantyre have been chosen as the points of competition for our analysis. In those cities, maize from local farmers as well as maize from the surplus region in the central highlands of Malawi competes with imports.

Since wholesale and retail markets in those towns are integrated. In addition, no specific wholesale prices are available. Therefore, the annual average of maize retail prices in those cities has been taken as the wholesale price in our analysis.

Table 3: Domestic price at wholesale, 2005-2010 (in MWK/Kg)

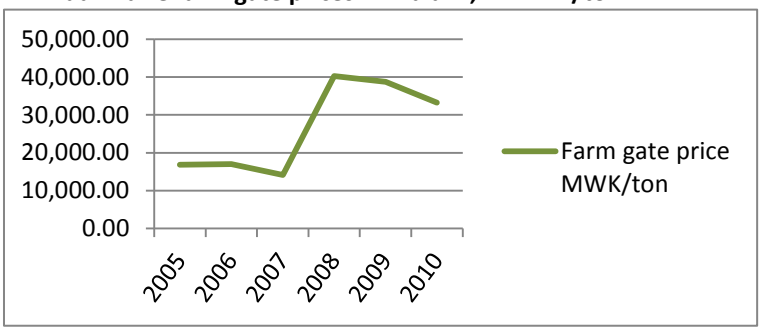
	2005	2006	2007	2008	2009	2010
Mzuzu	21.79	29.79	22.81	49.48	41.57	35.00
Blantyre	25.19	28.25	19.74	48.40	59.95	37.89
Average	23.49	29.02	21.28	48.94	50.76	36.45

Source: Ministry of Agriculture and Food Security; GIEWS

With regard to the farm gate price, these consist of annual national averages obtained from surveys carried out by the Ministry of Agriculture and Food Security through the national price monitoring system.

Table 3 and Figure 12: Annual maize farm gate prices in Malawi, in MWK/ton

year	MWK/ton
2005	16,860.00
2006	17,010.00
2007	14,120.00
2008	40,270.00
2009	38,680.00
2010	33,270.00



Source: Ministry of Agriculture and Food Security

EXCHANGE RATES

Observed

The exchange rate between the Malawi Kwacha and the US 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.

Adjusted

As indicated by the national team, media sources and IMF reports, the Malawi Kwacha has been significantly overvalued since 2007. This is reflected in a dynamic parallel market for foreign exchange. For that reason, an adjusted exchange rate has been applied from 2007 to express the difference between the nominal exchange rate and the exchange rate in the parallel market. The values used are annual averages of parallel market exchange rates of Malawi Kwacha to the US Dollar, as calculated by the Reserve Bank of Malawi.

The IMF has confirmed that the overvaluation of the Malawi Kwacha gradually increased to 10.8 percent on average in 2010. In 2011, the African Development Bank indicated in a report that the Malawi kwacha remained overvalued by between 10 and 20 percent in early 2011. Despite a 10 percent devaluation in August 2011, parallel market rates have more recently increased to MWK 230 in December 2011 against an official rate of MWK 165 to the US dollar.

Table 4: Malawi Kwacha/US Dollar exchange rates, 2005-2010

	2005	2006	2007	2008	2009	2010
Official Nominal Exchange Rate	118.42	136.01	139.96	140.52	141.17	150.49
Parallel Market Exchange Rate	118.42	136.01	140.94	138.24	147.15	166.83

Source: IMF, Reserve Bank of Malawi

In June 2011, several donors including the World Bank, the EU, the AfDB and DFID suspended their general budget support to Malawi as a result of the absence of agreement between Malawi and the IMF on the review of reforms to address external economic imbalances, including exchange rate misalignment.

ACCESS COSTS

Observed

Access costs analyzed include both the cost to bring the commodity from the border to the wholesale, as well as from the farm to the wholesale.

Since we analyze two different trade flows, the access cost from border to wholesale is taken as the average of the costs from the Tanzania-Malawi border at Songwe River Bridge to the Northern Region's main wholesale market at Mzuzu on the one hand, and from the Mozambique-Malawi border near Milange to the wholesale market of Blantyre. The access costs include transport costs, bribes and costs related to roadblocks and checkpoints. The transport costs are taken as reported by Tchale and Keyser (2010). For an estimation of additional costs of transport related to bribes, roadblocks and delays, no specific data on Malawi was available. For that reason, an average of these costs in Eastern Africa of 5.7 percent as specified in World Bank (2009) was applied.

Table 5: Observed access costs border to point of competition 2005-2010, MWK/ton

	2005	2006	2007	2008	2009	2010
Border - Mzuzu	711.05	810.42	874.86	951.09	1031.19	1107.62
Border - Blantyre	1437.57	1638.46	1768.75	1922.85	2084.80	2239.31
Average p/ton	1074.31	1224.44	1321.81	1436.97	1557.99	1673.46

Observed market access costs from the farm-gate to the wholesale market are based on the long-distance flow of maize that exists from the surplus areas in Central Malawi to the deficit regions in the South and in the North. These access costs are taken as the cost to transport maize from the key production areas around Machinga and Kasungu to the selected wholesale markets in Blantyre and Mzuzu respectively, and include all transport costs (Tchale and Keyser, 2010) as well as additional costs for bribes, roadblocks and delays.

Table 6: Observed access costs from farm gate to point of competition 2005-2010, MWK/ton

	2005	2006	2007	2008	2009	2010
Kasungu - Mzuzu	3586.18	4087.33	4412.36	4796.79	5200.78	5586.24
Machinga - Blantyre	1530.31	1744.16	1882.86	2046.91	2219.30	2383.78
Average p/ton	2558.25	2915.75	3147.61	3421.85	3710.04	3985.01

Adjusted

For both the access costs from the border to the points of competition, as well as for the farm gate to the points of competition, adjustments have been made. These adjustments consist of taking out the additional costs for delays, bribes and roadblocks. This has resulted in a minor downward adjustment of the access costs for both elements of the chain.

Table 7: Adjusted access costs border to point of competition 2005-2010, MWK/ton

	2005	2006	2007	2008	2009	2010
Border - Mzuzu	672.96	767.01	828.00	900.14	975.95	1048.28
Border - Blantyre	1360.56	1550.69	1674.00	1819.85	1973.12	2119.36
Average p/ton	1016.76	1158.85	1251.00	1359.99	1474.53	1583.82

Table 8: Adjusted access costs from farm gate to point of competition 2005-2010, MWK/ton

	2005	2006	2007	2008	2009	2010
Kasungu - Mzuzu	3394.08	3868.38	4176.00	4539.84	4922.19	5287.00
Machinga - Blantyre	1448.34	1650.73	1782.00	1937.26	2100.42	2256.09
Average p/ton	2421.21	2759.55	2979.00	3238.55	3511.30	3771.54

EXTERNALITIES

No externalities have been taken into account in the analysis.

BUDGET AND OTHER TRANSFERS

In the analysis, public expenditure on the farm input subsidy programme has been included as a budgetary transfer to producers. In order to calculate the amount of budget and other transfers per ton of maize, the total annual expenditures on maize seeds and fertilizer of the FISP were taken and divided by production in order to obtain the budget transfer figure per ton of produce.

QUALITY AND QUANTITY ADJUSTMENTS

No indications of significant quality differences between domestic or foreign produce have been found therefore no adjustments are applied in our analysis.

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 groundnuts in Malawi.

DATA OVERVIEW

Table 1: Sources of data used in the calculations of indicators

		Description	
Concept		***Observed***	***Adjusted***
Benchmark price		*Based on regional wholesale prices in major markets in neighboring countries of Southern Tanzania and Northern Mozambique. Price data taken from GIEWS. Converted to Benchmark Price by adding access costs to Malawi border.*	*N.A.*
Domestic price at point of competition		*Annual average of wholesale price at Mzuzu and Blantyre markets, based on price data from Ministry of Agriculture and Food Security (MOAFS) and GIEWS*	*N.A.*
Domestic price at farm gate		*Annual average of farm gate price as reported by Ministry of Agriculture and Food Security (MOAFS)*	*N.A.*
Exchange rate		*Annual average of exchange rate as reported by IMF*	*Average annual parallel market rate as estimated by the Reserve Bank of Malawi*
Access cost from border to point of competition		*Transport costs based on average per km costs taken from Tchale & Keyser (2010) from border to major markets in deficit areas in Nothern & Southern Malawi, Mzuzu and Blantyre respectively. Also including costs for bribes, delays, roadblocks.*	*Access costs adjusted for additional costs such as delays, roadblocks and bribes.*
Access cost from farm-gate to border		*Transport costs based on average per km costs taken from Tchale & Keyser (2010) from farm gate in surplus area to markets in deficit areas in Nothern & Southern Malawi. Also including costs for bribes, delays, roadblocks.*	*Access costs adjusted for additional costs such as delays, roadblocks and bribes.*
QT adjustment	Bor-Wh	*N.A.*	*N.A.*
	Wh-FG	*N.A.*	*N.A.*
QL adjustment	Bor-Wh	*N.A.*	*N.A.*
	Wh-FG	*N.A.*	*N.A.*

Table 2: Data and values used in the calculations of indicators

Years		Unit	Symbol	2006	2007	2008	2009	2010
Trade Status				import	import	import	import	import
Benchmark Price								
	Observed	USD/TON	$P_{b(int\$)}$	170.50	124.82	274.43	270.07	219.66
	Adjusted	USD/TON	P_{ba}					
Exchange rate								
	Observed	LC/USD	ER_o	136.01	139.96	140.52	141.17	150.49
	Adjusted	LC/USD	ER_a	136.01	140.94	138.24	147.15	166.83
Access costs border - point of competition								
	Observed	LC/TON	ACo_{wh}	1,224.44	1,321.81	1,436.97	1,557.99	1,673.46
	Adjusted	LC/TON	ACa_{wh}	1,158.85	1,251.00	1,359.99	1,474.53	1,583.82
Domestic price at point of competition		LC/TON	P_{dwh}	29,020.00	21,275.00	48,940.00	50,760.00	36,444.58
Access costs point of competition - farm gate								
	Observed	LC/TON	ACo_{fg}	2,915.75	3,147.61	3,421.85	3,710.04	3,985.01
	Adjusted	LC/TON	ACa_{fg}	2,759.55	2,979.00	3,238.55	3,511.30	3,174.58
Farm gate price		LC/TON	P_{dfg}	17,010.00	14,120.00	40,270.00	38,680.00	33,270.00

CALCULATION OF INDICATORS

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

Box 1: MAFAP POLICY INDICATORS

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

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

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

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

The $NRPo_{fg}$ captures all trade and domestic policies, as well as other factors affecting market incentives and disincentives 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 follow the same general pattern:

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

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

Both Nominal Rates of Protection and Nominal Rates of Assistance (NRAA) were calculated in this analysis. The NRA includes budgetary and other transfers. In the case of maize in Malawi, these transfers mainly consist of input subsidies provided to maize farmers.

Table 6: MAFAP price gaps for Maize in Malawi 2006-2010 (MWK per ton)

	2006	2007	2008	2009	2010
Trade status for the year	m	m	m	m	m
Observed price gap at wholesale	4,605.84	2,483.49	8,939.78	11,077.06	1,716.15
Adjusted price gap at wholesale	4,672.04	2,431.63	9,643.19	9,544.68	(1,785.71)
Observed price gap at farm gate	(4,488.41)	(1,523.90)	3,691.63	2,707.10	2,525.11
Adjusted price gap at farm gate	(4,578.41)	(1,744.37)	4,211.74	975.98	(1,188.75)

Source: Own calculations using data as described above.

Table 7: MAFAP nominal rates of protection (NRP) for Maize in Malawi 2006-2010 (%)

	2006	2007	2008	2009	2010
Trade status for the year	m	m	m	m	m
Observed NRP at wholesale	18.9%	13.2%	22.3%	27.9%	4.9%
Adjusted NRP at wholesale	19.2%	12.9%	24.5%	23.2%	-4.7%
Observed NRP at farm gate	-20.9%	-9.7%	10.1%	7.5%	8.2%
Adjusted NRP at farm gate	-21.2%	-11.0%	11.7%	2.6%	-5.1%

Source: Own calculations using data as described above.

Table 8: MAFAP nominal rates of assistance (NRA) for Maize in Malawi 2006-2010 (%)

	2006	2007	2008	2009	2010
Trade status for the year	m	m	m	m	m
Observed NRA	-4.1%	21.4%	31.5%	24.2%	27.8%
Adjusted NRA	-4.5%	19.7%	33.4%	18.5%	12.1%

Source: Own calculations using data as described above.

Table 9: MAFAP Market Development Gaps for Maize in Malawi 2006-2010 (MWK per ton)

	2006	2007	2008	2009	2010
Trade status for the year	m	m	m	m	m
International markets gap (IRG)	0	0	0	0	0
Exchange policy gap (ERPG)	0.60	(122.66)	626.43	(1,615.84)	(3,590.04)
Access costs gap to point of competition (ACG_{wh})	65.59	70.81	76.98	83.46	89.64
Access costs gap to farm gate (ACG_{fg})	(156.19)	(168.61)	(183.30)	(198.74)	(810.43)

ND: No data available for calculation

Source: Own calculations using data as described above.

4. INTERPRETATION OF THE INDICATORS

Graphs 1 and 2 present the two sets of indicators that MAFAP will generate, including price gaps, Nominal Rates of Protection and Nominal Rates of Assistance. Price gaps give an absolute picture of the policy effort (observed) and of international markets and market development gaps while the ratios provide a percentage that can be compared across countries and products.

The data and indicators collected for Malawi show a mixed picture, but protection for producers in the three last years under review. The NRP at farm gate changes from -20.9% in 2006 to 10.1% in 2008. At wholesale, the NRPs register protection for all years though at slightly higher levels. Since the benchmark price is based on wholesale prices in neighboring countries, this signifies that wholesale prices in Malawi are consistently higher than those in Southern Tanzania and Northern Mozambique. For that reason, despite the increases in local production (informal) imports of maize are likely to continue. Since no tariffs apply, the reasons for the existing protection should be sought in other policy instruments that the Government of Malawi uses to intervene in the maize market. These include import and export licenses, export bans, private trading bans, minimum farm-gate prices, maximum retail prices and input subsidies. Due to the high degree and variability of interventions, as described in paragraph 2.e, further analysis might be needed to assess the effect of individual policy measures on the incentives/disincentives structure.

In 2007, Malawi witnessed a bumper harvest and a record-high maize production which suppressed farm-gate prices. However, the same occurred in neighboring countries and domestic prices remained lower than reference prices. The NRP however rose to -9.7% percent at farm-gate level, which meant that farmers were significantly more supported in 2007 than in 2006.

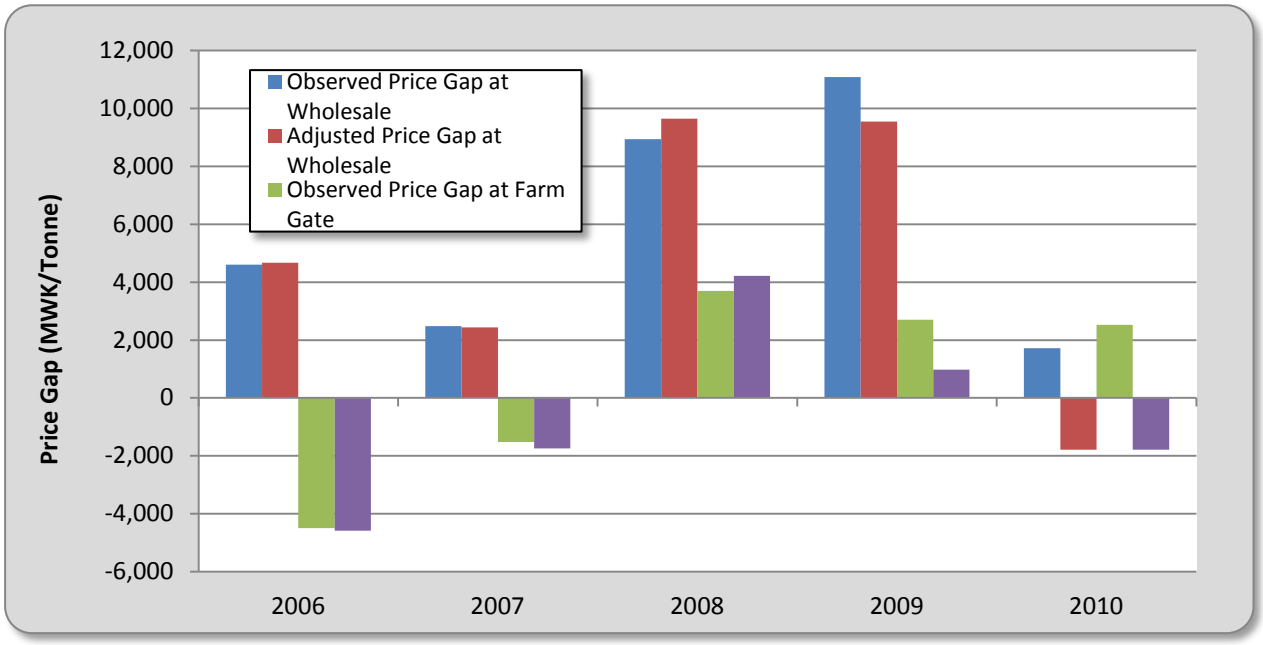
In 2008 and 2009, during the world food price crisis, increases recorded at both wholesale and farm-gate prices in Malawi outnumbered the increase of the benchmark price. Observed wholesale and farm-gate prices are significantly higher than the reference price, and farmers are incentivized. When taking into account the structure of the value chain and exchange rate policies in the adjusted figures, incentives in 2008 turn out to be slightly higher after adjustment as a result of the undervaluation of the Malawi Kwacha in that year. In 2009 however, the situation reversed and the adjusted NRP was once again lower than the observed as a result of excessive access costs and increasing overvaluation of the local currency. In 2008 and 2009, the farm input subsidies programme of the Malawi Government is further expanded. The increases of budget and other product related transfers to farmers result in strong assistance rates, as demonstrated by the NRA. It is important to note that in response to the food crisis, several policy measures were taken by the Government of Malawi, including a short-term ban of private trade. This ban could have forced traders to reduce their risks and increase their margins to compensate for increased price volatility and uncertainty, which explains the high access costs in 2009.

In 2010, as a result of drought, the southern region of Malawi faced strong drops in production while the northern and central regions recorded surpluses.

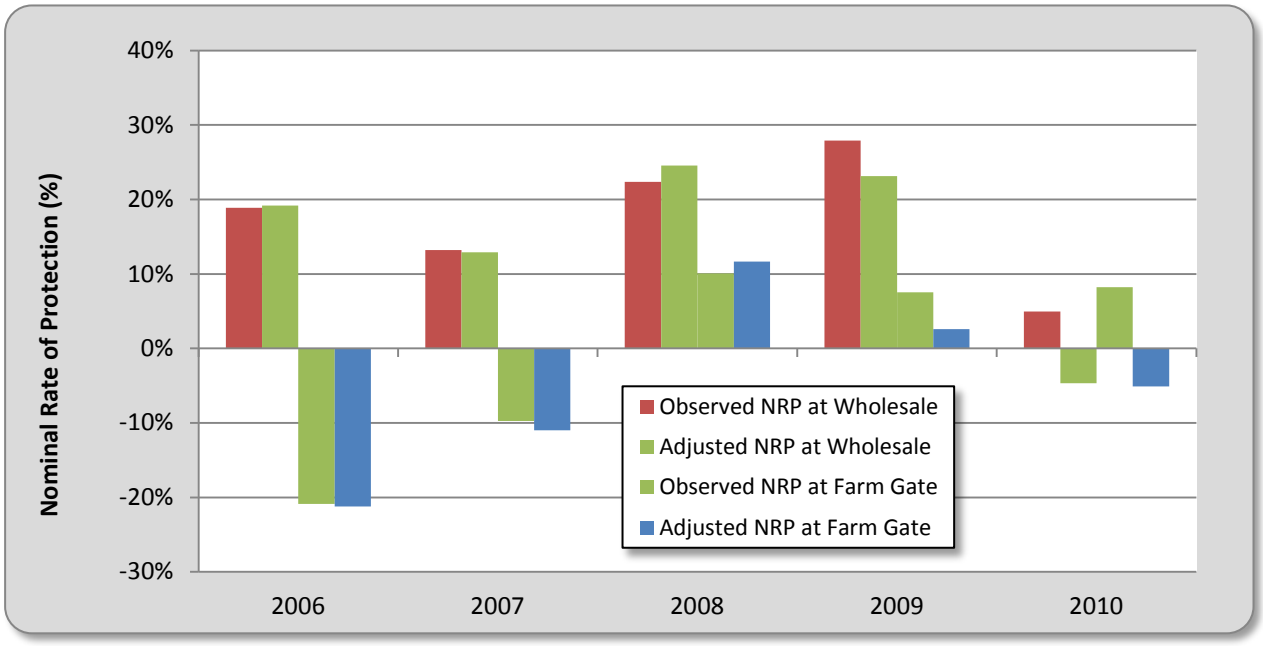
More in general, the differences between the NRPs for observed and adjusted prices highlight the level of inefficiencies along the value chain and the effect of exchange rate policy in Malawi in the period under review. These inefficiencies can be the result of concentrations of power by traders,

monopsonies, high transport costs and other inefficiencies. This constitutes a market development gap.

Graph 1: Observed and adjusted price wedges for maize at wholesale and farm gate in Malawi 2006-2010 (MWK/tonne)



Graph 2: Observed and adjusted nominal rate of protection, and adjusted nominal rate of assistance for maize at wholesale and farm gate in Malawi 2006-2010



5. PRELIMINARY CONCLUSIONS AND RECOMMENDATIONS

MAIN MESSAGE

On the basis of the data currently collected and assuming no major data problems, it seems that the government objective of increasing agricultural productivity has materialized as over the last five years important maize production increases have been realized and significant rises in yields have been registered. In the same period, extensive budgetary transfers are recorded through the gradual expansion of the Farm Input Subsidy Programme.

When these budgetary transfers are left out, the level of incentives and disincentives is more mixed. On the one hand, farmers have received prices significantly above reference prices in most years of the period under review. On the other hand, excessive access costs to bring the commodity from the farm to the wholesale market suppress the incentives, result in lower protection of farmers and leave a market development gap that could be reduced through investments that reduce inefficiencies in the value chain.

Our analysis also shows that in 2009 and 2010, the increasing overvaluation of the Malawi Kwacha to the US dollar increasingly influences adjusted nominal rates of protection as it reduces the competitiveness of domestically produced maize. Continuing reports of overvaluation of the local currency inhibit opportunities for farmers and traders to export Malawi maize in years of surpluses. At the same time, overvaluation has also made maize imports from neighboring countries cheaper, which is of benefit to consumers – particularly in the maize-deficit south.

An important challenge for the MAFAP analysis of incentives and disincentives in the Malawi maize market is related to the high levels of variability and unpredictability that characterize maize-related marketing and trade policies in Malawi. Uncertainty related to import and export licenses and input subsidies as well as ad-hoc policies such as private trading bans and government-set price bands at farm-gate and retail, create a market environment in which incentives and disincentives are not just influenced by actual policies but to a great extent also by market parties' expectations or uncertainties on applicable policy measures. This makes it more complicated to assess the impact of specific policies and relate them to variations in incentives across years.

Further analysis is suggested to provide answers to the question whether the current system of subsidies is sustainable in the long term. Research of farm level revenue and production costs is needed to estimate the profitability of smallholder maize production in case these transfers would be reduced or abolished by future governments.

PRELIMINARY RECOMMENDATIONS

In recent years, Malawi has increased its production levels of maize and has become a practically self-sufficient maize producer. Additional investment in maize production could be incentivized through further development and stabilization of the maize market, in particular to meet the government's stated policy objective of increased exports of food staples.

For that reason, it is recommended that less ad-hoc marketing and trade policy measures are taken and that export barriers, such as licensing schemes and bans, are gradually removed. These measures

could increase stability, reduce price fluctuations and improve predictability. In combination with public investments in infrastructure to further reduce access costs and a reduction of the overvaluation of the Malawi Kwacha, this could lead to increased competitiveness and exports in surplus years, and change the way incentives for farmers are generated while ensuring access to maize for Malawian consumers at a competitive price.

LIMITATIONS

The first limitation is that under the current phase of MAFAP no structural, in-depth collaboration with local counterparts is envisaged in Malawi. This limits the possibilities of data collection and analysis, as local technical and institutional partners are better able to link certain outcomes to specific policy measures, as well as their level of enforcement.

The second limitation is the complexity of the marketing chain as the parastatal ADMARC and private traders operate in very diverse manners. Further investigation is required to analyze their respective margins and behavior. Access costs calculations are also influenced by the fact that maize is produced by practically all smallholder farmers in Malawi. This complicates the calculations of average transaction costs to take maize from the farm gate to the wholesale market.

Thirdly, regional cross-border trade is an important feature of the maize market in Malawi and regionally. This means that areas with maize deficits, particularly in the densely populated Southern Region of Malawi, are often supplied by produce from neighboring Mozambique. However, much of this trade is informal and data on these trade flows is scarce.

FURTHER INVESTIGATION AND RESEARCH

- carry out analysis of farm-level costs and revenues in an effort to estimate the differences in profitability of maize production with and without input subsidies;
- conduct further research on the maize value chain in order to obtain more detailed breakdowns of access costs and increased insight in the significant variations of observed access costs between years;
- add the retail dimension and analyze whether current policies support the Growth and Development Strategy's expected outcome of economic food access for all Malawians through affordable maize prices in the retail market;
- expand the policy review in an effort to try to link specific policy measures in certain periods, such as for example government-set minimum farm-gate prices implemented in 2007, to changes in protection and assistance;
- Investigate the large difference between wholesale and farm-gate prices in 2006, in order to determine whether this difference can be assigned to specific events or to data issues.

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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		Maize						
	International currency		US Dollars (USD)			Malawi Kwacha			
					Year	2006	2007	2008	2009	2010
	DATA		#REF!	Symbol	trade status	m	m	m	m	m
	Benchmark Price									
1		*Observed*	USD/TONNE	$P_{b(int\$)}$		170.50	124.82	274.43	270.07	219.66
1b		*Adjusted*	USD/TONNE	P_{ba}						
	Exchange Rate									
2		*Observed*	MWK/USD	ER_o		136.01	139.96	140.52	141.17	150.49
2b		*Adjusted*	MWK/USD	ER_a		136.01	140.94	138.24	147.15	166.83
	Access costs border - point of competition									
3		*Observed*	MWK/TONNE	ACo_{wh}		1,224.44	1,321.81	1,436.97	1,557.99	1,673.46
3b		*Adjusted*	MWK/TONNE	ACa_{wh}		1,158.85	1,251.00	1,359.99	1,474.53	1,583.82
4	**Domestic price at point of competition**		MWK/TONNE	P_{dwh}		29,020.00	21,275.00	48,940.00	50,760.00	36,444.58
	Access costs point of competition - farm gate									
5		*Observed*	MWK/TONNE	ACo_{fg}		2,915.75	3,147.61	3,421.85	3,710.04	3,985.01
5b		*Adjusted*	MWK/TONNE	ACa_{fg}		2,759.55	2,979.00	3,238.55	3,511.30	3,174.58
6	**Farm gate price**		MWK/TONNE	P_{dfg}		17,010.00	14,120.00	40,270.00	38,680.00	33,270.00
7	Externalities associated with production		MWK/TONNE	E						
8	Budget and other product related transfers		MWK/TONNE	BOT		3,599.00	4,866.00	7,821.00	5,998.00	6,024.00
	Quantity conversion factor (border - point of competition)		Fraction	QT_{wh}		1.00	1.00	1.00	1.00	1.00
	Quality conversion factor (border - point of competition)		Fraction	QL_{wh}		1.00	1.00	1.00	1.00	1.00
	Quantity conversion factor (point of competition - farm gate)		Fraction	QT_{fg}		1.00	1.00	1.00	1.00	1.00
	Quality conversion factor (point of competition - farm gate)		Fraction	QL_{fg}		1.00	1.00	1.00	1.00	1.00

	CALCULATED PRICES		#REF!	Symbol	2006	2007	2008	2009	2010
	Benchmark price in local currency								
9		*Observed*	MWK/TONNE	$P_{b(loc\$)}$	23,189.72	17,469.70	38,563.25	38,124.95	33,056.43
10		*Adjusted*	MWK/TONNE	$P_{b(loc\$)a}$	23,189.11	17,592.37	37,936.82	39,740.79	36,646.47
	Reference Price at point of competition								
11		*Observed*	MWK/TONNE	RPo_{wh}	24,414.16	18,791.51	40,000.22	39,682.94	34,729.90
12		*Adjusted*	MWK/TONNE	RPa_{wh}	24,347.96	18,843.37	39,296.81	41,215.32	38,230.29
	Reference Price at Farm Gate								
13		*Observed*	MWK/TONNE	RPo_{fg}	21,498.41	15,643.90	36,578.37	35,972.90	30,744.89
14		*Adjusted*	MWK/TONNE	RPa_{fg}	21,588.41	15,864.37	36,058.26	37,704.02	35,055.71

	INDICATORS		#REF!	Symbol	2006	2007	2008	2009	2010
	Price gap at point of competition								
15		*Observed*	MWK/TONNE	PGo_{wh}	4,605.84	2,483.49	8,939.78	11,077.06	1,714.69
16		*Adjusted*	MWK/TONNE	PGa_{wh}	4,672.04	2,431.63	9,643.19	9,544.68	-1,785.71
	Price gap at farm gate								
17		*Observed*	MWK/TONNE	PGo_{fg}	(4,488.41)	(1,523.90)	3,691.63	2,707.10	2,525.11
18		*Adjusted*	MWK/TONNE	PGa_{fg}	(4,578.41)	(1,744.37)	4,211.74	975.98	(1,785.71)
	Nominal rate of protection at point of competition								
19		*Observed*	%	$NRPo_{wh}$	18.9%	13.2%	22.3%	27.9%	4.9%
20		*Adjusted*	%	$NRPa_{wh}$	19.2%	12.9%	24.5%	23.2%	-4.7%
	Nominal rate of protection at farm gate								
21		*Observed*	%	$NRPo_{fg}$	-20.9%	-9.7%	10.1%	7.5%	8.2%
22		*Adjusted*	%	$NRPa_{fg}$	-21.2%	-11.0%	11.7%	2.6%	-5.1%
	Nominal rate of assistance								
23		*Observed*	%	NRAo	-4.1%	21.4%	31.5%	24.2%	27.8%
24		*Adjusted*	%	NRAa	-4.5%	19.7%	33.4%	18.5%	12.1%

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