Analysis of price incentives for cashew nuts in the United Republic of Tanzania 2005–2013

Technical Notes Series
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For more information visit: www.fao.org/in-action/mafap
Executive summary

Product: Cashew nuts
Period analyzed: 2005-2013
Trade status: Export in all years

Commodity context

- Cashew nuts are produced mainly in the southern region of the United Republic of Tanzania (URT) and represent a small portion of total agricultural production, with an average of 104,000 tonnes annually between 2005 and 2014.
- Roughly 90 percent of cashew nut production is exported unprocessed and is one of URT’s main agricultural exports following coffee and cotton, representing an average 10 percent of total agricultural exports.
- Since 2008, a warehouse receipt system (WRS) has been in place that ensures all cashew production is sold via cooperatives through an auction centrally managed by the Cashew Board of Tanzania (CBT).
- Exports of unprocessed cashew nuts are subject to an export tax with the stated objective being to encourage domestic processing. However, the ratio of shelled to unshelled has actually decreased since 2008/09.

Figure: Observed and adjusted nominal rate of protection (NRP) at farm gate for cashew nuts in the United Republic of Tanzania 2005-2012

Note: Although the overall analysis in this note covers 2005-2013, analysis at the farm gate level was only possible until 2012 due to lack of farm gate prices for 2013.
Source: Author’s calculations, 2014.

The observed Nominal Rate of Protection (NRP, green bars) in the graph above measures the effect of policy distortions and overall market performance on price incentives for producers. Farmers received disincentives until the creation of the Warehouse Receipt System in 2008, at which point they began receiving mild to strong incentives, particularly in 2011 when international cashew prices
peaked. The adjusted NRP (blue bars) captures the same elements as the observed NRP in addition to market distortions that result from inefficiencies in the commodity’s value chain. The adjusted NRP is 6 percent lower on average than the observed, indicating that excessive service fees, district cess and margins along the value chain further reinforce disincentives to cashew farmers.

Driving factors
- Until 2008, farmers received disincentives of an average -20 percent because, owing to the lack of a coordinated exchange system, traders were able to manipulate the market and offer a price much lower than the international equivalent.
- After the creation of the WRS, producers began to receive incentives of an average 9 percent; the system allows farmers to receive a partial payment of 75 percent immediately to meet cash needs so that they were able to sell when prices are favorable, engaging them in the auction market by providing a bonus payment if the cashews sell for more than was estimated at the beginning of the season.
- Incentives were however affected by high administrative fees associated with the WRS, overcharging for services, and high local taxes, bringing incentives down to a neutral situation (zero incentive) on average from 2008 to 2012.
- Budgetary transfers to cashew farmers, in the form of input subsidies, reduced disincentives by only 1 percent.
- The increase of the export tax from 10 to 15 percent in 2010 did not have the desired effect of increasing domestic processing and the share of government revenue collected from the tax that is channeled back to the sector is below 20 percent.
- The increasingly high export tax on raw cashew nuts (RCN) may be encouraging under-reporting at the border. This may have been the case in 2011 in particular owing to the great discrepancy between the FOB Tanzania and the CIF India.

Recommendations
- The Government of the United Republic of Tanzania should consider revoking the export tax or ensure that a greater part of the revenue goes back to the sector, mainly to assure a better functioning of the WRS and increased processing opportunities. Furthermore, removing or reducing the export tax may encourage more accurate reporting at the border.
- Excessive costs in the value chain should be eliminated to increase producer prices. These costs include: the cash distribution fee as this should be covered by the Union Levy, the fumigation and weigh scale fee, which should be included in the warehouse commission, and the district produce cess.
- Despite benefits of WRS on farmers’ income, this is limited by the closed bidding system and lack of transparency. It is therefore recommended to increase competition and transparency by establishing an online database for crop deliveries to warehouses and weekly reports on prices and auction results using Moshi Coffee exchange as example (NMB, 2013).
- Diversify export markets and encourage the entry of new buyers at cashew auctions to increase competition and potentially improve prices for producers;
- Explore the possibility of disconnecting the WRS from the auction system, so that it functions as a financing mechanism for farmers who want to participate and for processors who want to buy in season.
1. Purpose of the note

This technical note aims to describe the market incentives and disincentives for maize producers in the United Republic of Tanzania (URT) over the period 2005-2013. The national data used in this analysis is for crop years 2004/05 to 2012/13, but has been taken as years 2005-2013 for the purpose of this analysis.

For this purpose, yearly averages of domestic 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 reference prices and domestic prices along the commodity’s value chain indicate the extent to which incentives (positive gaps) or disincentives (negative gaps) were present at the farm gate and wholesale level. The price gaps are expressed in relative terms as a percentage of the reference price, referred to as the Nominal Rate of Protection (NRP). These key indicators are used by MAFAP to assess the effects of policy and market performance on prices.

This technical note begins with a review of the commodity’s production, consumption/utilization, marketing and trade, value chain and policy context (Chapter 2). It also provides a detailed description of how key data elements were obtained and indicators were calculated (Chapter 3). The indicators were then interpreted in light of existing policies and market characteristics (Chapter 4), and key policy recommendations were formulated on the basis of this interpretation (Chapter 5). Finally, the note concludes with a few main messages, limitations of the analysis and areas identified for further research to improve the analysis (Chapter 6).

The results and recommendations presented in this analysis of price incentives can be used by stakeholders involved in policy-making for the food and agriculture sector. They can also serve as input for evidence-based policy dialogue at the national, regional or international level.

This technical note should not be interpreted as an in-depth value chain analysis or detailed description of the commodity’s production, consumption/utilization, marketing and trade or policy context. All information related to these areas is presented merely to provide background on the commodity under review, help understand major trends and facilitate the interpretation of the indicators.

All information in this technical note is subject to review and validation.

2. Commodity context

Production

Cashew nuts are the most important export crop, after tobacco and coffee accounting for an average of ten percent of total agricultural exports (FAO, 2014). As illustrated in Figure 1, cashew nut production remained relatively stable over the period 2005-2010, fluctuating between 72 000 and 99 000 tonnes. In 2011 and 2012, total land planted to cashew nut increased dramatically, possibly due to the increasing international prices and more favorable pricing system after the introduction of the Warehouse Receipt System in 2008. Although production more than doubled over the same period, this growth was minimal compared to growth in area harvested, causing a significant drop in apparent yield. Furthermore, newly planted cashew trees take several years before they bear nuts for harvest, so planting would not have an effect on production or yield right away. Production decreased slightly after 2012 in response to declining auction prices in both 2012 and 2013 as well as
farmers not receiving payments on time (see Results and interpretation), levelling off at around 130 000 tonnes in 2014.

**Figure 1: Cashew nut production, area harvested and yield, 2005-2014**

![Cashew nut production, area harvested and yield, 2005-2014](image)

*Note: Yields as reported by the CBT appear to have been computed as a derivative of total production and area harvested. Source: CBT, 2014.*

The average yield over the period 2005-2014 was around 0.7 tonnes/ha, making the URT one of the most productive countries in East Africa. However, this yield is still far from those obtained in West Africa (i.e. two tonnes/ha in Nigeria) or in the most productive countries growing cashew nuts (i.e. three tonnes/ha in Mexico, close to five in the Philippines and Peru) (Nkonya and Barreiro-Hurlé, 2013). Yield is highly sensitive to care and good practices such as proper pruning and application of fertilizer and sulphur to avoid fungal infections (UNIDO, 2011). This in turn is partially driven by prices since favorable prices tend to make farmers more willing to invest in tree maintenance activities (Fynn, 2004). In URT, cashew trees are most commonly cultivated in small-scale mixed cropping systems; however, large mono cropping systems do exist. Over 85 percent of cashew farmers operate on plantations that are about one hectare in size, using household labour. Many plantation owners are poor elderly people, who often cannot afford to invest in production and maintenance (UNIDO, 2011). In order for cashew production to be fully exploited, it is important for the government to incentivize care and maintenance of those already growing as well as young entrepreneurs to enter the sector.

Cashew trees will grow in drought prone conditions and in poor soil. Furthermore, food crops can be grown amongst the trees, making cashew an ideal asset for small-scale farmers (Fitzpatrick, 2012). Most of the production is concentrated in the southern coastal regions of Pwani, Lindi and Mtwara which account for 89 percent of total area and production (Figure 2). In the southern zone (Mtwara, Lindi and Ruvuma), over 700 000 households rely on cashew production to meet household income and food security needs (Akyoo and Mpenda, 2014).

**Figure 2: Average distribution of total land area planted with cashew trees by region, 2005-2013**
Consumption/utilization

Over the past decade, an average of ten percent of total cashew production was used for domestic consumption, while the rest was exported (Figure 4). Despite the existence of large automated cashew processors (for more information on processing, see: Description of the value chain), most of the remaining 10 percent are processed by hand by cottage processors and consumed as a primary food item in the southern production areas, where cashew prices tend to be lower relative to other food items (UNIDO, 2011). In these major consumption areas, cashew nuts are a valuable source of macro and micro nutrients, such as protein (18 g/100 g), fats (44 g/100 g) and iron (7 g/100 g). They also contain high levels of magnesium, zinc, copper, manganese and essential fatty acids (USDA, 2015).

Figure 4 shows the trend of apparent domestic consumption of cashew nuts, which is quite volatile over the study period. This trend can be interpreted not necessarily as changes in consumption habits but more as changes in export optimization. For example, in the two years following the introduction of the WRS (2007-08), large volumes cashews were left unsold on the domestic market as traders were adjusting to the new system (Akyoo and Mpenda, 2014). More profoundly, in 2012, there was strong political interference in the cashew market, attempting to ensure the indicative price to farmers later in the marketing season when there was a slump in the international market. This made URT cashews less competitive, leading to exchange failure and traders going elsewhere to buy cashew.

Source: CBT, 2014.

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1 Estimated based on production and export volumes from the CBT.
Cashew trees produce fruit, which consists of two parts: the seed, or what is referred to as the cashew nut, and the apple. Both parts are edible, although only the cashew nut is fully utilized in URT. In its raw form, the seed is encased in a smooth dark brown kidney shape shell that contains a toxic resin. This is attached to the apple, which is a fleshy pear-shaped stalk with a juicy, spongy but astringent yellow pulp (Morton, 1987). The cashew apple is rich in nutrients and produces a juice that contains 3 to 6 times more vitamin C than orange juice (Adou et al., 2012). However, since cashew apples are highly perishable due to their soft flesh and skin and bruise easily during transport, they are untradeable without additional processing. In URT, they are mainly discarded when the nuts are harvested.

Cashew apples are not the only by-product of cashew production and processing, but could be most easily exploited for domestic value addition. Due to the high concentration of vitamin C (136-372 mg/100 g), it is recommended to process cashew apples into juice, jam and dried snacks (Akinwale, 2000 and Adou et al., 2012). Currently, the only use of cashew apple, bibo, in URT is for distilling into cashew gin known as gongo, a strong liquor that is contraband. Another use with great potential is bio-ethanol production (UNIDO, 2011).

**Marketing and trade**
The United Republic of Tanzania exports almost all of its cashew nuts unprocessed, as shown in Figure 4. More than 80 percent of the country’s cashew nut exports are sent to India, where they are shelled for re-export or used in other food products. India is the world’s main processor of cashew nuts, with a competitive processing industry and a policy environment that fosters imports of raw cashew nuts through the provision of import subsidies (UNIDO, 2011), while protecting its domestic market for processed cashew nuts by imposing a standard import tariff of 30 percent and a
preferential tariff of 20 percent (CBEC, 2014)\(^2\) as well as a value added tax (Mitchell and Baregu, 2012). Given that harvesting in URT takes place six months earlier than harvesting in India, the demand for raw cashew nuts is quite high as Indian processors are ready to purchase inputs to keep their operations running throughout the year (UNIDO, 2011).

Figure 4: Volume of processed vs. unprocessed cashew nut exports, 2005-2014

The United Republic of Tanzania has a competitive advantage because it produces larger nuts than other African countries and markets during the scarce season. The cashew harvest occurs after the harvest in West Africa, but before the harvest in India. High volumes of production in West Africa and expectations of a good Indian crop exert downward pressure on domestic prices. Furthermore, delays in the East Africa harvest clash with India’s harvest, thereby reducing prices. Harvest season in URT begins in October, 5-6 months before the northern hemisphere’s 70 percent of global production. Since Mozambique does not join the market until January in order to protect their domestic processing industry, URT is the only significant raw cashew exporter in Africa marketing cashew in November and December (Akyoo and Mpenda, 2014; NMB, 2013).

Like Mozambique, URT also aims to encourage in-country processing but does so by imposing an export tax on raw cashew nut exports that has increased incrementally, from 3 to 8.5 percent in 2005, and then to 10 percent in 2006, and finally to 15 percent in 2010 (UNIDO, 2011). We would expect to find a positive correlation between the increase in tax and ratio of processed to raw cashew exports. However, we can see from Figure 4 and Table 1 that the exports of processed nuts have actually fallen since 2009, and quite steeply since 2010. The ratio of processed (shelled) to unprocessed (with shell) exports was highest between 2005 and 2010, peaking at 8 percent in 2009, but has since declined to around 1 percent.

\(^2\) Furthermore, on 17 March 2012, there was an increase in the tariff to RS 60 per kg or 45 percent – whichever is higher – to processed cashew imports. (For more information, see http://www.cbec.gov.in/customs/cs-act/notifications/notfns-2013/cs-tarr2013/cs27-2013.htm2012).
Several constraints to domestic processing have been identified and relate to high start-up costs, unreliable water and energy. Cashew processing is very capital intensive, requiring expensive machinery; even a small-scale manual processing plant with a capacity of 48 tonnes per year requires an investment of roughly TZS 1 billion (as in Kitama village). Furthermore, incumbent buyers who are purchasing raw cashew for the Indian processors frustrate attempts for new buyers to enter the market (Akyoo and Mpenda, 2014). Interestingly, the WRS seems to support the raw cashew export market as opposed to the domestic processing market since we can see an increase in export of raw versus processed nuts since 2009 despite the export tariff. If processing high processing and investment costs for facilities and machinery, coupled with high interest rates are prohibitive in comparison with the export tax, it will not be profitable to give up the Indian export market in favour of domestic processing.

### Table 1: Production and export volumes (tonnes) and share (%) of shelled and unshelled cashew nuts from URT

<table>
<thead>
<tr>
<th></th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
</tr>
</thead>
<tbody>
<tr>
<td>Production (CBT)</td>
<td>71,918</td>
<td>77,446</td>
<td>92,573</td>
<td>99,107</td>
<td>79,069</td>
<td>75,367</td>
<td>121,135</td>
<td>158,719</td>
<td>127,947</td>
</tr>
<tr>
<td>Cashew Nuts in Shell - Exports (CBT)</td>
<td>70,667</td>
<td>66,708</td>
<td>69,259</td>
<td>75,888</td>
<td>64,335</td>
<td>63,044</td>
<td>113,374</td>
<td>127,139</td>
<td>117,914</td>
</tr>
<tr>
<td>Cashew Nuts Shelled - Exports (CBT)</td>
<td>1,023</td>
<td>2,821</td>
<td>4,985</td>
<td>4,925</td>
<td>5,068</td>
<td>3,691</td>
<td>3,028</td>
<td>1,192</td>
<td>1,073</td>
</tr>
<tr>
<td>Cashew Nuts in Shell - Exports (TRA)</td>
<td>70,515</td>
<td>52,498</td>
<td>52,509</td>
<td>76,054</td>
<td>68,078</td>
<td>65,919</td>
<td>125,468</td>
<td>134,193</td>
<td>123,686</td>
</tr>
<tr>
<td>Cashew Nuts Shelled - Exports (TRA)</td>
<td>1,497</td>
<td>2,684</td>
<td>5,336</td>
<td>6,898</td>
<td>6,538</td>
<td>12,997</td>
<td>20,823</td>
<td>16,852</td>
<td>3,493</td>
</tr>
<tr>
<td>Apparent domestic consumption</td>
<td>-210</td>
<td>6,708</td>
<td>16,193</td>
<td>16,183</td>
<td>7,495</td>
<td>7,050</td>
<td>3,436</td>
<td>29,877</td>
<td>8,501</td>
</tr>
<tr>
<td>Ratio of shelled to with shell</td>
<td>1%</td>
<td>4%</td>
<td>7%</td>
<td>6%</td>
<td>8%</td>
<td>6%</td>
<td>3%</td>
<td>1%</td>
<td>1%</td>
</tr>
<tr>
<td>Share of production consumed domestically</td>
<td>0%</td>
<td>9%</td>
<td>17%</td>
<td>16%</td>
<td>9%</td>
<td>9%</td>
<td>3%</td>
<td>19%</td>
<td>7%</td>
</tr>
<tr>
<td>Share of production exported</td>
<td>100%</td>
<td>91%</td>
<td>83%</td>
<td>84%</td>
<td>91%</td>
<td>91%</td>
<td>97%</td>
<td>81%</td>
<td>93%</td>
</tr>
</tbody>
</table>

Sources: CBT, TRA and author’s calculations, 2014.

**Cashew marketing system in the United Republic of Tanzania**

Marketing cashew nuts in URT has undergone significant changes in recent years. In 1991, the system was liberalized, allowing farmers to sell to any buyer (Mitchell and Baregu, 2012). Cashew nuts were primarily sold via primary societies, who acted as agents for private buyers. Under this system, competition was modest, but exporters/buyers managed to keep farm gate prices low despite an indicative farm gate price announced by the Cashewnut Board of Tanzania (CBT). Sometimes traders and buyers agreed to intentionally delay purchasing cashew nuts, causing farmers to panic and accept any price. The system attracted a large number of intermediaries, which led to higher marketing and transaction costs that further reduced farm gate prices (UNIDO, 2011).

Certain characteristics of the cashew market called for the implementation of a coordinated exchange mechanism, namely the introduction of the WRS in the 2007/08 cropping season. These characteristics include a lack of quality control and grading, as well as the absence of transparent market information globally. Since tree crops like cashew are asset specific investments, meaning
that the land cannot easily or cheaply be diverted to other crops, cashew growers lack bargaining power (Leonard and Straus, 2003). Finally, since the timing of engagement with the international market is very tight, as described above, it is necessary to ensure that production and marketing are streamlined (Akyoo and Mpenda, 2014).

Under the WRS, producers must provide estimates of their expected harvest to their primary cooperative society, known as AMCOs (Agricultural Marketing Co-operative Society). These estimates are then used to apply for loans to market the cashew nuts. Before the marketing season each year, the CBT and sector stakeholders convene to agree on and set an indicative price, intended to guide farmers in what they should expect based on the international market and production costs. The indicative price determines the total value of the loans requested. The government then issues guarantees to the banks providing the loans. Guarantees are administered through cooperative unions, which set loan limits for borrowers (Akyoo and Mpenda, 2014).

During harvest season, AMCOS consign the cashew nuts to designated warehouses for auctioning. Cashew season officially begins and bank financing is provided around early October (NMB, 2013). Warehouse operators report on the weight, grade, kernel outturn and moisture content of the cashew nut lots to cooperative unions on a weekly basis. Lots from the various primary cooperative societies are stored separately and are advertised in a sales catalogue for potential buyers. Interested buyers submit bids in a closed tender box located at union offices and are opened later that day to avoid misconduct. The bidding process is overseen by a committee of a maximum of 14 representatives from various institutions such as the CBT (chair of the committee), the warehouse licensing board, commercial banks, cooperative unions and cooperative societies (UNIDO, 2011).

Catalogues that are provided to buyers before bidding contain information on quality, quantity and type of cashews available. However, rather than gazetting auctions publicly, prospective buyers are informed about the auction by phone, a system that does not ensure equitable dissemination of information nor has the ability to attract new buyers (Akyoo and Mpenda, 2014). Several claims regarding the anti-competitive nature of the cashew auction in URT have been at least partially substantiated since there are only 22 main buying companies with a concentration ratio of over 40 percent, suggesting that it is oligopsonistic and therefore, likely collusive (Akyoo and Mpenda, 2014; NMB, 2013).

**Description of the value chain**

Primary societies were the sole marketers of cashew nuts from independence until 1991, when marketing was liberalized and farmers were allowed to sell to any buyer. Marketing changed again in 2007/08 with the introduction of the WRS, which requires that all raw cashew nuts are marketed through AMCOs for sale at auction.

Under the WRS, the structure of the value chain is as depicted in Figure 5. Producers either sell in domestic markets (left side of the figure) or export (right side of the figure). Exports must first go through AMCOs, which consigns the cashew to designated warehouses, where it is stored while it is marketed and sold at auction to exporters and processors. Before the WRS, exports would bypass the green boxes depicted in Figure 5, since farmers could sell directly to exporters and processors without having to go through the centralized warehouse and auction system. Since most cashews are exported unprocessed, the most common channel is to be sold via auction to exporters for processing elsewhere.
Figure 5: Schematic representation of the cashew nut value chain in URT

Cooperative unions and warehouses

There are over 700,000 households in the southern zone growing cashew, most of whom are smallholders. There are also production areas in the northern coastal regions, but to a much lesser extent. Farmers harvest the nuts between October and February. Raw nuts must be dried in the sun for at least 3 days in order to evaporate excess moisture, leaving moisture content of just 8-10 percent. Moisture exceeding this amount will cause the nuts to spoil and rot. After drying, the nuts are graded into standard and below standard 80 kg sisal bags before transport to warehouses by AMCOS (UNIDO, 2011).

Primary cooperative societies / AMCOS

Farmers are obliged to sell their cashew through primary cooperative societies (i.e. AMCOS). Small-scale cashew traders may also be members and sell on behalf of farmers. When selling to AMCOS, farmers receive a first payment, which is normally financed by credit undertaken by AMCOS. AMCOS in turn sell to buyers via the auction and charge farmers a fee for its services. In theory, AMCOS are supposed to use the income from the fee to build, upgrade and maintain storage facilities, and to eventually provide additional services such as input procurement and access to irrigation infrastructure. While irrigation still is not used in cashew production (CBT, 2012), AMCOS do purchase fertilizer and chemicals in bulk, as well as equipment such as sprayers and gunny bags. The second payment to farmers also includes a bonus if the cashews sell for more than expected at auction.

Cooperative unions and warehouses

More than 200 primary cooperative societies are organized under a total of six cooperative unions in URT: TANECU and MAMCU (grouping AMCOS located in Mtwara), ILULU (Lindi), TAMCU (Tunduru),

Source: Authors’ own elaboration based on UNIDO, 2011.
CORECU (Pwani) and DARECU (DSM). Cooperative unions procure large volumes of equipment and inputs for distribution to cooperatives and organize transportation of cashew nuts to warehouses. They also acquire and transfer loans to their respective cooperatives (UNIDO, 2011).

When cashews are deposited in certified warehouses, a receipt is provided to AMCOS. The lots are separated by cooperative and auctioned to buyers by the cooperative union, which prepares the sales catalogues for each consignment based on weekly information provided by warehouse operators. Around 26 privately owned and certified warehouses are dispersed throughout the country’s cashew production areas, with the capacity to store more than 160,000 tonnes of cashew nuts. In addition, smaller, community level warehouses also function as assembly points (NMB, 2013).

Processors
About 15 percent of total cashew production is processed. Primary processing involves the steps before, as well as shellling, and may be outsourced or done by the secondary processors, who then peel, sort and pack the cashews. This latter step requires higher hygienic and quality standard certification. Small-scale or ‘cottage’ processors usually operate individually, shellling, peeling and roasting cashews by hand for sale in small roadside stands (UNIDO, 2011).

Only five of the country’s 11 processing facilities are currently operating, with a combined processing capacity of about 40,000 tonnes. Olam Ltd in Mtwara is currently the largest cashew processor, with the capacity to produce 25,000 tons of processed cashew per annum. Other large-scale processors are Export Trading Company in Tunduru and Mohammed Enterprise in Dar es Salaam, which have a maximum processing capacity of 5,000 tonnes per annum. Jumbo Nut in Dar es Salaam and Perfect Cashew Nut in Masasi are medium-scale processors, with a maximum processing capacity of 3,000 tonnes per annum.

Traders
Various types of international and domestic traders buy cashew for both local and multinational companies. From 2005 to 2013, an average 94 percent of cashew nuts was exported unprocessed to India, while the remainder is processed (i.e. de-shelled and peeled) before export to the United States, European Union, and Middle East. Often, large-scale processors are also major exporters. The power of exporters is limited by the concentration of buyers in India; with concentration of raw cashew purchases in two main buyers (UNIDO, 2011).

Indian processors can afford to pay higher prices for raw nuts since the government subsidizes these purchases in order to keep the industry going in the off-season. Exports of raw nuts bring immediate cash to traders, whereas, although processed nuts would fetch a higher price, the return is much farther away. Furthermore, the market for processed cashew exports is still under-developed.

Value chain governance and power relationships between actors
Prior to the WRS, exporters/buyers enjoyed significant market power over farm gate prices. Although the WRS aims to address this problem, significant market power is still concentrated among a few main buyers in India that purchase raw cashew nuts from various exporters. Of the 89 buyers who were licensed in the 2011/12 marketing season, over half did not register for the following season. This suggests there may be anti-competitive behavior. The lack of diversification in URT’s cashew export market increases the risk for collusion and fixed prices (Akyoo and Mpenda, 2014).
Cashew processors are currently in a weaker position than exporters given their difficulties to finance and access raw materials. Before the WRS was introduced, processors could purchase inputs directly from farmers and maximize profits by paying farmers a lower price. However, under the new marketing system, they must compete at auction with exporters who have a much faster return on investment (UNIDO, 2011).

This unequal distribution of power between value chain actors is compounded by the fact that the auction system is not transparent. The prices at which lots were sold and the winning bidders are not officially published at the end of the buying season (UNIDO, 2011). Furthermore, there are reports that buyers have been permitted to change their bid during the auction, which is supposed to be conducted by sealed bid (Mitchell and Baregu, 2012).

Policy decisions and measures
The cashew sector in URT involves several ministries, often with overlapping mandates. The Ministry of Agriculture, Food Security and Cooperatives (MAFC) oversees the crop and its production, the WRS operates under the auspices of the Ministry of Industry and Trade (MIT) and the Local Government Authority (LGA) while the cashew nuts themselves are under the jurisdiction of the CBT. Furthermore, the Central Bank of Tanzania is involved as a guarantor of the financing from commercial banks, which are lending to the cooperatives in order to pay the farmers.

All crop boards affiliated with the MAFC are required to align their budget with the Medium Term Expenditure Framework (MTEF). The National Cashew Development Strategy, 2007/08-2009/10 defines the CBT’s role in national and international regulation and development of the industry and includes short-term targets related to: increasing productivity through the provision of improved seedlings to increase tree density of existing plantations, training and R&D dissemination to farmers, improving cashew nut quality and promoting domestic processing through rehabilitation of idle processing factories.

In recent years, policy measures have had the overall objective of protecting farmers and promoting domestic value addition. However, they have resulted in one of the most heavily taxed cashew sectors in the world and a highly regulated and politicized policy environment. Key policies directly affecting the cashew sector during the period under review (2005-2013) are summarized in detail below according to several broad areas of intervention.

Commercialization and marketing
In 2005, the Warehouse Receipt Act was adopted to increase farmers’ access to credit and investment. Under this Act, a Warehouse Receipt System (WRS) was piloted in Mtwara in 2007 and subsequently implemented across the entire sector in 2009. Warehouse receipts are common tools often used within a liberalized marketing system. However, according to Mitchell and Baregu (2012), implementation of the WRS involved three major changes to URT’s liberalized marketing system for cashew nuts:

1. Farmers are obliged to sell their cashew production to AMCOS, which obtains credit from cooperative unions. The cooperative unions operate as brokers without taking ownership of the cashew nuts and provide access to loans from commercial banks.

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3 Refer to Annex I for details on the CBT.
2. Cashew nuts are used as collateral for the loans, which are further secured by government guarantees.

3. All cashew nuts for export must be sold via blind auction markets managed by the CBT.

The WRS functions under several governing bodies: the MAFC, MIT, the Local Government Authority (LGA) and the Central Bank of Tanzania (Akyoo and Mpenda, 2014). The Cashewnut Industry Act of 2009 affirms in clause 15 that private traders have a legal right to participate in the WRS. However, cooperatives and local or central political pronouncements have banned private traders for out-bidding and outcompeting cooperatives (Akyoo and Mpenda, 2014). Cashew traders are entitled by law but forbidden by politicians to participate in the cooperative system and cashew nut producers might only be accepted if they wish to export their produce. The only other option is to operate in a thin domestic market (Akyoo and Mpenda, 2014).

A registered farmer may, for the purpose of facilitating farming activities, enter into a contract for farming with any cashew nut production financier, buyer, processor or any other person interested in sponsoring production and marketing of the farmer’s produce. Every contract for farming made must be submitted to the CBT for perusal and registration. The CBT has the mandate to monitor the implementation of contracts in order to protect the interests of both parties. A person registered as a cashew nut buyer, seller, processor, exporter, importer, warehouse owner or operator is required to apply for a license.

**Indicative Prices**

An indicative price is set by a stakeholder committee which is overseen by the CBT. The price is based on both the cost of production for farmers and the export parity price. The indicative price at auction is the indicative farm gate price plus all fees for warehouse services, cooperative levies and district produce cess. The indicative price is taken by many to be a season long floor price; however, this has resulted in market failures in the past since market prices sometimes fall later in the season (Akyoo and Mpenda, 2014).

**Taxes to production**

An agricultural produce Cess is collected by the LGAs at 5 percent of the farm gate price. Other taxes and levies faced by cashew farmers are; a Development levy, an Education levy (together 2.2 percent of farm gate price), and the optional Pembejo levy of 3 percent that the government matches in contribution to subsidized inputs; farmers who do not contribute do not receive the subsidy (World Bank, 2009).

**Subsidies and support to production**

The government funds the Naliendele Agricultural Research Institute (NARI) located in Mtwara. NARI is one of seven agricultural research zonal centers in URT under the MAFC. It covers the Regions of Mtwara and Lindi, as well as the Tunduru District in the Ruvuma Region, located in the southeastern corner of the country. It was established in 1970 and was entrusted with the mandate to conduct agricultural research that addresses the needs and aspirations of the farmers, particularly improved crop productivity and quality. NARI coordinates Cashew and Oilseed crops at national level and collaborates within and outside the country in verifying research outputs.
There are 10 Cashewnut Development Centers (CDC), or research/trial sites, under NARI where improved cashew varieties that are tolerant to powdery mildew, for example, are developed and cloned. Although the CDCs also function as training and extension centres for farmers, the uptake of improved varieties has been limited. Farmers have not yet invested in this new technology to any meaningful extent even though uncontrolled, powdery mildew can reduce crop yield by up to 70 percent.

In 2010/11, the government established the Cashew Development Trust Fund (CDTF), which uses 6 percent of the revenue from the export tax on raw cashew nuts, as well as an annual budget from the MAFC, to subsidize inputs for cashew farmers. Primary cooperative societies pay 50 percent of the market value of input costs, while the fund subsidizes the remainder. The CBT approves suppliers and disburses funds from the account.

**International trade**

The government removed the export tax on processed cashew nuts in 2004/05 and gradually raised the tax levied on raw cashew nut exports to encourage in-country processing. In 2005, the 3 percent export tax on raw cashew nuts was raised to 8.5 percent, and then to 10 percent in 2006, and finally to 15 percent in 2010 (UNIDO, 2011).

**Tax revenue and public expenditure towards the cashew sector**

According to the CBT (2012), revenues from the export tax on raw cashew, which are not transferred to the national treasury, are to be distributed according to objectives and priorities set by the cashew stakeholder’s forum. Since 2006, tax revenues should have been distributed according to the structure shown in Table 2.

**Table 2: Distribution of revenues from the export tax on raw cashew nuts, 2006-2014**

<table>
<thead>
<tr>
<th>Year</th>
<th>2006-2009</th>
<th>2010-2014</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Tax Rate (%) of FOB</strong></td>
<td>10%</td>
<td>15%</td>
</tr>
<tr>
<td><strong>Distribution (allocations as % of total tax revenue)</strong></td>
<td>Treasury (35%)</td>
<td>Treasury (35%)</td>
</tr>
<tr>
<td></td>
<td>Inputs (55%)</td>
<td>Agrochemical subsidies (35%)</td>
</tr>
<tr>
<td></td>
<td>Research (10%)</td>
<td>Research (7%)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Marketing and branding (7%)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Administration costs of the CBT (7%)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Cashew Development Trust Fund (7%)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Local Government Authorities (3%)</td>
</tr>
</tbody>
</table>

*Source: UNIDO, 2011 and CBT, 2012.*

Figure 6 shows that the estimated revenue from the export tax far exceeded the amount spent on the cashew nut sector each year, with the expenditure to revenue ratio ranging from 30 percent in 2006/07 to only 4 percent in 2012/13. On average, only about 13 percent of the total revenue generated from the export tax was channeled back into the sector, as compared to the intended 65 percent (Table 2).
Figure 6: Revenue from the cashew export tax vs. public expenditure allocated to the cashew nut sector, 2007-2013

Note: Estimated revenue skyrockets in 2011 because export volumes almost doubled and FOB prices increased by 15 percent.

According to MAFAP’s Public Expenditure Analysis, funds were allocated to the cashew sector through the MAFC’s recurrent budget to the Naliendele Cashewnut Research Institute for agricultural research, extension and technology transfer from 2009/10 to 2012/13. The Cashew Board of Tanzania also received budgetary support through the MAFC from 2006/07 to 2012/13 for training, marketing and administrative costs.

Table 3: Public expenditure allocated to cashew sector from 2007 to 2013

<table>
<thead>
<tr>
<th>(TZS Millions)</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
</tr>
</thead>
<tbody>
<tr>
<td>Naliendele Cashewnut Research Institute</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>200</td>
<td>170</td>
<td>170</td>
<td>100</td>
</tr>
<tr>
<td>Tanzania Cashewnut Board (Marketing and Training)</td>
<td>1 110</td>
<td>568</td>
<td>872</td>
<td>995</td>
<td>1 143</td>
<td>962</td>
<td>702</td>
</tr>
<tr>
<td>Total Policy Transfers to Cashew nuts</td>
<td>1 110</td>
<td>568</td>
<td>872</td>
<td>1 195</td>
<td>1 313</td>
<td>1 132</td>
<td>802</td>
</tr>
</tbody>
</table>

Source: Author’s calculations, 2014.
3. Methodology

MAFAP methodology seeks to measure price incentives for producers and other marketing agents in key agricultural value chains. The analysis is based on the comparison between observed domestic prices and constructed reference prices. Reference prices are calculated from the international price of the product at the country’s border, where the product enters the country (if imported) or exits the country (if exported). This price is considered the benchmark price free of influence from domestic policies and markets. MAFAP estimates two types of reference prices – observed and adjusted. Observed reference prices are those that producers and other marketing agents could receive if the effects of distortions from domestic market and trade policies, as well as overall market performance, were removed. Adjusted reference prices are the same as observed reference prices, but also exclude the effects of any additional distortions from domestic exchange rate policies, structural inefficiencies in the commodity’s value chain, and imperfect functioning and non-competitive pricing in international markets.

MAFAP’s price incentives analysis is based on the law of one price, which is the economic theory that there is only one prevailing price for each product in a perfectly competitive market. This law only applies in the case of homogeneous goods, if information is correct and free, and if transaction costs are zero. Thus, this analysis was conducted for goods that are either perfectly homogeneous or perfect substitutes in the local market in terms of quality, or, failing that, are simply comparable goods. Indicators calculated from reference and domestic prices will, therefore, reveal whether domestic prices represent support (incentives) or a tax (disincentives) to various agents in the value chain.

Domestic prices are compared to reference prices at two specific locations along commodity value chains – the farm gate (usually the main production area for the product) and the point of competition (usually the main wholesale market where the domestic product competes with the internationally traded product). The approach for comparing prices at each location is summarized below, using an imported commodity as an example. In this situation, the country is importing a commodity that arrives in the port at the benchmark price (usually the unit value CIF price at the port of entry). In the domestic market, we observe the price of the same commodity at the point of competition, which is in this case the wholesale market, and at the farm gate. We also have information on observed access costs, which are all the costs associated with bringing the commodity to market, such as costs for processing, storage, handling, transport and the different margins applied by marketing agents in the value chain. These include access costs between the border and wholesale, as well as between the farm gate and wholesale.

The benchmark price is made comparable to the domestic price at wholesale by adding the access costs between the border and wholesale, resulting in the observed reference price at wholesale. This takes into account all the costs incurred by importers and other agents to bring the commodity to market, which in effect, raises the price of the commodity. The reference price at wholesale is further made comparable to the domestic price at the farm gate by deducting the access costs between the farm gate and wholesale, resulting in the observed reference price at farm gate. This takes into account all the costs incurred by farmers and other agents to bring the commodity from the farm to the wholesale market. Mathematically, the equations for calculating the observed
reference prices at wholesale ($RP_{owh}$) and farm gate ($RP_{ofg}$) for an imported commodity are as follows:

$$RP_{owh} = P_b + AC_{owh}$$

$$RP_{ofg} = RP_{owh} - AC_{ofg}$$

where $AC_{owh}$ are the observed access costs from the border to wholesale, including handling costs at the border, transport costs from the border to the wholesale market, profit margins and all observed taxes and levies, except tariffs, and $P_b$ is the benchmark price. $AC_{ofg}$ are the observed access costs from the farm gate to wholesale, including handling costs at the farm, transport costs from farm to wholesale market, processing, profit margins and all observed taxes and levies.

The same steps described above can be taken a second time using benchmark prices and access costs that have been adjusted to eliminate market distortions due to exchange rate misalignments, structural inefficiencies in the commodity’s value chain and imperfect functioning and non-competitive pricing in international markets, where possible and relevant. The adjusted benchmark prices and access costs are then used to generate a second set of adjusted reference prices, in addition to the first set of observed reference prices calculated.

For exported commodities, a slightly different approach is used. In this case, the border is generally considered the point of competition (wholesale), and the unit value FOB price for the commodity is normally taken as the benchmark price. Furthermore, observed and adjusted reference prices at wholesale are obtained by subtracting, rather than adding, the access costs between the border and wholesale. Mathematically, the equations for calculating the observed reference prices at wholesale ($RP_{owh}$) and farm gate ($RP_{ofg}$) for an exported commodity are as follows:

$$RP_{owh} = P_b - AC_{owh}$$

$$RP_{ofg} = RP_{owh} - AC_{ofg}$$

After observed and adjusted reference prices are calculated for the commodity, they are subtracted from the domestic prices at each point in the value chain to obtain the observed and adjusted price gaps at wholesale and farm gate. Observed price gaps capture the effect of distortions from trade and market policies directly influencing the price of the commodity in domestic markets (e.g. price ceilings and tariffs), as well as overall market performance. Adjusted price gaps capture the same as the observed, in addition to the effect of any distortions from domestic exchange rate policies, structural inefficiencies in the commodity’s value chain, and imperfect functioning and non-competitive pricing in international markets. Mathematically, the equations for calculating the observed price gaps at wholesale ($PG_{owh}$) and farm gate ($PG_{ofg}$) are as follows:

$$PG_{owh} = P_{wh} - RP_{owh}$$

$$PG_{ofg} = P_{fg} - RP_{ofg}$$

---

4 Structural inefficiencies in commodity value chains may include government taxes and fees (excluding fees for services), high transportation and processing costs, high profit margins captured by various marketing agents, bribes and other non-tariff barriers.
where \( P_{fg} \) is the domestic price at farm gate, \( RP_{ofg} \) is the observed reference price at farm gate, \( P_{wh} \) is the domestic price at wholesale, and \( RP_{owh} \) is the observed reference price at wholesale.

A positive price gap, resulting when the domestic price exceeds the reference price, means that the policy environment and market functioning as a whole generate incentives (support) to producers or wholesalers. For an imported commodity this could be due to distortions such as the existence of an import tariff. On the other hand, if the reference price exceeds the domestic price, resulting in a negative price gap, this means that the policy environment and market functioning as a whole generate disincentives (taxes) to producers or wholesalers. For an imported commodity this could be due to distortions such as a price ceiling established by the government to keep domestic prices low.

In general, price gaps provide an absolute measure of the market price incentives (or disincentives) that producers and wholesalers face. Therefore, price gaps at wholesale and farm gate are divided by their corresponding reference price and expressed as a ratio, referred to as the Nominal Rate of Protection (NRP), which can be compared between years, commodities, and countries.

The Observed Nominal Rates of Protection at the farm gate \( (NRP_{ofg}) \) and wholesale \( (NRP_{owh}) \) are defined by the following equations:

\[
NRP_{ofg} = \frac{PG_{ofg}}{RP_{ofg}} \quad \text{and} \quad NRP_{owh} = \frac{PG_{owh}}{RP_{owh}}
\]

where \( PG_{ofg} \) is the observed price gap at farm gate, \( RP_{ofg} \) is the observed reference price at the farm gate, \( PG_{owh} \) is the observed price gap at wholesale and \( RP_{owh} \) is the observed reference price at wholesale.

Similarly, the Adjusted Nominal Rates of Protection at the farm gate \( (NRP_{afg}) \) and wholesale \( (NRP_{awh}) \) are defined by the following equations:

\[
NRP_{afg} = \frac{PG_{afg}}{RP_{afg}} \quad \text{and} \quad NRP_{awh} = \frac{PG_{awh}}{RP_{awh}}
\]

where \( PG_{afg} \) is the adjusted price gap at farm gate, \( RP_{afg} \) is the adjusted reference price at the farm gate, \( PG_{awh} \) is the adjusted price gap at wholesale and \( RP_{awh} \) is the adjusted reference price at wholesale.

If public expenditure allocated to the commodity is added to the price gap at farm gate when calculating the ratios, the Nominal Rate of Assistance (NRA) is generated. This indicator summarizes the incentives (or disincentives) due to policies, market performance and public expenditure. Mathematically, the Nominal Rate of Assistance is defined by the following equation:

\[
NRA = \frac{PG_{afg} + PE_{csp}}{RP_{afg}}
\]

where \( PE_{csp} \) is commodity-specific public expenditure that has been identified and measured as monetary units per tonne.

Finally, MAFAP methodology estimates the Market Development Gap (MDG), which is the portion of the price gap that can be attributed to “excessive” or inefficient access costs within a given value
chain, exchange rate misalignments, and imperfect functioning of international markets. “Excessive” access costs may result from factors such as poor infrastructure, high processing costs due to obsolete technology, government taxes and fees (excluding fees for services), high profit margins captured by various marketing agents, bribes and other non-tariff barriers. Therefore, the total MDG at farm gate is comprised of three components – gaps due to “excessive” access costs, the exchange rate policy gap and the international market gap. When added together, these components are equivalent to the difference between the observed and adjusted price gaps at farm gate.

Similar to the price gaps calculated, the MDG is an absolute measure, which is also expressed as a ratio to allow for comparison between years, commodities, and countries. This relative indicator of the total MDG affecting farmers is derived by calculating the ratio between the total MDG at farm gate and the adjusted reference price at farm gate as follows:

$$MDG_{fg} = \frac{(ACG_{wh} + ACG_{fg} + EXPG + IMG)}{RP_{afg}}$$

where $ACG_{wh}$ is the access cost gap at wholesale defined as the difference between observed and adjusted access costs at wholesale, $ACG_{fg}$ is the access cost gap at farm gate defined as the difference between observed and adjusted access costs at the farm gate, $ERPG$ is the exchange rate policy gap, and $IMG$ is the international market gap.

A more detailed description of the methodology applied in this analysis is available on MAFAP’s website at www.fao.org/in-action/mafap.

4. Data requirements and calculation of indicators

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

National data was used in this analysis for crop years 2004/05 to 2012/13, but taken as years 2005-2013 for the purpose of this analysis.

Trade status of the product
This analysis focuses on the raw cashew nut value chain since processing is limited and thus not representative of the sector. URT was a net exporter of raw cashew nuts in all years, with an average of 90 percent of total production exported during the period under review (Table 1).

Market pathway analysed
As depicted in Figure 7, cashew nuts are produced in the southern regions of the country, particularly in Mtwara (66 percent), Lindi (22 percent), Pwani (6 percent) and Ruvuma (5 percent). The farm gate price used in the analysis is the average final price paid to farmers in all regions.

Since the 2007/08 crop season, all cashew nuts are sold to AMCOs and deposited in certified warehouses located in each producing region. There are around 26 privately owned warehouses in the cashew growing areas with capacity of more than 160 000 tonnes. In addition, community level warehouses function as assembly points (NMB, 2013). There are more than 200 AMCOS organized
under six co-operative unions (CUs) that each have an auction managed by the CBT, where cashews are sold through a blind ballot system. The district CU auctions are: TANECU and MAMCU (grouping AMCOS located in Mtwara), ILULU (Lindi), TAMCU (Tunduru), CORECU (Pwani), and DARECU (Dar es Salaam).

Although the auction is considered the point of competition, cashews are physically stored in warehouses until they are sold and transported to the port for shipping. Raw cashew nuts are mainly shipped from the port in Mtwara to India and Vietnam for processing.

**Figure 7: Market pathway for cashew nut in the United Republic Tanzania**

![Map of Tanzania showing market pathway for cashew nut](image)

Source: Adaptation of Australian Government, Department of Foreign Affairs and Trade, 2014.

**Benchmark prices**

*Observed*

Benchmark prices are taken as the unit export value of raw cashew nuts (FOB in US$/tonne) as reported by the CBT.
Figure 8 compares the CBT reported price with other available data sources. As the primary institution concerned with cashew marketing and trade, the CBT monitors all exports and their corresponding FOB prices and is therefore the most accurate reporter. Furthermore, the CBT price follows a similar trend to that of UN Comtrade in all years except 2009.

The FOB price reported by the Tanzania Revenue Authority (TRA) is much lower than the other prices reported and is unrealistic when compared with the auction price plus access costs, particularly in 2010 and 2011.

![Figure 8: Comparison of FOB prices for raw cashew nuts from available information sources (US$/tonne)](image)

Sources: UN Comtrade, TRA and CBT, 2014.

### Domestic prices

**Observed prices at point of competition**

The average auction price for raw cashew nuts, as reported by the CBT, is taken as the price at the point of competition. Since the cashew auction was established during the 2007/08 crop season, prices were only available for years 2008 to 2013 (Table 4).

**Table 4: Auction price for raw cashew nuts in URT (TZS/tonne), 2008-2013**

<table>
<thead>
<tr>
<th>Year</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
</tr>
</thead>
</table>
Observed prices at producer level

At the beginning of the cashew marketing season, the CBT sets an indicative farm gate price based on production costs and international market dynamics. Before the introduction of the WRS, farmers rarely received this. However, after the introduction of the WRS in 2008, farmers were able to receive 75 percent of the indicative payment when they deposit the cashew in the warehouse, and the remaining 25 percent when the cashews are sold. Furthermore, if the price at auction is higher than the indicative auction price, farmers will receive a bonus payment as well. The indicative price plus the bonus constitute the average final price to farmers (Table 5).

Table 5: Indicative and final farm gate price for raw cashew nuts in URT (TZS/tonne)

<table>
<thead>
<tr>
<th>Year</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indicative farm gate price in</td>
<td>750 000</td>
<td>600 000</td>
<td>600 000</td>
<td>610 000</td>
<td>670 000</td>
<td>700 000</td>
<td>800 000</td>
<td>1 200 000</td>
<td>1 200 000</td>
</tr>
<tr>
<td>Average final price to farmers</td>
<td>600 000</td>
<td>500 000</td>
<td>370 000</td>
<td>690 000</td>
<td>670 000</td>
<td>885 000</td>
<td>1 440 000</td>
<td>1 340 000</td>
<td>NA</td>
</tr>
</tbody>
</table>

Source: Akyoo & Mpenda, 2014 (as reported by CBT).

Exchange rates

Observed

Average nominal exchange rates between the Tanzanian Shilling (TZS) and the US Dollar (US$) are used in this analysis. These exchange rates were obtained from the Bank of Tanzania (BoT) and are shown in Table 6.

Table 6: Average Nominal Exchange Rates (TZS/US$), 2005-2013

<table>
<thead>
<tr>
<th>Year</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
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<td>1 320</td>
<td>1 400</td>
<td>1 574</td>
<td>1 583</td>
<td>1 599</td>
</tr>
</tbody>
</table>

Source: Bank of Tanzania.

Adjusted

Exchange rates were not adjusted in this analysis.

Access costs

Point of competition to border

Table 7 shows the access costs between the auction and border have been obtained from the CBT in US$ per tonne for crop year 2012/13 (taken as year 2013) and converted to TZS per tonne based on
the nominal exchange rate. They have then been extrapolated for all other years in the study period using URT’s Consumer Price Index (CPI). Margins of 5 percent have been added to this segment of the value chain.

The only adjustment has been the removal of the Value Added Tax (VAT) applied by the Tanzania Port Authority (TPA), as shown in Table 7.
Table 7: Observed and adjusted access costs between the auction and the border for raw cashew nuts in URT (TZS/tonne), 2005-2013

<table>
<thead>
<tr>
<th>YEAR</th>
<th>ER</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
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</thead>
<tbody>
<tr>
<td>TZA CPI</td>
<td>66</td>
<td>71</td>
<td>76</td>
<td>84</td>
<td>94</td>
<td>100</td>
<td>113</td>
<td>131</td>
<td>141</td>
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</tr>
<tr>
<td>Transport charges</td>
<td>37 609</td>
<td>40 336</td>
<td>43 170</td>
<td>47 607</td>
<td>53 387</td>
<td>56 697</td>
<td>63 893</td>
<td>74 116</td>
<td>79 950</td>
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<tr>
<td>Labour charges</td>
<td>18 804</td>
<td>20 168</td>
<td>21 585</td>
<td>23 803</td>
<td>26 694</td>
<td>28 349</td>
<td>31 946</td>
<td>37 058</td>
<td>39 975</td>
<td></td>
</tr>
<tr>
<td>TPA wharfage</td>
<td>4 513</td>
<td>4 840</td>
<td>5 180</td>
<td>5 713</td>
<td>6 406</td>
<td>6 804</td>
<td>7 667</td>
<td>8 894</td>
<td>9 594</td>
<td></td>
</tr>
<tr>
<td>TPA handling</td>
<td>10 530</td>
<td>11 294</td>
<td>12 088</td>
<td>13 330</td>
<td>14 948</td>
<td>15 875</td>
<td>17 890</td>
<td>20 753</td>
<td>22 386</td>
<td></td>
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<tr>
<td>VAT on the TPA</td>
<td>3 009</td>
<td>3 227</td>
<td>3 454</td>
<td>3 809</td>
<td>4 271</td>
<td>4 536</td>
<td>5 111</td>
<td>5 929</td>
<td>6 396</td>
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</tr>
<tr>
<td>Documentation fees</td>
<td>1 504</td>
<td>1 613</td>
<td>1 727</td>
<td>1 904</td>
<td>2 135</td>
<td>2 268</td>
<td>2 556</td>
<td>2 965</td>
<td>3 198</td>
<td></td>
</tr>
<tr>
<td>Storage charges</td>
<td>1 504</td>
<td>1 613</td>
<td>1 727</td>
<td>1 904</td>
<td>2 135</td>
<td>2 268</td>
<td>2 556</td>
<td>2 965</td>
<td>3 198</td>
<td></td>
</tr>
<tr>
<td>Loading and unloading</td>
<td>6 017</td>
<td>6 454</td>
<td>6 907</td>
<td>7 617</td>
<td>8 542</td>
<td>9 072</td>
<td>10 223</td>
<td>11 859</td>
<td>12 792</td>
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</tr>
<tr>
<td>Clearing &amp; Forward charges</td>
<td>1 504</td>
<td>1 613</td>
<td>1 727</td>
<td>1 904</td>
<td>2 135</td>
<td>2 268</td>
<td>2 556</td>
<td>2 965</td>
<td>3 198</td>
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<tr>
<td>SGS charges</td>
<td>752</td>
<td>807</td>
<td>863</td>
<td>952</td>
<td>1 068</td>
<td>1 134</td>
<td>1 278</td>
<td>1 482</td>
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<tr>
<td>Weighing charges</td>
<td>1 504</td>
<td>1 613</td>
<td>1 727</td>
<td>1 904</td>
<td>2 135</td>
<td>2 268</td>
<td>2 556</td>
<td>2 965</td>
<td>3 198</td>
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<tr>
<td>Weight shortage</td>
<td>20 309</td>
<td>21 781</td>
<td>23 312</td>
<td>25 708</td>
<td>28 829</td>
<td>30 617</td>
<td>34 502</td>
<td>40 023</td>
<td>43 173</td>
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</tr>
<tr>
<td>Overhead costs and bank charges</td>
<td>11 283</td>
<td>12 101</td>
<td>12 951</td>
<td>14 282</td>
<td>16 016</td>
<td>17 009</td>
<td>19 168</td>
<td>22 235</td>
<td>23 985</td>
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<tr>
<td>Trader margins</td>
<td>193 059</td>
<td>180 576</td>
<td>145 899</td>
<td>187 294</td>
<td>219 780</td>
<td>239 400</td>
<td>311 652</td>
<td>324 832</td>
<td>333 871</td>
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</tr>
<tr>
<td>Adjusted margins (5%)</td>
<td>53 628</td>
<td>50 161</td>
<td>40 528</td>
<td>52 026</td>
<td>61 050</td>
<td>66 500</td>
<td>86 570</td>
<td>90 231</td>
<td>92 742</td>
<td></td>
</tr>
<tr>
<td>Total Observed (TZS/tonne)</td>
<td>311 903</td>
<td>308 037</td>
<td>282 315</td>
<td>337 731</td>
<td>388 484</td>
<td>418 564</td>
<td>513 554</td>
<td>559 040</td>
<td>586 513</td>
<td></td>
</tr>
<tr>
<td>Total Adjusted (TZS/tonne)</td>
<td>169 463</td>
<td>174 395</td>
<td>173 490</td>
<td>198 655</td>
<td>225 483</td>
<td>241 128</td>
<td>283 360</td>
<td>318 510</td>
<td>338 988</td>
<td></td>
</tr>
</tbody>
</table>


Farm gate to point of competition

Access costs from the farm gate to the point of competition have likewise been obtained from the CBT for crop years 2004/05 to 2012/13 (taken as years 2005 to 2013). An estimated profit margin equal to 10 percent of the farm gate price was added to the observed costs before the introduction of the WRS and decreased to 5 percent in the adjusted domain. The margin is not charged after since the fees charged by the CUs should cover their margins. Other adjustments include the removal of the district cess as per MAFAP methodology, fumigation and weighing scale certification and cash distribution charges since, as noted by Akyoo and Mpenda (2014), these fees essentially double charge the value chain for services that should already be included in the warehouse/storage fees and the primary cooperative (AMCOS) levy (Table 8).
Table 8: Access costs from farm gate to auction for raw cashew nuts in URT (TZS/tonne)

<table>
<thead>
<tr>
<th></th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
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</thead>
<tbody>
<tr>
<td><strong>OPERATIONAL COSTS</strong></td>
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<tr>
<td>AMCOS Levy</td>
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<td>50 000</td>
<td>50 000</td>
<td>50 000</td>
<td>50 000</td>
<td>50 000</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Union Levy</td>
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</tr>
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<td>District Council Produce Cess</td>
<td>37 500</td>
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<td></td>
</tr>
<tr>
<td>Warehouse/Storage</td>
<td>8 000</td>
<td>17 000</td>
<td>17 000</td>
<td>15 000</td>
<td>14 000</td>
<td>14 000</td>
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<td>Transportation</td>
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<td>Shrinkage</td>
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<td>13 400</td>
<td>13 500</td>
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<td>6 000</td>
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<td>Fumigation and weighing scale certification</td>
<td>2 000</td>
<td>2 000</td>
<td>2 800</td>
<td>3 148</td>
<td>1 000</td>
<td>500</td>
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<td>Loan interest</td>
<td>15 000</td>
<td>8 000</td>
<td>18 000</td>
<td>18 000</td>
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<td>Bank costs</td>
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<td><strong>COST OF PURCHASING RCN</strong></td>
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<td></td>
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<tr>
<td>Gunny bags and rope</td>
<td>27 500</td>
<td>27 500</td>
<td>27 500</td>
<td>27 500</td>
<td>31 250</td>
<td>31 500</td>
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<td>1 000</td>
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<td>1 000</td>
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<td>1 000</td>
<td>1 000</td>
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</tr>
<tr>
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<td>1 000</td>
<td>1 000</td>
<td>1 400</td>
<td>1 574</td>
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</tr>
<tr>
<td>Cash distribution</td>
<td>6 000</td>
<td>5 000</td>
<td>5 000</td>
<td>5 000</td>
<td>5 000</td>
<td>5 000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Source: UNIDO, CBT</strong></td>
<td></td>
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<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Margin (10%)</td>
<td>60 000</td>
<td>50 000</td>
<td>37 000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adjusted Margin (5%)</td>
<td>30 000</td>
<td>25 000</td>
<td>18 500</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total Observed (TZS/tonne)</strong></td>
<td>191 000</td>
<td>170 500</td>
<td>157 500</td>
<td>229 500</td>
<td>249 500</td>
<td>265 100</td>
<td>260 722</td>
<td>286 000</td>
<td>266 750</td>
</tr>
<tr>
<td><strong>Total Adjusted (TZS/tonne)</strong></td>
<td>123 500</td>
<td>115 500</td>
<td>109 000</td>
<td>191 000</td>
<td>208 750</td>
<td>222 300</td>
<td>212 574</td>
<td>220 000</td>
<td>201 250</td>
</tr>
</tbody>
</table>

Sources: UNIDO (2011); CBT (2014).

Budget and other transfers
The amount of public spending allocated to the cashew sector was obtained from MAFAP’s agricultural public expenditure database, though data is only available for years 2007-2013. As shown in Table 7, total expenditure on cashew was divided by total cashew production to derive the amount of budgetary transfers per tonne of cashew produced in each respective year (Table 9).
Table 9: Budgetary transfers to the cashew nut sector (TZS/tonne), 2007-2013

<table>
<thead>
<tr>
<th></th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
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<tbody>
<tr>
<td>Agricultural Research</td>
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</tr>
<tr>
<td>Training</td>
<td>555 120 000</td>
<td>283 997 333</td>
<td>436 001 141</td>
<td>497 627 933</td>
<td>571 424 667</td>
<td>481 089 000</td>
<td>350 947 747</td>
</tr>
<tr>
<td>Extension / technology transfer</td>
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<tr>
<td>Marketing</td>
<td>555 120 000</td>
<td>283 997 333</td>
<td>436 001 141</td>
<td>497 627 933</td>
<td>571 424 667</td>
<td>481 089 000</td>
<td>350 947 747</td>
</tr>
<tr>
<td>CBT administration costs</td>
<td>555 120 000</td>
<td>283 997 333</td>
<td>436 001 141</td>
<td>497 627 933</td>
<td>571 424 667</td>
<td>481 089 000</td>
<td>350 947 747</td>
</tr>
<tr>
<td>TOTAL (without administration)</td>
<td>1 110 240 000</td>
<td>567 994 667</td>
<td>872 002 282</td>
<td>1 195 255 867</td>
<td>1 312 849 333</td>
<td>1 132 178 000</td>
<td>801 895 493</td>
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<tr>
<td>Production volume</td>
<td>92 573</td>
<td>99 107</td>
<td>79 069</td>
<td>75 367</td>
<td>121 135</td>
<td>158 719</td>
<td>127 947</td>
</tr>
<tr>
<td>Budgetary transfer per tonne</td>
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<tr>
<td></td>
<td>11 993</td>
<td>5 731</td>
<td>11 028</td>
<td>15 859</td>
<td>10 838</td>
<td>7 133</td>
<td>6 267</td>
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</table>


Quality and quantity adjustments
In this analysis there is no quantity or quality conversion because the product analysed is exported unprocessed.

Data overview
Following the discussions above, below is a summary of the main sources and methodological decisions taken for the analysis of price incentives and disincentives for cashew nuts in URT as explained in the methodology section.

Table 10: Data sources and methodological choices

<table>
<thead>
<tr>
<th>Concept</th>
<th>Description</th>
<th>Observed</th>
<th>Adjusted</th>
</tr>
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<tr>
<td>Benchmark price</td>
<td>FOB as reported by the CBT</td>
<td>N.A.</td>
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<tr>
<td>Domestic price at point of competition</td>
<td>Average auction price as reported by CBT</td>
<td>N.A.</td>
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</tr>
<tr>
<td>Domestic price at farm gate</td>
<td>Final farm gate price as reported by CBT via Akyoo &amp; Mpenda (2014)</td>
<td>N.A.</td>
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</tr>
<tr>
<td>Exchange rate</td>
<td>Average nominal exchange rate as reported by BoT</td>
<td></td>
<td>Not adjusted</td>
</tr>
<tr>
<td>Access cost from border to point of competition</td>
<td>Access costs were obtained from the CBT for the year 2012/13 and deflated with the CPI</td>
<td>Adjusted by removing VAT of TPA based on MAFAP methodology</td>
<td></td>
</tr>
</tbody>
</table>
Access costs from point of competition to farm gate

Time series access costs were obtained from the CBT

Access costs were adjusted based on literature review and MAFAP methodology

<table>
<thead>
<tr>
<th>QT adjustment</th>
<th>Bor-Wh</th>
<th>N.A.</th>
<th>N.A.</th>
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<td>Wh-FG</td>
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<td>N.A.</td>
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<tr>
<td>QL adjustment</td>
<td>Bor-Wh</td>
<td>N.A.</td>
<td>N.A.</td>
</tr>
</tbody>
</table>

### Summary of indicators

**Table 11: Summary of data used in the analysis, 2005-2013**

<table>
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<th>Year</th>
<th>2005</th>
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<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
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</tr>
<tr>
<td>Benchmark price</td>
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<td></td>
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<td></td>
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<td></td>
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<td></td>
</tr>
<tr>
<td>Observed</td>
<td>USD/TONNE</td>
<td>Pb(int$)</td>
<td>950</td>
<td>800</td>
<td>650</td>
<td>870</td>
<td>925</td>
<td>950</td>
<td>1 100</td>
<td>1 140</td>
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<tr>
<td>Adjusted</td>
<td>USD/TONNE</td>
<td>Pb(a)</td>
<td>950</td>
<td>800</td>
<td>650</td>
<td>870</td>
<td>925</td>
<td>950</td>
<td>1 100</td>
<td>1 140</td>
</tr>
<tr>
<td>Exchange rate</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Observed</td>
<td>TZS/USD</td>
<td>ERo</td>
<td>1 129</td>
<td>1 254</td>
<td>1 247</td>
<td>1 196</td>
<td>1 320</td>
<td>1 400</td>
<td>1 574</td>
<td>1 583</td>
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<tr>
<td>Adjusted</td>
<td>TZS/USD</td>
<td>ERa</td>
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<td>1 254</td>
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<td>1 196</td>
<td>1 320</td>
<td>1 400</td>
<td>1 574</td>
<td>1 583</td>
</tr>
<tr>
<td>Access costs border - point of competition</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Observed</td>
<td>T2S/TONNE</td>
<td>Acowh</td>
<td>118 844</td>
<td>127 461</td>
<td>136 416</td>
<td>150 438</td>
<td>168 704</td>
<td>179 164</td>
<td>201 902</td>
<td>234 208</td>
</tr>
<tr>
<td>Adjusted</td>
<td>T2S/TONNE</td>
<td>Acawh</td>
<td>115 835</td>
<td>124 235</td>
<td>132 963</td>
<td>146 629</td>
<td>164 433</td>
<td>174 628</td>
<td>196 790</td>
<td>228 279</td>
</tr>
<tr>
<td>Domestic price at point of competition</td>
<td>T2S/TONNE</td>
<td>Pdwh</td>
<td>866 667</td>
<td>796 667</td>
<td>1 009 333</td>
<td>1 728 000</td>
<td>1 576 667</td>
<td>1 270 667</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Access costs point of competition - farm gate</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Observed</td>
<td>T2S/TONNE</td>
<td>Acfg</td>
<td>131 000</td>
<td>120 500</td>
<td>120 500</td>
<td>290 500</td>
<td>317 000</td>
<td>335 100</td>
<td>340 722</td>
<td>346 000</td>
</tr>
<tr>
<td>Adjusted</td>
<td>T2S/TONNE</td>
<td>Acfg</td>
<td>93 500</td>
<td>90 500</td>
<td>90 500</td>
<td>229 500</td>
<td>249 500</td>
<td>265 100</td>
<td>260 722</td>
<td>286 000</td>
</tr>
<tr>
<td>Domestic price at farm gate</td>
<td>T2S/TONNE</td>
<td>Pdfg</td>
<td>600 000</td>
<td>500 000</td>
<td>370 000</td>
<td>690 000</td>
<td>670 000</td>
<td>885 000</td>
<td>1 440 000</td>
<td>1 340 000</td>
</tr>
<tr>
<td>Externalties associated with production</td>
<td>T2S/TONNE</td>
<td>E</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Budget and other product related transfers</td>
<td>T2S/TONNE</td>
<td>BOT</td>
<td>11 993</td>
<td>5 731</td>
<td>11 028</td>
<td>15 859</td>
<td>10 838</td>
<td>7 133</td>
<td>6 267</td>
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<tr>
<td>Quantity conversion factor (border - point of competition)</td>
<td>Fraction</td>
<td>QTwh</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Quality conversion factor (point of competition - farm gate)</td>
<td>Fraction</td>
<td>QIwh</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Quantity conversion factor (point of competition - farm gate)</td>
<td>Fraction</td>
<td>QTfg</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Quality conversion factor (point of competition - farm gate)</td>
<td>Fraction</td>
<td>QIfg</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
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</tbody>
</table>

Source: Authors’ calculations, 2014.
### Table 12: MAFAP price gaps at farm gate for raw cashew nuts in URT

<table>
<thead>
<tr>
<th>Trade status</th>
<th>Unit</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
</tr>
</thead>
<tbody>
<tr>
<td>Observed price gap at point of competition</td>
<td>TZS/Tonne/Cashew Nuts with Shell</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>86,944</td>
<td>-146,246</td>
<td>29,664</td>
<td>398,572</td>
<td>234,819</td>
<td>-163,456</td>
</tr>
<tr>
<td>Adjusted price gap at point of competition</td>
<td>TZS/Tonne/Cashew Nuts with Shell</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>83,135</td>
<td>-150,517</td>
<td>25,128</td>
<td>393,460</td>
<td>228,890</td>
<td>-169,852</td>
</tr>
<tr>
<td>Observed price gap at farm gate</td>
<td>TZS/Tonne/Cashew Nuts with Shell</td>
<td>-109,078</td>
<td>-155,079</td>
<td>-106,106</td>
<td>81,444</td>
<td>-71,746</td>
<td>65,764</td>
<td>257,794</td>
<td>145,819</td>
<td>NA</td>
</tr>
<tr>
<td>Adjusted price gap at farm gate</td>
<td>TZS/Tonne/Cashew Nuts with Shell</td>
<td>-179,587</td>
<td>-213,305</td>
<td>-158,060</td>
<td>41,135</td>
<td>-114,767</td>
<td>21,228</td>
<td>207,682</td>
<td>74,890</td>
<td>NA</td>
</tr>
</tbody>
</table>

Source: Authors’ calculations, 2014.

### Table 13: MAFAP nominal rates of protection (NRP) for raw cashew nuts in URT

<table>
<thead>
<tr>
<th>Trade status</th>
<th>Unit</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
</tr>
</thead>
<tbody>
<tr>
<td>Observed nominal rate of protection at point of competition</td>
<td>%</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>10</td>
<td>-15</td>
<td>3</td>
<td>28</td>
<td>16</td>
<td>-11</td>
</tr>
<tr>
<td>Adjusted nominal rate of protection at point of competition</td>
<td>%</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>10</td>
<td>-15</td>
<td>2</td>
<td>27</td>
<td>15</td>
<td>-11</td>
</tr>
<tr>
<td>Observed nominal rate of protection at farm gate</td>
<td>%</td>
<td>-15</td>
<td>-24</td>
<td>-22</td>
<td>13</td>
<td>-10</td>
<td>8</td>
<td>22</td>
<td>12</td>
<td>NA</td>
</tr>
<tr>
<td>Adjusted nominal rate of protection at farm gate</td>
<td>%</td>
<td>-23</td>
<td>-30</td>
<td>-30</td>
<td>6</td>
<td>-15</td>
<td>2</td>
<td>17</td>
<td>6</td>
<td>NA</td>
</tr>
<tr>
<td>Observed nominal rate of assistance at farm gate</td>
<td>%</td>
<td>-15</td>
<td>-24</td>
<td>-20</td>
<td>14</td>
<td>-8</td>
<td>10</td>
<td>23</td>
<td>13</td>
<td>NA</td>
</tr>
<tr>
<td>Adjusted nominal rate of assistance at farm gate</td>
<td>%</td>
<td>-23</td>
<td>-30</td>
<td>-28</td>
<td>7</td>
<td>-13</td>
<td>4</td>
<td>18</td>
<td>6</td>
<td>NA</td>
</tr>
</tbody>
</table>

Source: Authors’ calculations, 2014.
Table 14: MAFAP Market development gaps for raw cashew nuts in URT

<table>
<thead>
<tr>
<th></th>
<th>Unit</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exchange rate policy gap</td>
<td>TZS/Tonne/Cashew Nuts with Shell</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Access costs gap to point of competition</td>
<td>TZS/Tonne/Cashew Nuts with Shell</td>
<td>-3 009</td>
<td>-3 227</td>
<td>-3 454</td>
<td>-3 809</td>
<td>-4 271</td>
<td>-4 536</td>
<td>-5 111</td>
<td>-5 929</td>
<td>-6 396</td>
</tr>
<tr>
<td>Access costs gap to farm gate</td>
<td>TZS/Tonne/Cashew Nuts with Shell</td>
<td>-67 500</td>
<td>-55 000</td>
<td>-48 500</td>
<td>-36 500</td>
<td>-38 750</td>
<td>-40 000</td>
<td>-45 000</td>
<td>-65 000</td>
<td>-65 000</td>
</tr>
<tr>
<td>Total market development gap</td>
<td>TZS/Tonne/Cashew Nuts with Shell</td>
<td>-70 509</td>
<td>-58 227</td>
<td>-51 954</td>
<td>-40 309</td>
<td>-43 021</td>
<td>-44 536</td>
<td>-50 111</td>
<td>-70 929</td>
<td>-71 396</td>
</tr>
<tr>
<td>Market development gap as share of farm gate price</td>
<td>%</td>
<td>-12</td>
<td>-12</td>
<td>-14</td>
<td>-6</td>
<td>-6</td>
<td>-5</td>
<td>-3</td>
<td>-5</td>
<td>NA</td>
</tr>
<tr>
<td>Market development as share of adjusted reference price at farm gate</td>
<td>%</td>
<td>-9</td>
<td>-8</td>
<td>-10</td>
<td>-6</td>
<td>-5</td>
<td>-5</td>
<td>-4</td>
<td>-6</td>
<td>-5</td>
</tr>
</tbody>
</table>

Source: Authors’ calculations, 2014.

5. Results and interpretation

Measuring price incentives for cashew farmers is essential for promoting and maintaining high levels of production and quality. Higher prices lead to increased volume and quality output since farmers are more willing to dedicate time to tree maintenance activities. This analysis focuses only on raw cashew nuts (RCN) in shell as this constitutes the majority of exports (over 70 percent). Auction markets were introduced in the cashew sector as part of the WRS in 2008. Consequently, the indicators could only be measured at auction level from 2008-2013. Furthermore, although indicative farm gate prices for cashew nut are available until 2014, final farm gate prices were available only until 2012.

Figure 9 compares auction and farm gate prices for raw cashew nuts to their distortion-free equivalents, i.e., reference prices. The difference between these two prices, referred to as the price gap, measures the effect of policy and market distortions on price incentives for cooperatives at auction and producers at farm gate. As illustrated, before the WRS was introduced in 2008, producers received prices lower than the equivalent international price at farm gate; whereas after, they received prices either much nearer or above it. The producer price is pegged to the auction price; therefore, the domestic prices at the point of competition and at the farm gate follow a similar trend.
The cashew market has several characteristics that leave producers vulnerable without a coordinated exchange. These characteristics are: a high level of uncertainty and seasonality in the international cashew market, the nature of tree crops like cashew as asset specific investments that cannot easily be redirected towards more profitable crops, and the need for quality assessment and standards (Akyoo & Mpenda, 2014). Final producer prices before 2008 were much lower than the reference prices as farmers were being exploited by large numbers of intermediaries, calling for a coordinated exchange mechanism to be implemented, namely the warehouse receipt system (WRS). The WRS has reduced the number of intermediaries, and hence marketing costs, and has given producers the advantage of receiving the residual from the auction price which is linked to international market.

An indicative price is set annually by the CBT and is based on world market information and farmer’s production costs (ANSAF, 2013). Despite the indicative price announced by the CBT, before the WRS, exporters were determining the price that farmers received, and in some cases, intentionally delayed purchase, forcing farmers to sell at a lower price (UNIDO, 2011). Since producers are in need of cash in order to pay back loans or to pay school fees, they are willing to sell at a reduced price.

Since the introduction of the WRS in 2008, farmers who are engaged in the system are paid 75 percent of the indicative market price up front and receive the remainder after the cashews have been sold. If the cashews are sold for a price higher than the indicative price, they are entitled to receive a bonus. The indicative price plus the bonus totals the final price paid to farmers (Figure 10). This system engages farmers in the international market, allowing them to benefit from price increases. The introduction of an indicative price at the auction level, which is composed of the indicative price at farm gate plus the administrative costs associated with the running of cooperatives and WRS, also provides some protection to farmers from international price fluctuations. The WRS evidently had an immediate impact on price and cost distribution throughout the value chain, allowing farmers to access cash immediately while awaiting the sale of their crop at a fair price.
In Figure 11, the price gaps at farm gate and auction are expressed in relative terms, as a percentage of the distortion-free price. This indicator, referred to as the Nominal Rate of Protection (NRP), measures the extent to which the overall policy environment and performance of the domestic cashew nut market generate price incentives (support) or disincentives (taxes) to producers. Furthermore, an NRP at point of competition that is consistent with the indicator at farm gate will indicate high price transmission between these points in the value chain. They are presented together since they follow a similar trend.

If taking into consideration the entire period under review, cashew farmers were supported by an average 2 percent. However, there are two distinct periods to consider: before and after the implementation of the WRS in 2008. Farmers received disincentives of an average -20 percent from 2005 to 2007 but from 2008 to 2012, received average incentives of 9 percent. Cooperative unions received an average 5 percent more at auction over the 2008 to 2013 period than the international equivalent price.
In 2008, the first year of the WRS, we see an immediate change in the incentive structure at farm gate. This shift is attributable to the engagement of farmers in the auction market, allowing them to be eligible for a bonus payment after the cashews have sold instead of selling to traders as a final market.

It is likely that the FOB price for 2009, as reported by the CBT, is overestimated since other sources indicate a significant fall in prices. Since cashew prices are determined by the final consumer and since the crisis initially hit the consuming countries, the price of developing countries’ exports fell, not limited to cashew (Kilama, 2013). Cashew prices began falling in mid-2008 and were lowest between November 2008 and February 2009, precisely the time that URT is marketing their harvest (Kalima, 2013). This means that disincentives are exaggerated in this year but nevertheless would have the same relationship between farm gate and auction. In 2009, disincentives would have only been felt at auction level since the cooperatives absorbed the storage and interest payments due to a delayed start in marketing until December 2008. Farmers did not receive a bonus in the 2008/09 season but at least were shielded from the low prices (Figure 10). Low prices at auction in 2008/09 can be attributed to the financial crisis and a fall in global consumer demand for luxury foods and processed goods.

Demand for cashew was increasing into October 2009 and Indian and Vietnamese processors were running low on domestic stocks, pushing up RCN prices for the 2009/10 marketing season (Globaltrading, 2015). This resulted in high export, auction, and final farm gate prices, meaning that in 2010, price transmission was highly effective with relatively neutral incentives.

In 2011, raw cashew prices reached global historical highs of up to US$ 1 800/tonne owing to a global fall in production of 25 percent, political turmoil in Ivory Coast, and competition amongst major
processing countries for purchase of raw nuts (Kullikarni, 2011). The average CIF price in India in 2011 was US $1 711. Domestic auction prices and thus farm gate prices followed this high trend in 2011, with the highest auction price recorded at TZS 2 182 (US$ 1 386). Strangely though, as shown in Figure 12, the export price as reported by the CBT, UN Comtrade, and the TRA do not increase at the same rate.

![Figure 12: Comparison of import, export, and domestic prices for raw cashew nuts, 2005-2013](image)

There are several possible explanations for why the export price does not reflect the import and auction price trend in 2011. It is possible that exporters are underreporting because of the high tax on exports of raw cashew nuts (15 percent since 2010). Another possibility is that shipping and insurance costs increased substantially in 2011. Since fuel constitutes over 60 percent of shipping costs, the increase in crude oil prices by 14 percent in 2011 may have increased costs. Insurance and other risk related costs also increased in 2011 due to the expansion of the war risk insurance area to cover the wider Indian Ocean. Trade routes have been affected by Somali piracy since 2010 and Indian trade has been affected since 2011 (One Earth Future Foundation, 2011). Increased fuel and insurance costs as well as the costs of re-routing vessels may partially explain the large gap between the FOB and CIF prices in 2011, although it is unlikely to have made the sort of effect we see in Figure 12. According to UNCTAD (2013), container freight rates actually declined in 2011 due to an excess supply of carriers and low demand.

In 2012, both farmers and cooperatives received price incentives. However, this does not capture several market failures that occurred that year. International cashew prices fell but the domestic market was not responsive, leaving 90 000 tonnes of cashew unsold and at risk of rotting by the end of the season (NMB, 2013; Foodnews, 2012). Since the indicative price is understood by domestic market players to be a season long price and because of interference in the market by politicians who told farmers/cooperatives not to sell for less than the indicative price, the domestic market was
unable to adapt to a fall in prices. By February 2012, the CFR price in India was roughly US$ 1,300, which, minus access costs to the farm gate in URT, would have resulted in a farm gate price of around US$ 500, when the indicative price at US$ 800 continued to be respected (NMB, 2013). The government was forced to intervene and implement an export guarantee scheme with the Bank of Tanzania that enabled the cooperatives to start paying farmers for cashews that had been delivered and stored in warehouses since October 2011; it is estimated that cooperative societies owed farmers upwards of TZS 50 billion (Mgwabati, 2012 and Foodnews, 2012). However, by April 2013, over 5,000 farmers in Lindi region had still not received these payments, cooperatives offering less than half of what had been agreed the previous year, causing violent riots (Gosh, 2013). In 2013, the auction and international equivalent price are almost on par, indicating a return to a more functional market, at least at the auction level.

Figure 13 shows the Nominal Rate of Assistance (NRA), which is similar to the NRP, but takes into account additional support to producers resulting from budgetary transfers to the sector. The NRA at farm gate was only slightly (1 percent) above the NRP, indicating minimal budgetary incentives relative to market price incentives.

The adjusted indicators reflect unnecessary taxes and inefficiencies in the market. The adjusted NRA is significantly lower than the observed NRA, indicating that value chain taxes and inefficiencies far outweigh any benefits that have been transferred to farmers through budgetary payments.

These structural inefficiencies and unnecessary taxes in the cashew nut value chain have reduced incentives by an average -9 percent of the farm gate price, as shown in the Market Development Gap (MDG) indicator (Figure 14). The MDG enables further disaggregation of these taxes and
inefficiencies, which include the VAT levied by the Tanzania Port Authority (TPA) in the access costs gap to point of competition, the district cess and high profit margins obtained by intermediaries in the access costs gap to farm gate from 2005 to 2007. If these costs were removed from the value chain, farm gate prices would have been almost 10 percent higher on average.

Figure 14: Market development gap (MDG) for cashew nuts in URT, 2005-2012

6. Recommendations

The warehouse receipt system appears to have had a positive impact on incentives to production. However, it is likely that the strong incentives, particularly in 2011, are over estimated due to possible under-reporting, which may be attributable to the extremely high export tax. Since the export tax is not the appropriate tool for encouraging domestic processing and is thus not having the desired effect, it is recommended to remove this tax. Instead, encourage private sector investment in processing by increasing access to financial services for domestic entrepreneurs and building partnerships with international entrepreneurs. In order to facilitate this, it will be important to develop a secure supply chain, where processors can establish direct sourcing relationships with farmers and cooperatives.

If the export tax is not revoked entirely, the government should consider reducing it and ensuring that a greater part of the revenue goes back to the sector, mainly to ensure better functioning of the WRS and increased processing opportunities. The CBT has recently embarked on the construction of three cashew processing factories in Mwara, Tunduru (Ruvuma), and Mkuranga (Coast Region), each with a capacity to process 10 000 tonnes per year. The Cashew nut Industry Development Trust Fund (CIDTF) is contributing TZS 6 billion for the project (Kazoka, 2015).
Despite benefits of WRS on farmers’ income, this is limited by the closed bidding system and lack of transparency. The lack of information has been identified as a major source of mistrust between farmers, AMCOS and Unions. For these reasons, it is recommended to increase competition and transparency by establishing an online database for crop deliveries to warehouses and weekly reports on prices and auction results using Moshi Coffee exchange as example (NMB, 2013). This would also lay the groundwork for marketing processed cashew internationally since the auction market has been dominated by RCN buyers who are likely colluding to maintain their market. Diversify export markets and encourage the entry of new buyers at cashew auctions to increase competition and potentially improve prices for producers; Disconnect the WRS from the auction system, so that it functions as a financing mechanism for farmers who want to participate and for processors who want to buy in season.

It should be made clear to market agents that the indicative price is not intended to be a season-long minimum price as it is based on the market dynamics at the start of the season. The international market can change rapidly between October and February and URT must ensure both that financing to purchase raw cashew is available earlier in the season in order to start marketing on time while prices are high, and that the indicative price is updated according to the change in international prices.

Excessive costs in the value chain should be eliminated such as the cash distribution fee as this should be covered by the Union Levy, the fumigation and weigh scale fee which should be included in the warehouse commission, as well as the VAT of the Tanzania Port Authority (TPA) and the district produce cess. These additional costs increase auction prices and make URT less competitive in the international market. Remove barriers to trade such as local taxes and fees along the value chain to increase producer prices.

7. Conclusion

Main message
Price incentives to cashew farmers are essential to ensure high volumes and quality of cashew production to satisfy increasing global demand. Our analysis has shown that in 2011, when incentives and cashew prices were high, production was highly responsive, increasing in 2011 and 2012. Until 2008, farmers received disincentives of an average -20 percent because, owing to the lack of a coordinated exchange system, traders were able to manipulate the market and offer a price much lower than the international equivalent.

After the creation of the WRS, producers began to receive incentives of an average 9 percent; the system allowed farmers to receive a partial payment of 75 percent immediately to meet cash needs so that they were able to sell when prices are favorable, engaging them in the auction market by providing a bonus payment if the cashews sell for more than was estimated at the beginning of the season. Incentives were however affected by unnecessary administrative fees associated with the WRS, over-charging for services, and high local taxes, bringing incentives down to a neutral situation (zero incentive) on average from 2008 to 2012.

Budgetary transfers to cashew farmers, in the form of input subsidies, reduced disincentives by only 1 percent. The increase of the export tax from 10 to 15 percent in 2010 did not have the desired effect of increasing domestic processing and the share of government revenue collected from the tax
that is channeled back to the sector is below 20 percent. Furthermore, the increasingly high export tax on raw cashew nuts (RCN) may be encouraging under-reporting at the border. This may have been the case in 2011 in particular owing to the great discrepancy between the FOB of URT and the CIF India.

**Limitations**

Overall, the data availability was fair and price/cost information was available for the entire period in most cases. Unfortunately, although indicative farm gate prices were available for the entire period and up until 2014, final farm gate prices were only provided until 2012.

Data quality on the other hand could certainly be improved. Owing to the lack of transparency at the auction, it is impossible to get disaggregated price information volumes and time of year. This type of information would enable a very precise analysis of the incentives structure.

It is probable that the CBT reported FOB is not accurate, particularly in 2009 and 2010-13. This is affecting not only the national accounting but also inhibiting accurate research and policy advice. There are many studies on the cashew sector that have estimated the share of the export price that farmers receive and have based their policy advice on this. All of this research may be therefore inaccurate and thus providing the wrong advice to the government. We highly recommend therefore, to make data available to researchers and to ensure accurate reporting by commodity boards.

The same is true with the final price paid to farmers; this should be made publicly available as well as how it is calculated. Foremost for the farmers to understand how the pricing mechanism works, so they can hold accountable their primary and cooperative unions, and also for policy implications – the difference between the indicative and final price makes the difference between strong incentives or strong disincentives, which will have a very strong impact on the policy advice.
Further investigation and research
For the next technical note on cashew nuts in URT, we would like to conduct more in-depth research on the institutional dimensions of the auction as well as on the indicative price and how it is set. There is a lot of conflicting research surrounding the auction system and the indicative price setting mechanism.

For example, according to Akyoo and Mpenda (2014), there were several changes in the functioning of the auction such as the indicative price being unknown to stakeholders and buyers initially and then later, after misuse of this system, was made public and transparent. However, the years in which these changes took place are frustratingly not mentioned. According to the same source, the way that the bids were taken changed as well, from being deposited in a ballot box and opened a few days later, to being opened the same day – again due to misuse of the previous system. This information is interesting but has no utility unless accompanied by a date.

Indicative price setting is likewise unclear, with Akyoo and Mpenda stating that it is based only on the cost of production of cashew farmers, whereas in the past, it was set by the export parity. Again, we are given no date as to when this change occurred.

In the next phase of the programme, we will be calculating an additional indicator called the Effective Rate of Protection (ERP) which will require additional data to be acquired on inputs such as sulfur (fungicide), fertilizer, sprayers, and pruning equipment.
References


Delmas. 2015. Website. Available at: https://www.delmas.com/static/eCommerce/Attachments/DELMAS%20CASHEW_EAF.pdf.


ANNEX I: Cashewnut Board of Tanzania

The cashew sector in the United Republic of Tanzania is overseen by the CBT, established in 1984, and now governed by the Cashewnut Industry Act (Parliamentary Act number 18) of 2009 and its subsequent regulations approved in 2010. The CBT’s mandate is to regulate the cashew industry in terms of quality, processing and marketing. It is composed of seven representatives from cashew nut processors, two farmers, MAFC, the cashew research institute and other members who possess experience and knowledge in the cashew nut industry. Its chair is held by a Presidential appointee.

The board has the following functions (United Republic of Tanzania, 2009):

i. advise the government on policies and strategies for the development of the cashew nut industry in order to improve quality and increase production competitiveness in local and international markets;

ii. regulate and control the quality of cashew nuts, kernels and cashew nuts by-products;

iii. collect, refine, maintain, use or disseminate information or data concerning the cashew nut industry;

iv. promote and facilitate the formation of associations;

v. enforce the implementation of regulations with respect to farming, marketing, processing, transporting and storage of cashew nuts;

vi. represent the government in local and international fora dealing with matters relating to the cashew nut industry; and

vii. link efforts of stakeholders in expanding and modernizing the cashew nut industry in the United Republic of Tanzania.

The CBT convenes stakeholder meetings for setting indicative prices, providing market indicators and functioning as a referee to ensure that dealers abide by the agreed prices. According to part IX of the cashew nut regulations (2010), the indicative cashew nut farm gate prices are deliberated upon and determined by the stakeholders forum, which is composed of representatives from the MAFC, management, board of directors, buyers, the District Executive Director of Local Government Authorities of cashew growing districts, cashew nut co-operative unions, growers associations, regional & district commissioners in cashew growing regions, interested banks, input suppliers, PMO-RALG, Ministry of Finance, Ministry of Industry and Trade, the Cashew Research Institute, the Agricultural Council of Tanzania, processors, the Tanzania Chamber of Commerce, Industry and Agriculture, the Cashewnut Industry Development Trust Fund and any other stakeholder as the board may determine.

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5 Replaced the Tanzania Cashewnut Marketing Board in 1993, as the regulatory body.
6 PMO-RALG = Prime minister’s office, regional administration and local governments.