

# ウガンダ市場における国産米の品質向上

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# Enhancing the Quality of Locally Produced Rice in Domestic Market : A Survey in Eastern Uganda

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**Summary** : This study assesses the competitiveness of locally produced rice in the markets with regards to quality management, consumer demand and producer rewards. Due to its low quality, rice produced by smallholder farmers ends up in public markets since it does not qualify to enter supermarkets. Most rice from public markets is destined for home consumption and the rest for cooking in hotels and restaurants. For home consumption, demand is influenced by price more than quality. Contrarily, demand is influenced by quality more than price for hotels and restaurants. If quality does not improve, farmers risk losing their quality oriented clients. Quality improvement efforts are hampered by poor postharvest handling techniques and low farmer motivation as a result of low price premiums. Premiums paid by consumers are absorbed by the high marketing costs incurred by rural rice traders more especially brokers. Training of farmers and traders about quality and investment in rural infrastructure to reduce marketing costs are possible measures.

**Key words** : Uganda, Rice, Postharvest handling, Quality management, Price premium

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## I. Introduction

Like in many other Sub-Saharan countries, postharvest handling practices of Ugandan rice farmers are generally poor. Paddy is manually cut and heaped for some days before being threshed and dried on bare ground. After several days of long hours of drying, the paddy is milled using small Mill-top and Engelberg<sup>1)</sup> machines from where it's traded in an unbranded form. In addition, farmers often use a mixture of local varieties and paddy is usually inhomogeneous (Kilimo Trust, 2014). The resultant rice from such postharvest practices is always of low quality characterized by presence of foreign matter and high percentages of broken. Many studies (Rickman et al., 2013 ; EUCORD, 2012 ; Kilimo Trust, 2014 ; PMA, 2012) report that delayed threshing and over-drying increase internal cracking (fissuring) and consequently makes the grain more susceptible to breaking during husking and whitening, thereby reducing white-rice and head-rice (wholly milled) yields. As explained by Rickman et al. (2013), when very dry rice is stored it can absorb moisture from the surrounding humid air which increases fissuring.

In the same vein, rice milling is done by less efficient and outdated mill-top and engelberg milling machines which increases the percentage of broken rice. The low quality problem is compounded by the fact that the above machines lack de-stoners and the grading capacity. Candia and Masette (2012) elaborates that the resultant effect of these factors is that the locally

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grown rice by smallholder farmers and processed by cottage milling companies does not compete well with imported brands in the liberalized market of Uganda. This is particularly true for the top segment market such as supermarkets where locally produced rice has failed to penetrate at the expense of high quality imported rice (PMA, 2009 ; Kikuchi et al., 2013).

With increasing urbanization and number of middle class consumers who prefer convenience in terms of quality, supermarkets are rapidly gaining importance as a marketing channel. Low quality rice has many impurities which necessitates considerable time on sorting and thus viewed as an inconvenience to middle class consumers. One of the major challenges for Uganda is therefore to produce sufficient and affordable rice that meets the preferences of its fast-growing and increasingly urbanized population ; and which can compete with imported rice both in terms of price and quality (EUCORD, 2012).

The purpose of this study is to understand the competitiveness of locally produced rice in the market through quality enhancement by : (i) assessing the current quality of rice in domestic market, (ii) analyzing the quality management practices at various marketing stages and (iii) profiling consumer choice between price and quality.

Improving the market competitiveness of locally produced rice is crucial for reducing the amount of imported rice and contributing to food security in Uganda. The competitiveness of locally produced rice against imported rice in the market depends primarily on its acceptance by the consumer (Stryker, 2013). Consumers tend to set minimum quality standards of rice they purchase and therefore any effort of enhancing grain quality of locally produced rice needs to consider quality targets based on a good understanding of consumer preferences (Futakuchi et al., 2013). If Africa (including Uganda) wants to reduce import dependency, it will have to invest in value-adding by tailoring quality of its domestically produced rice to urban consumer standards (Demont et al., 2012).

Unlike in other parts of Africa where urban consumers prefer imported rice as a status symbol, Ugandan consumers prefer local rice due to its good aroma and taste given the same quality (Kilimo Trust, 2014). There is therefore a huge market for local quality rice into which rice farmers can exploit if varietal and postharvest quality characteristics are tailored to urban consumer preferences (Demont and Ndour, 2014). Consequently, the country would save on the value of rice imports. Also, national welfare would increase as the consumers express their preferences for rice quality by paying a premium for rice with the desired characteristics. If these retail price premiums are transmitted back to the farmer through the marketing system, then market participants have the incentive to further improve quality (Unnevehr et al., 1992).

If quality is not improved however, there is an unpleasant future for locally produced rice. In the long term as consumer standards rise and the retail sector becomes more sophisticated, greater value is placed on packaging and branding. Such changes will inevitably impact the rice market. Consumers will become less tolerant of local low quality rice and this could increase rice imports (Kilimo Trust, 2014).

In the short term, branding and packaging is not a priority for Ugandan consumers. Kikuchi et al. (2013) reports that the quality of rice that matters in the rice market in Uganda is not so

sophisticated yet as only three criteria are employed to determine quality. These include cleanliness (without stones and other odd materials), whiteness (color) and brokenness (degree of broken rice). Similarly, JAICAF (2010) reports presence of foreign matter and percentage of broken rice as the two most important price determining factors for locally produced rice in Uganda. As such the above two factors have given Vietnam and Pakistan rice a competitive advantage to local price (Kilimo Trust, 2014). However, if postharvest quality is improved, Super rice has the potential to outcompete the imported rice due to its good aroma.

## II. Methodology

The research was conducted in Eastern Uganda in the districts of Namutumba and Jinja. Namutumba is one of the major rice growing districts and the nearby Busembatya town is the primary transaction center where rice from farmers is purchased by trader agents and brokers before entering the regional and national wholesale and retail markets. Jinja is the major town and wholesale and retail market for Eastern Uganda.

Before the actual survey in August and September 2014, the researcher first conducted a desktop research through literature review to assess the general quality of rice in Uganda. This was followed by visiting the Uganda National Bureau of Standards (UNBS) and conducting semi-structural interviews with representatives from departments of quality and standards. The purpose was to establish whether rice standards existed and implementation criteria.

Thereafter, the researcher spent about two weeks in Jinja conducting personal observations and interviews with fifteen rice retailers. The questions were both structured and semi-structured and covered a wide range of topics including rice brands, sales, quality management, suppliers and clients. Retailer interviews were therefore useful in estimating their profitability, quality improvement procedures and consumer preferences. Since the researcher was interested in 15 respondents and from literature review (Kikuchi et al., 2013) it was established that Jinja market had about 45 rice retailers, systematic sampling of every third rice retailer was selected for interview.

For every retailer who was interviewed, rice samples (0.5kg) were purchased for each rice category (brand) traded which formed a basis for personal quality observations. A total of 75 samples were collected from 15 retailers implying an average of 5 brands per trader. Subsamples of 100g were drawn from each sample and analyzed for important attributes of physical quality such as stones and broken rice through manual sorting, weighing and calculating their respective percentages.

Because most of the rice in the market was coming from Busembatya and the quality of rice from the same place was relatively lower than rice from other places, the researcher visited that area and conducted interviews with rice farmers. Since Busembatya is a trading town, the nearby rice growing villages in Nsiize Sub County of Namutumba district were purposively selected. A focus group discussion with 12 representative stakeholders followed by individual interviews with 20 randomly chosen rice farmers were conducted. The topics ranged from post-harvest handling methods and quality improvement practices to benefits and challenges.

The findings were summarized using flow charts, graphs and tables with the help of descriptive statistics like frequency, average and percentages. In addition, economic measures like profits were also analyzed.

### III. Rice quality in the context of East African Standards

With respect to Ugandan consumers, rice quality is grouped into cooking and physical qualities. Regarding cooking qualities, consumers prefer aromatic to non-aromatic, sticky to non-sticky and bulging to non-bulging rice varieties (UNRDS, 2009). These qualities can only be influenced through breeding and are not regulated by national rice standards. The physical quality of milled rice is characterized by a combination of desirable and measureable characteristics. Such characteristics include milling degree, whiteness, head rice, chalkiness, colored kernels, moisture content, foreign matter, and etcetera. In line with market requirements (standards), physical quality characteristics are used to classify rice into grades.

Due to the integration of rice marketing policies among the East African member countries (Makosa, 2014), quality standards have also been harmonized. Even though the East African Standards (EAS, 2013) has detailed criteria for grading rice, only two characteristics (cleanliness and brokenness) are capable of influencing the choice of a Ugandan consumer. Together with moisture content, these two characteristics are briefly defined as follows:

*Cleanliness* is determined by the presence or absence of foreign matter (organic and inorganic impurities). The more the foreign matter, the less the quality. Organic impurities include such substances as rice husks, straws, livestock and poultry excreta, and etcetera. On the other hand inorganic impurities include lumps of earth, sand, stones, dust and small metals such as nails.

*Brokenness* refers to the percentage of broken kernels in rice. The less the broken percentage, the higher the quality. According to EAS (2013), rice is said to be broken when the kernel length is less than 75% of the length of wholly milled grain. The same standards also define milled rice as whole or broken kernel from which the hulls and at least the outer bran layers have been removed. In relation to brokenness is *head rice* which refers to milled rice with length of 75% of whole kernel or more. The more the head rice, the more the quality.

*Moisture content* defined as the quantity of water contained in the rice grain is another important quality measure. It is usually determined by the moisture meter for accurate figures in modern farming and agribusiness as opposed to estimating quality through biting which is a characteristic of smallholder farmers in Uganda. The optimum and recommended moisture content for rice is 13-14%. Low moisture content as a result of over drying reduces quality by increasing brokenness. Similarly, high moisture content as a result of under drying reduces quality by increasing rotting and toxic compounds on the rice grain.

The harmonization of Uganda national standards with the East African standards has relaxed the quality requirements for Ugandan rice. Table 1 compares selected quality attributes of rice standards before harmonization using the example of year 2011 versus the standards after harmonization (2013). Moisture content was raised from 13% (in 2011) to 14% (2013) for all rice grades. In addition, the percentage of broken for grade 2 rice was raised from 7% (2011) to more

than double (15%) in 2013. Similarly, broken percentage for grade 3 rice was relaxed to 25%. Although the above standards are in place, their implementation is similar to non-existent.

**Table 1** Selected standards characteristics for Uganda

Period	Characteristic	Maximum limits (%)		
		Grade 1	Grade 2	Grade 3
2011 (Before Harmonization)	Broken	5	7	15
	Inorganic matter	0.1	0.1	0.1
	Organic matter	0.1	0.2	0.5
	Moisture content	13	13	13
2013 (After Harmonization)	Broken	5	15	25
	Inorganic matter	0.1	0.1	0.1
	Organic matter	0.1	0.2	0.5
	Moisture content	14	14	14

Source : UNBS (2011), EAS (2013)

A big advantage of ‘Pakistan’ and ‘Vietnam’ rice brands, which are imported from Asia where the rice milling process is with a perfect de-stoning function, is their cleanliness that does not necessitate rice retailers to make any cleaning of milled rice before selling (Kilimo Trust, 2014).

Although the above standard is for both locally produced and imported rice, in practice it is applicable only on imported rice. An interview with representatives from Uganda National Bureau of Standards (UNBS) revealed that implementation is usually at the border posts and to small extent large scale producers since they don’t have the capacity in terms of personnel to monitor the many small scale producers who are the majority. In case the rice does not meet the required quality standards, it’s either destroyed or not allowed into the country. The respondents also reported that there is no streamline policy on quality and standards which make implementation difficult. The cost of attending a three day general course on quality management is 360,000Ush (140US\$) per person which is beyond most small scale farmers, millers and traders. Training also takes place at the UNBS headquarters in Kampala which significantly increases costs for rural stakeholders. This has kept away key players in the rice value chains from accessing the skills on quality. As a result, local rice market actors have little knowledge about rice standards in Uganda.

#### **IV. The quality of rice on the market**

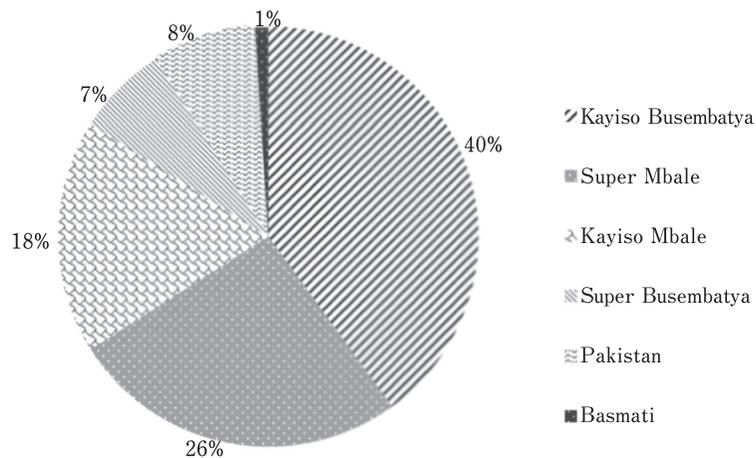
##### **(1) Market share of rice brands**

The information used in this section was captured from rice retailers in Jinja central market. The volume of rice stocked by retailers was recorded according to brand and the percentage calculated. Brand as used in this context is a loose name given to rice with respect to the variety and place of purchase, for instance ‘Super Mbale’ refers to Super rice from Mbale town. There are two main types of locally produced rice, Kayiso and Super. Kayiso (or Kaiso) literally

meaning needle (Lusoga language) refers to long and thin shaped grain lowland rice varieties especially the old K-series (K-5, K-9, K-85...) developed by IRRI and introduced in Uganda by Kibimba rice scheme. Their desired characteristic is enlargement of the grain on cooking. On the other hand, Super (or Supa) varieties are lowland thick aromatic grains which originated from Surinam. These two are further categorized as Busembatya or Mbale depending on their place of purchase. Pakistani rice from Pakistan and Basmati from India are the only imported rice brands on the market. Figure 1 shows the market share of rice brands on the market.

Kayiso Busembatya is the most prevalent brand on the market with 40% share, followed by Super Mbale (26%) with Basmati (1%) the least prevalent. Generally, locally produced rice constituted 91% of the total rice on the market. A combined share of Kayiso (that is Kayiso Busembatya and Kayiso Mbale) is 58% while that of Super is 33%.

In their survey report, Kikuchi et al. (2013) quote closely similar findings for 'East Near' which includes Jinja and other districts of Busoga sub region. Whereas they (Kikuchi et al., 2013) had 'Upland rice' as one of the local brands on the market, this survey did not identify any. There is a possibility that Upland rice has been integrated into Super and Kayiso brands since farmers usually grow different rice varieties but fail to separate them during drying and milling. Consequently, they sell undifferentiated rice to traders who brand it depending on the perceived majority of a particular variety. Most often, traders disguise such rice as Super due to its high price. The same findings were pointed out by Kikuchi et al. (2013).



**Fig. 1** Market share by rice brands  
Source : Retailer survey (Aug-Sep, 2014)

## (2) Physical quality of rice brands

Personal observational results of physical quality by brand are shown in table 2. The quality of imported rice is generally higher than that of locally produced rice. Basmati is the cleanest without any stones and any broken rice. The local rice is of varying quality with Super Mbale which contains 0.1% stones and 25% broken the highest. On the other hand, Kayiso Busembatya

represents the lowest quality of rice on the market with 1% stones and 45% broken. Based on variety, irrespective of place of purchase, Super (Mbale and Busembatya) is of higher quality (0.15% stones and 25% broken) compared to Kayiso which is 0.9% stones and 40% broken on average. This could be due to the fact that grains of Kayiso are long and narrow which creates a higher possibility of breaking compared to Super rice grains which are relatively shorter and thicker.

The above figures seem alarming for broken but there is a marked improvement of quality since Candia and Masette (2012) reported 52.7% as the least broken. This improvement can be attributed to continued adoption of mill-top machines which produce relatively better quality rice than the Engelburg machines which were previously predominant (Kijima et al., 2013).

Worryingly however, the quantity of foreign matter is deteriorating. Candia and Masette (2012) recorded 0.8% as the highest share of foreign matter in their samples. In contrast we are reporting 1% share of stones in Kayiso Busembatya which is the most prevalent brand in the market. The reason for this quality deterioration is not clear. One possible reason could be the increased demand and competition for paddy by high number of new entrants to milling business who penetrate deep into the villages in search of paddy (Kikuchi et al., 2013 ; Kijima et al., 2013). In this case farmers become complacent about the quality of their rice thereby leading to deterioration. To improve this situation, implementation of institutional rules and regulations concerned with quality and standard need to be strengthened.

Another observation worth noting was that rice from Mbale (both Super and Kayiso) is of higher quality compared to rice from Busembatya. This could be due to the fact that Mbale is more urbanized than Busembatya. According to Kijima et al. (2013), Mill-top machines which produce better quality rice than their Engelburg counterparts tend to concentrate in urban areas.

**Table 2** Physical quality of rice brands in comparison to UNBS\* requirements

Type	Brand	Stones (%)	Broken (%)
Local	Kayiso Busembatya	1.0	45
	Kayiso Mbale	0.8	35
	Super Busembatya	0.2	25
	Super Mbale	0.1	25
Imported	Pakistan	0.0	20
	Basmati	0.0	0
UNBS*	Grade 3	0.1	25
Maximum limits	Grade 2	0.1	15
	Grade 1	0.1	5

Source : Personal analysis from retailer rice samples (Aug-Sep, 2014), \*Uganda National Bureau of Standards

Generally the quality of locally produced rice is poor. Using the criteria of this research, only Super Mbale meets the minimum quality as set by the Uganda National Bureau of Standards (UNBS) in collaboration with the East African Standard (EAS). At 0.1% stones and 25% broken it qualifies as grade 3 which is the lowest grade of milled rice. It is more likely that if full quality

assessment criteria as indicated in EAS (2013) was undertaken, none of the locally produced rice would be graded. Also, many policies including quality standards in member countries have been harmonized due to East African integration. As a result there have been relaxation and tightening of some guidelines to allow market access for many goods and services in member countries. This has enabled Super Mbale to meet minimum standards which would have otherwise not qualified.

## V. Quality management practices

### (1) Farmers' perspective

Even though UNBS has a detailed guideline to quality standards, the population has simplified criteria for determining quality. Table 3 shows different views of farmers regarding rice quality. Each question had several responses and the respondent was required to choose the most important. 80% of farmers consider presence of foreign matter such as stones and poultry droppings as the main factor which affects quality. Following foreign matter was brokenness (12%). This implies that if the rice has no foreign matter and has low percentage broken, it is considered to be of high quality by farmers irrespective of other characteristics outlined in EAS (2013).

Actually presence of foreign matter and brokenness are the only criteria used by traders while procuring rice from farmers. Consequently, farmers' efforts to improve quality are con-

**Table 3** Quality management practices and perceptions by farmers

Probing question	Most common response	Frequency	Second common response	Frequency
Drying period	4-5 days	70%	5-7 days	30%
Testing for dry paddy	Biting	90%	Crashing in hand	10%
Considerations for quality	Foreign matter	80%	Broken rice	12%
Activities for improving quality	Sweeping the drying yard	50%	Keeping away poultry	40%
Benefits to selling quality rice	Readily marketable	60%	None	30%
Constraints to quality improvement	Less price premium	45%	Lack of quality control skills	40%

Source : Farmer survey (Aug-Sep, 2014).

cerned with clean drying. They do this by sweeping the drying yard and monitoring the paddy by keeping away poultry from contaminating it by their excreta. Unfortunately, they dry on bare ground and sweeping exacerbates the problem by bringing the stones to the surface. Monitoring of paddy during drying is a difficult task and in most cases farmers are usually overwhelmed by poultry. Use of tarpaulins for drying is not common as smallholder farmers are more concerned with minimizing costs. Most of the farmers (60%) are aware that good quality rice is readily marketable but they do not have the motivation of investing in quality control items like tarpaulins and moisture meters due to less price premium. A big percentage of farmers (45%) cited low price premium as the major obstacle to improving quality. They believe that the premium for

high quality is always taken up by the rural brokers who collect rice before selling to wholesalers.

Whereas some effort is put in controlling foreign matter, nothing is being done to minimize brokenness. Farmers assume the quality of the milling machine is solely responsible for the amount of broken rice. According to Odogola (2006), the drying length affects the moisture content of paddy and increases the development of internal cracks which raises the possibility of breaking during milling. Unknowingly, farmers have a tendency of over drying their paddy before milling due to lack of moisture meters. To assess moisture, 90% of respondents said they bite the paddy while the rest crash it between their palms. As this method is not accurate and the optimum moisture range is narrow (12-14%), there is a high possibility of drying to below or above optimum. However, the risks associated with under drying paddy (more than 14% moisture content) such as fermentation and rotting are more costly to the farmer as all the rice may be rejected. On the other hand, the risks associated with over drying such as broken rice are less costly since there is market for such rice. For this reason, most farmers (70%) dry for 4-5 days or more compared to the recommended duration of 2-3 days for proper moisture content.

This finding is consistent with the results of the group discussions (table 4). Farmers actually dry paddy for 8 hours per day in contrast to 4 hours per day as recommended in the

**Table 4** Conventional versus recommended paddy drying

	Study area	Recommended*
Drying period in days	4-7	2-3
Hours of sunshine exposure per a day	8	4
Depth of paddy spread (cm)	1-2	5-10
Hours between subsequent stirring	2-3	0.5-1

Source : Farmer survey (Aug-Sep, 2014)

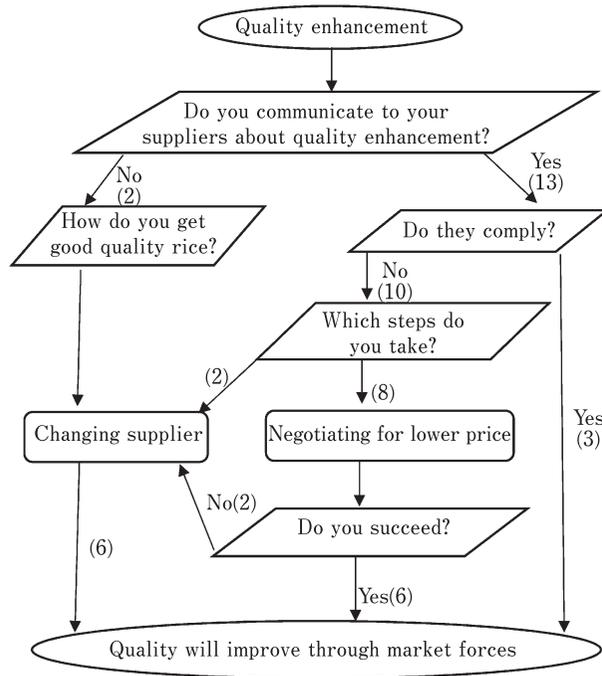
\* Recommended sun drying of rice paddy by USAID-East Africa

crop conditioning handbook (USAID East Africa, 2011). Also, they spread a thinner layer of 1-2cm deep instead of the recommended 5-10cm. All these drying procedures lead to over dried paddy with moisture content of about 10% and internal cracks of above 41% as reported by Candia and Masette (2012). Consequently, higher percentages of broken rice are obtained on milling.

## (2) Retailers' approach

There was no retailer who participated in rice improving procedures like cleaning and sorting. This is contrary to the findings of Kikuchi et al. (2013) who reported some traders in Kampala who engaged in sorting their rice before selling. Although they did not directly impact on the quality of rice they sold, retailers influenced quality by demanding good rice from their suppliers. With the help of a bag trier, retailers always draw samples and check for the presence of foreign matter and broken percentage to estimate the quality of rice in the supplying market.

Figure 2 shows how retailers get the desired quality of rice. In case the supplier provides lower quality rice than required, the retailer will communicate his desires for quality improve-



**Fig. 2** Quality management by retailers (figures in brackets represent the number of retailers for a particular response)

Source : Retailer survey (Aug-Sep, 2014)

ment. Some retailers do not communicate however, / they instead change the supplier without any notice since there are no formal contractual agreements. For those who communicate, some suppliers comply and improve the quality without further intervention by the retailer. In most cases suppliers do not immediately comply, this prompts the retailer to react by either changing the supplier or negotiating for a lower price. More often, a compromise is always reached where low quality rice is transacted at a lower price. In some instances when an agreement for lower price is not reached, the retailer changes the supplier.

Therefore ‘changing the supplier’ and ‘bargaining for lower price’ are the two quality management tools used by retailers. If the marketing system was efficient, the quality would improve due to market forces. Unfortunately, this is not true as farmers continue receiving less premium as cited earlier in table 3. This implies that the price premium is lost along the chain before reaching farmers. By accepting less price from retailers for low quality rice as illustrated in figure 2, wholesalers (retailers’ suppliers) remit the premium to rural brokers (wholesalers’ suppliers). Since farmers sell their rice after milling directly to rural brokers, mill operators do not interfere with the price premium. It is therefore logical to conclude that the quality premium is taken by rural brokers as they form the link between farmers and wholesalers. This view is sup-

ported by Kikuchi et al. (2013) who reported that brokers who operate outside Kampala (rural brokers) make the highest returns (95% per year) compared to other rice value chain actors such as millers, Kampala brokers, wholesalers, and retailers. However, these returns are consistent with the risks involved in their business and the high transport costs. Namazzi (2008) concurs that the high transport costs for agricultural commodities in rural Uganda are responsible for poor price transmission from consumers to farmers.

## VI. Consumer demand for quality

Since the rice on the market is differentiated according to brands and each brand is of single quality, consumer choice was estimated as the daily retail sales for each brand. Table 5 indicates the demand or amount of retail sales by brand. Despite Kayiso Busembatya having the lowest quality, it commands the greatest demand. On average each retailer sales 91 kg of Kayiso Busembatya daily which is almost double the sales of the closest brand Kayiso Mbale (47 kg). The amount sold of Basmati was negligible and was left out of the analysis. For the brands included in the analysis, Pakistan was the least sold at 10 kg per day despite being of the highest quality. The relatively quality local brand Super Mbale was the third in sales amount (40 kg). The above observation implies that consumer choice is influenced by other factors besides quality.

A look at price (table 6) reveals that Kayiso Busembatya is the cheapest as it retails at 2000 Ush/kg while Super Mbale most expensive at 3000 Ush/kg. Pakistan, the only foreign brand is of the better quality and lower price (2800 Ush/kg) than Super but has very little daily sales. This implies that locally produced rice is more demanded than imported rice. Amongst the locally produced rice, price is important for Kayiso varieties as consumers choose Kayiso

**Table 5** Retailer daily sales by rice brand

Retailer	Daily Sales (kg)				
	Kayiso Busembatya	Kayiso Mbale	Super Busembatya	Super Mbale	Pakistan
1	96	35	—	45	8
2	82	60	30	42	12
3	100	—	35	—	10
4	95	45	—	38	13
5	85	40	—	40	6
6	90	50	38	42	9
7	88	48	33	50	11
8	80	52	—	35	10
9	96	45	30	40	12
10	110	55	35	45	15
11	85	40	28	35	5
12	86	—	—	36	8
13	90	46	30	43	7
14	92	—	35	40	10
15	90	50	—	35	8
Average	91	47	29	40	10

Source : Retailer survey (Aug-Sep, 2014)

Busembatya over Kayiso Mbale due to its lower price even though the former has inferior quality. The same cannot be said of Super varieties however as more priced Super Mbale is chosen over Super Busembatya. Therefore for Super varieties, quality is the main determinant of demand. A further look at the extreme right of table 6 explains the market segments for these rice brands. Kayiso brands are mostly consumed at home where each household sorts the rice before cooking.

Buying cheaply priced rice is considered a better option for reducing household expenditure since most families live on limited budget. In addition, Kayiso varieties have the ability to expand on cooking which implies that 1 kg of Kayiso rice can serve more people than when using any other variety. Given the same household size, less amount of rice will be required when feeding on Kayiso than when feeding on other rice brands. As a result, the expenditure on Kayiso lowers considerably making it the most demanded. These findings are consistent with Kilimo Trust (2013) study which reported that most rice consumers in Uganda prefer affordability to quality and taste.

**Table 6** Rice demand by brand

Brand	Average daily sales (kg)	Sales price (Ush/kg)	Purchase price (Ush/kg)	Daily markup (Ush)	Main consumption point
Kayiso Busembatya	91	2000	1800	18200	Home
Kayiso Mbale	47	2200	1950	11750	Home
Super Mbale	40	3000	2600	16000	Restaurant
Super Busembatya	29	2800	2400	11600	Restaurant
Pakistan	10	2800	2500	3000	Restaurant

Source : Retailer survey (Aug-Sep, 2014).

On the other hand, Super brands are mostly consumed in restaurants and hotels. Since hired labor is involved in sorting rice, restaurants prefer buying relatively high quality Super Mbale to minimize the costs. It should be noted that Super varieties are associated with good aroma which attracts clients who decide to eat out as a way of changing from the daily diet.

## VII. Conclusion

This paper assesses quality management practices, consumer demand and producer rewards to address the problem of low competitiveness of locally produced rice in Ugandan markets. Poor drying of paddy is a major contributing factor to low quality rice in the market. Farmers tend to excessively dry paddy to less than recommended moisture content which increases the broken percentage of milled rice. Much as the rice standards are in place, their implementation has not been effected. The traders and farmers are not aware of such quality requirements since they have not been trained by the standards body. Training of farmers about postharvest skills such as threshing, drying and storage will to some extent contribute to improved rice quality. The national standards body should consider offering free trainings to rice marketing stakeholders from their respective locations. Lessons for particular category of market actors can be organized in groups to minimize costs. Skills training will need to be complemented with

investment in basic drying equipment like moisture meters and tarpaulin by farmers to significantly improve the quality of their rice. However, this can only be possible if the farmers feel the returns to such investments in terms of price premiums are worthy. The premiums for quality are usually paid by consumers to retailers who in turn transmit them to their suppliers (usually wholesalers). However, premium paid by wholesalers to brokers does not reach farmers as it is retained by brokers to cover high transaction costs particularly transport. As a result, there is less motivation for improving the quality of their paddy. In line with Kherallah (2000), this study recommends the government to invest in infrastructure such as roads in rice farming areas to reduce transport costs. This will help in smooth transmission of price premium to farmers. In turn, farmers will be capable of making important postharvest handling choices which influence rice quality. Also, reduced transportation cost will translate into less consumer price which in turn will increase the demand for local rice as Ugandan consumers are price conscious.

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### Notes

- 1) Engelburg is an old type single pass steel roller huller which is popular in Uganda due to its less maintenance costs. Mill-top machines are compact single pass rubber roller hullers. Both machines have no de-stoners and produce low quality rice.

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## ウガンダ市場における国産米の品質向上 ——東部ウガンダでの現地調査から——

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本稿は、品質管理、消費者の需要、生産者の所得によって、市場におけるウガンダ国産米の競争力を示すことを目的とする。国産米は低品質なため、スーパーマーケットと取引する基準を満たさないため、小規模農家の米は公設市場で取引されることになる。公設市場で販売されるほとんど米は家計消費向けであり、ホテルやレストラン向けは少ない。家計消費向けの米の需要は品質よりも価格により影響されている。一方、外食向けの需要は品質が重要な要因である。品質が改善されなければ、農家はその品質指向の顧客を失うリスクがある。収穫後の農家の乾燥・調製技術が低いこ

とや、品質向上しても価格プレミアムが得られにくいことから、農家の品質向上への取り組み意欲が低く抑えられている。高品質米に対して消費者は価格プレミアムを支払っているが、産地流通業者、とくにブローカーの取り分が多く、農家には届いていない。高いマーケティングコストを削減するために、農村のインフラストラクチャーの整備や農家・流通業者への教育・啓発が考えられる対策である。

キーワード：ウガンダ、米、収穫後の乾燥調整、品質管理、価格プレミアム