Expanding Markets for Rice in the East African Community (EAC) Region

Great opportunity for actors in locally produced rice
About KT

Kilimo Trust (KT) is a non-profit and non-political regional organization contributing to efforts designed to make the East African Common Market (EACM) work better for wealth creation and elimination of hunger in the region through agriculture. KT is contributing to this through regional solutions to local problems in the development of strong regional agricultural value chains that enhance security of incomes, food, and nutrition in the region (see the strategy in details on www.kilimotrust.org). The mission of KT is to “catalyze the growth and competitiveness of strategic agricultural sectors for the benefit of a large number of people in East Africa”.

KT is one of a few “home-grown” organizations working on agriculture for development at regional level within the East African Community (EAC). It has chosen as its core business, to support the transformation of food and nutrition security in the EAC Region away from high risk subsistence farming into lower risk trade-based systems. Why is this important? Because, the very low levels of specialisation in the production of food commodities by smallholders within EAC, encourage the production of food commodities in subsistence and unsustainable manner, leading to perpetuation of hunger and poverty. At the moment, the opportunity created by the EACM is hardly being utilized to overcome this problem because, regional markets are for all intent and purposes left out of national strategies for food security, by both surplus and deficit countries - limiting opportunities for: i) enhanced incomes for producers, and/or ii) providing good nutrition at prices that low-income earners in rural and urban areas can afford:

Therefore, to contribute to the necessary transformation, KT is working to become a coordinating HUB for regional food markets development programs designed and coordinated in ways that will enable the following to be achieved within 15 years (starting 2012):

a) Specialization in production of staples to: i) effectively utilize comparative advantages; and ii) enable smallholder producers of the key food commodities to “farm as business” and become competitive.

b) A structured regional trade in foods driven by the private sector business linkages for each commodity.

c) A high proportion of the food commodities (especially perishables) produced in the EAC, are transformed to differentiated value-added products preferred by the final consumer.

About this Report

The expanding of rice markets in the East Africa Community report unpacks the potential of rice as a food and income security crop in the region. The report presents clearly the status, opportunities and challenges facing the sector. The authors go ahead to present a ten (10) year vision for the sector in the EAC. The journey towards understanding the rice sector in the region will be covered in six main chapters of this report namely: Demand, Supply, Trade, Prices, Trajectory and Ten year vision. The work in this report resulted to a Competitive Africa Rice Initiative (CARI) programme and KT is implementing the Tanzania component.

Acknowledgements

This comprehensive analysis work is the result of the invaluable efforts of many people and organizations. Due to limited space, Kilimo Trust will not mention each of the contributors by name. However, our sincere gratitude goes to all who contributed financially and/or technically to this work. Specifically, we would like to acknowledge the Gatsby Charitable Foundation for commissioning this work and supporting it to the end both financially and technically. We also would like to acknowledge the team from Kilimo Trust who drafted the report and worked tirelessly to improve it to this final product.

To all, THANK YOU.
Consumption of rice in the EAC grew at an average rate of 4% per annum over the ten year period to 2012, a trend projected to continue in the foreseeable future. The increase is driven by: i) increasing population (about 3% per year); ii) growth in demand by the expanding middle income class - willing to pay for the convenience provided by storage and cooking characteristics of rice compared to traditional staples; and iii) increasing consumption by the producers themselves - for example, an average of 30% of the rice produced in Tanzania being consumed by the producers.

Therefore, rice has become the second most important staple in the EAC, after maize, with an estimated consumption of 1.80 million MT in 2012. Tanzania is the largest producer and consumer of rice in the EAC, with annual consumption standing at approximately 1.18 million MT, nearly 65% of EAC production. Kenya is the second largest net consumer at 370,000 MT annually compared to its local production that is estimated to be only 122,465 MT (Mulinge W. & Witwer M., 2012). Uganda, Rwanda and Burundi consume 167,000 MT, Rwanda 83,000 MT, and Burundi 58,000 MT respectively. Production of rice within the EAC has been increasing through the expansion of the land under rice cultivation but with very limited increase in productivity and competitiveness. Yields achieved in the EAC Region stand between 1.5 to 2.5 MT/Ha, compared to 4 MT/Ha in Pakistan, 5MT/Ha in China and 6MT/Ha in Vietnam.

The US$500 million per annum on rice imported into the East Africa Common Market (EACM) area provide a tremendous opportunity for rice farmers in the region. Rice demand in the EAC exceeds supply (1.25 million MT per annum), by over 0.6 million MT per annum - a deficit supplied with imports from mainly Asian countries. Kenya is the leading importer, from outside the EAC, at over 300,000 MT per annum. Eighty percent of the rice imported into Kenya comes from Pakistan (74%), Vietnam (10%) and Thailand (5%).

But we should urgently deal with the low price competitiveness of the EAC’s rice
sector. While it has high potential for farmers and consumers, rice produced especially by the smallholders in the EAC is not price competitive compared to other Asian rice producing countries. For example, farm-gate prices of paddy in the EAC range from US$ 455/MT in Morogoro - Tanzania, to as high as US$ 700/MT in Kenya. Such prices are often double the prices of paddy in the Asian countries that are exporting rice to the EAC. For example, such prices are only US$175/MT in Bangladesh, US$169/MT in India, and US$371/MT China.

The low productivity and low competitiveness can be attributed to:

a) Small scale of operations by the majority of producers who cultivate farms of less than a hectare – limiting opportunities for economies of scale.

b) Inadequate water management for paddy production under both irrigated and rain-fed systems. For example, over 75% of paddy production in Tanzania uses rain-fed and/or rainwater harvesting systems with very limited water control systems. The main challenge is the costs of setting up irrigation schemes, which range from US$3,000 to 12,000 per hectare.

c) Inadequate use of improved varieties, quality seed and other inputs due to several factors including: limited availability of varieties that are high yielding while meeting preferences of the consumer; inadequate business understanding by smallholders of the benefit to cost ratios of using better inputs; limited access to finance (especially due to high cost of borrowing); and limited supply of certified seed and other inputs.

d) The limited access to markets which reduces smallholders’ appetite for “farming as a business” (i.e. taking risks with productivity-enhancing inputs and other good agricultural practices). This then limits the development of input supply businesses creating a negative feedback loop that keeps smallholders in a “low-yields trap”.

e) Low productivity of labour that limits wealth creation for smallholder producers of rice. For example, due to an almost complete lack of labour-saving mechanization, rice farmers in Tanzania spend 130 person-days per hectare/season in the farming operations, as opposed to 14 person-days spent by Thai farmers.

f) Inefficiency in milling which amplifies the consequences of low yields. Most of the rice produced locally is milled using very old small scale mills of out-dated technology that deliver out-turns of around 50% paddy conversion to milled rice. These cannot compete with mills made of modern technology that can convert up to 72% of paddy to milled rice. The old small-scale mills also deliver low quality as they do not have de-stoning, polishing and grading capabilities. Therefore, a high proportion of locally produced milled rice is of poor quality reducing its market competitiveness even further. At the same time, there is serious underutilization of installed capacity of modern (medium to large scale) mills. Most utilize less than 30% of installed capacity reducing incentive for further investment in modern equipment.

Trade is mainly at national level with minimal rice crossing borders. For example, only 3% of the rice imported into Kenya comes from Tanzania. Official figures show that between 27,000 – 37,000 MT are formally traded across borders within the EAC Region and another 17,000 – 25,000MT are exported outside the regional borders. This translates to a mere 3.5% of the total consumption of rice in the region – very small regional trade indeed. However, informal trade is also significant and if considered, it can drive these figures a bit higher. Key obstacles to intra-region trade are:

a) Non-tariff barriers (NTB). These include export bans, for example, by Tanzania; proof of certificate of origin because of the significant amounts of rice imported from outside the EAC; road blocks and slow processes at border posts adding 20% to the final price; poor technology and
processes for assessing quality standards at the borders; and domestic levies which often account for up to 8% to the final price.

b) High costs of transportation. For instance, in some cases transport could make up over 50% of consumer price of rice. These costs added to the relatively very high farm-gate prices, translate to very high prices of locally produced rice forcing most consumers to opt for imported rice.

c) Tariffs on imports which have not helped to boost local production that much. A common external tariff of 75% was imposed on rice imports into the EAC as a measure to protect domestic supply. However, it has proven difficult to implement effectively due to several exemptions such as: i) Kenya was charging only 35% owing to the importance of Pakistan as a main buyer of Kenya’s tea; ii) Tanzania had negotiated a 12.5% rate for Zanzibar due to the importance of rice in the island; and iii) early in 2013, the Tanzanian government, reacting to skyrocketing consumers prices, gave permission for the importation of 60,000 MT of rice duty free.

Low resilience is a major threat to the rice sector in the EAC Region. The failure by the sector to thrive even under the high tariffs on imported rice, when these were fully implemented by Tanzania and Uganda, is an indication that the sector is not resilient. Furthermore, consumers’ standards and preferences are rising with the increase in disposable income, placing more importance on branding and packaging. Local rice sector has not been able to meet such consumer requirements. However, on the positive side is the fact that locally produced rice is still highly demanded due to its aroma and other presentational qualities. This provides head room for making the sector more resilient and competitive. Using this advantage, public and private sector should increase investment in modern technologies to increase: yields, labour productivity, and quality of milled rice in response to consumer preferences.

To assist the smallholder farmers and traders of rice locally produced within the EAC to cash-in on the expanding demand for rice; a regional-wide sector development program is required to undertake the following:

a) Enhance efficiency in postharvest handling, milling and trading to improve quality, differentiation, and branding while reducing costs. These become even more critical in the context of falling tariffs on rice imports and rising consumer standards in the future. This will require support to the private sector to implement business “as un-usual” innovations for effective linking of smallholders to key market segments and thus enhance “farming as a business”.

b) Enable business enterprises of smallholder producers of rice to respond effectively to regional markets for rice products. This will require “business as un-usual” public sector intervention in agricultural development so that projects dealing with the rice sector in the EAC can be re-designed to expand their horizon beyond irrigation. Such projects should then focus more on working with relevant partners in enabling regional trade in differentiated rice products – for example, by investing more in cross-border business development and specialised trade facilitation services.

c) Improve and make the business environment more predictable - through, for example, increased quality and dynamically updated evidence, driven by analysis and diagnostics of international, regional and national markets.

d) Improve productivity of all factors of production (labour, land, water and capital) - mainly by supporting adoption of: Good Agricultural Practices (G.A.P); and labour-saving mechanization especially for the “women tasks” of trans-planting, weeding, harvesting and threshing.

To respond to some of the challenges highlighted in this report, a Competitive Africa Rice Initiative (CARI) in Tanzania is already in place. However, rapid scaling up is required.
Competitive Africa Rice Initiative (CARI) Tanzania

Developmental Goal
To improve the livelihoods of smallholder rice farmers and traders in Tanzania.

Aim
To double incomes of 30,000 smallholder farmers in the rice value chain.

Specific Objectives
- To increase the productivity and quality of paddy rice.
- Improve sourcing capacity through structured producer-off-taker-linkages as well as improved storage technologies and processing efficiency.
- To increase access to financial products and services by the value chain actors.
- To support processes required to improve the policy environment for development of the rice sector.
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<td>AATF</td>
<td>African Agricultural Technology Fund</td>
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<tr>
<td>AGRA</td>
<td>Alliance for a Green Revolution in Africa</td>
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<td>ASA</td>
<td>Agricultural Seed Agency</td>
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<td>CARD</td>
<td>Coalition for African Rice Development</td>
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<tr>
<td>CET</td>
<td>Common External Tariff</td>
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<tr>
<td>COMTRADE</td>
<td>Common format for Transient Data Exchange for power systems</td>
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<tr>
<td>DAP</td>
<td>Di-Ammonium Phosphate</td>
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<tr>
<td>DIMAT</td>
<td>Development of Inclusive Markets in Agriculture and Trade</td>
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<td>DRC</td>
<td>Democratic Republic of Congo</td>
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<td>EAAPP</td>
<td>Eastern Africa Agricultural Productivity Project</td>
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<td>EAC</td>
<td>East African Community</td>
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<td>EAGC</td>
<td>Eastern Africa Grain Council</td>
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<td>ETG</td>
<td>Export Trading Group</td>
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<td>FAO</td>
<td>Food and Agriculture Organisation</td>
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<td>FAPRI</td>
<td>Food and Agricultural Policy Research Institute</td>
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<td>GAEZ</td>
<td>Global Agro-ecological Zones</td>
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<td>IFAD</td>
<td>International Fund for Agricultural Development</td>
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<tr>
<td>IIASA</td>
<td>International Institute for Applied Systems Analysis</td>
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<td>IRRI</td>
<td>International Rice Research Institute</td>
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<td>JICA</td>
<td>Japan International Cooperation Agency</td>
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<td>JKUAT</td>
<td>Jomo Kenyatta University of Agriculture and Technology</td>
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<tr>
<td>KATRIN</td>
<td>Kilombero Agricultural Research and Training Institute</td>
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<td>KRPL</td>
<td>Kapunga Rice Project Limited</td>
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<td>KSC</td>
<td>Kenya Seed Company</td>
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<td>MAFSC’s</td>
<td>Ministry of Agriculture, Food &amp; Cooperatives</td>
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<td>MIAD</td>
<td>Mwea Irrigation Agricultural Development Centre</td>
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<td>MT</td>
<td>Metric Tones</td>
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<td>NBS</td>
<td>National Bureau of Statistics</td>
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<td>New Rice for Africa</td>
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<td>QDS</td>
<td>Quality Declared Seed</td>
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<td>R&amp;D</td>
<td>Research and Development</td>
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<td>RATIN</td>
<td>Regional Agricultural Trade Intelligence Network</td>
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<td>RCMRD</td>
<td>Regional Centre for Mapping of Resources for Development</td>
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<td>SACCOs</td>
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<td>SADC</td>
<td>Southern Africa Development Community</td>
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<td>SAGCOT</td>
<td>Southern Agricultural Growth Corridor of Tanzania</td>
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<td>SME</td>
<td>Small and Medium Enterprise</td>
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<td>SRI</td>
<td>System of Rice Intensification</td>
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<td>TANEXA</td>
<td>Tanzanian Exporters’ Association</td>
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<td>TIC</td>
<td>Tanzanian Investment Centre</td>
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<tr>
<td>TXD</td>
<td>Tanzania Cross Dakawa</td>
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<tr>
<td>USAID</td>
<td>United States Agency for International Development</td>
</tr>
<tr>
<td>USD</td>
<td>United States Dollar</td>
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<tr>
<td>USDA</td>
<td>United States Department of Agriculture</td>
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More than half of the world population depend on rice as a staple food and for many the only cereal. It is estimated that global consumption of rice per year will exceed 550 million MT by 2035. Across sub-Saharan Africa, rice is becoming an increasingly important food and cash crop. Since the 1960s, annual production of milled rice has increased four-fold to over 14.5 million MT, but consumption has increased even faster (at about 20% per year) reaching 21 million MT in 2012 (ATF, 2012). The deficit is made up through imports into the continent, largely from Asia.

In the EAC, rice is the second most important staple food, behind maize. Consumption has reached 1.8 million MT per year and is expanding each year driven mainly by wealthier urban consumers. This is a trend that seems set to continue in the foreseeable future. Annual production is 1.25 million MT and is growing steadily. Local rice production is dominated by 1.5 million smallholder families who grow rice on farms of less than 3 Ha, of these, about 1.1 million are in Tanzania (EAC - NBS, 2006-8). Many more people are involved in the processing and trading of rice along the value chain. Rice is both a staple for 70% of farming families and an important cash crop for over 80% of those families (about 7.5 million people) bringing in an average annual income of US$550 per household.

Rice is also becoming a large part of the region’s food bill and is important to the region’s macro-economic and political stability. Consumers in the region are currently spending an equivalent of US$500 million per annum on rice imported into the East Africa Common Market (EACM). Urban dwellers now consume almost as much rice as they do maize (Skytel, 2011).

The governments of the EAC Partner States recognise the importance of rice. Compared to other agricultural commodities, the rice sub-sector receives a substantially higher proportion of public support going to agriculture from both donors and governments. This support is in the form of direct investment (especially in irrigation infrastructure) and through tariffs designed to protect local rice producers against the competition with imports. For example, in Tanzania, rice was a priority crop under the country’s Agricultural Sector Development Programme (ASDP) - that pools resources from most donors supporting agriculture in the country. On the negative side, the increasing importance of rice as a staple is leading to unnecessary political interference in the sector.

Production is currently growing faster than demand but the increase comes from expanding the area under rice rather than from yield increases. Rice yields across the region remain stubbornly low limiting the
ability to compete against imports. Hence, often tariffs are used as a way to protect local production, but this is both unsustainable and has proven to be unworkable. If demand is to be met from local production that compete commercially with imported rice\(^3\), then yields must increase and efficient value chains established to deliver differentiated rice products that are valued in an increasingly sophisticated market place. The benefits from this would be immense. It would provide sustainable livelihoods for millions of smallholder farming families; it would reduce poverty and hunger, and increase national and household food security across the region. But achieving this goal will require significant changes across the rice sector from ‘plough to plate’.

This report presents the results of a study undertaken to assess the potential role of the rice value chain in reducing poverty and eliminating hunger among rural and urban poor in the EAC. The report presents a unique and comprehensive analysis of the current (2013) and potential future supply and demand for rice in the region. It critically reviews the current sector trajectory, and offers a vision for rice for the next 5-10 years.

There is a dearth of data and information on the rice sector in the EAC and so much of the information in this report comes from commissioned research undertaken in 2012-13, which included extensive surveys across the region involving:

a) Four thousand (4,000) rice consumers (Kilimo Trust, 2012);

b) One thousand five hundred (1,500) smallholder rice growers in key districts of Tanzania and Uganda (Zaal et al, 2012);

c) Seventy (70) rice and grain traders and processors (EAGC, 2013); and

d) Primary interviews with seventy (70) key sector stakeholders – farmers, processors, traders, financial service providers, inputs providers, researchers, and donors.

Therefore, this report presents evidence-based analysis of: demand and supply; market development and trade, the potential 5 – 10 year vision; and key levers of change; and obstacles to change.

\(^3\) It must however be noted that the rice sector in Asia where most imports come from, is very highly subsidized – to the extent that the generous rice sub-sector subsidies in Thailand drained national treasuries so much as to be one of the causes of the political turmoil in the country.
2. DEMAND

2.1 Characteristics

It is estimated that consumption of rice per annum in the EAC stands at 1.8 million MT. Tanzania is the region’s largest rice market, consuming 1.18 million MT of milled rice annually. Kenya is the region’s second largest rice consumer at 370,000 MT; Uganda consumes 167,000 MT, Rwanda 83,000 MT, and Burundi 58,000 MT (Figure 1).

Tanzania has the highest per capita rice consumption in the region of 25kg, compared 9.5kg in Kenya, 8kg in Uganda (Kilimo Trust, 2012), and 4kg in Rwanda and Burundi (Stryker (2011), CARD-IFAD (2010)). Regional consumption has grown rapidly, apart from a drop in 2004-05, when the 75% import tariff was introduced and temporarily depressed imports to Tanzania (Figure 2). Regional consumption growth is 4% per year, with national growth rates ranging from over 3% in Tanzania to over 6% in Kenya. In Uganda, consumption is growing at 4% and in Rwanda 5% per year.

![Figure 2: Trends of regional consumption of rice by country, 2003-12](image)

![Figure 1: Annual consumption by country](image)
A combination of population, urbanization and income growth drives consumption in Tanzania as well as all the other EAC Partner States. Rice is an expensive staple and costs 3-4 times more than maize (RATIN, 2013). However, it is a preferred staple for those who can afford it and so its consumers tend to be the wealthier in society. Consumers with relatively higher incomes are likely to consume 2 to 4 times the rice purchases of those with relatively lower incomes (Kilimo Trust, 2012). This explains why consumption has risen in line with national per capita income, and the fact that most rice is consumed in urban areas. For example, in Uganda and Rwanda, per capita consumption of rice in rural areas is about half that of the rate in urban areas (Figure 3).

Rural consumption is mainly concentrated in the rice producing areas, with an estimated 10% (in Uganda) to 30% (in Tanzania) of the locally produced rice being consumed by the producers themselves (Zaal, 2012, Kilimo Trust, 2012 and Stryker, 2011). Rural consumers also show greater preference for local varieties of highly aromatic rice. Therefore, rice imports are mainly consumed in urban areas – where consumers prefer branded and well packaged rice and rice products. Almost all the rice produced in the region is consumed as milled rice rather than as any other product such as flour or breakfast cereal. Consumption of locally produced by-products such as bran is also very limited.

### 2.2 Drivers

#### 2.2.1 Aroma

There is a strong preference across the region for Aromatic rice as reported by 91%, 84% and 72% of consumers in Tanzania, Uganda and Kenya. In Tanzania and Kenya, both urban and rural consumers living close to producing areas tend to be more discerning of rice quality, often valuing local aromatic but expensive varieties. This is true of consumers in Mwea (Kenya) and Mbeya (Tanzania). Uganda, with its very low rural consumption patterns does not follow this trend and higher income urban consumers are the ones sensitive to the aroma-driven quality.

#### 2.2.2 Affordability

Affordability is identified by most consumers as ‘important’ or ‘very important’. For 84% of consumers in Tanzania and Uganda, and 90% in Kenya, economic factors largely dictate how much rice urban consumers buy, placing it above quality and taste. This suggests high income-elasticity for rice. Indeed, prices paid by high-income consumers are significantly higher, in all the cases, than those paid by low-income earners (Figure 4). However, for most of the consumers in the region, both high and low income earners, consumption of rice fluctuates with price. For example, in Kenya a greater proportion of consumers say they would reduce consumption if prices rose.

This explains the findings that Kenyan market share of low quality and low price imported rice, is very high (Figure 5). This does not mean that rice in Kenya is always cheaper than it is in Tanzania. Outside Nairobi, prices are around 10% higher than in Tanzania. But relative to incomes, Kenyans are somewhat less willing to spend money on rice than Tanzanians or Ugandans.

Price sensitivity among consumers also increases as one nears the coast. Consumers in Dar es Salaam and Mombasa, where cheap imports are more abundant, are more price sensitive than those in other parts of the country. This correlation between imports and price sensitivity is not necessarily due to the greater availability of cheap rice. Cheaper rice may well
attract a different type of consumer who is on a lower income and is thus more sensitive for this reason.

In Uganda it was 67% but in Kenya it was 84%. However, across the region, rice consumers in urban areas prefer branded packaging more than those in rural areas.

The preferences for product presentation may relate to the level of sophistication of retail practices around the region. Consumers purchase rice from a variety of sources including at the farm-gate, rice processors, wholesale shops, open markets, small shops, mini-supermarkets, and supermarkets. In general, the level of sophistication at the point of purchase (i.e. retail shops and supermarkets rather than open markets) increases with consumer income and location – whether urban or rural. In Kenya, retailing is significantly more sophisticated than in the rest of the region. Consumers’ expectations of branded packaging rise with their exposure to formal retail shops and supermarkets.

Generally, most consumers in the region purchase rice from open markets, and rice is identified more by the geographical area of production and the historical reputation of that source. For example, in Tanzania where there is high level of segmentation even among low income consumers, rice from Kyela District in the south of the country on the border with Malawi, is ranked highest because of its aroma and test, while rice from Shinyanga is ranked lowest because of past history on high level of contamination with stones.

2.2.4 Summary

Rice consumers in the EAC are highly segmented and the wide variation of prices across the region (for example, outside Nairobi, prices in the region are often double the world prices) suggests an inefficient trading systems. Therefore, interventions in the sub-sector should focus at enabling suppliers of locally produced rice to deliver differentiated products demanded by the different consumer segments (Figure 6).
Figure 6: Key centres of rice consumption in the EAC.
3. SUPPLY

3.1 Key Characteristics and Trends

Annual milled rice production across the EAC is about 1.25 million MT. Tanzania produces about one million MT (80% of the total regional production). Uganda produces 130,000. Kenya produces slightly above 100,000 MT while Rwanda, and Burundi each produce less than 50,000 MT. In Tanzania, annual production is increasing by 9%, in Kenya by 11%, Uganda by 6%, and in Rwanda by 4%. In all cases, the growth is as a result of increasing area under rice cultivation rather than from increase in yield (Figure 7). In Uganda and Kenya, area under rice is increasing at an average rate of 8% per annum while in Tanzania the rate 5%.

As shown in Figure 8, cultivation of rice in the EAC is concentrated in three areas (which together contribute 75% of the region’s production):

a) Tanzania’s ‘Lake Zone’ (Mwanza, Geita, Shinyanga, Simiyu and Tabora regions);

b) Morogoro and Mbeya regions of Tanzania (referred to as the ‘Southern Corridor’); and

c) Eastern Uganda.

In Kenya, most production (30,000 MT) comes from

Figure 7: Rice production in Tanzania and Uganda

NB: Uganda’s growth is less volatile largely because rainfall in the country is more reliable than Tanzania, so production is less vulnerable to annual fluctuations.
the 10,000 Ha Mwea irrigation scheme, located 100 km North East of Nairobi. The remainder (10,000 MT) is upland rice from Nyanza and Western provinces, and the Coast and Rift Valley provinces.

All EAC countries import rice to supplement local production. Kenya imports 0.3 million MT, Tanzania, is almost self-sufficient but imports 140,000 MT, Uganda imports 65,000 MT but exports half of this to Rwanda, DRC, and South Sudan. Rwanda imports 20,000 MT, almost a quarter of national consumption.

The rest of this chapter critically assesses the factors influencing supply response by local producers and value chains. Such factors include: land availability and use; supply and management of agricultural water; productivity enhancement through better seeds and use of fertilizers, and the control of pests and diseases with chemicals; sector financing; and processing, marketing and trade.

Figure 8: Key production areas in Uganda and Tanzania
Source: Ministries of Agriculture
3.2 Factors Influencing Supply

3.2.1 Size of farms and yields

Rice is predominantly grown on smallholder farms, with households cultivating more than one field but with a total area of less than 2 Ha with the average under rice being 1.25 Ha. Medium sized farms (2 – 6 Ha) and Large estates (>6 Ha) make little contribution to rice production (Figure 9).

Smallholders allocate to rice less than 50% of land under cultivation, except in the Mbeya and Morogoro rice growing areas. This can perhaps be explained by the findings that in the Mbeya, Morogoro and Eastern Uganda - rice growing areas, farmers treat rice as a commercial crop and retain only 10-20% for home consumption.

Despite expanding production of rice, yields remain low and stagnant across the region. In Tanzania, the average yield is only 1.5 MT/Ha. In Uganda and Kenya the average is 2.5 MT/Ha (EAC NBS, 2006-08). These are very low compared to the global average of 4 MT/Ha. In Pakistan, which supplies most of the imports to the EAC, the average yield is 4 MT/Ha. Smallholder rice growers in China and Vietnam achieve yields of 5 to 6 MT/Ha, often much more. Often, the low productivity leads to high production costs per MT, forcing farmers to keep prices high to cover their costs, sell at a loss, or change enterprises.

3.2.2 Availability of land suitable for rice cultivation in the EAC

With consistent low levels of productivity across the region, the analytical work reported here used the Global Agro-ecological Zones (GAEZ) developed by the International Institute for Applied Systems Analysis (IIASA) to develop maps of land suitability for rice production in the EAC (RCMRD, 2013). Two rice suitability maps were produced - one to assess the potential for ‘less intense-input’ rice production, which is the norm for most rice grown in the EAC, and a second to assess the potential for rice grown under ‘intensive-input’ agronomy in order to examine the potential for change.

The maps presented in Figures 12 and 13 are based on 2005 data, but they do provide a useful picture of production in the region which has not changed significantly in the intervening period. This mapping exercise led to two main conclusions:

a) First, both maps highlight significant areas with good potential for growing rice:

i) Central and eastern Uganda + western Kenya around Lake Victoria;

ii) The Lake Zone in Tanzania stretching across north-west of the country; and

iii) The Southern Corridor of Tanzania from the coast all the way to the border with Malawi, Zambia and the DRC in the south west of the country - particularly in the south-west around Mbarali in Mbeya region, and in central Tanzania in the Kilombero and Wami valleys of the Morogoro region”.

b) Second, the maps clearly show that, from an agro-ecological standpoint, land in East Africa is not well suited for ‘low-input use’ rice farming. The outcome of this exercise clearly shows that any commercial vision for the rice sector must involve upgrading farmers to adopt ‘high-input’ agronomy practices.

A comparison between the existing main rice growing areas and the mapped rice areas shows that in general farmers are growing rice in the areas most suitable for ‘high-input’ production (Figures 10 and 11). Furthermore, most rice farmers in East Africa are currently growing rice in areas of high or very high potential. The maps particularly highlight
the importance of the Southern Corridor for rice production in Tanzania.

This analysis shows that the region’s rice sector is performing far below its optimum due to its low input system of production. The adoption of best bet practices of rice production like fertilizer use, timely planting, weeding and harvest, soil moisture management, use of improved germ-plasm and use of labour saving technologies should be exploited if sustainable transformation into a commercially viable rice subsector is to be achieved.
High-input agro-ecological potential | Actual area under current production

Uganda

Tanzania: Lake Zone

Tanzania: South & Southern Growth Corridor

Key: acreage under rice per 10km unit

51 - 100 | 101 - 200 | 201 - 500 | 501 - 1000 | > 1000

Figure 11: Rice suitable areas vs current production areas
3.2.3 Supply and management of agricultural water

Water is a key input to rice production. Rice is traditionally cultivated by flooding fields after crop emergence, or following transplantation of young seedlings. Flooding is not mandatory; rice can be cultivated under ‘upland’ conditions. But flooding reduces weed growth, deters vermin infestation and ensures a more reliable crop yield. Natural lowlands prone to flooding from rainfall are often used to grow paddy. Contour bunds are used to catch and retain rainwater. In some cases this can be supplemented by managing river flooding. In areas where irrigation is possible, most irrigation schemes, even modern ones, are gravity-based stream diversion with very little water storage and/or pumping. Consequently, most irrigation schemes are “rain-fed” since they rely on seasonal water flows and can only grow one rice crop during the rainy season, as opposed to some Asian countries where many irrigation schemes are designed to produce two crops which adds to the schemes economic viability.

Irrigation, when well designed, can increase the reliability and duration of water supply and this can raise average rice yields by 2 MT/Ha (Figure 12). A major advantage is that irrigation reduces the risk of low rainfall. The yields of upland rice, given the likelihood of even drier conditions, can be up to 20% lower than for rice grown under irrigation conditions.

Most of the irrigation schemes in the EAC are built and run by governments e.g. Mwea and Ahero Irrigation schemes in Kenya, and Mubuku, Doho, Agoro, Olwenyi irrigations scheme in Uganda. However, a few are owned and run by communities and private companies like the dominion farms in Kenya, Tilda Rice Corporation in Uganda which operates the Kimbimba rice irrigation scheme. Costs for government-developed schemes can range from US$3,000/Ha to $12,000/Ha. In Tanzania, farmer cooperatives on the schemes (or ‘water user groups’) are then responsible for funding operation and maintenance. This on-going process is overseen to varying degrees by the government, which may also step in to undertake large-scale rehabilitation. In Kenya, the National Irrigation Board (NIB) takes on this role.

In Tanzania, where yields are the lowest in the region, 95% of rice is produced under rainfed lowland conditions. In Uganda, the situation is similar with an exception of eastern Uganda, where most of the country’s rice is produced. Existing modern irrigation schemes exist include Mubuku, Doho and Kimbimba. The former two are under rehabilitation while Kimbimba is fully operational under Tilda rice cooperation. Upland rice is commonly in the central, north and west of the country.

According to the agro-ecological maps developed by RCMRD, rainfed rice cultivation in Kenya is unsuitable due to of low and erratic rainfall. Over 80% of the land under rice is irrigated and as a result the yields are the highest in the region. Kenya has an ambitious plan to increase the current irrigation capacity to 18,000 Ha from the current 12,000 Ha an initiative that will cost about Ksh 13.5 billion. It is estimated that this investment will increase production from the current 59,000 MT to 92,000 MT.

3.2.4 Seed supply for improved varieties

Most smallholder farmers do not use or have access to improved, certified seed. Instead seed is re-used for 3-5 years before being refreshed. In the Lake Zone of Tanzania, where rice is less commercial, the period before farmers restock their seed can be even longer (Zaal, 2012). Although local varieties are low-yielding, they produce aromatic rice which is highly demanded (see Box 1).

Certified seed of improved varieties are not widely available to, and/or fully utilized by farmers. This is the result of limited investment in the seed system for rice in East Africa both in R&D and distribution. In Tanzania, the most widely produced variety is Saro 5 (TXD 306), released in 2002 by the Dakawa Research Centre following cross-breeding of Super
with an improved variety from Korea (KM-67). Saro 5 is semi-aromatic, it is well-adapted to both irrigated and lowland rain fed conditions; it has a short growing season (110-125 days); has a shorter stem hence less likely to lodge under heavy rain and wind but susceptible to Rice Yellow Mottle Virus. It yields up to 6 MT/ Ha under smallholder conditions, even without irrigation and has gained popularity among farmers as a good compromise between yield and aroma. It is worth noting that it is relatively difficult to breed varieties that are both high yielding and aromatic due to inherent genetic trade-off between these two characteristics.

In Uganda and some parts of Kenya, New Rice for Africa (NERICA) varieties are increasingly used. These varieties, developed by AfricaRice, uses less water, are more resistant to diseases and are adapted to upland conditions. NERICA yields up to 5 MT/ Ha under ideal conditions and since rice is a self-pollinated, farmers can utilize own seed with minimal loss of vigour. However, NERICA is not so popular with consumers because it is non-aromatic.

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**Box 1: Locally produced varieties are popular**

‘Super’ variety was introduced to Tanzania in the 1960s and is now the preferred rice due to its aroma and good taste. It is a tall, aromatic cultivar with extra-long grains, adapted to lowland irrigated conditions. It takes 125-140 days to mature but tends to lodge and is very susceptible to Rice Yellow Mottle Virus and rice blast. Since farmers have cultivated this variety for over 40 years without regularly renewing the seeds, private sector millers estimate the yield potential under local irrigation to be 3MT/ Ha under the best conditions. Due to its popularity the variety was introduced in Uganda and farmers mixed it with other local varieties. In our survey farmers named over 15 different varieties with names including the word ‘Super’ (Super Kilombero, Super India, etc.).
This, together with its lack of suitability to lowland conditions means that it is not well adopted across the EAC, except in Uganda, where it was heavily promoted by the government through the office of the Vice-President, donors including the Japan International Cooperation Agency (JICA) and the Food and Agriculture Organisation (FAO). Based on this intensive investment, Ugandan seed companies invested in NERICA distribution and so its production has spread rapidly in upland areas in the north and west of the country.

In Kenya, most rice growers, especially in Mwea, choose aromatic ‘basmati’ varieties that are highly valued for their aroma and taste although they are low yielding. In Tanzania, farmers in Morogoro focus more on yield, whereas those in Mbeya region are more interested in marketable varieties with good aroma and taste which command high farm-gate prices (Zaal, 2012). ‘Mbeya rice’, and more specifically within the Mbeya environs and ‘Kyela rice’ are the strongest consumer brands because of their aromatic quality. In Uganda ‘Kaiso’ is preferred by farmers because it is high yielding, but in the market it is regarded as a low-quality brand and is mainly consumed by the poor.

3.2.5 Chemicals

The use of fertilisers, herbicides and pesticides on smallholder rice farms is limited in the EAC. Figure 14 gives a pointer to the worrying low levels of use of fertilizers in selected areas in Uganda and Tanzania. The low use of fertilizers is as a result of the high cost of accessing them. Secondly, rice markets are not predictable enough to act as an incentive to intensify rice productions systems.

In Tanzania, the 2002-2003 Agricultural Census showed that 80% of farmers thought that availability was not the problem; rather most (63%) could not afford to buy them. There also appears to be a limited knowledge and appreciation of the benefits of using fertilisers. In some instances, farmers were not using fertiliser correctly – some used products in combination that actually reduced yields rather than increasing them. This situation is not helped by private fertiliser manufacturers who do not see the rice smallholder market as attractive enough to dedicate tailored R&D resources.

3.2.6 Labour

A total of 154 man-days per acre are required to grow rice and so labour can be a significant constraint especially in cases where family labour is inadequate. For instance, transplanting rice rather than broadcasting seed can significantly improve yields. But it takes twice the labour to transplant and so across the region less than two-thirds of rice is transplanted. Using tractors, rotavators, weeders and combine harvesters, would reduce and free up labour to improve farm practices and enable the family to undertake other income-generating activities.
Machinery can significantly reduce labour costs and help to increase yield. However, the level of mechanisation among rice farmers is extremely low. Machinery use for land preparation is still rare even though cultivation by hand can take up 14 of the 154 man-days per acre.

Most work is done by family members. On average Men spend over twice as many days cultivating the crop as women. The most common technology is ox-plough (Figure 16).

Hired labour is a substitute for inadequate machinery, particularly for the back-breaking land preparation, transplanting, and weeding. In the areas where rice production is commercial (Mbeya, Morogoro and Eastern Uganda) hired labour is common. With a couple of notable exceptions (Mbeya and Tabora – where seed choice plays a major role in productivity) investing in additional labour has clear impact on yields (Figure 17).

3.2.7 Pests

According to this survey, farmers in Tanzania are most concerned about birds eating the grain and in Uganda the major problem is with rodents (Zaal, 2010). Rice is not as susceptible to insect pests as other crops, such as maize and cotton. Only 3 out of 1,400 farmers mentioned access to insecticides as the most important change that could improve their productivity. However, insects are still seen as an issue, followed by diseases such as rice blast.

3.2.8 Farm-level finance

Farmers need finance if they are to invest in production but access is low. In Tanzania, according to the 2002-2003 Agricultural Census, only 2% of those who purchased fertiliser had access to credit, which suggests that fertiliser may only be available to those farmers who can finance their pre-harvest cash flow (Tanzanian Agricultural Census, 2002-2003). Thus lack of finance is a key constraint to investment in farm inputs. In the survey, only 10-15% of rice farmers reported having access to credit for some aspects of their farming (Figure 18) (Zaal, 2012). This percentage is low considering the high demand for credit. The two constraints to accessing credit are poor terms and conditions of borrowing and inappropriate financial products and services as reported by 40% of actors who do not access credit.
The sources of credit for the rice sector include Savings and Credit Cooperatives (SACCOs), commercial banks, relatives and friends, and village lenders. SACCOs were the main source of formal credit due to the convenience and flexibility of payment terms despite the high interest rates they charge.

The largest proportion of the credit is channelled to accessing inputs and hiring labour (Figure 19). This is so because the two factors needed for rice production are expensive and jointly account for the highest percentage of production cost of rice.

Two particular features of rice are pertinent to this picture. First, rice in general requires more water than other crops, meaning a slight decline in water supply affects the crop adversely. This exposes rice farmers to risks and hence securing a loan becomes difficult especially those farmers operating under rain fed conditions. Second and more positive, harvested rice is relatively non-perishable and resilient to pests and therefore, so long as it is stored appropriately, it could be used as collateral for credit. The downside of this however, is that good storage facilities are not readily available to most smallholders.

Although SACCOs are the main providers of finance, it is not clear how innovative their products and services are as many of them have suffered from poor governance which limits their effectiveness and erodes trust among their smallholder members. SACCOs have also struggled with low repayment rates and this has limited their further spread. This is one of the main reasons why the penetration of other formal financial institutions is so limited. Finance providers have held back from providing credit to farmers because of the high risk of non-repayment and the transaction costs involved. The risks are high because of the low level of collateral available to farmers and, because most smallholders do not irrigate, they have to rely on unpredictable rainfall to generate revenue and repay their loans.
3.2.9 Farm-gate marketing and processing

**Farm-gate marketing:** Farmers market different proportions of their crop for cash. In eastern Uganda and the Southern Corridor of Tanzania, farmers are commercially minded and sell most of their crop (Figure 20). In Tanzania, 10-15% of the farmers barter a proportion of their crop with neighbours for other goods. They also keep some for household consumption. Majority of farmers sell un-milled rice (paddy) to traders and millers e.g. in Tanzania only 10 – 20% of farmers sells milled rice to traders. This is the case because:

a) For some farmers, the mills are located far from their areas of production leaving them with few options of milling their paddy.

b) Most of the toll mills produce poor quality milled rice with a high percentage of broken hence farmers opt to selling paddy to minimize the losses from the milling process. Such poor quality rice also fetch low prices in the market place.

c) The milling charges per kg are high in some instances and hence farmers would not recover their costs and make profits on milling their paddy e.g. in Tanzania, milling per kg costs about Tsh 100/Kg – Tsh 200/Kg).

d) Transportation of paddy that is 35% - 40% heavier than milled rice to the milling location is expensive.

**Processing:** Rice processors are generally located near the production areas. Given that paddy is 35-40% heavier than milled rice, it is cost effective to aggregate paddy and mill it near the production zones and then transport milled rice. At least 80% of the paddy produced is milled by small-scale village mills. These mills tend to have a daily paddy throughput capacity of less than 10 MT (usually about 5 MT or less), and they are not equipped with de-stoners, polishers, and graders. As a result, quality of the resulting milled rice is poor, it is unpolished and a high percentage of broken grain and foreign matter. Moreover, the poor, generally manual, post-harvest practices (threshing, winnowing and drying) which are the norm (Zaal, 2012) significantly increase the level of broken grain and foreign matter in the rice after milling. Since farmers often use a mixture of local varieties, paddy is unlikely to be homogenous. Milling machines cannot be calibrated to deal with different types of rice in the same.

Small-scale millers tend to provide milling services only. They ‘toll-mill’ rice owned by traders for a fee per weight rather than integrating into trading activities. Milling costs range from US$15 to US$45/MT. Larger millers often charge more for de-stoning and grading. After milling, rice is packaged into large, unbranded 100 kg bags. Smaller, branded packaging is rare at the milling stage.

A small number of medium and large scale mills have been built over the last 5-10 years that operate higher quality processing machines –with de-stoners, polishers, and graders – and brand their output. These millers are more likely to seek a greater level of control of the value chain in which they operate have integrated vertically into trading activities – proactively purchasing paddy directly from farmers or small traders and selling milled rice to traders. A few millers own distribution networks with transporters, wholesalers and retail operations in urban centres. The density of commercial processors is greatest where there are more commercially-orientated smallholders. A small number of processors, together with a few estate farms and traders purchase paddy and provide finance and/or training in order to drive up the quality of paddy and to maintain privileged access to it. These schemes tend to be unsophisticated, save a few exceptions, and the number of smallholders engaged in this way per scheme is low, ranging from under 100 to 1,500.

![Figure 20: Level of commercialization of rice](image-url)
Poor post harvest management of paddy e.g drying causes huge losses reducing significantly the volume of quality paddy available for milling.
4. TRADE

4.1 Domestic Trade

4.1.1 Main trade flows

Most rice grown in East Africa stays in the country where it is produced. The main domestic rice flows are from production areas to key urban centres. In Kenya, rice flows from Mwea to Nairobi; and in Western and Nyanza Province it is consumed in urban centres in western Kenya, with little reaching Nairobi. Imports enter Kenya through Mombasa port and most are transported to Nairobi. In Ugandan, rice flows from producing areas in the eastern region to Kampala and other urban centres. The main rice market flows in Tanzania are shown in (Fig. 21)

Figure 21: Rice supply routes in Tanzania in “000” MT (Does not include rice consumed by producer households)
The largest flow is from the Southern Corridor of Tanzania to Dar es Salaam. Smaller amounts flow to Dar es Salaam from the Lake Zone. This may be due to the longer distance involved and poor roads which add to transport costs. The Lake zone also exports to Uganda, Rwanda, Kenya and the Democratic Republic of Congo (DRC) whose markets are closer and in some cases are more attractive commercially. There is little export activity from the Southern Corridor.

4.1.2 Implications

Rice is most commonly transported from producing areas to market centres by small and medium sized traders. It is then sold at wholesale markets such as Tandale in Dar es Salaam or direct to specific wholesalers or retailers. In some cases, a large trader operating nationally or even regionally may purchase rice directly from the mill-gate. This is less common but is more likely to occur with the larger millers where large volumes are available at lower transaction costs. One large Tanzanian wholesaler tried moving into rice trading but was unable to reliably procure the volumes and quality of rice needed for a profitable enterprise. Although anecdotal, this suggests that even for Tanzania, the region’s largest producer, quality and quantity of supply still remain too variable for some large traders to become heavily involved in the cross-country trade of local rice. Trading in rice thus remains highly fragmented with a large number of small scale players.

There is limited vertical integration among millers in Tanzania to develop significant trading or wholesale activities as revealed by a study of some value chain structures in Tanzania. The value chains show many layers of significant mark-up from mill-gate to retail - often as much as 40-60% of the end-price. This is illustrated by two case studies based on interviews with millers and traders; one in Kilombero region and a second in Singida in North-Central Tanzania (Figures 22).

Another value chain structure is evident in the Mwea region in Kenya. The chain is better integrated given that the scheme is located close to Nairobi. A number of millers have moved into wholesaling and sell much of their milled rice directly to retailers. This allows millers to reduce transaction costs and make a significant mark-up despite the relatively high cost of paddy (Figure 23). As a result, the processing sector in Mwea is more commercialised than elsewhere in the region.
4.2 Regional Trade

4.2.1 Main trade flows

Over 500,000 MT of rice is imported into the region annually. Intra-regional trade and regional exports are low by contrast, although growing. Official figures show that 27,000 - 37,000 MT is traded intra-regionally and 17,000 - 25,000 MT is exported from the region. Factoring informal trade then intra-regional trade may be as much as 80,000 MT, but even this is small compared to imports. Figure 24 maps the key cross-border trade flows, their relative sizes, and some of the key data discrepancies.

Figure 24: Map of regional trade flows in “000” MT

NB: Data on cross-border trade in the EAC are unreliable. Interviews and secondary research suggests that informal flows are considerable; one estimate even argues that it accounts for 88% of rice trade in the EAC. Levels of informal trade also of course fluctuate with trade policy. To arrive at an informative picture of trade flows, we have therefore used four sources of data: official exporter country data, official importer country data, informal trade data where monitored and in-house deductions based on supply and demand levels. Significant known discrepancies between these are flagged throughout and discussed in more detail in the next sections.
Kenya is clearly the region’s largest market for imports at just over 300,000 MT each year. Tanzania imports an estimated 140,000 MT based on an analysis of the gap between supply and consumption. Mirror data from exporters suggests that Uganda imports around 75,000 MT. Kenya imports 74% from Pakistan, 10% from Vietnam, 5% from Thailand and some 3% from Tanzania (Figure 25).

Official export data indicates that Tanzania exports 17,000 MT annually (Figure 27). But import data suggests that Tanzania exported 30,000 MT to the region over the same period. However, these data do not take account of unofficial trade which has grown because of the export restrictions. Assessing informal flows the actual total could be nearer 70,000 MT (Stryker, 2011).

Uganda is the region’s most significant exporter outside of the region. Our analysis suggests the total annual export is 90,000 MT (official export data suggests 33,000 MT). Official data indicates the direction of these exports – 24% to Rwanda and 76% leaving the region, with 58% to the Democratic Republic of Congo and 18% to Sudan. Some 25-40,000 MT (of the total 90,000 MT) are re-exports. Uganda is a key transit corridor for cheap Pakistani or Vietnamese rice which is then exported onwards to Rwanda, DRC, and South Sudan.

Intra-regional trade is low but it is expanding rapidly at over 30% annually since 2005, driven primarily by recent growth in production volumes in Tanzania. Much of the surplus is exported from the Lake Zone region of Tanzania. Data on imports shows that 35% go to Uganda, 35% to Rwanda, and 20% to Kenya. Interviews with rice traders from Tanzania confirm that very little rice is exported to Mozambique, Zambia, and Malawi.

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*Figure 25: Imports by origin*

*Figure 26: EAC imports 2008-10 average*

*Figure 27: Official exports from the EAC*

*Source: COMTRADE 2008 -10 average exports as reported by exporters*
Inland transport drives rice prices high and this makes regionally-produced rice uncompetitive and can contribute up to 60% - 70% of the consumer price. Uganda imports 23% from Tanzania. Rwanda imports 29% from Tanzania and 23% from Uganda (Figure 28).

4.2.2 Drivers

Factors which limit trade in rice range from low regional production, competitiveness of imports despite high import tariffs, variations in consumer preferences across the region and policy restrictions on intra-regional trade.

Common External Tariff: CET is in place in order to protect domestic rice markets particularly Uganda and Tanzania. In practice, the system has a number of exceptions and variations which limit its impact: Kenya's tariff is only 35%. The Kenyan government negotiated this exemption in recognition of Pakistan's strategic importance as the main buyer of Kenya's tea. This has a significant impact on rice prices in Nairobi.

The Kenyan exception has knock-on effects in Uganda. Interviews with traders in Kampala suggest that the practice of re-labelling Pakistan rice as Kenyan rice to evade any incremental duty is a real concern. Although Kenyan rice only makes up 3% of Ugandan imports, this smuggling process attracts a risk premium which impacts on rice prices in Uganda. Such complaints – and perhaps a desire to increase their revenue share of import duties – have recently led to the Ugandan government to establish an 86% tariff on all rice imported from Kenya.

Tanzania has negotiated a 12.5% rate for Zanzibar given the importance of rice to the island's food security and the small number of rice farmers. As a result several thousand metric tons of black-market imports come into Tanzania through Zanzibar (Therkildsen, 2011), although this has only limited impact on national rice prices.

Rwanda and Burundi also have official exceptions to the CET. In Burundi, a 0% rate was effective since June 2012, and in Rwanda a 30% rate was effective since 2009. However, since Rwanda imports 55% of its rice duty-free from the EAC, this derogation has little effect.

In Tanzania, which maintains the full tariff, the politics of implementing the CET are more complex than this picture suggests. Effective duty rates charged (total duty collected divided by total imports) have not changed since before 2005 (Therkildsen, 2011), even though the policy clearly has an impact on volumes and prices. Part of the explanation for this apparent contradiction is that import policy is not solely dependent on the tariff. Import permits are also required, and limits on access to permits may impact on import volumes as high tariffs.

A second explanation is that significant quantities of rice are regularly allowed into the region duty-free basis under special exception quotas with permits. This keeps annual average effective duty rates down while imports are restricted by tariffs and permits thus keeping prices high all year round. Concerns about food security are the main reason for issuing quotas and they generally occur at times of high prices. The perspective is convincingly argued by Therkildsen (2011).

![Figure 28: Official rice exports from Tanzania to the rest of the EAC](source: COMTRADE mirror data (Tanzania exports as reported by EAC importers))
Beyond this, the import lobby which benefits from these permitted quotas is small though politically connected. Ninety percent of the imports come from only five large firms. In October 2012 a duty free rice import permit was awarded for 120,000 MT to two politically connected trading groups. This was only withdrawn (after at least 60,000 MT had already entered the country duty free at peak pre-harvest prices) following a strong lobby by other, possibly equally well-connected, investors. Whatever the nuances of this situation, it is protectionism.

Exceptions to the tariff and permit regime are small and infrequent enough to maintain an effective obstacle to importing large quantities of rice. This means that imports have a small market share, except for Kenya where the 35% tariff means imports in that market can be priced more competitively (Therkildsen, 2011).

**Intra-regional trade policy:** A related policy driver of trade patterns is the range of non-tariff national policy restrictions within the region. These barriers are often partly based on food security concerns, so rice as a key staple is likely to be particularly affected. But a restrictive intra-regional trade policy environment can dis-incentivise businesses and sometimes prevent them from building links to and servicing new EAC markets. These barriers are erratic and may take the form of a full export ban (as in Tanzania until 2012); an onerous tariff (for instance, the 86% Kenya-Uganda tariff); prohibitive levels of bureaucracy; or simply policy uncertainty reducing incentives to forge new trade links. Our survey of traders and processors suggests that these are key factors currently constraining intra-regional trade and current policy was cited as a significant hindrance to expanding rice trading.

Tanzania is keen on restricting exports and has introduced six separate food export bans in the last 10 years. Historically, bans are announced most often between January and March each year as prices rise prior to harvest. Although a ban has not been in place since 2012, it will take time for traders’ confidence to return. More significant however is the bureaucracy involved in gaining export permits even when there is no ban. About five different Letters of Permission are required and must be issued by the District, Regional, and Central government authorities based on the organisation’s individual assessment of food security concerns (TANEXA, 2012). This may well push more traders to consider informal trade routes, but the greater risks involve the additional transaction.

**Transport:** Markets inland from Mombasa such as Uganda, Rwanda, and Burundi do not rely as much on international rice imports as Kenya. According to Nathan Associates (2011), transporting 1MT of imported rice to Kampala could cost US$100 suggesting that mileage is the most significant cost of trade and can account for up to 70% of total costs of imported rice. Border costs can account for up to 20%, domestic levies can account for up to 8% and warehousing and insurance costs are minimal. Thus the full direct costs of trade from Mombasa to Kampala may be as much as US$150/MT.

Transport around Lake Victoria can be particularly expensive, because of poor roads. The direct cost of trading rice from Moshi in Tanzania to Nairobi is about US$55/MT and Mwanza in Tanzania to Kampala is around US$75/MT. Transport costs from Mbeya and much of the Southern Corridor to Dar es Salaam are relatively low and traders take advantage of empty trucks coming back to Dar es Salaam from Malawi and Zambia (EAGC, 2013). Although these variations are a relatively small proportion of the end-price of rice, they could make a substantive difference as to whether a particular route is profitable for a trader or not, thus potentially playing a role in shaping trade flows.

**Consumer preferences:** consumer preferences drive regional trade and impact demand of both low and high quality rice, but there are differences across the region. Aroma is a highly preferred trait and most consumers are sensitive to price changes. Local rice varieties are preferred by most people in the EAC and this enables local production to enjoy a significant market share despite being priced at varying premiums over Asian rice. Most of the imports are non-aromatic and of poor quality.
5. PRICES

Price is driven by the varying availability of cheap Asian imports, by the different national tariff regimes and by transport costs and distances to markets. In Tanzania, 75% CET produces some of the highest rice prices in the region which are well above world prices. Kenya has a low tariff (35%) and so imports are high and Nairobi prices are the lowest in the region. However, the average price in Kenya is much higher than in Nairobi and reflects the high transport costs of getting rice further inland. Prices are higher in Uganda where CET is 75%.

Prices are lower in the main rice producing areas than in the urban areas. In Tanzania, rice production is so high that the national average price is lower than in Dar es Salaam. Price trends in Tanzania, the region’s largest market, highlight two things (Figure 31).

First, prices in Tanzania are rising and have increased by 75% since 2006. Several factors contribute to this but a plausible explanation is the increasing unmet demand.

Second, like most markets in the region, prices fluctuate cyclically over the seasons. Prices are highest from January to March, prior to harvest. Indeed, the difference between high and low season consumer prices is about 30%. In Uganda fluctuations are slightly lower but in Kenya they are negligible. This is attributed to varying availability of imports, which are not seasonal, and the dependence on rice as a staple food. Uganda and Kenya are less dependent on seasons and imports and so when prices rise, consumers switch to other staples and this tends to bring prices down again.

Figure 30: Average retail prices in main cities, 2012
Source: RATIN, 2013
NB: The national prices are the average of around 5 - 6 leading urban consumption centers across each country - and are not, therefore, weighted by volumes.
Figure 31: Average retail prices in main cities, 2012
Source: RATIN, 2013
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6. RICE SECTOR TRAJECTORY

Box 2: The rice sector trajectory

Competitiveness
- Competitiveness is low and the sector is reliant on tariff protection.
- Paddy prices are 300% more than Asian benchmarks; post-milling mark-ups are high, often totaling to US$500/MT; and quality of mills is poor.
- Key constraints are low on-farm and value chain investment and low intra-regional trade.

On-farm investment
- Paddy prices are high due to low on-farm investment in inputs, seed, and labor and so yields are low by global standards.
- This is driven by weak farm-level supply and demand for inputs.
- Improved seed is not readily available. Public investment in research and development and seed distribution is weak. Private investment is limited and public involvement is often inefficient.
- Demand for seed and chemical inputs is low, because of weak farmer purchasing power - driven by lack of access to finance and poor agronomic knowledge.

Value chain investment
- Investment in expansion and technical upgrading among processors is minimal; mills are small, low quality, and inefficient. Little investment in vertical integration and economies of scale among rice traders.
- Value chain investment is constrained by weak financial services, SME growth faces regulatory disadvantages; and the investment environment is weak.

Restricted intra-regional trade
- The level of intra-regional trade is low which reduces opportunities, incentives, and market efficiency.
- This is driven primarily by restrictive policies and bureaucracy.

Sector resilience
- Beyond the CET, the sector faces an unsupportive policy environment, particularly regarding intra-regional trade.
- There are few supporting institutions to provide effective dialogue with policy-makers and to support access to key market information.

Threats to the sector
- Policy – CET is unlikely to be sustainable and an imminent reduction has already been mooted; further restrictions to intra-regional trade may emerge.
- Consumer standards – Consumer sensitivity to mill quality, packaging, and branding is rising, potentially faster than mills and farmers are currently able to upgrade.
The rice sector profile set out in this report presents a worrying trajectory. First, although production is currently growing faster than demand, this is based on unsustainable increases in the area under rice rather than on productivity gains and so local supply growth may slow and be unable to keep pace with demand. Since demand for rice is unlikely to reduce in the foreseeable future, this trajectory points to an increasing dependency on imported rice, increasing foreign currency outflows, and increasing consumer exposure to global price spikes.

Second, local rice remains uncompetitive and its current market share depends to a large extent on tariff protection. This is unsustainable in the long run. In this section we examine constraints that inhibit the development of a competitive rice sector and we seek to explain its main drivers. We also examine the sector’s lack of resilience to any forthcoming threats or changes in market dynamics and identify a number of specific, imminent threats to the sector. These threats put at risk the livelihoods of some 1.5 million households (nearly 7.5 million people) that farm rice and the livelihoods of many others who depend on the downstream value chain.

6.1 Low Competitiveness

Typical value chain cost breakdowns for rice grown in Tanzania and Kenya illustrate the price differential between local and imported rice (Figures 32). In Tanzania, the difference between total costs of domestically produced rice and imported rice is 20% while in Kenya it is 140%.

Figure 32: Rice costs in US$/MT Kenya and Tanzania compared to costs of imported rice

NB: The data for the Tanzania and Kenya value chain cost breakdowns are from interviews with the private sector; the Tanzanian data were gathered from the Kilombero Valley and the Kenyan data from Mwea.
The ‘production’ costs are based on the cost of 1.6 MT of paddy. This is the volume of paddy required to produce 1 MT of milled rice. In each of these value chains - and indeed across the region - the cost of paddy is the most significant contributor to end-cost. Reliable, broad-based data on paddy prices is sparse. But our farmer survey reported the price of paddy to be between US$350 and $800/MT (Figure 33). In Mbeya, the mid-point price between harvest and pre-harvest was US$540/MT and in Morogoro it was US$455/MT. In Eastern Uganda the price was about US$600/MT and in the Lake Zone about US$650/MT. Seasonal variations range from 20% in more commercially developed regions to over 35% in the less commercial Lake Zone.

In Kenya, production costs for basmati paddy from Mwea were up to US$700/MT even around harvest time. However, when using higher yielding but non-aromatic ‘BW’ variety, which is reportedly inferior in taste and aroma even to imports, the same farmers were only able to sell at around US$400/MT. Hence farmers do not use this variety.

These prices do not compare competitively with those in other rice producing countries. One assessment of rice value chains showed average paddy prices of US$175/MT in Bangladesh, US$169 in India, and US$371 in China (Reardon et al, 2012). Paddy costs in East Africa account for nearly 50% of the end-price and so paddy prices are clearly crucial for the competitiveness of East African rice. Trade mark ups can add between 40%-60% to the end-price.

In addition to the costs, poor quality of mills is also a significant barrier to competitiveness. Poor harvest and post-harvest practices and farmers’ use of mixed seed varieties all contribute to low quality output. Traders and processors see the difficulty of accessing high-quality paddy as a key constraint to expanding their activities. But many small millers do not have good quality processing equipment and handling and storage facilities and practices which are the means of reducing the high levels of broken grains and foreign matter in milled rice.

Poor post-harvest handling and processing has a significant financial impact on the rice sector, and costs the industry both market share and value. High milling quality is one of the main advantages of imported rice. Grade 1 domestic rice (with less than 5% broken grains) can at times command a 50% premium in Dar es Salaam’s main wholesale rice market, but very little local rice currently achieves that grade. However, in Tanzania sophisticated blending takes place amongst traders to even out the high-percentage of broken rice from low-quality mills and so achieve an ‘acceptable’ quality balance.

Two key trends lie behind this low and stagnant competitiveness. First, the low level of investment in upgrading the efficiency and quality of the value chain. Public investment has not yet been able to fill this gap, and there is no sign that this is likely to change in the medium term. Second, the low level of trade reduces efficiency and cuts opportunities for growth, thereby reducing the incentives for investment.
6.2 Low Investment for On-farm Development

There is minimal on-farm investment in water management, use of certified seed, chemicals and labour. The result is low yields that are of poor quality paddy, crops which are often harvested at the wrong times, badly dried, lacking variety homogeneity, and containing foreign matter.

However, farm-level investment does not always originate with farmers. In many agricultural value chains, off-takers share some of this investment burden on the basis that they will also share in the reward by accessing consistent supply of high quality paddy. In East Africa, on-farm investment by off-takers is rare. In comparison, 45% of mills in China provide cash advances to producers and 20-30% provides seed and extension services.

Low on-farm investment is driven by constraints at supply level where seed of improved, high yielding varieties adapted to East African agro-ecological conditions is limited leading to low quality products with low market prices. This limits investment opportunities in technology development and uptake mechanisms.

Low on-farm investment at demand level is constrained by low purchasing power of the farmers and the negative perception that rice enterprise is highly risky and the rewards from the investment may not match the risks.

In Tanzania, there are only four senior rice breeders, and currently head the key research institutes. Note that the rate of new graduates joining the breeding profession is low. Despite some donor support, key research institutes, such as the Regional Centre of Excellence for rice at the KATRIN institute at Ifakara, still have limited facilities.

According to the head of the Institute at Ifakara, management of current breeding programmes is highly constrained due to insufficient funding. The situation in Kenya and Uganda is similar. Researchers at Jomo Kenyatta University of Agriculture and Technology (JKUAT) in Kenya describe underfunded, scattered efforts by a small number of breeders working with insufficient facilities. In Uganda, investment in seed research beyond NERICA adaptation is minimal.

This lack of investment means that few suitable, high yielding varieties have been released. In Tanzania, 11 new varieties were released between 1999 and 2012, including three NERICA varieties. Six of these are upland varieties, but upland conditions represent only 20% of Tanzania’s cropped rice area (Zaal, 2012). Only Saro 5 has seen a widespread uptake. More recently, though, an internationally-funded selection programme led by the International Rice Research Institute (IRRI) released two new varieties in January 2013 which are currently being multiplied.

The picture in Kenya is only slightly better. Out of eight varieties released since 2000, five are bred for non-irrigated (mostly upland) systems, in spite of the poor upland conditions for rice growing and the fact that more than 80% of Kenya’s rice is irrigated. No new irrigated varieties have been released since 2005. In Tanzania and Kenya, breeders all express scepticism about the value of NERICA in East Africa’s agro-ecological and market environment, so it is perhaps not surprising that NERICA-related varieties have only taken hold in Uganda’s uplands despite being available for over five years in the rest of the region.

A number of private companies have recognised the market potential of rice and have recently begun investing in seed research programmes. In Tanzania, Syngenta and Kilombero Plantations Ltd (KPL) are collaborating on trials and ETG are planning to develop their own research programme in the Southern Corridor. In Kenya, Hybrid Seeds East Africa, a new company, is looking into two-line of hybrid rice primarily for the Tanzanian market, while Dominion, the country’s only rice farm estate, has already developed its own seed. However, except for Dominion, all of these initiatives are at a very early stage and are essentially experiments. It remains to be seen whether they will ultimately invest in taking these initiatives forward to scale or otherwise. Moreover, the extent to which each initiative might benefit the wider sector is not clear at this stage.

Investment on bulking and distribution of seed, which globally tends to have a large element of private firm involvement, is also extremely low. Tanzania has five private companies producing rice seed (AGRA, 2013), but all are small-scale as a side-line to much larger hybrid maize operations. Kenya is reported to have no private companies operating in the sector. In Uganda, a few companies have invested heavily in NERICA, promoted by the government. NERICA has become attractive for commercial distributors as a result of the high level of public support it has received. Nevertheless, the formal seed sector still
only comprises 8% of the total seed sector in the country (Kilimo Trust, 2012).

Two main factors account for this low level of investment in seed production and distribution. First, the self-pollinating nature of rice means that farmers are able to re-use seed without losing vigour. This reduces the potential market size for seed and also complicates distribution networks - investment in a sales channel to one location will not necessarily lead to repeat sales in subsequent years. Although hybrid varieties represent a more attractive commercial opportunity, there is no investment in R&D to develop hybrid rice in the region. Distributors would still need to compete with inexpensive or free local, self-pollinated seed for market share.

Second, in Tanzania and Kenya, bulking and distribution of seed is dominated by large parastatals e.g. the Agricultural Seed Agency (ASA) in Tanzania, and Kenya Seed Company (KSC) and the National Irrigation Board (NIB) in Kenya. This inhibits private sector investment in Kenya, where the parastatal sector is relatively effective and the rice sector small and concentrated on a few irrigation schemes, this does not present a major constraint to farmer access. Nevertheless, the extent of R&D in rice is limited and consequently the varieties available through this channel remain low yielding. In Tanzania, whose sector is ten times larger but widely dispersed, ASA is unlikely to have the capacity to supply seed to the whole sector. Its role could be more effective as a bulker and wholesaler of foundation seed to private seed companies, but - partly because few such companies exist, and partly because of limited links with those that do exist - it currently operates to retail level, crowding out potential private investment.

Supply-side access to other chemical inputs, particularly fertilizer, is constrained by the small number of high-quality input companies. Only Yara operates at a large scale to cover the region and although there are some other smaller local players, there are often expressed concerns about product quality. Distribution is also an issue but is less of a problem than is the case with seed. The primary constraint lies more at the level of input dealer, many of whom are small businesses lacking the resources to invest in major village-level distribution systems.

Access to labor-saving technology for ploughing, planting, and weeding is more demand-constrained by lack of farmer access to finance. Investment in low-cost technology might be an appropriate route, depending on existing capacity in the market to quickly ramp up production and distribution. An overarching constraint on the supply of inputs is fragmentation of the value chain. Unlike many major cash crops, such as tobacco, tea and cotton, there is no easy way to bulk and distribute inputs to producers through processors since even the largest off-takers have less than 2% market share. Seed multiplication and distribution should be encouraged.

Input intense system of rice production requires farmers to risk by investing in capital in order to increase their productivity but they face two key external risks - the threat of poor climatic conditions and significant price fluctuations. This makes the credit worthiness of the rice farmers low. While rice ecologies are not typically drought-prone, yields can vary between good and bad rainfall years by up to 2.5 times (Zaal, 2012). Wholesale prices in Dar and Kampala have fluctuated by 40-50% over the last two years (RATIN, 2013). Perceptions of risk from pest and diseases are likely to impact investment.

Experience from other crop value chains also highlight that demand for inputs is also driven by education - knowing what inputs to use and when, being able to assess the risks and be able to manage them and assess that the expected returns are significant enough to make an investment. Knowledge would also help the farmers to produce quality paddy that will earn them premium prices at the market place. Constraints on public extension services in East Africa are well-recognized and at present neither private input suppliers nor are off-takers effective providers of extension services for rice farmers.

6.3 Low Investment in Value Chain Development

Investment by small millers to upgrade to larger, more efficient machines that produce good quality rice is minimal and growth and consolidation in the processing sector is low compared to Asian benchmarks. An average a small mill in Bangladesh and China has a capacity similar to or above that of the few mid-sized mills in the EAC, and far above that of the average informal mill in the region. Even the largest East African mills, like Kilombero Plantation Limited or Tilda rice, are significantly smaller than their large Asian counterparts. Milling costs of paddy in the EAC are high compared to the Asian competitors (Figure 34) due to higher power tariffs, low supply of good quality paddy.

Inadequate access to appropriate financial products and services limits investment by processors and traders in upgrading and expansion processing.
technologies. Two issues are particularly relevant to the rice industry. First, the loans required by processors are between US$20,000 and US$200,000 and many financial service providers find it difficult to provide such large sums. Second, rice processing and trading is a high volume and low margin business and so both working capital and storage and processing assets come under significant pressure when businesses attempt to increase turnover to increase profit. Medium and large-scale millers interviewed said that access to finance for working capital and capital expenditure were key constraints to expanding their businesses.

Limited human capacity is also prevalent across the region to design and manage rice businesses and organizations. Some investors interviewed were discouraged by the difficulty of managing producer supply chains in a fragmented industry where side-selling is the norm. These factors reduce the incentives for existing players to risk significant capital on expansion.

6.4 Restricted Intra-regional Trade

Low production volumes in the EAC results to lack of surplus for trade hence the low level of formal intra-regional trade. This reduces the opportunities provided by the regional market which is a disincentive to investment.

Informal trade weakens economic viability of formal business channels including the rice subsector by reducing competitiveness thereby increasing costs of doing business formally. This is another dis-incentive to investment in opportunities available in regional trade in rice.

As a result, a number of potential trade routes in the region are under-exploited. In particular, the export route from Tanzania to Uganda offers considerable potential. Tanzania currently supplies less than a quarter of Uganda’s imports, despite its largest rice-growing region being located just across Lake Victoria from Kampala and prices in Uganda are some US$150/MT higher than in Tanzania. The export market in Nairobi also has major growth potential for Tanzanian producers.
The primary constraints to greater intra-regional trade are restrictive policies and bureaucracy in particular the occasional export bans and high levels of red tape for exporters, particularly from Tanzania. Policy-makers justify such trade restrictions on the grounds of food security. While this is understandable, it under-values the role of rice as an income generating enterprise for nearly 7.5 million producers (including livelihoods in the downstream value chain). Research has shown that export bans in particular are not positive for the overall national welfare and do impact negatively to domestic producers (FAO, 2011).

Transport infrastructure is also an important element of intra-regional rice trade. Small transport cost differentials can reduce the profitability of some trade opportunities, and costs around the Lake Zone are likely to be particularly high.

Figure 35: Accessibility of major production areas to the main market centers.
6.5 Low Resilience

There are concerns about the lack of the sector’s resilience to the challenges and changes. Resilience has not been tested and in recent years the sector has experienced a measure of stability. Most notable is the CET which has enabled the domestic sector to compete with imports.

However, there are indications that the sector lacks resilience. In Tanzania, the response to permits issued in October 2012 for 120,000 MT of tariff-free rice imports was weak and uncoordinated. One private rice business exploited its connections to lobby government and the sector was unable to present a common position on the issue to government either in anticipation of the event or after. This was in spite of the opinions expressed by rice businesses during this study that such tariff exemptions are highly detrimental to the sector.

Almost none of the underlying conditions for sector resilience are present. First, policy-making is not always constructive. The CET reflects a desire among policy-makers to nurture the rice sector, although this could also have been driven by an imperative to generate tax revenues. Beyond the CET, the policy environment for the sector is not particularly positive. A good example is the restrictive intra-regional trade policy and unpredictable exemptions to the CET. Policy-makers may wish to support food security but their actions may also hurt rice sector interests. Even the CET itself faces an uncertain future.

The regulatory environment does not readily support businesses and this impacts competitiveness and growth. It limits investment in new technologies, geographies, and business models that can adapt to new market conditions and in turn impacts the sector’s resilience. Investment is lacking in supporting the infrastructure needed to enable the rice sector to respond to changing market conditions. Limited public investment in irrigation infrastructure, except in Kenya, limits average yield potential and reduces the sector’s resilience to erratic rainfall patterns both now and in the future as the climate changes.

Private sector-government feedback loops are weak. There are currently little or no structures or institutions through which rice producers and businesses can coordinate their position on key policies or interventions and then advise or lobby government. In Tanzania, there is no national rice sector association; nor any national millers’ or producers’ association.

The Eastern Africa Grain Council (EAGC) with headquarters in Nairobi is a long way from the centre of gravity of the region’s rice production in Tanzania and this limits its impact on the sector. Its primary focus is understandably on maize, the region’s most important staple. But this organisation presents a potentially important platform for regional rice traders and processors. At present there are few rice growers as members.

The Southern Agricultural Growth Corridor of Tanzania (SAGCOT) is a multi-stakeholder platform spanning government, donors, and the private sector and is a valuable resource for promoting investment in the agricultural development in the Southern Corridor. It focuses on several value chains, including rice, but it lacks adequate resources to properly support the rice sector.

The lack of market data on rice adds to the sector’s fragility. Some wholesale and retail pricing data are available but much more is needed to produce reliable, timely and accurate information on production volumes, storage capacity and paddy prices in order to build business confidence. Information is also essential as an evidence base for policy-making, for informing local policy think-tanks to conduct vital research and advise governments on critical policy issues, and to support effective private sector lobbying.

Public investment in research to improve rice varieties is under-resourced and the seed system is unable to adequately react to significant changes such as consumer preferences or the prevalence of pests. Much more research is needed to assess the potential impact of climate change on rice improvement and production.
6.6 Threats to the Sector

6.6.1 Policy threats

The rice market in East Africa is dominated by the CET and any significant reduction in the tariff in the future would pose a real threat causing a stampede by imported rice. EAC officials have already announced a plan to reduce the tariff to 25% from the next financial year but plans for implementing this are still unclear (EAC, 2013).

The effect of changes in CET is complex. In Tanzania, the policy on import permits will determine how the market responds to changes. Uganda may choose to retain its tariff on rice from Kenya which is outside the EAC framework. Urbanisation will increase pressures on government to reduce consumer prices as rice is one of the main urban food staples. At the same time the rice industry does not have the institutional or technical capacity to petition government for a more gradual change in the tariff regime or a ban on tariff exemptions, in the case of Tanzania.

In Tanzania, export bans have in the past had a detrimental effect on the sector’s prospects. The current USAID Feed the Future policy initiative has had a welcome impact in lobbying for change with positive Presidential announcements that there will no longer be bans on exporting rice. However, there is still uncertainty that this commitment will be upheld by the new government after the 2015 national elections.

6.6.2 Consumer standards

Consumer standards are rising and the retail sector is becoming more sophisticated and this places greater value on packaging and branding. This is particularly true in Kenya and the trend will spread across the rest of the region as living standards generally rise. Such changes will inevitably impact the rice market. Consumers will become less tolerant of local low-quality rice and this could increase rice imports. Our consumer survey supports this notion – over 90% value cleanliness as ‘very important’ or ‘important’. Dissatisfaction with unclean rice is much higher in Kenya than in Tanzania but this is unlikely to be due to dirtier local rice. Rather it reflects the dominance of well-processed imports into Kenyan markets.

In this situation, the value of unbranded and unpackaged rice will reduce. But in its present state, the sector is unlikely to be able to raise the level of packaging and branding of locally produced rice to remain competitive.

6.6.3 Climate

The region is well endowed with water resources but availability varies from place to place and generally the resource is poorly managed both nationally and at farm level. Rain fed cropping still dominates the rice sector and so the erratic and unreliable nature of rainfall and uncertainties that climate change may bring poses a serious threat to the viability of the sector. These threats are not well-understood and it is vital that further research is undertaken to fully understand the implications. The industry will need to build in climate-resilience, such as promoting better on-farm water management in order to make best use of available resources. Efforts to expand the area under irrigated rice will need to take account of these challenging conditions.

6.6.4 Market volatility

Recent experiences in Tanzania have seen the cotton and cashew markets destabilised by sudden price fluctuations. While the issues are complex and difficult to predict with accuracy, there are reasons for similar concerns in the rice sector. At present global output is at record levels and world stocks-to-use ratio is a high at 34%. Thailand in particular has stockpiled rice for two years through a government-sponsored scheme to support domestic paddy prices. They now hold huge reserves which are mostly overvalued against current prices. If these stocks were released onto the world market, prices could fall significantly. The 10-year forecast of the Food and Agricultural Policy Research Institute (FAPRI) suggests that the price of rice will fall.

However, there may be some volatility in global prices. Only 7% of rice production is traded (it is 16% for wheat), and rice exports are highly concentrated with the top five exporters account for 85% of global net trade. Fluctuations in production therefore tend to have a disproportionate effect on prices. Rice also has a critical role in Asia’s food security, and so it is politically sensitive and vulnerable to national government policy actions and private sector speculation. There is some risk that global price volatility could change market dynamics in East Africa.
Free movement of goods, services and labour are important prerequisites to expanding regional trade of rice.
7. PROPOSED 10 YEAR VISION

Box 3: Highlights of the vision for the sector

There is a significant market opportunity in the rice sector and with the right support, this demand can be met.

**Market opportunity**

Our estimated increase in market demand over the next 5 years is over 0.8 million MT. This is mostly import substitution in Kenya and growth in consumption in Tanzania.

**Supply capacity**

Extensive areas of East Africa are well suited agro-hydrologically to high-input rice cultivation with potential yields reaching 7-8 MT/Ha. The region is less suited to low-input rice cultivation.

**Vision for a successful industry**

To take advantage of these opportunities the sector must be competitive and resilient. The sector requires:

- Cost and quality competitive paddy production. Farmers must be able to access inputs and employ optimal agronomic practices. More irrigation would be beneficial but it is not essential for a competitive sector.
- An effective and market-orientated R&D system for improved variety and seed.
- Higher quality processing, involving consolidation and new investment.
- More efficient and freer trade through greater vertical integration, economies of scale, and less restrictive intra-regional trade policy.
- Effective public-private coordination on both policy and market information.

**Levers of change**

Levers of change can promote near-term competitiveness:

- Improve functioning of key secondary markets.
- Address farmer demand: training and finance.
- Promote value chain integration and consolidation.
- Enable appropriate investment in irrigation.
- Levers of change can also promote long-term competitiveness and resilience:
- Attract new investment to capitalize and professionalize value chains.
- Encourage new investment in R&D.
- Build supporting institutions and industry associations to encourage a supportive policy environment, well-coordinated interventions, and reliable industry data.
The rice sector must break out of its current low-investment trajectory. In this report we argue that this is achievable with the right public and donor support and there are significant benefits in doing this. It will significantly improve the direct economic prospects of nearly 7.5 million people, increase national and household food security, and reduce outflows of foreign currency used to purchase imports.

Here we present the key building blocks of a vision to develop a competitive, expanding rice industry across the region. First, we look at the huge market opportunity that can, with the right support, drive growth. We then argue that the sector has the potential capacity required to take advantage of this opportunity by increasing on-farm productivity. To do this the sector will also need to be more competitive and resilient along the value chain. Finally we explain the key features that are essential for a successful sector and identify the key levers of change.

7.1 Market Opportunity

Based on our investigations we assess that the market opportunity across the region over the next 5 years for locally produced rice to be in excess of 800,000 MT (Table 1). This comprises both import substitution and growth in domestic consumption and is segmented by country and product type based on the existing market segments. In arriving at these estimates we assumed that current trends in consumption will continue with relatively stable prices. The current supply growth is not factored in since this is unlikely to be sustainable. We have also assumed that CET, prevailing consumer preferences, and the available varieties in the region remain largely the same.

The two major market opportunities are in Tanzania, for aromatic rice to address consumption growth, and in Kenya largely to reduce reliance on imports.

The market is not just limited to consumption within the region. Estimated exports from Uganda to the DRC and South Sudan are 90,000 MT, often at higher prices than can be obtained within the region. Given the political volatility of both countries this market should not be taken for granted, but this opportunity is likely to continue to grow over the next five years (Table 1).

7.2 Supply Capacity

Current increases in rice production are coming from increasing the land area and our investigations show that there is still room for further expansion into areas that are well suited to rice cultivation.

In Tanzania, there is potential to expand production South and West from the Lake Zone: into Kigoma region, and the districts in the South and West of Tabora region (Urambo and Sikonge). Indeed the agro-ecological mapping suggests that these areas are better suited to rice growing than the districts of Mwanza and Shinyanga Regions which currently dominate production. There are also opportunities in the south in Lindi (Kilwa & Liwale districts).

In Uganda, there are opportunities in parts of the Western and Central regions, and in Northern Uganda. In Kenya the conditions are not suited to rain fed rice cultivation but there are opportunities for more irrigated rice in Western and Nyanza regions along the Tana River in the coastal region.

<table>
<thead>
<tr>
<th>Table 1: Market opportunities ('000 MT)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Import Substitution</strong></td>
</tr>
<tr>
<td>Kenya</td>
</tr>
<tr>
<td>Uganda</td>
</tr>
<tr>
<td>Rwanda</td>
</tr>
<tr>
<td>Tanzania</td>
</tr>
<tr>
<td>Burundi</td>
</tr>
</tbody>
</table>

Source: ITC, 2013
N.B: Values are for year 2012; Burundi and Rwanda market growth data is not available
Expansion needs to be private sector rather than government or donor led, but it will be important to know what crops are currently being cultivated on this land and whether these produce better economic benefits than growing rice. This requires further research.

In Tanzania the main issue will be marketing the output from the new areas. Figure 42 both the areas and the markets (in purple) and shows distances between potential production centres in Lindi in the South and Rukwa in the West and markets. It also shows travel times – yellow is slow and red is fast. In Rukwa, the market access challenge will be significant growth in export trade to Rwanda, Burundi, and potentially DRC. To overcome the trade restrictions and avoid being dominated by inefficient informal ‘panga’ routes, a trade policy is needed which eases exporting. Transport from Lindi is also a challenge and interviews with sector players suggest that rice produced in this district is unlikely to get to markets in Dar es Salaam. However, the on-going gas development in Mtwara (south of Lindi) may mean that the problems of transport and access to this area may improve.

In Uganda, transport from new rice areas in the North-East and Central Plateau are much less important. The issue here is the low density population. These areas are potentially exploitable with encouragement from government, as was successfully done further north, but it is questionable that the area could sustain large production centres that would interest major traders and processing investments.

In Kenya the government is focusing on irrigated rice and is planning significant investment over the next 5 years, including large-scale expansion of existing schemes in central and western Kenya (see Annex I – Kenya). A conservative estimate is an additional 20,000ha of irrigated rice land in the next 5 years, which will more than double the current rice area and production. The main risk is water availability, particularly in Central Province. Water is already a national political issue and climate change presents a more significant threat to Kenya than to other countries in the region. Basing food security on large irrigation schemes is a policy which may benefit from a wider review of medium-term water policy.

Capacity building of actors will help increase productivity without necessarily opening more land for production.
7.3 Turning the Yield Potential into Reality

Box 4: System of rice intensification

One frequently-cited approach to improving agronomic practices is the System of Rice Intensification (SRI). Individual on-farm practices vary but broadly SRI requires farmers to use fertilizer; grow seedlings in high-nutrient environments; and transplant them according to well-defined and larger than average spacing. It typically involves less or intermittent flooding but this can increase the weeding burden and labor needs. It is an intensive approach to rice agriculture but the returns can be high - up to 8 MT/ha. But to achieve this farmers need access to credit and encouragement from a strong market buyer to treat the crop commercially. AfricaRice, the leading rice research institute in Africa, say that SRI Rice per se is no more productive than a range of other intensive approaches to agronomy and is best treated as a collection of useful practices to be used depending on local conditions.

The main focus of sector development must be raising productivity. So the key question is - what are the achievable yields? The region has large areas which are agro-ecologically well suited to rice production and most are close to existing rice growing areas. The present low yields suggest that these could be increased significantly. Interviews with sector experts suggest that one benchmark is smallholders who already use high-input, labour-intensive agronomy and are achieving 7-8 MT/ha even with semi-aromatic varieties that are not among the highest yielding varieties available. This has only happened in a few areas that have benefited from donor interventions, such as SRI rice but the evidence is encouraging (see box 5). SRI Rice is being promoted by KPL to around 4,000 farmers in Morogoro Region with extremely good results, and Kapunga Rice Project Limited (KRPL) in Mbeya is also achieving similar yields with an intensive programme of support to medium-scale irrigated tenant farmers. However, neither case is effectively replicable at scale: KPL are supported by a major USAID grant, and KRPL benefit from access to the largest irrigation scheme in Tanzania.

A second benchmark is yields from smallholder irrigation schemes which boost productivity by some 2 MT/ha. The impact on production costs is variable and depends on a balance between savings in weeding time, increased yield, and the extra costs of maintaining irrigation infrastructure and paying water fees.

There are question marks over the viability of irrigation investment but even if the benefits are good, the extent of irrigation across the region is likely to remain low in the foreseeable future. The main focus must be on yield expectations from rainfed farming. In Morogoro, the only area with a sufficiently large sample of farmers using high-input agronomy, paddy yields are twice those in areas of low-input agronomy (Figure 37) (Zaal, 2013). This is a similar yield gain to that from irrigation. These data suggest that there is considerable potential for increasing productivity provided that high-input agronomy practices are adopted.

7.4 Vision for a Successful Industry

The rice industry, donors, and policy-makers need a clear vision for upgrading and improving the rice sector and reaching the level of competitiveness needed to sustain it - this means improving competitiveness and resilience. To achieve this, the
industry must reach a point where production and productivity can meet the rising market demand and compete with imports. But the industry must also be resilient so that, through free trade and effective policy-making, it can flexibly adjust to future changes in demand, world markets, and climate.

7.4.1 Competitiveness

The rice industry must be competitive. First, it must be cost competitive, through efficient trade and processing and through significantly higher on-farm productivity. Ideally a successful sector would see reduced farm-gate prices and rising smallholder incomes. Second, the sector must be quality (or product) competitive. Both issues are related to the problems of low investment.

On-farm competitiveness: Greater investment on-farm is needed to increase productivity and the quality of paddy. Farmers need affordable access to inputs and this requires off-taker or producer associations to invest in the value chain to develop and provide a range of supporting markets and services which deliver affordable inputs direct to the farm. What is needed is a successfully functioning secondary market both for inputs and for the finance necessary to enable farmers to buy those inputs. Off-takers acting as a distribution channel to provide farmers with inputs on credit is one step in this direction, but it only partially answers the sector’s problems at least until substantial consolidation among off-takers occurs. However, this conclusion may be less valid in Kenya, which has a much more concentrated milling sector and a small number of large irrigation-based associations whose membership comprises the majority of all rice farmers in the country. However, it is true of Tanzania and Uganda, where the bulk of the region’s rice is grown.

A vision for the sector must include a sustainable solution for extension services. In Tanzania and Uganda several NGOs are working on this issue but few have a sustainable model, beyond securing ongoing donor funding. This is unlikely to mean developing a one-size-fits-all model, rather it will need a variety of different approaches (see box). Other options include an industry-funded partnership with a major rice research and training institute such as AfricaRice. This could include a new industry association to provide specialist extension services to association members; or direct support to the public sector extension system to improve its efficiency and responsiveness to the needs of rice farmers.

Finally, should the industry vision be based on irrigation or rainfed cropping? Irrigation can supplement inputs, although estimates for the multiplier effect are very difficult to find. At Kapunga Rice Project, an estate farm in Mbeya, irrigated tenant farmers achieve 7MT/Ha, which is similar to yields claimed on the Mkula irrigation scheme in Kilombero during the years when irrigation was supplemented by government input vouchers. Maintenance costs were quoted at US$125/Ha. If charged to the smallholder these would add 30% to the annual costs of a high-input agronomic regime which, according to our smallholder survey, already cost US$375/Ha. Low-input rice, according to the same survey, costs US$150/Ha (Zaal, 2012). Based on these data, we assessed the cumulative impact of high-inputs and irrigation on smallholder incomes (Figure 38).

A benefit of irrigation is reduced climate risk, which can increase farmers’ incentives to invest and encourage finance providers to offer services. The challenge for irrigation is the high capital expenditure required. Interviews with a range of stakeholders suggest the cost of construction is between US$3,000 and US$12,000/Ha (GoT, 2013). Based on the incremental gains to smallholders the payback period for investing in irrigation ranges from 5 years (best-case scenario) to over 20 years (most expensive case).

In conclusion, irrigation will continue to have a role but new schemes are best assessed on a case-by-case basis rather than assumed a priority as a core part of a vision for the sector. Where a cost effective scheme can be built or rehabilitated a 5-year payback for a public investment appears reasonable. If costs rise much over US$5,000/ha, or rice prices fall, the investment would be much less attractive.

Value chain competitiveness: A successful sector needs a cost and quality competitive downstream value chain. Direct trade and processing costs are not a large component of the end-cost of rice in East Africa, but in Tanzania there are considerable value chain mark ups. Increasing vertical integration among traders and processors can reduce these layers of mark-up and bring about economies of
scale. Strengthening the value chain, may lead to consolidation especially among processors. Larger millers are more likely to have the capacity to invest in supporting smallholders and integrating into more downstream trading activities. Crucially, they are more likely to have the capacity to invest in sophisticated processing machinery capable of producing the quality of output that will be increasingly demanded by the market.

In order to integrate, consolidate, and upgrade, existing rice businesses will need greater access to SME-level financial services. New investment will also be needed over the next 5-10 years to bring in fresh capital, technical capacity, and new business models. This will need a positive regulatory environment and strong public investment support.

**A resilient industry:** Resilience is built upon free trade, good research support, effective pro-industry policies, and strong institutional architecture. The rice sector must develop resilience to be able to adjust to future threats and opportunities. Several industries across the region have achieved competitive status, only to collapse through a failure to continue investing and upgrading. The rice sector must learn from these experiences.

Free trade is essential for a resilient industry. It will enable the industry to take advantage of evolving market opportunities and changes in consumer demand. In the medium term regional rice production will not match consumption. Kenya cannot meet national demand and the same is true though to a lesser extent in Uganda. Tanzania may over produce and have a domestic surplus. Also the varieties of rice produced may not match consumer preferences. Kenya’s new irrigation schemes may over-produce expensive aromatic rice better suited to markets in Tanzania, Uganda, and other regional markets. Northern Tanzania could switch to non-aromatic rice and export this to Nairobi to compete with imports. Climate change or international market spikes may exacerbate these regional disparities. Free trade would enable all these supply-demand issues to be resolved within the region.

Taking advantage of regional dynamics through trade requires effective pro-trade policies. These would include a regional consensus to avoid national-level export bans and intra-regional border tariffs; a reduction in cross-border bureaucracy; and investment in key transport infrastructure.

Effective trade also requires a number of soft market enabling interventions. Comprehensive and accurate information systems are needed to provide data on prices and markets. A deeper network of market linkages is also needed to build trust between importers and exporters. Sector associations too have an important role to play in supporting information systems and market linkages.

**Good research support is needed:** More plant breeders and researchers are needed together with supporting facilities either through government or through donor funding. Seed development systems need upgrading. In Tanzania, researchers, seed companies, and NGOs, say the time to certify and bulk seed needs to be much faster and access to new seed material for the private sector needs improving. Reform may help to accelerate existing research and improve incentives for new investment. Greater collaboration is needed among breeders across the region to build on the World Bank Centre of Excellence programme, or the IRRI rice breeder linkages initiative. A regional agreement on certification would help to leverage currently scattered efforts.

Research also needs strong links with the commercial value chain. Existing breeding already involves user trials with both farmers and consumers, but breeders are keen to see more institutionalized, proactive feedback loops from farmers and traders about preferences for varietal traits that would help target further research. Effective pro-industry policies involve carefully managing tariff reduction to ensure that a growing industry is not undermined too aggressively by a withdrawal of protection. Public investment should be carefully targeted where it can have the greatest impact. This may not necessarily be high-profile irrigation schemes but transport infrastructure or pump-priming subsidies to develop input markets. Broader policy decisions on land and water resource use, infrastructure investment, research, and trade all need to be coordinated around a common vision for the sector.

Strong national and regional institutional architecture can promote the sectors interests among policymakers and help the rice industry to acquire key sector data that can inform lobbying and policy decisions. Strong, effective institutions, and supportive policies and regulations are all pre-requisites for continued investment to upgrade the industry and to attract new investment.

### 7.5 Potential Social Impact

#### 7.5.1 Impact to Smallholders

Increasing rice production and productivity across the region will benefit some 1.5 million smallholders...
and 7.5 million dependents. Between 65-90% of rice farmers see rice as their main cash crop and few have any second cash crop to supplement rice income. It is the main staple of two-thirds of Tanzania’s rice farmers. Together these facts highlight the importance of rice for generating income and increasing household and national food security among the region’s impoverished smallholders.

Yield gains of 2 MT/Ha can be expected and this would benefit a typical rice-growing household annually by about US$500, even allowing for the extra costs of high-input production (Zaal et al, 2013). This is a substantial income gain.

This vision is not without risks. But the alternative of ‘doing nothing’ and continuing along the present trajectory also involves risks for poor communities and few, if any, benefits. The challenge facing smallholders of competing in a no-tariff market is probably the greatest public intervention risk in the sector. The CET is unlikely to continue as pressures grow, particularly from urban consumers who wish to reduce their household food bills. If the tariff was removed and VAT applied then rice in Tanzania would be over 50% more expensive than imported rice. This would make local rice uncompetitive and seriously threaten not just the plans for increasing production but it would also remove income from existing producers.

7.5.2 Food Security

Increasing rice production and productivity will have a positive impact on household food security. It would increase farm incomes and reduce risks by increasing production even in years of poor rainfall and crop disease.

Food security for urban rice consumers can be increased by reducing the price they pay for rice. Increasing rice imports would keep prices low in the short term but this is a high risk strategy in view of the uncertainty and volatility of global prices as seen in 2008. Long term food security could be achieved by abolishing the CET. But it would need to be done gradually as local rice productivity and market efficiency increases so as not to impact negatively on the local production process.

7.5.3 Employment

Increasing on-farm investment would create new employment opportunities in the rural labour market and also jobs in the market such as finance and inputs, wholesale, and retail. Increasing disposable income among rural communities would also stimulate broader economic activity and create employment opportunities outside the rice value chain.

Employment may also benefit from upgrading the rice value chain downstream of the farm. Some jobs may be lost with the closure of uncompetitive milling businesses and similar displacement effects would be seen elsewhere in the value chain. But investment in commercial rice mills and in trading would create new high-quality jobs.

7.6 Key Levers Of Change

7.6.1 Levers in the Short Term

- Improve the functioning of key secondary markets by addressing bottlenecks in the seeds market, to ensure that rice farmers can access to high-quality seed. In Tanzania a review of the research, approval, and multiplication system is a priority followed by a similar review in Uganda and Kenya. Engagement at regional level is also needed to harmonise breeding and licensing across the EAC. Investment is required in bulking and distribution, either through building the capacity of local QDS producers or through the formal seed system.

- Improve access to inputs; chemical inputs, primarily fertiliser, through supporting fertiliser manufacturers to develop distribution channels by improving distribution to village level and developing agro-dealers and input suppliers as service providers and trainers for farmers.

- Address demand-side constraints to competitiveness: Improve financial markets for rural rice producers and SME rice millers. This may involve value chain finance from large off-takers or large input suppliers, such as Yara. Given the small number and limited reach of value chain players, this will require working directly with financial institutions to develop and market new finance products. Improve extension services such as the private sector approaches currently being trialled.

- Promote value chain integration & consolidation: Provide high potential millers with access to finance and technical assistance to enable them to expand their businesses and strengthen the value chain.

- Promote farmer associations, particularly those with the capacity to provide marketing services to their members, to consolidate the farm-gate market and provide a platform for services such as access to inputs, finance, and training.
Enable appropriate investment in irrigation and support effective planning and execution for investments in irrigation to ensure that scarce public resources are well-spent within the sector.

7.6.2 Levers in the Medium to Long Term

Attract new investment to professionalise the value chain by bringing new, large-scale professional off-takers to the sector by reforming the policy environment and providing strong institutional support to investment promotion.

Encourage new investment in R&D. Establish a pipeline of improved varieties that are attractive to farmers and consumers. Investment will be important plus a more integrated approach to research and a structure which provides better market feedback from the private sector to researchers and breeders.

Promote greater regional research integration, such as the World Bank EAAPP by engaging in open public-private debate on policy and a common, viable vision for the rice industry by developing an effective institutional architecture for the sector, such as a rice sector association able to represent the private sector and provide a regular platform or forum for discussion. A regional rice association (alongside or as part of the EAGC) would facilitate discussion of regional trade, research, and investment.

Provide immediate technical assistance to support public and private sector targeted research to inform debate on a given range of policy issues such as trade and tariff policy, investment promotion, land and water use, and seed supply systems and Provide public goods such as market and pricing information, technical assistance, and extension services through an effective industry association.

7.6.3 Obstacles to Change

The potential obstacles to successfully implement change in the sector relate to politics and capacity.

Politics

The most important obstacles to change are the vested sector interests and ideologically-motivated opposition to change. Vested interests include rice importers who currently profit from high mark-ups under the CET policy regime and those who oppose efforts to liberalise intra-regional trade. Corrupt local government officials, who benefit from the complex export licensing regime and the opportunity to tax shipments passing through their districts, may also resist efforts to ease the bureaucracy.

Ideological opposition comes in two forms. First, the political dialogue in Tanzania naturally supports small businesses and smallholder farmers. But a policy which leads to industry consolidation and large scale investment is understandably seen as a threat to this status quo. Clearly any change must show that it will not threaten smallholders and small businesses, rather it must show that it is beneficial for them and creates new jobs and opportunities.

Second, concerns national food security. In Tanzania, rice is seen as one of its central planks. There are fears that liberalising the rice trade could mean that valuable rice stocks may be exported for higher profit when they are needed to supply home markets. For this reason any change in the sector faces the risk that future-policy making intended to support food security will disrupt the sector. If the regional rice sector is to have a positive policy environment in the long-run, governments must begin to treat rice as a strategic growth and export industry.

Human capacity

There is a risk that a lack of human capacity may prevent real change from taking place. The lack of managers with relevant experience is one of the key barriers to increasing private investment in smallholder out-grower or service schemes. There is an appreciation of the potential value of such schemes for securing quantities of high-quality paddy, but a lack of capacity to implement them. Similarly, the development of professional seed companies and input agro-dealer networks, such as the Last Mile Alliance, are highly dependent on securing people with the necessary skills. Management capacity is also absent on the farm to enable effective producer groups to form, especially where there is any marketing component to the scheme. Across a range of industries, the development of trade or industry associations has similarly been dependent on the presence of a dynamic, effective leader to build consensus and provide effective services in what are often fragmented, under-resourced sectors.
REFERENCES


2. Alliance for a Green Revolution in Africa (AGRA) (2013): Personal communication


4. COMTRADE (2013): Average exports as reported by exporters 2008-10.

5. COMTRADE (2013): Mirror data (Tanzania exports as reported by EAC importers).


16. RCMRD (2013): Mapping carried out by the Regional Centre for Mapping of Resources for Development.


20. United States Department of Agriculture (USDA) (2012): Production and consumption totals are averaged over 2009-11 and growth rates are those of trend lines calculated from 2005-12 data.


APPENDICES

Table 2: Current and new irrigation schemes in Kenya

<table>
<thead>
<tr>
<th>Scheme</th>
<th>Acreage (Ha)</th>
<th>No. of farmers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mwea Main Scheme</td>
<td>6,095</td>
<td>3,854</td>
</tr>
<tr>
<td>Mwea Out-Growers</td>
<td>1,340</td>
<td>2,500</td>
</tr>
<tr>
<td>Ahero</td>
<td>878</td>
<td>558</td>
</tr>
<tr>
<td>Kasiru Kolal</td>
<td>81</td>
<td>267</td>
</tr>
<tr>
<td>Nyatini</td>
<td>81</td>
<td>176</td>
</tr>
<tr>
<td>West Kano</td>
<td>911</td>
<td>782</td>
</tr>
<tr>
<td>South West Kano</td>
<td>1,215</td>
<td>2,998</td>
</tr>
<tr>
<td>Bunyala Main</td>
<td>534</td>
<td>134</td>
</tr>
<tr>
<td>Munaka Section</td>
<td>135</td>
<td>153</td>
</tr>
<tr>
<td>Nemali Section</td>
<td>85</td>
<td>81</td>
</tr>
<tr>
<td>Muluwa Section</td>
<td>400</td>
<td>234</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>27,338</strong></td>
<td><strong>11,737</strong></td>
</tr>
</tbody>
</table>

Table 3: Current and planned interventions in the rice value chain by governments of EAC member states and donor organizations

A) Governments

<table>
<thead>
<tr>
<th>Burundi</th>
<th>Kenya</th>
<th>Rwanda</th>
<th>Tanzania</th>
<th>Uganda</th>
</tr>
</thead>
<tbody>
<tr>
<td>Implementing a National Agricultural Investment Plan 2012-2017. Government has allocated US$ 53 million for development of Irrigation and catchment area. Government has allocated US$ 2 million For Rice value chain development.</td>
<td>The Government investing in expansion and rehabilitation of irrigation schemes in the country. Several schemes are being expanded or rehabilitated. Mwea irrigation capacity by 7,952 ha to 14,612 ha using US$125 million. Funding is provided by IICA and the Government of Kenya.</td>
<td>The Kihere Community based water management project (KWAMP) is supported by a donor basket of funds and the Government of Rwanda. It is aimed at promotion of commercial agriculture in Kihere district. Total basket amount is US$ 43 million and the project period is 2009 - 2016</td>
<td>Implementing the Agricultural Sector Development Program (ASDP) aimed at increasing agricultural productivity, profitability and farm incomes. Funding for the project is US$ 423 million and is slated to run from 2006 to 2016. The project is funded from a basket of funding contributed to by; Government of Tanzania, World Bank, African Development Bank, Irish Aid, IFAD, Government of Japan and European Union.</td>
<td>Through Kilimo Trust, UNDP and the GoU Implementing DIMAT Project aims at addressing challenges identified in Uganda’s Agriculture Sector Development Strategy and Investment Plan (DSIP). Funding for the project is US$ 4 million from 2011 - 2014</td>
</tr>
<tr>
<td>Rehabilitation of South West Kano irrigation scheme. Funding is US$450,000 provided by the government and World Bank plus Other projects include; Bunyala at US$ 962,500, Ahero at US$ 562,500, Mbega, Perkerre dam at US$ 1.625 million, and Bunyala irrigation project at US$ 82,500.</td>
<td>The Support Project for the Strategic Plan for the Transformation of Agriculture is funded by a donor basket of funds and the Government of Rwanda. It is aimed at intensification of sustainable production systems. Total basket amount is US$ 22.7 million and the project period is 2006 - 2013</td>
<td>The Government of Tanzania is funding in partnership with the World Bank; the National Inputs Voucher System through a program called the Accelerated Food Security Program. The Program was aimed at providing subsidies for a range of food and cash crops including rice. The total funding allocated to the project is US$ 185 million. The project period is 2009 to 2013.</td>
<td>GoU and donors support improvement of several agricultural commodities including rice through NARO. The program fund is US$ 178 million. Donors include; IDA and the World Bank. The funding period is 2009 – 2014</td>
<td></td>
</tr>
</tbody>
</table>
### A) Continued

<table>
<thead>
<tr>
<th>Burundi</th>
<th>Kenya</th>
<th>Rwanda</th>
<th>Tanzania</th>
<th>Uganda</th>
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<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>The Market Infrastructure, Value Addition and Rural Finance Support Program (MIVARF) is aimed at enhancing farmers’ access to markets and financial services. The program is financed by a basket funding from IFAD, African Development Bank, Government of Tanzania and AGRA to the tune of US$ 169 million.</td>
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<td></td>
<td></td>
<td></td>
<td>Another Tanzania Agriculture and Food Security Investment Program (TAFSP) aimed at increasing smallholder productivity of rice farmers. Required funding for this program is US$ 30 million and the program period is expected to be 2012 - 2017.</td>
<td></td>
</tr>
</tbody>
</table>

### B) Donors

<table>
<thead>
<tr>
<th>Kenya</th>
<th>Rwanda</th>
<th>Tanzania</th>
<th>Uganda</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mwea irrigation capacity increased by 7,952 ha to 14,612 ha using US$125 million. Funding is provided by JICA and the Government of Kenya.</td>
<td>Increasing crop production with quality extension services project is aimed at boosting rice production in Bugesera and Ngoma districts. It is funded by JICA to the tune of US$ 5.5 million. The project period is 2010 - 2013</td>
<td>The Feed the Future-Tanzania program is funded by USAID and is aimed at increased Access, availability, and utilization of African-grown staple foods in regionally integrated markets in the Northern and Central Corridors in East Africa. Feed the Future Tanzania aims to rehabilitate irrigation schemes in Kilombero Valley in Morogoro region for increased rice production. The project is known as NAFAKA project and is implemented by ACDI-VOCA.</td>
<td>The DIMAT Project funded by UNDP and the Government of Uganda aims to address challenges identified in Uganda’s Agriculture Sector Development Strategy and Investment Plan (DSIP). Funding for the project is US$ 4 million and is implemented by Kilimo Trust. The project period is 2011 - 2014</td>
</tr>
</tbody>
</table>

| Rehabilitation of South West Kano irrigation scheme. Funding is US$450,000 provided by the Government of Kenya and World Bank | Project D’ Appui aux infrastructures rurales de la region naturelle du Bugesera (PAIR). The project aims to support infrastructure development, productivity and watershed management. This project is supported by the African Development Bank and the grant amount given was US$ 30 million. Project period is 2009 - 2015 | The Government of Tanzania is implementing the Agricultural Sector Development Program (ASDP) aimed at increasing agricultural productivity, profitability and farm incomes. Funding for the project is US$ 423 million and is slated to run from 2006 to 2016. The project is funded from a basket of funding contributed to by; Government of Tanzania, World Bank, African Development Bank, Irish Aid, IFAD, Government of Japan and European Union. | Support to the National Agricultural Research organization for improvement of several agricultural commodities including rice. The program is funded by both donors(IDA) and Government of Uganda to the tune of US$ 178 million. The funding period is 2009 - 2014. |
### Kenya

<table>
<thead>
<tr>
<th>Project</th>
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<tbody>
<tr>
<td><strong>The Sustainable Smallholder Irrigation Development and Management in Central and Southern Kenya (SIDEMAN)</strong></td>
<td>The project is funded by JICA. It is aimed at promotion of irrigation. JICA committed GoJ 235mYen while GoK KES 47.5m. The project period is 2010 - 2013.</td>
</tr>
<tr>
<td><strong>Development of next generation of new rice varieties for sub-Saharan Africa and Southeast Asia</strong></td>
<td>The project is funded by JICA to the tune of US$ 8 million. It is part of Japan’s technical assistance to Kenya and runs between 2010 - 2015.</td>
</tr>
<tr>
<td><strong>Global Agriculture and Rural Development (GARD) in Tanzania</strong></td>
<td>The project is funded by JICA to the tune of US$ 185 million. The project period is 2009 to 2013.</td>
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</tbody>
</table>

### Rwanda

<table>
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<tbody>
<tr>
<td><strong>Kihere Community based water management project (KWAMP)</strong></td>
<td>KWAMP is supported by a donor basket of funds and is aimed at promotion of commercial agriculture in Kihere district. Donors contributing to the basket include: IFAD, WFP and DED. Total basket amount is US$ 43 million and the project period is 2009 - 2016.</td>
</tr>
</tbody>
</table>

### Tanzania

<table>
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<tbody>
<tr>
<td><strong>The Market Infrastructure, Value Addition and Rural Finance Support Program (MIVARF)</strong></td>
<td>The program is aimed at enhancing farmers’ access to markets and financial services. The program is financed by a basket funding from IFAD, African Development Bank, Government of Tanzania and AGRA to the tune of US$ 169 million.</td>
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</table>

### Uganda

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<tr>
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</thead>
<tbody>
<tr>
<td><strong>The Support Project for the Strategic Plan for the Transformation of Agriculture</strong></td>
<td>The Support Project for the Strategic Plan for the Transformation of Agriculture is funded by a donor basket of funds and the Government of Rwanda. It is aimed at intensification of sustainable production systems. Donors (IFAD, the Netherlands Government and DFID). Total basket amount is US$ 22.7 million and the project period is 2006 - 2013.</td>
</tr>
<tr>
<td><strong>The Stress Tolerant Rice for Africa and South Asia (STRASA) - Africa Project</strong></td>
<td>The Stress Tolerant Rice for Africa and South Asia (STRASA) - Africa Project funded by Bill and Melinda Gates foundation is aimed at development and dissemination of rice varieties tolerant to drought in rain-fed areas of Africa and South Asia.</td>
</tr>
</tbody>
</table>

### Case Studies

- **The Government of Kenya is investing in rehabilitation & Expansion of irrigation schemes** as; Bunyala at US$ 962,500, Ahero at US$ 562,500, Mbega, Perkerra dam at US$ 1.625 million, and Bunyala irrigation project at US$ 82,500. All these projects are co-funded by the government and World Bank.

- **The East Africa Agricultural Productivity Enhancement Project** is a World Bank funded project aimed at improving rice production through better access for farmers to improved varieties, management practices and post-harvest technologies; germplasm collection and preservation; strengthening seed systems; strengthening capacity of national institutions for rice improvement, enhance agro-processing and value addition processing. The project is implemented in Uganda, Tanzania and Kenya by the respective national research organizations. The program period is 2011 - 2016 and the World Bank has committed US$ 30 million to each of the Centres of Excellence.

- **The Government of Kenya is investing in rehabilitation & Expansion of irrigation schemes** such as; Bunyala at US$ 962,500, Ahero at US$ 562,500, Mbega, Perkerra dam at US$ 1.625 million, and Bunyala irrigation project at US$ 82,500. All these projects are co-funded by the government and World Bank.
Kilimo Biashara Institute of East Africa (KBIEA)

Kilimo Biashara Institute of East Africa is a virtual institution that utilises knowledge gained from practical implementation of regional programmes on trade in food. It will be managed and run in collaboration with other development partners and will offer evidence-based solutions to challenges facing regional trade in the East African Community region.

On the one hand and despite the increasing recognition of the need for increased competitiveness to boost trade of staple foods, there is a dearth of aggregated evidence-based information on matters of regional trade. This constrains effective and coordinated investment in priority areas, appropriate policy making and correct identification of obstacles to trade. On the other hand, many organizations have generated a lot of knowledge over the time based on their experiences in project development and implementation. However, they rarely share and hence, other stakeholders do not get the chance of learning resulting to re-inventing the wheel kind of efforts. To address the issue of knowledge sharing, KBIEA will be running the first course in June, 2015 as a forum of knowledge sharing.

Objectives

The objectives of KBIEA is to impart practical solutions to the many challenges slowing down regional trade on food staples in the EAC. The solution will originate from real experiences from different actors in the region. Themes, speakers and partners will be carefully selected to ensure quality of content and value for money for the sake of the participants and sponsors.

By end of each course, participants will be able to:

- Understand better the challenges they face in their work either as individuals and/or organizations;
- Appreciate solutions from others in the same sector who have been faced by similar challenges and solved them;
- Understand better the sector they are operating in by sharing with others in the same sector; and
- Join a regional knowledge sharing online platform to continue with discussions emanating from the training as well as seek real time solutions as new challenges emerge.

Approach:

In order to share our knowledge and that of others, the institute will offer short courses/workshops physically and virtually. To harness the knowledge of others, Kilimo Trust will partner with those organizations who are an authority in specifics aspects of agricultural development. Running at least
two courses a year subject to demand and availability of resources, some of the key thematic areas of interest include:

- Agricultural production, farming as a business and market systems.
- Value chain integration for cross-border regional markets.
- Value chain institutions development.
- Policy advocacy.
- Financial literacy and management for agricultural development.

**Target Participants**

To deliver the ambition of the institute, Kilimo Trust targets to reach to different audience who shall be re-defined on a case basis. They include:

- Practitioners at all nodes of the value chain
- Policy markers
- Economic and trade strategy experts
- Development agencies
- Public and private sector investors
- Agents that manage tariffs and trade barriers.

**Awards**

The institute will offer limited partial scholarships based on set criteria and in a transparent way. The criteria will be announced widely before the onset of the project for participants to take advantage of it. In addition, the institute will award a certificate to successful participants.

**Venue**

The venue of the training will always be in one of the EAC Partner States informed by the theme at hand, availability of training expertise, resources required, and number of participants from a particular Partner State among other factors. Any deviation from this norm will be communicated in advance.

For More Information about KBIEA, Contact

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