
Incentives in support of the agricultural sector in the East African Community (EAC)

Executive summary

Since Burundi, Kenya, Uganda, Rwanda and Tanzania ratified the EAC common market protocol in November 2009, costs associated with trade including transport and logistics have drastically reduced. However, that pace of regional cooperation appears to have slowed. A more-concerted effort to achieve collective objectives could instil trust in the benefits of regional integration; but inadequate commitment to a regional development agenda leaves room to pursue national objectives. This has been the case especially in the agricultural sector, where several bitter disputes concerning trade in agro-processed commodities have occurred. Mistrust between EAC member countries, coupled with beggar-thy-neighbour agricultural policy choices have hindered amicable resolution of the disputes. It is against this backdrop that the Rwandan Ministry of Trade and Industry requested a benchmarking study of agriculture-related policies within the EAC, to inform a proposed VAT exemption for locally processed cereal commodities.

Governments can choose from a wide set of measures to support agriculture, including infrastructural development, research and development, direct transfers, and output or input market price subsidies. In order to make informed policy decisions, it is important to analyse the different policy measures and their effects on individual players in the economy. As a first step, we provide an overview of VAT regimes applicable to cereals and cereal products across the EAC. Next, focusing on Rwanda we estimate the fiscal costs and welfare benefits of exempting cereal products from the VAT. Finally, we compare the composition of public agricultural expenditures and the impact of agriculture and trade policies on producer incentives along value chains for cereals across EAC countries. The report focuses on rice, maize and wheat in Kenya, Rwanda, Uganda and Tanzania, covering the period 2005 to 2017, as reported the FAO Monitoring and Analysing Food and Agricultural Policies (MAFAP) programme. These analyses provide decision makers with an assessment of the merits and demerits of the proposed policy change.

An overview of the policy and market environment for Rwanda between 2005 and 2016 shows that public spending patterns benefit food crop production with 80% of total expenditures, compared to 14% for cash crops. The majority of public expenditure was allocated to input subsidies and agricultural infrastructure, aimed at lowering production costs. In addition to direct agricultural spending, policies supporting domestic output prices also serve as a production incentives. Comparing domestic prices with international prices allows us to analyse whether domestic producers are receiving price incentives to increase production. The study computes the Nominal Rate of Protection (NRP), an internationally comparable indicator summarizing the rate of price incentives faced by producers of specific commodities. A positive NRP shows that policies incentivised production, while negative NRPs indicate disincentives to produce. The NRP for rice was 86 percent on average over the analysed period, partly due to the fact that average CET applied by Rwanda over the period (46 percent). The NRP for wheat was 31 percent on average over the analysed period, largely due to the CET applied by Rwanda over the period

(9 percent). The substantially higher NRPs compared to official tariffs suggests the existence of market imperfections along rice and wheat value chains, limiting transmission of international prices to the Rwandan market.

The analysis of VAT regimes shows few similarities, as several differences exist across commodities and countries. The standard VAT rate in Kenya is 16 percent, while a Zero-Rate is applied on all supplies of wheat and maize flour, and rice is exempted. Rwanda maintains an 18% VAT on local and imported supplies of processed cereals. In Tanzania, wheat grain attracts an 18% VAT, while other cereals and cereal products are exempt. Uganda levies an 18% VAT on supplies of maize flour, wheat flour and rice milled from outside the country, while Ugandan-produced rice is Zero Rated. The implications of VAT exemptions for cereals in Rwanda suggest high fiscal costs, yet small improvements to household welfare. The largest would be with maize flour, where a VAT exemption generates a reduction in poverty by 1.4 percent, at a cost to the government of RWF 84.2 Billion equivalent per year.

In summary, the existing policy environment benefits rice, maize and wheat through a combination of direct agricultural expenditures and imperfect international price transmission, resulting in high price incentives for producers. The analysis suggests that that incentivizing the prices of rice, maize and wheat might not raise productivity nor improve household welfare very much, relative to its cost in terms of government revenue. Our analysis suggests that this approach is undermined several critical supply-side and demand-side constraints. On the supply side, market inefficiencies including high processing costs and poor post-harvest management offset any gains from output price support, by reducing the price received by producers. In addition, structural obstacles, such as land scarcity and low adaptation to local climatic conditions of varieties preferred by Rwandan consumers, prevent producers earning higher prices. On the demand side, consumption of local rice and maize seems to reduce as household income increases. Urban consumers tend to be highly sensitive to quality, and can afford to substitute starchy foods for animal protein and processed food. As Rwanda approaches middle-income status, this trend is likely to accelerate. Alternative policy measures to improve productivity and competitiveness of local cereals sectors can include the following:

- 1) Complement the current food availability policies with measures to improve access/affordability and price stability;
- 2) Rebalance public expenditure in support of agriculture towards public goods and infrastructure;
and
- 3) Strengthen regional cooperation frameworks to cultivate increased trust in regional integration.

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I. Background

The government of Rwanda views agriculture as one of the sectors with potential to drive sustainable economic growth as the country seeks to reach middle-income status by 2035 (MINECOFIN, 2017). This will require accelerated technological upgrading, culminating in a shift from subsistence agriculture towards higher value production. To stimulate crop production, the Government of Rwanda (GOR) has prioritized investments in public goods provision, infrastructure, and farmer training. To stimulate local agro-processing industries and improve Rwanda's external trade position, the government provides tax incentives, import tariff protection, and supporting infrastructure (MINICOM, 2011). Additionally, the Ministry of Trade and Industry proposes a VAT waiver to promote domestic agro-processing (Safari, 2017). The following report assesses the merits and demerits of this policy change, focusing on rice, maize and wheat. These account for 19 percent of household consumption¹ and 2 percent of GDP.²

Agricultural sector performance showed in Figure 1 shows mixed performance in the decade prior to 2017. Aggregate production increased by 7.5 percent per year, driven by an expansion in harvested area. Yields per hectare for most crops remained stable but below achievable levels. Staple food crops posted substantially higher larger gains compared to cash crops. This is attributable to a greater policy weight given to producing food crops. The pattern of public spending in support of agriculture benefited the food crop sectors with 80 percent of total expenditure, compared to 14 percent for cash crops (MAFAP, Agricultural policy incentives in the last decade (2005 - 2016), 2018). Furthermore, the majority of expenditure was allocated to infrastructure and input subsidies aimed at lowering costs of production. Land allocation also reflects the spending patterns as new arable land is increasingly devoted to food production, but less so for export crops. Coffee, which is among Rwanda's major export revenue earners, has even experienced a slight (1 percent) decline in cultivated area.

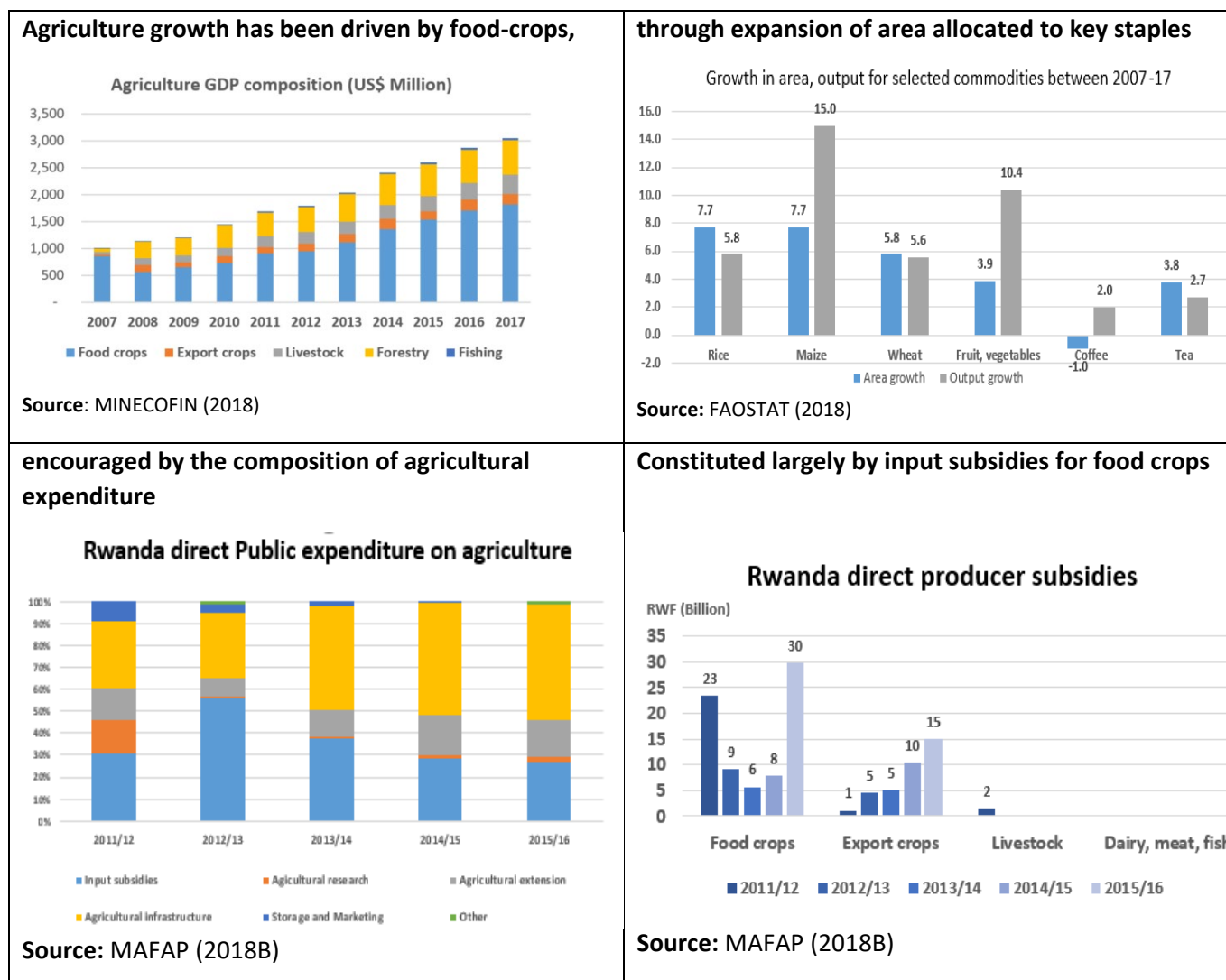
Since 2007, government interventions in Rwanda's agricultural sector have sought to address domestic supply constraints, with the objective of raising competitiveness in import-competing sectors. Since its launch in 2007, the Crop Intensification Program has been the main vehicle for agricultural development sector development. The CIP describes a set of interventions, including crop regionalization, input subsidies and capacity building aimed at promoting priority food crops (MINAGRI, 2011). Post-harvest marketing and internal trade are organized by agricultural cooperatives, with guidelines issued for the priority crops. To attract further investment into agro-processing, an 18 percent VAT exemption has been proposed to compensate for the impact on local commodity markets stemming from perceived distortionary policies, particularly producer subsidies, in the East African Community (EAC) counterpart states. The Ministry for Trade and Industry, requested the International Growth Centre (IGC) to evaluate the economic merits of this policy change. Focusing on maize, rice and wheat, this report analyzes two research questions:

1. Does the existing policy and market environment specific to maize, rice and wheat promote or hinder production?
2. What would be the fiscal cost and welfare benefit of the VAT exemption for milled rice and flours of maize, and wheat?

¹ Source: NISR, Integrated Household Living Conditions Survey micro data , 2018

² Source: Diao et al. (2017)

Figure 1: Rwanda’s recent agriculture sector performance



The policy and market environment includes public agricultural expenditures and interventions, which raise producer prices. Assessing the responsiveness of production to existing policies indicates the extent to which further measures of similar nature can stimulate production. The fiscal cost entails the tax revenue foregone in exempting the commodities from VAT. The welfare benefit measures the impact on household poverty of the reduction of VAT from the consumer price. Considered together, these analyses assess the merits and demerits of the proposed VAT exemption. The rest of this report is organized as follows: the next section gives an overview of the rice, wheat and maize value chains in Rwanda, while section 3 describes the methodology used to address the questions posed above. Section 4 discusses the implications of the results and the last section offers recommendations drawn from the results.

II. Overview of rice, wheat and maize value chains in Rwanda

Cereals, like other crops in Rwanda, are predominantly produced by smallholder farmers. The average farmland holding is 0.5 hectares per household. Only 2 percent of farmers cultivate land more than 10 hectares (NISR, Rwanda Seasonal Agricultural Survey, 2018). Production of rice, maize and wheat is rapidly increasing, driven largely by expansions of the area under cultivation. On the consumption side, urban areas account for an enlarging share

of aggregate expenditures, but cereals still occupy a large share of consumption budgets for rural households. Rwanda exports locally produced cereals to the Democratic Republic of Congo (DRC), and it imports maize from Uganda, wheat from Kenya and rice from India. Rwanda's trade with the rest of the world is governed by its membership of the EAC and COMESA regional trade blocs. The following paragraphs address production, marketing, and trade in more detail.

Production

Rice, maize and wheat collectively occupy 128,000 hectares in Rwanda, equivalent to 12 percent of the total harvested area, and distributed as follows: maize: 8 percent, rice: 3 percent, wheat: 1 percent. As priority crops under the CIP, producers receive subsidized seed, fertilizer and pesticides (MINAGRI, 2011). Production patterns in table 1 show that the rate of adoption of improved seeds for rice (43 percent), maize (82 percent) and wheat (80 percent) exceeded by far the average rate of 5.4 percent. Corresponding production trends presented in table 2 for the decade following implementation of the CIP also show positive shifts in favour of cereals. Harvested area increased by over 5 percent annually for the three commodities, contributing to rapid increases in production of 13.4 percent for maize, 5.8 percent for wheat and 5.0 percent for rice.

Low quality of local produce is not high. For instance, 70 percent of cultivated rice is a short-grain variety, while consumers prefer long-grain rice (Kathiresan, 2011). In the case of maize, roughly half of output contains high concentrations of aflatoxins (Nkurunziza, 2019). Muhayimana (2012) observes the same occurrence, citing low quality of local produce as the reason why most of domestic wheat demand is imported.

Marketing

Rice, maize and wheat value chains are highly commercialized, based on the share of produce sold (Table 1). In 2017, the fraction of produce sold by Rwandan farmers was 88 percent of rice, 83 of maize and 52 percent of wheat. The Ministry of Trade and Commerce (MINICOM) regulates domestic trade of rice maize and wheat to maintain minimum quality standards and incomes for farmers. The Ministry sets seasonal farm-gate prices, and requires aggregation and marketing activities to be led by producer cooperatives.³

Table 1: Production patterns for rice, wheat and maize, Rwanda, 2017

Crop	Area Harvested	Share of cultivated land (%)	Yield per hectare (MT)	Production (MT)	Improved seed usage rate (%)	Share of produce sold (%)
Wheat	10,758	1	1.0	10,926	79.8	52
Maize	85,130	8	1.2	358,417	82.1	83
Rice	31,581	3	3.5	108,958	43.2	88

Source: FAOSTAT (2018), NISR seasonal agricultural survey data.

Table 2 Production trends for rice, wheat and maize, Rwanda, 2007 to 2017

Crop	Change in area harvested (%)	Change in yield per hectare (%)	Change in production (%)
Wheat	5.2	1.4	5.0
Maize	7.7	5.3	13.4
Rice	7.7	-1.3	5.8

Source: FAOSTAT (2018).

Processing

Rwanda's agro-processing industry is characterised by few firms serving many farmers and farmer cooperatives. The largest cereal processing industries are *Bathesa* and *Pembe* for wheat, *Africa Improved Foods (AIF)*, and

³ See maize in MINICOM (2015) and rice in Esira (2012).

MINIMEX industries for maize. The rice processing industry is less concentrated with 19 small-to-medium mills distributed across the country. Loss of competitiveness in price of local agro-processing becomes salient at this stage of the supply chain. Aggregated indicators from Rwanda's input-output matrix in table 3 below show that non-agricultural inputs and factors account for 80 percent of the value of cereal output. This is likely due to inefficiencies resulting from capacity underutilization and inefficient machinery. Capacity utilization is roughly 50 percent for maize⁴ and 45 percent for rice.⁵ An average processor in Rwanda extracts 65 percent of milled rice from a unit of paddy, whereas an average processor in India can extract 70 percent.

Table 3 Input shares in gross output of the agricultural processing sectors, Rwanda, 2015 (percentage of gross output)

	Meat, Fish, Dairy (%)	Cereals (%)	Coffee (%)	Tea (%)	Bakery (%)	Alcoholic beverages (%)
Ag. intermediates	21	20.3	28.9	31.4	60.7	78.8
Non-ag. intermediates	62.9	57.3	20.4	20.8	11.2	4.4
Labour	7.6	11.9	18.5	18.3	14.0	8.9
Capital	8.4	10.3	32.2	29.5	14.1	7.8
Total	100	100	100	100	100	100

Source: Pradesha and Diao (2014).

Consumption

An average Rwandan household typically spends at least half of their income on food. Of all food commodities, rice, wheat and maize are among the most important. Table 4 below shows that in 2015-16, rice accounted for 9.4 percent of total household consumption expenditure, distributed evenly between imported and local rice. The share consumption allocated to rice in low-income market segments is substantially less than maize. The share of expenditure on imported rice lies 3 percentage points lower for the poor, but expenditure on local rice appears inelastic with respect to income.

Table 4 Consumption patterns for rice, wheat and maize, Rwanda, 2015-16

	Total Consumption (RWF million)	Consumption in total food spending			Consumption in total spending by the poor (%)
		National (%)	Poor (%)	Rural (%)	
Local rice	381	4.6	4.6	4.5	3
Imported rice	394	4.8	1.7	3.8	1.1
Wheat	9	0.1	0.1	0.1	0.1
Maize	700	8.5	14.3	8.7	9.3

Source: Own computations from integrated household living conditions survey micro data.

Trade

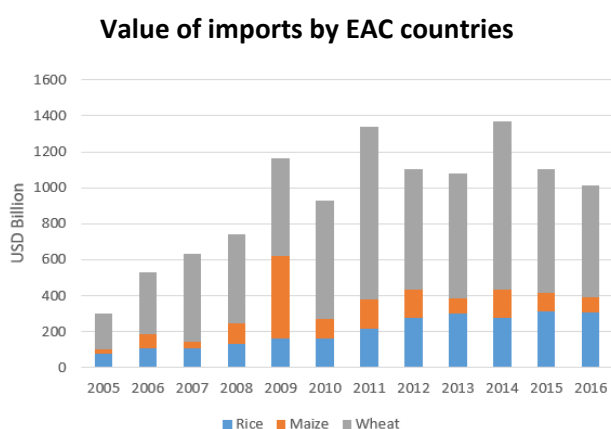
Membership to the COMESA free trade area and EAC customs union governs Rwanda's trade with the rest of the world. Goods originating from outside the EAC are taxed according to a 0-15-25 percent tariff structure corresponding to capital-, intermediate- and finished goods respectively. The treaty designates over 80 commodities as "Sensitive Items" whose variable duty rates exceed 25 percent, including maize (50%), rice (75%) and wheat (35%). The treaty allows for flexibility in application of the CET, to enable countries to address their short-term food-security needs and raw material requirements of critical industries. Cereals such as rice, maize and wheat are the most traded among EAC countries, with imports increasing by 10-13 percent per year from 2005 to

⁴ Source: MINICOM (2011)

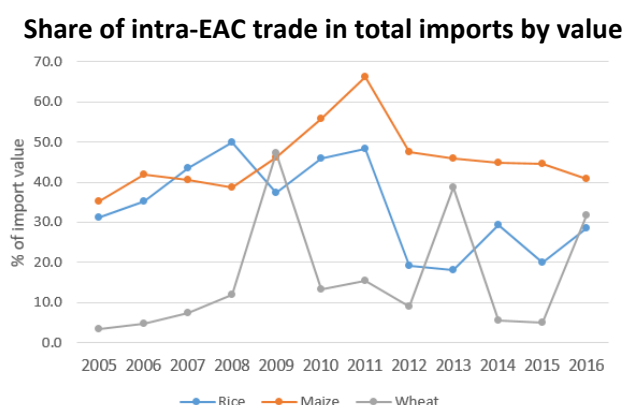
⁵ Source: Safari (2017)

2016. In 2016, intra-EAC trade in the three commodities accounted for 30-40 percent of the total, although that share has been trending downwards since 2010. As countries have prioritized national food security objectives over regional cooperation, occurrences of quantitative restrictions on trade have increased.

Table 5: Intra-EAC trade in rice, maize, wheat from 2005 - 2016



Source: ITA Trade map



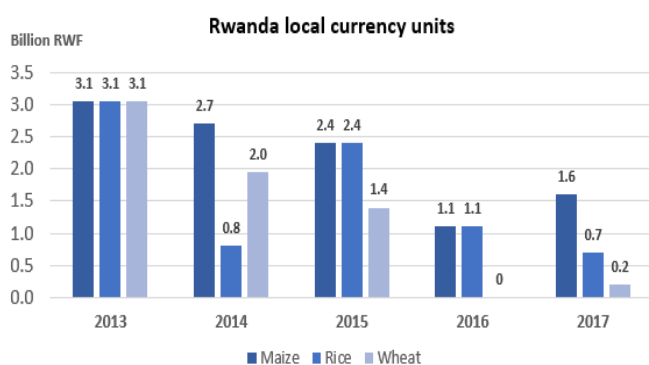
Source: ITA Trademap

Agricultural-specific government policies

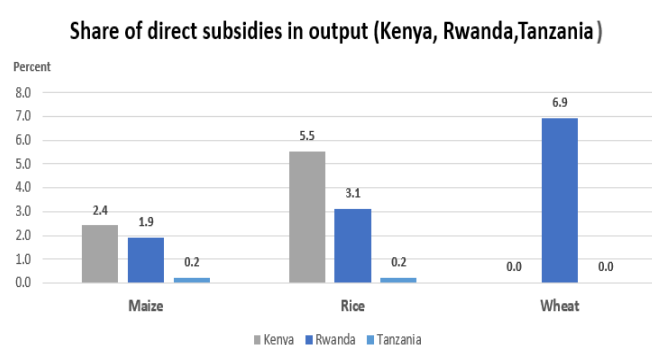
As the government of Rwanda regards cereals as essential for food security, agricultural policy has sought to promote local production to reduce reliance on food imports. Since its launch in 2007, the Crop Intensification Program has been the main vehicle for agricultural development sector development. Key interventions under this program include seed and fertilizer subsidy schemes, capacity building and extension and machinery grants. Figure 2 below reveals agricultural expenditures that are specific to agricultural production, particularly transfers to value chain agents including producers, consumers, input suppliers, processors, traders and transporters.

The first panel of figure 2 shows expenditure in absolute terms. We observe that in 2013, direct expenditure for rice, maize and wheat exceeded RWF 9 billion, which was roughly 0.6 percent of the total budget in that year. Expenditures in subsequent years trended downwards, as major projects completed their execution. The second panel of figure 2 compares the share of output value accounted for by producer subsidies across three countries for which data are available (Rwanda, Kenya and Tanzania). The figure shows that Tanzania and Kenya places higher policy weight to producing rice and maize, while Rwanda prioritizes wheat. Kenyan producers of rice and maize receive a larger share of production value as subsidies, compared to Rwanda and Tanzania.

Figure 2: Actual expenditure on direct input subsidies for maize, rice, wheat in 2013-17



Source: MAFAP (2018B)



Source: MAFAP (2018B), FAOSTAT

VAT rates applicable to rice, maize and wheat in Kenya, Rwanda, Tanzania and Uganda

Across all countries, rice and maize is exempted from VAT, while wheat is taxed. Uganda and Tanzania levy 18 percent VAT on unprocessed wheat grain, while it is VAT exempt in Kenya and Uganda. For processed commodities in all countries, a Zero-Rated VAT is applied supplies to government institutions, diplomatic organizations, and special economic zero rate and export markets. Suppliers who provide services or goods which are Zero-Rated can recover any VAT they have incurred. The treatment of locally supplied goods varies across countries. For instance, until 2013, both imported and locally milled rice in Uganda was Zero-Rated. However, a 2014 amendment of the VAT law ruled that value-addition activities for rice that exceed 5 percent of the value at supply are eligible for VAT. This rule was revoked in 2015, restoring local rice to Zero-Rated, while imported rice is liable for VAT. Rwanda levies VAT on local and imported rice, while it is exempted in Kenya and Tanzania. In the case of wheat flour and maize flour, Rwanda and Uganda levy an 18 percent VAT, while it is exempted in Tanzania and Zero-Rated in Kenya. Table 6 summarizes the applied VAT rates across countries and commodities.

Table 6: VAT on domestic supply of rice, maize, and wheat in Kenya, Rwanda, Uganda and Tanzania

	Rice (paddy)	Rice (milled)	Maize (grain)	Maize (flour)	Wheat (grain)	Wheat (flour)
Kenya ^a	Exempt	Exempt	Exempt	0%	Exempt	0%
Rwanda ^b	Exempt	18%	Exempt	18%	Exempt	18%
Tanzania ^c	Exempt	Exempt	Exempt	Exempt	18%	Exempt
Uganda ^d	Exempt	18% - imported 0% - local	Exempt	18%	18%	18%

a/ **Source:** Kenya Value Added Tax Act, 2017.

b/ **Source:** Rwanda Tax Law, 2014.

c/ **Source:** Tanzania Value Added Tax Regulations, 2015.

d/ **Source:** Okuja, Domestic Tax Laws of Uganda, 2017.

III. Welfare implication of VAT exemption for cereal commodities for Rwanda

In order to make an informed decision regarding a VAT exemption on agro-processed goods, it is important to weigh the costs against the benefits for the Rwandan economy. All factors constant, we expect that a VAT exemption would reduce the price of a commodity, thereby improving households' overall purchasing power. This would then move some households over a consumption-based poverty line. Comparing the loss of government tax revenues with the gains in terms of poverty indicates the trade-off associated with the proposed exemption. Table 7 provides this comparison for rice, maize and wheat.

Column 1 of the table shows the annual expenditure, which indicates the size of potential revenue forgone by commodity from the VAT exemption. According to table 3 above, value-addition accounts for 79.7 percent of gross value of production of cereals. This corresponds to 14.4 (18% of 79.7%) percent of the gross value receivable as tax revenue from each unit purchase. Using actual expenditures from the integrated household living conditions survey, we estimate the foregone revenue from the proposed VAT exemption in column 3. For individual households, the tax deducted from the purchase price of a commodity would increase a household's disposable income available to spend on all commodities. Household incomes would increase in proportion to the deducted tax, and the relative weight of the commodity in the household's consumption budget (column 4). NISR (2018) provides the elasticity of poverty to income as -1.1 percentage points for a one percent increase in income. Finally, column 5 shows the impact on poverty of the VAT exemption.

Table 7: Welfare impact of a VAT exemption on rice, maize, wheat (2016)

	Annual expenditure on commodity (RWF Billion)	Expenditure share of total household consumption	Annual tax revenue forgone (RWF Billion)	Annual income increase from VAT exemption	Poverty impact of increase in income
	[1]	[2]	[3]= [1] x 14.4%	[4]= [2] x 0.14	[5]=[4] x -1.1
Rice (local)	381	0.72%	54.9	0.8%	-0.88%
Rice (imported)	394	0.75%	56.7	0.9%	0.99%
Wheat (grain)	4	0.01%	0.6	0.0%	0
Wheat (flour)	6	0.01%	0.9	0.0%	0
Maize (Flour)	585	1.11%	84.2	1.3%	-1.43%

Source: Authors' calculations from Integrated Household Living Conditions Measurement Survey 2015-16.

The results show that the impact of the proposed policy change on poverty are substantially small relative to the government revenues forgone for each commodity. This is most likely because individual food items account for a small share of total incomes. For example, a VAT exemption on maize flour in 2014-15 would generate a reduction in poverty by 1.43%, at a cost to the government of RWF 84.2 Billion equivalent. The above analysis contains a number of limitations. Firstly, the survey does not record expenditures from non-household entities, which understates the change in in tax revenue. Secondly, the analysis considers only direct impacts, whereas the indirect impacts are ambiguous a priori.

IV. Impact of production and market policies on price incentives

This study uses agricultural price distortion indicators as a measure of the impact of government policies and support to agriculture, comparing Rwanda with its neighbours. The Monitoring and Analysing Food and Agricultural Policies (MAFAP) programme computes and publishes annual price incentives indicators. MAFAP estimates the price gap between the domestic price and an international reference price as a ratio, namely the Nominal Rate of Protection (NRP), for many African countries. The following section briefly describes the price incentives methodology and data that are involved.

1) Price Incentives:

The indicators that estimate the price distortions to agricultural commodity prices in African countries, NRPs, focus on the production side. The idea behind the approach is to compare the producer price of a locally produced good with a similar internationally traded good. This approach assumes that internationally traded good commodities are valued at identical, perfectly competitive prices, free from the influence of policies. Policies that might affect domestic prices in small countries, but not international prices, include import tariffs, taxes, market regulations and production subsidies. Additionally, market inefficiencies along value chains, although not explicitly measured by NRPs also affect prices.

As the initial step in calculating NRPs, MAFAP calculates the price gap between the domestic and international price at two points on the commodity value chain: at the wholesale level, where local rice competes with foreign rice for the first time in the domestic market, and at the farm gate level. The initial point of competition for importable goods is at the wholesale level, while for exportable goods it is at the exit border.

A positive (negative) price gap resulting when the domestic price exceeds (is less than) the reference price indicates that domestic policies, and market conditions, support (penalize) local producers. Expressing the price gap as percentage of the reference price allows for relative comparison of support levels across countries. This indicator is known as the NRP computes as follows:-

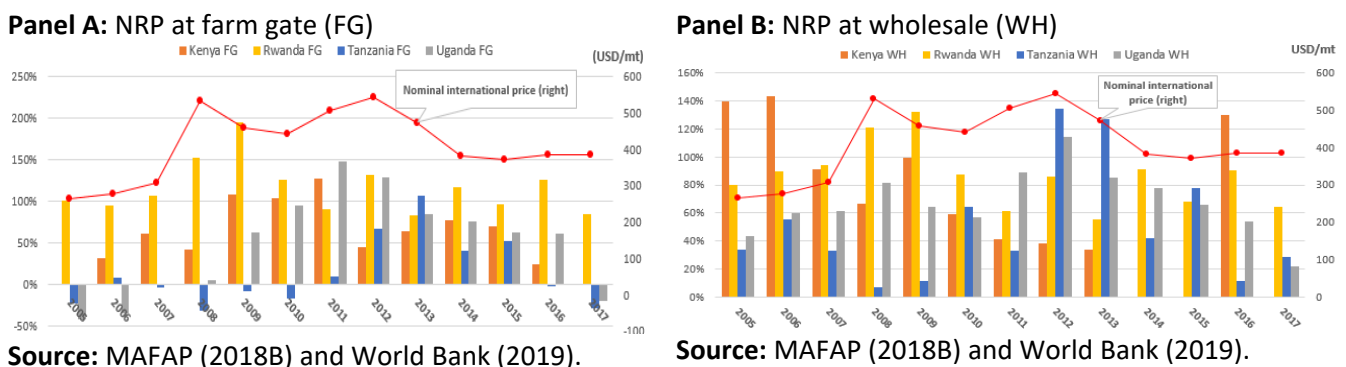
$$NRP = \left(\frac{\text{Domestic price} - \text{Reference Price}}{\text{Reference price}} \right) \times 100\%$$

The following graphs show the development of production, yields and NRPs for rice, maize and wheat in Rwanda, Kenya, Tanzania and Uganda from 2005 to 2017. Overall, the trends in price incentive across EAC quite volatile. The graphs indicate that positive NRPs are not associated with higher production in each country. While Uganda's production continuously increased over the observed period, there is no clear trend in NRPs. In Rwanda, there has been an increase in NRPs until 2011, but this has not resulted in increased production. Only in Tanzania do the two lines move into the same direction.

Given that rice is such an important crop in Eastern Africa, the policies affecting rice production and consumption have high priority for policy makers. Across the EAC, National Rice Development Strategies (NRDS) are the key vehicles for supporting rice farmers through direct budget allocations and tariff measures. The policy environment aims to insulate these farmers from international competition. It is not surprising to see positive NRPs for rice over most of the time period covered in this study for all analysed countries, both at the farm gate (Figure 3A) and the wholesale level (Figure 3B). The main protective measure in the region is the CET applied by the EAC with higher tariff rates for imports of staple cereal commodities.

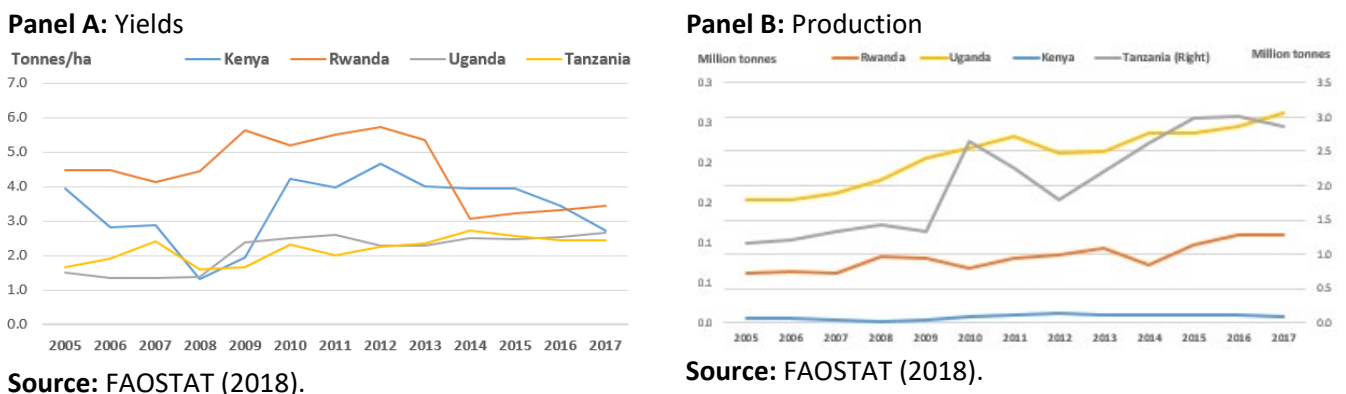
In the case of Tanzania, there has been a change in trend NRP levels in 2013. This was due to a bumper harvest in the region in that year, and therefore lower prices, but also the limited possibilities for exporting to neighbouring countries. Rwanda, Uganda and Burundi applied the CET rate on rice imports from Tanzania, accusing the former of repackaging and exporting smuggled Asian rice as Tanzanian rice.

Figure 3: Rice Nominal Rates of Protection (NRPs) at wholesale for Kenya, Rwanda, Tanzania, Uganda 2005-17



Rwanda has superior average yields in rice compared to the other analysed countries (Figure 4). Although rice productivity is higher in Rwanda, Tanzania and Uganda are able to achieve higher competitiveness with abundant land for rice production.

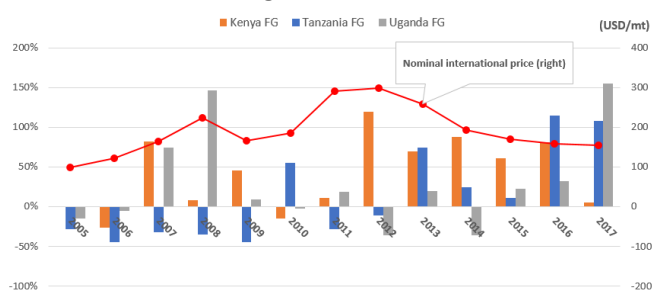
Figure 4 Rice yields in Kenya, Tanzania, Uganda, and Rwanda



The NRPs for maize in Kenya, Tanzania and Uganda are volatile (Figure 5), suggesting much policy interaction for this crop but also volatile border prices. Since Rwanda's maize output is relatively low, NRPs were not calculated. Overall, for Kenya, Tanzania and Uganda, the positive trend in NRPs goes in hand with increasing production, but looking at it in more detail, farmers face much political uncertainty for maize production. In Tanzania, there have been export bans in the past, as well as export licensing systems, public procurement, price setting mechanisms and distribution of subsidized maize (MAFAP, 2018A). Uganda, with its more liberal market environment, still shows volatile NRPs over the analysed period. The main export market for Ugandan maize is Kenya. Therefore, their trade policies and fluctuations of maize demand influence the Ugandan NRPs. Adverse weather conditions in Kenya leading to reduced output coupled with interventions by National Cereals and Produce Board led to high NRPs through an increase of domestic prices.

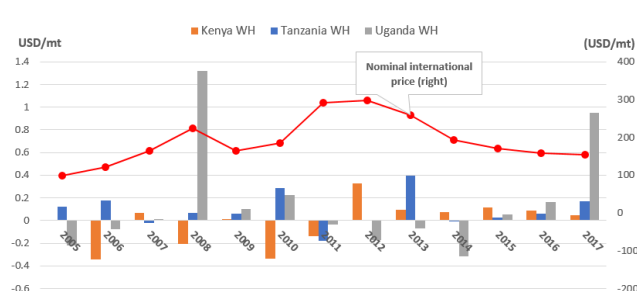
Figure 5: Maize Nominal Rates of Protection (NRP) for Kenya, Tanzania, Uganda in 2005-17

Panel A: NRP at farm gate



Source: MAFAP (2018B) and World Bank (2019).

Panel B: NRP at Wholesale

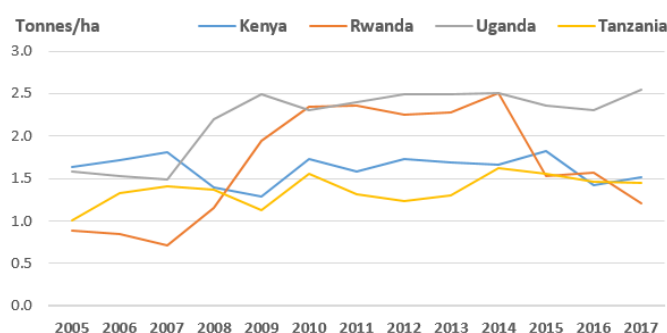


Source: MAFAP (2018B) and World Bank (2019).

Maize productivity has been fairly comparable across the region until after 2014, where Uganda achieved yields of approximately 2.5 tonnes per hectare compared to 1.5 tonnes per hectare among its neighbours. Uganda is East Africa's main supplier of maize, with production levels in 2017 equivalent to roughly the supply from Kenya, Tanzania and Rwanda combined.

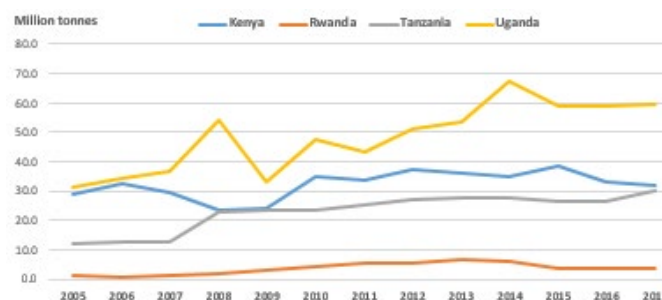
Figure 6: Maize yields and production in Kenya, Tanzania, Uganda, Rwanda, 2005-17

Panel A: Yields



Source: FAOSTAT (2018).

Panel B: Production

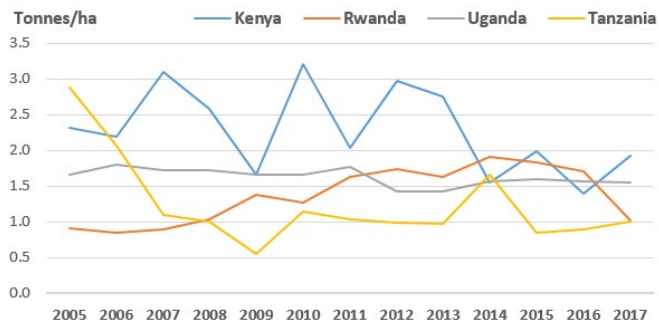


Source: FAOSTAT (2018).

Kenya is by far the largest producer of wheat in the region, followed by Tanzania. In comparison, the production of wheat is negligible in Uganda and even more so in Rwanda (Figure 3). Nonetheless, NRPs in Rwanda for wheat are relatively high. This may be due to low-recorded imports of wheat into the country between 2013 and 2017, implying limited transmission of the international price to the domestic price.

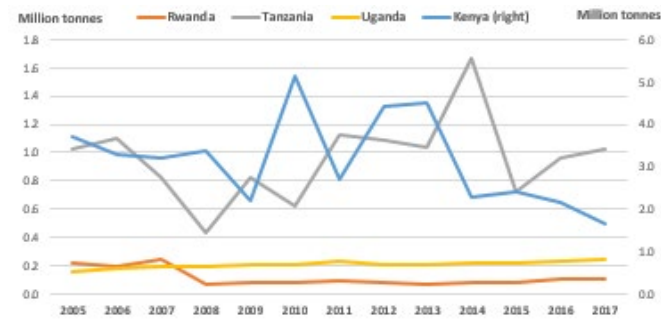
Figure 7 Wheat yields and production in Kenya, Tanzania, Uganda, Rwanda, 2005-17

Panel A: Yields



Source: FAOSTAT (2018).

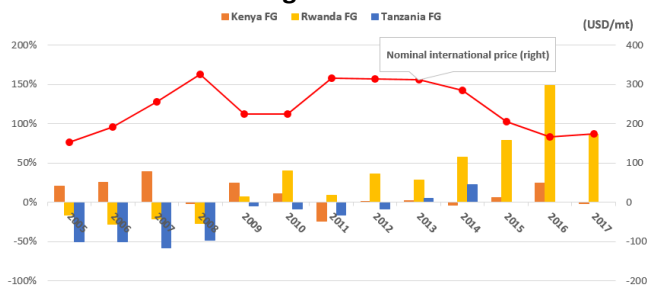
Panel B: Production



Source: FAOSTAT (2018).

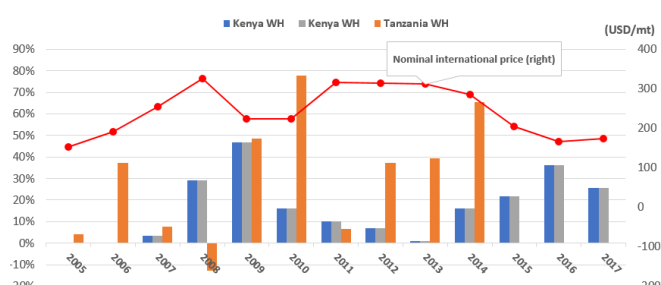
Figure 8: Wheat Nominal Rate of Protection (NRP) in Kenya, Rwanda, Tanzania 2005-16

Panel A: NRPs at farm-gate



Source: MAFAP (2018B) and World Bank (2019).

Panel B: NRPs at wholesale

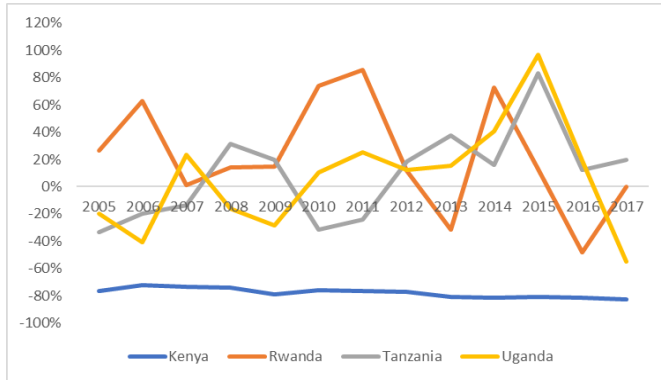


Source: MAFAP (2018B) and World Bank (2019).

While political action has boosted price incentives for farmers, as reflected in the NRPs, market inefficiencies may create price disincentives for farmers in the East African region and may even offset the positive incentives to farmers. Overall, there has been a pro-producer bias of policy support in the observed period in the EAC region, emphasizing that domestic staple food production is a major goal. However, there is no priority to promote agricultural export crops, as can be seen analysing the agricultural budget expenditure. For the countries under focus, export crops account for less than 20 percent of the agricultural budget. On the other hand, food crops absorb roughly 25-30 percent of the agricultural budget in Uganda Kenya, approximately 75-80 percent in the case of Tanzania and Rwanda (MAFAP, 2018A).

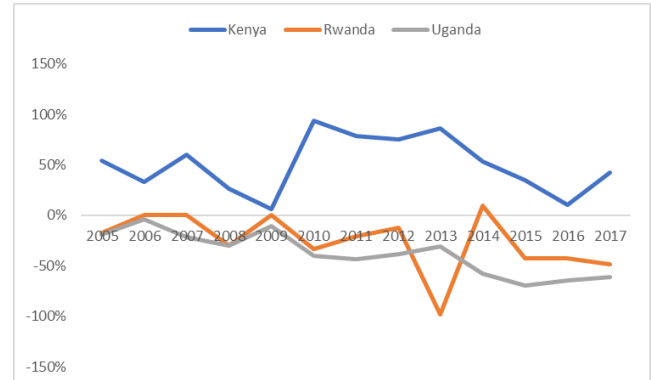
Figure 9: Tea and Coffee Nominal Rate of Protection (NRP) in Kenya, Rwanda, Tanzania and Uganda 2005-17

Panel A: NRPs at farm-gate for coffee



Source: MAFAP (2018B).

Panel B: NRPs at farm-gate for tea



Source: MAFAP (2018B).

V. Discussion

A. Implications of additional subsidies in support of rice, maize, wheat.

Existing policy measures provide substantial boosts to price incentives for food producers, but the supply response is minor. Due to trade and production policies, the NRPs for wheat and rice in Rwanda averaged 128 and 31 percent, respectively, between 2016 and 2017. Wheat and rice production increased less than proportionally, by just 5 and 5.3 percent, respectively, due mostly to an expansion in harvested area by 5 and 7 percent, respectively. Yields increased by 1.4 percent for wheat and declined by 1.3 percent for rice. Responsiveness to price incentives is limited due to land scarcity and volatile price signals providing little long-term planning security. Given these conditions, higher domestic prices do not necessarily lead to increased production and so limit the rise in farm household incomes.

Competitiveness of Rwanda's agro-processing is hindered by non-agricultural costs and limited access to raw materials. According to Pradesha and Diao (2014), non-agricultural intermediate inputs and primary factors of production account for 60% of the value of output of cereals. Capacity underutilization also raises processing costs per unit of output. Low responsiveness of supply to price increases, as noted above, hinders policy efforts to increase domestic production capacity. In addition, poor post-harvest handling renders a substantial share of local raw materials to be unsuitable. This suggests that directing policy initiatives towards reducing non-agricultural costs and facilitating access to high-quality raw materials from international markets would do more to enhance competitiveness.

Market-insulating policies, including market price support and border protection, can be counter-productive for food security. As noted in the previous section, interventions aimed at curbing transmission of international prices have been prevalent and highly volatile in East Africa over the period analyzed. These types of policies result in price distortions and create an uncertain environment for producers. Such price distortions thus do little to enhance farm household welfare.

Urban preferences for high-value commodities increasingly drives Rwanda's demand for agricultural commodities. Demand for high-value commodities, which rises with incomes and the rate of urbanization, is likely to accelerate as urban penetration approaches rates consistent with middle-income status by 2035. This suggests that Rwanda's ability to maintain a favorable balance of trade in agricultural products will depend on the ability to earn revenue from high-value agricultural exports, and less on domestic production of staple commodities.

B. Regional integration: implications for Rwanda's agricultural policy

Inadequate cooperation on agricultural-sector development has eroded trust in the integrity of policies in counterpart states. The lack of a shared vision for development of the agricultural sector has led EAC member countries to pursue national interests, in some cases at the expense of other countries' and regional collective interests. Quantitative restrictions to trade by both importing and exporting countries are increasingly prevalent. Regional governance frameworks appear to have been ineffective, as policies restricting trade within the EAC continue to uphold. Despite the potential welfare gains from liberalization of trade, a fully liberalized EAC market remains a distant objective.

VI. Recommendations

- **Complement the current food availability policies with measures to improve access/affordability and price stability.**

Sustained food security requires price stability and economic and physical access to food. This report shows that the current policy and market environment encourages domestic production but does little to promote economic access and price stability. Alongside the current policies promoting staple food crops, promoting high-value crops to augment agricultural household incomes can increase economic access for net buyers of staple foods. This could require rebalancing agricultural expenditure towards high-value export crops, such as on productivity enhancing research. Policies that insulate domestic prices from international competition should be applied sparingly if at all. Negative impacts of price instability can be addressed by providing social safety nets during the short periods of high or low food prices, thereby directly helping poor people. At the same time, negotiation of favourable external trade terms within the EAC – such as the removal of critical raw materials from the list of sensitive items – would improve competitiveness of local agro-processing.

- **Rebalance public expenditure in support of agriculture towards public goods and infrastructure.**

Public goods, such as agricultural research and development, and market-enabling infrastructure, such as post-harvest handling facilities, can encourage private sector investment, leading to efficiency gains for the economy. Analysis shows that these activities can generate larger economic benefits compared to price-supporting measures. Rebalancing agricultural budgets towards these activities can have large economic benefits for the country.

- **Strengthen regional cooperation frameworks to cultivate increased trust in regional integration.**

In order to materialize the benefits of a liberalized market for cereals, a regional governance framework needs to be established. This would address the concerns of net-exporting countries towards market access, and of net-importing countries towards stable and fair prices. Regional blocs that have successfully created a regional identity have allocated sectoral responsibilities within partner states. However, if one country starts subsidizing production, other countries will tend to follow to keep their crop production competitive. This can lead to a cycle of ever-increasing subsidies (as in developed countries in the past) and production of commodities sold at less than their social cost of production.

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