MAFAP
SPAAA

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

ANALYSIS OF INCENTIVES AND DISINCENTIVES FOR RICE 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.

MAFAP is implemented by the Food and Agriculture Organization of the United Nations (FAO) in collaboration with the Organisation for Economic Co-operation and Development (OECD) and national partners in participating countries. It is financially supported by the Bill and Melinda Gates Foundation, the United States Agency for International Development (USAID), and FAO.

The analysis presented in this document is the result of the partnerships established in the context of the MAFAP project with governments of participating countries and a variety of national institutions.

For more information: **http://www.fao.org/mafap**

Suggested citation:
Barreiro-Hurle, J. 2012. Analysis of incentives and disincentives for rice in the United Republic of Tanzania. Technical notes series, MAFAP, FAO, Rome.

© FAO 2013

FAO encourages the use, reproduction and dissemination of material in this information product. Except where otherwise indicated, material may be copied, downloaded and printed for private study, research and teaching purposes, or for use in non-commercial products or services, provided that appropriate acknowledgement of FAO as the source and copyright holder is given and that FAO's endorsement of users' views, products or services is not implied in any way.

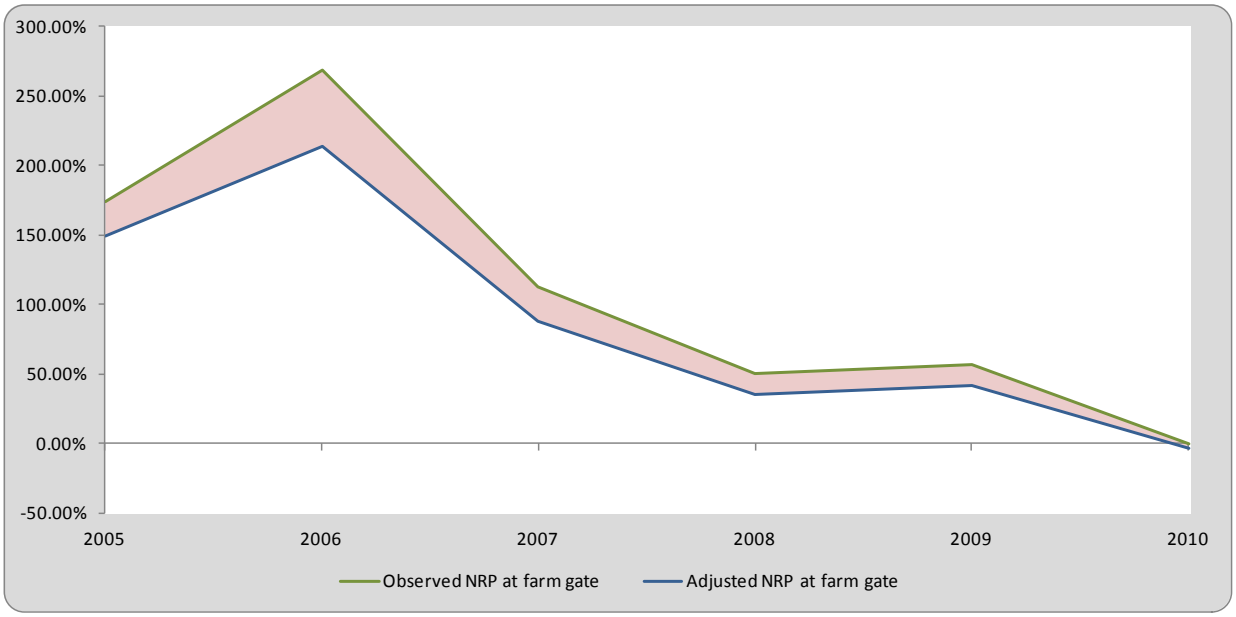
All requests for translation and adaptation rights, and for resale and other commercial use rights should be made via www.fao.org/contact-us/licence-request or addressed to copyright@fao.org.

FAO information products are available on the FAO website (www.fao.org/publications) and can be purchased through publications-sales@fao.org.

SUMMARY OF THE NOTE

Product: Rice
Period analyzed: 2005 – 2010
Trade status: Imported until 2009 / exported in 2010

- Rice is the 7th most important agricultural crop in The United Republic of Tanzania accounting for 5 percent of total value of production, it represents 10 percent of total caloric intake in Tanzania's diet;
- Rice production in The United Republic of Tanzania has increased steadily during the last decade and Tanzania has shifted from being a net imported to export small quantities to regional markets;
- Notwithstanding this increase in production, yields remain significantly lower than in neighboring countries.



The observed Nominal Rate of Protection (NRP) (green line) indicates that farmers have benefited from the external tariff for Rice in The United Republic of Tanzania which generates incentives to famers, all this at the cost of high rice prices for consumers. The adjusted NRP (blue line) captures the effects of market inefficiencies on farmers, showing that part of the protection is caused by the inefficiencies in the port of Dar and captured by traders due to excessive marketing costs. The area in red shows the additional protection that these inefficiencies represent for producers. When The United Republic of Tanzania becomes a net exporter, farmers are missing part of the potential gains of export markets, due to trade restrictions (export ban).

If The United Republic of Tanzania is to remain a rice net exporter yields should increase as surpluses are now benefiting from the common external tariff and are not competitive without border protection.

Contents

SUMMARY OF THE NOTE 3
1. PURPOSE OF THE NOTE 5
2. COMMODITY CONTEXT 2
PRODUCTION 2
CONSUMPTION/UTILIZATION 6
MARKETING AND TRADE 7
DESCRIPTION OF THE VALUE CHAIN AND PROCESSING 12
POLICY DECISSIONS AND MEASURES 16
3. DATA REQUIREMENTS, DESCRIPTION AND INDICATORS CALCULATION 20
BENCHMARK PRICES 20
EXCHANGE RATES 21
DOMESTIC PRICES 21
ACCESS COSTS 26
QUANTITY AND QUALITY ADJUSTMENTS 32
CALCULATION OF THE INDICATORS 35
4. INTERPRETATION OF INDICATORS 39
5. PRELIMINARY CONCLUSIONS AND RECOMMENDATIONS 41
MAIN MESSAGE 41
PRELIMINARY RECOMMENDATIONS 41
LIMITATIONS 41
FURTHER INVESTIGATION AND RESEARCH 41
6. BIBLIOGRAPHY 42
ANNEX I: Methodology Used 44
ANNEX II: Data and calculations used in the analysis 45

1. PURPOSE OF THE NOTE

This technical note aims to describe the market incentives and disincentives for rice 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 is preliminary and still subject to review and validation.

2. COMMODITY CONTEXT

Rice is the third most important food and cash crop in The United Republic of Tanzania after maize; and it's among the major sources of employment, and income for many farming households (ACT, 2010). Rice is mainly produced by small-scale farmers, while marketing is dominated by middlemen and traders (Kilima, 2006). Rice productivity in The United Republic of Tanzania (about 1-1.5 tonnes/ha) is lower than in most neighboring countries (see Figure 3) and is one of the lowest in the world[1.] Furthermore, Tanzania's rice market is liberalized and consumers have the option to purchase rice imported from different countries.

The National Rice Sector Development Strategy, therefore, intends to transform the existing subsistence-dominated rice sector into a commercially viable production system (URT-MAFC, 2009). This note will contribute to better understanding whether policies and general economic environment is providing farmers with the required incentives to achieve this objective.

PRODUCTION

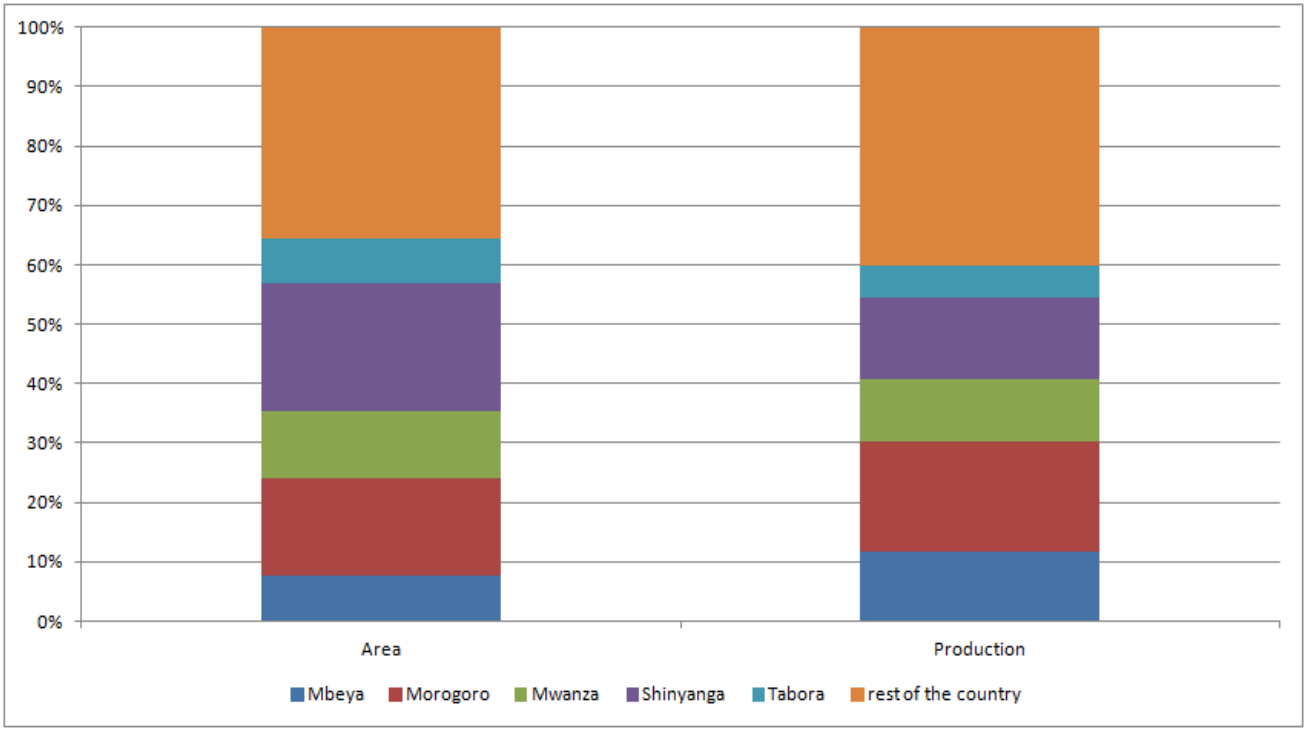
According to the Agricultural census of 2004, 17 percent of all agricultural households grow rice. Rice production in The United Republic of Tanzania covers approximately 681 000 ha, representing 18 percent of cultivated land. Virtually all rice (99 percent) is grown by smallholder farmers using traditional seed varieties. Rice is grown in different areas in The United Republic of Tanzania mainly within three main ecosystems (Sagcot, 2010):

a. Rain fed lowlands (68 percent): average productivity 3.5 mt/ha;
b. Rain fed uplands (20 percent): average productivity 1.2 mt/ha;
c. Irrigated rice cultivation (12 percent): average productivity 3.8 mt/ha.

Most irrigated plots are part of small, village-level schemes; however, some are part of large-scale schemes that were formerly state-managed farms (Minot, 2010). Nearly half of the country's rice production is concentrated in the regions of Morogoro, Shinyanga, Tabora, Mwanza and Mbeya (Figure 1). The first four rice producing regions are located in the northern part of the country and the fifth is located in the south.

[1] Tanzania ranks 95 out of 116 countries for which rice yield data is available in FAOSTAT (2004-2010 average).

Figure 1: Distribution of paddy production and area by region 2005-2010



Source: MAFSC and own elaboration

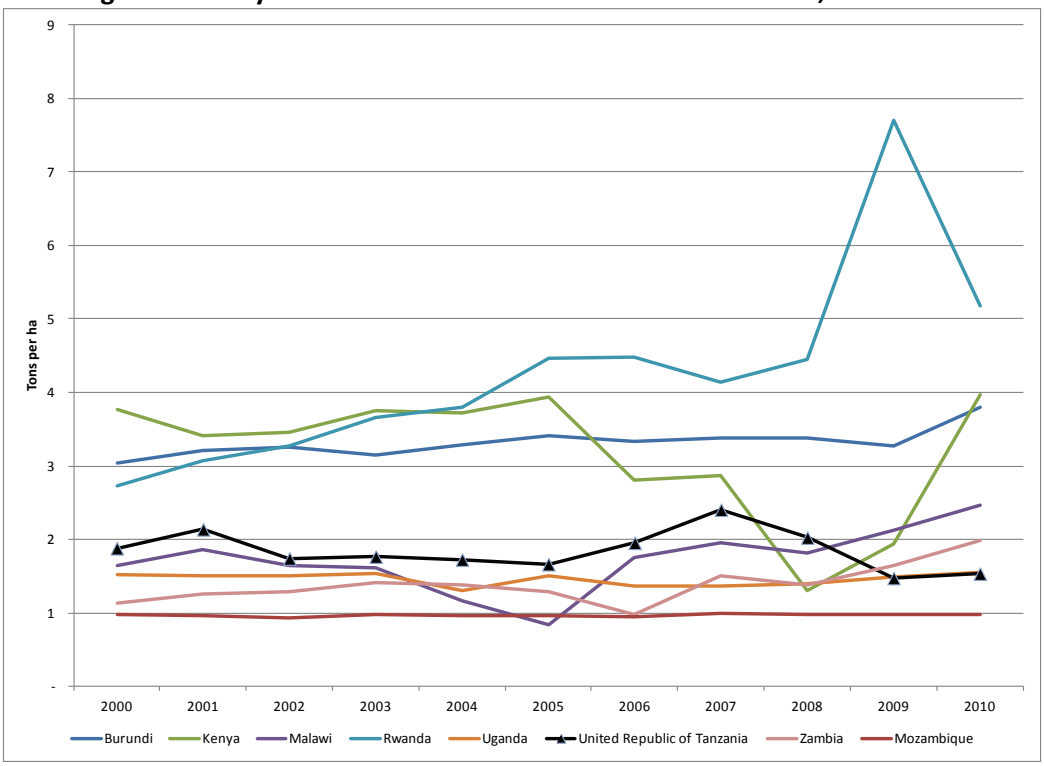
Paddy rice production in The United Republic of Tanzania has been increasing since 2000 (see Figure 2). Increases have mainly been driven by expansion in total land planted with rice rather than increases in yield, except from 2005 to 2007, when the up-scaling of a fertilizer subsidy program (National Agriculture Input Voucher Scheme, NAIVS) raised yields and production significantly. However, yields decreased in 2008 and 2009 while the total area allocated to rice production once again increased, when many cotton producers switched to rice production after experiencing significant losses due to declining world prices (Ngailo et al, 2007). The lack of land suitable for rice production and the insufficient knowledge available in the new group of producers help explain the substantial decline in yields and stagnant growth in rice production that occurred between 2007 and 2009, even while the fertilizer subsidy program was maintained. In 2010, total rice production fell as yields recovered only slightly and land allocated to rice production dropped to average figures for the decade.

Figure 2: Paddy Rice Production, Area Harvest, and Yield in Tanzania, 2000-2010

Source: FAOSTAT

Compared to other coutnries in Eastern Africa, rice yields in The United Republic of Tanzania are lower than in Rwanda, Kenya and Burundi. They are comparable to those in Uganda or Malawi and higher than those in Mozambique and Zambia (see Figure 3). This is mainly attributed to low adoption of yield enhancing inputs and technologies, (Mghase et al, 2010) as a significant number of farmers still rely on rainfall and traditional seed varieties. Moreover, from 2007 yields in The United Republic of Tanzania seem to have followed a decreasing trend in comparison to an overall increase in the other countries in the region.

Figure 3: Paddy Rice Yields in Selected East African Countries, 2000-2010



Source: FAOSTAT

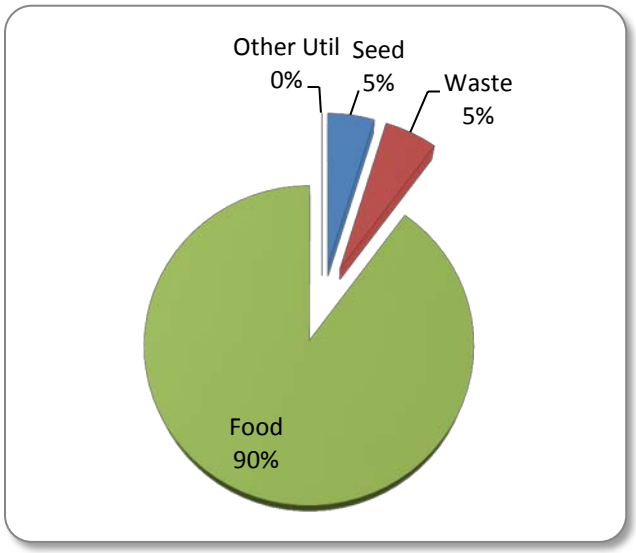
Based on data from FAOSTAT's Food Balance Sheet for paddy rice in The United Republic of Tanzania (shown in Table 1 below), Figure 4 indicates that 90 percent of paddy rice produced is used for food, while about 5 percent is wasted and another 5 percent is used as seed. The amount of paddy rice available for consumption fluctuated between 28 and 29 kg per capita from 2000 to 2007.

Table 1: Food Balance Sheet for Paddy Rice in Tanzania (in tonnes)

	2000	2001	2002	2003	2004	2005	2006	2007	Average
Production (I)	781,538	867,692	984,615	1,096,923	1,058,462	1,167,692	1,206,154	1,341,846	1,063,115
Import Quantity (II)	280,455	202,330	111,651	275,783	281,924	109,183	137,649	71,146	183,765
Stock Variation (III)	-43,785	14,377	-42,775	-143,389	-78,427	35,448	28,829	-72,432	-37,769
Export Quantity (IV)	8,360	9,287	13,397	17,235	3,541	13,539	6,457	29,347	12,645
Domestic Supply(V: I+II+III-IV)	1,009,848	1,075,113	1,040,094	1,212,083	1,258,418	1,298,784	1,366,175	1,311,213	1,196,466
Seed (VI)	33,320	50,904	55,872	55,182	63,179	67,500	63,900	63,900	56,720
Waste (VII)	52,795	53,742	56,919	66,441	65,391	69,221	72,258	77,091	64,232
Other Utilization (VIII)	69	38	60	54	39	7	34	60	45
Food (X: V-VI-VII-VIII)	923,665	970,429	927,242	1,090,406	1,129,810	1,162,058	1,229,983	1,170,160	1,075,469

Source: FAOSTAT

Figure 4: Final Use of Paddy Rice Supply in Tanzania (Average for 2000-2007)



Source: FAOSTAT

CONSUMPTION/UTILIZATION

Rice is the third most important crop in terms of daily calories consumed per capita in The United Republic of Tanzania (see Table 2). The average consumption of rice from 2002 to 2007 was 200 Kcal/capita/day compared to 553 Kcal/capita/day of maize and 208 Kcal/capita/day of cassava. Since rice is generally more expensive than maize and other staple foods, it is more important in the diets of high and middle income consumers in both urban and rural areas.

In addition to being a staple food for medium and high income consumers, rice is also the preferred dish for many households during festival season or social functions. Furthermore, it is often preferred by urban households because it is convenient to prepare. Thus, shifting consumer preferences from conventional foods to rice, increasing per capita incomes and rapid urbanization in recent years has resulted in a substantial increase in annual per capita rice consumption by nearly 20 percent to about 25-30 kg/year (Kibanda, 2008). This growth in per capita rice consumption has stimulated both domestic production and rice imports (Minot, 2010). However, imported rice is considered inferior in quality compared to local rice by consumers and, therefore, imported rice is sold at lower prices compared to domestic rice (Minot, 2010).

Table2: Food Crops Consumption (Kcal/capita/day), 2002-2007

Crops	2002	2003	2004	2005	2006	2007	Average
Maize	627.03	598.81	532.22	519.02	524.31	522.39	553.96
Cassava	196.77	215.28	172.76	216.06	215.69	234.89	208.57
Rice	179.04	203.69	206.02	207.01	211.1	194.39	200.21
Wheat	92.42	80.21	95.4	108.91	111.69	123.34	102.00
Sweet Potatoes	79.93	34.36	98.88	90.63	86.97	80.03	78.47
Sorghum	50.27	34.77	60.11	65.45	62.28	84.67	59.59
Plantains	29.78	27.22	27.73	27.38	26.62	25.88	27.43
Potatoes	16.09	15.17	28.5	27.71	23.79	22.87	22.35

Source: FAOSTAT

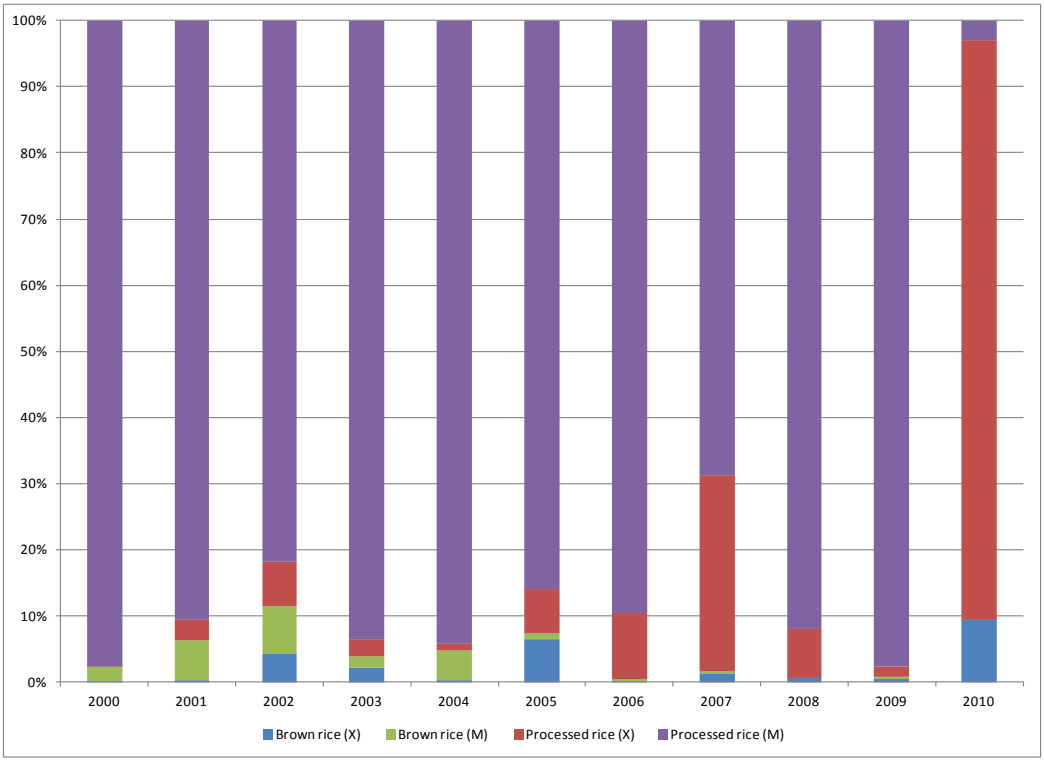
MARKETING AND TRADE[2]

According to UN COMTRADE data, most rice traded in The United Republic of Tanzania is milled and broken (processed) rice. Paddy and husked (brown) rice is also traded, but in much lower quantities (see Figure 5). The traded volume of less processed (brown) rice was always higher for exports than for imports between 2000 and 2010 (see Figure 6). As of 2008, all processed rice traded refers only to broken rice.

The United Republic of Tanzania has been a net importer of rice since 2000, with the exception of 2010 (see Figure 6). The total volume of rice traded has steadily decreased, reaching below 10 percent in the second half of the 2000's from a maximum of 27 percent in 2000. Similarly, the share of imports on total consumption has followed the same trend (see Figure 7).

[2] Rice trade data for Tanzania diverges, depending on the source used. FAO data shows that Trade Statistics and Food Balance Sheets for paddy rice are not equivalent. Due to the better granularity of UN COMTRADE data, this section builds mainly on this data source.

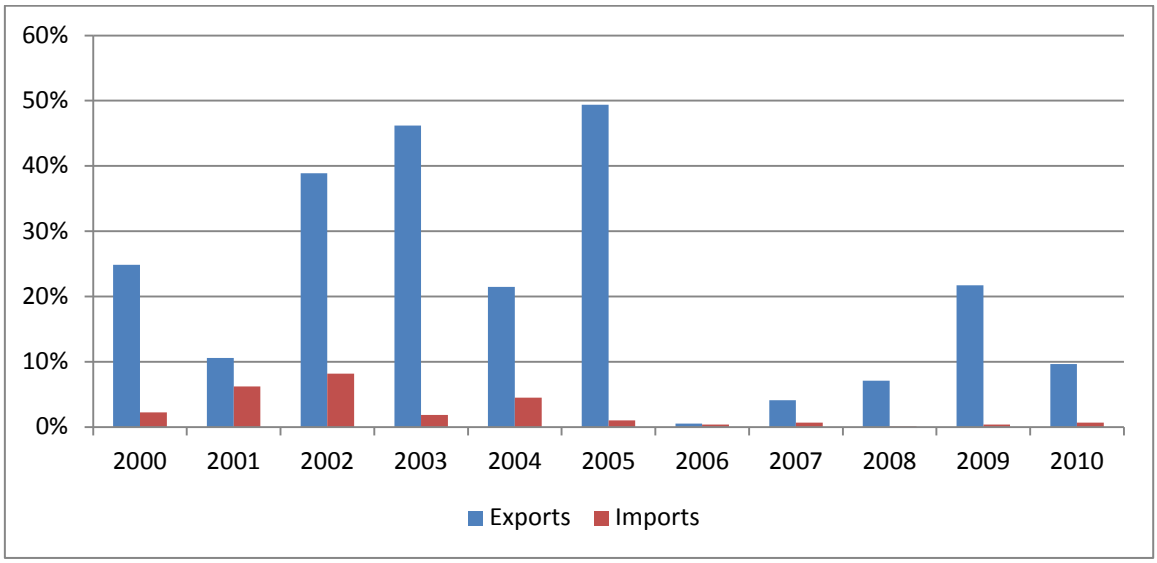
Figure 5: Composition of Traded Rice in Tanzania (in Milled Equivalent), 2000-2010



Source: UN COMTRADE

Note: Brown rice refers to paddy and husked rice [HS 100610 and 100620], while processed rice refers to milled and broken rice [HS 100630 and 100640]. Paddy and husked rice were converted to their milled equivalents using conversion ratios of 0.65 and 0.80, respectively.

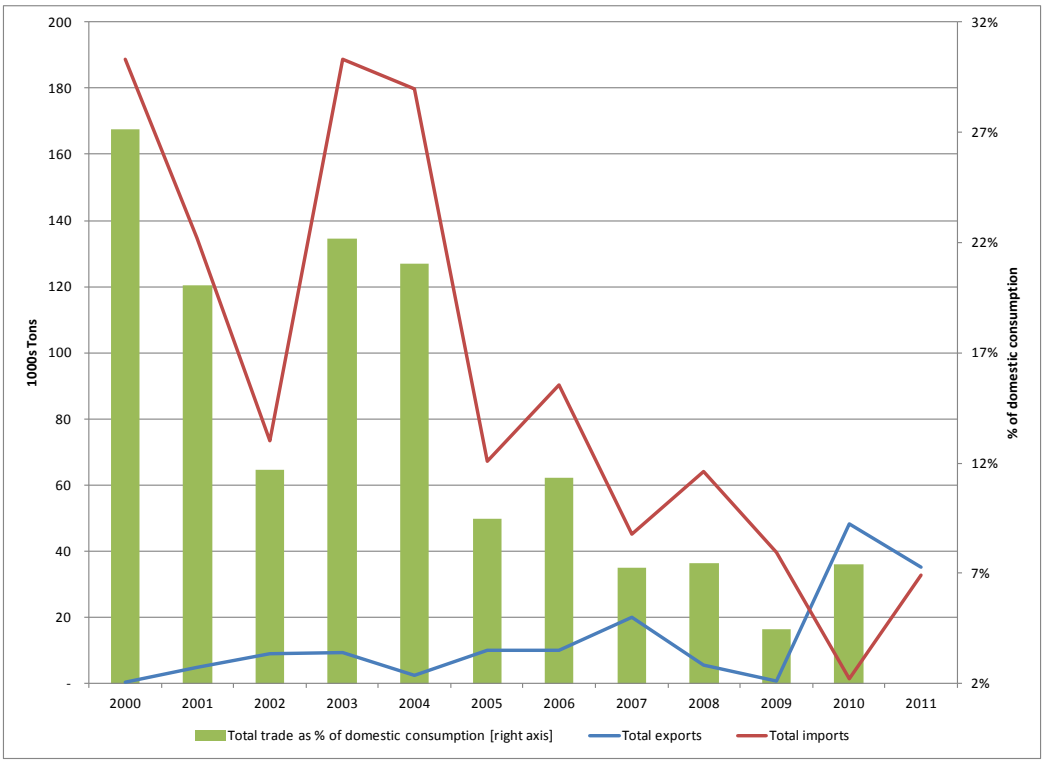
Figure 6: Share of Brown Rice (in Milled Equivalent) in Total Rice Trade, 2000-2010



Source: UN COMTRADE

Note: Brown rice refers to paddy and husked rice [HS 100610 and 100620]. Paddy and husked rice were converted to their milled equivalents using conversion ratios of 0.65 and 0.80, respectively.

Figure 7: Volume of Rice Trade (tonnes in Milled Equivalent) and Share of Total Trade in Domestic Consumption in Tanzania, 2000-2010



Source: UN COMTRADE

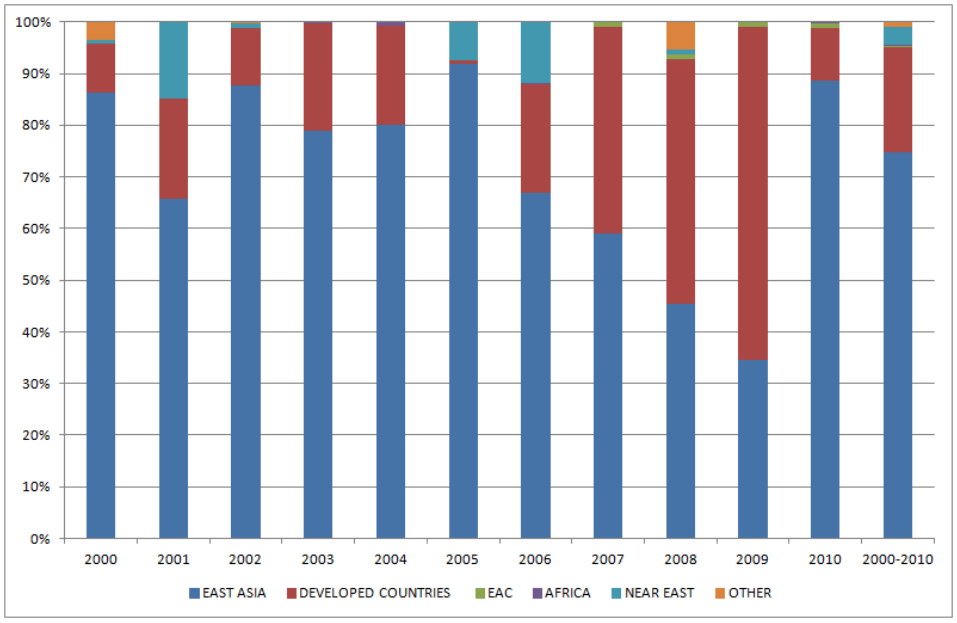
Notes: Consumption was calculated as apparent consumption (Y+M-X). Paddy and husked rice were converted to their milled equivalents using conversion ratios of 0.65 and 0.80, respectively.

Most of Tanzania's rice imports come from East Asia[3] (see Figure 8). Imports from developed countries play an important role some years (mainly during the period leading to the food price crisis), with imports coming mainly from Japan and the USA probably in the form of food aid.

As for exports, The United Republic of Tanzania is mainly a regional player (see Figure 9), exporting nearly 80 percent of its surplus to East African Community (EAC) countries and the rest mostly to other neighboring African countries (i.e. Malawi, DRC and Zambia).

[3] East Asia includes imports originated from the Arabic peninsula countries, as it is considered that imports from Asia actually pass through these countries on their way to Tanzania.

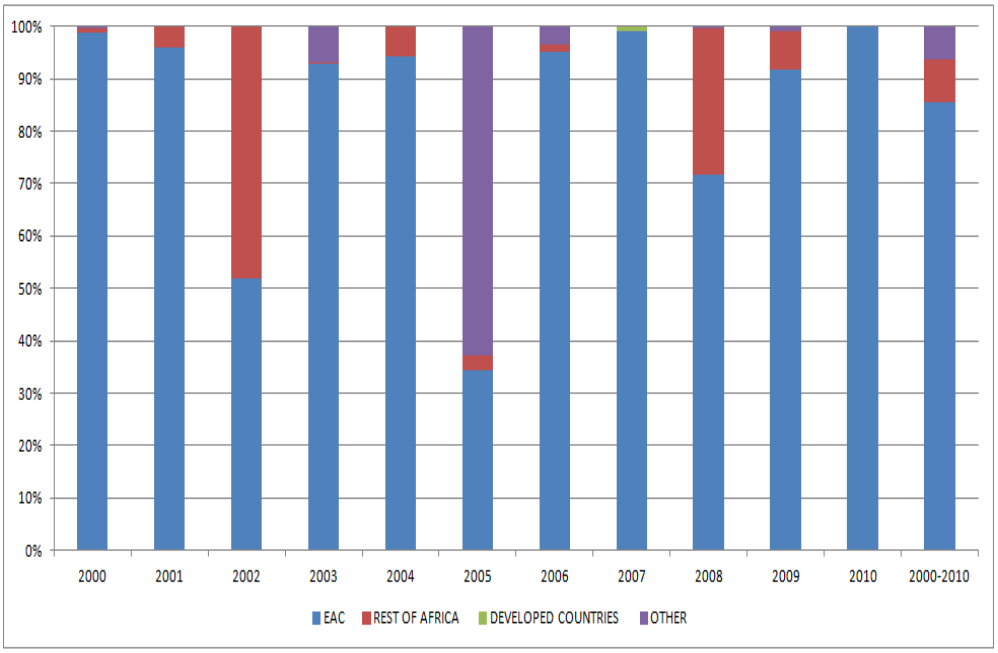
Figure 8: Rice Imports (in Milled Equivalent) to Tanzania According to Origin, 2000-2010



Source: UN COMTRADE

Notes: Paddy and husked rice were converted to their milled equivalents using conversion ratios of 0.65 and 0.80, respectively.

Figure 9: Rice Exports (in Milled Equivalent) from Tanzania According to Destination, 2000-2010



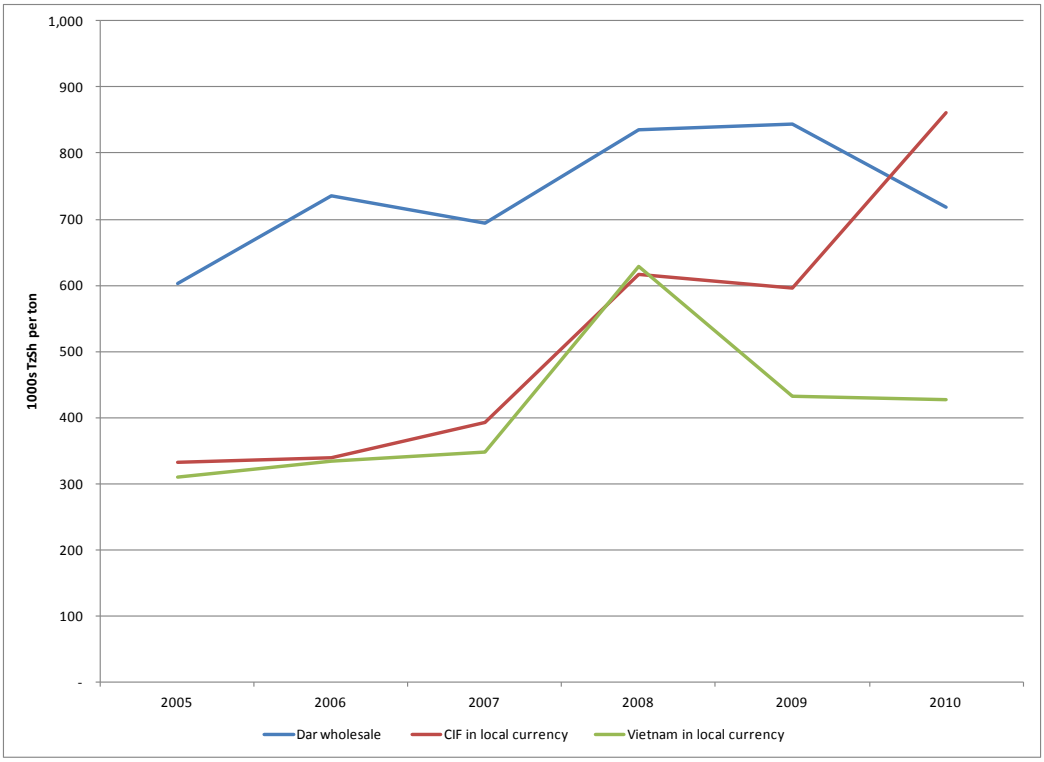
Source: UN COMTRADE

Notes: Milled Paddy and husked rice were converted to their milled equivalents using conversion ratios of 0.65 and 0.80, respectively.

A first analysis of import and domestic prices needs to take into account that import prices are calculated as unit values derived from volume and value data, while domestic prices are taken from direct observations in local wholesale markets. Since domestic price data is only available as of 2006, the analysis does not include 2005. Domestic price data in The United Republic of Tanzania is reported for husked rice; however, import prices are mainly for milled or broken rice (see Figure 5).

Figures 10a and 10b plot the trends for rice prices in real terms for the wholesale market in Dar es Salaam, the unit values from trade data (i.e. CIF unit values of imports to The United Republic of Tanzania for milled rice[4]) and the unit price at origin (i.e. FOB unit prices from Vietnam5) in a yearly and monthly basis. As shown, prices seemed to be fairly integrated, following a similar trend up to 2008, except in 2010, when local prices declined and The United Republic of Tanzania became a net exporter. This is an expected situation as surplus production lowers domestic prices before reaching a position to compete in international markets. Figure 10b shows that prices in The United Republic of Tanzania were more volatile than in the international market due to the fact that imports take some time to arrange before they can be traded in the domestic market to stabilize prices.

Figure 10a: Yearly averages of Dar es Salaam wholesale prices (husked), CIF Unit Values (milled) and Vietnam FOB Export Quotations (5 percent broken) for Rice in Real Terms, 2006-2010 (TZSH per tonne)

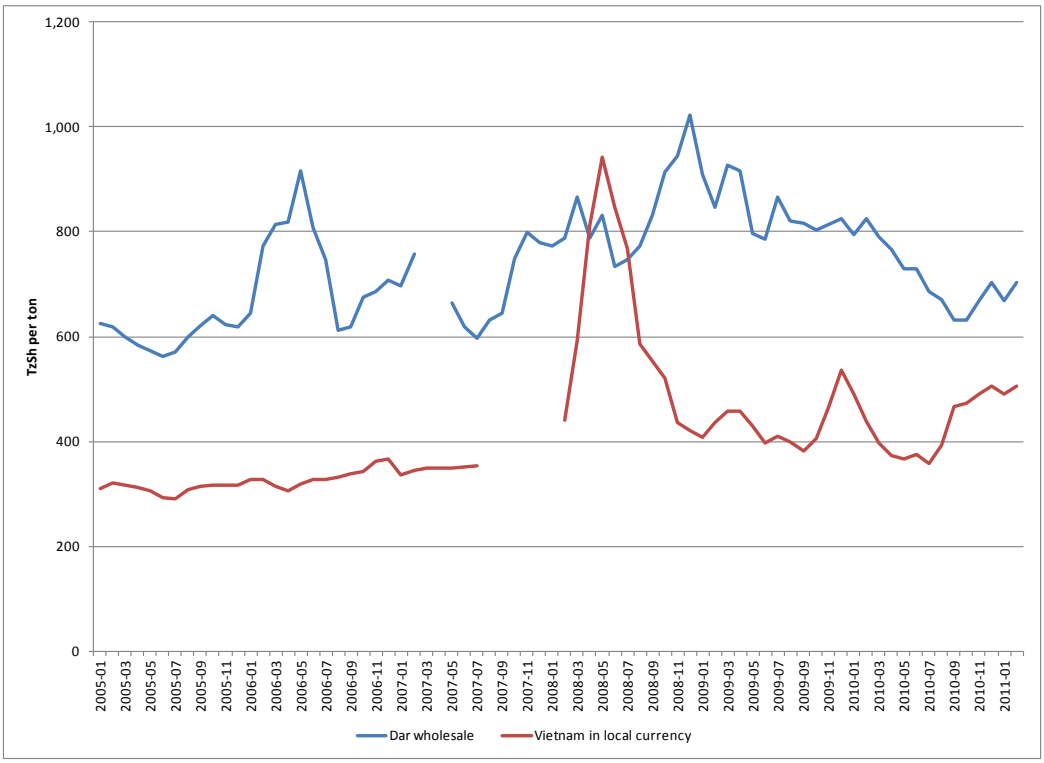


Source: MTI, UN Comtrade and International Grains Council for prices and WB for CPI

[4] Although broken rice is traded in higher volumes during the period of analysis, the imports of broken rice come mainly from the USA and have very low unit values (i.e. 90 USD in 2007) pointing at some kind of tax exemptions or subsidized prices for these imports.

[5] Of the two countries for which the International Grain Council reports export quotations (Thailand and Vietnam) the latter is the main partner for Tanzania. Moreover, International Grain Council prices refer to broken rice and imports from Thailand to Tanzania are mostly of milled rice.

Figure 10b: Monthly averages of Dar es Salaam wholesale price (husked) and Vietnam FOB export quotations (5 percent broken) for rice in real terms for 2006-2010 (TZSH per tonne)



Source: MTI, and International Grains Council for prices and WB for CPI

DESCRIPTION OF THE VALUE CHAIN AND PROCESSING

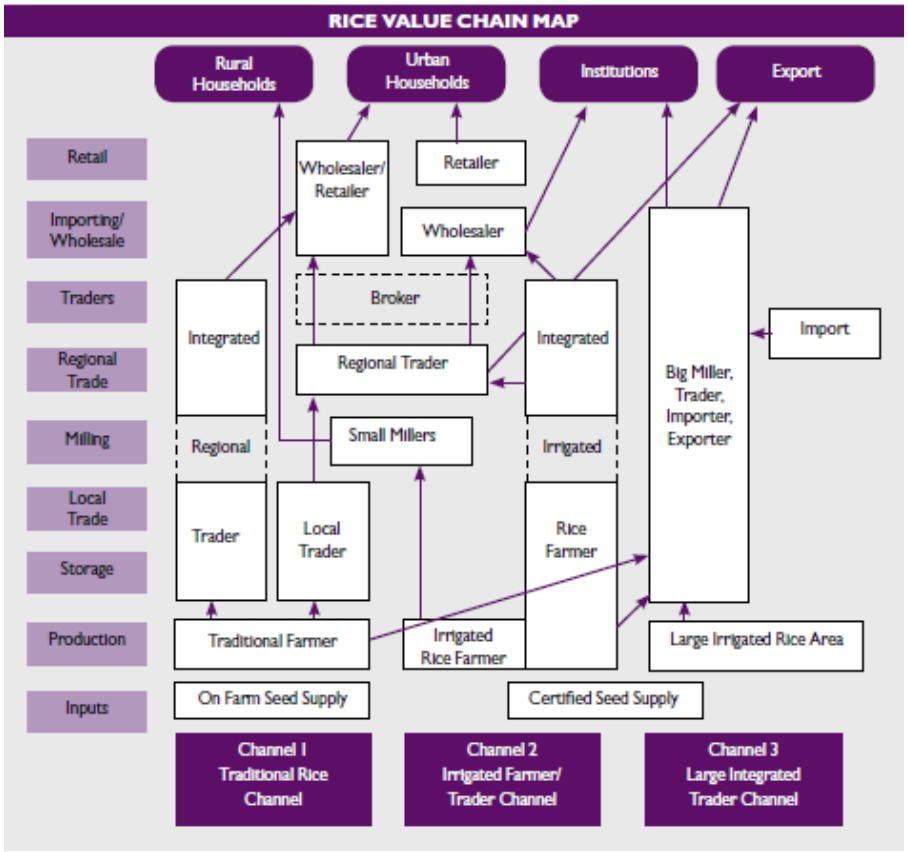
Rice is an important commercial crop among farming households. According to National Agricultural Sample Census of 2002-03, 42 percent of rice production is marketed, compared to 28 percent of maize and just 18 percent of sorghum. About 13 percent of marketed rice is sold by small-scale farmers, and the rest is sold by large-scale farmers (Minot, 2010).

Figure 11 shows the rice value chain in The United Republic of Tanzania. In general, rice marketing is fragmented into three main channels: (1) the traditional rice producers channel; (2) the irrigated farmer/traders channel; and (3) the larger irrigated farmers trader with millers and brokers playing a central role in the trading process. The first and second supply channels for rice are generally long and many actors are involved before the crop reaches final consumers. In fact, it is estimated that there are about 35 cash transactions along the value chain before rice reaches final consumers (ECI, 2003). Long supply chains, combined with poor transport networks, have contributed to large marketing margins (Eskola, 2005). However, more structured supply chains are emerging, and there is increasing interest from large, foreign investors in the crop value chain. (Match maker associates Ltd, 2010).

As shown in Figure 10, the first stage of the value chain is production, followed by storage, local trade, milling, regional (local) trade, traders, wholesale/importing and finally retail.

Normally, once paddy is harvested, it is sold to local traders, who either trade it at the regional market as paddy or send it to a mill for processing. The milled rice is then sold at the wholesale level to traders from the local markets/retail shops or the paddy might be sold to larger millers, who export large quantities of processed rice.

Figure 11: Rice Value Chain



Source: Micro AgCLIR Report 2010

In addition to taxes, marketing costs influence very much the level of consumer prices and the profitability of rice production, processing, marketing/distribution and retail. However, it is important to note that imported and domestic rice follow different paths into the market. For locally produced rice, village and inter-village traders buy milled rice and/or paddy rice from producers and then sell to urban based brokers/wholesalers. The brokers, in turn, sell rice to retailers, who then sell to consumers. On the other hand, for imported rice and rice under the food aid counterpart fund, 50 percent is distributed through wholesalers, 30 percent through traders' or importers' own distribution system and 20 percent through retail shops (MAFC and FAO, 2008).

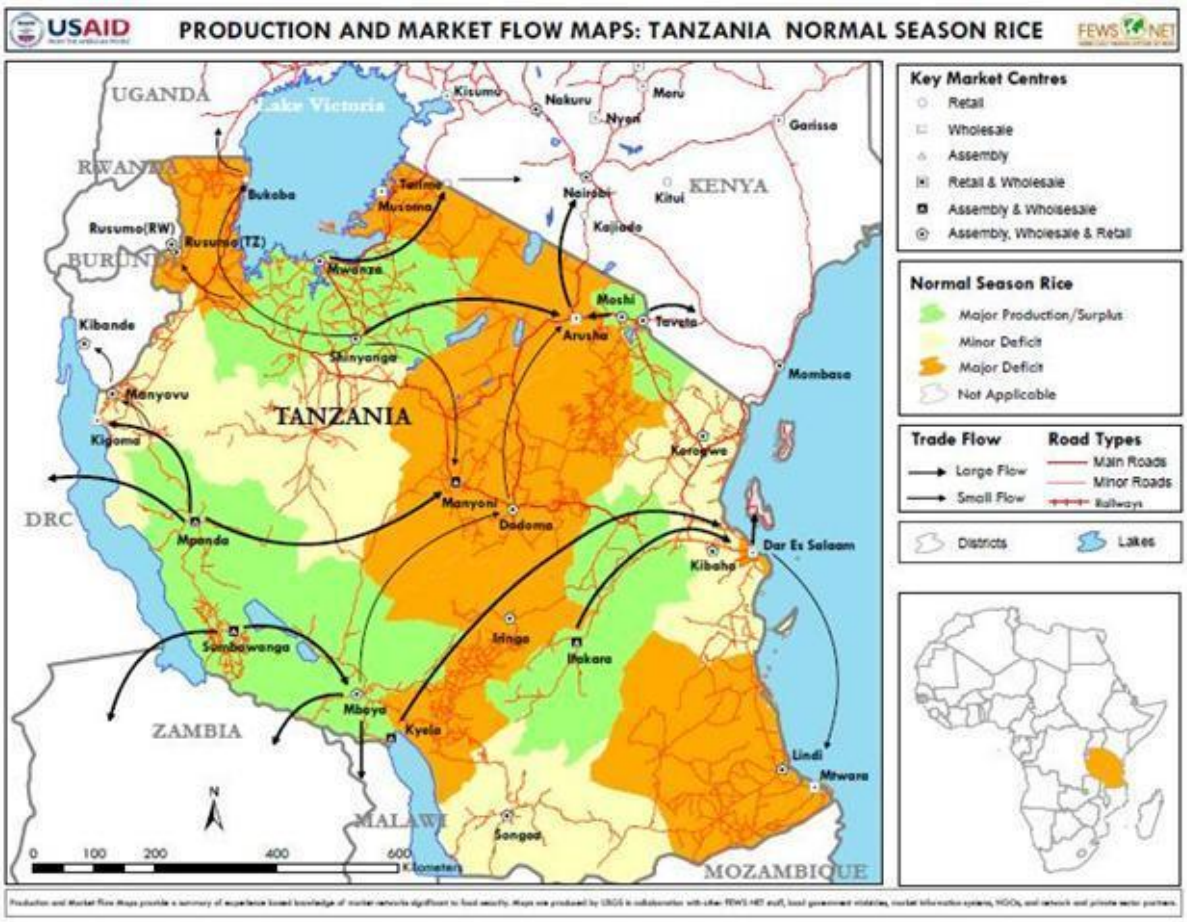
Based on simplified gross margin (SGM) of rain-fed smallholder farmers (SHFs), the profitability varies from negative to modest returns of 27 percent, which suggests the profits are negligible and most producers remain at a subsistence level. The irrigated farms are much more productive and profitable, with SGMs varying from 2 percent to 61 percent. Rice producers' main cost drivers are (own) labour (60-80 percent), inputs (10-30 percent) and local transport costs (5-10 percent). The other main actors in the value chain (traders, millers and retailers) realize positive gross margins varying from 9 to 25 percent. The main cost drivers for traders/millers are raw material (paddy rice) for processing and trading (60-80 percent), transport costs (6-12 percent), milling (5-10 percent), loading and unloading (2-3 percent), taxes (2-3 percent) and, for the larger traders, storage rental (20-30 percent) (SACGOAT, 2010).

As mentioned above, there are two main rice producing areas in The United Republic of Tanzania – the north around Lake Victoria and the Southern Highlands. As Figure 11 shows, rice surplus produced in the south is transported and sold mainly in Dar es Salaam, but a smaller share of

production is also exported to markets in Malawi and Zambia. On the other hand, the northern region tends to direct their surpluses to markets in Kenya, Rwanda and Uganda.

Figure 12 demonstrates that the trade flows for rice are mainly going through local markets and cross border trade. Rice is mainly transported from Arusha to the regional market in Nairobi, Kenya, which offers higher prices. There is also a smaller trade flow that goes from Musoma to Nairobi through the Silari border. Local traders in regions bordering other countries often find it cheaper to export than to transport the same rice to major domestic markets. This is mainly due to high transport costs affecting both internal and export trade of agricultural crops. Therefore, high transport costs are often an impediment to the competitiveness of exports (Mkenda and Campenhout, 2010). Alternative sources (SAGCOT) include the area south of Shinyanga (i.e. Tabora) as a surplus area which seems to be in line with the importance of that region in total rice production (see Figure 1).

Figure 12: Rice Production and Trade Flow Map

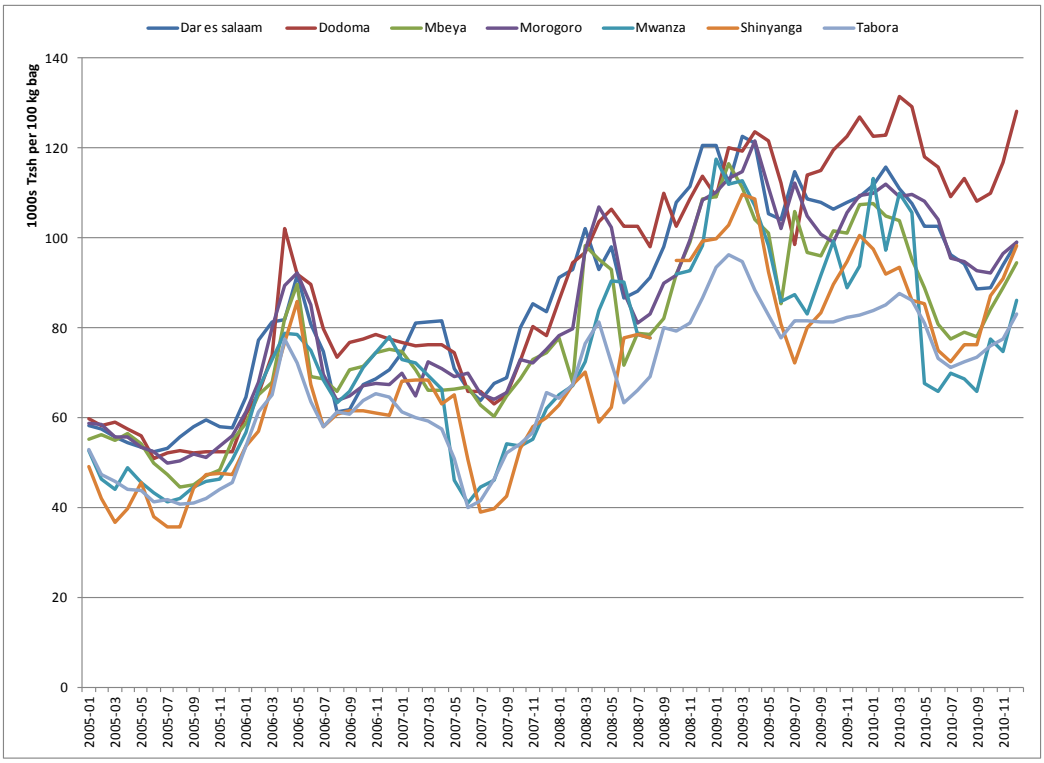


Source: FEWSNET

Locally produced rice is traded in more than 20 wholesale markets across the country. Rice from Malawi enters into the local market in Mbeya City and finds its way to Dar es Salaam. Price dynamics in the country can be seen in Figure 13a. The lowest rice prices are found in rice surplus zone (i.e. Mbeya, Morogoro, Mwanza, Shinyanga and Tabora) while higher prices are found in major urban areas where rice is mainly consumed (Dar es Salaam Dodoma and Arusha). Figure 13b shows this dichotomy reporting average prices by market type, and plots also the market price differential between production and consumption areas, which on average is above 100 USD per tonne.

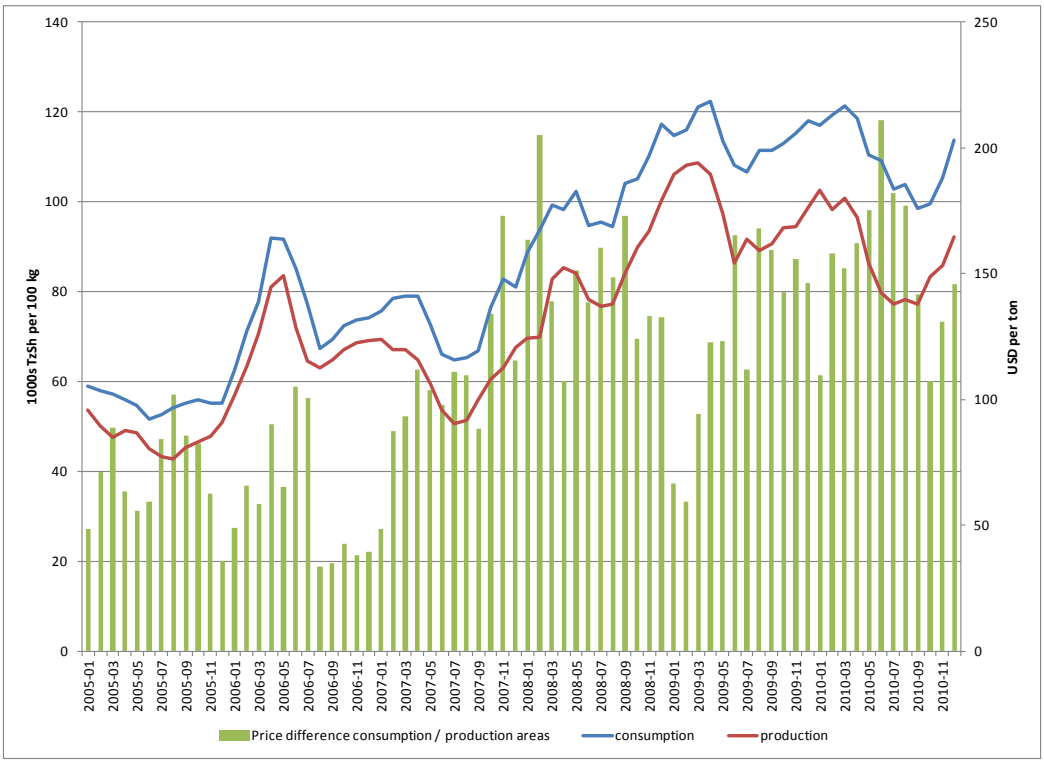
However, local prices are higher than international market prices primarily due to inefficiencies in the supply chain and tariff applications (Minot, 2010).

Figure 13a: Rice Prices at Selected Rice Markets in Tanzania



Source: Own calculation using MTI data

Figure 13b: Rice prices in major production and consumption markets together with price differential between them



Production areas include Mbeya, Morogoro, Mwanza, Shinyanga and Tabora. Consumption areas include Dodoma and Dar es Salaam.
Source: Own calculation using MTI data and IMF for exchange rates

The seasonality of rice prices is lower than that of maize prices. The highest-to-lowest monthly price ratio varies between 1.23 in Dar es Salaam and 1.33 in Mtwara. This is most probably related to the fact that rice storage involves smaller losses than maize storage (Minot, 2010). Furthermore, marketing information flow within the rice value chain is asymmetric, leading to farmers selling their products at lower prices (DAI 2003, p.30).

POLICY DECISSIONS AND MEASURES

The Tanzanian Government is committed to implementing the World Food Summit Plan of Action contained in the 1996 Rome Declaration on World Food Security and the Millennium Development Goals (MDGs), as internationally agreed targets of halving poverty, malnutrition and hunger by the year 2015. Similarly, the government is committed to implementing the African Union's (AU) Comprehensive Africa Agriculture Development Programme (CAADP). CAADP has five pillars, one of which is increasing food supply and reducing hunger.

The 2001 Agricultural Sector Development Strategy (ASDS) focuses on increasing agricultural productivity, profitability and farm incomes. Since then, the government has implemented the Agricultural Sector Development Programme (ASDP) as an operational response to ASDS. In essence, the ASDP addresses the need to increase food production to meet the food security objective of achieving self-sufficiency in staple food production, including rice production.

The ASDP applies a Sector Wide Approach (SWAP) which allows for greater coordination of agriculture sector activities by involving key ministries, including the Ministry of Agriculture, Food Security and Cooperatives (MAFSC), the Ministry of Industry and Trade, the Ministry of Livestock and

Fisheries (MLF), the Ministry of Water (MoW) and the Ministry of Finance (MoF), on one hand and private sector on the other.

The 2009 Kilimo Kwanza (agriculture first) initiative, which was primarily developed by the private sector, was adopted by the government to coordinate the implementation of investment projects in agriculture led by the private sector. Kilimo Kwanza's objective is to revamp the green revolution ambitions and increase large-scale agricultural investments.

As part of the implementation of CAADP, the government launched the Tanzania Agriculture and Food Security Investment Plan (TAFSIP) in 2012 to attract more investment in the agriculture sector, particularly to crops which have significant bearing on food security and household income, such as rice.

In 2009, The United Republic of Tanzania passed the Cereals and Other Produce Act. This act created a new cereal board with significant powers to intervene in rice and maize markets. The new board has the authority 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 that the Minister approves, which aid the development of trade in cereals. As of May 2012, the cereal board was still not functioning.

According to the Department of Food Security at the MAFSC, the new Board 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 will allow for the purchase of a targeted volume of 150 000 tonnes. Moreover, the Board has inherited the milling assets of the former National Milling Corporation in Arusha and Iringa. Given that these changes are recent,, the impact of the board cannot be assessed in this technical note which covers the period 2006 -2010. However, by comparingof indicators for future years with those already available it will be possible to evaluate the market effects of the board.

The 2008 National Rice Development Strategy (NRDS) is one of the crop specific strategies prepared within the framework of ASDP. The NRDS contributes to Tanzania's national policies and international commitment to improve the livelihoods of citizens in rural communities through enhancing household food security and incomes. The vision of NRDS is to transform the existing subsistence-dominated rice sub-sector into a commercially viable production system. The strategy underscores the existing potentials for rice production in The United Republic of Tanzania and focuses on: i) development and availability of improved seeds resistant or tolerant to major biotic and abiotic stresses, ii) development and availability of improved post harvest processing technologies and value addition (grading and packaging) processes, iii) low use of labour saving technologies and inadequate technology transfer, and iv) construction of more irrigation infrastructure.

In particular the NRDS has defined intervention strategies, which are to be implemented in periods of three-years. The time frame was synchronized with the Government Medium Term Expenditure Framework (MTF) to ensure that the implementation of activities is financed and split into two groups depending on the timeframe for implementation:

- short term (1-3 years) strategies:
    - increasing production and productivity of rice in selected irrigation schemes;
    - reducing production and post-harvest losses;
    - increasing availability of and access to agricultural inputs (improved seeds, fertilizers, pesticides and appropriate farm machineries);
    - rehabilitation and development of new irrigation schemes.
- medium (3-5 years) and long-term (5 years onwards) strategies:
    - expansion of areas in lowland irrigation, rain-fed lowland and upland ecosystems;
    - increasing access to farm machinery and post harvest technologies;
    - encouraging investment in medium- and large-scale processing industry.

According to the MAFSC, since the implementation of the rice strategy productivity has increased from 0.8 ha/tonne to 1.4 ha/tonne in 2011, data that is not supported by national averages (see Figure 2).

Moreover, The United Republic of Tanzania is a member of EAC and the Southern Africa Development Community (SADC). This dual membership means that there are different tariff structures, which primarily targets non-EAC member states. For EAC member states there has been gradual removal and also reduction of rice tariffs over the years. Table 3 shows that from 2005 to 2010, EAC members' tariff stood at 0 percent, while the MFN tariff for all other states was stood at 75 percent or USD 200/tonne. South Africa and COMESA have no specific tariffs, but between 2005 and 2007, a 5 percent tariff was applicable to South Africa. In 2008, the president of The United Republic of Tanzania declared that it would even ban imports of rice if they kept arriving so cheaply in The United Republic of Tanzania. Surprisingly, this statement coincided with the peak in rice prices. Tanzania's rice exports are mainly directed to EAC countries rather than other regions.

Table 3: Trade Regime and Tariff Structure

Product	Regime	2010	2009	2008	2007	2006	2005	2003	2000	1998	1997	1993
Rice	MFN (EAC CET)	75 or 200 USD/tonne [whatever is higher]						25		-	-	-
	Customs duty	-	-	-	-	-	-	-	-	30	30	20
	COMESA	-	-	-	-	-	-	-	-	6	-	-
	EAC	0						5	-	-	-	-
	South Africa	-	-	-	5			-	-	-	-	-
	SADC	10	15	15	25			25	25	-	-	-

Source: WITs (2012)
-: no specific tariff

The taxation regime is treated differently among rice value chain actors, as seen in Table 4. Farmers and commercial producers are exempted from the Value Added Tax (VAT), income and sales tax and cess (district sales tax). Thus, the tax regime encourages both commercial and farmers to produce more rice. However, traders, millers, transporters and importer/exporters are subject to different types of taxes and tariffs.

Tanzania's Revenue Authority imposes income tax bands on different levels of turnover to owners of millers, local traders, importers and exporters. A district sales tax between 1-5 percent of the bag value is also applicable to all agents along the value chain, if they transport grain bags from the district to any destination.

These costs have made local rice more expensive than imported rice, even after a 75 percent import duty and 18 percent value added tax. For example, in January 2010, Thai A1 Super rice (a low-quality rice) could be imported at a CIF price of USD 445/MT, compared to the domestic rice sold in Dar es Salaam at USD 750/MT for low grade and USD 970/MT for the best quality rice. In a price-sensitive market, local rice could not compete with imported rice without the 75 percent duty imposed on imported rice. This duty raises the price of Thai A1 Super to USD 779/MT and allows the local product to remain on the market. This means that domestic prices are less sensitive to volatility in world prices but they are more easily affected by variation in domestic production.

Table 4a: Local Taxes and Tariff to Rice

Category	Farmers		Traders	Millers	Transporters	Importer/Exporters
	Peasants	Commercial				
Value added Tax (VAT)	Exempt	Exempt	Exempt	Exempt	Exempt	Exempt
Income Tax	Exempt	Tax bands on turnover bands (see table 5b)				
Sales Tax	Exempt	Eliminated in 1998 (and replace by VAT).				
Cess (district sales tax)	Exempt	1-5percent of bag value: determined and collected at the district level; and paid by whomever is transporting grain				

Source: Micro Ag CLIR, 2010

Table 4b: Local Income tax rates to millers/transporters/importers

TURNOVER	TAX PAYABLE WHERE INCOMPLETE RECORDS ARE KEPT	TAX PAYABLE WHERE COMPLETE RECORDS ARE KEPT
Where turnover does not shs.3,000,000	TzSh20,000	0.7percent of the turnover
Where turnover exceeds 3,000,000 but does not exceeds 7,000,000	TzSh 50,000	0.7percent of the turnover
Where turnover exceeds 7,000,000 but does not exceeds 14,000,000	TzSh 165,000	Shs. 50,000 plus 1.6percent turnover in excess of Shs 7,000,000
Where turnover exceeds 14,000,000	TzSh 385,000	Shs 165,000 plus 3.6percent of turnover in excess of shs. 14,000,000

Source: TRA Income Tax Act, 2004

3. DATA REQUIREMENTS, DESCRIPTION AND INDICATORS CALCULATION

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.

Analysis for price incentive and disincentive for rice in The United Republic of Tanzania is done for the period 2005-2010. We consider the wholesale market of Dar es Salaam as the point of competition 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.

Based on the analysis of trade presented above, which is summarized in Table 5, we can see that The United Republic of Tanzania is a net importer during the period 2005-2009 and becomes a net exporter in 2010. As it can be seen, broken rice seems to set the trade position of The United Republic of Tanzania and should therefore be considered as the product for which the benchmark price has to be taken.

Table 5: Net exports of Tanzania for different categories of Rice (2006-2010)

	2005	2006	2007	2008	2009	2010
Paddy	4,583	-71	944	472	-185	5,987
Husked	1,706	-289	-108	64	164	916
Broken	-46,753	-58,253	-37,115	-47,185	-26,140	12,541
Milled	-14,726	-21,744	11,629	-11,719	-12,638	29,528
Milled equivalent	-57,117	-80,275	-24,959	-58,546	-38,767	46,694

Notes: Milled conversion ratios used 0.65 for paddy and 0.80 for husked.

Source: UN Comtrade

BENCHMARK PRICES

Benchmark prices are taken as CIF prices for years in which the product is imported and as FOB prices when it is exported. As mentioned above broken rice is the main product for trade in The United Republic of Tanzania, however as it can be seen in Table 6 prices show a significant drop during the 2007-2009 while international prices do not show such a large drop[6]. Checking the origin of imports during that period one can see that most of them are from developed countries in 2007 for example, 35percent from USA with a unit value of 77 USD per tonne) while CIF unit value for rice imported from Vietnam is far lower than FOB prices for the same period (i.e. for 2007, 80 USD CIF unit value versus 300 USD FOB). Moreover, the quality of broken rice is highly variable allowing, while unbroken rice has a much lower dispersion in quality and price. Therefore we have chosen to use the unit values of milled rice as benchmark prices because they follow a more coherent behavior.

[6] FOB prices from major exporters reported by the International Grains Councils show a year on year increase of 11percent in 2007 and 103percent in 2008, which are more in line with evolution of milled rice CIF unit values for Tanzania.

Table 6: CIF unit values (USD per tonne) for imports of rice in Tanzania 2006-2010

	2005	2006	2007	2008	2009	2010
Paddy	156	670	213	726	396	1,935
Husked	84	213	174	1,384	505	1,316
Broken	169	228	90	135	127	246
Milled	**274**	**271**	**338**	**608**	**597**	**844**

Source: UN Comtrade

For 2010, when The United Republic of Tanzania is a net exporter, the benchmark price would be the declared FOB price which is reflected in Table 7. Taking into account that most exports where related to milled rice, it will be this unit value that will be used for the analysis. Exports that year where directed mainly to Rwanda (70 percent of total trade) and this will be taken into account for identifying the market paths for calculating access costs.

Table 7: FOB unit values (USD per tonne) for exports of rice in Tanzania 2010

Type of Rice	2010
Paddy	258
Husked	155
Broken	163
Milled	**349.96**

Source: UN Comtrade

EXCHANGE RATES

Table 8 shows exchange rates for Tanzanian Shilling (Tsh) against US dollar. We note a small difference between IMF and Bank of Tanzania (BoT) reported exchange rates that can be explained by the fact that the Tsh is free floated currency. The BoT data was picked for the analysis.

Table 8: Comparative Exchange rates

Exchange rate (yearly average of monthly data)	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**
IMF	1,128	1,251	1,245	1,196	1,320	1,409
BOT	1,129	1,253	1,239	1,196	1,320	1,432

Source: UNCOMTRADE and BOT

DOMESTIC PRICES

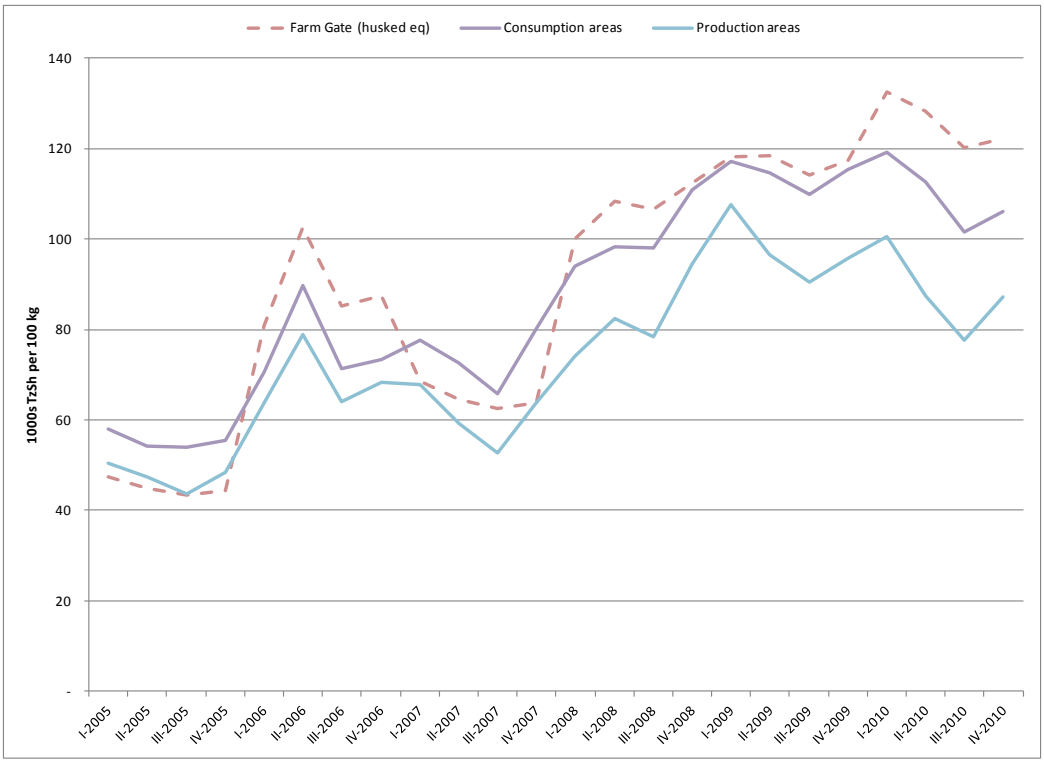
The National Bureau of Statistics (NBS) reports farm gate price quarterly as a country average. Price is reported for paddy rice. However comparing these prices to wholesale prices reported by the Ministry of Trade and Industry "husked rice" we can see (figure 14) that farm gate prices are higher than wholesale prices over the whole period, they are also higher than average wholesale prices for production areas and country averages[7].

Two main reasons lead us to discard farm gate prices and use wholesale prices in production areas for the analysis: (i) the fact that paddy rice needs to undergo some degree of milling before it can be

[7] Farm gate prices are reported for Paddy Rice and husked equivalent has been calculated as the ratio of the conversion factors to milled rice of paddy and husked (0.80/0.65).

compared to husked rice (with the associated costs8); and (ii) the absence of regulated prices for rice in The United Republic of Tanzania.

Figure 14: Rice NBS farm gate prices (husked equivalent) and whole sale prices for in major rice production and consumption areas (TzSh per 100 kg).



Source: NBS, MTI and own calculations

The Ministry of Trade and Industry has 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 2005[9]. We therefore decided to approximate the farm gate price with the wholesale price at markets in major surplus areas. Figure 15 shows the location of markets for which MTI reports wholesale prices and the route for rice flows both when The United Republic of Tanzania is a net importer and a net exporter.

Dar es Saaam is the main point of entry for imports as imports primarily come mainly from East Asia. For 2010 we consider that exports do not go through Dar as they are directed mainly to Rwanda, therefore we consider that the point of competition are the markets of the main producing areas close to the Rwanda border (Mwanza and Shinyanga).

[8] Milling costs only stand at 30 TzSh per kg or 3,000 per 100 kg of paddy or 3 700 per 100 kg of milled equivalent.

[9] Asche *et al.* (2012) report that prices are obtained for 6 or 7 traders in each market reporting the highest and lowest price, 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 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 the different sources for prices do not coincide.

Table 9: Domestic prices (TzSh per tonne) at point of competition for husked rice in Tanzania (2006-2010)

	2005	2006	2007	2008	2009	2010
Dar es Salaam	562,015	735,260	742,239	984,949	1,117,393	
Main Rice market in North Tanzania (Shinyanga)						858,793

Source: MTI

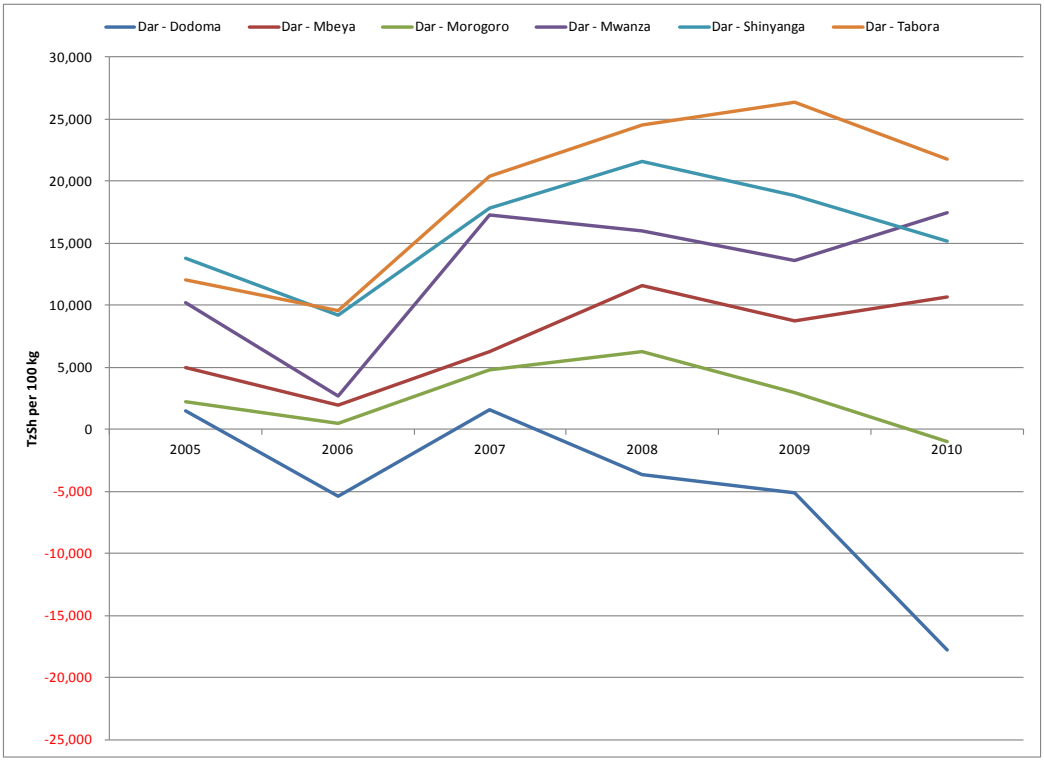
Figure 15: Markets for which Ministry of Trade in Tanzania records wholesale prices for husked rice and representation of the assumed marketing chain

Black arrows represent flows in importing years and green arrows for exporting ones.

Source: own elaboration

The typical marketing route would involve rice for surplus areas feeding towards Dar es Salaam (see Figure 12) when there is a production deficit; and surplus areas feeding the neighboring countries when there is a production surplus (i.e. 2010). To consider the viability of these different marketing routes we have conducted a price differential analysis. For export years we have considered the main producing areas and compared prices with Dar es Salaam for the study period both in absolute values (Figure 16) and in implicit cost per kilometer (Table 10). Assuming that the transportation cost of 0.12 USD per tonne value reported by SAGCOT and World Bank is correct, Tabora most consistently reports wholesale market prices low enough to compete In the Dar es Salaam wholesale market. (The price differential between other surplus areas and Dar es Salaam is frequently less than transportation costs so they could not profitable trade with Dar es Salaam. Tabora is therefore chosen as the reference farm gate price.

Figure 16: Wholesale price differentials between major producing areas and Dar es Salaam (TzSh per 100 kg)



Source: MTI and own elaboration

Table 10: Husked Rice price differentials with Dar for main rice producing areas in Tanzania

	2005	2006	2007	2008	2009	2010
Wholesale price differentials (TZSH per tonne)						
Mbeya	50,040	19,469	63,181	115,774	87,220	106,826
Morogoro	22,385	4,954	48,129	62,974	30,030	-9,981
Mwanza	102,132	27,318	172,532	159,667	135,997	174,247
Shinyanga	137,990	92,420	178,449	216,410	188,423	151,313
Tabora	120,177	96,065	204,416	245,441	263,575	217,781
Wholesale price differentials (TZSH per tonne per km)						
Mbeya	60.43	23.51	76.31	139.82	105.34	129.02
Morogoro	115.39	25.54	248.09	324.61	154.79	-51.45
Mwanza	90.54	24.22	152.95	141.55	120.57	154.47
Shinyanga	140.66	94.21	181.91	220.60	192.07	154.24
Tabora	143.93	115.05	244.81	293.94	315.66	260.82
Wholesale price differentials (USD per tonne per km)						
Mbeya	0.05	0.02	0.06	0.12	0.08	0.09
Morogoro	0.10	0.02	0.20	0.27	0.12	-0.04
Mwanza	0.08	0.02	0.12	0.12	0.09	0.11
Shinyanga	0.12	0.08	0.15	0.18	0.15	0.11
Tabora	0.13	0.09	0.20	0.25	0.24	0.18

Source: MTI and own calculations

The same analysis for 2010 when The United Republic of Tanzania is a net exporter shows that only Tabora would be sending rice towards the north via Shinyanga. Therefore farm gate price are always approximated as Tabora wholesale prices. Table 11 summarizes the prices used as farm gate for the analysis.

Table 11: Wholesale prices used as farm gate prices for the analysis

	2005	**2006**	**2007**	**2008**	**2009**	**2010**
Tabora	441,837	639,195	537,822	739,507	853,818	792,325

Source: MTI

ACCESS COSTS

Observed access costs border to wholesale. For the period 2005/2009 when The United Republic of Tanzania is a net importer of rice mainly via Dar we have considered the observed costs of landing at the port of Dar es Salaam. 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[10]. Although these costs refer to maize we can consider that they can be applied to all cereals. These costs are summarized in Table 12a and revisited with additional information obtained from more up to date sources.

Table 12a: 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% 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% of CIF	
Tally fee	Payable to the shipping company	USD 1 per tonne	
Tanzania central freight bureau booking fees	TCFB fee for enforcing fair fright charges for exports and imports	2.5 % of CIF or FOB	Currently under SUMATRA (Surface and Marine Transports Authority) and set at 0.3 USD per tonne[11]. 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	% 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 elaboration.

In order to check the validity of the Surface and Marine Transport Regulatory Authority (SUMATRA) declared fees for bulk imports we have calculated the implicit unit value (USD) based on total

[10] 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.

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

revenues of SUMATRA related to imports and total value of imports12. This generates a fee in TzSH per USD of imports of 0.60 (2007); 0.46 (2008) and 0.88 (2009). Considering the CIF unit value prices for those years we see that the fee levied on rice would be between 0.16 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 is actually 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 rice 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 as follows in table 12b.

Table 12b: Components of the observed access costs from border to point of competition considered in the analysis when Tanzania is an importer of Rice 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[13].
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	
SUMATRA 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 elaboration.

Costs not referred to % of the import values have been actualized or deflated 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 12c.

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

[13] 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).

As these access costs refer to milled rice and domestic prices are for husked rice they are multiplied by a technical quantity factor of 0.8 to avoid comparing different products (see below for quantity adjustment for benchmark price).

Table 12c: Access costs from border to point of competition when Tanzania is an importer of Rice through Dar es Salaam

Year	Access costs (TzSh per tonne)
2005	47,279
2006	53,861
2007	71,077
2008	86,610
2009	114,564

Source: own elaboration as described above

Figure 17 compares wholesale prices in Dar with CIF prices plus access costs both with and without tariff. AS it can be seen the price in Dar is above the import parity price from 2005 to 2007 while in 2008 the price seldom allows to cover for the tariff.

Figure 17: Wholesale prices in Dar es Salaam, reference price and cost of imports with tariff for Rice (TzSh per tonne)

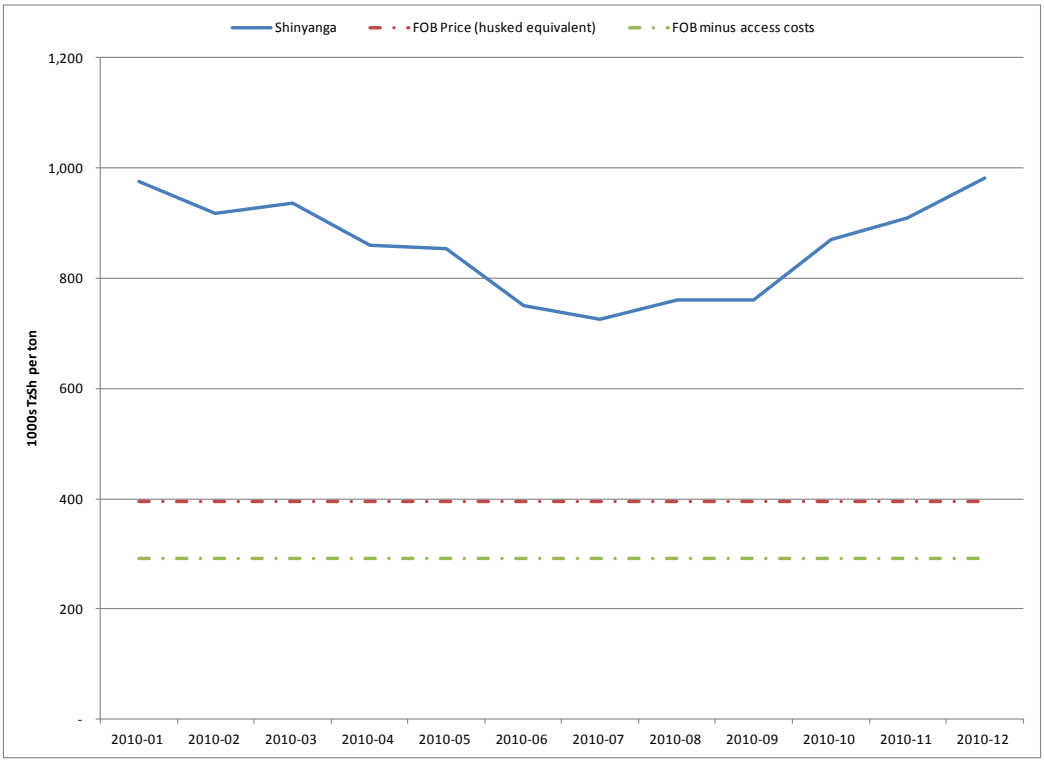
CIF prices for milled rice have been converted to husked equivalent

Source: MTI (wholesale prices), UN COMTRADE (CIF prices), WITS (tariffs) and IMF (exchange rates).

In 2010 The United Republic of Tanzania is a net exporter of rice and most of it goes to Rwanda. For this year we consider the point of competition the main producing areas in the north of the country

(Shinyanga). Access costs in this case include transport from Shinyanga to the border with Rwanda (Musumo, 403 km), 5 percent margin over purchase price at wholesale market, and documentation and phytosanitary inspection costs as above. Transport costs have been calculated using the average cost per km and tonne of transport reported by the NFRA for maize in Northern Tanzania (238 TzSh in 2011) and converted into 2010 prices using the country's CPI. As it can be seen in Figure 18 reported FOB prices are much lower than prevailing prices in the area and we are not aware of of export subsidies (in 2010 exports from The United Republic of Tanzania were banned during part of the year). Therefore, the benchmark price for 2010 will need to be reconsidered.

Figure 18: Rice wholesale prices in production area, FOB prices and FOB prices minus access costs (TzSh per tonne)



FOB prices for milled rice have been converted to husked equivalent
Source: MTI (wholesale prices), UN COMTRADE (FOB prices) and IMF (exchange rates).

Observed access costs farm gate to wholesale

As prices at point of competition and farm gate are for the same product we only need to take into account handling, transport and margins as components of access costs. For the first two elements we have used the data available from the transport and handling costs of the National Food Reserve Agency (NFRA). They report costs for truck transport of maize which can be extrapolated to rice. Two per km and tonne values have been calculated using their data, a low value (representing transport costs in the southern part of the country) and a high value (representing transport costs in the northern part of the country). These values stand at 0.11 and 0.16 USD per tonne per km in 2011 values.

The latter has been used in the calculation of the observed access costs considering the distance between Dar and Tabora (844 km). Tables 13a and 13b summarize the cost estimates of observed access costs for import and export years respectively.

Table 13a: Access cost from farm gate to point of competition for years when Tanzania is a net importer of Rice

	2005	2006	2007	2008	2009
a. Purchase price in Tabora (TzSh per tonne)	441,837	639,195	537,822	739,507	853,818
b. Margin	5%	5%	5%	5%	5%
c. Distance Tabora – Dar (km)	844	844	844	844	844
d. Transport cost (TzSh per km and tonne)	132.89	142.52	152.54	168.22	188.64
e. Access costs (TzSh per tonne) [a*b + c*d]	134,249	152,250	155,632	178,949	201,903

Source: MTI, NFRA and own calculations

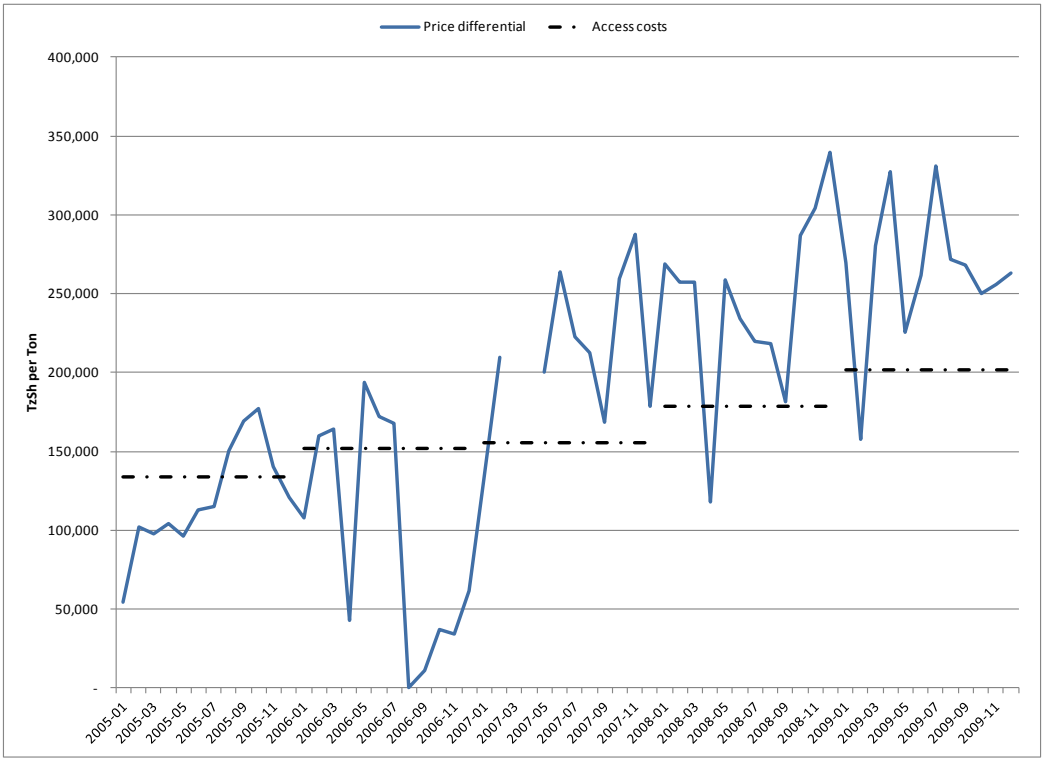
Table 13b: Access cost from farm gate to point of competition for years when Tanzania is a net exporter of Rice

	2010
a. Purchase price in Tabora (TzSh per tonne)	792,325
b. Margin	5%
c. Distance Tabora – Shinyanga (km)	194
d. Transport cost (TzSh per km and tonne)	200.34
e. Access costs (TzSh per tonne) [a*b + c*d]	78,481

Source: MTI, NFRA and own calculations

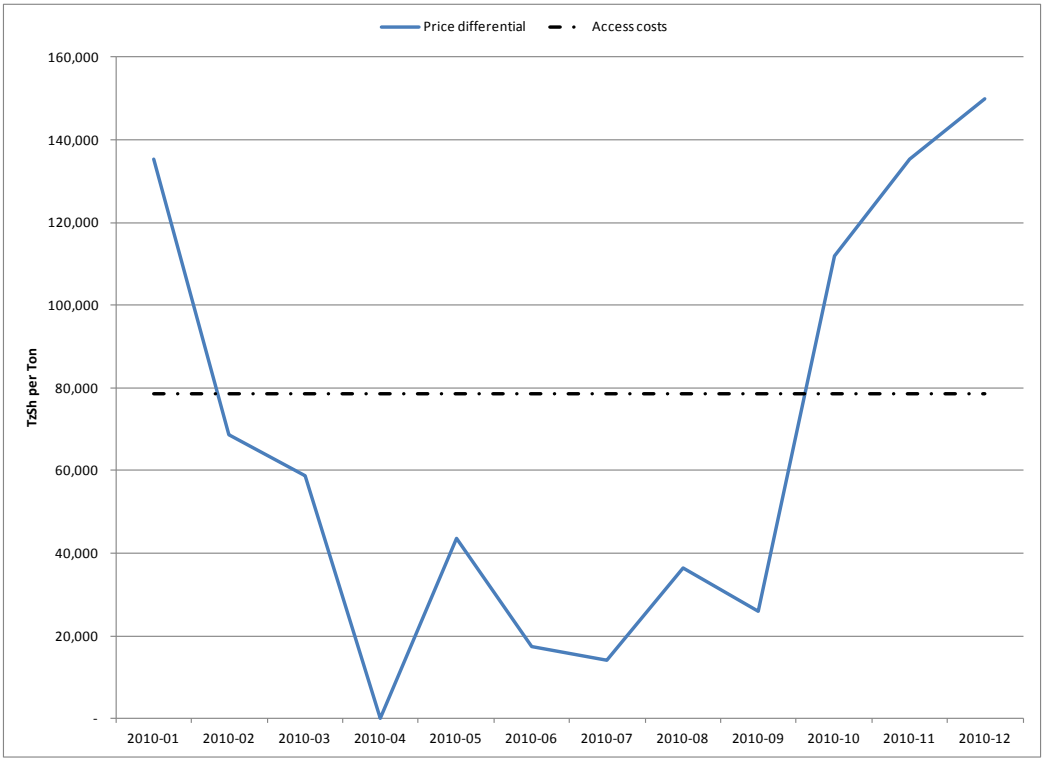
Figures 19a and 19b compare the access costs considered in the analysis with the actual price differences between the markets considered as point of competition and farm gate. As it can be seen there are incentives for arbitrage between the markets considered at least during three months of the year.

Figure 19a: Access costs and price differentials between Dar and Tabora



Source: MTI and Table 13a.

Figure 19b: Access costs and price differentials between Shinyanga and Tabora



Source: MTI and Table 14b.

Adjusted access costs

For access costs from border to wholesale in years when The United Republic of Tanzania is a net importer adjusted costs have been calculated assuming lower handling costs in the port of Dar as reported by World Bank (2011). This report identifies costs as 4.5 USD (2006 values) instead of the 20 USD (2003) values reported by Temu et al (2010).

In years when The United Republic of Tanzania is a net exporter, adjusted access costs from border to wholesale and farm gate to wholesale have been calculated assuming a lower unit transport costs (that of southern routes (170 TzSh per km and tonne) compared to northern routes (238 TzSh per km and tonne) used in the observed domain.

QUANTITY AND QUALITY ADJUSTMENTS

As import prices are for milled rice and domestic prices are for husked rice we need a quantity adjustment of 0.80 as one tonne of husked rice only produces 0.80 tonnes of milled rice. Otherwise, the reference price would be overvalued.

For the time being we do not have any evidence that the local husked rice has a positive or negative price premium compared to imported rice and therefore there is no quality adjustment included.

Summary table for data description in MAFAP technical notes

The following table summarizes the main sources and methodological decisions taken for the analysis of price incentives and disincentives for rice in The United Republic of Tanzania. While the table reflects general approaches and presents the data used, section 4 below discusses specific changes (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: *unit value of milled rice imports as reported in UN COMTRADE (some additional selection of relevant imports for some years as discussed below).* ▪ Years when TZA is a net exporter: *Wholesale price at Kigali market (Rwanda) as reported by EAGC minus transport from Tanzania Border to Kigali and 5% margin over Tanzania price at point of competition plus access costs to border.*	*N.A.*
Domestic price at point of competition		▪ Years when TZA is a net importer: *Annual average wholesale price for Dar es Salaam* ▪ Years when TZA is a net exporter: *Annual average wholesale price for Mwanza and Shinyanga (main markets close to the border of Rwanda)*	*N.A.*
Domestic price at farm gate		▪ Years when TZA is a net importer: *Annual average wholesale price Tabora* ▪ Years when TZA is a net exporter: *No farm gate price assumed*	*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: *observed export and import costs at port of Dar es Salaam plus 5% margin over CIF price* ▪ Years when TZA is a net exporter to: *observed export costs (phyto sanitary inspection and Delivery order) from port of Dar; transport costs from Shinyanga to border using 0.16 USD (2011) per km as declared by NFRA; 5% margin over wholesale price at point of competition.*	▪ Years when TZA is a net importer: *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: *as observed but assuming a 0.11 USD per km cost which is the lower truck transport reported by NFRA (southern Tanzania).*
Access costs to farm gate		▪ Years when TZA is a net importer: *5% margin on purchase price of rice plus transport and handling costs using NFRA reported per km and tonne (northern Tanzania costs) multiplied by actual distance from Tabora to Dar.* ▪ Years when TZA is a net: *5% margin on purchase price of maize plus transport as declared by NFRA for Northern Tanzania route.*	▪ Years when TZA is a net importer: *as observed but using a lower transport costs per km and tonne (southern Tanzania)* ▪ Years when TZA is a net exporter: *as observed but using cheapest truck transport costs reported by NFRA for the transport component.*
QT adjustment	Bor-Wh	▪ 0.80 to transform milled rice into husked rice	*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	*m*	*m*	*m*	*m*	*m*	*x*
DATA	*Unit*	*Symbol*						
Benchmark Price								
Observed	USD/TONNE	$P_{b(int\$)}$	**274.94**	**271.32**	**338.52**	**608.86**	**597.03**	**913.79**
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	AC_{owh}	**47,278.28**	**53,860.59**	**71,076.66**	**86,610.49**	**114,563.70**	**160,557.33**
Adjusted	TzSh/TONNE	AC_{awh}	**31,196.90**	**34,734.46**	**50,718.99**	**65,039.06**	**71,791.32**	**142,369.87**
Domestic price at point of competition	TzSh/TONNE	P_{dwh}	**562,015.00**	**735,260.00**	**742,239.00**	**984,949.17**	**1,117,393.33**	**858,793.00**
Access costs point of competition - farm gate								
Observed	TzSh/TONNE	AC_{ofg}	**134,249.71**	**152,250.12**	**155,632.52**	**178,949.31**	**201,903.65**	**78,481.57**
Adjusted	TzSh/TONNE	AC_{afg}	**102,667.23**	**102,667.23**	**102,667.23**	**102,667.23**	**102,667.23**	**72,786.69**
Farm gate price	TzSh/TONNE	P_{dfg}	**441,837.50**	**639,195.00**	**537,822.50**	**739,507.50**	**853,818.33**	**792,325.00**
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}	**0.80**	**0.80**	**0.80**	**0.80**	**0.80**	**0.80**
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 Dar	Via Dar	Via Dar	Via Dar	Via Dar	Via Shinyanga

CALCULATION OF THE INDICATORS

The indicators and the calculation methodology used are described in Box 1. A detailed description of the calculations and data requirements is available in the MAFAP project website.

Box 1: MAFAP METHODOLOGY AND POLICY INDICATORS

Calculation of the policy indicators

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

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

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

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

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

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

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

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

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

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

With the data described above we obtain the price gaps summarized in Table 14, nominal rates of protection in Table 15 and Market Development Gaps in Table 16.

Table 14: MAFAP price gaps for maize in Tanzania 2005-2010 (Tzsh per Mt)

	2005	2006	2007	2008	2009	2010
Trade status for the year	m	m	m	m	m	x
Observed price gap at wholesale	266,426	409,667	333,985	315,630	372,217	(10,871)
Adjusted price gap at wholesale	282,507	428,793	354,343	337,201	414,990	(29,058)
Observed price gap at farm gate	280,498	465,852	285,201	249,138	310,546	1,142
Adjusted price gap at farm gate	264,997	435,395	252,593	194,427	254,082	(22,739)

Source: Own calculations using data as described above.

Figure 20: MAFAP price gaps for rice in Tanzania 2005-2010 (Tzsh per Mt)

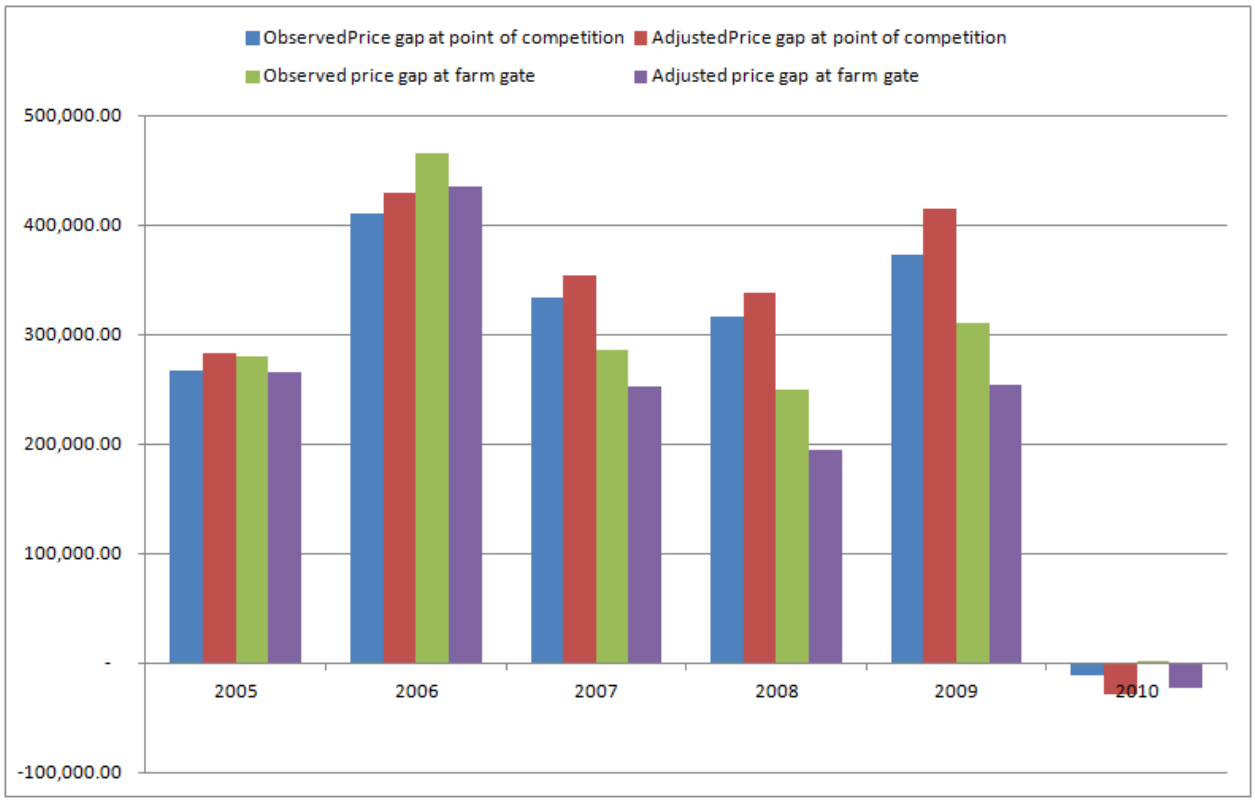


Table 15: MAFAP nominal rates of protection (NRP) for maize in Tanzania 2006-2010 (%)

	2005	2006	2007	2008	2009	2010
Trade status for the year	m	m	m	m	m	x
Observed NRP at point of competition	90.13%	125.82%	81.81%	47.16%	49.95%	-1.25%
Adjusted NRP at point of competition	101.07%	139.92%	91.35%	52.06%	59.08%	-3.27%
Observed NRP at farm gate	173.86%	268.75%	112.90%	50.81%	57.16%	0.14%
Adjusted NRP at farm gate	149.85%	213.64%	88.56%	35.67%	42.37%	-2.79%

Source: Own calculations using data as described above.

Figure 21: MAFAP nominal rates of protection for rice in Tanzania 2005-2010 (Tzsh per Mt)

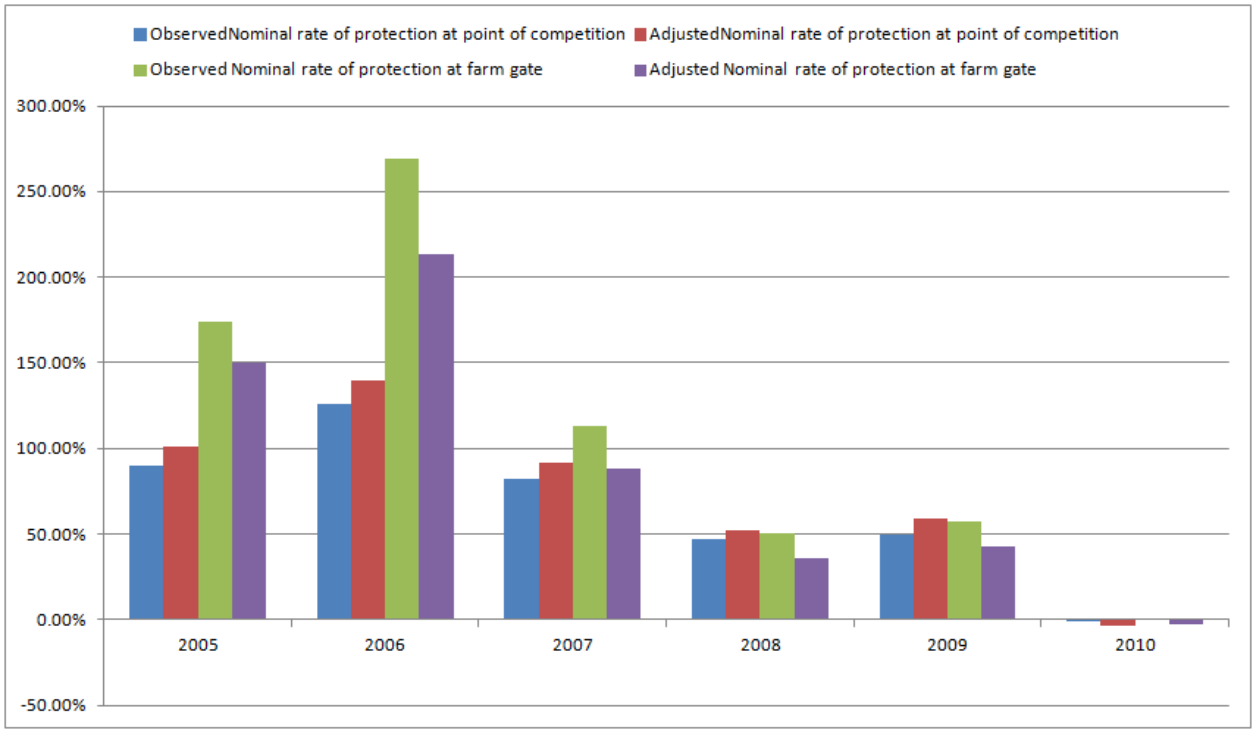


Table 16: MAFAP Market Development Gaps for maize in Tanzania 2006-2010 (Tzsh per Mt)

	2005	2006	2007	2008	2009	2010
Trade status for the year	**m**	**m**	**m**	**m**	**m**	**x**
International markets gap (IRG)	-	-	-	-	-	-
Exchange policy gap (ERPG)	-	-	-	-	-	-
Access costs gap to point of competition (ACGwh)	16,081	19,126	20,357	21,571	42,772	(18,187)
Access costs gap to farm gate (ACG_{fg})	(31,582)	(49,582)	(52,965)	(76,282)	(99,236)	(5,694)

ND: No data available for calculation

Source: Own calculations using data as described above.

4. INTERPRETATION OF INDICATORS

The United Republic of Tanzania has followed a policy of protection of rice farmers using a relatively high tariff (75 percent or 200 USD per tonne) applied to imports outside the EAC. This has translated into positive price gaps during the years when The United Republic of Tanzania is a net importer. This is coherent with the concerns of cheap imports declared by the President. However, between 2008 and 2009 the level of incentives saw a drastic reduction in 2008 and 2009 (Figure 21). However, the actual level of protection is much higher than the tariff itself showing that overall functioning of the market is leading to higher prices in The United Republic of Tanzania, even when tariffs were removed.

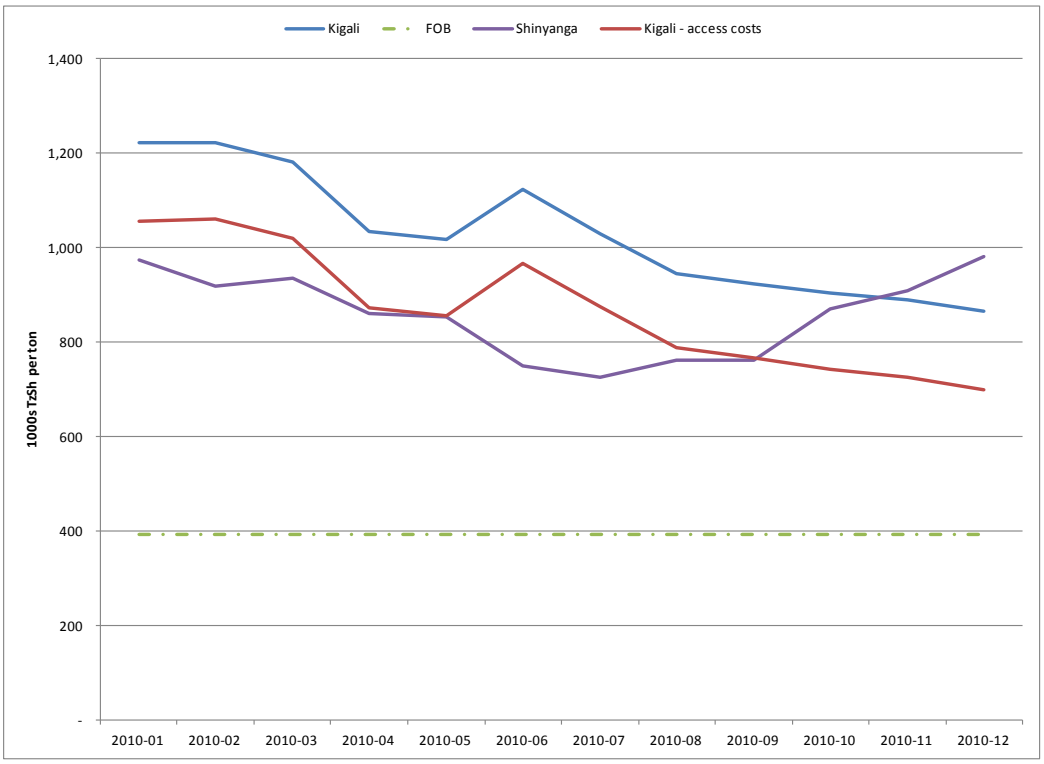
Up to 2006 most of the protection was translated also to producing areas. However as of 2007 the level of protection at farm gate level has seen a reduction, which can be due to either market power by traders (i.e. margins well above the 5 percent assumed in our calculations) or excessive costs in the value chain (increased production might have led to limited storage capacity and pressure on access costs). In addition, there is evidence that bad functioning of the value chain (too many intermediaries, high transport costs, asymmetric distribution of information, and lack of storage capacity by farmers) limits the protection to farmers and translates into disincentives.

Although the MAFAP methodology does not allow for in-depth causality analysis, this protection (together with other measures such as the input subsidy) has allowed for an increase of the overall production of rice in The United Republic of Tanzania and has led the country to become a rice exporter in the region.

Results for 2010 are a bit more difficult to interpret as there is if we take the FOB implicit unit value as benchmark price we would obtain a significant positive price gap, with domestic prices being higher than FOB quotations, even without taking into consideration the access costs, all year long (see Figure 18). To explore the plausibility of this result, we have made the analysis using wholesale prices for rice in Kigali (main destination of exports) taken from the East African Grain Council Data base as reported by GIEWS and compare them to reported FOB prices and domestic prices (Figure 22).

The figure also includes a reference price at Shinyanga based on Kigali which adds to domestic access costs an additional 5 percent for the local trader in Rwanda and the cost of transportation from the border to Kigali.

Figure 22: Comparison of alternative benchmark prices for rice in Tanzania (Tzsh per Mt)



Note: Kigali prices are in husked equivalent

Source: GIEWS (Kigali wholesale price), COMTRADE (FOB price), MIT (Shinyanga wholesale price), IMF (exchange rates) and own elaboration.

Therefore we have considered that for 2010 the general approach for benchmark price is not valid and used the wholesale price in Kigali to construct an alternative benchmark price as described above. With this new data we see that there is a slight disincentive to farmers which is most likely linked to the existence of an export ban. Moreover, we have taken very conservative estimates of margins[14] thus the disincentive could be even higher. Even when the export ban only applied to maize its effects (see Maize technical note) seem to have extended to other cereals.

[14] We have considered that there are two different traders between Shinyanga and Kigali each of them earning a 5% margin over the purchase price. If only one trader is involved in the process the NRP would be below -5%).

5. PRELIMINARY CONCLUSIONS AND RECOMMENDATIONS

MAIN MESSAGE

- import tariffs in place in The United Republic of Tanzania do result in effective price premiums for farmers. Although we have not documented the evolution of effective application of tariffs, it seems these have been reduced during the period of high food prices;
- the policy to prevent cheap imports is actually delivering the expected outcomes, however the cost for consumers is quite high;
- protection used to be higher for farmers (i.e. close to the production areas) than for wholesalers in consumption areas, however following liberalization of the rice market in 2007 this balance was changed and now protection is higher in consumption areas;
- protection to farmers could be increased, without having effects on consumer prices if market access was improved;
- in 2010 when The United Republic of Tanzania became a net exporter the existence of an export ban prevented farmers receiving higher prices.

PRELIMINARY RECOMMENDATIONS

If the change in the trade status situation for rice in The United Republic of Tanzania from net importer to net exporter becomes permanent it would be advisable to start removing the border tariffs. However, as yields in The United Republic of Tanzania remain below the region's average it is probable that without protection Tanzanian rice would not be competitive in international markets. The rice sector needs a supporting environment that lead to additional investment at farm level so as to increase yields and lower production costs. In this way domestic demand could be covered at lower prices, thus benefiting consumers and surpluses exported to neighboring countries when prices in those markets are more rewarding.

LIMITATIONS

The analysis made does not cover the final stage of the value chain, that from the mill to the farm gate, considering the transformation of paddy into husked rice. Market development gaps in that domain could be significant and prices for farmers could be increased without changing any of the parameters considered in the study.

FURTHER INVESTIGATION AND RESEARCH

Producer prices as reported by NBS should be further checked and data on milling costs obtained in order to incorporate into the analysis the incentives related to the first stage in the value chain.

6. BIBLIOGRAPHY

Asche, F.; Gjolberg, O.; Guttormsen, A. (2012). Testing the central market hypothesis: a multivariate analysis of Tanzanian sorghum markets. Agricultural Economics, 43(1): 115-123.

Ebony Consulting International (ECI) (2003). Rice Sub sector study. DAI private Enterprise Support Activities Project – USAID.

Economic and Social Research Foundation (ESRF) Survey 2: Agricultural Trade Policies Tanzania

Eskola, E. (2005). Agricultural marketing and supply chain management in Tanzania: a case study. Working Paper No 16, ESRF study on globalization and East Africa Economies. Dar es Salaam.

Kilima, F.T.M. (2006) Are price changes in the World Market Transmitted to Markets in Less Developed Countries? A Case of Sugar, Cotton, Wheat, and Rice in Tanzania.

Kibanda NJM (2008). Rice Research and Production in Tanzania. Paper Presented at the African Japanese Plenary Workshop on Sustainable Rice Production Held in Alexandria, Egypt on 23-25th August

Match Maker Associates Limited, November 2010: value chain analysis of rice and maize in selected districts in Tanzania.

Mghase,J., Shiwachi,H. Nakasone, K. and Takahashi,H. (2010). Agronomic and socio-economic constraints to high yield of upland rice in Tanzania. African Journal of Agricultural Research Vol. 5(2) pp. 150-158.

Ministry of Agriculture Food Security and Cooperatives and FAO (2008). Agricultural Sector Reforms in Tanzania. Perspectives from within. Rome, 353 pp.

Nicholas Minot, 2010: Staple food prices in Tanzania. Prepared for the COMESA policy seminar on "Variation in staple food prices: Causes, consequence, and policy options", Maputo, Mozambique, 25-26 January 2010 under the African Agricultural Marketing Project (AAMP)

Ngailo, J., Kaswamila, A., and Senkoro, C. (2007). Rice Production in the Maswa District, Tanzania and its Contribution to Poverty Alleviation. Research Report No. 07.1. REPOA.

MicroCLIR/CIBER assessment; the legal, policy, regulatory, and institutional constraints to the growth of maize and rice in Tanzania. Agenda for Action, August 2010

Mkenda, B and Campenhout, B (2011).Estimating Transaction Costs in Tanzanian Supply Chains. International Growth Center. Working Paper No 11/0898

Rural Livelihood Development Company (RLDC), November 2009: Rice Sector Strategy. Improving Rice Profitability through Increased Productivity and Better Marketing. Focusing on Tanzania's Central Corridor.

Southern Agricultural Growth Corridor of Tanzania (SAGCOT) Appendix IV: Value Chain and Market Analysis

SAGCOT (2010). Southern Agricultural Growth Corridor of Tanzania. Annex IV: Value chain and market analysis. Dar es Salaam.

Temu, A.; Manyama, A.; Temu, A. (2010). Maize trade and policy interventions in Tanzania. In Sarris and Morris (eds.) Food security in Africa. Market and trade policy for staple foods in Eastern and Southern Africa. FAO and Edward Elgar: 317-353.

ANNEX I: Methodology Used

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

ANNEX II: Data and calculations used in the analysis

	DATA		Unit	Symbol	Year trade status	2005 m	2006 m	2007 m	2008 m	2009 m	2010 x	Notes
	Benchmark Price											milled rice
1		*Observed*	USD/TON	$P_{b(int\$)}$		**274.94**	**271.32**	**338.52**	**608.86**	**597.03**	**913.79**	CIF Price
1b		*Adjusted*	USD/TON	P_{ba}								
	Exchange Rate											
2		*Observed*	TZSH/USD	ER_o		1,128.93	1,251.90	1,245.04	1,196.31	1,320.31	1,409.27	
2b		*Adjusted*	TZSH/USD	ER_a								
	Access costs border - point of competition											
3		*Observed*	TZSH?TON	ACo_{wh}		47,278.28	53,860.59	71,076.66	86,610.49	114,563.70	160,557.33	See access costs
3b		*Adjusted*	TZSH?TON	ACa_{wh}		31,196.90	34,734.46	50,718.99	65,039.06	71,791.32	142,369.87	See access costs
4	**Domestic price at point of competition**		TZSH?TON	P_{dwh}		**562,015.00**	**735,260.00**	**742,239.00**	**984,949.17**	**1,117,393.33**	**858,793.00**	husked rice in Dar
	Access costs point of competition - farm gate											
5		*Observed*	TZSH?TON	ACo_{fg}		134,249.71	152,250.12	155,632.52	178,949.31	201,903.65	78,481.57	
5b		*Adjusted*	TZSH?TON	ACa_{fg}		102,667.23	102,667.23	102,667.23	102,667.23	102,667.23	72,786.69	
6	**Farm gate price**		TZSH?TON	P_{dfg}		**441,837.50**	**639,195.00**	**537,822.50**	**739,507.50**	**853,818.33**	**792,325.00**	husked rice in Tabora
7	Externalities associated with production		TZSH?TON	E								
8	Budget and other product related transfers		TZSH?TON	BOT								From PE Analysis
	Quantity conversion factor (border - point of competition)		Fraction	QT_{wh}		0.80	0.80	0.80	0.80	0.80	0.80	milled to husked
	Quality conversion factor (border - point of competition)		Fraction	QL_{wh}								
	Quantity conversion factor (point of competition - farm gate)		Fraction	QT_{fg}								
	Quality conversion factor (point of competition - farm gate)		Fraction	QL_{fg}								

	CALCULATED PRICES		Unit	Symbol	2005	2006	2007	2008	2009	2010	Formula
	Benchmark price in local currency										
9		*Observed*	TZSH?TON	$P_{b(loc\$)}$	310,388.01	339,665.51	421,470.94	728,385.31	788,264.68	1,287,776.83	[1]*[2]
10		*Adjusted*	TZSH?TON	$P_{b(loc\$)a}$	310,388.01	339,665.51	421,470.94	728,385.31	788,264.68	1,287,776.83	[1]*[2]
	Reference Price at point of competition										
11		*Observed*	TZSH?TON	RPo_{wh}	295,588.69	325,592.99	408,253.41	669,318.74	745,175.44	869,664.13	([9]*[QTwh])+[3]
12		*Adjusted*	TZSH?TON	RPa_{wh}	279,507.31	306,466.86	387,895.74	647,747.31	702,403.07	887,851.60	([10]*[QTwh])+[3b]
	Reference Price at Farm Gate										
13		*Observed*	TZSH?TON	RPo_{fg}	161,338.97	173,342.87	252,620.89	490,369.43	543,271.79	791,182.56	[11]-[5]
14		*Adjusted*	TZSH?TON	RPa_{fg}	176,840.09	203,799.64	285,228.51	545,080.08	599,735.84	815,064.91	[12]-[5b]

	INDICATORS		Unit	Symbol	2005	2006	2007	2008	2009	2010	Formula
	Price gap at point of competition										
15		*Observed*	TZSH?TON	PGo_{wh}	266,426.31	409,667.01	333,985.59	315,630.43	372,217.89	(10,871.13)	[4]-[11]
16		*Adjusted*	TZSH?TON	PGa_{wh}	282,507.69	428,793.14	354,343.26	337,201.86	414,990.27	(29,058.60)	[4]-[12]
	Price gap at farm gate										
17		*Observed*	TZSH?TON	PGo_{fg}	280,498.53	465,852.13	285,201.61	249,138.07	310,546.54	1,142.44	[6]-[13]
18		*Adjusted*	TZSH?TON	PGa_{fg}	264,997.41	435,395.36	252,593.99	194,427.42	254,082.49	(22,739.91)	[6]-[14]
	Nominal rate of protection at point of competition										
19		*Observed*	%	$NRPo_{wh}$	90.13%	125.82%	81.81%	47.16%	49.95%	-1.25%	[15]/[11]
20		*Adjusted*	%	$NRPa_{wh}$	101.07%	139.92%	91.35%	52.06%	59.08%	-3.27%	[16]/[12]
	Nominal rate of protection at farm gate										
21		*Observed*	%	$NRPo_{fg}$	173.86%	268.75%	112.90%	50.81%	57.16%	0.14%	[17]/[13]
22		*Adjusted*	%	$NRPa_{fg}$	149.85%	213.64%	88.56%	35.67%	42.37%	-2.79%	[18]/[14]
	Nominal rate of assistance										
23		*Observed*	%	NRAo	174%	2.6874606	1.12897079	0.508062004	0.571622804	0.001443963	([17]+[8])/[13]
24		*Adjusted*	%	NRAa	149.85%	213.64%	88.56%	35.67%	42.37%	-2.79%	([18]+[8])/[14]

	Decomposition of PWAfg	Unit	Symbol	2005	2006	2007	2008	2009	2010	Formula
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_{wh}	16,081.38	19,126.13	20,357.67	21,571.43	42,772.38	(18,187.47)	[3]-[3b]
28	Access costs gap to farm gate	TZSH?TON	ACG_{fg}	(31,582.49)	(49,582.90)	(52,965.29)	(76,282.09)	(99,236.43)	(5,694.88)	[5b]-[5])
29	Externality gap	TZSH?TON	EG	-	-	-	-	-	-	-

FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS

MAFAP SPAAA

supported by the *Bill and Melinda Gates Foundation*