



# MAFAP SPAAA

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

## ANALYSIS OF INCENTIVES AND DISINCENTIVES FOR COFFEE IN THE UNITED REPUBLIC OF TANZANIA

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JANUARY 2013



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

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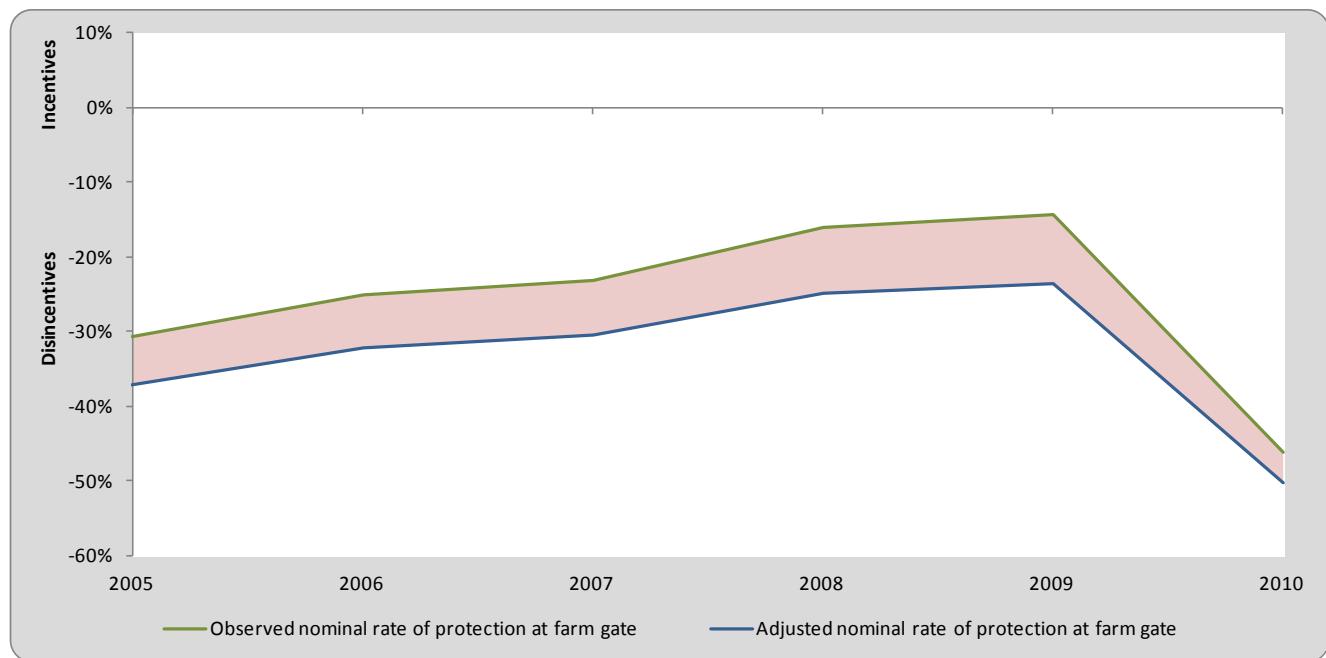
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## SUMMARY OF THE NOTE

Product: Coffee  
Period analyzed: 2005 – 2010  
Trade status: Exported in all years

- Coffee is Tanzania's second major export commodity after Tobacco accounting for 14 percent of agricultural exports and 4 percent of total exports;
- Production is more or less constant around 40 000 tonnes with some exceptional harvests. Close to 100 percent of production is exported, mainly to the European Union;
- Marketing of coffee exports is marketed in a centralized auction in Moshi (Northern Tanzania).



The observed Nominal Rate of Protection (NRP) (green line) indicates that farmers have been taxed in coffee production and thus do not get the full price they would in absence of policy or functioning markets. The adjusted NRP (blue line) captures the additional effect of district cess on farmers. The area in red shows the additional disincentive that local taxation represents for producer. Farmers are more penalized by the functioning of the export value chain and export administrative costs than by the local taxation.

The Government of the United Republic of Tanzania should increase the monitoring of farm gate prices and auction level prices in order to better understand how these relate and how the magnitude of the disincentives is shared between farmers and exporters.

## CONTENTS

|  |    |
|--|----|
| .....  | 2  |
| SUMMARY OF THE NOTE.....   | 3  |
| CONTENTS .....   | 4  |
| 1. PURPOSE OF THE NOTE .....   | 5  |
| 2. POLICY CONTEXT .....  | 2  |
| PRODUCTION.....  | 2  |
| CONSUMPTION/UTILIZATION .....  | 5  |
| MARKETING AND TRADE .....  | 7  |
| DESCRIPTION OF THE VALUE CHAIN AND PROCESSING.....                   | 9  |
| POLICY DECISIONS AND MEASURES .....                                  | 12 |
| 3. DATA REQUIREMENTS, DESCRIPTION AND CALCULATION OF INDICATORS..... | 2  |
| TRADE STATUS OF THE PRODUCTS .....                                   | 2  |
| BENCHMARK PRICES.....  | 2  |
| DOMESTIC PRICES .....  | 2  |
| EXCHANGE RATES.....  | 5  |
| MARKET ACCESS COSTS.....   | 5  |
| EXTERNALITIES .....  | 7  |
| BUDGET AND OTHER TRANSFERS .....                                     | 7  |
| QUALITY AND QUANTITY ADJUSTMENTS.....                                | 7  |
| CALCULATION OF INDICATORS.....                                       | 10 |
| 4. INTERPRETATION OF THE INDICATORS .....                            | 13 |
| 5. PRELIMINARY CONCLUSIONS AND RECOMMENDATIONS .....                 | 14 |
| MAIN MESSAGE .....   | 14 |
| PRELIMINARY RECOMMENDATIONS.....                                     | 14 |
| LIMITATIONS .....  | 14 |
| FURTHER INVESTIGATION AND RESEARCH .....                             | 15 |
| BIBLIOGRAPHY.....  | 16 |
| ANNEX I: List of acronyms .....                                      | 17 |
| ANNEX II: Methodology Used.....                                      | 18 |
| ANNEX III: Data and calculations used in the analysis .....          | 19 |

## **1. PURPOSE OF THE NOTE**

This technical note aims to describe the market incentives and disincentives for coffee 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 farm gate and wholesale level. In relative terms, the price gaps are expressed as Nominal Rates of Protection. These key indicators are used by MAFAP to highlight the effects of policy and market development gaps on prices.

The note starts with a brief review of the 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 Part 3.

The results 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. POLICY CONTEXT**

Coffee is the second leading agricultural export commodity in The United Republic of Tanzania after tobacco, accounting for 14 percent of agricultural exports during the period 2004-2009 (FAOSTAT) and 4 percent of total exports during the period 2004-2011 (COMTRADE). Over 90 percent of coffee is produced by smallholder farmers. The coffee industry provides direct income to more than 80 000 households and livelihoods for more than 2.5 million Tanzanians (URT-Coffee Board and TACRI, 2010).

However, low world prices since the early 1990s have forced many local producers to substitute coffee with maize or rice as a source of household income, thus leading to the stagnation of local coffee production. Having witnessed the state of the coffee industry in the country, the government in collaboration with the private sector, have implemented various measures for revamping the sector since the early 2000s.

As part of the Agricultural Sector Development Programme (ASDP), the government launched the Coffee Industry Development Strategy, 2011-2016, which aims to increase coffee production from 50 000 tonnes to 80 000 tonnes and improve the quality of output by increasing the share of premium coffee production from 35 percent to 70 percent of total production by 2016.

## **PRODUCTION**

The United Republic of Tanzania is rich in abundant, arable land suitable for producing high quality Arabica and Robusta coffee. The country's three main coffee producing areas include the Northern Highlands (in the Kilimanjaro and Arusha Regions), the Southern Highlands (in the Mbeya, Ruvuma and Ludewa Regions), and the Western Lake Zone (in the Kagera Region)<sup>1</sup>. Other important coffee producing areas include the Tanga, Iringa, Manyara, Morogoro, Kigoma, Mwanza, Rukwa and Mara Regions.

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<sup>1</sup> High Value Agriculture Study: African Coffee Industry and Japan's Trade and Aid –Supporting the Tanzanian and Ethiopian Coffee Industries and their Export Promotion.

**Figure 1: Major Coffee Producing Regions**



Source: Tanzania Coffee Association

In recent years, coffee production in south Tanzania has been increasing, but production in the north, where higher quality coffee is typically grown, has been decreasing. At the same time, cooperatives have been struggling to sell high-end, premium coffee as a result of multinational companies' presence in Tanzania's coffee auction. These companies use the "buy-back system"<sup>2</sup> approach, whereby they purchase coffee beans directly from local farmers, process them and put them up for auction and then buy their own coffee in the auction at low prices.

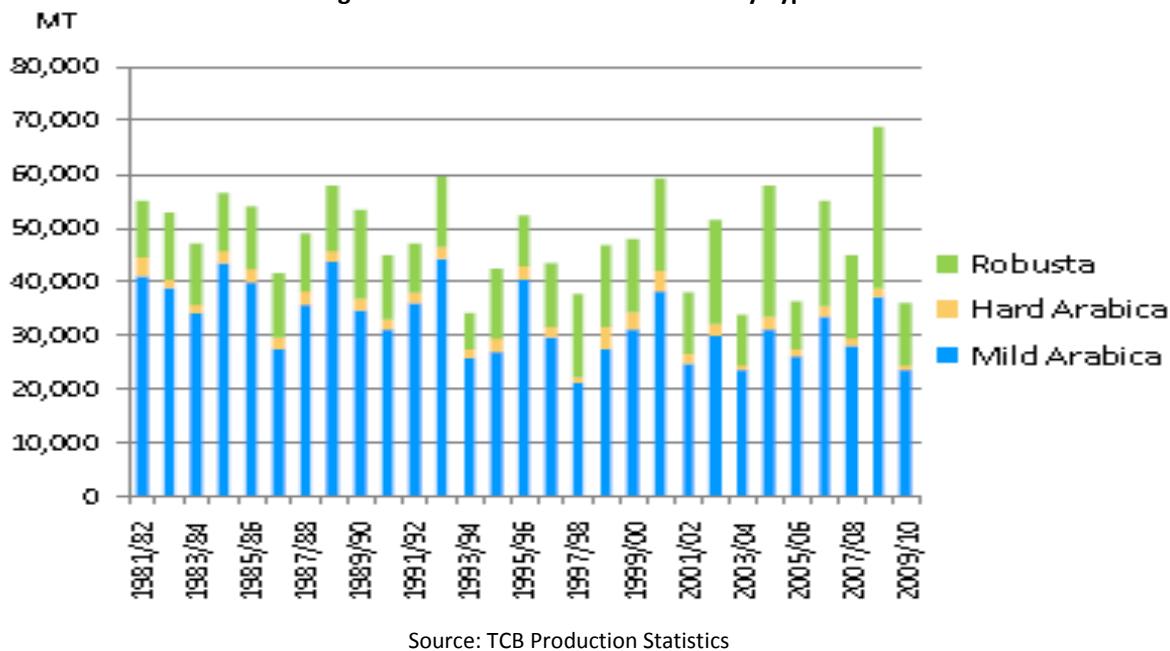
They do this through several subsidiary companies that they establish with different licenses, despite the "one-license" regulation implemented by the Government of The United Republic of Tanzania. In this way, they are able to suppress auction prices and benefit from higher export prices, covering eventual losses and limiting the capacity of cooperatives to receive premium prices at auction.

Figure 2 shows coffee production by type from 1981/1982 to 2009/2010. Despite fluctuations in production, Mild Arabica leads other types of coffee produced in The United Republic of Tanzania, followed by Robusta. Robusta production peaked in 2008/2009 after several reforms in the subsector, including the improvement in Robusta varieties. Hard Arabica and Mild Arabica have been fluctuating significantly, with modest increases, but not enough to surpass 1992/1993 and 1988/1989 levels.

Coffee production in The United Republic of Tanzania is extremely price elastic. Therefore, market prices are one of the major factors causing fluctuations in production. In 2008/09, the volume of coffee produced increased to nearly 70 000 tonnes in response to the spike in international prices that occurred during the food price crisis. However, coffee production decreased to just 36 000 tonnes in the following year, possibly due to the fact that coffee trees are biennial bearing, yielding a heavy crop in one year and a light crop the next year.

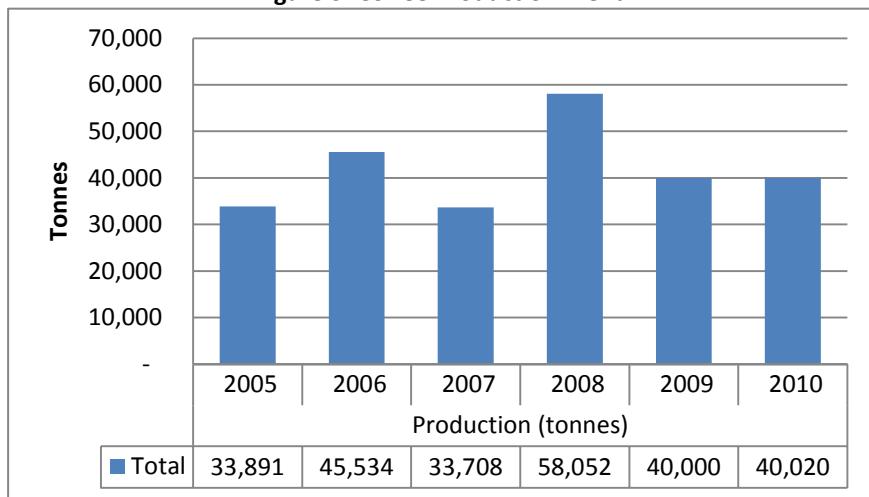
<sup>2</sup> Ibid.

**Figure 2: Tanzania Coffee Production by Type**



As shown in Figure 3, FAOSTAT trade statistics also depict the same coffee production trend in The United Republic of Tanzania, showing a steep decrease in production in 2009 after a dramatic increase in 2008.

**Figure 3: Coffee Production Trend**



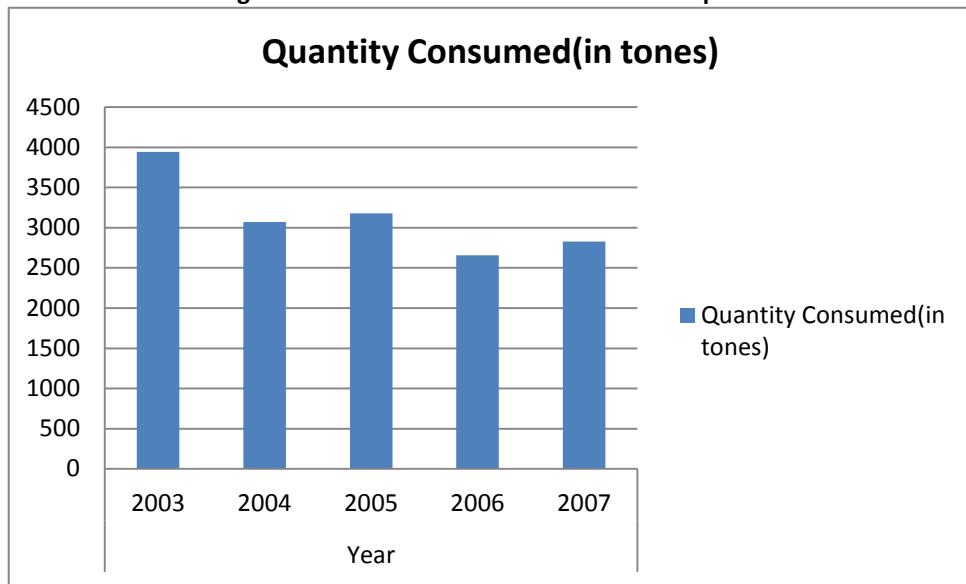
The coffee industry in The United Republic of Tanzania suffers from several factors, including a lack of access to irrigation systems, a large number of older coffee trees and highly volatile coffee prices, which causes dramatic fluctuations in production. It also suffers from poor agricultural practices adopted by many smallholder producers, limited access to credit, a lack of adequate farming inputs and low use of inputs by producers. However, despite these major constraints, Tanzania coffee

production is expected to increase as a result of recent market conditions and the introduction of pest and disease resistant coffee varieties<sup>3</sup>.

## CONSUMPTION/UTILIZATION

The annual per capita coffee consumption in the country is 0.06 kg, and only 4.2 percent of the country's total coffee production is consumed domestically. FAOSTAT statistical data also reveals that since 2003, the total quantity of coffee consumed by the domestic market has been gradually declining (see Figure 4). This may be due to a weak coffee drinking culture within the Tanzanian society. Thus, encouraging and promoting domestic coffee consumption could be a strategy to increase the bargaining power of local producers. The domestic market could serve as an alternative to the export market, especially since there have been many complaints from producers that the low prices for coffee exports do not even cover the cost of production. Once the domestic market for coffee is expanded, farmers would be able to sell coffee to local consumers at reasonable prices.

Figure 4: Tanzania Domestic Coffee Consumption

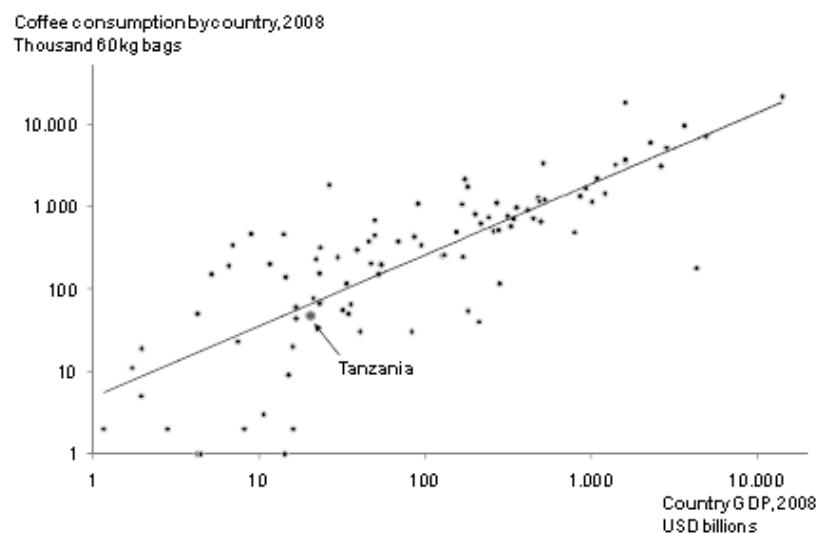


Source: FAOSTAT Website and Author's computation

Tanzania's Coffee Industry Development Strategy, 2011-2016 does not explicitly state how domestic consumption of coffee could be expanded. Instead, it assumes that increases in coffee consumption are proportionate to increases in GDP. Therefore, it implies that no effort needs to be put towards increasing domestic coffee consumption, as it will gradually increase along with the nation's GDP (Figure 5 illustrates this direct, positive relationship).

Figure 5: Relation between GDP and Coffee Consumption (2008)

<sup>3</sup> TaCRI,2010.



Source: TCB and TaCRI 2010 "Tanzania Coffee Industry Development Strategy 2011-2016"

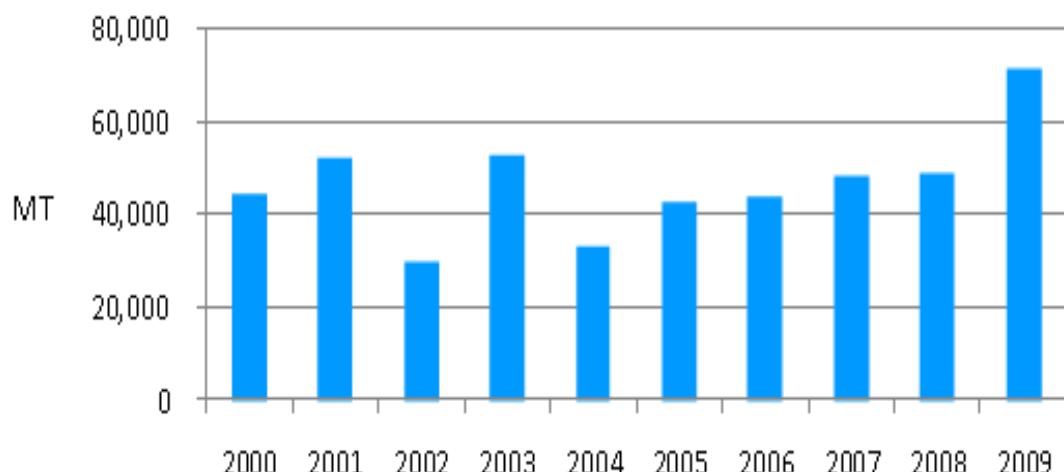
## MARKETING AND TRADE

Until the late 1980s, coffee production and marketing in The United Republic of Tanzania was integrated in a single marketing channel through the cooperative system and associated crop boards. After liberalization of the coffee subsector in the early 1990s, growers no longer needed to market their product via cooperatives and could choose between four marketing channels – Private Coffee Buyers, the Cooperative System, Independent Primary Societies<sup>4</sup> and Farmer Groups. This rapid transformation resulted from the collapse of several cooperatives, which created a vacuum in the in Tanzania's coffee marking system.

The bill that opened coffee marketing and production to the private sector limited the responsibilities of Tanzania's Coffee Board to coffee grading, issuing licenses and permits and operating coffee auctions. In 2002/03, the Tanzania Coffee Association introduced the "one license regulation" to increase competition of cured coffee at auction. This meant that a company or cooperative could either be a buyer, a processor or an exporter, but not any combination of the three. The objective of the regulation was to prevent agents from using the "buy-back system" as a means to restrict competition and suppress prices.

Figure 6 shows coffee exports were highest in 2009 due to the huge bumper crop produced in 2008 (see Figure 2). During the rest of the period, exports remained stable around 40 000 tonnes, representing most of domestic production.

**Figure 6: Volume of Coffee Exports in Tanzania, 2000-2009**



Source: ITC, 2010

Table 1 summarizes the available data on production and trade in coffee obtained from FAOSTAT and UN COMTRADE. Irrespective of the source, data clearly depicts that The United Republic of Tanzania is a net exporter of coffee. In some years the amount exported was higher than the amount actually produced. However, this is due to the quantity of coffee stocked in the previous year.

<sup>4</sup> These are farmers' organizations formed with intentions of bargaining on behalf of farmers and earn higher returns through avoidance of intermediaries faced in crop marketing.

Table 1 also shows that the quantity imported is minimal compared to the quantity exported, which is consistent with the low consumption levels described above.

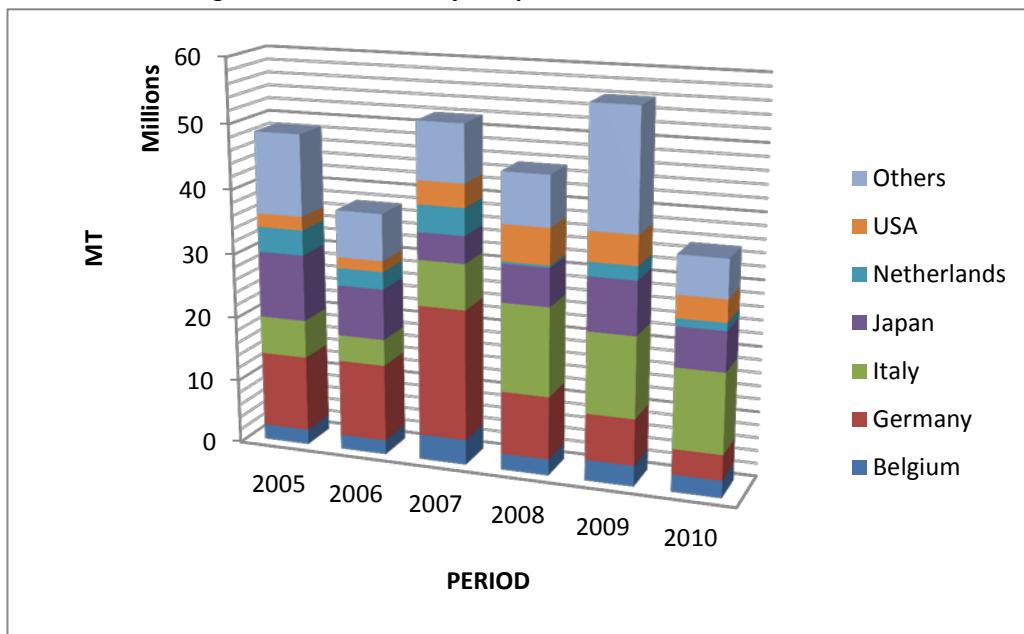
**Table 1: Coffee Commodity Production and Trade 2005-2010**

| <b>FAOSTAT</b>           |           | <b>2005</b> | <b>2006</b> | <b>2007</b> | <b>2008</b> | <b>2009</b> |
|--------------------------|-----------|-------------|-------------|-------------|-------------|-------------|
| <b>Production</b>        | <b>Qt</b> | 33,891      | 45,534      | 33,708      | 58,052      | 40,000      |
| <b>Export Qt (tonne)</b> |           | 47,982      | 39,030      | 53,530      | 47,406      | 58,143      |
| <b>Import Qt (tonne)</b> |           | 115         | 134         | 196         | 134         | 259         |
| <b>UN COMTRADE</b>       |           | <b>2005</b> | <b>2006</b> | <b>2007</b> | <b>2008</b> | <b>2009</b> |
| <b>Export Qt (tonne)</b> |           | 48,642      | 37,569      | 51,914      | 45,356      | 56,025      |
| <b>Import Qt (tonne)</b> |           | 65          | 31          | 96          | 24          | 54          |

Source: FAOSTAT and UN COMTRADE databases

Figure 7 presents Tanzania's major export partners for coffee in 2010. As shown, Europe is the main destination for the country's coffee exports. However, Japan and the USA are also major coffee export destinations, signifying both the breadth and diversity of Tanzania's coffee market in world trade.

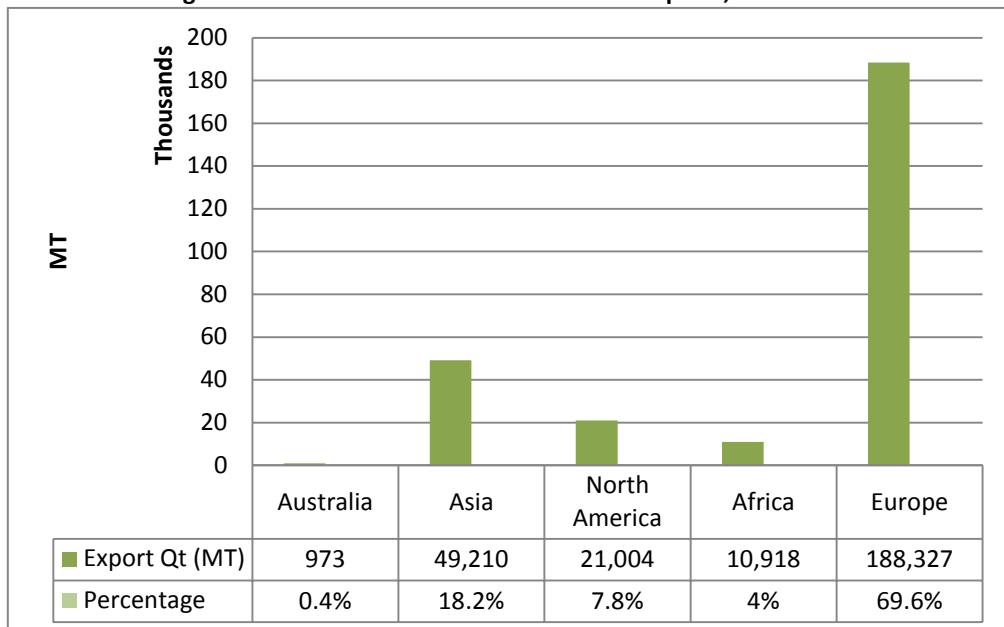
**Figure 7: Tanzania's Major Export Partners for Coffee, 2010**



Source: UN COMTRADE, 2010

Figure 8 provides a much broader spectrum of Tanzania's coffee export destinations from 2005 to 2010. As shown, Europe accounted for about 70 percent of the country's total coffee exports during this period. Of this 70 percent, Germany was the leading buyer (34.2 percent), followed by Italy (29.4 percent), Belgium (8.8 percent) and the Netherlands (7.6 percent). Figure 8 also shows that Asia (18.2 percent) was the second major destination, with Japan accounting for 78.2 percent of all coffee exported to Asia. North America, which refers to the USA in this case (since the USA was the sole buyer), accounted for 7.8 percent of Tanzania's coffee exports, followed by Africa and Australia, which accounted for 4 and .4 percent of all exports, respectively.

**Figure 8: Destinations of Tanzania's Coffee Exports, 2005-2010**

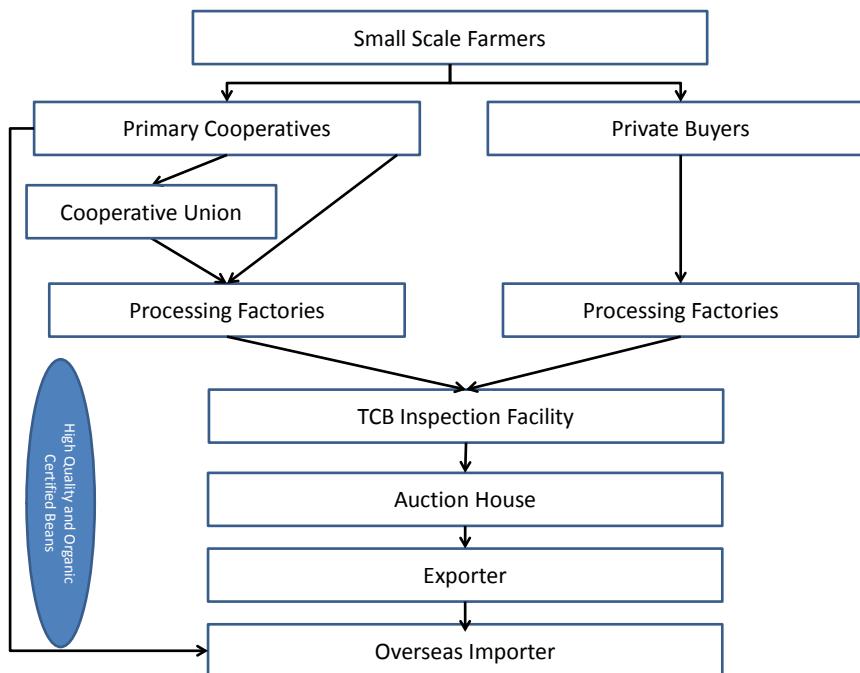


Source: UN COMTRADE database and Author's own calculation

## DESCRIPTION OF THE VALUE CHAIN AND PROCESSING

Figure 9 illustrates the marketing and distribution chain for coffee in The United Republic of Tanzania. The first stage of primary processing is carried out by the producers at the farm level. This involves handpicking red cherries and pulping on the same day, washing, fermenting, drying and packaging. Before selling, farmers need to grade their coffee according to the established grades by Tanzania Coffee Board (TCB), which is done on the farm after pulping.

**Figure 9: A Simplified Marketing and Distribution Chain for Coffee in Tanzania**

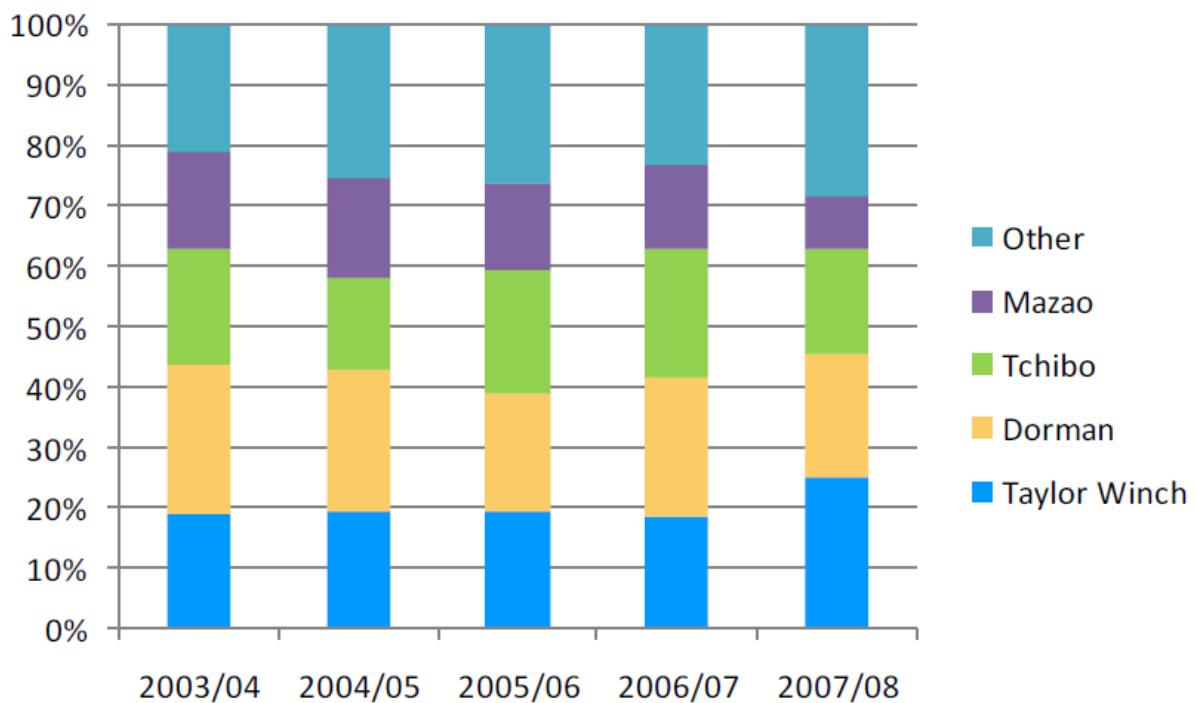


Source: PROMAR (2011).

After primary processing is complete, farmers transport their produce, either through private buyers or through primary cooperatives, to curing factories for secondary processing. These curing factories are operated and managed by cooperatives or by few private estate mills. As soon as the coffee enters this stage, the crop falls under the ownership of the society in charge of curing the coffee or the grower paying for the commercial mills. It is at this stage that the coffee is sampled, tested by inquirers and blended with other coffee based on the instructions from TCB.

After quality assessment, samples are transported to the Moshi coffee auction, located in the Kilimanjaro Region in Northern Tanzania. Following the auction, the coffee is transported from regional warehouses to the port in Dar es Salaam for export. Purchases at the Moshi coffee auction are concentrated in four main purchasers which account for over 70 percent of total volume (Figure 10).

**Figure 10: A Simplified Marketing and Distribution Chain for Coffee in Tanzania**



Source: PROMAR (2011)

In cases where coffee is allowed to be exported directly by the TCB after checking whether it meets the criteria for direct exports<sup>5</sup>, coffee does not need to go through the Moshi auction.

Producer organizations that offer high quality or certified organic coffee (no less than Grade C) and meet the requirements established under the 2003 coffee regulations are eligible for direct export. However, if these requirements are not met, the producer organization is required to go through the auction where grading is done, and the coffee is sold in accordance with its grade. Table 2 shows the quantity of coffee sold through the auction system and the direct exports system.

**Table 2: Volume of Coffee Sold through Auction and Direct Exports, 2005-2010 (tonne)**

|                | 2005   | 2006   | 2007   | 2008   | 2009   | 2010   |
|----------------|--------|--------|--------|--------|--------|--------|
| AUCTION SALES  | 53,682 | 33,000 | 51,303 | 33,852 | 51,067 | 23,552 |
| DIRECT EXPORTS | 2,904  | 2,727  | 3,534  | 9,671  | 17,509 | 11,055 |

Source: TCB

<sup>5</sup> <http://www.tacri.org/home/coffee-in-tanzania/current-coffee-market-price> accessed on 22nd February, 2012.

## POLICY DECISIONS AND MEASURES

### ***General Agricultural Policies***

In 2001, through the Agricultural Sector Development Strategy (ASDS), Tanzania's agricultural policy was established. This led to the 2003 Agricultural Sector Development Program (ASDP), which aims to provide guidance for the implementation of the country's agricultural development plans. This was a 7-year program with a total budget of USD 250 million. The government provided 76 percent of the funding for the program, while 12 percent came from the basket fund and another 12 percent came from revenue generated through fees charged to farmers on specific programs.

To improve the agricultural sector, the government reintroduced fertilizer subsidies in 2003/04, which were targeted toward grain producers in the Southern Highlands. Two billion of Tanzanian shillings (TZS) was set aside to meet part of the transport costs for distributing 33 277 tonnes of fertilizer to maize and rice producers in this region. Subsidies provided to producers increased from 2005/06 to 2009/10 and expanded to cover additional crops, such as coffee, cashew nut, cotton, sorghum, sunflower and tea. The main inputs supplied under this program include agrochemicals, inorganic fertilizers, improved seeds and improved seedlings. This subsidy scheme was conducted through the contract and voucher systems. The contract system covered all 21 regions in The United Republic of Tanzania and was implemented from 2005/06 to 2007/08, while the voucher system covered only 11 regions and was implemented from 2008/09 to 2009/10.

In 2009, another agricultural policy known as KILIMO KWANZA was established with the aim of transforming agriculture in The United Republic of Tanzania to modern and commercial agriculture. However, there are many areas where this policy overlaps with ASDP, which may result in duplicated efforts.

It is believed that under this policy framework, The United Republic of Tanzania will be able to improve its agricultural sector through technical development, which will result in increased production, processing and exportation of agricultural produce. This would be achieved through active participation of the private sector in agricultural investments and proper coordination among all stakeholders involved in agriculture.

### ***Policies and Measures Specific to the Coffee Sub-sector***

According to Ponte (2004) in 1994 there was shift from 1994 from coffee trade control of co-operatives and/or marketing boards. The monopolistic system in the domestic trade ensured that coffee remained in 'local' (mostly African Tanzanian) hands up to the auction. At the export level, smaller (mostly Asian-owned) Tanzanian export companies were able to compete with Kenya-based exporters and the subsidiaries of multinational corporations. The adoption of the 1993 Crop Boards Act marked a profound change in the regulatory framework of Tanzanian coffee marketing. In the 1994/95 season, domestic trade was opened up to private traders and processors. However, the Tanzania Coffee Board (TCB) retained numerous regulatory powers, and maintains licensing powers and the function of running the coffee auction, allowing domestic traders to buy coffee only at authorized buying posts. It does not permit farm-gate buying, although the rule is not observed in some areas of the country. Finally, the TCB does not allow the movement of coffee from one area (southern, northern, western) to another. Liberalization of the coffee market in Tanzania has yielded

mixed results. On the one hand, farmers are paid cash on delivery and receive a higher proportion of the export price than in the pre-liberalization period. On the other hand, input-credit schemes have collapsed, the volume of coffee exports has not improved, and there are strong indications that coffee quality has decreased because farmers are paid one price for all coffee irrespective of quality. Most importantly, liberalization saw the dramatic capturing of the Tanzanian coffee market by foreign companies at all levels (domestic trade, processing and export) except for farming where 95 percent of coffee is still produced by smallholders.

However, despite of the market liberalization process which started in 1994, the degree of liberalization is still questionable as all coffee from either private buyers or any entity, must be sold through Moshi Auction run by TCB or through a direct export contract that also needs to be approved by TCB. In addition, different licensing requirements apply almost at each level of value chain.

Private buyers to operate need to select their locations well in advance and send application to the District Executive Director to have it endorsed by the local committee. After completion of this process, TCB issues a one year buying license to the buyer, that is valid for the following year. In addition to this, there are other several licenses that coffee buyers need apply on an annual basis to get engaged in other coffee trade aspects such as:

- i. processing license for dry hulling of Robusta coffee;
- ii. central pulping license for wet processing of Arabica coffee;
- iii. coffee warehousing license for storing coffee;
- iv. green coffee exporter's license needed for coffee trading;
- v. instant coffee export license; and
- vi. roasted bean and ground coffee export license.

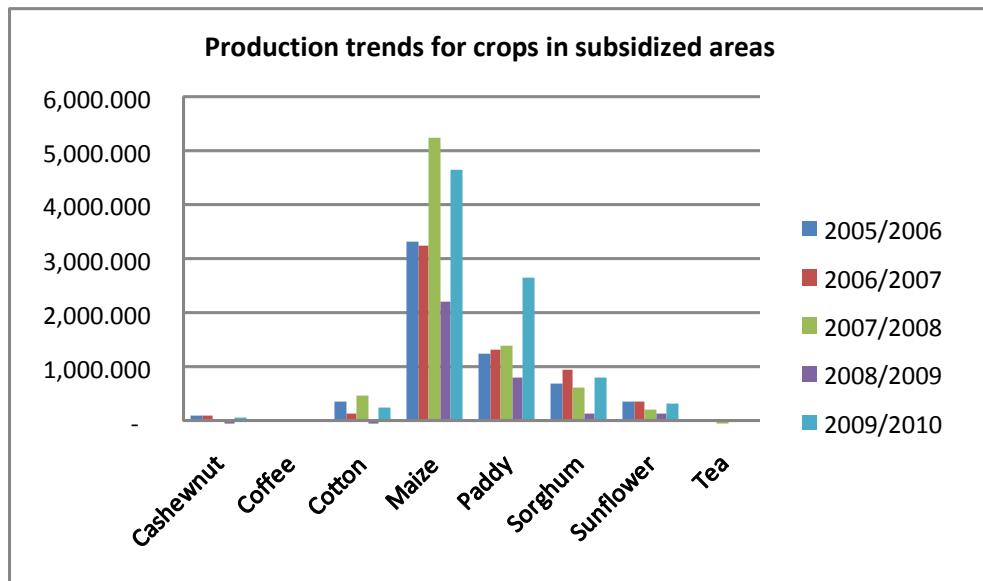
After a decade of lack of any major action to promote the coffee industry, the government established the 2011-2016 Tanzania Coffee Industry Development Strategy (TCIDS), which supports the ASDS, ASDP and KILIMO KWANZA strategies. This TCIDS focuses on five key points – (1) increasing production, (2) improving quality, (3) improving the business environment, (4) increasing farmer incomes and price premiums and (5) increasing value addition throughout the coffee value chain.

Two innovative financing mechanisms have been made available to Tanzanian coffee producers in recent years. These include KILICAFE's financial linkage and the Warehouse Receipt System (WRS). Under the WRS system, the bank advances an agreed maximum amount of funds to the cooperative societies (PCS) based upon the estimates approved during their annual general meeting. After approval, the bank provides cash to them within the approved ceiling as soon as they submit coffee parchment to the curing mill and submit receipts to the bank (Mmari, 2012).

KILICAFE's financial linkage was well facilitated by Techno Serve, which not only provided technical assistance to KILICAFE, but also provided them with direct links to credit sources. Through such assistance, in 2007, KILICAFE was able to obtain a TZS 197.9 million interest-free loan and a TZS 121.9 million grant from the United States-based African Development Fund for a project to expand specialty coffee in The United Republic of Tanzania.

In addition to these financial initiatives, the government has been providing subsidies on agricultural inputs to the coffee sub-sector since 2004. However, the impact of these subsidies has been minimal when compared to other subsidized crops, such as maize, paddy and sorghum. This raises questions about the efficiency and effectiveness of subsidies in the coffee sub-sector (see **Error! Reference source not found.1**).

**Figure 11: Production trends for crops in subsidized areas, 2005-2010**



Source: MAFC, 2010

### 3. DATA REQUIREMENTS, DESCRIPTION AND CALCULATION OF INDICATORS

#### TRADE STATUS OF THE PRODUCTS

The United Republic of Tanzania is a net exporter of coffee. Table 3 shows the trade balance for “*coffee not roasted, not decaffeinated*” [HS6 code 090111], which is the main coffee commodity traded in The United Republic of Tanzania.

**Table 3: Trade Status (X-M) for Coffee 2005-2010**

| X-M (MT) | 2005   | 2006   | 2007   | 2008   | 2009   | 2010   | Average export surplus |
|----------|--------|--------|--------|--------|--------|--------|------------------------|
| Coffee   | 48,577 | 37,539 | 51,818 | 45,332 | 55,971 | 35,562 | 45,800                 |

Source: UN COMTRADE and Author's calculations

#### BENCHMARK PRICES

Since The United Republic of Tanzania was a net exporter of coffee in all years under review, a unit value FOB price was taken as the benchmark price in this analysis. Unit value FOB prices for “*coffee not roasted, not decaffeinated*” [HS6 code 090111] were calculated using export value and quantity data obtained from UN Comtrade. Table 4 presents this data as well as the unit value benchmark prices used.

No adjustments were made to benchmark prices, since Tanzanian buyers do not have excessive market power that distorts prices. Therefore, the price received by exporters is considered to be a reflection of reasonably functioning international markets.

**Table 4: Implicit FOB unit values (USD/tonne) for exports of Tanzanian coffee to the world 2005-2010**

|                         | 2005       | 2006       | 2007        | 2008       | 2009       | 2010        |
|-------------------------|------------|------------|-------------|------------|------------|-------------|
| Export Quantity (tonne) | 48,641     | 37,559     | 51,886      | 45,331     | 56,022     | 35,359      |
| Export value (USD)      | 79,263,225 | 73,916,695 | 113,023,136 | 99,674,981 | 111,232,89 | 102,293,659 |
| Unit value (USD/TONNE)  | 1,629      | 1,968      | 2,178       | 2,198      | 1,985      | 2,892       |

Source: UN COMTRADE

#### DOMESTIC PRICES

Two domestic prices were required – the price at the point of competition (wholesale) and the price at the farm gate. Prices in The United Republic of Tanzania are reported for clean coffee at both points. The **point of competition** is assumed to be the coffee auction in Moshi and the border for direct exports (see section on value chain). Thus, an average between the price for direct exports at the border and the auction price in Moshi was taken as the price at the point of competition.

Price data was obtained from Tanzania Coffee Board which provides separate prices for auctioned coffee and direct exports, as well as average prices between auctioned coffee and direct exports. Table 5 shows the different prices available for coffee at the point of competition. Price are provided irrespective of coffee variety.

**Table 5: Coffee Wholesale (auction) Prices, 2005- 2010**

| TCB                            | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 |
|--------------------------------|------|------|------|------|------|------|
| <b>AUCTION SALES (USD/MT)</b>  | 1225 | 1784 | 1811 | 2240 | 1913 | 2695 |
| <b>DIRECT EXPORTS (USD/MT)</b> | 2482 | 2646 | 2674 | 2341 | 2091 | 2132 |
| <b>AVERAGE PRICES (USD/MT)</b> | 1289 | 1850 | 1866 | 2262 | 1959 | 2515 |

Source: TCB

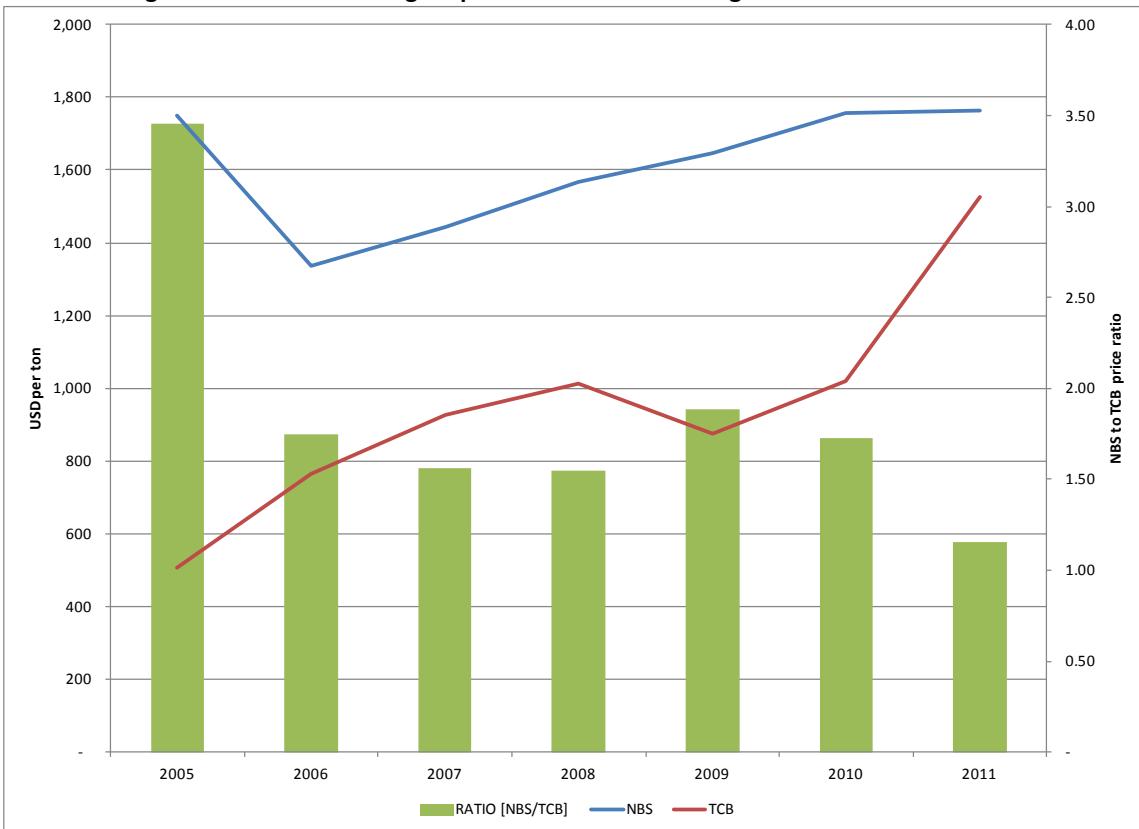
Farm gate prices were obtained from TCB as national averages for Arabica and Robusta coffee. Farm gate prices were also obtained from NBS which provide data independent of coffee type. Prices from both sources are presented in Table 6 below. Based on the relative sales according to volume of each coffee variety reported by the TCB we have calculated the weighted average of farm gate prices using sales volumes as reported by TCB. Data for farm gate prices varies significantly between sources (see Figure 12).

**Table 6: Coffee Farm gate Prices 2005-2010**

| TCB                                     | 2005  | 2006  | 2007  | 2008  | 2009  | 2010  |
|---|-------|-------|-------|-------|-------|-------|
| <b>TCB [ARABICA PARCHMENT] (USD/MT)</b> | 797   | 959   | 1 205 | 1 254 | 1 137 | 1 277 |
| <b>TCB [ROBUSTA] (USD/MT)</b>           | 124   | 216   | 402   | 585   | 531   | 497   |
| <b>TCB [WEIGHTED AVERAGE] (USD/MT)</b>  | 507   | 766   | 925   | 1 014 | 874   | 1 019 |
| <b>NBS [ALL VARIETIES] (USD/MT)</b>     | 1 750 | 1 335 | 1 449 | 1 567 | 1 645 | 1 728 |

Source: National Bureau of Statistics (NBS) and Tanzania Coffee Board (TCB)

**Figure 12: Tanzania farm gate price for coffee according to different data sources**

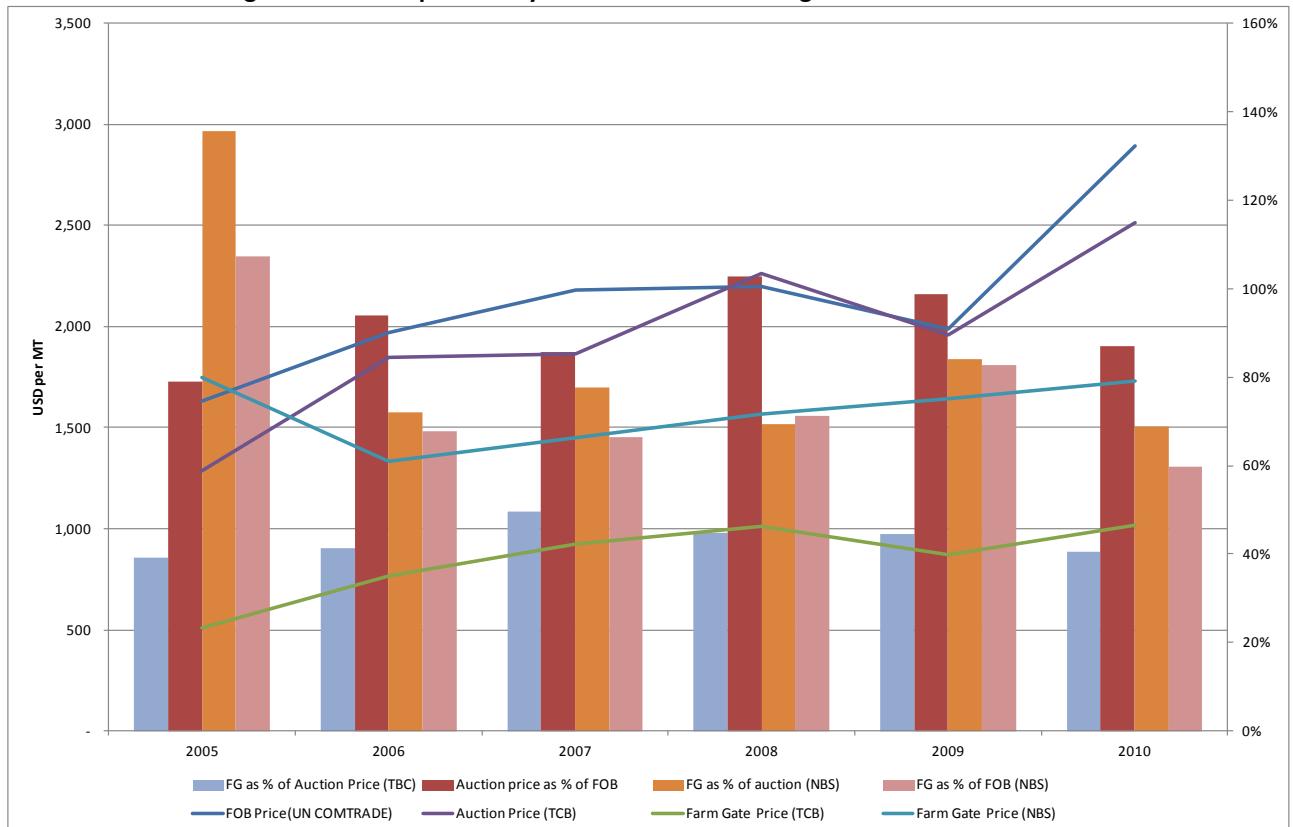


Source: National Bureau of Statistics (NBS) and Tanzania Coffee Board (TCB) and own calculations

Decisions about which data sources to use for farm gate prices were based on the analysis of the relationships between farm gate, auction and FOB prices. As depicted in Figure 13, using TCB data for wholesale prices are slightly lower than FOB prices (wholesale prices represent 91 percent of FOB price). Contrary to intuition TCB prices in 2008 are higher than FOB prices and there is a high variability of the percentage of the FOB price represented by the wholesale which in principle cannot be explained by the access costs (see below).

The reason for selecting TCB data as the source for farm gate prices was based on the relationship between auction prices and farm gate prices. When using NBS as a source for farm gate prices, they represent a very high percentage of the auction price (85 percent on average and even above 100 percent in 2005) and show high variability, which is contrary to the access cost data (see below). The ratio of the wholesale price represented by the farm gate price when using TCB data is much more stable and, on average, much lower (40 percent). Therefore, we discarded the NBS data for farm gate prices and used TCB data instead.

**Figure 13: Coffee price analysis in Tanzania according to data sources**



Source: National Bureau of Statistics (NBS) and Tanzania Coffee Board (TCB) and own calculations

## EXCHANGE RATES

All data for this analysis was available in USD, so there was no need to use exchange rates. For future aggregation purposes, data in USD will be converted to the local currency using average annual exchange rates obtained from the IMF database and summarized in Table 7:

**Table 7: Exchange rate Trend in Tanzania 2005-2010**

|  | 2005     | 2006     | 2007     | 2008     | 2009     | 2010     |
|--|----------|----------|----------|----------|----------|----------|
| Exchange rate (yearly average of monthly data) | 1,128.90 | 1,251.90 | 1,244.99 | 1,195.75 | 1,318.71 | 1,409.27 |

Source: IMF

## MARKET ACCESS COSTS

As our farm gate price is a national average, this study assumes the flow of coffee from production areas in Northern parts of the United Republic of Tanzania (Kilimanjaro and Arusha) as well as Southern parts (Ruvuma and Mbeya) to regional export warehouses, from which coffee samples are taken to auction in Moshi.

As explained in value chain section of the policy context, all export sales of coffee go either through the TCB managed auction in Moshi or through direct export contract approved by the TCB (Keyser et al, 2010). For sales to take place in the auction system, sellers are supposed to send their samples to Moshi at least one week before the auction, which takes place on a weekly basis.

Once auction sales are concluded, export buyers pay for the transport costs from the regional warehouses, where the coffee is kept waiting for auctioning in Moshi, to Dar es Salaam for export. The price paid to TCB at the auction covers the whole procedural movement from farmers to secondary processing units and from secondary processing units to coffee companies/cooperative unions. It also covers the transport of samples to the auction from regional warehouses. Once all these transaction costs are deducted, the remainder (the farm gate price) is given to the producer. In addition, the exporter is required to pay 5 percent of farm gate prices as a district cess.

**Observed access costs** Data for 2009 (PROMAR, 2011) shows that total costs of marketing coffee from the farm gate to the port of Dar es Salaam stood at 1 078 TZS per kg. Compared to the auction price of 2009 this means approximately 41 percent of the auction price. Two other sources report market access data for the same year. A study by the World Bank (Keyser et al, 2010) reports a total cost of 540 USD per tonne (713 TZS per kg or 28 percent of the auction price) and TCB reports access costs covering 32.4 percent of the auction price (for 2009 this means 818 TZS per kg). Each study reports different components of access costs however the cost structure reported by PROMAR (2011) best relates to the price data available and has thus been selected for this study. The costs used are reflected in Table 8.

Table 8: Estimated Observed Access Costs from farm gate to auction (2009)

| Cost Item              | TZS per kg   | % of total cost |
|------------------------|--------------|-----------------|
| Transport              | 507          | 47              |
| primary society levy   | 151          | 14              |
| cooperative union levy | 97           | 9               |
| secondary processing   | 65           | 6               |
| bank interest          | 54           | 5               |
| export bags            | 32           | 3               |
| auction commission     | 22           | 2               |
| TACRI Research         | 22           | 2               |
| Others                 | 129          | 12              |
| <b>TOTAL</b>           | <b>1 078</b> | <b>100</b>      |

Source: PROMAR (2011).

As it can be seen in Table 8, the costs reported by PROMAR (2011) includes TACRI which we consider as part of the access costs from auction to the border and therefore the total cost considered here stands at 1 056 TZS per kg or 800 USD per tonne.

In addition we add a 10 percent profit over farm gate prices and the district cess which stands at 5 percent of the farm gate price, thus the total access cost which has three component:

- [1] Costs as described in Table 8;
- [2] District Cess (5 percent of farm gate price); and
- [3] Profit margins on 10 percent over farm gate price.

With respect to **adjusted access costs**, we assume that the observed access costs already represent a well-functioning value chain and we have no evidence of over pricing in any of the components.

However, district cess (equal to 5 percent of the farm gate price) was removed and profits assumed as 5 percent of farm gate price.

The only observed access costs from the border to the point of competition included in this analysis was a TaCRI (Tanzania Coffee Research Institute) research levy equal to 0.75 percent of the export price and the TCB fee of 1 percent of auction price<sup>6</sup> which is applied to every tonne of coffee exported from Tanzania. All information on observed access costs from the auction to the border was obtained from TCB.

**Adjusted access costs** between the border and point of competition are considered to be zero.

## EXTERNALITIES

There are no any estimates on externalities in the coffee value chain in The United Republic of Tanzania

## BUDGET AND OTHER TRANSFERS

Although we are aware of the existence of direct budget transfers to the coffee sub-sector as a result of subsidies for agricultural inputs provided to farmers, no specific data on expenditures targeted towards coffee production are currently available.

## QUALITY AND QUANTITY ADJUSTMENTS

When small farmers sell their coffee parchment, the primary cooperative buyer or private buyers inspect the beans and evaluate them based on standards, such as color (with aim of judging their cleanliness and dryness), density, weight and finally by shape. After such a thorough evaluation, they assign a visual grade from Special (no defect beans), to Parchment 1 (20 percent or less beans with defects), Parchment 2 (more than 20 percent beans with defects), Parchment 3 (beans that were not thoroughly washed). However, despite such formalities, this quality assessment process is rarely followed. Therefore, buyers tend to offer only one price for all beans<sup>7</sup>.

After buyers purchase the parchment coffee, they take the coffee to the auction, where it is sold to the final buyers for export. According to TCB statistical data on auction prices for coffee, the coffee is not sold according to different grades, but rather provides average prices on coffee sales from auction and direct export.

Farmers sell coffee beans prior to the curing process; however, since curing losses have been included as access costs, it is not necessary to use a quantity adjustment factor.

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<sup>6</sup> Keyser et al (2010)

<sup>7</sup> Government of Japan (2010);High Value Agriculture Study: African Coffee Industry and Japan's Trade and Aid –Supporting the Tanzanian and Ethiopian Coffee Industries and their Export Promotion.

### **Summary table for data description in MAFAP technical notes**

Following the discussions above, Table 9 provides a summary of the main sources and methodological decisions taken for the analysis of price incentives and disincentives for coffee in The United Republic of Tanzania. While the table reflects general approaches, specific changes are discussed in Part 4.

**Table 9: Summary for data description in technical notes**

| <i>Concept</i>                         |        | <i>Description</i>  |   |
|--|--------|---|---|
|  |        | <i>Observed</i>   | <i>Adjusted</i>   |
| Benchmark price                        |        | <ul style="list-style-type: none"> <li>▪ Unit value of exports of The United Republic of Tanzania to the world for commodity coffee not roasted, not decaffeinated [HS6 code 090111]</li> </ul>   | N.A.  |
| Domestic price at point of competition |        | <ul style="list-style-type: none"> <li>▪ Weighted average of auction prices by coffee variety as reported by TCB.</li> </ul>  | N.A.  |
| Domestic price at farm gate            |        | <ul style="list-style-type: none"> <li>▪ Weighted average of producer price by coffee variety as reported by TCB.</li> </ul>  | N.A.  |
| Exchange rate                          |        | <ul style="list-style-type: none"> <li>▪ As all data is in USD we assume an exchange rate of 1</li> </ul>   | N.A.  |
| Access cost to point of competition    |        | <ul style="list-style-type: none"> <li>▪ 0.75 percent of auction price as fee to the TACRI and 1 percent of FOB price as TCB Levy</li> </ul>  | <ul style="list-style-type: none"> <li>▪ Zero</li> </ul>  |
| Access costs to farm gate              |        | <ul style="list-style-type: none"> <li>▪ Transport, processing, export bags, auction commission, cooperative union levy and primary society levy as reported by PROMAR (2011).</li> <li>▪ percent of farm gate price as district cess.</li> <li>▪ 10 percent profit margin over farm gate price.</li> </ul> | <ul style="list-style-type: none"> <li>▪ <i>Profit margin set to 5 percent and district cess deducted.</i></li> </ul> |
| 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.  |

Source: authors

The data used for the analysis is summarized in Table 10.

**Table 10: Data used for analysis**

|   |             | Year           | 2005     | 2006     | 2007     | 2008     | 2009     | 2010     |
|---|-------------|----------------|----------|----------|----------|----------|----------|----------|
|   |             | trade status   | x        | x        | X        | x        | x        | x        |
| <b>DATA</b>   | <b>Unit</b> | <b>Symbol</b>  |          |          |          |          |          |          |
| <b>Benchmark Price</b>  |             |                |          |          |          |          |          |          |
| <i>Observed</i>   | USD/TONNE   | $P_{b(int\$)}$ | 1,630.00 | 1,968.00 | 2,178.00 | 2,199.00 | 1,986.00 | 2,893.00 |
| <i>Adjusted</i>   | USD/TONNE   | $P_{ba}$       |          |          |          |          |          |          |
| <b>Exchange Rate</b>  |             |                |          |          |          |          |          |          |
| <i>Observed</i>   | TZS/USD     | $ER_o$         | 1.00     | 1.00     | 1.00     | 1.00     | 1.00     | 1.00     |
| <i>Adjusted</i>   | TZS/USD     | $ER_a$         |          |          |          |          |          |          |
| <b>Access costs border - point of competition</b>                   |             |                |          |          |          |          |          |          |
| <i>Observed</i>   | TZS/TONNE   | $ACo_{wh}$     | 24.48    | 32.60    | 34.45    | 38.89    | 34.03    | 48.65    |
| <i>Adjusted</i>   | TZS/TONNE   | $ACa_{wh}$     | -        | -        | -        | -        | -        | -        |
| <b>Domestic price at point of competition</b>                       |             |                |          |          |          |          |          |          |
| <i>Observed</i>   | TZS/TONNE   | $P_{dwh}$      | 1,225.00 | 1,784.00 | 1,811.00 | 2,240.00 | 1,913.00 | 2,695.00 |
| <b>Access costs point of competition - farm gate</b>                |             |                |          |          |          |          |          |          |
| <i>Observed</i>   | TZS/TONNE   | $ACo_{fg}$     | 875.99   | 914.85   | 938.81   | 952.11   | 931.13   | 952.78   |
| <i>Adjusted</i>   | TZS/TONNE   | $ACa_{fg}$     | 825.33   | 838.28   | 846.27   | 850.70   | 843.71   | 850.93   |
| <b>Farm gate price</b>  |             |                |          |          |          |          |          |          |
| <i>Externalities associated with production</i>                     | TZS/TONNE   | E              |          |          |          |          |          |          |
| <i>Budget and other product related transfers</i>                   | TZS/TONNE   | BOT            |          |          |          |          |          |          |
| <i>Quantity conversion factor (border - point of competition)</i>   | Fraction    | $QT_{wh}$      |          |          |          |          |          |          |
| <i>Quality conversion factor (border - point of competition)</i>    | Fraction    | $QL_{wh}$      |          |          |          |          |          |          |
| <i>Quatity conversion factor (point of competition – farm gate)</i> | Fraction    | $QT_{fg}$      |          |          |          |          |          |          |
| <i>Quality conversion factor (point of competition – farm gate)</i> | Fraction    | $QL_{fg}$      |          |          |          |          |          |          |
|   |             | NOTES          |          |          |          |          |          |          |

Source: authors

## CALCULATION OF INDICATORS

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

### Box 1: MAFAP POLICY INDICATORS

MAFAP analysis uses four measures of market price incentives or disincentives. *First*, are the two observed nominal rates of protection, one 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:

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

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:

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

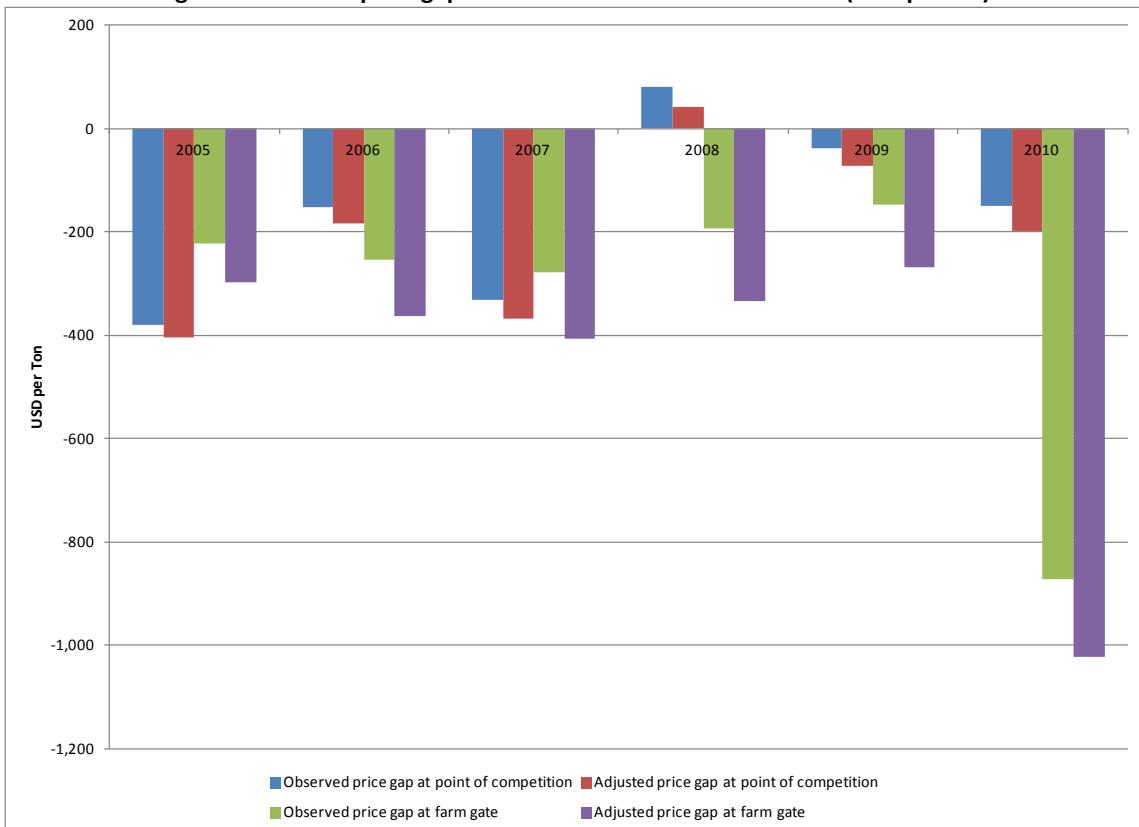
MAFAP analyzes market development gaps caused by market power, exchange rate misalignments, and excessive domestic market costs, which contribute to the NRpo and NRPa indicators. Comparison of the different rates of protection identifies where market development gaps can be found and reduced.

**Table 11: MAFAP price gaps for coffee in Tanzania 2005-2010 (USD per Mt)**

|  | 2005  | 2006  | 2007  | 2008  | 2009  | 2010    |
|--|-------|-------|-------|-------|-------|---------|
| <b>Trade status for the year</b>           | x     | x     | x     | x     | x     | x       |
| Observed Price gap at point of competition | (381) | (151) | (333) | 80    | (39)  | (149)   |
| Adjusted Price gap at point of competition | (405) | (184) | (367) | 41    | (73)  | (198)   |
| Observed price gap at farm gate            | (223) | (255) | (279) | (194) | (147) | (873)   |
| Adjusted price gap at farm gate            | (298) | (364) | (406) | (334) | (268) | (1,024) |

Source: Own calculations using data as described above.

**Figure 14: MAFAP price gaps for coffee in Tanzania 2005-2010 (USD per Mt)**

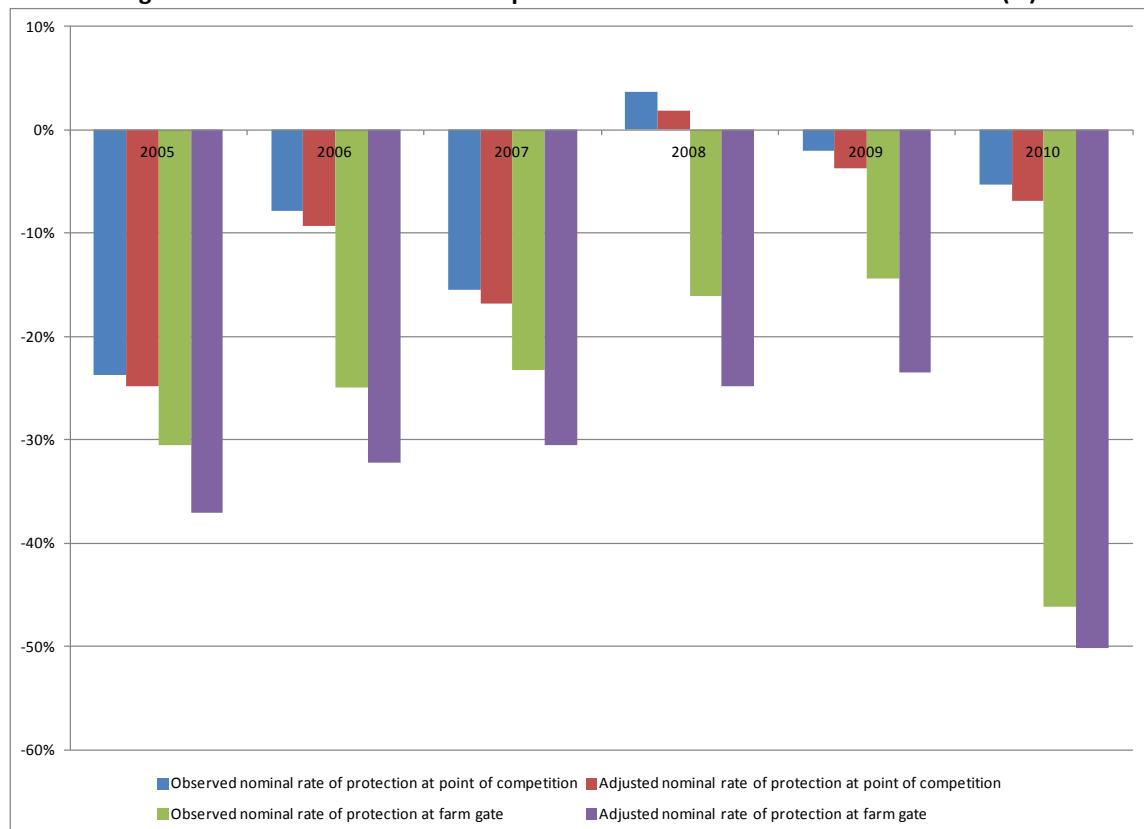


**Table 12: MAFAP nominal rates of protection (NRP) for coffee in Tanzania 2005-2010 (%)**

|   | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 |
|---|------|------|------|------|------|------|
| <b>Trade status for the year</b>                            | x    | x    | x    | x    | x    | x    |
| Observed Nominal rate of protection at point of competition | -24% | -8%  | -16% | 4%   | -2%  | -5%  |
| Adjusted Nominal rate of protection at point of competition | -25% | -9%  | -17% | 2%   | -4%  | -7%  |
| Observed Nominal rate of protection at farm gate            | -31% | -25% | -23% | -16% | -14% | -46% |
| Adjusted Nominal rate of protection at farm gate            | -37% | -32% | -31% | -25% | -23% | -50% |

Source: Own calculations using data as described above

**Figure 15: MAFAP nominal rates of protection for coffee in Tanzania 2005-2010 (%)**



**Table 13: MAFAP Market Development Gaps for Coffee in Tanzania 2005-2010 (USD per Mt)**

|   | 2005   | 2006   | 2007   | 2008    | 2009   | 2010    |
|---|--------|--------|--------|---------|--------|---------|
| <b>International markets gap</b>                | -      | -      | -      | -       | -      | -       |
| <b>Exchange policy gap</b>                      | -      | -      | -      | -       | -      | -       |
| <b>Access costs gap to point of competition</b> | (24.5) | (32.6) | (34.4) | (38.9)  | (34.0) | (48.6)  |
| <b>Access costs gap to farm gate</b>            | (50.7) | (76.6) | (92.5) | (101.4) | (87.4) | (101.9) |
| <b>Externality gap</b>                          | -      | -      | -      | -       | -      | -       |
| <b>Market Development Gap (%)</b>               | -9%    | -10%   | -10%   | -10%    | -11%   | -7%     |

ND: No data available for calculation

Source: Own calculations using data as described above

## **4. INTERPRETATION OF THE INDICATORS**

### ***MAFAP Price gaps***

Estimated observed and adjusted price gaps of coffee at farm gate and point of competition in The United Republic of Tanzania are shown in Table 9. The results indicate that farmers and, to a lesser extent, wholesalers face disincentives for production, as price gaps have mostly been negative since 2005 (with the exception of price gaps at the point of competition for 2008). Price gaps at farm gate have remained more or less stable throughout the study period, with a significant increase in 2010.

Since no export trade taxes are levied on coffee in the United Republic of Tanzania, the negative price gaps could be explained by the malfunctioning of the value chain (i.e. access costs are higher than those reported by the value chains studies consulted) or general market development gaps (i.e. lack of price transmission). As far as the former is concerned, cost data was obtained from recent value chain studies and several sources were compared in order to make sure that the most accurate estimate was used, so under estimation is not very probable. In addition, the data provided does not explicitly mention para-legal payments and additional costs due to the structure of the value chain (i.e. market power by multinationals).

Regarding the adjusted domain, the district cess, the TCB levy and TACRI fees represent a minor disincentive compared to the rest of the issues highlighted above. However, they do mean that farmers receive lower remuneration.

Most of the disincentives are due to excessive access costs between the farm gate and the border. Findings reveal that the access costs gap from the farm gate to point of competition are much larger than from the border to the point of competition (as shown in Table 13).

Price gaps are higher when international prices raise, therefore highlighting the loss of market opportunities by coffee farmers when international prices grow.

### ***MAFAP Nominal Rates of Protection***

Observed and adjusted nominal rates of protection are calculated by relating observed and adjusted price gaps to the reference price at farm gate and the point of competition. Both observed and adjusted nominal rates of protection at the point of competition, on average, are not as low as the rates at farm gate. This further demonstrates the high costs incurred by farmers than those incurred by traders or buyers. As explained earlier, up to 50 percent is charged on coffee from growers, and that is excluding other non-financial barriers not taken into account.

## 5. PRELIMINARY CONCLUSIONS AND RECOMMENDATIONS

### MAIN MESSAGE

Even when FOB prices have been increasing steadily since 2005, the ratio of the farm gate price to the FOB price has remained quite stable throughout the period (from 44 percent to 57 percent). Taking into account the access costs data available, this means that farmers are not fully realizing the benefits of increasing coffee prices. This could be attributed to the pricing system of the value chain, where access costs are calculated as a percentage of the wholesale price instead of based on actual costs. While this protects farmers when prices are low, it actually limits their capacity to benefit from high prices. Trade liberalization has to some extent helped improve the sector, although, not much is being done to ensure that small-scale farmers are receiving the amount they deserve.

All the burden of the disincentives in the value chain lay on farmers, probably due to the market power of exporters, which have managed to maintain a dominating position irrespective of the government's efforts to introduce more competition in the auction system with the one-license initiative.

As there are no explicit trade policies in place, the price gaps and nominal rates of protection identified are related to overall market development gaps. In addition, the role of the fee for TaCRI is minimal compared with the disincentives created by the functioning of the auction system. Other inefficiencies in the value and trading chain also play a role, including several levies and charges for membership to TCB.

The market development gaps could be related to an underestimation of access costs resulting from missing data on transport costs from the Northern part of The United Republic of Tanzania (Kilimanjaro) to Dar es Salaam, which are assumed to be high due to of the high cost of fuel and processing.

### PRELIMINARY RECOMMENDATIONS

The government should further enforce the one license system as it is still clear that major multinationals control the auction and this makes farmers receive a low share of the export price. Even in the best years farmers only get 46 percent of the export price and when considering all access costs still face a disincentive of nearly 200 USD per tonne.

### LIMITATIONS

The lack of access to critical information on coffee in the United Republic of Tanzania has made it very difficult to accurately estimate observed and adjusted market costs, nominal rates of protection and price gaps. It has not been possible to obtain figures on profits realized by small-scale farmers as well as large-scale farmers. This has also made this analysis difficult, especially since export figures may not provide the actual profit margin realized during the period.

## **FURTHER INVESTIGATION AND RESEARCH**

It would be desirable to undertake this analysis distinguishing between different marketing channels (cooperatives versus private traders) in order to see whether incentives differ between them.

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## **ANNEX I: List of acronyms**

|        |   |
|--------|---|
| ASDP:  | Agricultural Sector Development Programme |
| ASDS:  | Agricultural Sector Development Strategy  |
| FG:    | Farm Gate                                 |
| FOB:   | Free on Board                             |
| IMF:   | International Monetary Fund               |
| NBS:   | National Bureau of Statistics             |
| NRP:   | Nominal Rate of Protection                |
| PCS:   | Private Cooperative Societies             |
| TACRI: | Tanzania Coffee Research Institute        |
| TCB:   | Tanzania Coffee Board                     |
| TCIDS: | Tanzania Coffee Development Strategy      |
| TZS:   | Tanzanian Shilling                        |
| URT:   | United Republic of Tanzania               |
| USD:   | United States Dollar                      |
| WH:    | Wholesale                                 |
| WRS:   | Warehouse Receipt System                  |

## **ANNEX II: Methodology Used**

A guide to the methodology used by MAFAP can be downloaded from the MAFAP website or by clicking [here](#).

### ANNEX III: Data and calculations used in the analysis

| DATA  | Unit  | Symbol             | Year<br>trade status    | 2005     | 2006     | 2007     | 2008     | 2009     | 2010                     | Notes   |
|---|---|--------------------|-------------------------|----------|----------|----------|----------|----------|--------------------------|---|
|   |   |                    |                         | x        | x        | x        | x        | x        | x                        |   |
| <b>Benchmark Price</b>                                    |   |                    |                         |          |          |          |          |          |                          |   |
| 1   | Observed  | USD/TON            | P <sub>b</sub> (n\$)    | 1,630.00 | 1,968.00 | 2,178.00 | 2,199.00 | 1,986.00 | 2,893.00                 | FOB Price   |
| 1b  | Adjusted  | USD/TON            | P <sub>ba</sub>         | -        | -        | -        | -        | -        | -                        |   |
| <b>Exchange Rate</b>                                      |   |                    |                         |          |          |          |          |          |                          |   |
| 2   | Observed  | USD/USD            | ER <sub>o</sub>         | 1.00     | 1.00     | 1.00     | 1.00     | 1.00     | 1.00                     |   |
| 2b  | Adjusted  | USD/USD            | ER <sub>a</sub>         | -        | -        | -        | -        | -        | -                        |   |
| <b>Access costs border - point of competition</b>         |   |                    |                         |          |          |          |          |          |                          |   |
| 3   | Observed  | USD/TON            | ACo <sub>wh</sub>       | 24.48    | 32.60    | 34.45    | 38.89    | 34.03    | 48.65                    | 0.75% of FOB TACRI and 1% of Wholesale TCB  |
| 3b  | Adjusted  | USD/TON            | ACo <sub>ah</sub>       | -        | -        | -        | -        | -        | -                        |   |
| <b>Domestic price at point of competition</b>             |   |                    |                         |          |          |          |          |          |                          |   |
| 4   | Domestic price at point of competition                        | USD/TON            | P <sub>dwh</sub>        | 1,225.00 | 1,784.00 | 1,811.00 | 2,240.00 | 1,913.00 | 2,895.00                 | TCB total sales   |
| <b>Access costs point of competition - farm gate</b>      |   |                    |                         |          |          |          |          |          |                          |   |
| 5   | Observed  | USD/TON            | ACo <sub>fg</sub>       | 875.99   | 914.85   | 938.81   | 952.11   | 931.13   | 952.78                   |   |
| 5b  | Adjusted  | USD/TON            | ACo <sub>afg</sub>      | 825.33   | 838.28   | 846.27   | 850.70   | 843.71   | 850.93                   | 800 USD and 10% FG price and 5% District cess same but wth 5% FG price and no district cess |
| 6   | Farm gate price   | USD/TON            | P <sub>afg</sub>        | 506.57   | 765.66   | 925.39   | 1,014.07 | 874.18   | 1,018.56                 | TCB FG Price weighted average by type   |
| 7   | Externality associated wth production                         | USD/TON            | E                       | -        | -        | -        | -        | -        | -                        |   |
| 8   | Budget and other product related transfers                    | USD/TON            | BOT                     | -        | -        | -        | -        | -        | -                        |   |
| 9   | Quantity conversion factor (border - point of competition)    | Fraction           | QT <sub>wh</sub>        | -        | -        | -        | -        | -        | -                        |   |
| 10  | Quantity conversion factor (border - point of competition)    | Fraction           | QT <sub>ah</sub>        | -        | -        | -        | -        | -        | -                        |   |
| 11  | Quantity conversion factor (point of competition - farm gate) | Fraction           | QT <sub>f</sub>         | -        | -        | -        | -        | -        | -                        |   |
| 12  | Quantity conversion factor (point of competition - farm gate) | Fraction           | QT <sub>fg</sub>        | -        | -        | -        | -        | -        | -                        |   |
| <b>CALCULATED PRICES</b>                                  |   |                    |                         |          |          |          |          |          |                          |   |
| Calculated Price  | Unit  | Symbol             | 2005                    | 2006     | 2007     | 2008     | 2009     | 2010     | Formula                  |   |
| <b>Benchmark price in local currency</b>                  |   |                    |                         |          |          |          |          |          |                          |   |
| 9   | Observed  | USD/TON            | P <sub>b</sub> (loc\$)  | 1,630.00 | 1,968.00 | 2,178.00 | 2,199.00 | 1,986.00 | 2,893.00                 | [1]*[2]   |
| 10  | Adjusted  | USD/TON            | P <sub>ba</sub> (loc\$) | 1,630.00 | 1,968.00 | 2,178.00 | 2,199.00 | 1,986.00 | 2,893.00                 | [1]*[2]   |
| <b>Reference Price at point of competition</b>            |   |                    |                         |          |          |          |          |          |                          |   |
| 11  | Observed  | USD/TON            | RP <sub>wh</sub>        | 1,605.53 | 1,935.40 | 2,143.56 | 2,160.11 | 1,951.98 | 2,844.35                 | [9]-[3]   |
| 12  | Adjusted  | USD/TON            | RP <sub>ah</sub>        | 1,630.00 | 1,968.00 | 2,178.00 | 2,199.00 | 1,986.00 | 2,893.00                 | [10]-[3b]   |
| <b>Reference Price at Farm Gate</b>                       |   |                    |                         |          |          |          |          |          |                          |   |
| 13  | Observed  | USD/TON            | RP <sub>afg</sub>       | 729.54   | 1,020.55 | 1,204.75 | 1,208.00 | 1,020.85 | 1,891.57                 | [11]-[5]  |
| 14  | Adjusted  | USD/TON            | RP <sub>aafg</sub>      | 804.67   | 1,129.72 | 1,331.73 | 1,348.30 | 1,142.29 | 2,042.07                 | [12]-[5b]   |
| <b>INDICATORS</b>   |   |                    |                         |          |          |          |          |          |                          |   |
| Indicator   | Unit  | Symbol             | 2005                    | 2006     | 2007     | 2008     | 2009     | 2010     | Formula                  |   |
| <b>Price gap at point of competition</b>                  |   |                    |                         |          |          |          |          |          |                          |   |
| 15  | Observed  | USD/TON            | PGo <sub>wh</sub>       | (380.53) | (151.40) | (332.56) | 79.89    | (38.97)  | (149.35)                 | [4]-[11]  |
| 16  | Adjusted  | USD/TON            | PGa <sub>wh</sub>       | (405.00) | (184.00) | (367.00) | 41.00    | (73.00)  | (198.00)                 | [4]-[12]  |
| <b>Price gap at farm gate</b>                             |   |                    |                         |          |          |          |          |          |                          |   |
| 17  | Observed  | USD/TON            | PGo <sub>fg</sub>       | (222.97) | (254.89) | (279.36) | (193.92) | (146.67) | (873.00)                 | [6]-[13]  |
| 18  | Adjusted  | USD/TON            | PGa <sub>fg</sub>       | (298.10) | (364.06) | (406.34) | (334.22) | (268.11) | (1,023.51)               | [6]-[14]  |
| <b>Nominal rate of protection at point of competition</b> |   |                    |                         |          |          |          |          |          |                          |   |
| 19  | Observed  | %                  | NRPo <sub>wh</sub>      | -23.70%  | -7.82%   | -15.51%  | 3.70%    | -2.00%   | -5.25%                   | [15]/[11]   |
| 20  | Adjusted  | %                  | NRPa <sub>wh</sub>      | -24.85%  | -9.35%   | -16.85%  | 1.86%    | -3.68%   | -6.84%                   | [16]/[12]   |
| <b>Nominal rate of protection at farm gate</b>            |   |                    |                         |          |          |          |          |          |                          |   |
| 21  | Observed  | %                  | NRPo <sub>afg</sub>     | -30.56%  | -24.98%  | -23.19%  | -16.05%  | -14.37%  | -46.15%                  | [17]/[13]   |
| 22  | Adjusted  | %                  | NRPa <sub>afg</sub>     | -37.05%  | -32.23%  | -30.51%  | -24.79%  | -23.47%  | -50.12%                  | [18]/[14]   |
| <b>Nominal rate of assistance</b>                         |   |                    |                         |          |          |          |          |          |                          |   |
| 23  | Observed  | %                  | NRAo                    | -30.56%  | -24.98%  | -23.19%  | -16.05%  | -14.37%  | -46.15%                  | ((17)+(8))/[13]   |
| 24  | Adjusted  | %                  | NRAa                    | -37.05%  | -32.23%  | -30.51%  | -24.79%  | -23.47%  | -50.12%                  | ((18)+(8))/[14]   |
| <b>Decomposition of PWAfg</b>                             |   |                    |                         |          |          |          |          |          |                          |   |
| Decomposition Component                                   | Unit  | Symbol             | 2005                    | 2006     | 2007     | 2008     | 2009     | 2010     | Formula                  |   |
| 25 International markets gap                              | USD/TON   | IRG                | -                       | -        | -        | -        | -        | -        |                          |   |
| 26 Exchange policy gap                                    | USD/TON   | ERPG               | -                       | -        | -        | -        | -        | -        |                          |   |
| 27 Access costs gap to point of competition               | USD/TON   | ACCo <sub>wh</sub> | (24.48)                 | (32.60)  | (34.45)  | (38.89)  | (34.03)  | (48.65)  | ((3b)-(3))               |   |
| 28 Access costs gap to farm gate                          | USD/TON   | ACCo <sub>fg</sub> | (50.66)                 | (76.57)  | (92.54)  | (101.41) | (87.42)  | (101.86) | [5b]-[5]                 |   |
| 29 Externality gap  | USD/TON   | EG                 | -                       | -        | -        | -        | -        | -        |                          |   |
| Market Development Gap                                    | USD/TON   | MDG                | (75.13)                 | (109.17) | (126.98) | (140.30) | (121.44) | (150.50) | [25]+[26]+[27]+[28]+[29] |   |
| Market Development Gap                                    | %   | MDG                | -9.3%                   | -9.7%    | -9.5%    | -10.4%   | -10.6%   | -7.4%    | MDG/RPafg                |   |



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