CONSUMER PREFERENCE OF RICE AND RICE PRODUCTS

RICE PLATFORM Report, 2019
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LIST OF ACRONYM

AHP  Analytic Hierarchy Process
AICC  Africa Institute of Corporate Citizenship (AICC)
CI  Consistency Index
CR  Consistency Ratio
CT  Consumer Theory
CVM  Contingent Validation Method
GAR  Gross Attendance Ration
IRRI  International Rice Research Institute
MAP  Malawi Agriculture Partnership
NSO  National Statistical Office
PPP  Public Private Partnership
RI  Random Consistency Index
SPSS  Statistical Package for Social Scientists
SSS  Sub Saharan Africa
US  United States (of America)
WTA  Willingness to Accept
WTP  Willingness to Pay
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EXECUTIVE SUMMARY

Consumers differ in their preference for rice and rice products. There are two key assumptions used to assess preference for the consumers. Both assumptions state that preference can be ranked and is transitive in nature. In Malawi the main rice varieties are Kilombero, Faya, Pussa and TC10 including other varieties like kidney and Amanda. Production of rice has reduced with 7.2% in 2018 as compared to increase of 8.1% in 2017. Rain fed production contributes about 60% of total production with the remainder attributed to irrigation production. Rice is largely consumed as food in Malawi and ranked second from Maize. This study set out to understand diversity of consumer preference of rice. Key attributes of rice were singled out for analysis that included; aroma, taste, colour of rice, easy cooking and grain size. The study employed Consumer Willingness to Pay (WTP) and analytic hierarchy approach. This was complimented by other non-parametric test for further validation of results and discussion. In general consumer awareness levels varies across varieties with Kilombero and Pussa being the most popular varieties of rice. The study established that there is a significant relationship between consumption patterns and awareness level; varieties with high awareness level had high consumption levels as compared to those with low awareness levels. The study recommends that there is need to deliberately create public awareness on the other varieties. Consumers were found to prefer Kilombero five times more than Pussa and six time more than TC10. While they prefer Faya two times more than Pussa and three times more than TC10. The study also established that despite these preference variations among consumers, there is little effort towards value addition in the rice sub sector. Currently, value addition is done at small scale and for primary activities such as packaging. The study recommends the need for a shift towards high value products like animal feed and other industry products.
1.0 INTRODUCTION

Global supplies of major cereals have exceeded overall demand in recent years. This has led to a significant buildup of surplus and much lower prices in international markets as compared to the previous decade. World production of major cereals reached a new height in 2017, exceeding the previous peak in 2016 which has further grown in 2018. Global production of cereals is projected to increase by 13% by 2027. This increase is attributed to improved high yields due introduction of new technologies like Systems of Rice Intensification (SRI) and improved varieties (OECD-FAO, 2017).

Rice is mainly consumed as food, animal feed, and is also used in industrial applications including fuel. Food demand is influenced by population and income growth, and increasingly also by trends in dietary patterns and consumer preferences. Demand for animal feed is closely linked to the human consumption of livestock products, such as meat, eggs and milk, but also by the evolution of livestock production technology. In Malawi there is growing demand for animal feed which has been induced by growing demand and gradual evolution of the livestock sector. This present an available opportunity for farmers to shift to production of non-food products from rice and by-products.

In Malawi rice is mainly produced by smallholder farmers and is grown as a secondary cereal crop to other crops like maize. As other, crops rice has a dual purpose of being a cash and food crop. Mostly, rice is grown as a commercial crop in cases of working as a group, club, association or cooperative in a specific rice scheme. Rice is grown mostly along western shore of lake Malawi, lake Chirwa and along Shire river. Malawi has a potential of 70,000 hectares for rice production. Only 15% of rice production is attributed to irrigation. (AICC, 2016).

Consumers vary in their preference of rice varieties. Given such diversity, it is very complicated to deal with consumer preferences. Economists deal with this general challenge through some general proposition about consumer behaviors. These propositions are that are widely believed to be true. The first assumption is that preference is complete in the sense that consumer can rank their preferences. The second assumption is that preferences are transitive. This assumption follows a logic causality assumption under deductive reasoning. It states that if consumer prefer Kilombero to Pussa and Pussa to Faya then the consumer prefers Kilombero to Faya. The last assumption is about consumers. It states that a consumer is presumed to prefer more of any goods to less. This is also termed non-satiation and is expressed as more is preferred to less.

Consumers make decisions by allocating their scarce income across all possible goods in order to obtain the greatest satisfaction. Consumer preference has two major dimension of measurement either explicated method or the conjoint analysis which are used in consumer preference measurement. In self-explicated method consumers are directly asked to evaluate certain features and characteristics. It is the responsibility of researchers to evaluate by calculating utility based on the answers from consumers. The major challenge for this method is that most times consumers do not know or they are hardly able to define relative importance of some attributes. On the other hand, conjoint analysis does not ask consumers to directly to evaluate product and the investigator calculate utilities from particular preferences. This method is basically adequate in case of complex products with a lot of attributes. This method can also handle a product with maximum of nine attributes unless otherwise and assume homogeneous consumers which is not the case most of times.

African Institute of Corporate Citizenship (AICC) promotes principles of corporate citizenship- corporate governance, corporate competitiveness, corporate sustainability and corporate social responsibility in its dealings.

1. The method assume that consumer use exactly the same routine to define preference order
The conviction behind pursuing these principles and adoption of the Public Private Partnership (PPP) model is to ensure that players along the agricultural value chains are accountable and responsible in the manner in which they conduct their businesses. AICC, through the Malawi Agriculture Partnership Program II (MAP II) is implementing various projects aimed at strengthening agro commodity value chains in legumes, rice, cotton and innovations. Innovation and the role of improved technology is especially emphasized in implementing innovative solutions to transform the agriculture sector in Malawi.

The African Institute of Corporate Citizenship through the Rice Platform facilitated a study whose main aim was to evaluate the consumer preferences for rice varieties and rise products. As consumer preference related to rice grain quality is highly heterogeneous, consumers have become sensitive to the quality attributes of different rice commodities found on the market and are choosing products that closely match their tastes and preferences. As such, AICC conducted this study, to analyze consumers’ awareness preferences for rice varieties and rice products.

1.1 OBJECTIVES

1.1.1Main objective

➢ To investigate the consumer preferences on different rice varieties and products

1.1.2 Specific objectives

➢ To examine the consumer awareness about different rice varieties
➢ To assess consumer preference for different rice varieties
➢ To examine consumer willingness to pay for rice products

2.0 LITERATURE REVIEW

Rice is the most important staple crop in the world; it is central to food security of over half of the world’s population, particularly in the developing countries. Despite being central to food security in developing countries consumers are becoming more aware of the quality attributes of different rice commodities found in the market. The effect has been that consumers are choosing products that closely match their tastes and preferences. As such, the international rice market is highly segmented and preferences are highly heterogeneous, not only across countries, but also within countries. For example, fragrant rice is considered high-quality rice in traditional rice-exporting countries such as India and Thailand. By contrast, fragrant rice is considered contaminated and spoiled in the Western countries (Kaorsa-ard, 1992).

The preference of a customer is perceived as a motivation expressed by affective compatibility towards a product. In the processed foods industry, consumer preferences are driven by features related to the material substance of the good; shape, package, taste, consistency, colour or brand. Similarly, rice grain may be of high- or low-quality type, based on the size and shape of the rice grain and variety. As consumer preference related to rice grain quality is highly heterogeneous, there is no unique way to evaluate rice grain quality. Rice grain quality can be an inbuilt part of the grain. However, grain quality can also be superficial and thus can be manipulated by labelling, packaging, and milling. Importantly, the visual appearance of rice grain, such as shape and size, is an important attribute of grain quality that largely affects both the consumers’ decisions to purchase and the price of rice (Bhonsle, 2010).
2.1 Consumer Theory

Consumer theory is the study of how buyers decide to spend their money, given their preferences and budget constraints. Consumers normally implement preferences when they go for comparing different alternatives and choices. According to (Azabagaoglu, 2017), the rice purchasing behaviour of the consumers can be classified and grouped under; reasons for the selection of the kinds of rice, package preferences, location of purchase, packaging and frequency of purchasing rice. The study found that the most important factor for families to prefer Baldo was its palatability which was seconded by the variety’s size (big grains). The US Calrose variety was preferred instead of Baldo for another group of consumers, the participants mentioned its cleanliness, in addition to its flavour and its suitable price. Ordinary rice was preferred because of its low price which functioned as a sales strategy. Consumers that are sensitive to price prefer this product because it is similar to Baldo rice. Other reasons for identifying the product with Baldo were that the rice is easy-to-cook, palatable and has a good flavour.

2.2 Approaches to Measure Consumer Preferences

Consumer behaviour theories are intended to address the concepts of consumer preference, utility maximization and demand functions. It is generally agreed that individual choices are influenced by habit, experience, advertising, peer pressure, accumulated opinion, household and family constraints (Louviere, 1983). The consumer theory also proposes that consumers make choices based on preferences for attributes of goods.

Although a hardly comprehensible concept, it has been demonstrated that the consumers’ preference can be measured effectively. It is imperative for producers and processors to understand the concept of preferences because it represents a basis for pretesting models of the new product developments, which in turn determines the functional relationships between the buyer’s opinion concerning a product and purchase behaviour.

2.2.1 Willingness to Pay Approach

Willingness to Pay (WTP) is a term for the highest price a consumer will pay for one unit of a good or service. Traders can appropriately price different varieties of rice depending on how successful they read the demand on the market. In order to acquire this insight, rice traders can utilise from strategies that indicate consumers’ WTP though direct and indirect approach. The direct approach of determining WTP involves questioning consumers directly to ask what they would be willing to pay for a certain product. On the other hand, an indirect approach to measure WTP provides consumers with choices; consumers are provided with a set of options and have them choose which option they are most willing to pay for.

A recent study by International Rice Research Institute (IRRI) found that Vietnamese consumers are more likely to pay a premium for sustainably produced rice. The study assessed tested urban Vietnamese consumers’ response to sustainable production labels in rice. Through behavioural market experiments, they assessed consumers’ Willingness To Pay for rice produced and labelled under the national sustainable production standard. They found that consumers were willing to pay price premiums of 9% for certified sustainably produced rice on top of the price of regular rice. These premiums even further increased up to 33% when they were informed about what the label on sustainably-produced products mean and where exactly the rice was produced.

2.2.2 Choice Modelling

Choice modelling is a multi-attribute approach, in which respondents are asked to choose between more than two alternatives, where each alternative is described by multiple attributes. Choice modelling attempts to model
the decision process of an individual through revealed preferences or stated preferences made in a particular context. Revealed preference methods obtains preferences information from the consumers’ past behaviour and they reflect real choices observed in the market (Nandagirib, 2015). On the other hand, stated preference method is a group of techniques which uses individual respondents’ statements about their preferences. Hypothetical questions are used to ask respondents to indicate how much they are willing to pay for a specific good.

### 2.2.3 Choice Experiment

In this method, consumers are presented with different attributes and they choose the most preferred ones and then show their willingness to pay for those attributes. This modification is what lends the choice experiment to be the appropriate analytical method. Choice experiment has advantages over Contingent Valuation Method (CVM) in that it helps evaluation of multiple attributes; provides more information than CV Min that respondents can express their preferences for a valued good over a set of many other alternatives. In choice experiment, a status quo option is included in each choice set in order to allow flexibility to consumers when making their choices (Hanley et al., 2001).

Choice experiment is flexible in that it gives many options to respondents; and it frames questions in a way closely similar to a true purchase situation which will lead to the valuation of attributes as well as situational changes. According to Hanley et al., (2001), choice experiment helps respondents to make a clear choice between alternatives and provide more information. Additionally, choice experiment allows the researcher to estimate the extent to which individuals are prepared to trade-off attributes. This enables the estimation of implicit prices for attributes, which allows measurement of consumer welfare associated with changes/improvements in various packages of different products/services. This will be followed by open ended questions where respondents will be asked to make possible recommendations.

### 2.2.4 Analytic Hierarchy Process (AHP)

Analytic Hierarchy Process (AHP) is one of the method employed in this study. AHP is a multi-criteria decision making method that was developed by Professor Thomas. The method is derived from ratio scales of paired comparison for selected variables. In the study the input was obtained from actual measurement such as feelings and preference of rice varieties including other attributes like price and taste among others. Due to measurement methodology, AHP allows some small inconsistency in judgement because humans are not always consistent. Furthermore, the ratio scales are derived from the principle Eigen vectors and the consistency index is derived from the principle Eigen value.

### 3.0 METHODOLOGY

Data was obtained from interview-based questionnaires that were conducted across major districts in Malawi (Mzuzu, Lilongwe, Blantyre and Zomba). These four cities were selected to represent the best-case scenarios of the North, Central and Southern regions of Malawi respectively. The data was analyzed to identify, describe and explore the relationship between the consumer awareness/knowledge about rice varieties and the influence it has on consumption frequencies. The study was also designed to determine how the prescribed criteria for selecting rice affect consumer choices on the market.

### 3.1 Data Collection and Sample Size

The structured questionnaire was designed comprised of five sections. The main purpose of the first section was
to record background and demographic characteristics of the respondents including gender, age, education and their source of income was recorded. The following sections investigated consumption frequencies, consumer awareness for rice varieties, selection criteria for rice and the willingness to pay for rice products.

Data was collected in Lilongwe, Mzuzu, Zomba and Blantyre Market places. Specifically, Mchesi, Zigwagwa, Malosa, Songani, Zomba freea Market and Limbe in Blantyre. A total of 890 consumers were targeted using proportion allocation across purposively selected district. Simple random stratified sampling was used to identify sampling units for this study. Simple random sampling was used to allow application of statistical analysis.

3.2 Data Analysis

Data entry and management was done using Microsoft Excel 2013. Data analysis was conducted in a number of statistical packages including; Microsoft Excel, SPSS (Version 20) and Stata 13. Data analysis was conducted in three level to address objective of the study. This included, univariate analysis that included; summary statistics of respondents and other variables of interest. Bivariate analysis was conducted including cross tabulation and other statistical test like Chi-Square. In general, the study used both parametric and non-parametric test. Non-parametric test included calculation of consumer willingness to pay.

3.2.1 Analytic Hierarchy Approach

A pairwise approach was used to capture preference of consumers for four main varieties of rice mainly. These varieties include; Kilombero, Pussa, Faya and TC10. Scale of 1 to 9 was developed where consumers were selecting with each variety either on the left or right of the scale as shown by figure 1 below. Based on the input of consumers, comparison matrix was developed where all choice on the right hand side were reciprocated to make reciprocal matrix. This was followed by calculation of Eigen value and Eigen vector for the matrix. This was further developed into normalised principle Eigen vector which is also called Priority Vector.

Figure 1: Analytic Hierarchy Approach Assessment Tool for consumer preference

Source: Consumer Preference Survey
4.0 RESULTS AND DISCUSSION

4.1 Demographics Characteristics

The first section of this analysis focuses on demographic characteristics of consumers. The major demographic characteristics include in analysis are; gender, education background and income levels of consumers. This was intended to describe demographic variables of the sample and further understand its influence towards research objectives and findings at later stage within discussion.

4.1.1 Gender

It is easy to speculate effect between consumer preference and gender of consumers. Consumers were categorised as males or female. 52% of consumers were males while 48% were females as shown by figure 1 below.

Figure 2: Gender of consumers

Source: Consumer Preference Survey

Decision making breakdown may vary based on gender, as such the study included gender. In Malawi males and females always have difference in decision making which is attributed to range of factors including culture. This is against growing campaigns globally to see men and women equal. Equality between sexes is taken as an important advancement in human development. As shown in figure 1, the study covered a more males than females with a difference of 4%. This is against background that Malawi population is segregated by 51% and 49% males and females respectively (NSO). This equal presentation of males and females will positively affect results of this study as both males and females have almost equal presentation.

4.1.2 Education

Education is one of the important characteristics that might affect the person’s attitudes and the way of looking and understanding any particular social phenomena. In a way, the response of an individual is likely to be determined by his educational status and therefore it was imperative to investigate the educational background of consumers. Consumer educational level was categorised from tertiary, secondary, primary and those with no education. 42% of consumers had secondary school education level as shown in figure 3. The study further considered those with at least secondary education level as literate (57%) while the least were illiterate (43%).
The above mentioned figures validate reported Gross Attendance Ratio (GAR) of 127% at the primary school level and 37% at the secondary school level as reported by Malawi Government. This shows that number of people outside official schools age population for that level are attending primary school, and not all those who should be are attending secondary school. Furthermore, Gender Parity Index is 1.01 at the primary school level and 1.03 at the secondary school level. This indicates that there is relatively little difference in overall school attendance by school-age girls and boys at either the primary or secondary school level. Conversely, the Gender Parity Index for the Gross Attendance Ratio (GAR) is less than 1, which indicates that male children outside of the official school age population are more likely to attend school than their female counterparts; the GPIs for the Gross Attendance Ratio are 0.93 at the primary school level and 0.84 at the secondary school level.

4.1.3 Consumer Income sources

Consumer source of income was categorized into seven area ranging from business to remittance. As shown by figure 4 below, the majority of consumers (69%) used business as a main source of income while 2% of the consumers contacted used remittance as a main source of income.
In general consumers’ income plays an important role in shaping the economic conditions of an individual which in turn is likely to have bearing on the responses about a problem posed to him (Henseleit, Kubitzki, & Teuber, 2007). Sampled consumers were deliberately skewed towards business people as they had dual responsibility as consumer and traders. These rice traders were deliberate targeted on the assumption they have vast knowledge and understanding about rice varieties in Malawi. Furthermore, cross tabulation of source of income and education level showed 82% of consumers with tertiary education had salary as their main source of income. This imply that some of consumers were just visiting market places to buy rice. On the other hand, 2.3% of consumers were farmers. In this study, farmers were assumed to have limited knowledge on some varieties as compared to traders especially in the market places. Furthermore, the study included those people who are employed within market places, surviving through causal labour.

4.1.4 Consumer Awareness Levels of Rice

One of the objectives of this study was to analyse the effectiveness of promotion and commercialisation of rice in Malawi. This section of aimed at examining consumers’ awareness for rice varieties. The section also assessed how often consumers eat rice. The study found that Kilombero is the most popular rice variety available on the Malawian market with about 98.9% of the consumers expressing their knowledge about it. Out of enumerator’s judgment, 85% of the respondents had knowledge about the local rice varieties, and demonstrated their capability to distinguish different rice varieties. Figure 5 illustrates the collective levels of awareness for each of the main rice varieties on the market.

Figure 5: Consumer awareness level of rice varieties

![Consumer Awareness Levels of Rice](image)

Source: Consumer Preference Survey

Furthermore, results obtained under selection criteria for rice show that awareness for brown rice is low. This criterion had the lowest response rate summing up to 10%. It was observed that the sole reason for consuming brown rice was due to its nutritional benefits. nutritional benefits. Only 17% of the total respondents find brown rice acceptable, and preferable.

On the aspect of price, affordability of rice is of great importance, especially in underdeveloped countries where
Income levels are relatively low. Consumers may want to buy products that meet their standard, but patronising quality may be sacrificed for affordability. Over 56% of consumers are concerned with the price of rice before making a purchase, hence they tend to buy low-quality rice. The rest of the population strongly disregard price because cheaper rice often associated with compromised quality.

### 4.1.5 Rice Selection Preference

Rice grain quality may be defined on the basis of its physical properties or its ability to meet specific requirements of the consumers. The concept of consumer preference for rice can be inspired by attributes related to the material substance of the grains, with respect to appearance, aroma, cleanliness, palatability, colour, rate of breakage and shape. The study investigated the general motives behind the selected preferences for rice through the solicited criteria. Not all consumers filled in for all elements due to the issue associated with uncertainty. For example, for a consumer who has never seen/consumed brown rice were treated as a missing value in the date set. The same applied to other elements such as ease cooking to men who do not cook. Figure 6 is an illustration of the overview for consumer preferences pertaining to the rice selection criteria for rice, where aroma and cleanliness were most preferred with 98.33% and 98.63% respectively.

**Figure 6: Consumer rice selection preference.**

Source: Consumer Preference Survey

The study found that the aroma, taste, ease cooking and cleanliness (absence of foreign matter) have the strongest influence over rice selection on the market. Over 98% of the consumers strongly safeguard their rice purchase and ensure that it is aromatic; and 95% indicated that rice has to be clean because it saves time when
Preparing (sing foreign matter). The majority of consumers prefer tasty rice, and which is attractive in appearance with its colour. Consumers prefer rice with low breakage because it is easier to cook and reduces cohesion after cooking (stickiness). It was evident that the popularity of long grain rice was due to their relatively higher swelling power and ease to cook. A significant number of consumers (38%) however disregarded the shape of grain attribute.

4.1.6 Consumer Preferences

Consumers were asked to identify rice varieties that they prefer the most, and prompted them further to justify their answers. The study found that Kilombero rice is dominantly preferred by consumers across the targeted districts with 79% of the consumers indicating it as the best variety (see figure 7). This variety is widely acclaimed for its optimal aroma, followed by a wide range of factors relating to its palatability. These includes good taste, easy cooking, grain size, whiteness and low cohesion after cooking. The study found out that Faya is the second mostly preferred rice variety on the market with a 14% rate of respondents who indicated it as their favourite rice variety. Faya too is recognised for its moderate aroma rather than optimal aroma. The remaining 7% was shared amidst other rice varieties like TC10, Pussa and Amanda.

Figure 7: Consumer stated preference of rice

![Preference Chart](image)

*Source: Consumer Preference Survey*

Though Kilombero was highly preferred, the preference for majority of the consumers was not exclusive of other rice varieties on the market. Inclusively, the respondents endorsed rice varieties such as Faya and Pussa as a good alternative when Kilombero was available. The stated that elements of good taste and aroma can also be found in the other varieties. In summary, Kilombero and Faya can be categorised as excellent preferred varieties, whilst Pussa and TC10 were regarded good varieties respectively. Varieties such as Amanda, kidney, tambala and others can be deemed as acceptable in the perspective of the consumers.

4.1.7 Consumer Willingness to Pay

The study found a substantial relationship between the income level of a consumer and their buying behaviour on the market. The law of demand states that the demand curve can shift due to changes in customer’s income; rising or falling employment rates in a country can affect the demand curve. The demand for a normal commodity rises and drops when income of the customer increases and dwindles respectively.

This is so because consumers spend more money when they have higher incomes. The current study found that consumers with an income higher than K200,000.00 per month were more willing to pay highly for rice bread even if its price was higher than that of an ordinary wheat bread. High quality rice was found to attract relatively high prices on the market, hence, consumers believe that cheap rice offers a ridiculously low quality. Consumers with low income levels (below K50,000) are price sensitive, and tend to buy low quality rice anyway due to their
economic status. On the other hand, consumers with high income levels tend to disregard the price as a criterion for selecting rice. According to the study, over 56% of consumers with mid or high-level income levels (above K100,000) buy rice that meets their standards regardless of the price.

4.1.8 Preference Using Analytic Hierarchy Process

Results from the normalized principal Eigen vector which is also called Priority Vector showed that relative weights among the four rice varieties that were compared. Kilombero is 68%, Faya is 32%, Puss is 14% and TC10 is 11%. This means that Kilombero is the most preferred variety among the consumers followed by Faya, while Pussa and TC10 were least preferred among consumers. Consumers like Kilombero two-times more than Faya. Similarly, consumers like Kilombero five times more than Pussa while they like Kilombero six times more than TC10. The study further measured consistency of consumer preference using consistent ratio which is ratio of consistent ratio to random consistent index. If the value of consistency ratio is smaller or equal to 10%, the inconsistency is acceptable while if consistency ratio is greater than 10% there is need to revise consumer preference. The consumer preference consistency ratio of 7.9%, which indicate consistency in consumer preference choice or decision in this study.

4.1.9 Factors affecting Consumer Rice Preference

Consumers are faced with trade-offs in their purchasing decisions, choosing one variety from another means the consumer has to forego desirable characteristics of the alternative. The rice market is highly segmented, which explains a wide range of different preferences from one region to another. Consumers were asked to express their opinions for each of the popular rice varieties on the market – this enriched the study with information that helped to identify the all preferred varieties, acceptable varieties and unpleasant varieties.

4.1.9.1 Rice Quality and Price

Though aromatic or high-quality rice varieties are highly preferred, price sensitive consumers tend to buy unpreferred rice varieties. This is so because high-quality rice varieties are often associated with high market prices. Nevertheless, the average consumers on the market highly disregard price as a criterion to select price – as stated by many, cheap rice has no aroma, no taste, unclean and broken. On the other hand, high-quality rice offers a reasonably higher price which is suitable for its quality.

4.1.9.2 Local, Hybrid and Imported Varieties

Factors such as palatability and nutritional quality may be less important on the market because oftentimes consumer’s discriminations of rice may be based on entirely different areas of interest such as market availability and household satiety (swelling power). The results obtained on preference show a very high preference for local rice varieties. This finding is particularly important because local rice varieties are readily available and are an efficient alternative on the market. About 80% of the total consumers indicated that they prefer local varieties over hybrid and imported varieties. The sole reason behind this preference was based on its effect towards appetite through aroma and taste – many specified that hybrid and imported rice varieties are non-aromatic and tasteless contrary to its good appearance. Further, consumers stated that grain quality can also be superficial and thus can be manipulated by labeling, packaging and milling. Only 8% backed up hybrid/imported varieties as preferable due to their outstanding quality in appearance and hard texture (parboiled rice) which does not stick together after cooking.
4.1.9.3 Full and Broken Rice

The visual appearance of rice grain, such as the shape and size, is an important attribute for grain quality that largely affects consumers’ decision to purchase rice. It has also been revealed from the study that consumers prefer full grain rice than broken grain. This is due to the fact that full grain rice is easy to cook and has better rising capacity and does not stick together after cooking. Approximately, 98% of the entire of the sampled units find full grain rice more appropriate for meals. Although, a significant number of respondents indicated that broken rice is often targeted by household that intend to cook porridge as breakfast.

4.1.10 Rice Products

Products from rice grain and rice flour include parboiled rice. Parboiled is easy and quick cooking rice and ready to eat convenient food. Other products were; rice flour, rice starch, cakes and puddings, baked bread and crackers, breakfast cereals, puffed rice snacks, noodles, paper and pasta, baby or weaning food, fermented foods and beverages, pet food and bran products. In Malawi they are few initiatives and attempts to value addition for rice. Traditionally, rice products are on small scale which are also poorly packaged. Smallholder farmers are only involved in primary value addition activities like packaging which has limited potential to create jobs. Improvement of value addition initiatives under rice subsector have the potential to create jobs in rural areas. There is, therefore, need to select value added products based on marketability and profitability.

5.0 CONCLUSION AND RECOMMENDATIONS

5.1 Conclusion

5.1.1 Production of rice in Malawi

Production of rice is likely to increase due to improved yield through new technologies such as Systems of Rice Intensification (SRI) and improved varieties. With this expected increase in production, prices are likely to nose drive. Increased production of rice will induce demand of rice from other non-food products like animal feed. This demand from other non-food products present opportunity for rice farmer to explore viability of such enterprises.
In Malawi, rice continues to be the second main cereal from maize which accounts for over 60% of cultivated land. Like any other cereal crop in Sub Saharan Africa (SSS), rice is largely produced by small to medium subsistence farmers scattered along the lakeshores and Shire Valley areas. In 2017, production of rice registered a 15.2 million tons which is 8.1% increase from 2016 which has decreased with 7.2% in 2018 production cycle. This is attributed to persistent drought and floods due to El-nino in 2017/18 growing season.

5.1.2 Rice Varieties in Malawi

They are many rice varieties which are grown in Malawi; Kilombero, Faya, Pussa, TC10 and Other varieties like Amanda. These varieties are either romantic of aromatic with varying grain size and colour to much preference of consumers. For example, Malawi Kilombero rice is superior and highly versatile rice which is preferred for making rice dishes such as risotto and rice pudding.

Due to diversity of rice in terms of colour, taste and other rice attributes there is varied consumer preference for rice. This study employed key methods to assess consumer preference of rice and rice products in Malawi. Specifically, consumer Willingness to Pay and Analytic Hierarchy Approach were used to measure preference with primary data collected across Malawi.

5.1.3 Consumer awareness of rice

In general, consumer awareness of rice and rice product varies. Consumer are aware of some varieties as compared to other varieties. Kilombero is the most popular rice variety with awareness level of 99%. It was seconded by Faya which was rated at 77%. Based on rice variety attributed the most popular varieties were Kilombero and Faya which are aromatic varieties. The gap between these two varieties and other rice varieties was significant. Further examination showed that other varieties like TC10 were new in rice sub sector, hence need for deliberate initiatives to raise awareness levels of such varieties. Knowledge towards rice varieties is fundamental to induce demand and market for rice varieties. Low levels of rice varieties; TC10 and Pussa is likely to affect their consumption which also has market implications given the significant relationship between consumer awareness level and consumption patterns. Consumers are more likely to purchase and consume a product with high awareness levels and other product information.

5.1.4 Rice Selection Preference

Selection of rice variety attributes varies among the consumers keeping other factors constant. Attributes of rice ranging from aroma, taste, easy cooking, colour, grain size and price were considered. Among the list consumer considered aroma, easy cooking and colour as one of the key parameters for rice selection. Consumer considered white rice most preferred as compared to brown rice. Similarly, easy cooking of rice is one of the key parameter. This attribute present opportunity for parboiled rice in Malawi. Further investigation for consumer to identify the easy cooking varieties indicated that consumers were not able to differentiate and identify variety which is easily cooked. This presented a revealed preference among consumers. Production of rice varieties or rice products that reduce time for cooking can easy can induce market demand in Malawi.

5.1.5 Rice products

The rice sub sector like other value chains in Malawi is stuck at production with limited attempts to shift into secondary value addition. Traditionally, smallholders are involved in primary value addition attempts such as packaging and grading. Most of times, these value addition attempts are characterized by poor quality which cannot even compete both regional and global market. Within the value chain approach, the industry need to move
secondary value addition and into production of high value products like baked bread and crackers, breakfast cereals, puffed rice snacks, noodles, paper and pasta, baby or weaning food, fermented foods and beverages, pet food and bran products. These products have the potential to create jobs as compared to low value added products.

5.2 Policy Recommendations

- Looking a growing global trends in rice production and volatility of prices, Smallholder framers are supposed to shift interest in rice value addition of high levels. Furthermore, the sector need to shift into industrialisation level by opening up production of non-food products from rice like animal feed and other industrial raw materials and finished products.

- Rice subsector has potential to significantly contribute toward national GDP. There is need for serious attempts to scale up value addition of rice products. The concentration should be on high value products not only packaging among others. The high value products will meaningful contribute to job creation. These products include; baked bread and crackers, breakfast cereals, puffed rice snacks, noodles, paper and pasta, baby or weaning food and other fermented foods and beverages. Therefore, there is need for further study to establish feasibility of rice subsector to move into such value addition.

- There is need for deliberate efforts to raise awareness of varieties like Pussa and TC10 to improve public consumption and induce market demand. With low levels of these rice products and existence of relationship between consumption and awareness, there is need to create deliberate action to sensitize the population of existence of other rice varieties in Malawi.

- There is need for capacity building of farmers and other relevant stakeholders in parboiled rice. One of the opportunity with available demand from consumers is parboiled rice as consumers consider time take to prepare rice as one of the key parameters for selection rice variety.
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Published by:
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December 2017
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