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

ANALYSIS OF INCENTIVES AND DISINCENTIVES FOR MAIZE IN THE UNITED REPUBLIC OF TANZANIA

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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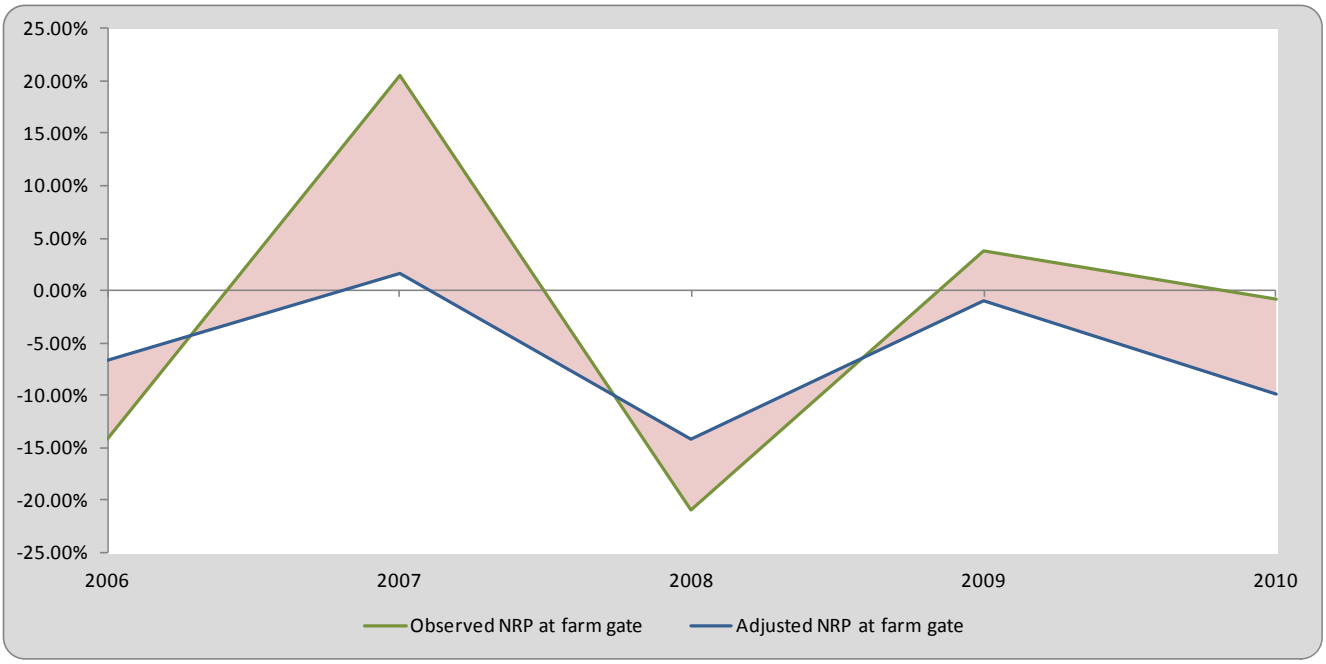
SUMMARY OF THE NOTE

Product: Maize
Period analyzed: 2006 – 2010
Trade status: Imported in 2006-2008 and 2010/exported in 2007 and 2009

- Maize is the 5th agricultural commodity in The United Republic of Tanzania by value of production during the period 2005-2010 accounting for 7.5 percent of total production value. Moreover, it represents close to five percent of total agricultural imports in The United Republic of Tanzania for the same period and is the main energy source in the diet accounting for 25 percent of total caloric intake;
- Maize is a very political commodity in The United Republic of Tanzania and frequent trade measures are put in place to assure food security;
- The United Republic of Tanzania is considered to be a potential maize producer for the whole east African region.



The observed Nominal Rate of Protection (NRP) (green line) indicates that farmers have been mostly receiving disincentives for Maize production. This has been due to the release of subsidized maize by the National Food Reserve Authority and excessive marketing costs along the value chain. The government is more interested in keeping maize prices low than in assuring a more remunerative price for farmers. During the years when The United Republic of Tanzania could export maize, the erratic trade policy (with frequent export bans) prevents farmers from getting better prices in regional markets. Moreover, lack of storage capacity makes The United Republic of Tanzania export Maize at low prices and then face high maize domestic prices.

CONTENTS

1. PURPOSE OF THE NOTE

This technical note aims to describe the market incentives and disincentives for maize producers in The United Republic of Tanzania. The note is a technical document and serves as input for the MAFAP Country Report.

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

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

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

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

Additionally, all information presented in this note is preliminary and still subject to review and validation.

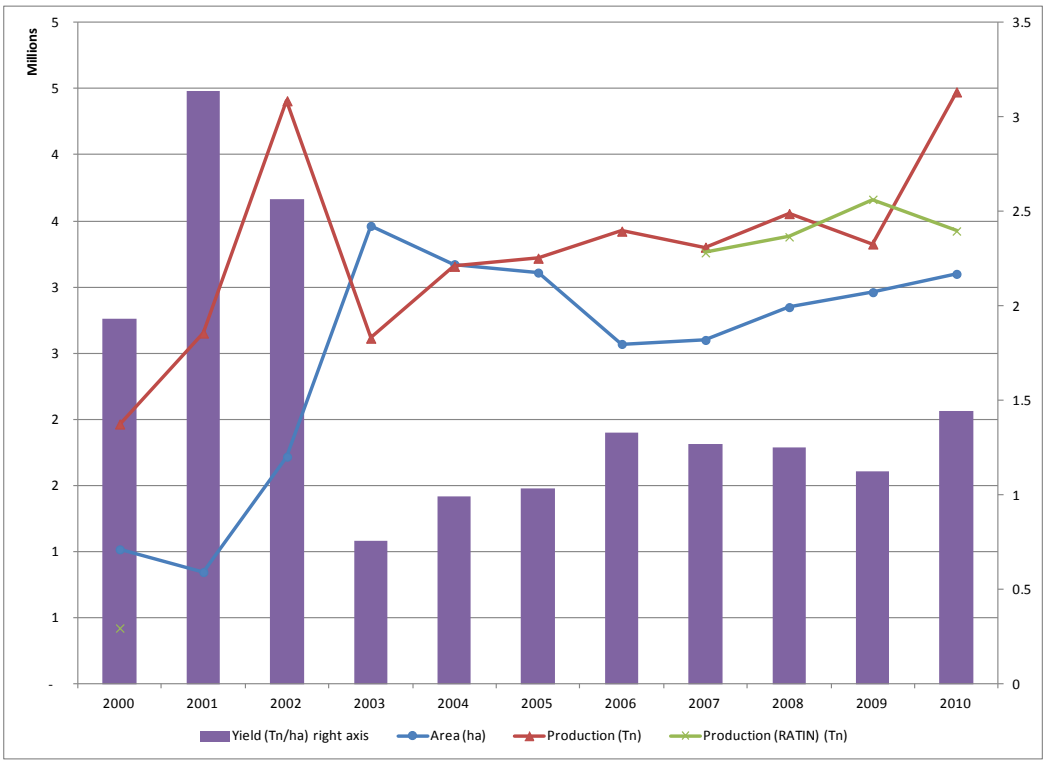
2. COMMODITY CONTEXT

Maize is the 5th agricultural commodity in The United Republic of Tanzania by value of production during the period 2005-2010 accounting for 7.5 percent of total production value. Moreover, it represents close to five percent of total agricultural imports in The United Republic of Tanzania for the same period and is the main energy source in the diet accounting for 25 percent of total caloric intake (FAOSTAT, 2010). Maize is considered the most important food crop in The United Republic of Tanzania covering 45 percent of total arable land and generating close to 50 percent of rural cash income, an average of 100 USD per maize producing household in 2008 (USAID, 2010). In the past two decades The United Republic of Tanzania has ranked among the top 25 maize producing countries in the world, dropping out of the list only three times 1986, 1997 and 2003.

PRODUCTION

The United Republic of Tanzania produces mainly white maize. Figure 1 shows the evolution of production, area and yields for maize in the country for the period 2000-2010. As it can be seen, area peaked in 2003 with nearly 3.5 million hectares devoted to this crop and has since then stabilized around 2.5 million hectares. Production is also more or less stable around 3.5 million tonnes while yields fluctuate between 1 and 1.5 tonnes per hectare down from an average of nearly 2.5 tonnes during the first three years of the 21st Century.

Figure 1: Main production figures for maize in Tanzania (2000-2010)



Note: Data reported by the East African Grain Council (RATIN) is presented for comparison with that reported by Tanzanian authorities. As it can be seen the increase in production in 2010 is not captured by RATIN.

Source: FAOSTAT and RATIN Food Balance Sheets.

Focusing on the period 2005-2010, maize production accounted for more than 70 percent of the cereal produced in the country. On the basis of Ministry of Agriculture, Food Security and

Cooperatives (MAFSC) reports, more than 20 regions in The United Republic of Tanzania are producing maize annually, mainly of white type. The southern regions of Iringa, Rukwa, Ruvuma, and Mbeya account for more than 35 percent of the total annual maize production. The southern highlands produce surplus maize compared to consumption levels, while there are deficits in the northern highlands, Dar es Salaam, and central regions. This is a result of the National Maize Project (1974-1979) which provided subsidized agricultural inputs to high potential areas until 1983. Most of these inputs were distributed in the Southern Highlands and Arusha region, mostly for maize production. Mbeya and Iringa are the largest producers and account for almost a quarter of the country's maize production. At present, 65 percent of approximately 3 million households in The United Republic of Tanzania grow maize, mainly poor smallholder farmers (average 1.2 has) who rely on traditional methods of cultivation under a rain fed regime (USAID, 2010; Nazir, *et al.,* 2010). According to the National Panel Survey of 2009, approximately 30 percent of all households sold surplus maize in that year.

According to FAOSTAT commodity balances[1] (Table 1 and Figure 2) maize produced in The United Republic of Tanzania goes mainly to food consumption with an average waste of 10 percent. Feed represents 17 percent of total maize production. Considering this data maize food availability per capita has been decreasing steadily since 2000 from 70 kg per person and year to 60 kg per person and year due mainly to the increased use of maize for feed.

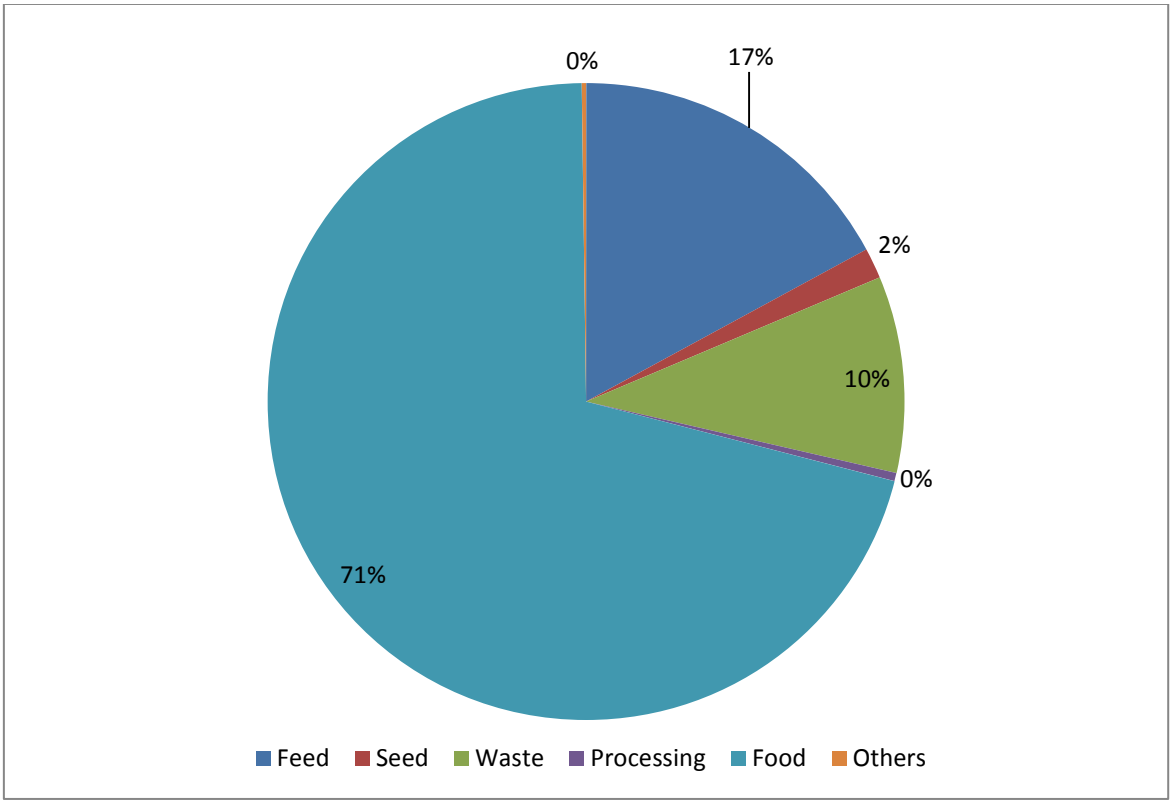
Table 1: Maize Commodity Balance for Tanzania

	2000	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**
Production (I)	1,965,400	2,652,810	4,408,420	2,613,970	4,651,370	3,131,610	3,423,020	3,659,000
Import Quantity (II)	66,976	94,314	94,704	87,791	221,364	57,128	304,275	19,211
Stock increase (III)	630,000	-110,000	-800,000	840,000	-1,250,000	500,000	30,000	135,000
Export Quantity (IV)	17,365	29,151	168,588	168,662	53,872	102,639	23,791	88,033
Domestic supply quantity (V: I+II+III-IV)	2,645,011	2,607,973	3,534,536	3,373,099	3,568,862	3,586,099	3,733,504	3,725,178
Feed (VI)	100,000	110,000	550,000	540,000	650,000	820,000	870,000	800,000
Seed (VII)	16,919	34,364	69,251	63,461	62,192	60,000	62,000	62,000
Waste (VIII)	143,989	163,186	375,714	275,189	572,941	422,990	423,900	424,499
Processing (IX)	12,189	12,019	12,427	12,386	16,348	12,048	17,569	17,656
Food (X: V-VI-VII-VIII-IX)	2,365,872	2,284,233	2,521,069	2,472,688	2,258,139	2,263,759	2,351,885	2,411,005
Other Util	6,042	4,172	6,075	9,375	9,242	7,302	8,149	10,018

Source: FAOSTAT

[1] It should be noted that production figures from FAOSTAT production and FAOSTAT Commodity Balance Sheets are not the same for 2004, 2005 and 2007. The biggest difference is for 2004 where production from FAOSTAT Commodity Balance Sheet is 46% higher than that for FAOSTAT production.

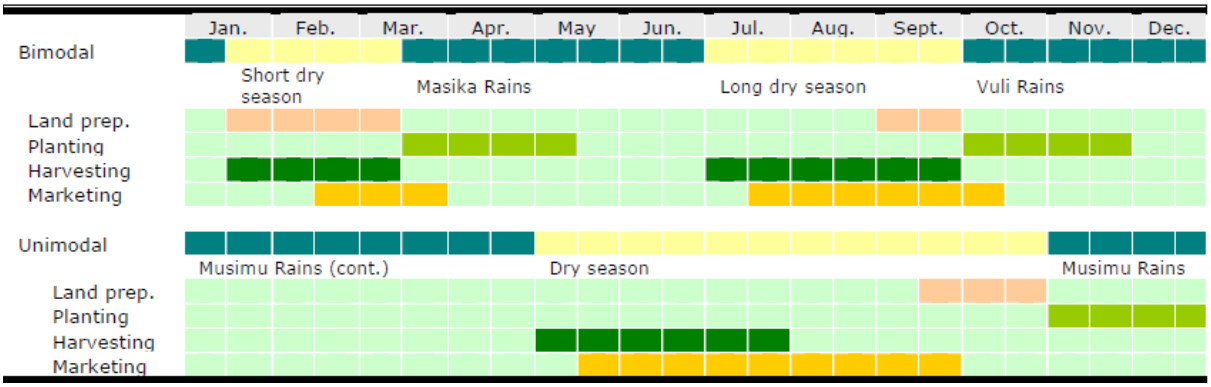
Figure 2: Final use of maize in Tanzania (average for 2000-2007)



Source: FAOSTAT

Maize is the main subsistence crop, and is grown by more than 50 percent of Tanzanian farmers. Maize is produced almost throughout the country (in all 21 mainland Regions). Maize is grown on about 41 percent of the cultivated land during the (masika) main season and 47 percent of the cultivated land during the (vuli) second season. The vuli season (October-December) contributes approximately 15 percent of the total annual maize production with Mara, Arusha, Kilimanjaro, Tanga, Morogoro, Mbeya, Coast, Kagera, Kigoma, and Mwanza regions having two agricultural seasons per year (vuli and masika seasons). The remaining maize production is from unimodal and bimodal masika long rain seasons. This allows that there is domestic production of maize in The United Republic of Tanzania nearly all year round (Figure 3).

Figure 3: Cropping seasons in Tanzania



Source: WFP, 2010.

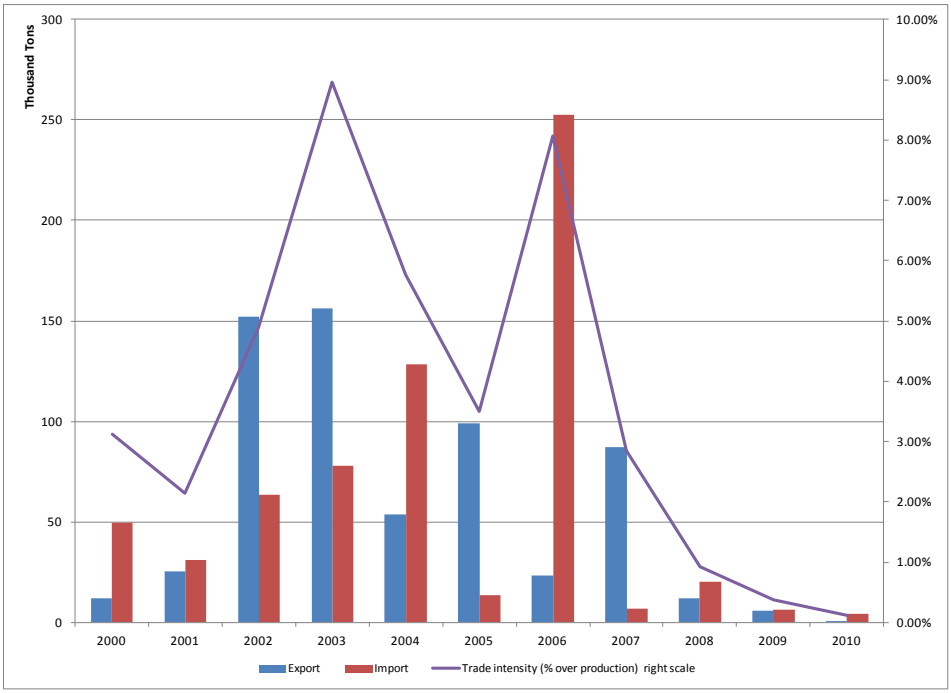
CONSUMPTION/UTILIZATION

Maize is the main staple food and is consumed by majority of the households in both rural and urban areas. Maize seed usually is processed into flour and mixed with water to make porridge or Ugali (stiff porridge). Maize consumption is also accelerated by introduction of school feeding program whereby maize porridge or stiff porridge represents the largest portion of the meal offered to primary school students. The program offers three types of meals from morning to evening. The program reaches more than 1 064 primary schools in the entire country.

MARKETING AND TRADE

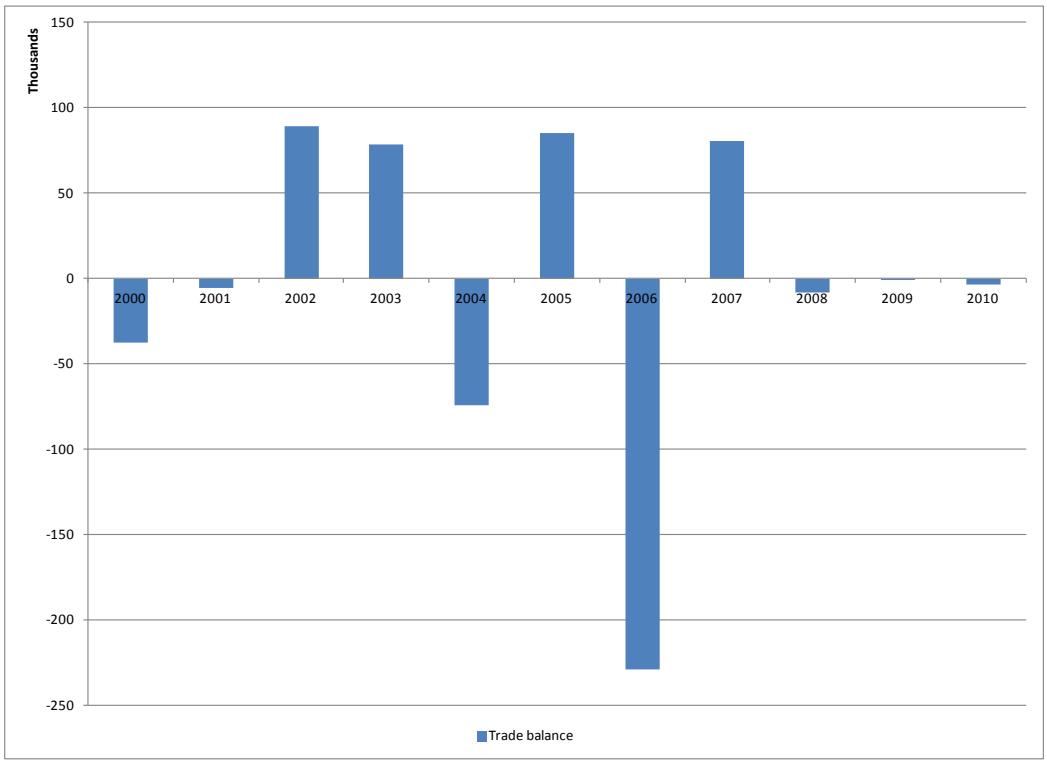
As mentioned above, maize in The United Republic of Tanzania was one of the major agricultural imports during the period 2004-2008. During the period from 2000 to 2009 trade intensity (defined as total trade over production) averaged 4 percent although there has been a decreasing trend since 2006 thus making trade very thin (Figure 4). While it is widely considered that The United Republic of Tanzania could be one of the breadbaskets of East Africa, with a production potential to feed deficit neighboring areas, 6 out of the last 10 years The United Republic of Tanzania was a net importer of maize (Figure 5).

Figure 4: Maize imports and exports in Tanzania (2000-2010)



Source: FAOSTAT and COMTRADE

Figure 5: Maize trade balance (X – M) in Tanzania (2000-2009)



Source: FAOSTAT and COMTRADE

The same analysis can be made using UN COMMTRADE data. The first conclusion that can be obtained from comparing the two data sources is that at an aggregated level both data sources do not match except for 2007 and 2008. We have no explanation for this discrepancy; however the net trade position of The United Republic of Tanzania is not affected by the data source, except for 2009. As COMTRADE data reports specific trade for maize other than seed which better reflects the commodity we want to analyze, we decided to use this source to carry out the analysis on trade related issues.

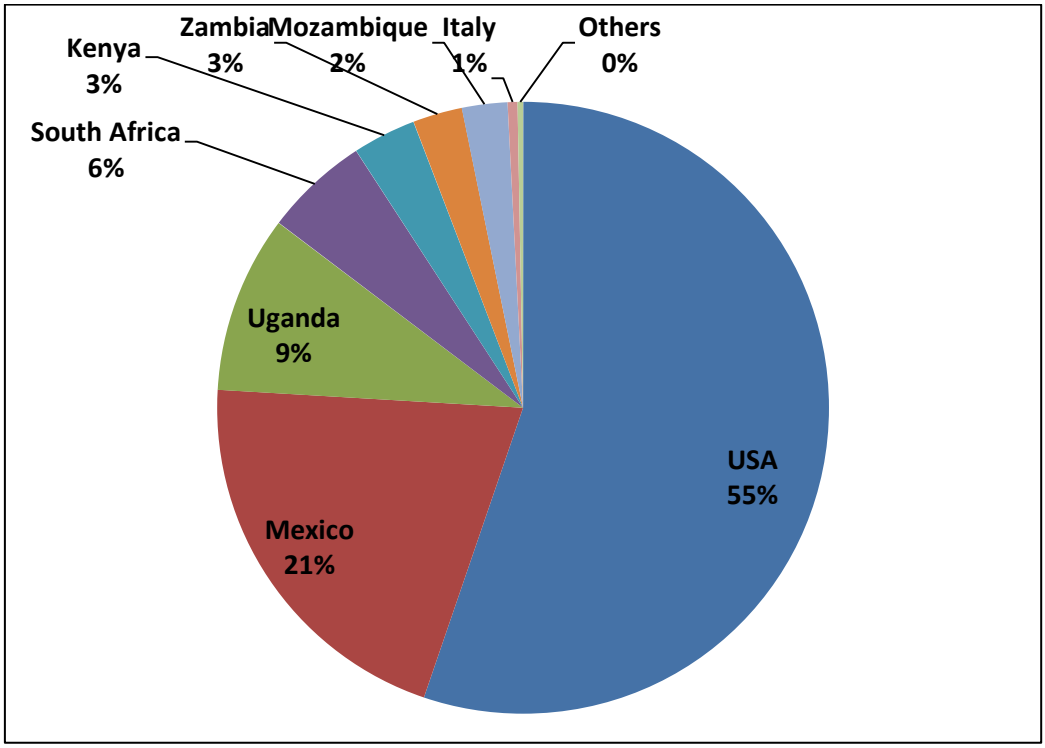
Table 2: Main figures of maize Trade in Tanzania (2005-2010)

Maize (corn)	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**
Import Qt (T)	18,901	252,632	6,609	20,468	6,415	18,588
Export Qt (T)	101,394	23,507	87,076	12,096	1,731	776
Net exports	82,493	(229,125)	80,467	(8,373)	(4,684)	(17,813)
Import (1000 USD)	3,320	51,273	2,312	8,694	8,341	15,676
Export (1000 USD)	10,857	6,397	11,953	3,236	1,675	1,185
Net trade (1000 USD)	7,537	(44,876)	9,641	(5,458)	(6,666)	(14,491)
Implicit value exports (USD/tonne)	107.08	272.13	137.28	267.55	967.82	1,527.60
Implicit value imports (USD/tonne)	175.67	202.96	349.89	424.78	1,300.35	843.32
Maize (corn), seed						
Import Qt (tonne)	4,298	23,427	1,684	3,686	6,363	14,390
Export Qt (tonne)	22,113	700	17,498	4,192	1,524	2
Net exports	17,815	(22,727)	15,813	506	(4,839)	(14,388)
Import (1000 USD)	1,120	6,077	1,583	4,527	8,310	14,173
Export (1000 USD)	2,197	82	2,135	1,251	1,238	8
Net trade (1000 USD)	1,077	(5,995)	552	(3,276)	(7,073)	(14,166)
Implicit value exports (USD/tonne)	99.35	117.76	122.00	298.42	812.39	3,515.00
Implicit value imports (USD/tonne)	260.57	259.41	939.70	1,228.27	1,306.13	984.96
Maize (corn), other than seed						
Import Qt (tonne)	14,603	229,205	4,925	16,782	52	4,199
Export Qt (tonne)	79,281	22,807	69,578	7,904	207	774
Net exports	64,678	(206,398)	64,653	(8,879)	155	(3,425)
Import (1000 USD)	2,200	45,196	730	4,167	31	1,503
Export (1000 USD)	8,660	6,315	9,819	1,985	437	1,177
Net trade (1000 USD)	6,460	(38,881)	9,089	(2,182)	406	(325)
Implicit value exports (USD/tonne)	109.23	276.87	141.12	251.17	2,110.15	1,521.95
Implicit value imports (USd/tonne)	150.68	197.19	148.17	248.31	596.72	357.89

Source: UN COMTRADE

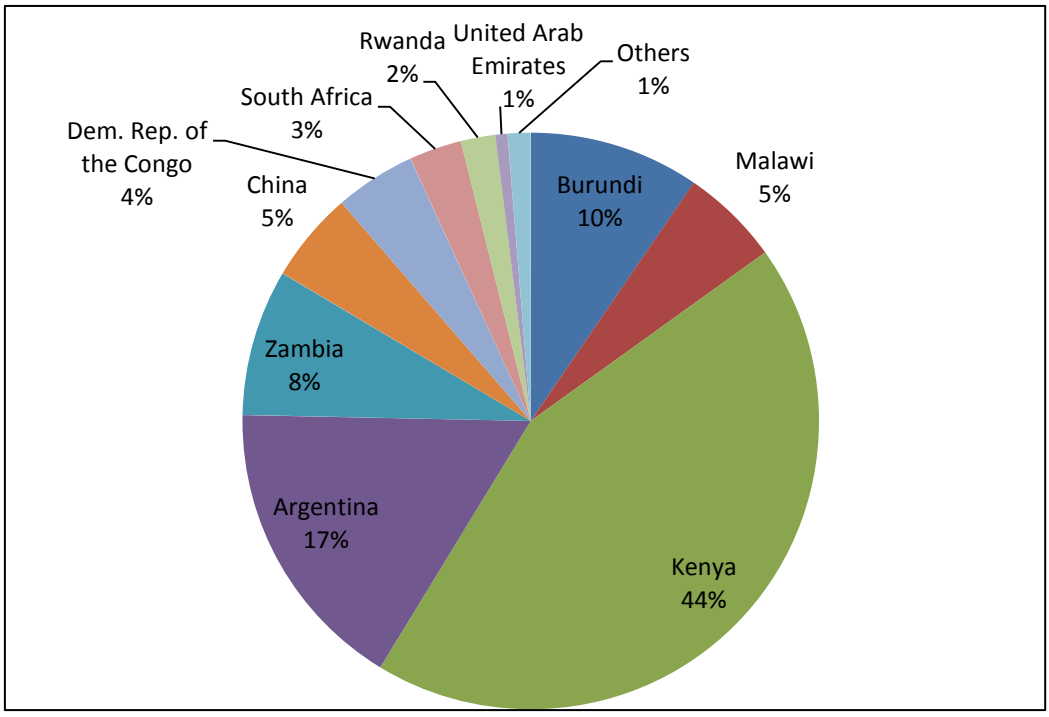
UN COMTRADE data allows us to identify the main partners. As trade is related mainly to "m*aize (corn), other than seed*" (80 percent and 83 percent of the total exports and imports during the period 2005-2010), we focus on this commodity for the analysis. The analysis shows that during the period 2005-2010 over 70 percent of the imports came from the USA and Mexico and only a minority from the partners of the EAC (12 percent from Uganda and Kenya). As far as exports are concerned nearly 45 percent go to Kenya, and over 55 percent to EAC countries.

Figure 6: Main origin of maize imports in Tanzania (2005-2010)



Source: UN COMTRADE

Figure 7: Main destinations of maize exports from Tanzania (2005-2010)



Source: UN COMTRADE

However, The United Republic of Tanzania has had exports bans for maize in place during most of this period with some exceptions (see section on policy review). The export ban normally follows a bad harvest or price peaks. The Government imposes this ban in order to avoid production being diverted to Kenya where prices for maize are significantly higher than in The United Republic of

Tanzania (Figure 8).This ban generates uncertainty for economic agents (and sometimes it is not clear whether the ban is in place or not), has impacts on investments, and reduces price incentives at the farm gate (World Bank, 2009).

Figure 8: Wholesale price difference: Nairobi minus Dar es Salam (USD per tonne)

Source: RATIN

Moreover, informal trade seems to be a big issue for maize in The United Republic of Tanzania. Although no official statistics of informal trade exist one can get an idea of the magnitude of this phenomenon by comparing trade reported by The United Republic of Tanzania and Kenya. When checking the origin of maize imports to Kenya the first thing that strikes is that reported imports from The United Republic of Tanzania do not match reported exports from The United Republic of Tanzania to Kenya. The difference is neither consistent nor systematic. Some years more exports to Kenya are reported (i.e. 2008 or 2005) and for others more imports from The United Republic of Tanzania are reported (i.e. 2010, 2009 or 2007). This situation does not relate to the net trade position of maize in The United Republic of Tanzania as the country was a net importer in 2008 and a net exporter in 2005.

Table 3: Maize imports and exports reported by Kenya and The United Republic of Tanzania

Year	Exports to Kenya reported by TZA (T)	Imports from TZA reported by Kenya (T)	Difference (M-X)	Trade balance of Tanzania
2010	111	413	302	Importer
2009	60	2,030	1,970	Exporter
2008	7,848	6,521	(1,327)	Importer
2007	21,016	40,135	19,120	Exporter
2006	120	4,371	4,251	Importer
2005	49,617	15,162	(34,455)	Exporter

Source: UN COMTRADE

An additional data source is the East African Grain Council (EAGC) which publishes maize balance sheets for the region. The reporting period for EACG is not the calendar year but the period from July to June. By inspecting the different sources we can see that trade figures do not match, highlighting the need to assure data quality for trade in order to carry out the analysis with reliable data so that ultimately policy advice would not be affected by uncertainties on the source of data used.

Table 4: Maize imports and exports declared by Kenya and Tanzania

Year	Exports to Kenya reported by TZA	Imports from TZA reported by Kenya	Imports from TZA reported by Kenya (EACG)	Exports to Kenya reported by TZA (EACG)
2010	111	413	80,000	60,000
2009	60	2,030	110,000	110,000
2008	7,848	6,521	36,631	36,631
2007	21,016	40,135	132,988	132,988
2006	120	4,371		
2005	49,617	15,162		

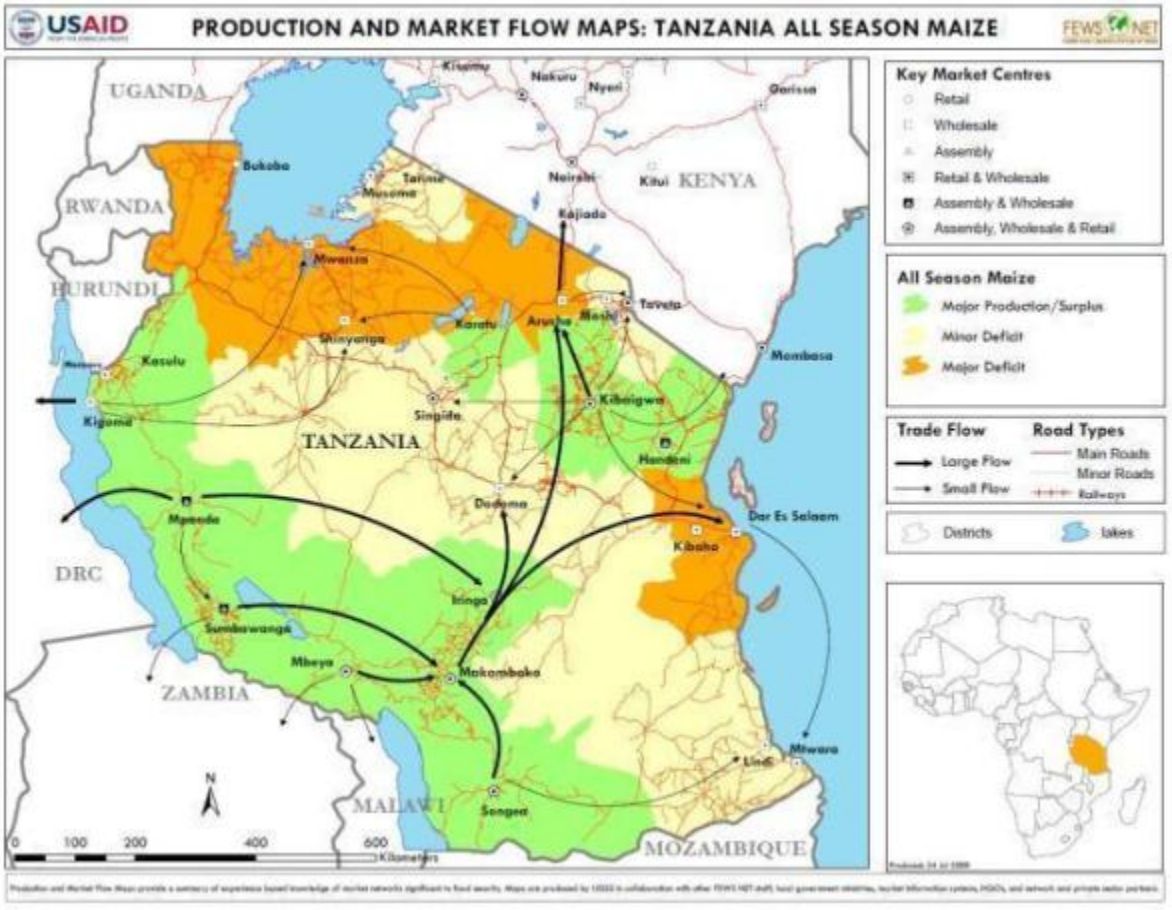
Source: UN COMTRDE and EAGC RATIN

It could well be that the difference in trade from UN Comtrade and EAGC relate to the issue of informal trade. If that is so, the ratio of formal to informal trade is quite substantial, in particular years for which there is a trade ban such as 2008 to 2010.

DESCRIPTION OF THE VALUE CHAIN AND PROCESSING

Production of maize in The United Republic of Tanzania happens mainly in the Southern Highlands which sends production surpluses towards Dar es Salaam and to a lesser extent to Zambia, Malawi and D.R. Congo. A second major producing area is in the north of the country where surpluses go to Kenya mainly via informal trade. The main domestic markets for Tanzanian maize are: Dar es Salaam (and by extension Zanzibar and Comoros), the Mtwara-Linid Region (south-east) northern cities such as Arusha and Moshi and exports to EAC partners (see above). The main trading market in Tanzania is Dar es Salaam, which is only the only market, where brokerage between millers and traders, takes place (SAGCOT, 2010).

Figure 9: Main maize production and market flows in Tanzania



Source: FEWS net

Most of the maize produced by rural households is for subsistence although the marketed share seems to be increasing since liberalization of markets (which will be addressed in a later section). For instance, in the early 90s it was estimated that 25 percent of the maize produced was traded. This is an increase of 5 percentage points from the 1983/84 estimate of 20 percent. Currently, it is estimated that the percentage of marketed share is 40 percent (MAFSC). Three main agents act in the value chain purchasing maize from farmers: private traders, the Cereals Board and the National Food Reserve Agency (see below). Taking into account the marketed and production volumes and the data available for purchases from NFRA and Cereals Board, the role of public interventions in the market remains low (always below 10 percent of apparent marketed consumption[2]).

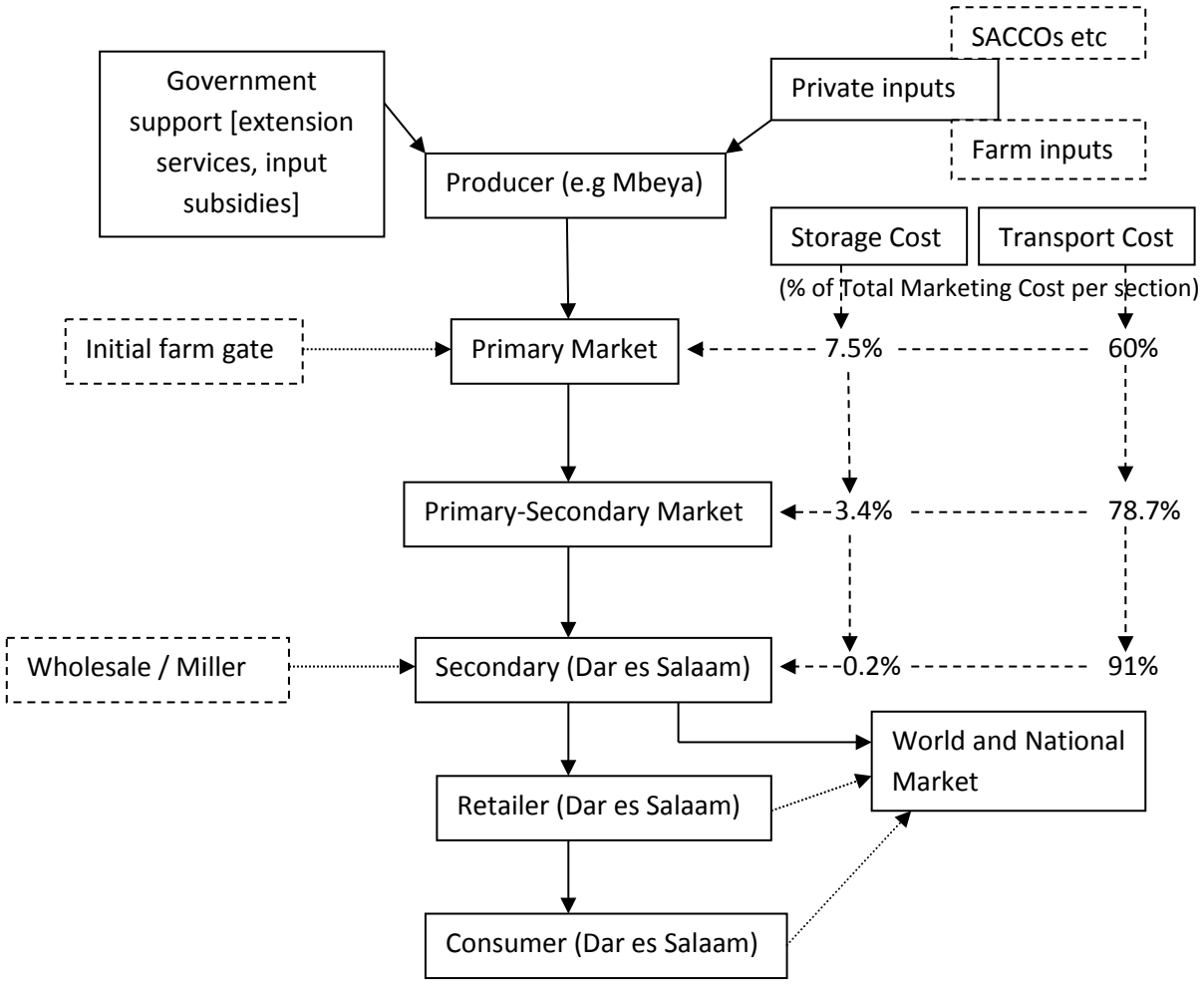
The maize marketing system is characterized by a very large number of small traders operating both from the main centers of production and from the major urban areas. Produce from the farm is taken to primary markets (i.e. big markets in producing areas) directly by farmers or middle men who purchase the maize at the farm. A simplified representation of the value chain functioning in The United Republic of Tanzania for maize can be found in Figure 10. Marketing channels are characterized by lengthy brokerage services dominating at village, district and national urban markets (Match Maker Associated, 2010).

[2] Apparent marketed consumption has been calculated as 40% of production plus imports minus exports.

The market margins are generally quite high, suggesting inefficiencies in supply chains. Prices greatly vary between seasons (during harvesting and periods of scarcity) 3. In addition, post harvest losses are quite significant and productivity levels are low.

Only large scale farmers or traders, with access to storage facilities and financial services are able to take advantage of price fluctuations. There are few emerging business models, such as warehouse receipt systems, that are supported by NGO projects but their significance is yet to be seen. Farmer organizational models are also emerging but have yet to reach a stage where smallholders begin to see their endeavors as a business or command a credible position in the supply chains. Farmer see maize production as a safety net strategy (i.e. assure some cash when they harvest) rather than as a business. The extent to which this is the result of lack of skills or lack of incentives and opportunities is still to be assessed.

Figure 10: Simplified Marketing Chain for maize in Tanzania



Source: Modified from Nazir *et al*. (2010)

[3] For example, for the period 2006/2010 wholesale price differences between Mbeya and Dar are on average 24% of the Mbeya price, with a maximum of 80%.

In The United Republic of Tanzania, storage contributes to stabilizing prices in harvesting season because farmers are able to save maize when supply is high, and consequently prices do not fall so sharply. According to Nizar et al. (2010), by the end of 2008 only 50 percent of small-scale maize farms had storage facilities, while 100 percent of large-scale farms did so. Storage costs are counted as costs of commercialization and are assumed to be the same for both small and large holder farmers. Storage cost accounts for 7.5 percent of the total marketing costs during the initial farm gate-primary market stage, 3.4 percent during the primary to secondary market stage, and 0.2 percent during the secondary-wholesale market stage. Because of the low investment in storage facilities, post harvest incurs losses accounting for USD 19.9 and USD 10.8 per tonne for small and large holder farmers, respectively. These values constitute 44.2 percent and 24 percent of the costs associated with the farm gate-primary and the primary-secondary markets costs, respectively.

Maize market efficiency increased in 1990s following trade liberalization reforms in The United Republic of Tanzania which started in the 1980s. Thus, maize producers benefited significantly from the sharp increases of maize produce prices. Transport Cost (TCs)[4] in The United Republic of Tanzania exceeds those in other EAC partners. From farm gate-primary markets, TCs average USD 6.4 per tonne, from primary-secondary market USD 27 per tonne, and from secondary- wholesale market USD 41.51 per tonne. TCs account for 60 percent, 78.7 percent, and 91 percent of the costs of the first, second, and third stages of marketing, respectively (World Bank, 2009). TCs for farmers increase due to the informal fees farmers pay to avoid delays, overload charges, and other problems. On average, Tanzania's farmers pay 10 informal fees per year in the full maize supply chain process, more than Kenya (8 bribes) and Uganda (4 bribes) farmers. An average of 7 of bribes from Tanzanian farmers occurs at roadblocks and 3 at weighbridges (World Bank, 2009). Nationwide, local taxes on maize commercialization account for around 4.3 percent of MCs. However, this percentage varies because each locality has its own tax rate.

Several price transmission analyses carried out for maize in The United Republic of Tanzania show that there seems to be no integration of domestic maize markets with international markets 2003-2007 (Minot, 2010) while internal markets do seem to be integrated during the period 2000-2008 (Ihle and von Cramon-Taubadel, 2010). This seems to be the case for most cereals, as internal market integration is also reported for sorghum by Asche et al (2012).

Price data has been obtained for raw maize and therefore no processing is considered.

POLICY DECISIONS AND MEASURES

Key strategies and programs in the Agricultural Sector

The United Republic of Tanzania started implementing sector-wide agricultural policies already in 2001, which led to operation programs. While the review of these policies and programs will be an integral part of the Policy Context technical note for The United Republic of Tanzania, as this has not been finalized yet a summary is presented as Annex II of this note.

[4] Transportation Costs (TCs) account for most of the commercialization cost in the supply chain because most of maize farmers do not own their transportation vehicles but rent them (70% of small scale farmers, 100% of medium scale and 67% of large scale farmers) (World Bank, 2009).

Specific measures for the maize sub-sector

In 2009 The United Republic of Tanzania passed the **Cereals and Other Produce Act**. This Act creates a new Board and vests it with significant powers to intervene in rice and maize markets. The board falls under the supervision of the Crop Development Department at the MAFSC.

The new Board is empowered to: i) facilitate research on cereals; ii) facilitate the offer of extension services to growers and dealers; iii) facilitate the development of agricultural input services; iv) disseminate information, including market information; v) promote production, processing and storage; vi) promote appropriate technologies; and vii) assist with the formation of farmers organizations.

Importantly, the Board is further empowered to carry out commercial operations, to buy and sell cereals, to import and export cereals, to process them, to provide warehousing services, to clean, dry, weigh, grade and package and to perform other commercial functions which the Minister approves which aid the development of trade in cereals. To achieve its ends, the Board may build or purchase equipment and buildings, establish market centres and/or provide training. The Act further creates a set of zone councils whose responsibly it will be to act as a liaison with local farmer groups, develop local market information services and further act as a consultative forum in which local farmers and traders can discuss and resolve their differences.

The Act also creates a new regulatory authority—the Cereal and Other Produce Regulatory Authority. The Act empowers this authority to: i) develop and enforce sustainable agronomical standards for products, processing and marketing, ii) ensure fair and competitive trade and set indicative market prices, iii) collect, refine and disseminate data, iv) license persons engaged in marketing and processing cereals, v) register growers, dealers and processors, vi) inspect premises in which cereals are stored and processed, and vii) regulate and control the collection, movement, marketing, transportation, importation and exportation and supply of cereals. These are sweeping powers, which depending on how they are implemented may be used either to enhance private sector investment and development of the maize or rice subsectors, or alternatively, can discourage further private investment and private sector lead development. So far we have found no evidence of the performance of the board, however how it will use the powers assigned to them seem to be one of the key issues for the development of the maize sub-sector in the future (Match Maker Associates, 2010).

The cereal board is still not functioning (May 2012). According to the Department of Food Security at the MAFSC it should act as a private commercial agent in the cereals market (maize, sorghum and rice mainly) substituting individual traders. However it seems that there will be budget allocations for the board in 2012 to allow them start functioning with a target volume of purchases of 150 000 tonnes. Moreover, the Board has inherited the milling assets of the former National Milling Corporation in Arusha and Iringa. Thus, the impact of the board cannot be assessed in this technical note (data coverage from 2006 to 2010) but comparisons of indicators with those for future years will allow us to evaluate it.

Direct intervention in maize, and to a lesser extent sorghum, markets in The United Republic of Tanzania is made through the the **National Food Reserve Agency (NFRA)**, formerly known strategic grain reserve (SGN). The NFRA is a semi-autonomous body which reports to the Permanent Secretary

of the MAFSC and is linked to the department of food security. According to the MAFSC it has a dual mandate: a) assure that there is food available to be distributed to the vulnerable; and b) intervene in the market (purchasing or selling) to stabilize prices. Regarding the fist mandate, the NFRA purchases grains, principally maize, in surplus areas for distribution during times of shortage. In response to the Disaster Management Department directives, the NFRA (SGR) sells grain to beneficiaries at subsidized prices[5]. Sales to the Prime Minister Office (PMO) and local authorities are at 380 Tzsh per kg and then these institutions release it to the market at subsidized prices.

For example, in July 2007, when the stock was released from the NRFA due to the food shortages, the released food was sold at Tshs 50 per kilogram when the market price was 187 Tzsh per kg. Through these interventions the Tanzanian Government seeks to stabilize food supply. The recipients are identified by local authorities (village executive officers) who decide if a household is able to pay or should receive free food. The NFRA aims to procure and store emergency food stock to the tune of 150 000 mt that should suffice addressing a food disaster for three months period regarded enough time to order and secure food imports from abroad.

As far as the stabilization of market prices, there seems to be some confusion on the roles of the different agents on setting prices and quantities. The normal procedure envisages MAFSC setting the objective quantities to be purchased and NFRA fixing annual floor prices. These prices are based on production costs (as from MAFSC statistics) plus 5 percent margin. In practice the Minister announces the purchasing price for Maize during his annual budget speech in August. This price is normally higher than the price the NFRA would calculate using the cost plus margin formula, and in many cases above the wholesale price in the areas where the NFRA makes purchases, in particular during the harvest season (Table 5 and Figure 11). Since 2010 the NRFA also sales maize to private millers at a price lower than domestic market prices (39 000 Tzsh per 100 kg). These sales are mandated by the MAFSC and aim to reduce maize flour prices, and occur mainly in Dar to small millers. Anecdotal evidence shows that the releases have little, if any, impact on maize flour prices and the system is to be revised, giving Regional Commissioners (RC) the authority to approve millers to which subsidized maize can be sold. The underlying rationale is that the RC would only license millers which sell maize flour at low prices.

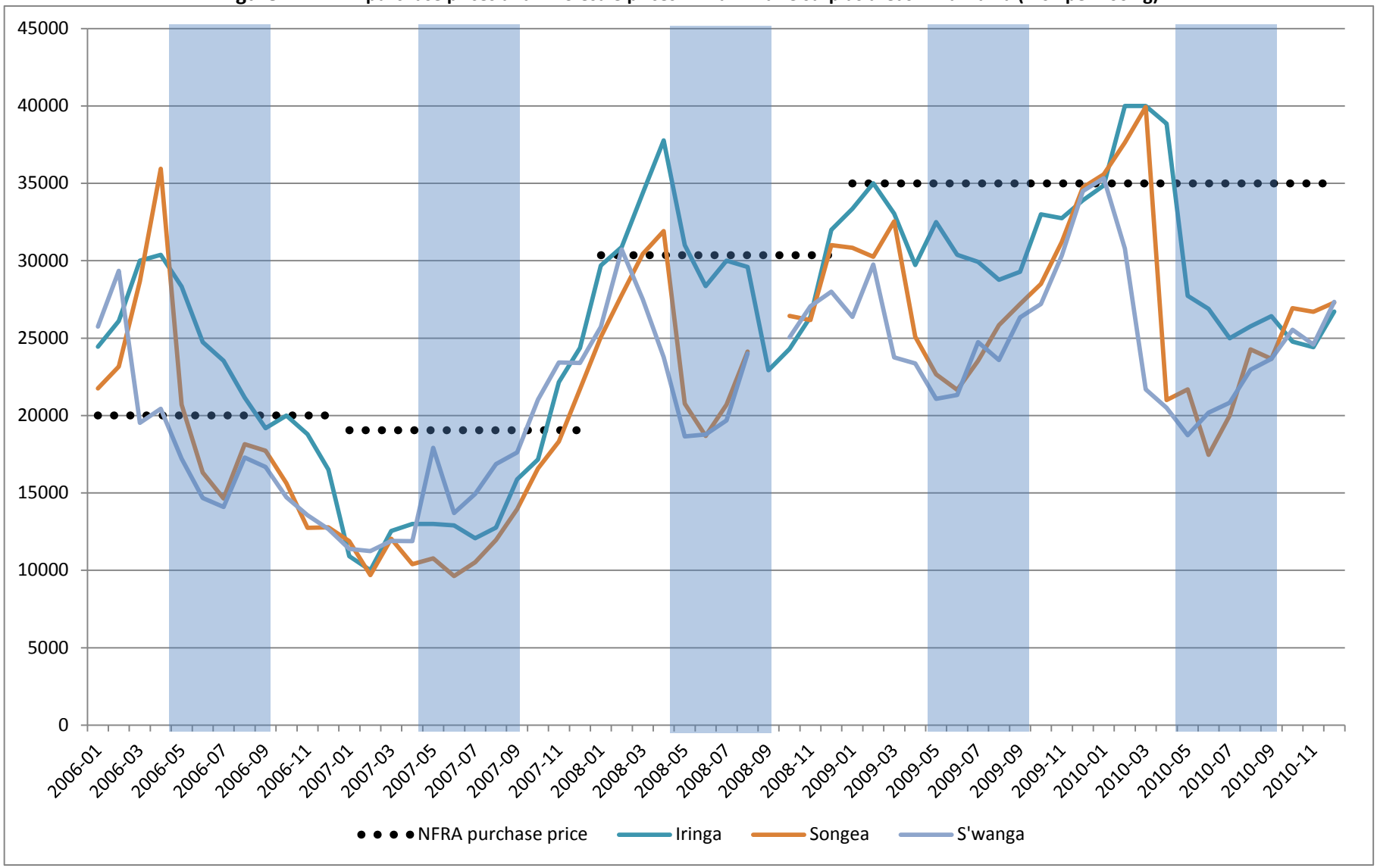
Table 5: NFRA maize purchase prices (Tzsh per 100 kg).

	2005	2006	2007	2008	2009	2010
NFRA maize purchase price	17,854	20,000	19,057	30,363	35,000	35,000

Source: MAFSC budget speeches (several years)

[5] The National Food Security Policy and the National Disaster Management Policy (2004) embrace a wide range of interventions to improve prevention, preparedness, recovery and rehabilitation in the event of natural or man-made disasters, such as drought and agricultural pests, flood, and disease outbreaks or epidemics. Institutional responsibility rests with two organizations: the Disaster Management Department (DMD) of the Prime Minister's Office; and the National Food Security Department of the Ministry of Agriculture and Food Security (MAFS). These institutions are overseen by the Tanzanian Disaster Relief Committee (TANDREC), an inter-ministerial committee tasked with determining the national response to disasters and overseeing relief operations.

Figure 11: NFRA purchase prices and wholesale prices in main maize surplus areas in Tanzania (Tzsh per 100 kg)



Note: shaded areas show usual the harvest period in uni modal production areas (see Figure 3 *Source:* Budget speeches (several years) and MTI

The NFRA has seven zone offices, and associated storage facilities, to implement its mandate. Three of them are in surplus areas (Iringa, Songea and Sumbawanga) and four in deficit areas (Arusha, Dar es Salaam, Dodoma and Shinyanga). Around the zone offices, NFRA operates around 90 to 120 buying centers where maize is directly purchased from farmers or warehouses. These buying centers are located mainly in the surplus areas of the Southern Highlands[6] and should create incentives for farmers to increase production due to guaranteed purchases based on fixed floor prices. For instance, the Government announced in 2010 that 73,672 tonnes of maize was to be purchased by the NFRA, and 126,915 tonnes transferred from the southern highland regions to areas facing drought. In 2011, due the food shortages caused by drought, the Government announced that the NFRA would continue to purchase food crops. Tshs 17.6 billion (USD 11 million) was allocated for the purchase of 200 000 tonnes of maize from farmers, starting from 1st August, 2011. In 2011, the price was set again at the competitive price of Tshs 350 per kilogram, to discourage farmers from selling in neighboring countries, however this price was not significantly higher, and in some cases lower, than the average wholesale prices reported in the producing areas during 2011.

However, actual market interventions normally fall below NFRA's plans due to financial constraints and limited warehouse facilities. During the shortages, the reserved grains are distributed to the market at an affordable price. While there is no explicit definition of "affordable prices" this normally implies prices below market level.

After the NFRA had released a portion of its stock in November 2008 and July 2009 to reduce food prices in areas where price rose sharply, the Government announced in August 2009 that it would maintain a sufficient stock level for 6 to 12 months needs in order to "ensure conditions of market stability". Between July and September 2009, a total of 64,545 MT of maize and 271 MT of sorghum were procured for maintenance of stock through NFRA, and a total of 84,056 MT of maize including carry over stock have been distributed to deficit areas. In cases where domestic production is not sufficient to cover domestic demand, the Government commissions private companies via tenders to import maize. The NFRA itself has no mandate to import from foreign markets, except in exceptional years. Table 6 summarizes the main purchases by the SGN/NFRA and final stocks for the period 2000-2011 together with the calculated sales (releases). Domestic purchases are at maximum 10 percent of total marketed production and the same applies to releases.

[6] However, the location of the centers changes annually, depending on the quality and quantity of maize.

Table 6: SGN (up to 2008) and NFRA (as of 2009) maize purchases (tonne).

Year	Domestic purchases (I)	Imports (II)	Reserve as 30/06 (III)	Implicit sales (IV)
1999/2000	86,430	74,043	74,709	n,a,
2000/2001	51,873		46,339	80,243
2001/2002	18,973		47,047	18,265
2002/2003	28,475		50,656	24,866
2003/2004	45,925	32,000	29,971	98,610
2004/2005	97,842		112,655	15,158
2005/2006	1,773	42,000	489	155,939
2006/2007	92,167	30,000	119,850	2,806
2007/2008	16,415		65,838	70,427
2008/2009	61,587		87,132	40,293
2009/2010	73,682		47,686	113,128
2010/2011	180,995		156,003*	72,678

*: Data for reserve at 30/06/2011 has been taken from an alternative source. Bank of Tanzania Monthly Economic Review (December 2011) and NFRA annual report shows discrepancy with NFRA purchase report which is much higher (217,529).
Note: implicit sales are calculated as {*(III)[year x-1] + (I) + (II) - (III)[year x]*}
Source: NFRA maize purchase report 1999-2011

Detailed data on sales is only available as of 2009 show that the majority of the sales are for local authorities (emergency sales in deficit areas); prisons and the army. Cash sales (i.e. to private millers), with the exception of 2012, are normally below 10 percent of total releases by the NFRA.

The strategic food reserve's role in overall maize markets remain limited compared to overall production (a maximum of 150 000 tonnes compared to an average production of 3,16 million tonnes during the period 2000- 2009). However analysis by Nyange and Wobst (2005) showed that markets responded differently to SGR interventions, trade and regional production depending on their nature for periods before 2000 (when its releases where not much higher than now although production was lower). While SGR procurement increase maize price in production areas, its effect was reversed when the stock was released. Furthermore, maize price is influenced by factors beyond Tanzania's border that is production in the region and trade. Food trade has a significant effect in domestic market prices. From the presented results it is evident that ***SGR support to producers is temporary during procurement and its action is offset when stocks are released***.

BORDER POLICY

As far as trade policy is concerned The United Republic of Tanzania is a member of East African Community (EAC) and the Common Market for Eastern and Southern Africa (COMESA). This affects its tariff structure which has a dual structure: one tariff for the trade partners from these regional free trade agreements and one for the rest. As show in Table 7, tariffs have been decreasing with time and for the period of analysis stand at 50 percent for non-EAC members and 0 percent for EAC members.

As shown above imports originate mainly from outside the EAC thus it is expected that in years when The United Republic of Tanzania is a net importer, this policy affects our price analysis. In July 2003 the Government passed a bill enabling protective measure to prevent imports of so-called cheap sub-standard products. This can be considered de-facto an import ban which was removed in 2008. However border measures in the country seem to be very unstable as during the high food prices crisis when The United Republic of Tanzania removed the import tariffs for maize from July 2007 to May 2008 and again in November 2008. As shown above (Figure 3), the measures do not seem to

have an impact (imports area banned but they exists) and when tariffs are removed trade intensity for maize in The United Republic of Tanzania remains quite low.

Table 7: Ad valorem Tariff Structure (in %) for Tanzania maize (excluding seed)

Product	Regime	2010	2009	2008	2007	2006	2005	2003	2000	1998	1997	1993
Maize	MFN	50	50	50	50	50	50	25		-	-	-
	EAC	0						5	-	-	-	-
	Customs duty	-	-	-	-	-	-	-	-	30	30	20
	COMESA	-	-	-	-	-	-	-	-	6	-	-

-: no specific tariff / shaded cells reflect partial waivers of import tariffs.
Source: WITS World Bank for 2012

While tariffs influence maize markets when the country is a net importer, in years when The United Republic of Tanzania is in a net exporting situation the main policy intervention is the export ban. The United Republic of Tanzania is the only country in East Africa that formally restricted trade during the 2000s and this has been a major policy debate issue in the country. This policy measures were in place during the 1980's and formally lifted in 1999 (World Bank, 2009). However it has gained prominence again during the food price peak events on the 2007-2009. Table 8 presents a chronology of export ban related decision during since 2004.

Table 8: Chronology of export restrictions events in Tanzania (2004-2011)

Date	Event
2004	Withdrawal of all maize export permits given to traders and suspension of issuing of new ones.
Jan - 2006	Export ban lifted for two months
Mar - 2006	Export ban reintroduced
Jan - 2007	Export ban lifted
Jan -2008	Export ban reintroduced
Oct -2010 (or Apr-2010)	Export ban lifted
May - 2011	Export ban reintroduced

Source: World Bank (2009) and FAPDA

As far as the analysis is concerned, during the three years when The United Republic of Tanzania was in an export position, there was an explicit export ban in 2005 and 2009; and no export ban in 2007. The existence of exports during export ban periods shows the elusive nature of the export ban. However just the existence of the ban has an impact on the functioning of the market and the prices in different locations. Different arguments have been given in favor of the export ban including food security (prevent food leaving the country when there is shortage in some areas) and price stabilization. The latter refers to the practice of imposing a ban before harvest to prevent farmers from selling their crops at very low prices due to lack of information on destination prices. Bans are lifted after harvest when farmers can request higher prices knowing the market conditions in Dar or other countries.

Traders, wishing to embark on regulated international trade for maize, need to get import and export permits from the Department of Food Security at MAFSC and Ministry of Industry and Trade; phytosanitary certificates and Customs documentation involving at least four ministries (MAFSC, Ministry of Industry and Trade, Ministry of East African Cooperation and Ministry of Finance).

Another policy affecting the maize market is local trade taxing which in The United Republic of Tanzania is a common income generating activity by local authorities. Taxation of local trade represents a significant share of local authoritys' income (10 percent of total income in Mbeya). However as local governments received high budget transfers from the central government (up to 97 percent), their share in local government total resources is quite limited (World Bank, 2010). Taxes are charged per bag (100 kg) and in Mbeya for 2008 the tax was 500 Tzsh (5 000 Tzsh per tonne) or 2 percent of wholesale price.

An additional major policy affecting maize production is a Fertilizer Subsidy (Mbwele and Pius, 2010). This was introduced in 2003 only for the Southern Highlands and expanded to the whole country in 2004. In 2008 the program was transformed into a Smart[7] subsidy using vouchers for targeting under the name of NAIVS (National Agricultural Input Voucher System) which subsidized 50 percent of fertilizer and seed costs to eligible farmers in 11 regions and expanded to 20 regions in 2009. Overall expenditure and some additional descriptive indicators are shown in Table 9.

The NAIVS program represents a quantitative leap in the amount of resources devoted to this policy measure, taking approximately 15 percent of public expenditure in agriculture[8]. This program also represents the single most important allocation area of the MAFSC budget (MAFSC, 2010).

Table 9: Fertilizer subsidy expenditure in Tanzania

	2005/6	2006/7	2007/8	2008/9	2009/10	2010/11
Total subsidized fertilizer cost(USD) million	7.1	19.1	17.3	57.8	48.4	63.6
Subsidized fertilizer cost delivered at rural depots/ware house(USD/mt) NB	418	438	600	978	444	554
Fertilizer transport cost etc(USD/mt)	15	15	18	18	20.8	20.8
Overall fertilizer cost (USD/mt)	433	453	618	996	464.8	574.8
Fertilize cost, for private retailers(USD/mt)	433	453	618	996	464.8	574.8
Government expenditure USD (million)	7.1	19.1	17.3	28.9	24.2	31.84
Donor expenditure (USD million)	-	-	-	28.9	24.2	31.8
Total program cost (USD million)	7.1	19.1	17.3	57.8	48.4	63.6
Total programme cost net of farmer redemption (USD/mt)	na	na	309	498	232.4	287,4
Programme Cost as % of National budget	0.23%	0.42%	0.38%	0.97%	0.69%	0.79%
Programme cost as % of GDP	0.01%	0.03%	0.03%	0.09%	0.09%	0.098%

Source: Mbweke and Pius (2010).

[7] SMART stands for the following characteristics in a subsidy: (S)pecific targeting to farmers who would not otherwise use purchased inputs (or to areas where added fertilizer can contribute most to yield improvement); (M)easurable impacts; (A)chievable goals; (R)esults orientation; (T)imely duration of implementation.

[8] World Bank (2010) reports agricultural expenditure as 5.83% of total expenditure for the period 2008-2011. Table 7 shows that NAIVS represents 0.82% of total expenditure for the same period. Thus NAIVS represents 14% of total agricultural expenditure.

3. DATA REQUIREMENTS, DESCRIPTION AND CALCULATION OF INDICATORS

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

The analysis of price incentives/disincentives is carried out for the period of 2005-2010 and aims at estimating price gaps and rates of protection at wholesale and farm gate levels. This analysis requires the following variables.

TRADE STATUS OF THE PRODUCTS

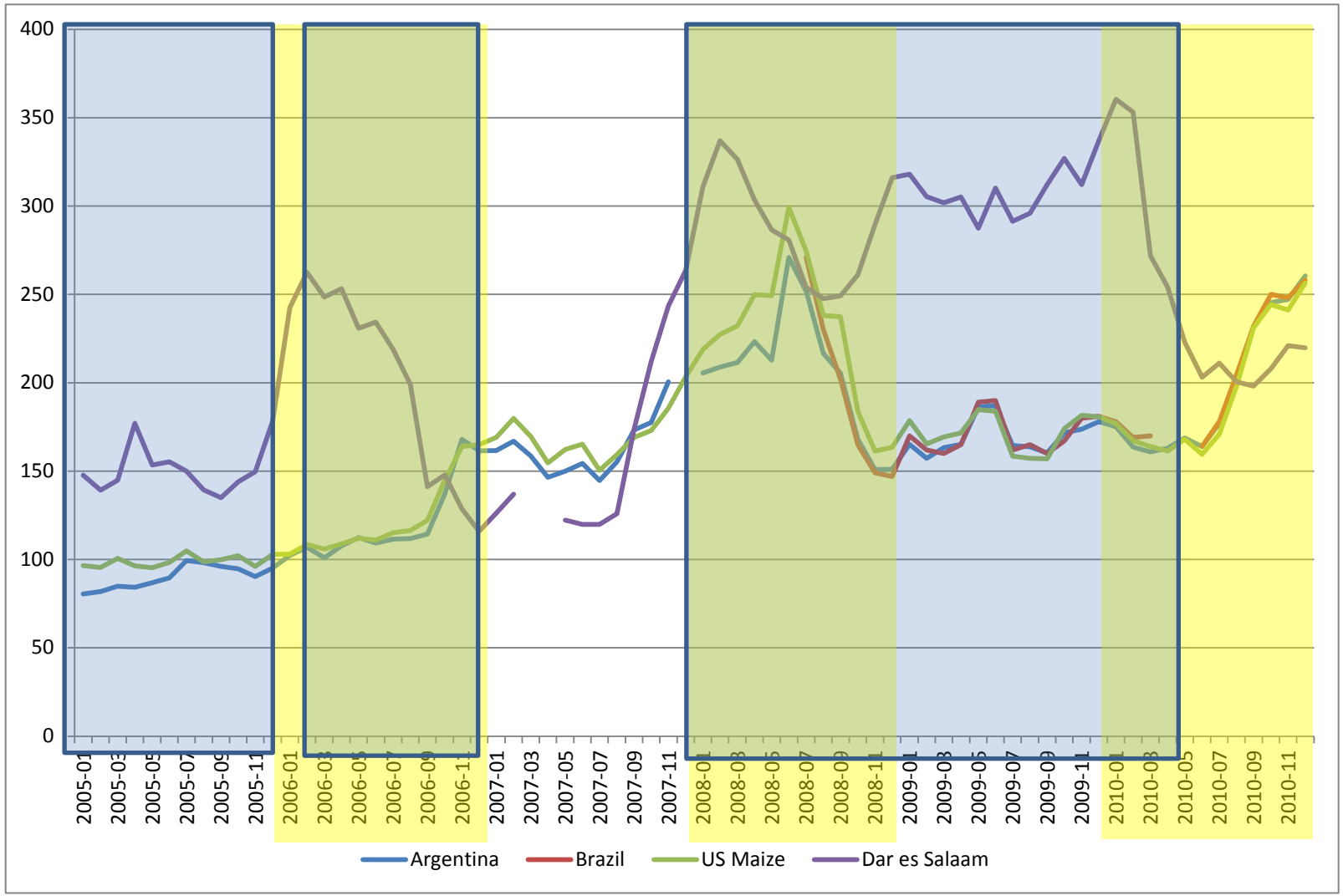
Following the review above the analysis is made with the assumption that the point of competition takes place at the wholesale market of Dar for years when The United Republic of Tanzania is a net importer and at the border when The United Republic of Tanzania is a net exporter. Table 10 shows the years for which t maize is an import and those for which it is an export based on the information provided in Figure 5 and Table 2 (FAOSTAT and COMTRADE). The only year when there is a discrepancy between the two sources is 2009. However the discrepancy seems to be related to trade on maize seed. During that year The United Republic of Tanzania had put the NAIVS in place, a program that included distributing seeds together with fertilizer to farmers and thus imported huge amounts of maize seed (over 6 000 Mt) which is also evident from the implicit import price obtained using FAOSTAT data (1.097 USD per tonne). Thus we consider that The United Republic of Tanzania was a net exporter of maize in 2009.

Table 10: Assessment of trade position of maize in Tanzania for price incentive and disincentive analysis

	2005	2006	2007	2008	2009	2010
Net trade (X-M) (Mt)FAOSTAT	4,485	(272,193)	80,467	(8,372)	(3,280)	
Net trade (X-M) (Mt) UN COMTRADE	64,678	(206,398)	64,653	(8,879)	155	(3,425)
Commodity analyzed as….	Export	Import	Export	Import	Export	Import

Source: FAOSTAT and UN COMTRADE

Figure 12: International FOB prices, Dar wholesale prices (USD per Mt) and net Tanzania trade position (2005-2010)



Yellow shaded periods refer to Tanzania importing maize while non-shaded ones refer to Tanzania exporting maize; blue shaded periods show maize export ban in place.

Source: World Grain Statistics, International Grains Council and MTI.

Figure 12 shows that The United Republic of Tanzania is generally a maize importer in periods when international prices are growing and exports when prices are more stable[9] plus the relationship of the export ban with the net trade of the country. The ban is in place both in time of recorded exports (thus showing limited enforcement capacity) and while the country is a net importer (thus showing limited success is feeding the domestic population with local production). Moreover, in import years at least during some months the domestic price was above the import parity price and during export years over the export parity price (see Figure 17), thus supporting the analysis of the commodity as an import or an export during those years.

[9] This is probably normal as price peaks relate to global supply shortages and/or demand peaks to which Tanzania is not immune.

BENCHMARK PRICES

Observed

Benchmark prices are the CIF prices for years in which the product is imported and as FOB prices when it is exported. Prices have taken as implicit prices calculated from UN COMTRADE for the product description "maize (other than seed)" (Table 2). Table 11 shows the prices used in the analysis.

Table 11: Benchmark prices (USD/Mt) considered for the analysis of price incentives/disincentives for maize in Tanzania

	2005	2006	2007	2008	2009	2010
Implicit FOB price (maize other than seed)	109.23		141.12		2,110.15	
Implicit CIF price (maize other than seed)		197.19		248.31		357.89

Source: UN COMTRADE

As it can be seen the price for maize exports in 2009 is out of the range of reasonable prices, probably due to the low traded quantity (only 207 Mt). This is evident when this price is compared to other international references. In 2009 FOB prices for maize from Argentina, Brazil and the US as reported by the International Grain Council where 206, 194 and 228 USD per Mt respectively. However these quotes are for yellow maize while in East Africa mainly white maize is traded. A reference price for white maize can be obtained from the Johannesburg Stock Exchange SAFEX Commodity derivatives[10]. Table 12 compares SAFEX prices for white maize with the implicit FOB prices from The United Republic of Tanzania for the period. As it can be seen 2009 is a clear outlier. Therefore the benchmark price used for the analysis in 2009 has been constructed by adjusting the SAFEX price applying the average ratio of The United Republic of Tanzania FOB exports to SAFEX for the 2005, 2006 and 2008 period, which results in 218 USD per Mt.

Table 12: Comparison of white maize FOB prices for Tanzania and South Africa 2005-2009

	2005	2006	2007	2008	2009
FOB Tanzania(USD / Mt)	109.23	276.87	141.12	251.17	2,110.15
FOB South Africa (USD / Mt)	108.81	182.48	210.07	221.62	184.70

Source: UN COMTRADE & SAFEX

Adjusted

So far we have no indication that the benchmark prices used in the analysis would reflect some kind of market power by international traders which would lead to excessive import prices or depressed export prices and therefore no adjusted benchmark price is considered in the analysis.

[10] Prices are reported in South African Rands and have been converted to USD using the IMF exchange rate database.

DOMESTIC PRICES

One of the first decisions that need to be taken to obtain domestic prices is the functioning of the value chain that is assumed. From the discussion above and Figure 9, it seems that the most representative maize pathway in The United Republic of Tanzania is that of production in the Southern Highlands and internal trade to major deficit areas, the main one being the city of Dar. For years when The United Republic of Tanzania has a deficit, local production competes with imports. For years when The United Republic of Tanzania has a surplus, it is not necessary that exports go directly through Dar. It might be possible that the analysis for those years should consider direct export from producing areas either towards Malawi and Zambia (in the case of the Southern Highlands) or towards Kenya (in the case of Arusha and even the Southern Highlands)[11]. However, at this stage the analysis is also done considering Dar as the point of competition.

Farm gate prices obtained from the Tanzania National Bureau of Statistics (NBS) for the period 2005-2010 which are reflected in Table 13 do not seem to be reliable. First, NBS claims that data on farm gate prices is obtained from the agricultural census which was done in 2004 and 2008, the latter having not yet been analyzed. Second, when comparing the average farm gate prices with wholesale prices available in The United Republic of Tanzania (see below) we see that the farm gate price is well above wholesale prices in major producing areas and even above the retail price in Dar es Salaam in two of the five years and exactly the same value in one of them (Figure 13). In addition, farm gate prices reported are higher than purchase prices used by NFRA as a producer support price (see Table 5) which would mean that this initiative would not be needed. Moreover, as markets in The United Republic of Tanzania are not perfectly integrated particularly between production areas (World Bank, 2009) we have decided not to use this data source.

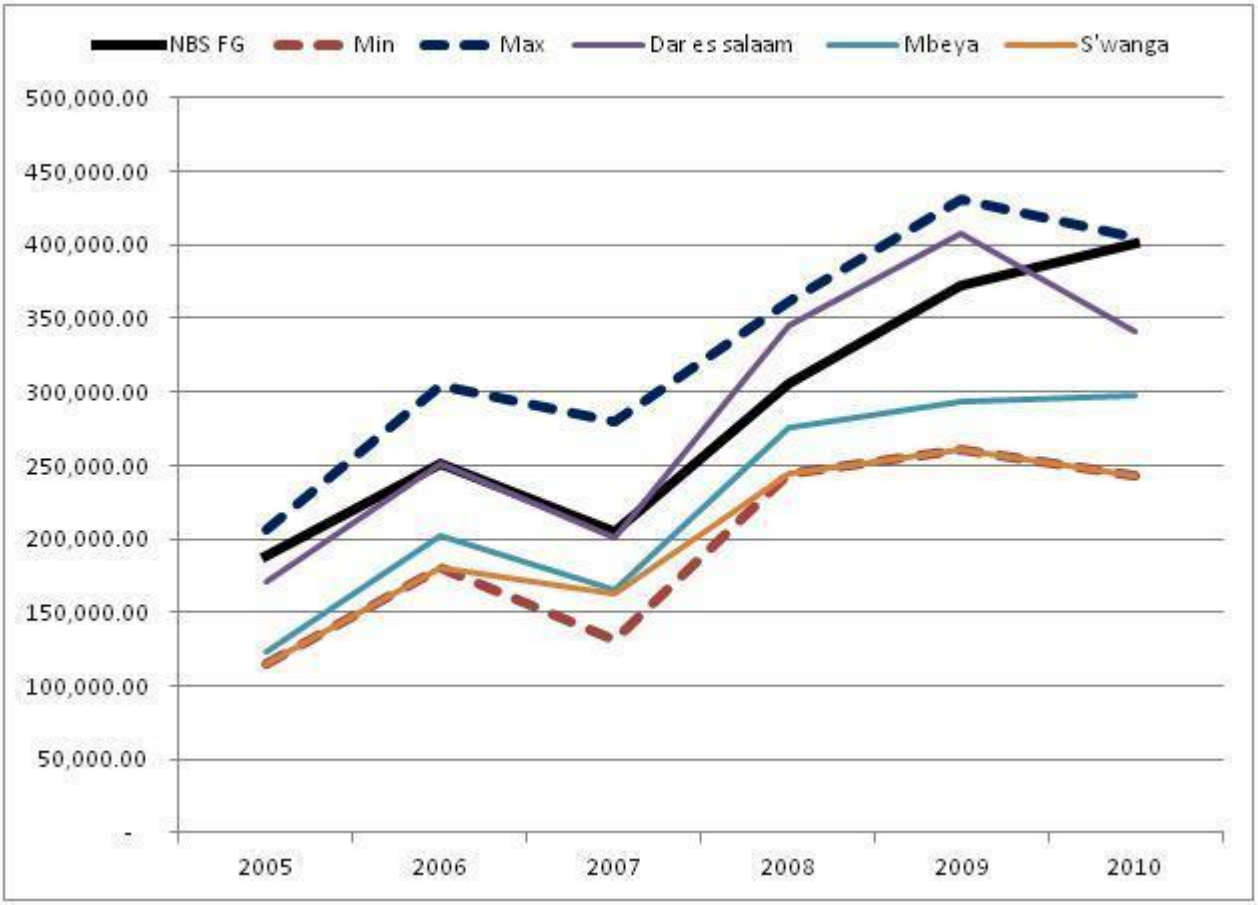
Table 13: Country average farm gate prices for Maize in Tanzania (Tzsh per tonne)

	2005	2006	2007	2008	2009	2010
Farm gate price	188,100	251,137	205,182	305,433	372,873	400,838

Source: NBS.

[11] In 2005 99 percent of exports when to countries with a physical borer with Tanzania (being Kenya the main importer); in 2007 the figure went down to 34 percent and in 2009 back up to 100 percent (with Rwanda as the main trading partner).

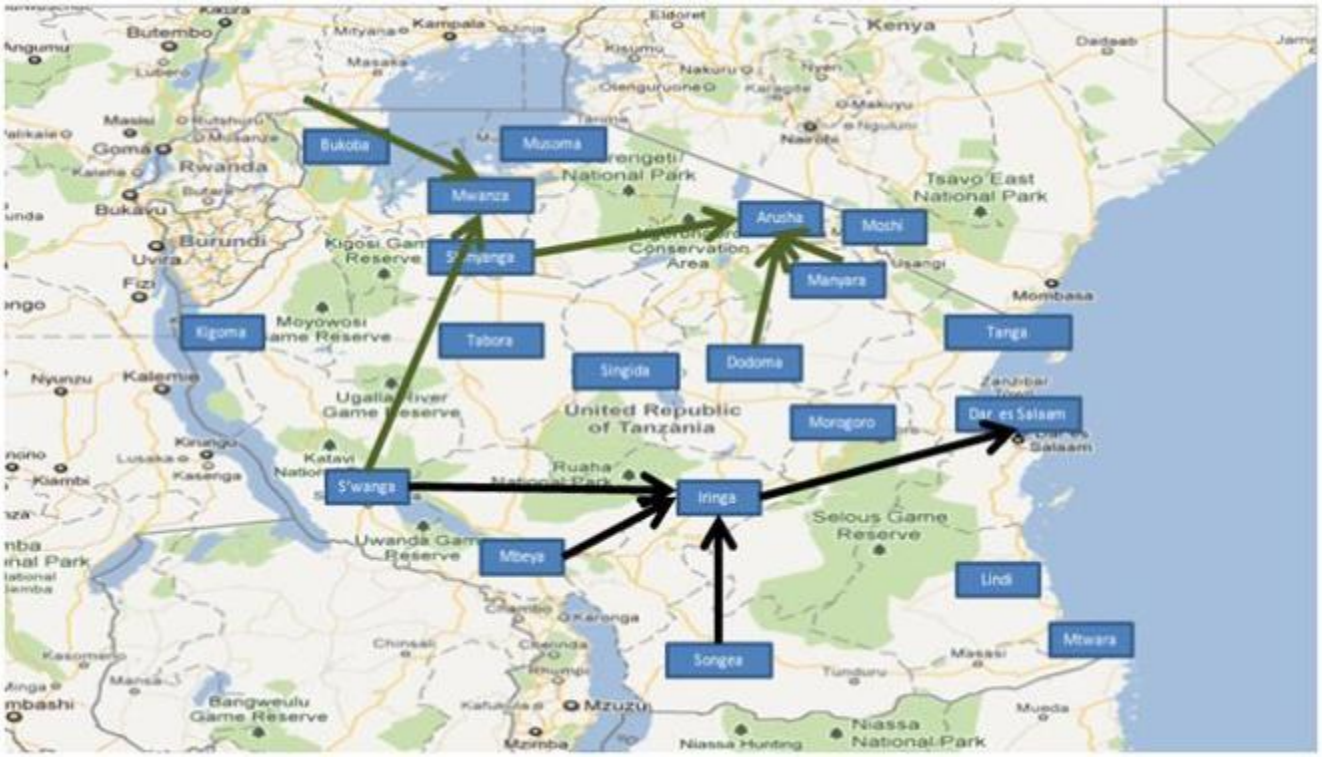
Figure 13: Maize farm gate prices and representative wholesale prices in Tanzania (Tzsh per tonne)



Source: NBS and MTI.

The Ministry of Trade and Industry keeps a good record of wholesale prices in 22 markets across The United Republic of Tanzania that can serve as proxies for farm gate prices. These are reported on a monthly basis since January 2004 while prices are collected three times a week. Asche et al. (2012) report that prices are obtained for 6 or 7 traders in each market reporting the highest and lowest price, and it is not clear to us what price is actually used to calculate the monthly averages. Prices are reported in local currency per 100 kg bags. This raw data is used by several other agents in The United Republic of Tanzania (i.e. EAGC, WFP, FEWSNET) to report average monthly prices, however due to the different exchange rates used and the different methodologies to input missing data, data from the different sources for prices is inconsistent. Figure 14 shows the distribution of the markets for which price information is available.

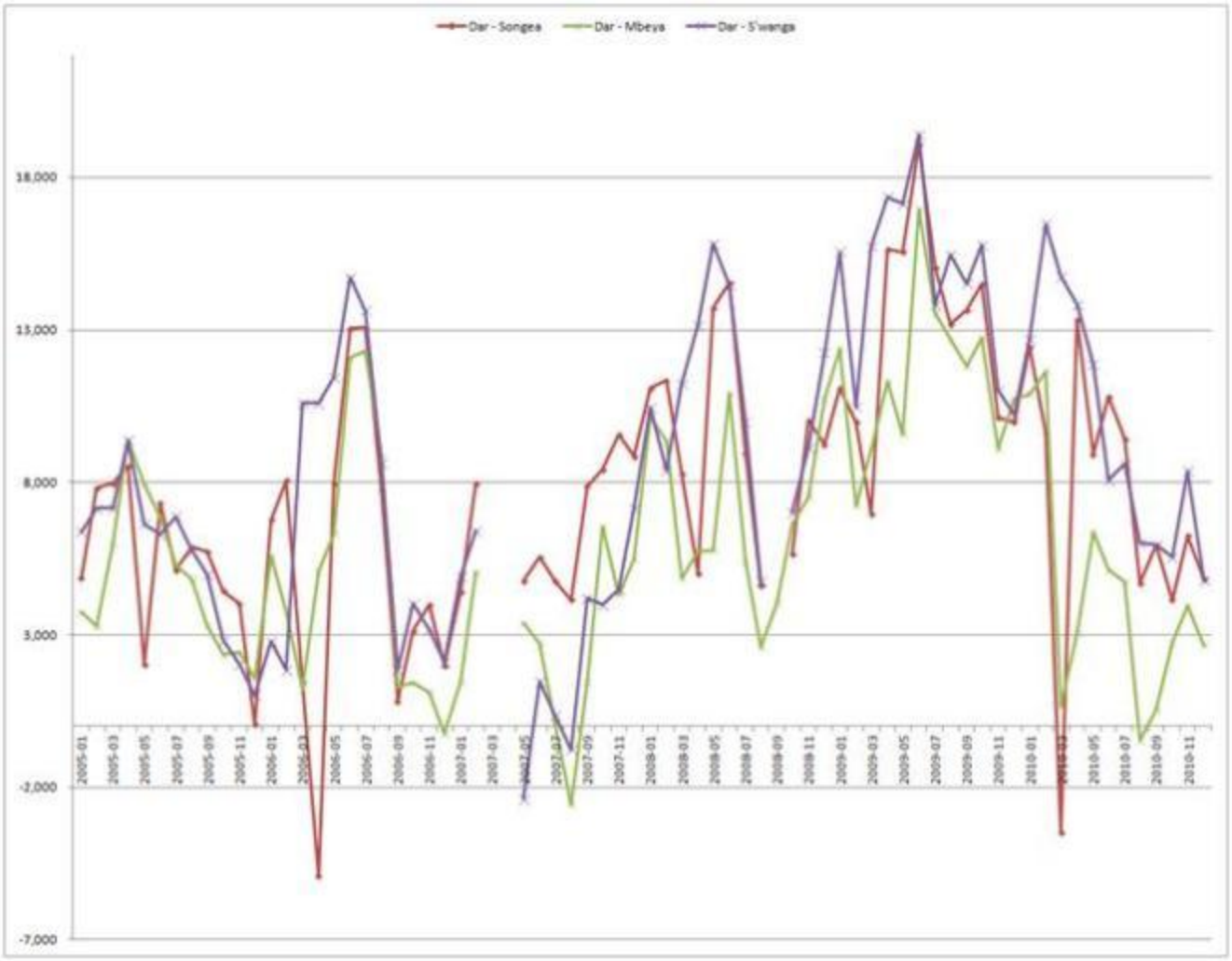
Figure 14: Markets for which Ministry of Trade in Tanzania records wholesale prices for maize and representation of the assumed marketing chains



Note: black arrows show marketing route for import years and export to rest of the world. Green arrows show marketing routes when exports go to Kenya or imports come from Uganda.
Source: own elaboration

The typical marketing pattern which is considered in this analysis starts with production in one of the southern highland areas (Mbeya, Iringa, Songea or Sumbawanga) which is then sold at the wholesale market of the district capital city and later sent towards Dar. We have tested whether this assumption is in line with the price structure at wholesale level (i.e. prices increase as the product moves from the southern highlands towards Dar es Salam). Figure 15 plots the difference in prices between these three pairs of cities during the period 2006-2011.

Figure 15: Price differences between Dar and feeder markets (TZsh per 100 kg)



Source: own elaboration from MTI data.

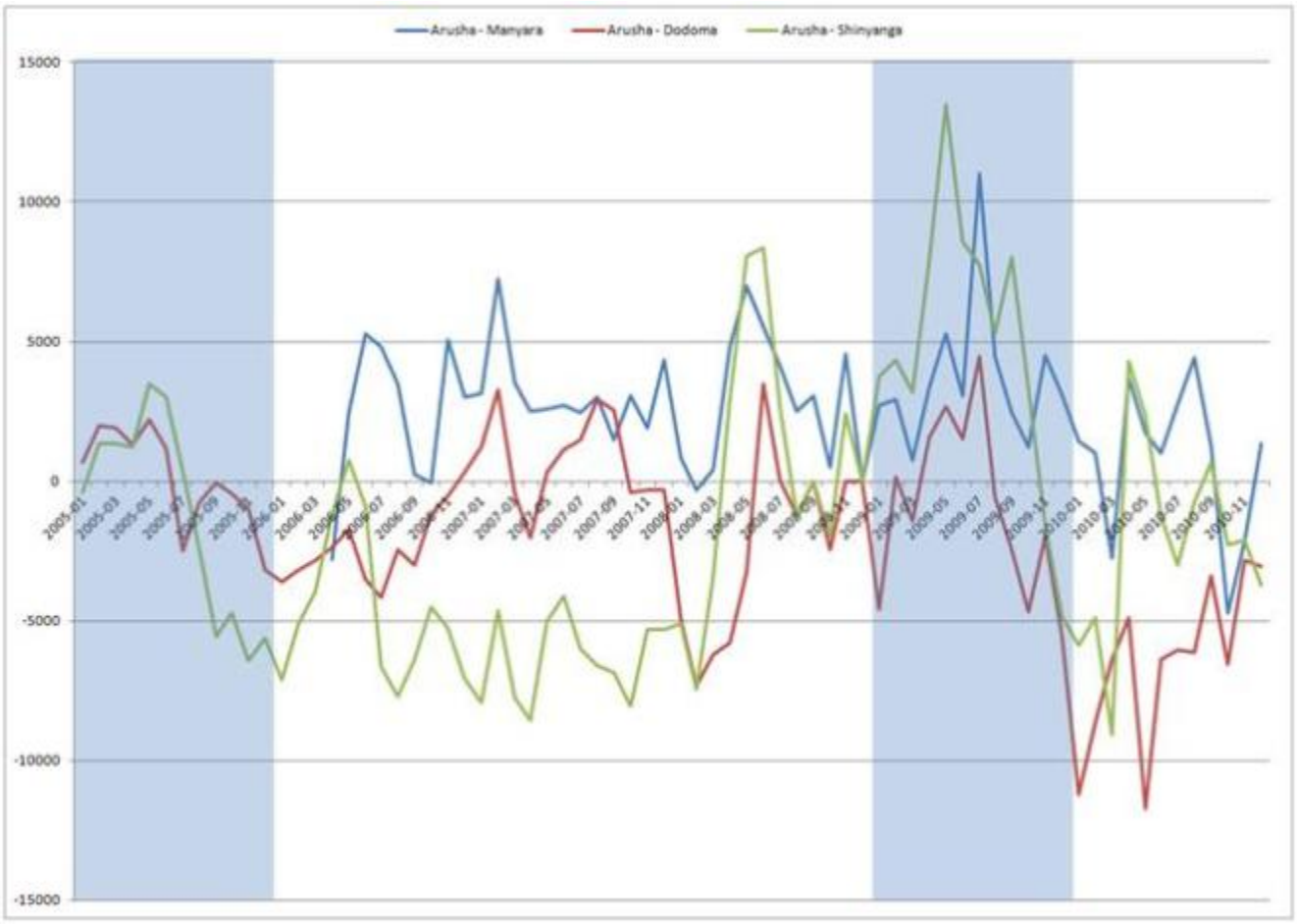
In a majority of cases the price in producing areas is lower than in Dar, and for the markets furthest apart (Dar with respect to Songea; Sumbawanga and Mbeya) the ratio is even higher (97 percent of positive differences). As the market for which the theoretically sound price relationship (i.e. price in Dar higher than in price in production region) is most strongly supported is Sumbawanga, and this is also the main producing region in the country we assume this to be the representative price for maize prices close to the farm gate. This decision is also supported by price transmission analysis of main maize markets in The United Republic of Tanzania, and although less integrated that those in Kenya, Dar seems to be moderately integrated with the production areas while weakly between the production areas themselves (World Bank, 2009).

If imports come from neighboring countries they will not pass via Dar, and go to different main wholesale markets depending on their origin. If they come from Kenya they will arrive at Arusha and if they come from Uganda via Mwanza (the main wholesale market close to the Uganda border). For these markets Sumbawanga is still used as the main producer market.

For export years the proposed route is valid when exports are not for neighboring countries. That is the case in 2007 (65 percent of exports go to destinations which imply shipping via Dar) but not for 2005 (63 percent goes to Kenya and 91 percent to Kenya and Burundi, DRC and Rwanda) or 2009 (98

percent goes to Kenya and Rwanda). For those years we need to take into account a different marketing path way. The main export route to Kenya is via Arusha and the main surplus area close to that market is Manyara. In addition, the Dodoma market is the main market in the area. Therefore we investigate the wholesale prices in these three markets during 2005 and 2009 to identify the most probably export route. As it can be seen in Figure 16 during those two years the price structure supports that trade route at least part of the year, and more consistently for Manyara. In 2005 there is no data for Manyara, therefore the analysis cannot be made.

Figure 16: Price differences between feeder markets and Arusha (TZsh per 100 kg)



Soruce: own elaboration from MTI data.

The analysis is made using the raw data available at the Ministry of Trade and Industry, which is disseminated in The United Republic of Tanzania via CountrySTAT. Annual average price were calculated and the price used is shown in Table 14.

Table 14: Maize wholesale prices (TzSh per ton) used for the analysis (shaded cells)

	2005	2006	2007	2008	2009	2010
Dar es Salaam	170,696	251,137	201,386	345,386	407,404	324,919
Arusha	183,940	242,170	188,965	322,269	401,857	324,919
Mwanza	304,896	256,710	345,665	393,688	369,217	304,896
Manyara	N.a.	203,838	157,284	291,621	364,566	317,410
S'wanga	123,200	202,090	164,855	275,570	293,075	297,684

Source: MTI and own elaboration.

EXCHANGE RATES

Observed

Exchange rates for the The United Republic of Tanzania have been taken from the IMF database and summarized in Table 15. Yearly averages have been calculated using the monthly data available in the source.

Table 15: Exchange rate TzSH/USD

	2005	2006	2007	2008	2009	2010
Exchange rate (yearly average of monthly data)	1,128.93	1,251.90	1,245.04	1,196.31	1,320.31	1,409.27

Source: IMF

Adjusted

There is no intervention on foreign currency markets in The United Republic of Tanzania as the rate floats freely and therefore no adjusted exchange rate is considered in the analysis.

ACCESS COSTS

Observed

Access costs from wholesale to border. As we consider the point of competition to be Dar transport costs can be considered negligible and we focus on actual costs of the import or export process in the Dar es Salaam port. Access costs from port to wholesale are reported by Temu *et al*. (2010) which identify up to 123 USD per tonne as non-tariff requirements for importation[12]. These costs are summarized in Table 16a and revised with additional information obtained from more up to date sources.

[12] Although they do not specify the year, it seems the figures are for early 2000's as they reference a tariff structure as that was in place from 2000 to 2003.

Table 16a: Main import charges at the Dar es Salaam port (early and mid 2000's)

Item	Description	Charge	Update
Pre-inspection charges	Pre-inspection by TISCAN a private company mandated by TRA	Destination inspection processing fees (1.2 percent of FOB)	
Phytosanitary charges	Post entry plant quarantine station inspection	15 USD per consignment	
Port wharfage fees	Paid to Tanzania Harbours Authority for goods while docked or leaving port	1.5 percent of CIF	
Tally fee	Payable to the shipping company	USD 1 per tonne	
TFCB booking fees	Tanzania central freight bureau fee for enforcing fair fright charges for exports and imports	2.5 percent of CIF or FOB	Currently under SUMATRA (Surface and Marine Transports Authority) and set at 0.3 USD per tonne[13]. Included
Clearing agents fees	Documentation fees	78.43 USD per consignment (estimated)	Caps set by SUMATRA Bill of lading 45 USD Delivery order 45 USD
	Agent fees	percent of value of goods	List of approved shipping agents includes over 30 companies.
Loading and unloading	Re-bagging, transport, silo charges etc.	USD 20 per tonne	
Health and food safety standards	Tanzania Food and Drugs Authority Permit	TzSh 1,000 for testing fees	Assumed to be per tonne

Source: Temu *et al.* (2010) and own calculation.

In order to verify the validity of the Surface and Marine Transport Regulatory Authority (SUMATRA) declared fees for bulk imports we have calculated the ratio of total revenues of SUMATRA related to imports and total value of imports[14]. This generates a fee of 0.60 TzSh per USD in 2007 [0.46 (2008) and 0.88 (2009)]. Considering the CIF unit value prices for those years (even when for 2007 and 2009 imports are too limited to have representative CIF prices for Maize) we see that the fee levied to Maize would be between 0.1 and 0.4 USD per tonne which is in the range of the declared fees. Therefore we consider that the SUMATRA import fee of 0.3 USD per tonne seems to be applied.

For some of these components, i.e. those reported as per consignment, we need to make some assumption about the average size of the import consignment in other to obtain a per tonne cost of access costs from the border to the point of competition. Even when maize is normally imported as bulk we can consider a minimum consignment size of 20 tonnes (i.e. one container). Taking into account these considerations the final components of observed access costs from border to point of competition in USD per tonne are shown in table 16b.

[13] As reported for dry bulk http://www.sumatra.or.tz/index.php?option=content&task=view&id=37&Itemid=2

[14] Aggregated trade volume is not available, nor the disaggregation of SUMATRA revenue by type of goods.

Table 16b: Components of the observed access costs from border to point of competition considered in the analysis when Tanzania is an importer of Maize through Dar es Salaam

Item	Value (USD per tonne)	Reference year	Notes
Pre-inspection charges	1.2% of FOB 0.9% of CIF	N.A.	Approximated for imports from original data (referred to FOB) using the FOB to CIF ratio of world exports to declared to Tanzania and world imports declared by Tanzania for 2005 and 2006[15].
Phytosanitary charges	0.75 USD per tonne	2003	Assuming an average shipment of 20 tonnes
Port wharfage fees	1.5% of CIF	2003	For export years applied to FOB
Tally fee	1 USD per tonne	2003	
TFCB booking fees	0.3 USD per tonne	2010	
Clearing agents fees	2.25 USD per tonne	2010	Only bill of lading (imports) or Delivery order (exports) and assuming an average shipment of 20 tonnes
	2% of CIF	N.A.	Estimate of normal fees due to sufficient competition in Dar
Loading and unloading	20 USD per tonne	2003	
Health and food safety standards	1,000 Tzsh per tonne	2003	

Source: Temu *et al.* (2010) and own calculation.

Costs not referred to percentage of the import values have been adjusted for inflation using the Tanzania CPI and those expressed in USD transformed to local currency using the average exchange rate for the year. In addition we consider a 5 percent profit by importers on purchase price and obtain the following access costs from border to wholesale when The United Republic of Tanzania is a net exporter reflected in the following Table 16c.

Table 16c: Access costs from border to point of competition when Tanzania is an importer/exporter of Maize through Dar es Salaam

Year	Access costs (TzSh per tonne)
2005	42,045
2006	58,602
2007	59,324
2008	67,718
2009	81,041
2010	84,550

Source: own elaboration as described above.

For the years when exports do not go via Dar we need to consider transport costs from point of competition to the border. Arusha is approximately 100 km from the Kenyan border in Namanga and Mwanza is approximately 500 km from the Uganda border in Mutukula. Taking the value per tonne and km reported for trucks by NFRA (see below) and deflating it to 2005 and 2009 we get a per km cost of 132and 188 TzSh, which is then multiplied by the distance to obtain the transport cost. We consider that exports by road would also pay the phytosanitary charges and the documentation charges and get a total access cost from point of competition to the border when exporting to Kenya of 15,905 TzSh per tonne in 2005 and 23,207 TzSh per tonne in 2009.

[15] For all other years trade data is too inconsistent to be used (i.e. FOB price higher than CIF price or volumes differing by more than one order of magnitude).

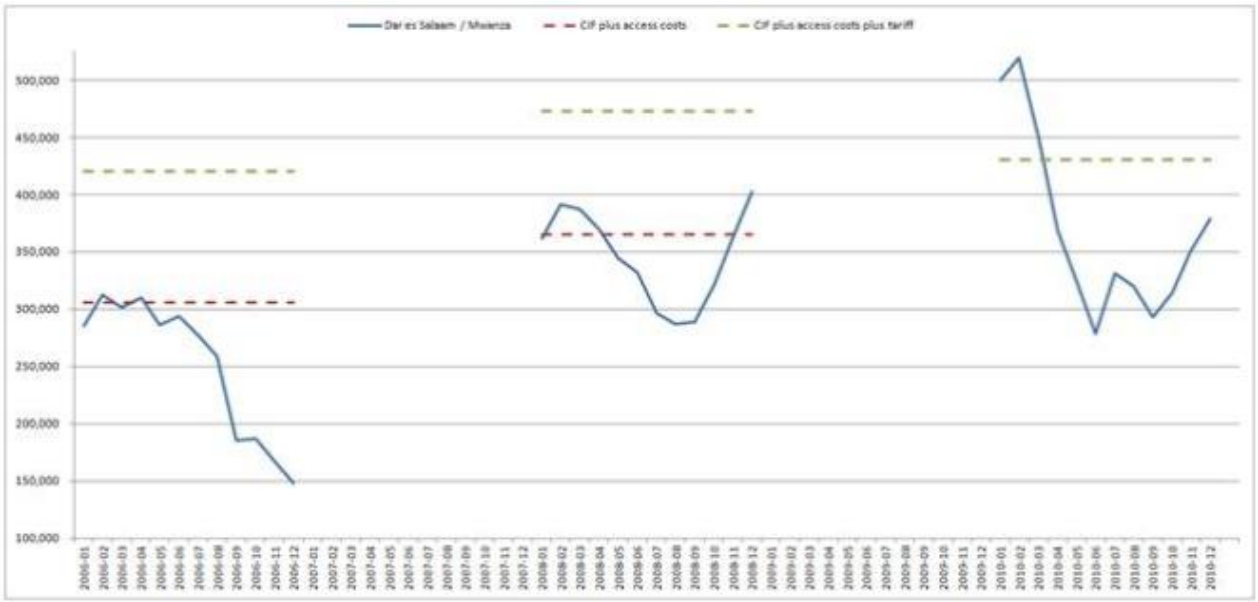
We can compare these access costs from the border to the point of competition to the actual price differences between imports (valued at local currency) and wholesale prices in Dar the years when trade happens mainly through Dar es Salaam (Table 17). In average values we can see that wholesale prices in Dar and Mwanza (for 2010) are below CIF prices plus access costs even when the calculations do not take into account the existing tariff which is set at 50 percent for non EAC partners and 0 percent for EAC partners[16] (Table 7). As we have monthly price data for Dar and Mwanza we can compare the CIF price plus access costs (i.e. the reference price) and the total costs of imports (CIF price plus access costs plus effective tariff) with the average monthly prices (Figure 17). During 2006 and 2008 at no moment in time did prices in Dar allow to cover the cost of the tariff for importers, as during those years tariff were partially lifted (see trade policy section) and NFRA undertook major imports (see policy decision section). Early in 2010 prices in Mwanza were higher than the import parity price and in 2007 prices in Dar just allowed for exports during some months.

Table 17: Import prices, access costs and domestic wholesale prices for Dar es Salaam Market

Year	CIF (FOB) Price in local currency	Access costs	CIF (FOB) price plus (minus) access costs	Domestic wholesale price in DAR
2006	246,862	58,602	305,464	251,137
2007 (FOB)	207,897[18]	59,324	148,572	201,386
2008	297,055	67,718	364,773	345,387
2010 (Mwanza)	308,630[17]	120,582	430,397	369,217

Source: COMTRADE, MTI and own elaboration as described above.

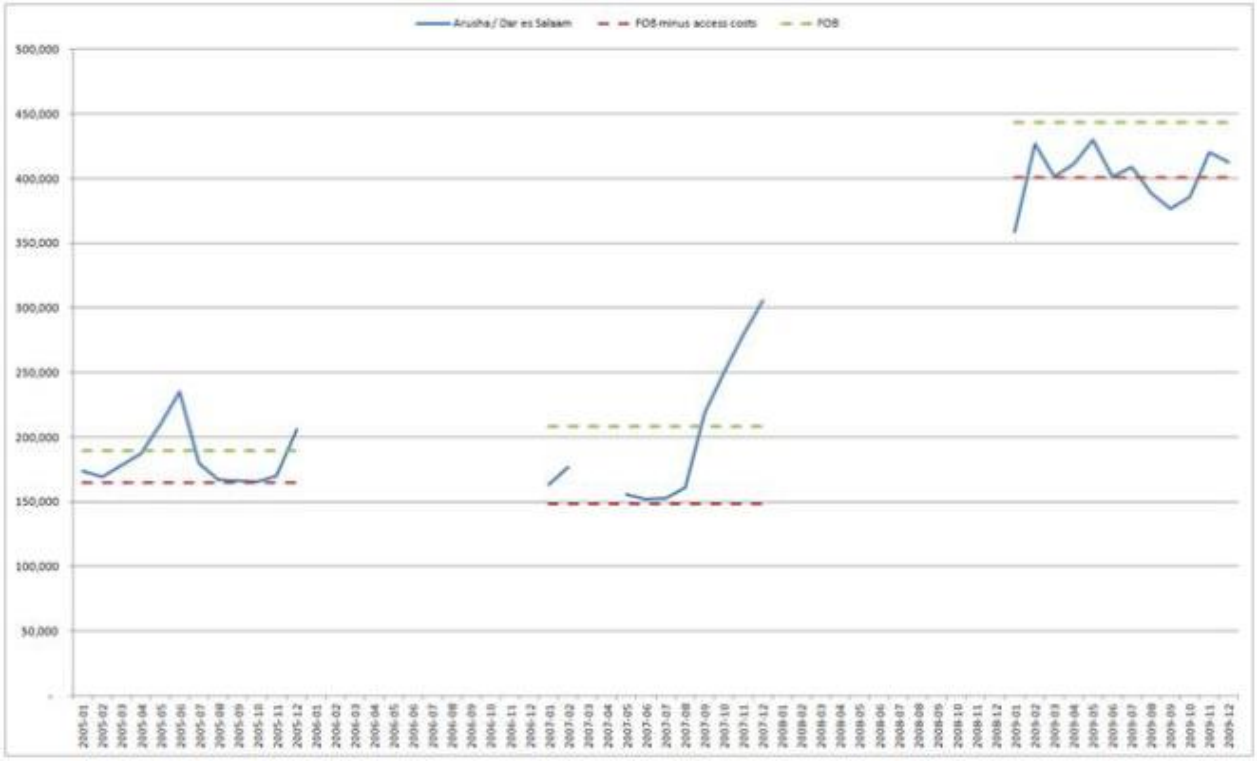
Figure 17a: Comparison of Dar es Salaam/Mwanza wholesale price, reference price and cost of imports with tariff for Maize (TzSh per tonne) during years when Tanzania is a net exporter



Note: for 2010 as imports come from Uganda (EAC member) a 0% import tariff is considered.
Source: COMTRADE, MTI and own elaboration as described above.

[16] Uganda main origin of imports for the analysis in 2010 is an EAC member.
[17] This figure does not correspond to the USD price reported in table 9. See below for explanation on change of Benchmark price for 2007 and 2010.

Figure 17b: Comparison of Arusha / Dar es Salaam, reference price and FOB price for Maize (TzSh per tonne) during years when Tanzania is a net importer



Note: for 2010 as imports come from Uganda (EAC member) a 0% import tariff is considered.
Source: COMTRADE, MTI and own elaboration as described above.

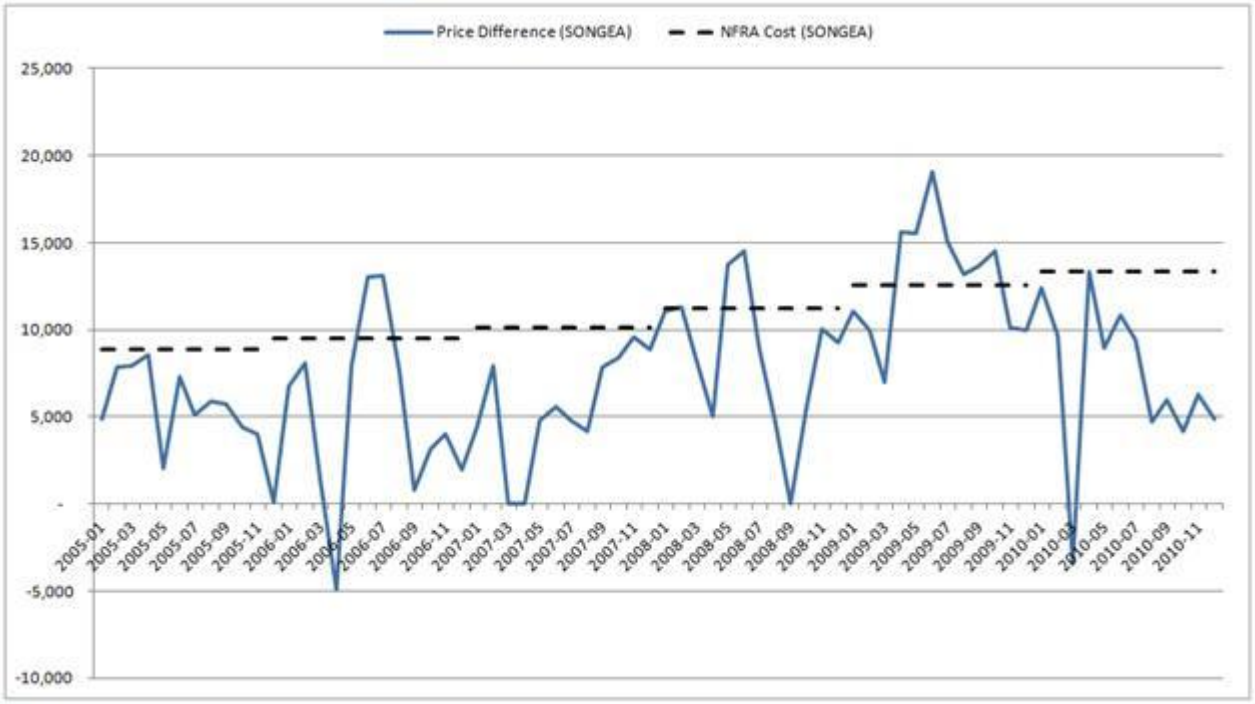
Access costs between farm gate and wholesale have been obtained from the NFRA. According to their accounting system transport costs from the different surplus storage centres to Dar es Salaam in 2011 are those reflected in Table 18. These costs have been deflated to obtain the transport costs for 2005-2010 and compared to the different price differentials in those corridors (Figures Figure **18**a to 18c). This analysis further supports the use of Sumbawanga as production area as price relationships allow for profit in most of the study period. This is due both to the lower transport costs (better infrastructure) and the lower prices in Sumbawanga.

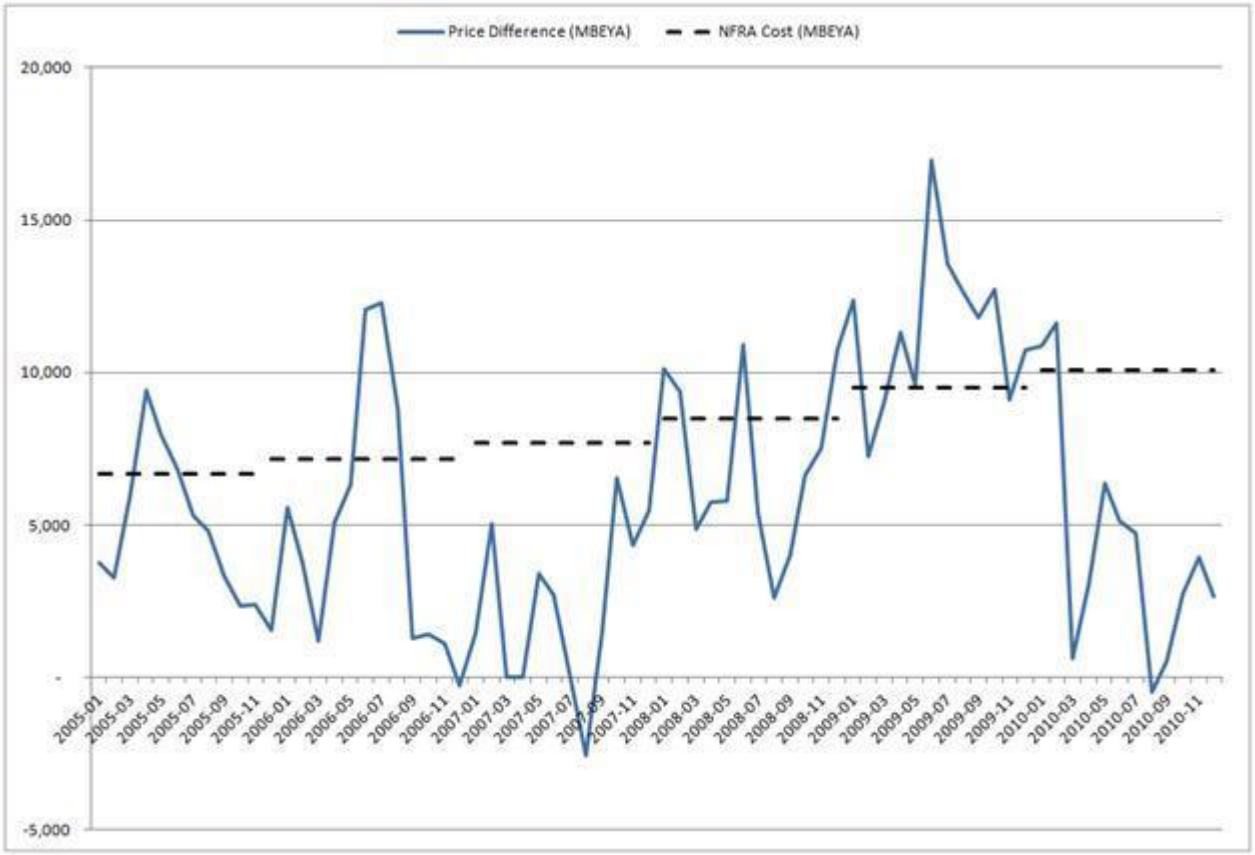
Table 18: Transport cost for NRFA shipments between major zone office storage centers

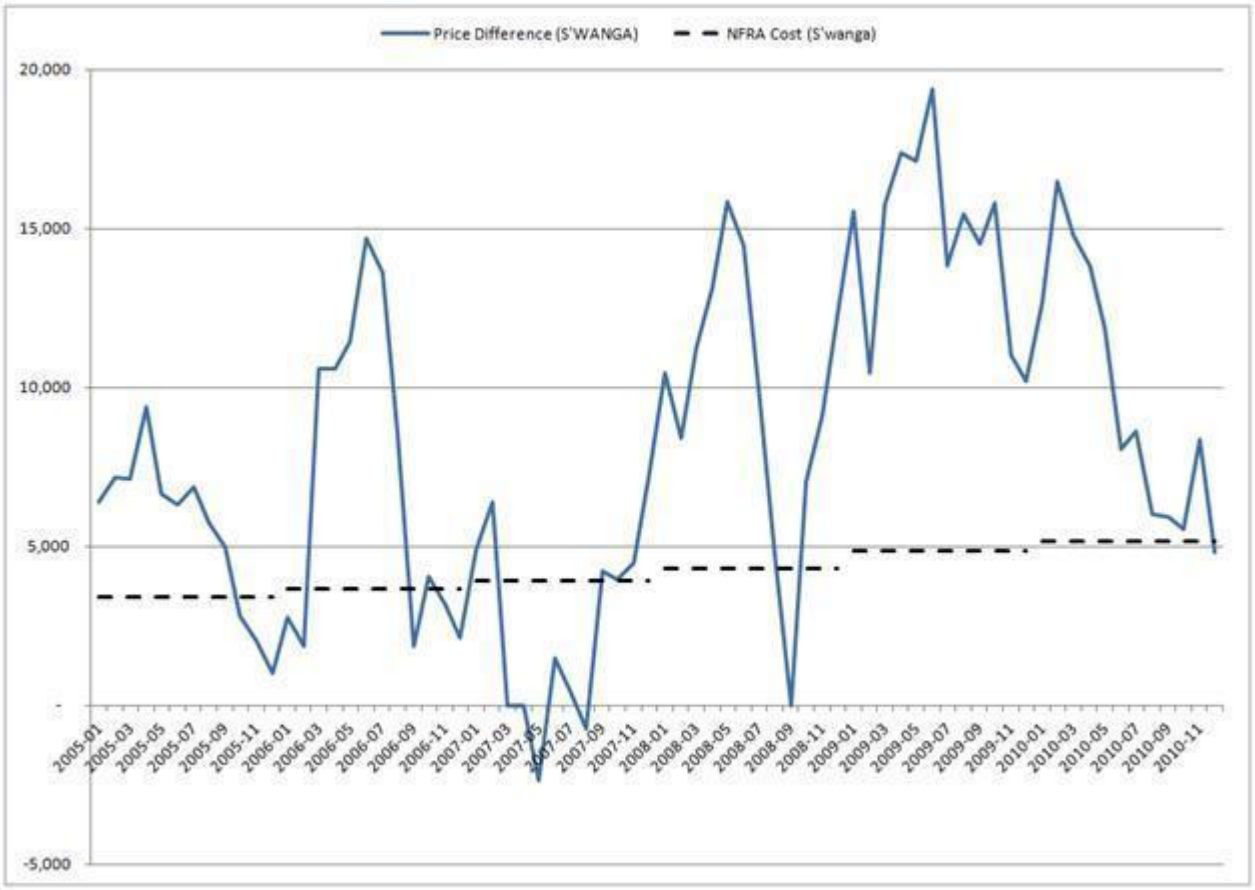
Corridor	Distance	Mode of transport	Cost (TzSh)	Cost per tonne and km (TzSh - USD)
Songea - Dar	927	Truck	158,500 per tonne	170.10 – 0.11
Mbeya – Dar	828	Train	119,917 per tonne	144.83 – 0.09
S'wanga – Dar	1,399	Train	3,442,600 per 40 tonne container	43.65 – 0.03
Arusha – Dar	N.a.	Train + truck	N.a.	238.00 – 0.16

Source: NFRA and own elaboration.

Figure 18a, 18b and 18c: Comparison of Difference between prices in Dar es Salaam and feeder areas with transport costs (TzSh per 100 kg)







Source: NFRA, MTI and own elaboration.

As the reported costs are paid by NFRA to an agent to undertake the transport we only add margins to the price of purchase of maize in Sumbawanga, as the margin of the transporter is already covered in the price. The final observed access costs used in the analysis when the marketing route is assumed to go from the southern highlands to Dar are reflected in Table 19.

Table 19: Access costs from farm gate to point of competition when trade route goes via Dar

Year	Access costs (TzSh per tonne)
2005	
2006	12,654
2007	12,052
2008	16,541
2009	
2010	

Source: NFRA, MTI and own elaboration.

When the trade goes via Arusha we use the value of cost per km and tonne using trucks reported by NFRA (16 USD cents) and multiply it by the distance between Manyara and Arusha (162 km) adding the same 5 percent margin to the purchase price. When trade goes via Mwanza we use the same approach but considering the distance between Sumbawanga and Mwanza (937 km).

As far as internal trade taxes, these refer mainly to the parts of the value chain which are not considered in this analysis (farm gate to primary market and primary market to secondary market)[18]. If this component of access costs were to be deducted in the construction of observed reference prices the observed price gaps would be reduced by that amount.

Adjusted

Adjusted access costs

Border Point of competition

In this section of the access costs we can consider the inefficiencies associated with the port of Dar es Salaam. For that we take into account the average costs and charges reported by the World Bank in their review of Africa's transport infrastructure (World Bank, 2011). The World Bank estimates that bulk dry handling costs averaged 4.5 USD per ton in 2006 while our estimate for 2003 is 20 USD per tonne for loading and unloading. The World Bank estimate is near the average of all ports surveyed in Africa (4.3 USD per ton) and marginally higher than costs in middle income African countries (3.8 USD per ton). Therefore, if we take into account the cost reported by the WB instead of the estimate of Temu *et* al. (2010), we construct our adjusted access costs from border to point of competition when considering Dar as the main gateway for trade. The rest components of the access costs remain the same and the adjusted access costs are reported in Table 20.

Table 20: Adjusted access costs from border to point of competition when Tanzania is an importer/exporter of Maize through Dar es Salaam

Year	Access costs (TzSh per tonne)
2005	N.a.
2006	22,351
2007	23,482
2008	25,901
2009	N.a.
2010	N.a.

Source: own calculation as described above.

In years where trade is via Arusha or Mwanza as this component is not in the cost, the adjusted access cost only considers a lower per km transport cost for the distance from Arusha or Mwanza to the border. The alternative value used is that of the cheapest truck cost reported by NFRA for its different transport routes.

Point of competition to farm gate

The access costs used already reflect the cheapest form of transport and handling available in The United Republic of Tanzania. Other studies (World Bank, 2009) report transport costs of 0.12 USD per tonne and kilometer. Moreover we have not included any informal tariffs in the calculation of the access costs. Therefore we do not consider adjusted access cost from point of competition to the border.

For export years via Arusha or Mwanza we do apply the cheapest per km cost of truck transport to the distance from farm gate (market closest to production) to whole sale.

[18] In the terminology of the World Bank (2009) report, the markets for which we have wholesale prices would qualify as secondary markets).

EXTERNALITIES

We are not aware of any positive or negative externalities associated with maize production in The United Republic of Tanzania and have therefore not considered this concept in the analysis.

BUDGET AND OTHER TRANSFERS

Although we are aware that there are some specific budgetary transfers to maize farmers (see fertilizer subsidy section above) we have not been able to identify an allocation key for maize and therefore no BOT have been considered.

QUALITY AND QUANTITY ADJUSTMENTS

No quality or quantity adjustments are needed for the analysis of the maize value chain.

Summary table for data description in MAFAP technical notes

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 Maize in The United Republic of Tanzania. While the table reflects general approaches, specific changes are discussed in Section 4, data reflects the final data used (i.e. taking into account deviations from general approach for specific years).

		Description	
Concept		***Observed***	***Adjusted***
Benchmark price		▪ Years when TZA is a net importer and when is a net exporter to non neighboring countries: *unit value of imports or exports as reported in UN COMTRADE (some additional selection of relevant imports for some years as discussed below);* ▪ Years when TZA is a net exporter to neighboring countries: *unit value of exports to neighboring countries as reported in UN COMTRADE.*	*N.A.*
Domestic price at point of competition		▪ Years when TZA is a net importer and when is a net exporter to non neighboring countries: *Annual average wholesale price for Dar es Salaam* ▪ Years when TZA is a net exporter to or net importer from neighboring countries: *Annual average wholesale price for Arusha (if imports come from Kenya) or Mzanza (if imports come from Uganda).*	*N.A.*
Domestic price at farm gate		▪ Years when TZA is a net importer and when is a net exporter to non neighboring countries: *Annual average wholesale price Sumbawanga* ▪ Years when TZA is a net exporter to neighboring countries: *Annual average wholesale price for Manyara (Kenya).*	*N.A.*
Exchange rate		▪ Annual average of exchange rate as reported by IMF.	*N.A.*
Access cost to point of competition		▪ Years when TZA is a net importer from rest of the world and when is a net exporter to non neighboring countries: *observed export and import costs at port of Dar es Salaamplus 5 percent margin over CIF price(M) or wholesale price at point of competition (X);* ▪ Years when TZA is a net exporter to or net importer from neighboring countries: *observed export costs (phyto sanitary inspection and Delivery order) from port of Dar plus transport costs from Arusha to Kenyan border using 0.16 USD (2011) per km as declared by NFRA plus 5 percent margin over CIF price (import) or wholesale price at point of competition (X).*	▪ Years when TZA is a net importer from rest of the world and when is a net exporter to non neighboring countries: *as observed but with handling costs as reported by World Bank (i.e. 4.5 USD (2006) per tonne of dry bulk versus 20 USD (2000) per tonne of dry bulk);* ▪ Years when TZA is a net exporter to or net importer from neighboring countries: *as observed but assuming a 0.11 USD per km cost which is the cheapest truck transport reported by NFRA.*
Access costs to farm gate		▪ Years when TZA is a net importer and when is a net exporter to non neighboring countries: *5 percent margin on purchase price of maize plus transport costs as declared by NFRA for train transport from S'wanga to Dar;* ▪ Years when TZA is a net exporter to neighboring countries: *5 percent margin on purchase price of maize plus transport as declared by NFRA for Arusha route.*	▪ Years when TZA is a net importer and when is a net exporter to non neighboring countries: *as observed* Years when TZA is a net exporter to neighboring countries: *5 percent margin on purchase price of maize plus transport using cheapest truck transport reported by NFRA.*
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.*

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

		Year	*2005*	*2006*	*2007*	*2008*	*2009*	*2010*
		trade status	*x*	*m*	*x*	*m*	*x*	*m*
DATA	*Unit*	*Symbol*						
Benchmark Price								
Observed	USD/TONNE	$P_{b(intUSD)}$	168.00	197.19	166.98	248.31	336.00	219.84
Adjusted	USD/ TONNE	P_{ba}						
Exchange Rate								
Observed	TzSh/USD	ER_o	1,128.93	1,251.90	1,245.04	1,196.31	1,320.31	1,409.27
Adjusted	TzSh/USD	ER_a						
Access costs border - point of competition								
Observed	TzSh/TONNE	ACo_{wh}	25,102.19	58,601.67	58,998.70	67,717.67	43,300.55	123,552.98
Adjusted	TzSh/TONNe	ACa_{wh}	18,743.84	34,694.00	33,551.61	40,753.38	33,644.99	95,346.61
Domestic price at point of competition	TzSh/TONNE	P_{dwh}	183,940.00	251,137.00	201,386.00	345,386.00	401,857.00	369,217.50
Access costs point of competition - farm gate								
Observed	TzSh/TONNE	ACo_{fg}	-	12,654.82	12,052.52	16,541.23	48,788.01	187,715.49
Adjusted	TzSh/TONNE	ACa_{fg}	-				41,543.37	134,856.75
Farm gate price	TzSh/TONNE	P_{dfg}	n.d.	251,137.00	164,856.00	275,570.00	364,567.00	243,470.00
Externalities associated with production	TzSh/TONNE	E						
Budget and other product related transfers	TzSh/TONNE	BOT						
Quantity conversion factor (border - point of competition)	Fraction	QT_{wh}						
Quality conversion factor (border - point of competition)	Fraction	QL_{wh}						
Quatity conversion factor (point of competition – farm gate)	Fraction	QT_{fg}						
Quality conversion factor (point of competition – farm gate)	Fraction	QL_{fg}						
		NOTES	VIA ARUSHA	VIA DAR	VIA DAR	VIA DAR	VIA ARUSHA	VIA MWANZA

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. Indicators have been calculated for the period 2006-2010 as there is no data available for domestic market prices in 2005. Moreover, as so far we have not been able to measure crop specific budget or other transfers, NRA's have not been calculated.

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.

With the data described above we obtain the price gaps summarized in Table 21, nominal rates of protection in Table 22 and Market Development Gaps in Table 23. Data is reported for 2005-2010 except for farm gate indicators for 2005 as we do not have data for that year

Table 21: MAFAP price gaps for maize in Tanzania 2005-2010 (Tzsh per Mt)

	2005	2006	2007	2008	2009	2010
Trade status for the year	x	m	x	m	x	m
Observed price gap at wholesale	19,381.95	(54,326.83)	52,487.92	(19,387.40)	1,533.39	(64,149.40)
Adjusted price gap at wholesale	13,023.60	(30,419.17)	27,040.83	7,576.88	(8,122.17)	(35,943.02)
Observed price gap at farm gate	n.a.	(41,672.00)	28,010.44	(72,662.17)	13,031.40	(2,181.41)
Adjusted price gap at farm gate	n.a.	(17,764.34)	2,563.36	(45,697.89)	(3,868.79)	(26,833.78)

Source: Own calculations using data as described above.

Figure 19: MAFAP price gaps for maize in Tanzania 2005-2010 (Tzsh per Mt)

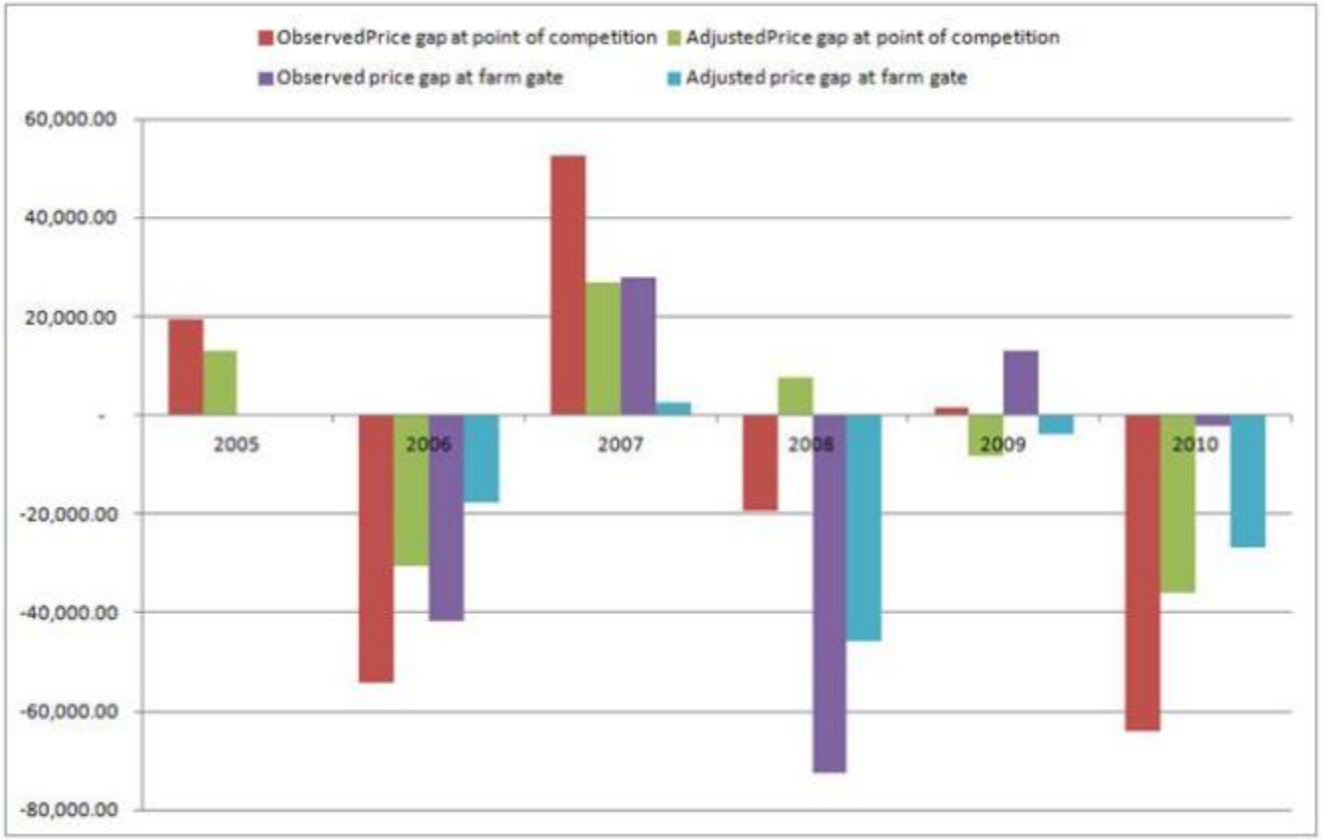


Table 22: MAFAP nominal rates of protection (NRP) for maize in Tanzania 2006-2010 (%)

	2005	2006	2007	2008	2009	2010
Trade status for the year	**x**	**m**	**x**	**m**	**x**	**m**
Observed NRP at point of competition	11.78%	-17.79%	35.25%	-5.31%	0.38%	-14.80%
Adjusted NRP at point of competition	7.62%	-10.80%	15.51%	2.24%	-1.98%	-8.87%
Observed NRP at farm gate	n.a.	-14.23%	20.47%	-20.87%	3.71%	-0.89%
Adjusted NRP at farm gate	n.a.	-6.61%	1.58%	-14.22%	-1.05%	-9.93%

Source: Own calculations using data as described above.

Figure 20: MAFAP nominal rates of protection for maize in Tanzania 2005-2010 (Tzsh per Mt)

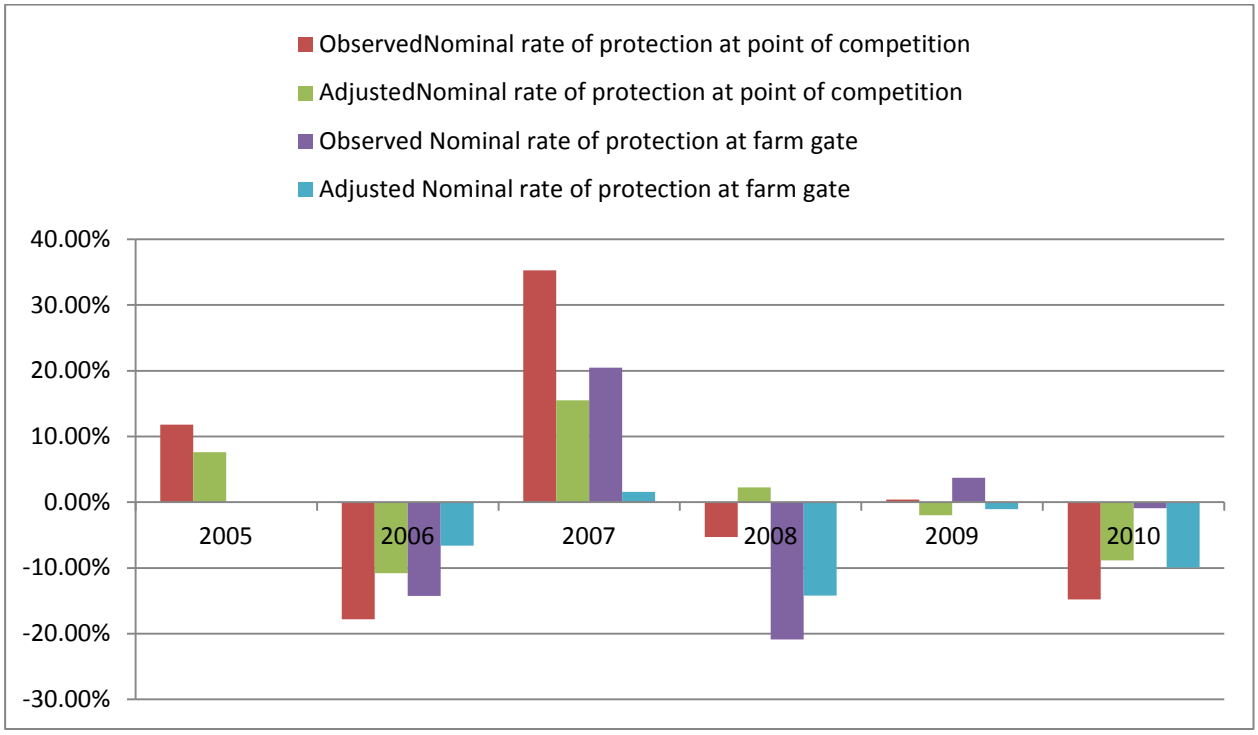


Table 23: MAFAP Market Development Gaps for maize in Tanzania 2006-2010 (Tzsh per Mt)

	2005	2006	2007	2008	2009	2010
Trade status for the year	x	m	x	m	x	m
International markets gap (IRG)	-	-	-	-	-	-
Exchange policy gap (ERPG)	-	-	-	-	-	-
Access costs gap to point of competition (ACGwh)	(6,358.35)	23,907.66	(25,447.09)	26,964.29	(9,655.56)	28,206.37
Access costs gap to farm gate (ACG_{fg})	-	-	-	-	(7,244.64)	(52,858.74)

ND: No data available for calculation

Source: Own calculations using data as described above.

4. INTERPRETATION OF THE INDICATORS

- *Years for which The United Republic of Tanzania is a net importer (2006-2008-2010)*

The results for these years are not consistent with the declared trade policy that The United Republic of Tanzania has in Place. Maize is protected by a tariff of 50 percent which was exempted for EAC partners. Imports in 2006 came mainly from non-EAC countries with a weighted tariff of 46.5 percent. In 2008 again imports came mainly from non-EAC countries with a weighted tariff of 36.2 percent. Trade volumes in 2010 were very low that year and CIF prices high. Imports came from Uganda and Italy mainly. If one excludes the imports from Italy (maybe related to WFP activities) then the CIF price is significantly reduced (219 USD per Mt versus 357 USD) with a tariff of 0 percent.

However the estimated NRP these three years, both at farm gate and point of competition are negative (except at farm gate level in 2008) meaning that the benchmark price based on imports are higher than prices received in domestic wholesale markets. From a theoretical perspective, other policies, government actions or market development gaps are depressing domestic prices during those years:

- **In 2006** the NFRA imported over 70 000 tonnes which were mainly donations of development partners, the releases of 158 000 tonnes (over 15 percent of domestic marketed production) together with the re-introduction of the export ban lowered domestic prices, therefore providing negative incentives to farmers. At farm level[19] negative incentives are higher mainly due to the lack of value chain development as the access costs used in the analysis (NFRA transport cost plus margins) are 4-times lower than the described by the World Bank.
- **In 2008** the disincentive at point of competition is much lower (5.3 percent) as well as the weighted tariff, and even when the NFRA did not import maize that year releases are again substantial (111 000 tonnes close to 10 percent of domestic marketed production). Again this depressed domestic prices in particular at the wholesale level. Even when the purchase price set by NFRA was higher than farm gate prices (Figure 11) this negative incentive also affected farmers, again mainly due to the very high costs of trading compared with the costs that can be obtained by the NFRA (the price difference between Sumbawanga and Dar is four time higher than the costs of the NFRA plus a 5 percent margin).
- **In 2010** imports came mainly from Uganda, and in low quantities (3 000 tonnes). Therefore we use the implicit CIF price for imports only from this destination. Although imports from EAC are not subject to import tariff, The United Republic of Tanzania still charges USD 10 per tonne (USD 200 per truck) as a fee at the border[20]. This represents a protection to maize producers. However, the support is eroded by other policies such as release of grain reserves and the existing market development gap and market inefficiencies. As a result, maize producers receive a negative support (disincentives) in import years when these come from the EAC such as 2010. This is probably due for releases from NFRA (close to 90 000 tonnes) particularly in drought areas (such as Mwanza) which create pressure to lower prices. Due to the long distance from the southern highlands to the point of competition (close to 1 000 km) the analysis at the farm gate shows a small incentive to farmers.

[19] Farm gate indicators do not take into account the initial stages of the value chain (from farm to secondary market). Access costs reported by World Bank (2009) are approximately the same for this segment as from secondary market to Dar.
[20] The Citizen (2012), one more step towards union of African States.

In addition the adjusted domain shows that high transport and administrative costs at the border generate an additional incentive to wholesalers (adjusted price gaps are lower than observed ones), but even if import procedures were more efficient the overall incentive would still be negative (adjusted price gaps are still negative, except for 2008).

High access costs represent a barrier to free trade since these raises the cost of imported maize, as shown in the observed domain. Conversely, simplifying import procedures and reducing other marketing costs increases the competitiveness of imported maize. Given current domestic prices, the latter reduces producers' disincentives. Based on these results, both wholesale and producers are currently receiving less support (more disincentives) than they should have under more efficient import procedures. On the other hand, measures to reduce access costs between production zones and wholesale markets are likely to improve incentives to producers by increasing competitiveness of domestic maize in the long run as domestic prices adjusts to world prices. For 2010, the high transport costs inside The United Republic of Tanzania generate additional disincentives which more than compensate for the reduction in protection that would results from efficient importing procedures.

However, an additional point that needs to be highlighted is the problem of annual averages to calculate the indicators. As shown in Figure 17 and Figure 18 price relationships only allow for market arbitrage with imports in the Dar market during the first five months of 2006 (considering no tariffs) and two more months (considering that government imports would not pay the different components of access costs). Market arbitrage between production areas and Dar, during harvest season when prices in production areas fall (Figure 11). As import prices are only available as yearly averages and import volumes are low and decreasing (Figure 4), one could consider that maize markets in The United Republic of Tanzania are not integrated in the world markets. However, Figure 12 shows that this does not hold as imports happen when price gaps between domestic prices and international prices peak.

Therefore we consider that the results of disincentives for farmers during the years when The United Republic of Tanzania is a net importer is sound, and the impacts of intervention in the market by the NFRA plus the overall market development gap in the country more than compensates the protection that the import tariff for maize should given producers. Our results point to a situation where the objective of lower prices for consumers is more important than high prices for farmers in the policy agenda of The United Republic of Tanzania, even when the NFRA purchasing price is higher than wholesale prices in producing areas during most of the harvesting and marketing periods (Figure 11).

- *Years for which The United Republic of Tanzania is a net exporter (2005-2007-2009)*

For these years our results show that using the sources reported above, domestic prices are higher than the reference price. This means that maize exports from The United Republic of Tanzania would be sold at subsidized prices in international markets, i.e. The United Republic of Tanzania would be exporting at a loss to international markets[21]. As there is no evidence of export subsidies existing in The United Republic of Tanzania and during 2005 and 2009 there was an export ban in place two

[21] Domestic prices are higher than benchmark prices and thus, assuming no quality differences between Tanzania maize and internationally traded maize, in order to access international market someone should be covering that price difference.

options need to be explored: a) market development gaps that lead to this positive price gap; and/or b) the marketing pathway chosen for analysis (see Figure 14) is not valid.

- **In 2005** the average FOB price actually hides two different export routes. Focusing on the route to neighboring countries in the north of the the price for those exports is slightly higher than the average (112 USD per tonne versus 109 USD per tonne), however the price gap is still positive. Assuming our access costs are correct, the price gap would be zero (i.e. what would be expected from a situation where no export tax is in place) starting at 182 USD per tonne. If we take away exports to neighboring countries (which would normally not go through Dar) the marketing route would be point of competition in Arusha and farm gate in Manyara (see Figure 14). As there is no price data for Manyara in 2005 our analysis has to focus on the point of competition (Arusha).Purchases by the NFRA do not usually happen in this area (which is considered a deficit area for NFRA and where most releases take place) therefore we can discard that NFRA interventions raise this price. Moreover, the average farm gate price reported by NBS is higher than our price at point of competition. Therefore we consider that we need to revise the benchmark price selection. As the majority of exports were directed to Kenya (63 percent of total exports) we can consider the price relationships between Nairobi and Arusha to derive an alternative benchmark price. The average wholesale price in Nairobi during 2005 as reported by RATIN stands at 208 USD per tonne, over 100 USD per tonne above the FOB price reported by The United Republic of Tanzania for exports to Kenay (88 USD per tonne). The border with Kenya is just 162 km away from Nairobi and transport costs from surplus areas to Nairobi are reported below 40 USD per tonne (see Technical Note for Maize in Kenya). Deducting this 40 USD from the wholesale price in Kenya we get an alternative "benchmark price" for maize exports of 168 USD per tonne. If we also consider that "informal" exports do not pay the regular fees for exports the access costs from point of competition to border are reduced to transport and 5 percent of purchase price in Arusha. With this new data which is summarized in Table 24, the results still show a slight positive price gap.

Table 24: Revised assumptions for indicator calculations in 2005 (already incorporated into the graphs presented above)

Concept	***Data source***	***Value***
Benchmark price	Wholesale price in Nairobi minus transport costs from Nairobi to Namanga (Tanzania border)	168 USD per tonne
Observed access costs form border to point of competition	5% of wholesale price at Arusha plus transport costs from Arusha to Namanga (local transport cost)	25,102 TzSh per tonne
Adjusted access costs from border to point of competition	5% of wholesale price at Arusha plus transport costs from Arusha to Namanga (cheapest transport cost)	18,744 TzSh per tonne

With this data we still see a positive price gap for 2005 of nearly 17 000 TzSh per tonne (NRP 10 percent). Thus, the export ban was not effective as part of the production was still exported, while food prices in Arusha were higher that he reference price. If more production would have come to the domestic market, prices in Arusha would have been lower, and basically the export ban was giving wrong incentives to players who thought would make more money exporting while domestic

markets were providing better signals. However, as we cannot analyze the impact at farm gate level due to the lack of data, the theoretical negative effects on farmers cannot be assessed.

- **In 2007** there was no export ban in The United Republic of Tanzania. Trade data shows that 65 percent of exported volume (over 45 000 tonnes; 2 percent of total production and close to 5 percent of marketed production) would follow the Dar route and is for this route that we focus our analysis. For those exports the weighed FOB price stands at 166 USD per Mt. With those figures we see that there is a positive price gap of over 50 000 TzSh per tonne at wholesale level and 30 000 TzSh per tonne at farm gate level. Again yearly averages might be hiding the real incentives to farmers, however the lack of storage facilities in the country led to exports at low prices while high prices later in the year (see Figure 17). Considering the adjusted costs we can see that removal of the inefficiencies in the port of Dar could reduce significantly the implicit export subsidy.

- **During the whole of 2009** the export ban was in place and reported exports fell dramatically (just 207 tonnes). The analysis for this year has been made with an alternative to reported FOB prices (i.e. SAFEX FOB prices see above). With such a benchmark price we would again have a positive price gap during 2009. However, the main export destinations of The United Republic of Tanzania that year were Kenya and Rwanda. While Rwanda has an implicit FOB price that is clearly not realistic (2,974 USD per tonne) exports to Kenya are reported at 250 USD. Table 25 shows the implicit FOB prices of exports to Rwanda and Kenya, the wholesale prices in the main markets close that border and the average wholesale prices in Nairobi and Kigali.

Table 25: FOB prices of Tanzanian exports, Tanzania wholesale prices in closest market to the border and wholesale prices for main markets in destination countries in 2009 (USD per Mt)

Price data source	USD per MT
Wholesale Arusha	*304.37*
FOB Tanzania to Kenya (export volume 60 Mt)	*250.07*
Wholesale Nairobi	*376.56*
Wholesale Bukoba	*326.21*
FOB Tanzania to Rwanda (export volume 143 Mt)	*2,947.22*
Wholesale Kigali	*358.58*
Price gap wholesale (Arusha) – FOB	*-45.70*
Price gap wholesale (Bukoba) – FOB	*2,621.01*
Price gap FOB - wholesale (Kenya)	*126.49*
Price gap FOB -wholesale (Rwanda)	*2,721.25*
Price gap wholesale (Arusha) – wholesale (Nairobi)	*72.19*
Price gap wholesale (Bukoba) – wholesale (Kigali)	*32.47*

Source: Comtrade for FOB prices and RATIN for wholesale prices.

Again we can assume that the main export market that year (both for formal and informal trade) was Kenya and thus we can construct an alternative FOB price as in Table 24. With this data we see that the export ban actually leads to a situation where no incentives or disincentives are in place but once we consider that the exports do not pay the official fees there is actually a disincentive at the wholesale level which is even higher for farmers due to excessive transport costs in the area.

5. PRELIMINARY CONCLUSIONS AND RECOMMENDATIONS

MAIN MESSAGE

- **During the years when The United Republic of Tanzania is a net maize importer** the protection of the external tariff is not transmitted to local markets due to the interventions of the NFRA. When The United Republic of Tanzania imports from regional partners, the excessive transport costs along the value chain means that farmers could get better prices if these where reduced;
- **During the years The United Republic of Tanzania is a net exporter**, there is a price incentive for farmers but basically it means that The United Republic of Tanzania due to lack of storage capacity has to export during the harvest season and then has to suffer higher internal prices that could be partly avoided with additional imports or better storage capacity;
- The export ban during 2007 and 2009 have prevented farmers from getting better prices (2009) and giving the wrong signals to traders (2007) when internal prices would have been higher.

From a **methodology point of view**, this case study shows that benchmark prices and marketing pathways might need to be modified on a yearly basis. Thus, results assuming a constant benchmark should always be checked against alternatives to see whether they hold. Moreover, annual averages show price differentials that might not be related to specific policies rather to the functioning of a market with little capacity for storage management.

PRELIMINARY RECOMMENDATIONS

- Consider removing the export ban, as it provides wrong signals to traders and depresses prices for farmers;
- If food availability for specific groups or areas is important, Improving storage capacity in the country would allow.

LIMITATIONS

- So far the farm gate price has been discarded for being implausible. However, if this would actually be the prices received by farmers, The United Republic of Tanzania would be protecting farmers (as the reported farm gate prices are higher than wholesale prices and additional access costs would need to be taken into account) and subsidizing consumers;
- All the analysis hangs on the plausibility of the assumed pathways from production to consumption. As it has been seen for exports, results differ when different pathways are assumed. This seems to be a key issue which makes analysis in Africa different to the mainstream approach used for developed countries.

FURTHER INVESTIGATION AND RESEARCH

- Expand the analysis to obtain data from farm gate to primary markets.

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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. Main agricultural sector wide strategies

In the last decade The United Republic of Tanzania has moved to support its agriculture in a more systematic way using a sector–wide (Ag-SWAP) approach. The United Republic of Tanzania mainland and Zanzibar have undertaken differentiated planning activities. For The United Republic of Tanzania mainland, in 2001 the Agricultural Sector Development Strategy (ASDS) was formulated basically as an implementing framework for the Agricultural and Livestock Policy of 1997. The formulation of the ASDS process was closely coordinated among the Agricultural Sector Lead Ministries (ASLMs) and the Development Partners. The ASDS was operationalized into the Agricultural Sector Development Programme (ASDP) in 2006. ASDP serves as a tool of the Government and stakeholders for coordinating and monitoring agricultural development in the country. Development activities at national level are based on the strategic plans of the ASLMs while activities at District level are implemented by Local Government Authorities (LGAs), based on District Agricultural Development Plans (DADPs).

In Zanzibar the Agriculture Strategic Plan (ASP) is the ongoing initiative since 2002 which was reviewed in 2004, 2008 and 2011. The ASP is implemented by the Ministry of Agriculture, and Natural Resources (MANR). Similar to ASDP, ASP is an instrument for guiding public and private efforts to meet broadly shared sector objectives to realize agreed inputs and outputs.

The ASDP has two major components, namely:

- A local component directing funds to Local Government Authorities (LGAs) for investments in infrastructure (including irrigation and marketing) or productive activities, agricultural services (primarily public and private agricultural extension and LGA based research activities), and capacity building and empowerment for farmer groups, local government and the private sector;
- A national component, which finances agricultural research and extension service activities, development of irrigation policy and national level infrastructure, policy development and planning, capacity building for food security and nutrition interventions, market development activities and programme coordination. The National component also provides technical guidelines to implementation of local component activities.

Within this framework, 75 percent of the resources to support the sector are allocated to the local level, and 25 percent to the national level. The ASP programmes and projects that are implemented by MANR and cover a wide range of programme areas in crop, livestock and fisheries, forest conservation, irrigation and infrastructure and cross cutting issues.

There are also a number of sub-sector programmes and projects that are being implemented within the ASDP framework. They cover livestock, fisheries, irrigation, mechanization, seeds, cooperatives, small and medium enterprises, trade, food and nutrition, agricultural marketing, land, environment, forest, water, micro-finance, investment promotion and industry. These include stand alone projects such as: Participatory Agricultural Development and Empowerment Project (PADEP), District Agricultural Sector Investment Project DASIP), Agricultural Marketing Systems Development Programme (AMSDP), Rural Financial Services Project (RFSP), and Marine and Coastal Environment Management Project (MACEMP). The Agricultural Services Support Programme (ASSP) is a sub-sector programme implemented within the framework of ASDP in Zanzibar.

In an effort to promote greater growth of the Agricultural sector, The United Republic of Tanzania signed the Compact for the Comprehensive Africa Agriculture Development Programme on the 8th of July 2010.

The CAADP Compact provides an opportunity for The United Republic of Tanzania to further strengthen its agricultural development efforts towards achieving greater impact on the country's economy and food security. In 2011 The United Republic of Tanzania approved its Agriculture and Food Security Investment Plan (TAFSIP) which has been formulated to support the implementation of the CAADP Compact.

Public efforts to support the sector are also being complemented by a number of local and international NGOs that are working in agriculture implementing innovative projects targeted mainly at smallholder farmers. Farmers' organizations are also increasingly becoming important players in supporting efforts to improve the situation of small-scale farmers. Apart from cooperatives there is a growing presence of farmer associations that serve as advocacy groups. These include the Agricultural Council of Tanzania (ACT), National Network of Farmers Groups (MVIWATA), and Tanzania Chamber of Commerce, Industry and Agriculture (TCCIA). There has also been a gradual improvement of the investment climate leading to a notable increase of private investment throughout the agricultural value chain: farming, processing and marketing. This pace is far from satisfactory and more efforts are needed to promote a more conducive environment for investment.

On the other hand, Kilimo Kwanza a joint initiative of the public and the private sector has been able to galvanize support from both parties in favour of increased investments towards a "green revolution" in the agricultural sector. The 10 pillars of Kilimo Kwanza build on, and amplify ongoing efforts under existing programs. Kilimo Kwanza has already inspired a number of initiatives by the private sector. An example is the Southern Agricultural Growth Corridor of Tanzania (SAGCOT) designed to spearhead public and private sector initiatives to promote investment along an agricultural growth corridor model in line with the The United Republic of Tanzania.

The agricultural sector undergoes annual joint implementation reviews and yearly Agricultural Sector Reviews and public expenditure reviews (ASR/PER) which allow stakeholders to assess performance of the sector and notably the main programme the ASDP.

These reviews have shown that in the course of implementing the ASDP/ASP notable achievements have been registered. Production and productivity has increased due to an expansion of area under irrigation, livestock dipping tanks, water infrastructure, feeder roads and development and adoption of improved production technologies. However, more effort is needed particularly to encourage the private sector to invest in irrigation infrastructure, provide extension and research services and establish contract farming and out-grower schemes that will benefit small-scale farmers.

TAFSIP is designed to avoid past mistakes and build on successful development initiatives. Foremost amongst the lessons learned from previous experience is the importance of managing and harmonizing all sectoral development initiatives in a large and diverse agricultural sector, with complex institutional structures and financing arrangements. The Agriculture Sector Development Programme (ASDP/ASP) represent an attempt to implement a sector-wide development programme, which is beginning to bear fruit after five years of implementation, but only accounts for about half of public investment in the sector, does not incorporate a number of substantial internationally

funded programmes, and has not been very successful in engaging the private sector. Thus, TAFSIP must become an overarching coordination mechanism for harmonizing investment decisions and implementation modalities (procedures, targets, indicators, work plans, reporting and M&E).

ANNEX III: Data and calculations used in the analysis

	DATA		Unit	Symbol	Year trade status	2005 x	2006 m	2007 x	2008 m	2009 x	2010 m
	Benchmark Price										
1		*Observed*	USD/TON	$P_{b[t-t1]}$		**168.00**	**197.19**	**166.98**	**248.31**	**336.00**	**219.84**
1b		*Adjusted*	USD/TON	P_{b_t}							
	Exchange Rate										
2		*Observed*	TzSH/USD	ER_t		1,128.93	1,251.90	1,245.04	1,196.31	1,320.31	1,409.27
2b		*Adjusted*	TzSH/USD	ER_t							
	Access costs border - point of competition										
3		*Observed*	TzSH/TON	$ACo_{a,t}$		25,102.19	58,601.67	58,998.70	67,717.67	43,300.55	123,552.98
3b		*Adjusted*	TzSH/TON	$ACa_{a,t}$		18,743.84	34,694.00	33,551.61	40,753.38	33,644.99	95,346.61
4	**Domestic price at point of competition**		TzSH/TON	$P_{d,a}$		**183,940.00**	**251,137.00**	**201,386.00**	**345,386.00**	**401,857.00**	**369,217.50**
	Access costs point of competition - farm gate										
5		*Observed*	TzSH/TON	$ACo_{f,t}$			12,654.82	12,052.52	16,541.23	48,788.01	187,715.49
5b		*Adjusted*	TzSH/TON	$ACa_{f,t}$		-				41,543.37	134,856.75
6	**Farm gate price**		TzSH/TON	$P_{df,t}$		**n.d.**	**251,137.00**	**164,856.00**	**275,570.00**	**364,567.00**	**243,470.00**
7	Externalities associated with production		TzSH/TON	E							
8	Budget and other product related transfers		TzSH/TON	BOT							
	Quantity conversion factor (border - point of competition)		Fraction	$QT_{a,t}$							
	Quality conversion factor (border - point of competition)		Fraction	$QL_{a,t}$							
	Quantity conversion factor (point of competition - farm gate)		Fraction	$QT_{f,t}$							
	Quality conversion factor (point of competition - farm gate)		Fraction	$QL_{f,t}$							
						via Arusha	via dar	via dar	via dar	via Arusha	via Mwanza

	CALCULATED PRICES		Unit	Symbol	2005	2006	2007	2008	2009	2010
	Benchmark price in local currency									
9		*Observed*	TzSH/TON	$P_{b[t-t1]}$	189,660.24	246,862.16	207,896.78	297,055.74	443,624.16	309,813.92
10		*Adjusted*	TzSH/TON	$P_{b[t-t1]}$	189,660.24	246,862.16	207,896.78	297,055.74	443,624.16	309,813.92
	Reference Price at point of competition									
11		*Observed*	TzSH/TON	$RPo_{a,t}$	164,558.05	305,463.83	148,898.08	364,773.40	400,323.61	433,366.90
12		*Adjusted*	TzSH/TON	$RPa_{a,t}$	170,916.40	281,556.17	174,345.17	337,809.12	409,979.17	405,160.52
	Reference Price at Farm Gate									
13		*Observed*	TzSH/TON	$RPo_{f,t}$	164,558.05	292,809.00	136,845.56	348,232.17	351,535.60	245,651.41
14		*Adjusted*	TzSH/TON	$RPa_{f,t}$	170,916.40	268,901.34	162,292.64	321,267.89	368,435.79	270,303.78

	INDICATORS		Unit	Symbol	2005	2006	2007	2008	2009	2010
	Price gap at point of competition									
15		*Observed*	TzSH/TON	$PGo_{a,t}$	19,381.95	(54,326.83)	52,487.92	(19,387.40)	1,533.39	(64,149.40)
16		*Adjusted*	TzSH/TON	$PGa_{a,t}$	13,023.60	(30,419.17)	27,040.83	7,576.88	(8,122.17)	(35,943.02)
	Price gap at farm gate									
17		*Observed*	TzSH/TON	$PGo_{f,t}$	#VALUE!	(41,672.00)	28,010.44	(72,662.17)	13,031.40	(2,181.41)
18		*Adjusted*	TzSH/TON	$PGa_{f,t}$	#VALUE!	(17,764.34)	2,563.36	(45,697.89)	(3,868.79)	(26,833.78)
	Nominal rate of protection at point of competition									
19		*Observed*	%	$NRPo_{a,t}$	11.78%	-17.79%	35.25%	-5.31%	0.38%	-14.80%
20		*Adjusted*	%	$NRPa_{a,t}$	7.62%	-10.80%	15.51%	2.24%	-1.98%	-8.87%
	Nominal rate of protection at farm gate									
21		*Observed*	%	$NRPo_{f,t}$	#VALUE!	-14.23%	20.47%	-20.87%	3.71%	-0.89%
22		*Adjusted*	%	$NRPa_{f,t}$	#VALUE!	-6.61%	1.58%	-14.22%	-1.05%	-9.93%
	Nominal rate of assistance									
23		*Observed*	%	NRAo	#VALUE!	-14.23%	20.47%	-20.87%	3.71%	-0.89%
24		*Adjusted*	%	NRAa	#VALUE!	-6.61%	1.58%	-14.22%	-1.05%	-9.93%

	Decomposition of PGafg	Unit	Symbol	2005	2006	2007	2008	2009	2010
25	International markets gap	TzSH/TON	IRG	-	-	-	-	-	-
26	Exchange policy gap	TzSH/TON	ERPG	-	-	-	-	-	-
27	Access costs gap to point of competition	TzSH/TON	$ACG_{a,t}$	(6,358.35)	23,907.66	(25,447.09)	26,964.29	(9,655.56)	28,206.37
28	Access costs gap to farm gate	TzSH/TON	$ACG_{f,t}$	-	-	-	-	(7,244.64)	(52,858.74)
29	Externality gap	TzSH/TON	EG	-	-	-	-	-	-

	Total values	Unit	Symbol	2005	2006	2007	2008	2009	2010
30	**Production volume**	tons							
	Market price support								
31	*Observed*	YYY	MPSo						
32	*Adjusted*	YYY	MPSa						

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