Factors Affecting Consumers' Purchasing Decision of Popular Rice Brands in Dhaka City

SURIYA JAMAN

DEPARTMENT OF AGRIBUSINESS AND MARKETING

SHER-E-BANGLA AGRICULTURAL UNIVERSITY

DHAKA-1207

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BY

SURIYA JAMAN

REGISTRATION NO: 16-07474
Email: suriyajaman2236@gmail.com
Mobile No: 01533360049

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Approved by:

.....	.....
Dr. Md. Rashidul Hasan	**Dr. Mohammad Ariful Islam**
Professor	**Principal Scientific Officer**
Department of Agribusiness and Marketing	Agricultural Economics Division
Sher-e-Bangla Agricultural University	Bangladesh Rice Research Institute (BRRI)
Dhaka-1207	Gajipur-1701
Supervisor	**Co-Supervisor**

.....

Dr. Sharmin Afrin
Chairman & Associate Professor
Examination Committee
Department of Agribusiness and Marketing
Sher-e-Bangla Agricultural University
Dhaka-1207

DEPARTMENT OF AGRIBUSINESS AND MARKETING
Sher-e-Bangla Agricultural University
Sher-e-Bangla Nagar,
Dhaka-1207

CERTIFICATE

This is to certify that the thesis entitled "**Factors Affecting Consumers' Purchasing Decision of Popular Rice Brands in Dhaka City**" submitted to the **Department of Agribusiness and Marketing**, Faculty of Agribusiness Management, Sher-e-Bangla Agricultural University, Dhaka in the partial fulfillment of the requirements for the degree of **Master of Science (MS) in Agribusiness and Marketing**, embodies the result of a piece of bona fide research work carried out by **SURIYA JAMAN**, Registration Number: **16-07474** under my supervision and guidance. No part of the thesis has been submitted for any other degree or diploma.

I further certify that any help or source of information received during the course of this investigation has duly been acknowledged.

.....

Dated: October 2024
Dhaka, Bangladesh

Dr. Md. Rashidul Hasan
Professor
Department of Agribusiness & Marketing
Sher-e-Bangla Agricultural University
Dhaka-1207
Supervisor

DEDICATION

I humbly dedicate this dissertation to my beloved parents for their endless love and support

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All admirations are due to “Almighty the merciful Allah” whose blessing have enabled me to complete the study successfully. Guidance, help and co-operation have been received from several persons during the tenure of the study; the author is immensely grateful to all of them.

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SAU, Dhaka The Author

Factors Affecting Consumers' Purchasing Decision of Popular Rice Brands in Dhaka City.

Abstract

The focus of this study is to investigate consumers' evaluation of rice attributes in different markets of Dhaka city. The study empirically examines the relationship between the retail price of rice and its attributes in the Dhaka city markets, using the hedonic pricing model. In this study, data were collected from retailers' shop in Agargaon, Taltola, Shewrapara, Kajipara, Mirpur 10, Mirpur 11, Mirpur-1, Mirpur-2, Mirpur-6, and Mirpur DOHS in Dhaka city in 2023. A total of 200 customers were chosen by using simple random sampling technique from different retail markets. The results illustrate that consumers pay a premium price for observable attributes, such as white rice, aroma, glutinous rice, medium bold grain, medium slander grain and slander grain. However, poverty level in selected consumers in the Dhaka city is 5.0% in terms of head count ratio (HCR) which is much lower than national level poverty (18.0%). Taking into consideration the above mentioned arguments, the study suggests that the government should support rice breeders to release new rice varieties with more aroma and attractive size and shapes of rice.

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LIST OF ABBREVIATIONS

BBS	Bangladesh Bureau of Statistics
BRRI	Bangladesh Rice Research Institute
et al.	et alia (and others)
etc.	et cetera
HCR	Head Count Ratio
PGI	Poverty gap index
RP	Revealed preference
SP	Stated preference
SPI	Square poverty gap index
Tk.	Bangladeshi Taka
WTP	Willingness to pay

Chapter One
INTRODUCTION

CHAPTER 1

Introduction

1.1 Background of the Study

Rice is an essential food that nourishes billions of people all over the entire globe. Rice is a kind of cereal food that has delivered the ultimate benefits to humanity as a staple diet since the dawn of agriculture in human history. Cereals are high in carbs, providing plenty of energy, lipids, vitamins, and other necessary components. (Monda *et al*., 2022). Rice, a source of energy for humans, is one of the most encouraging meals in this respect. Also, as most of the world's rice is grown and eaten in Asia, the region plays a significant role in the rice sector.

The world's largest producer and consumer of rice is China. It's critical to estimate paddy rice plantation area and rice cultivation accurately in order to feed China's growing population. However, over the past three decades, Xin *et al*., (2020) explained that Southern China has experienced significant losses in the areas where paddy rice has historically been grown. The paddy rice land area in Northeast China has grown by 3.68 million hectares between 2000 and 2017, greater than the combined paddy rice area of North Korea, South Korea, and Japan, according to annual maps created from satellite pictures.

Rathna *et al*., (2019) investigated that China is the top producer of rice, followed by India. Currently, only a small number of the approximately 40,000 known types of rice are widely grown, ground, and polished. Although most people in the world only eat white rice, various specialty rice varieties are also produced. These consist of the fragrant and colorful rice types.

Moreover, Pakistan is the world's tenth-largest producer of rice, with Asian nations—such as Thailand and India—dominating the global rice production market (World atlas, 2018).

The Asian country of Laos is landlocked in the middle of the Indochina peninsula. This country, which covers 236,800 km^2 (80% of which is hilly), is home to about 29 people per

square kilometer (Antriyandarti *et al*., 2023). Among the 6.8 million individuals who called this place home in 2014, 63% called the countryside home. Rice, a mainstay in the Laotian cuisine, is also one of the country's most important agricultural products. Nearly three-quarters of a daily portion, or 491 grams, of rice provides most of the calories the typical Laotian consumes. In addition, rice production takes up most arable areas, and the agricultural sector employs more people than any other. Laos's economy has grown alarmingly in only forty years, catapulting it from the lowest-income category to the lower-middle-income one. A lot has changed in the rice sector over this period. As a result, there has been a dramatic increase in both the planted area and the rice output. So, officially, the nation no longer needs any outside rice imports.

This predicament hinders the government's efforts to alleviate poverty and provide food security. To address its rice excess and deficit, Laos must consider strategies to mitigate the danger of inequality. Two methods exist for you to do this. One alternative in areas where rice is scarce is to construct roads

The worldwide food insecurity crisis of 2021 caused a decrease in total output, which affected many areas due to increased rice production in Central Java Province. 2022 Central Java Province produced 5.51 million tons more rice than East Java Province.

1.2 Present Agriculture Status of Bangladesh

Bangladesh's agricultural economy depends significantly on rice. Paddy production is projected to take up over three-quarters of total cultivated land in Bangladesh, and per capita meal consumption of rice is among the highest in the world. Bangladesh relies heavily on agriculture to drive rapid economic development. To ensure long-term food security, it's necessary to have a profitable, financially viable, and environmentally friendly agricultural sector. Bangladesh aims to achieve food self-sufficiency by focusing on its agriculture industry. The government aims to expand the agricultural industry in accordance with the National Agricultural Policy and 8th Five Year Plan objectives. In recent years, there has been an increase in food consumption.

Abundant crops have been grown in this nation due to very fertile terrain and suitable environment. The agricultural sector contributes around 11.38% to the country's cross-

border output in FY 2022-23, and approximately 45.4% of the population who are employed in the country engages in farm activities according to quarterly report on crop statistics and Agriculture labor wage July-September, 2023 (BBS, 2024). Furthermore, agriculture is the foundation of a diverse variety of consumer-demanded agricultural commodities markets, particularly in rural regions.

Table 1.1 Production, area of rice in Bangladesh

Year	Area (Acres)	Production (M tons)
2017-18	28699	36278
2018-19	28456	36391
2019-20	28213	36604
2020-21	28913	37608
2021-22	28892	38143

Source: Agriculture Wing, BBS 2023

Rice is one of the most commonly eaten staple food in Bangladesh. As a result, the country's population grows by 2.3 million per year, increasing the need for rice. Rice accounts for over 70% of individual calorie intake, particularly among hard workers. The rice sector, which covers around 11.53 million hectares, accounts for the great bulk of rural employment. (BBS, 2023). The area of rice, in general, Aman, Aus and Boro, varies in particular, for different years were shown in Figure 1.1.

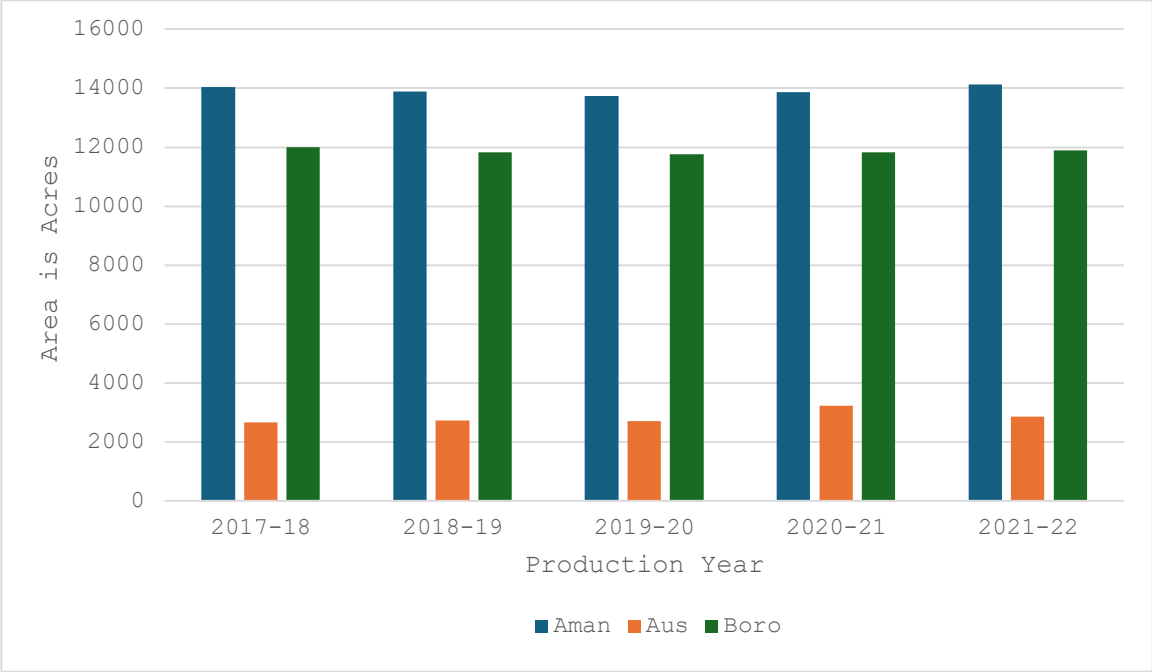

Figure 1.1 Area (acres) under rice cultivation

The annual average wholesale market price of rice is specified by several rice specifications such as the quality of fine, coarse, or medium rice, as indicated in table 1.2 below. (BBS,2022)

Table 1.2. Annual Average Wholesale Price of Rice in Bangladesh (Unit= Tk/quintal)

Specification	2017-18	2018-19	2019-20	2020-21	2021-22
Fine	5812	6489	6874.51	6221.44	6563.89
Coarse	5022	5388.95	5755.90	5172.65	5517.36
Medium	4320	4570.45	4788.07	4406.19	4981.25

Source: National Accounting Wing, BBS 2022

It is feasible to quantitatively alter qualitative attributes like attitude, perception, and opinion for the reasons mentioned before.

The supply and demand balance is calculated by taking into account domestic production, rice imports and exports, and per capita consumption throughout time periods. Figure 1.2 depicts the five-year average per capita rice availability and requirement. Between 2011-2015 and 2016-20, a significant surplus of rice per capita was achieved. (Alam, J., et al.,2020).

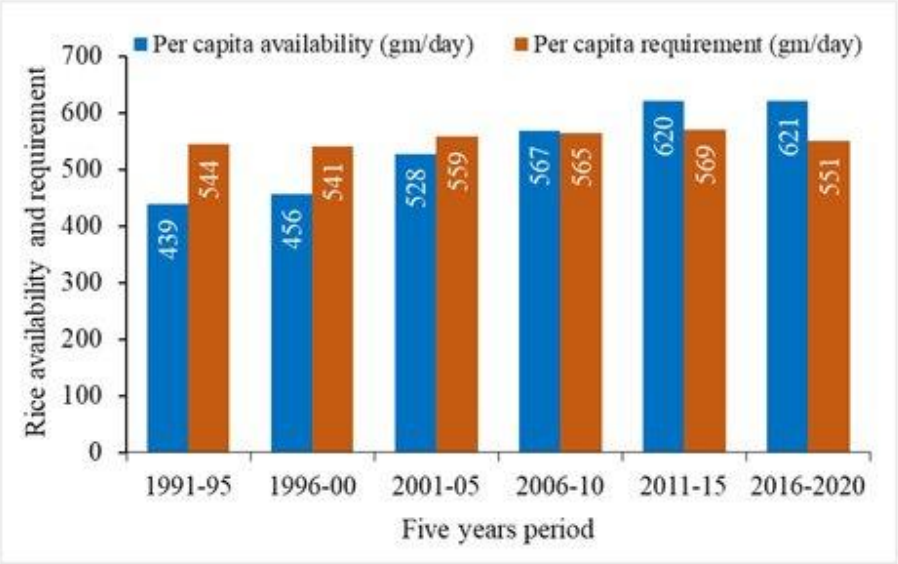

Figure 1.1: Rice demand and supply per capita over five years.

1.3 Justification of the Study

We calculate consumers' willingness to pay (WTP) for rice qualities using two methods: revealed preference (RP) and stated preference (SP). The SP approach is further divided into two categories: contingent valuation and choice modeling techniques, which include discrete choice experiments (DCE). The RP technique is divided into three categories: trip costs, random utility, and hedonic pricing. Each strategy has a distinct benefit and drawback. In contrast to this research, the hedonic pricing model is applied to investigate customer preferences. There are two main reasons to use this model. This model is appropriate for the rice situation in Bangladesh, since it is a stable product with a large market and price set by supply and demand.

Second, the hedonic pricing model is the most suitable, given the constraints of a period of time spending plan, machinery, and respondents.

Consumer theory has been used to study the WTP of agricultural commodities, including rice. Dalton (2004) studied upland rice varieties in West Africa, Souphinh (2010) investigated the WTP for 3 kg of glutinous organically grown rice in Laos, Naseem et al. (2013) studied customer tastes for rice qualities in West African food markets, Sakurai et al. (2015) studied the Malagasy rice customers, and Bunyasiri and Sirisupluxana (2017) studied the Thai HomMali rice sector in China as well.

Furthermore, several research has compared the higher yields of domestic highland rice cultivars in West Africa. Dalton (2004) investigated the WTP for novel upland rice varieties and discovered that the production rate was not a significant factor in the WTP. Significant influences were post-harvest and non-yield cultivation parameters, such as height of plants and cycle duration. Given the enhancement of standard of living, income, the welfare of local farmers, ecosystems, and organic rice production for exports in the future, Souphinh (2010) looked for to clarify the factors that determine of WTP for 3 kilograms of organic glutinous rice with locally based certifications (LBCs), and discovered that there was an optimistic significant value of the WTP for 3 kg of organic glutinous rice with LBC, and discovered that there was a favorable significant value for the WTP for 3 kg of organic glutinous rice with LBC; however, organic glutinous rice packed by a group of farmers or millers was neither significant nor impacted the responses. Naseem et al. (2013) explored consumer preferences for West African rice features and discovered that customers paid a premium on observation factors such as size of grain and rate of breaking. Furthermore, customers favored boiled and imported rice over regional and uncooked rice.

Sakurai *et al*. (2015) investigated how customers in Madagascar perceive unobservable rice quality in the absence of quality requirements and system of grading. Their premise was that customers and retailers used product locations and rice brands as visible indications of unobservable quality. The study found that both combinations of rice name and product origin had a significant impact on rice prices in Malagasy markets, even after managing for other variables like price variation and geographic features.

Improved understanding of the new market for Thai HomMali rice in Sichuan Province, China. Bunyasiri and Sirisupluxana (2017) investigated the factors influencing WTP both Chinese and Thai rice. They discovered that Chengdu customers mostly purchased rice

from convenience stores, contemporary trades, and supermarkets. Chinese customers prioritize color, broken rice, new season rice, rice standards, brand, softness, taste, and aroma when selecting rice attributes. Thai HomMali rice's WTP was mostly determined by its softness and flavor. Geographical market fragmentation can occur even with unsafe roads, inadequate data collection systems, and product mobility restrictions.

Existing research indicates that rice quality parameters including scent, chalkiness, thin or bold grain form, inert matter, and packaging impact pricing. Yet, this is the first study to apply the hedonic pricing model to investigate customer preferences for rice in Dhaka, Bangladesh.

This investigation aims to use hedonic pricing to assess consumer assessment of rice qualities in Dhaka City. The variable that is dependent in this technique is the market price for domestic rice. Explanatory factors include observable qualities such as rice variety attributes, socioeconomic factors, and economic factors.

This study's contribution is to directly help rice stakeholders in Bangladesh. Policymakers will be able to develop and implement policies that promote wider commercialization, notably of non-glutinous rice. This may shift a domestic rice breeder's focus to developing rice varieties that respond more to customer needs, rather than creating a breed of rice with the highest yield, so farmers can benefit more from planting higher value types. Improving commodity features in marketplaces can boost rice trade and value per kg. Additionally, the demand and WTP of domestic customers will be met. This may encourage academics to explore customer preferences for Bangladeshi rice.

This study will determine significant factors affecting consumers' buying of Popular rice brands. Consumers in Dhaka spend a considerable amount of money on rice. This study will find out consumers' tastes and preferences for rice. Customers in Bangladesh have a crucial role in driving the demand for different rice brands. Factors contributing to this trend include gender, age, family income, education level, household sizes, location, purchasing behavior, frequency of purchasing rice, characteristics of rice (like chalkiness, color, size of grains, cleanness, inert matter, aroma, glutinous, transparency, volume of expansion, packaging) and improved quality of rice brand. So, various branded companies adopted different policies for promoting their popular rice brands. Today's maximum

consumers seek polished and white rice brand to simplify their daily lives. This study examined customer attitudes towards popular rice brand in Dhaka, Bangladesh, using a questionnaire distributed in several neighborhoods.

The study findings will assist define factors associated with rice purchase behavior in Dhaka city.

1.4 Objective (s)

The following specific objectives were formulated for giving proper direction to the study:

- To know the socio-economic condition of the rice consumers.
- To identify the factors affecting consumers' buying popular rice brands in Dhaka city.
- To know the poverty level of selected consumers in Dhaka city.
- To know the opinion of consumer about health, brand and packaging, quality, taste, and preference of rice.

1.5 Limitations of the study

Collection of the consumer's data was the most difficult task during the survey. Most of the time consumers are reluctant to give appropriate information. Besides, they were busy and time specific during interview. Despite being aware of the effect of quality on price, the researcher was able to examine its impact because the intermediaries purchase rice based on their own criteria (this might be a problem in most of the agricultural markets in Bangladesh). There are some limitations of the study thus are indicated below.

a) Most of the data were collected through interview of the consumers and sometimes they did not well-cooperate with the interviewer.

b) The information was gathered mostly through the memories of the consumers.

c) Due to resource and time constraints, the research was based on small samples.

1.6 Layout of the Study

This thesis contains a total of five chapters which have been organized in the following sequence.

Chapter 1 includes introduction.

Chapter 2 is presented the review of literature.

Chapter 3 is discussed methodology of the relevant study.

Chapter 4 contains result and discussion consumers' purchasing decision.

Finally, Chapter 5 represents conclusion and policy recommendations to increase purchasing behavior of rice consumers.

Chapter two
LITERATURE REVIEW

CHAPTER 2
Review of Literature

2.1 Introduction

Several studies on consumer purchasing decisions have been conducted in various rice-growing countries across the world. A deeper understanding of brand awareness, purchase behavior, preference for a particular rice brand, popular rice brand choice determinants, and alternative purchasing has been analyzed. Because review of literature serves as a link between the past and today's research activity, an attempt has been made in this chapter to quickly examine the major works that are relevant to the current topic. All of these factors are taken into consideration. As a conclusion, it is ultimately the job of the researcher to choose the most significant predictors in a way that is objective.

As a result, an attempt has been made in this Chapter to review and document closely connected literatures. The relevant research has been evaluated and illustrated in the various parts listed below:

2.2 Literature Review

Gabul *et al.,* (2021) investigated at the socioeconomic features of rice buyers in Adamawa State, Nigeria. The study's population included all Adamawa State households. The study, yet employed a sample that measured 128 Household Heads (HHHs). According to the publication, consumers of rice in the area are younger, married, have a modest family size, are literate, and the majority belong to the business class and make a reasonable salary(State & Author, 2021). As a result, the study suggests that the consumption of rice is promising, as evidenced by consumer income and monthly rice spending.

Ab Samat *et al*., (2022) was also discovered that the price factor is the most influential in customers' rice choices, next to concern for health as well as perceived quality aspects, with packaging being the least influential. Furthermore, this study discovered that consumers are content with their rice option in the market, and marketers must increase their marketing approach in order to maintain customers loyal to their selections.

The hedonic price model was used to examine the implicit price of each characteristic for HomMali Rice in this study, which used a survey of customers of 412 sampling in

Chengdu. According to the findings, Chengdu customers prefer to buy rice from contemporary commerce, supermarkets, and convenience stores(Bunyasiri & Sirisupluxana, 2020).

Bairagi *et al.,* (2020) found in their study that women, educated consumers, large families, families that spend a smaller percentage of their food budget on rice, and Southeast Asian customers are the key drivers of the demand for rice aroma. (Science, 2021).

There are lots of varieties rice in the world. People has different taste and different choices to consume any types of rice(Saili *et al.*, 2022).

There is another study has clearly demonstrated how much rice is consumed and how much effect this has on the country's agricultural economics. Consumers today are brand sensitive, particularly in urban and semi-urban areas, and they place greater confidence and belief in packaged and branded rice than in loose rice. (Monda *et al.,* 2022).

Factors that are common include, but are not limited to, personal choices, cultural norms, economic conditions, and shop marketing strategies. In today's society, consumers' choices are heavily influenced by a myriad of socioeconomic and cultural aspects. There is a lot of focus on the pressures that come from many places, such family, social media, and other groups of people. A customer's awareness of a product or service may be influenced by several factors, including advertising, knowledge, attitude, product features, and social impact. Social effect is another facet of influence. Customers have a far better understanding of the product or service as a result of these variables' substantial contributions.

Purbaningsih *et al*., (2023) revealed that the rice purchasing decision process of consumers comprises of recognition of needs, informational searching, consideration of alternatives, buying choices, and evaluation after purchase. (Monda & Basu, 2023).

Model analysis indicates that BR11, BR22 and BRRI dhan32 were more preferable in T. Aman season; BR16, BRRI dhan28 and BRRI dhan29 in Boro season and BR9, BR16 and BR20 in Aus season among the producers and consumers(Charoenthaikij *et al.*, 2020). Although, BRRI variety contributes about 90% of total production, it does not reflect in field label because BRRI varieties are sold in different brand names(Demont *et al.*, 2020).

As for example, BRRI dhan28 sales as Nazirsail and BRRI dhan29 as Jhingasail and Miniket etc(Bunyasiri & Sirisupluxana, 2020).

Charoenthaikij *et al*., (2021) investigated in their study that consumer acceptance was strongly correlated with peak viscosity, and vice versa for the level of amylose, according to the preference mapping. Accessibility, eating habits, rice variety, preferences, rice quality, and health advantages, in that order, were the factors that most significantly influenced consumers' views toward rice intake and purchase intent.

Bhandari *et al* (2023) described that Likert scale is a form of a rating scale used for quantitatively measuring opinions, attitudes, or behaviors. It incorporates 4 or more questions that, when residents' response scores have been added together, measure a single attitude or traipsing attitude or trait. A survey using the Likert scale, an example presented to the CMS in the survey is to offer questions or statements that are of a Likert type and supply a continuum of items normally with ranging from 5 or 7 potential responses to understanding their degree of accord.

Rice is grown in almost every part of Bangladesh. Since most people in Bangladesh rely on rice for their daily nutrition, it has become the most famous meal in the country. You will not find a single household that does not utilize rice at some point in the cooking or eating process. The country's ideal climate and terrain make it ideal for growing rice.

2.3 Conclusion

Identifying fundamental variables influencing customer purchases of popular rice brands is critical in Bangladesh. Until date, appropriate research has not been conducted in this essential field. So, highly thorough and in-depth study efforts are urgently needed to provide information for customers to make decisions about purchasing rice.

Chapter Three
METHODOLOGY

CHAPTER 3
METHODOLOGY

3.1 Introduction

Each investigation must contain technique as a required and essential component. The correct strategy was taken in this study, which has a considerable influence on the reliability of the findings. A researcher needs to therefore make careful steps in order to conduct his study in a rational and scientific manner. It is critical for the researcher to understand the types of inquiry designs, techniques, and strategies that should be used when selecting subjects for study, employing sampling techniques, analyzing the data obtained and analyzing results in order to reach the proper conclusion. A chronological explanation of the methods utilized in this investigation is provided below.

3.2 Steps Followed During the Study

The survey methods of the research involve the following steps:

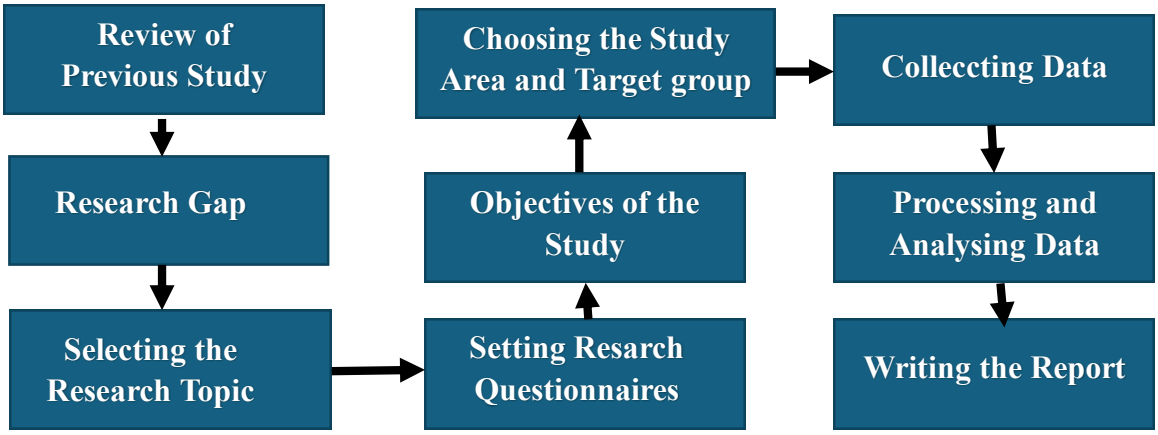

Figure 3.1. Flow Diagram of Research Methodology.

3.3 Selection of Study Area

Selection of field of study is a crucial factor in any research. The study regions should be chosen based on the primary focus of consumer attitudes and purchasing behavior, as well as the researcher's ease of access. As a result, the current study was conducted in Dhaka district, which was purposefully chosen due to the larger concentration of rice purchases, various sorts of variables, and the availability of logistical assistance for data collecting. Again, various parts of Dhaka city were chosen to collect primary data. The regions were namely Agargaon, Taltola, Shewrapara, Kajipara, Mirpur 10, Mirpur 11, Mirpur-1, Mirpur-2, Mirpur-6, and Mirpur DOHS.

Fig 3.2.: Study Areas.

3.4 Selection of sample and sampling techniques

Collected data from Dhaka residents, including students, service holders, and housewives, who consume numerous rice brands. In this investigation, a simple random sampling

procedure was utilized to choose the consumers. A basic random sampling procedure ensures that each response has an equal probability of being picked.

3.5 Sample size

The total number of responders were 200 consumers. Personal interviews were used to get information related to research objectives. Structures questionnaire was used to collect primary level data.

Table 3.1 Sample respondents in the study areas

Respondent category	Sample Size	Percent
Female	120	60%
Male	80	40%
Total	200	100%

3.6 Research Instruments

The right planning of a timetable is critical to the success of any study or survey. With the research objectives in mind, a preliminary organized interview schedule and questionnaire were carefully constructed to collect data from the participants who were selected. The researcher personally pre-tested the preliminary timetable on a few consumers in the study locations. If any corrections, changes, or adjustments were required during the interview, field editing was performed, and as a result, certain elements of the rough schedule were improved, adjusted, and re-arranged based on the actual and practical experience obtained from pretesting. The timetable was eventually created in a straightforward manner so that precise information could be accessed without repetition and confusion. The researcher obtained data from respondents using impersonal interviews.

Data were gathered through impersonal interviews in Dhaka from April to July 2023. Respondents answered a questionnaire. Face-to-face interviews were preferred over alternative techniques because obtaining detailed information about respondents' sentiments improves research efficiency and leads to a higher response rate. Furthermore, it enables for additional questions that may not be given in the questionnaire**.**

3.7 Questionnaire

The questionnaire consisted of self-developed items. The questionnaire included socio-economic characteristics of rice consumers, purchasing behavior of consumers on rice, types of rice, characteristics of rice. The questionnaire in this study used a five-point scale, with 1 indicating significant disagreement and 5 indicating strong agreement. Each variable contains several items/elements. In this questionnaire also included household expenditures and monthly incomes of the consumers. The questionnaire was designed in English. The questionnaire was translated into Bangla to accommodate responders with limited English proficiency.

3.8 Analytical technique

Hedonic pricing model was used for this research. Collected data were analyzed to satisfy the objectives. To carry out this process descriptive statistics such as frequency, percent, summation mean, standard deviation as a substantial part of data analysis were employed to analyze the data. Socio-economic characteristics of the respondents such as age, gender, income, occupation education level and the number of children in a family will be hypothesized to positively or negatively influence consumer preferences and their frequency of purchasing locally-produced rice.

3.8.1 Hedonic pricing model

Agricultural economists have used hedonic pricing for quite some time to estimate the implicit prices of attributes for various food crops. Using the hedonic models, it provides as a basis, one may quantify the long-term effects of external shocks on quality or the execution of regulatory regulations. All the models and processes used by applied economists in econometrics are covered on this page. This includes parametric, semiparametric, and non-parametric models and procedures. The objective is to provide a brief overview of all hedonic econometric models and to discuss the outcomes and benefits of each alternative. This area has great promise, what with the proliferation of personalized products and the ease of access to massive data sets. A collection of dummy variables is used to account for the price effects of connected ski areas that are covered by a multi-area ski pass.

Waugh (1929) is regarded as the first researcher who applied the hedonic pricing concept to agricultural products. He investigated the impact of the qualitative qualities of vegetable on their place in the market pricing, and his findings revealed that physical traits led to multiple prices on the market. More subsequently, there have been numerous uses of the consumer theory to examine other topics utilizing the hedonistic pricing model. In this regard, J. Liang, et al., (2021) dealt with testing and estimate. It is thought that the hedonic pricing models may be adjusted to a logarithmic function, which is regarded as the function form of data hedonic price evaluation.

The hedonic pricing model has been used on a variety of products. Many scholars have used different explanatory variables in regression analyses, depending on their hypotheses, the characteristics of products, study areas, and respondents.

However, this study examines consumer preference for popular rice brands. To reflect rice consumption in the markets, some important independent variables are added in the hedonic pricing model, such as glutinous rice, non-glutinous rice, types of rice, shape of grain, inert matter, aroma, current-season rice, chalkiness, transparency, whiteness, broken rice and packaging.

Equation (1) illustrates the hedonic regression model of this study.

$$lnP_{itp} = \alpha + \sum \beta_1 x_{1i} + \sum \beta_2 x_{2i} + \sum \beta_3 x_{3i} + \sum \beta_4 x_{4i} + \sum \beta_5 x_{5i} + \sum \beta_6 x_{6i} \sum \beta_7 x_{7i} + \sum \beta_8 x_{8i} + \sum \beta_9 x_{9i} + \sum \beta_{10} x_{10i} + \sum \beta_{11} x_{11i} + \sum \beta_{12} x_{12i} + \sum \beta_{13} x_{13i} + \sum \beta_{14} x_{14i} + \sum \beta_{15} x_{15i} + \sum \beta_{16} x_{16i} + \varepsilon_{itp} \quad \ldots\ldots (1)$$

Where, $lnPitp$ is indicated log of market price of rice (Tk/kg).

X_{1i} is indicated age of consumer.

X_{2i} is indicated log per capita income.

X_{3i} is indicated education (year of schooling).

X_{4i} is indicated each time rice purchase (kg).

X_{5i} is indicated household size (number)

X_{6i} is indicated packed rice.

X_{7i} is indicated current season rice.

X_{8i} is indicated inert matter (Substances that are not classified as pure seed, or particles of damaged or fractured seed units that are half or less of their original size are considered inert matter).

X_{9i} is indicated white rice.

X_{10i} is indicated chalkiness of rice (The centers or edges of milled grains show chalkiness as a result of light reflection that is dispersed).

X_{11i} is indicated aroma in rice.

X_{12i} is indicated glutinous rice (Glutinous rice means "sticky rice." The amount of starch in different types of rice varies).

X_{13i} is indicated transparent rice grain (Rice transparency describes how transparent fine rice is, and transmittance is a typical way of measuring this).

X_{14i} is indicated medium bold rice grain.

X_{15i} is indicated medium slander rice grain.

X_{16i} is indicated slander rice grain.

ε_{itp} = error term.

$\propto$ is intercept and

β_1 to β_{16} are the parameter to be estimated.

Ordinary least squares regression with standard errors has been used to estimate Equation (1).

3.8.2 Multicollinearity test

In general, while investigating consumers' evaluations of each rice characteristic, we often evaluate their willingness to pay (WTP). The approach is divided into two parts: the Multicollinearity Test and the Hedonic Pricing approach. Each strategy has a distinct benefit and drawback. However, in this study, the hedonic pricing model is employed to investigate customer preferences. There are two main reasons to use this model. To begin,

the assumptions of this model are appropriate for the rice situation in Bangladesh; for example, rice is a stable food, there are many customers and sellers in the marketplaces, and the price is decided by supply and demand. Second, the hedonic pricing model is the most appropriate, given the constraints of time, budget, equipment, and enumerators.

Multicollinearity emerges when multivariate linear regression analysis incorporates variables that are substantially linked not just with the dependent variable in question but also with one another.

When two or more independent variables in a multiple regression equation are highly correlated, we say that there is multicollinearity. When multicollinearity test is present, the statistical value of an independent variable is diminished to some extent.

3.8.3 Heteroscedasticity test

In the regression model, heteroscedasticity is important problem. Without addressing this, model gives misleading standard error and ultimate give wrong coefficient values. In this regression model, we assume Null hypothesis H_0: Constant variance in the error term. Alternate hypothesis is H_1: No constant variance in the error term. If hypothesis is rejected, we can say no constant variance. On the other hand, if hypothesis accepted, we can say constant variance and no heteroscedasticity problem in the model.

3.8.4 Measuring Poverty

In the context of measuring poverty in a population the indices in Foster *et al.* (1984) are commonly used which is expressed as:

$$P_{\propto} = \frac{1}{N}\sum_{i=1}^{N}\left[\frac{Z-y_i}{Z}\right]^{\propto} (\alpha > 0) \; and \; (y_i < Z) \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \; (2)$$

where Z is the agreed-upon poverty line (US$ 1.90/capita/day) converted to Bangladeshi Taka, N is the total household population, y_i is income per capita for the i^{th} person, and $\propto$ is a poverty aversion (sensitivity) parameter. When $\propto = 1$, it is a measure of the poverty gap. When $\propto = 2$, P equals the squared poverty gap, which is used as a measure of the severity of poverty. The study used the international monetary poverty line of US$ 1.90/capita/day (WBG, 2016), which is converted to taka per capita per year using official exchange rate.

Chapter Four

RESULT AND DISCUSSION

CHAPTER 4

RESULT AND DISCUSSION

This chapter presents the study's results and an interpretation of them.

4.1 Socio-Demographic Characteristics of Respondents

Finding out the respondent's attributes is the aim of this part. The following tables describe the various characteristics of the respondents. Tabulated data at consumers` level are presented under the following headings.

4.1.1 Age of the Respondents

Age of the consumers varied from 18 to 75 years, the averages are being 37.15 years with the standard deviation of 11.067. Table 4.1 shows that 35% of respondents were up to 30 years; 52% were between the ages of 30 and 50; 13% were above 50.

This demonstrates that the bulk of responders were in the 30–50 age range.

Table 4.1: Age of the Respondents

Categories	Basis of categorization (year)	Respondents		Mean	SD
		Number	Percent		
Young	Up to 30	70	35%	37.15	11.067
Middle aged	30 to 50	104	52%		
Old	Above 50	26	13%		
Total		200	100%		

Source: Field survey data April-July 2023

Age represented in Table 4.1 indicate that 52% of consumers were middle aged as prepared to 13% being old and 35% of respondents were young aged consumer.

4.1.2 Occupation of the Respondents

Table 4.2 shows that 26% of respondents were service holder; 22% of the respondents were housewife; 21% of the respondents were job holder; 16% of respondents were Businessmen; 8% of the respondents were students and also lower income consumers.

This demonstrates that the bulk of responders were service holder.

Table 4.2: Occupation of the rice consumers

Occupation	Respondent	
	Number	Percent
Business	32	16%
Service	52	26%
Housewife	44	22%
Student	15	8%
Job holder	42	21%
Low income	15	8%
Total	200	100%

Source: Field survey data April-July 2023

4.1.3 Family Income earning member (no) of the Respondent

Data represented table 4.3 shows that 47% of the respondent's family have only one earning member; 47% of the respondent's family have only 2 earning member; 6% of the respondent's family have 3 earning member.

Table 4.3: Family Income earning member (no) of the rice consumers

Income earning member (no)	Respondent	
	Number	Percent
1	94	47%
2	94	47%
3	12	6%
Total	200	100%

Source: Field survey data April-July 2023

4.1.4 Household member (no) of the Respondent

Here table 4.4 shows that 42% of the respondents have 5 to 6 members of the family; 40% of the respondents have 2 to 4 members of the family; 18% of the respondents have above 7 members of the family.

Table 4.4: Household member (no) of the rice consumers

HH member	Respondent	
	Number	Percent
2 to 4	80	40%
5 to 6	84	42%
Above 7	36	18%
Total	200	100%

Source: Field survey data April-July 2023

4.1.5 Level of education

The average education score of the respondents was 2.795 on the basis of their level of education, the respondents were classified into five categories as shown the table 4.4 showed that 52% of the respondents' qualification was graduate; 26% of the respondents' qualification was secondary level; 18% of the respondents' qualification was postgraduate; 3% of the respondents' qualification was primary level; 2% of the respondents' qualification was illiterate. Here majority of the respondents were graduated.

Table 4.5: Education level of the rice consumers

Categories	Respondent		Mean
	Number	Percent	
Illiterate	4	2%	2.795
Primary level (1-5)	6	3%	
Secondary level (6-12)	51	26%	
Graduation level (>12)	103	52%	
Post-graduation	36	18%	
Total	200	100%	

Source: Field survey data April-July 2023

4.1.6 Marital status of the Respondents

The average marital status of the respondents was 0.67 with standard deviation was 0.085098. Table 4.6 displays data pertaining to the marital status of the sampled respondents. Of them, 75% were married, while 19% were unmarried; 4% were separated/ widowed and 2% were divorced. This indicates that married respondents made up the majority of the sample.

Table 4.6: Marital status of the rice consumers

Categories	Respondent		Mean	SD
	Number	Percent		
Married	150	75%	0.67	0.085098
Divorced	4	2%		
Separated/ Widowed	8	4%		
Unmarried	38	19%		
Total	200	100%		

Source: Field survey data April-July 2023

4.2 Information about rice purchasing of the rice consumers

The following tables describe the various purchasing decision of the respondents. Tabulated data at consumers` level are presented under the following headings.

4.2.1 Location of purchase rice

From the table 4.7 indicates that location of purchase rice categorized about traditional bazar, chain shop, wholesale shop, retailer shop and also online shop. The average value was 2.04 with the standard deviation was 1.19816.

Table 4.7: Location of purchase rice of the consumers

Location of purchase rice	Mean	S.D.
Traditional bazar	2.04	1.19816
Chain shop		
Wholesale shop		
Retailer shop		
Online shop		

Source: Field survey data April-July 2023

4.2.2 Consumer purchasing popular rice brand

From the table 4.8 we can see that the average value was 3.525 with the standard deviation was 2.46572 on the basis of consumer purchasing popular rice brand. Here 29% of the respondents were purchased Miniket; 20% of the respondents were purchased Najirshail; 17% of the respondents were purchased Paijam; 14% of the respondents were purchased Shorna; 10% of the respondents were purchased BR28; 6% of the respondents were

purchased Katarivog and 5% of the respondents were purchased BR29. This indicates that Miniket brand made up the majority of the sample.

Table 4.8: Consumer purchasing popular rice brand of the rice consumers

Categories	Respondent		Mean	SD
	Number	Percent		
Najirshail	40	20%	3.525	2.46572
BR28	20	10%		
BR29	9	5%		
Shorna	28	14%		
Katarivog	11	6%		
Paijam	34	17%		
Miniket	58	29%		
Total	200	100%		

Source: Field survey data April-July 2023

4.2.3 Responsibility of rice (brand) purchasing decision

Here the average was .595 on the basis of responsibility of rice (brand) purchasing decision. Table 4.9 shows that 50% were husband; 39% were wife; 10% were son and 2% were daughter. This indicates that the majority of the sample husband purchased rice.

Table 4.9: Responsibility of rice (brand) purchasing decision

Categories	Respondent		Mean
	Number	Percent	
Husband	100	50%	0.595
Wife	77	39%	
Son	19	10%	
Daughter	4	2%	
Total	200	100%	

Source: Field survey data April-July 2023

4.2.4 Frequency of purchasing rice

From table 4.10 indicates that 88% of the respondents were purchased rice monthly; 11% of the respondents were purchased rice weekly; 1% of the respondents were purchased rice fortnightly. So the majority of the respondents were purchased rice monthly.

Table 4.10: Consumer frequency of purchasing rice

Items	Number of respondents	Percent of respondent
Daily	2	1%
Weekly	21	11%
Fortnightly	2	1%
Monthly	175	88%

Source: Field survey data April-July 2023

4.2.5 Amount of Rice purchase each time (kg)

Table 4.11 shows that 47% of the respondents were purchased 11-25 kg of rice; 42% of the respondents were purchased 26-50kg of rice; 7% of the respondents were purchased 1-10 kg of rice and 5% of the respondents were purchased above 50 kg of rice.

Table 4.11: Amount of Rice purchase each time (kg)

Categories	Respondent	
	Number	Percent
1-10 kg	14	7%
11-25 kg	93	47%
26-50 kg	83	42%
Above 50 kg	10	5%
Total	200	100%

Source: Field survey data April-July 2023

4.2.6 Consumer preference about the origin of rice

From table 4.12 shows that 75% of the respondents given their opinion “yes” for the origin of Bangladeshi rice and “no” for Bangladeshi rice. 75% of the respondents given their opinion “no” for the origin of Indian rice and “no” for Indian rice. So the majority of the respondents were purchased Bangladeshi rice.

Table 4.12: Consumer preference about the origin of rice

Items	Number of respondents	Percent of respondent
Bangladeshi rice		
Yes	150	75%
No	50	25%
Indian rice		
Yes	50	25%
No	150	75%

4.2.7 Consumer preference towards the attributes of rice

From table 4.13 indicates consumer preferences. 84% were given “No” for the purchasing chalkiness rice; 80% were given “Yes” for the purchasing white rice; 84% were given “No” for the purchasing brown rice; 88% were given “No” for the purchasing bold grains of rice; 80% were given “No” for the purchasing medium-bold grains of rice; 65% were given

Table 4.13: Consumer preference towards the attributes of rice

Items	Number of respondents	Percent of respondent
Do you purchase chalkiness rice?		
Yes	32	16%
No	168	84%
Do you purchase white rice?		
Yes	159	80%
No	41	21%
Do you purchase brown rice?		
Yes	33	17%
No	167	84%
Do you purchase bold grains of rice?		
Yes	25	12%
No	175	88%
Do you purchase medium-bold grains of rice?		
Yes	40	20%
No	160	80%
Do you purchase medium-slander grains of rice?		
Yes	70	35%
No	130	65%
Do you purchase slander grains of rice?		
Yes	77	39%
No	123	62%
Do you purchase rice with aroma?		
Yes	28	14%
No	172	86%
Do you purchase glutinous rice?		
Yes	42	21%
No	158	79%
Do you purchase non-glutinous rice?		
Yes	155	78%
No	45	23%
Do you purchase transparent grain of rice?		
Yes	169	85%
No	31	15%

Source: Field survey data April-July 2023

"No" for the purchasing medium-slander grains rice; 39% were given "Yes" for the purchasing slander grains rice; 86% were given "No" for the purchasing rice with aroma; 79% were given "No" for the purchasing glutinous rice; 78% were given "Yes" for the purchasing non-glutinous rice and 85% were given "Yes" for the transparent grain of rice.

4.2.8 Size of packaging for purchasing rice and Consumption of eating rice

Table 4.14 shows that size of packaging for purchasing rice. Here, 46% of the respondents were purchased 25 kg of packed rice; 33% of the respondents were purchased 10 kg of packed rice; 17% of the respondents were purchased 50 kg of packed rice and 5% of the respondents were purchased 5 kg of packed rice.

Alternatively, table 4.14 shows that consumption of eating rice. Here, 95% of the respondents were consumed rice twice a day; 4% of the respondents were consumed rice triple a day and 1% of the respondents were consumed rice once a day.

Table 4.14: Size of packaging for purchasing rice and Consumption of eating rice

Items	Number of respondents	Percent of respondent
Size of packaging for purchasing rice		
5 kg	9	5%
10 kg	66	33%
25 kg	91	46%
50 kg	34	17%
Consumption of eating rice		
Once a day	2	1%
Twice a day	190	95%
Triple a day	8	4%

Source: Field survey data April-July 2023

4.2.9 Other important information about the rice consumer in the study area

From table 4.15 shows that some important information about the rice consumer. Here 94% were given "Yes" for the price is an important factor when purchasing rice; 70% were given "Yes" for the purchase packed rice; 95% were given "Yes" for the cleanness in rice; 84% were given "No" for the current season rice; 92% were given "No" for the any inert matter in rice.

Table 4.15: Other important information about the rice consumer in the study area

Items	Number of respondents	Percent of respondent
Do you think the price is an important factor when purchasing rice?		
Yes	187	94%
No	13	6%
Do you purchase packed rice?		
Yes	140	70%
No	60	30%
Do you like cleanness in your rice?		
Yes	190	95%
No	10	5%
Do you like current season rice?		
Yes	32	16%
No	168	84%
Whether there is any inert matter in your rice?		
Yes	16	8%
No	184	92%

Source: Field survey data April-July 2023

4.3 Hedonic Pricing Model

We first evaluate Equation (1) considering all of the sample data. Table 4.1 present the model's estimation findings. The hedonic pricing model is used to assess the relative importance of each component in determining the factors value. The market price of rice disparities will reflect variances in the good's external surroundings when non-environmental components are accounted for in this model.

4.3.1 Coefficient value

Table 4.1 showed that if consumer's income increased 1 percent, market price of rice would be increased by 11.42 percent. The magnitude is positive and statistically significant at 1% level of probability. This shows that increase consumer income would lead to pay higher rate for purchasing rice.

Besides, generally, consumer like to eat white rice. After controlling other variables, if color of rice is white, market price of rice would be increased by 8.81%. This variable found to be positive and statistically significant at 5% level of probability. This shows that increase in demand of white rice would lead to pay higher price for purchasing rice.

Additionally, aroma in rice is important trait and consumer pay more for this. After controlling other variables, if aroma exist in rice, market price of rice would be increased by 45.69%. The aroma in rice dummy found to be positive and statistically significant at 1% level of probability.

Table 4.16: Results of Hedonic Pricing Models

Variables name	Coefficient	Standard error	t value
Dependent variable:	-	-	
Log market price of rice (tk/kg)	-		
Independent variables:	-	-	
Age (year)	-0.0012^{NS}	0.0011863	-1.01
Log per capita income	0.1142***	0.0402913	2.84
Education (year of schooling)	-0.0065^{NS}	0.0044056	-1.28
Each time rice purchase (kg)	-0.0003^{NS}	0.0013555	-0.22
Household size (number)	0.0181^{NS}	0.0111428	1.63
Packed rice dummy (1=packed rice, 0=otherwise)	-0.0155^{NS}	0.0335138	-0.46
Current season rice dummy (1= current season rice, 0=otherwise)	-0.0625^{NS}	0.0589488	-1.06
Inert matter dummy (1=inert matter, 0= otherwise)	-0.0554^{NS}	0.0502816	-1.10
White rice dummy (1=white rice, 0= otherwise)	0.0881**	0.0418338	2.11
Chalkiness rice dummy (1=chalkiness rice, 0= otherwise)	-0.0654^{NS}	0.0588326	-1.11
Aroma in rice dummy (1= aroma,0= otherwise)	0.4569***	0.0425616	10.73
Glutinous rice dummy (1=glutinous, 0= otherwise)	0.0931*	0.0548638	1.70
Transparent rice grain dummy (1= transparent rice, 0= otherwise)	-0.1699***	0.0566519	-3.0
Medium bold rice grain dummy (1= medium bold, 0- otherwise)	0.2643***	0.0530459	4.98
Medium slander rice grain dummy (1= medium slander, 0= otherwise)	0.1999***	0.0489087	4.09
Slander rice grain dummy (1= slander rice, 0= otherwise)	0.3633***	0.0510178	7.12
Constant	2.769***	0.4731963	5.83

Note: *$p < 0.10$, ** $p < 0.05$, *** $p < 0.01$ and NS= Not significant

Moreover, some consumers like to eat glutinous rice and want to pay for this. After controlling other variables, if rice is glutinous, market price of rice would be increased by

9.31%. Glutinous in rice dummy variable found to be positive and statistically significant at 10% probability level.

Also, after controlling other variables, if it is medium bold grain rice, market price of rice would be increased by 26.43%. Medium bold rice dummy variable found to be positive and statistically significant in 1% probability level. This shows that increase the demand for medium bold rice, consumer would pay more for it.

As well, after controlling other variables, if it is medium slander grain rice, market price of rice would be increased by 19.99%. Medium slander grain rice dummy variable found to be positive and statistically significant at 1% level of probability. This shows that increase in medium slander grain rice dummy would lead to pay higher for it.

In addition, after controlling other variables, if it is slander grain rice, market price of rice would be increased by 36.33%. Slander grain rice dummy variable found to be positive and statistically significant at 1% level of probability. This shows that increase in slander grain rice would lead to pay higher for it.

4.3.2 Diagnostic test

4.3.2.1 F-test

From table 4.1, F value gives overall model fitness. We found F value is was 24.36*** it is statistically significant at 1 percent level probability. This mode is overall good fit model.

Here, adjusted R2 is 65.4% that means 65.4% of the variation in output can be explained by input variables. In this study for sixteen independent variables about 65.4% of the data can be explained by the model.

4.3.2.2 Breusch-Pagan test for heteroscedasticity

From the table 4.1 chi^2 is 1.44 that means statistically insignificant. We have tested and found that there is no heteroscedasticity problem in this model.

4.3.2.3 Multicollinearity test

From table 4.1, mean VIF value is 2.16 that is less than 10 which indicates that there are no multicollinearity problem in this model.

Table 4.17: Results of diagnostic test

F test:	
F(16, 184)	24.36***
Adjusted R^2	0.654
Breusch-Pagan test for heteroscedasticity:	
Chi^2 (1) (H_0= Constant variance; H_1= Not constant variance)	1.44^{NS}
Multicollinearity test:	
Mean VIF	2.16
Sample size	200

Note: *p < 0.10, ** p < 0.05, *** p < 0.01 and NS= Not significant

4.4 Poverty

From the table 4.2 we estimated that HCR is 5%. It is less than national poverty level (18%).

Alternatively, PGI (Poverty gap index is 0.0061%. The mean proportional poverty gap in the population is compared to the non-poor, which has near to zero gap. Poverty depth provide complementary information on the incidence of poverty. It might be the case that in this study area there are a low gap.

The measures of SPI (Square poverty gap index) rate is 0.0013%. This poverty severity provides complementary information on the incidence of poverty. It might be the case that in this study area there are a low poverty severity.

Table 4.18: Poverty measurement of consumer of selected study locations.

Variable	Mean	Std. Dev.
Head count ratio (HCR)	0.050	.2184919
Poverty gap index (PGI)	0.0061	.0355018
Square poverty gap index (SPGI)	0.0013	.0093272

4.5 Likert Scale

Using a Likert scale to learn about customer knowledge of health, brand and packaging, quality, taste, and rice preference, we collected data from 200 consumers

4.5.1 Health related statement

Firstly, the respondent asked to give their opinion about the statement about “rice is a source of carbohydrate”. The result showed that most of the respondent were neutral in

this point and the percentage was 28%. On the other hand, 17% of the respondent were strongly disagree about the statement, 13% of the respondent were somewhat disagree about the statement, 17% of the respondent were somewhat agree about the statement and 26% of the respondent were strongly agree about the statement.

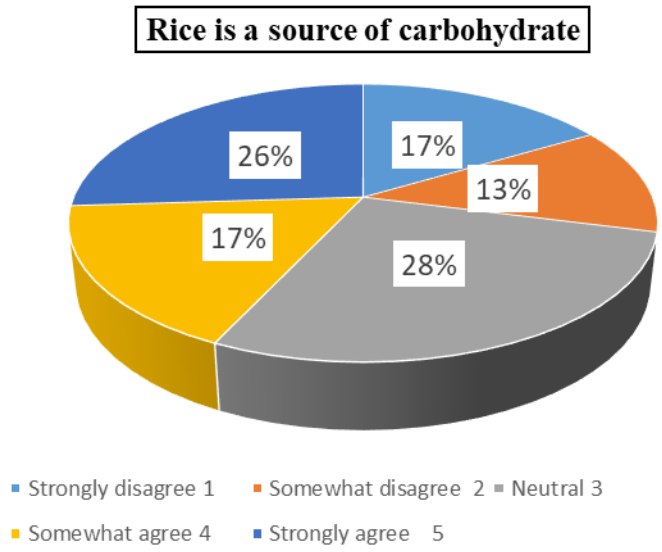

Fig 4.1: Consumers perception about rice is a source of carbohydrate

Secondly, the respondent asked to give their opinion about the statement about "rice can reduce heart disease and stroke". The result showed that most of the respondent were somewhat disagree in this point and the percentage was 37%. On the other hand, 17% of the respondent were neutral about the statement, 30% of the respondent were strongly disagree about the statement, 12% of the respondent were somewhat agree about the statement and 5% of the respondent were strongly agree about the statement.

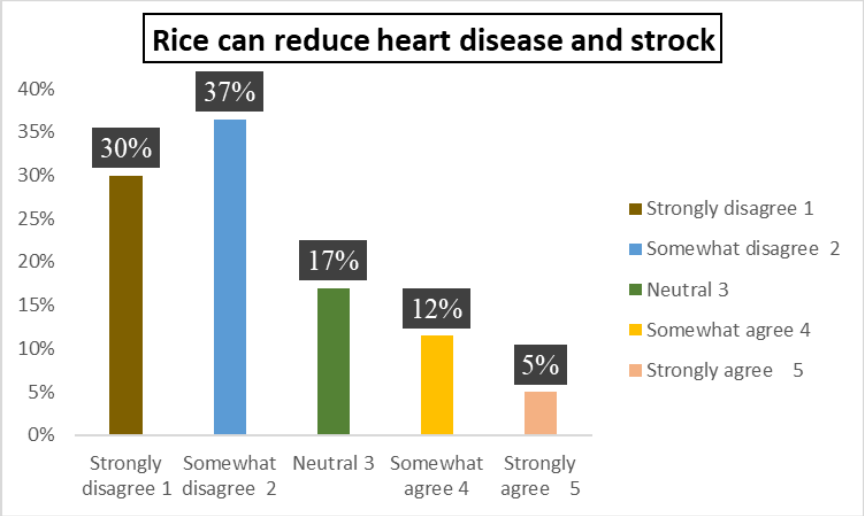

Fig 4.2: Consumers perception about rice can reduce heart disease and stroke

Thirdly, the respondent asked to give their opinion about the statement about "rice is the cause of obesity". The result showed that most of the respondent were somewhat agree in this point and the percentage was 34%. On the other hand, 27% of the respondent were neutral about the statement, 8% of the respondent were strongly disagree about the statement, 6% of the respondent were somewhat disagree about the statement and 25% of the respondent were strongly agree about the statement.

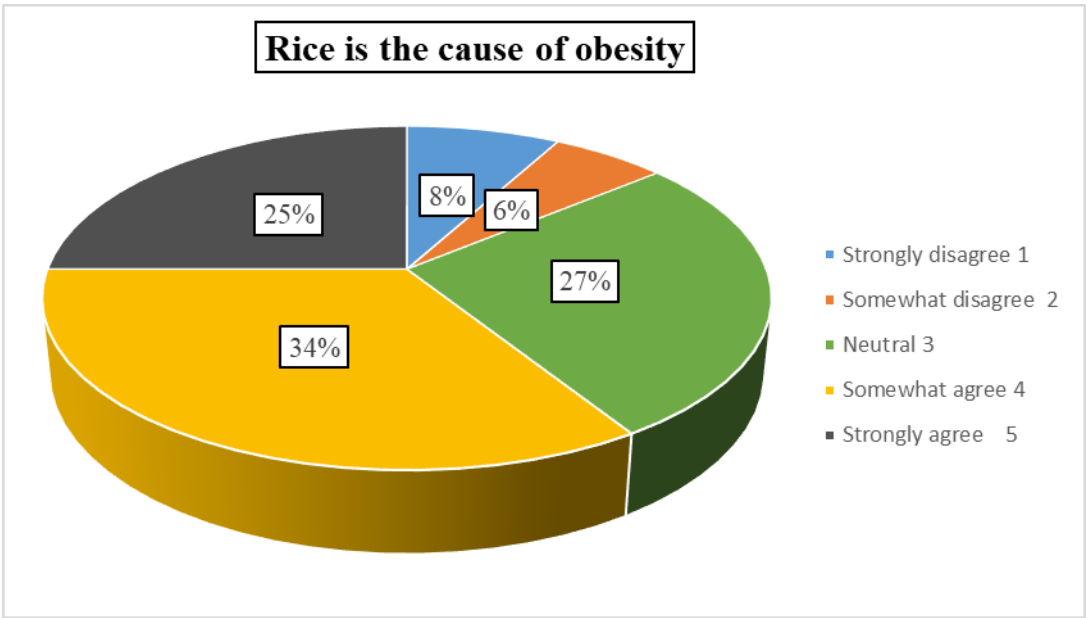

Fig 4.3: Consumers perception about rice is the cause of obesity

Fourthly, the respondent asked to give their opinion about the statement about "rice is the cause of diabetics". The result showed that most of the respondent were somewhat disagree in this point and the percentage was 26%. On the other hand, 5% were strongly disagree about the statement, 26% of the respondent were neutral about the statement, 25% of the respondent were somewhat agree about the statement and 18% of the respondent were strongly agree about the statement.

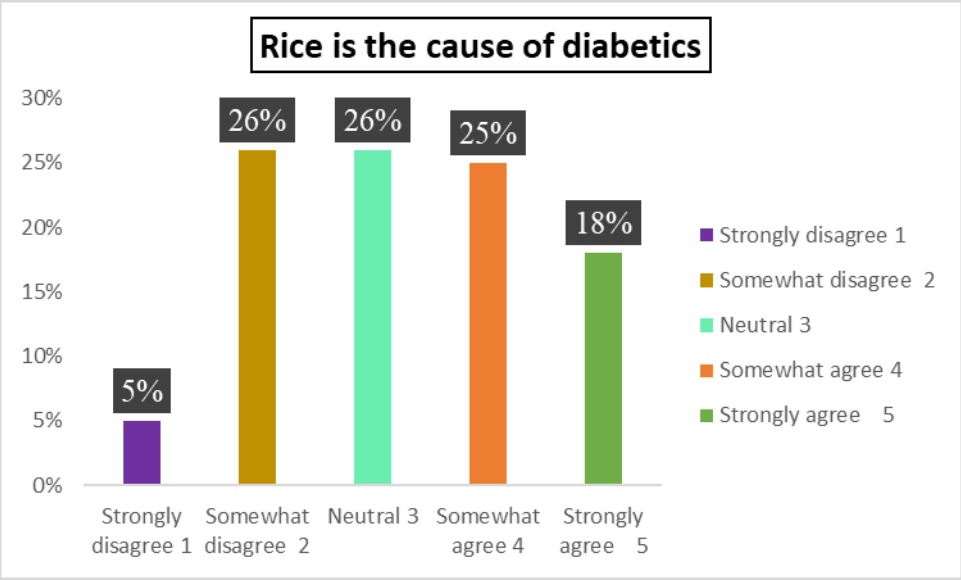

Fig 4.4: Consumers perception about rice is the cause of diabetics

4.5.2 About rice, brand and packaging statement

Firstly, the respondent asked to give their opinion about the statement about "price is an important factor while purchasing rice". The result showed that most of the respondent were strongly agree in this point and the percentage was 44%. On the other hand, 5% were strongly agree about the statement, 20% of the respondent were neutral about the statement, 28% of the respondent were somewhat agree about the statement and 4% of the respondent were somewhat disagree about the statement.

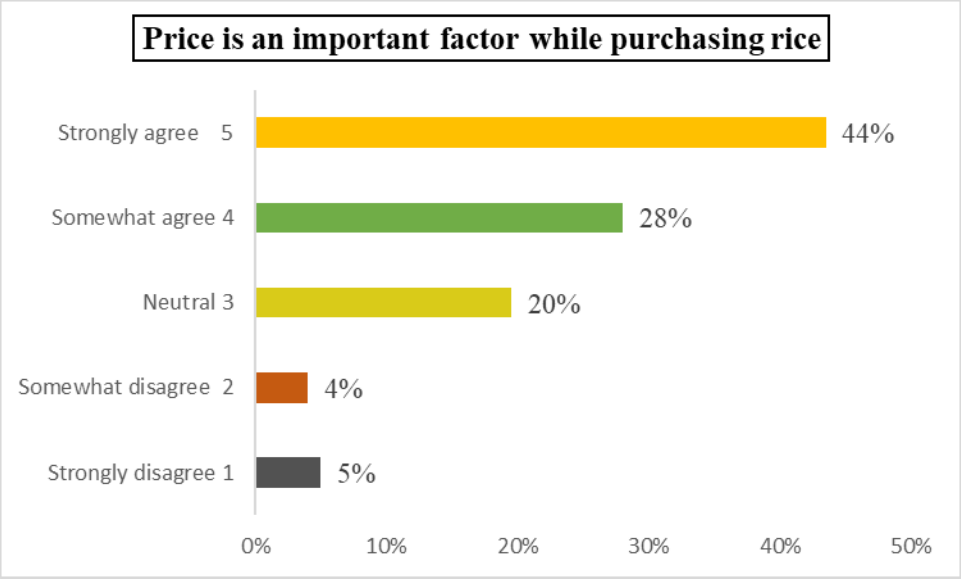

Fig 4.5: Consumers perception about price is an important factor while purchasing rice

Secondly, the respondent asked to give their opinion about the statement about "brand name is very important when purchasing rice". The result showed that most of the respondent were strongly disagree in this point and the percent was 26% and also strongly agree in this point and the percentage was 26%. On the other hand, 18% were neutral about the statement, 20% of the respondent were somewhat agree about the statement, 28% of

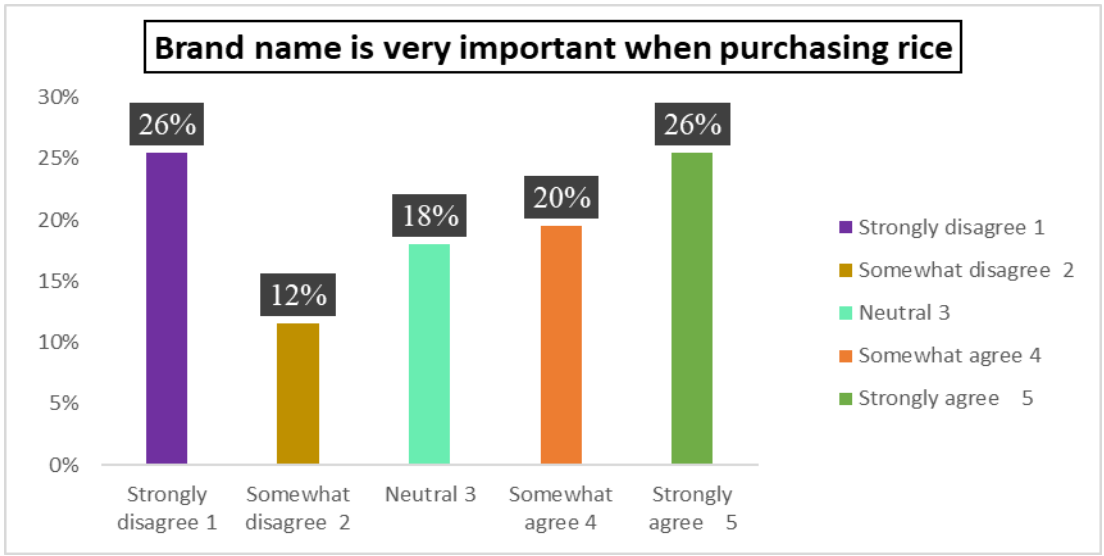

Fig 4.6: Consumers perception about brand name is very important when purchasing rice

the respondent was somewhat agree about the statement and 12% of the respondent were somewhat disagree about the statement.

Thirdly, the respondent asked to give their opinion about the statement about "packaging of rice to be attractive". The result showed that most of the respondent were neutral in this point and the percentage was 25%. On the other hand, 22% were strongly agree about the statement, 25% of the respondent were neutral about the statement, 23% of the respondent were somewhat agree about the statement and 22% of the respondent were somewhat disagree about the statement.

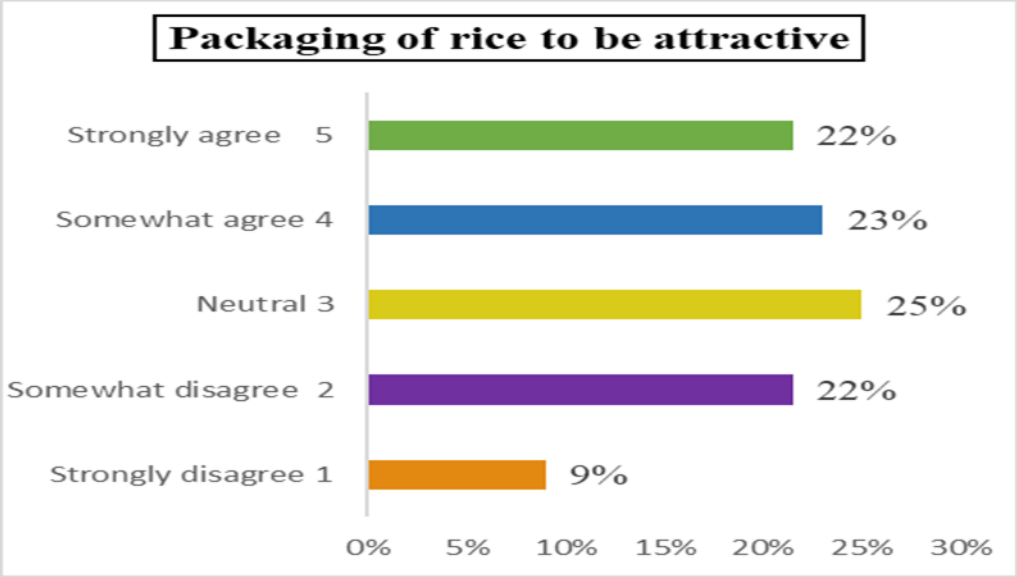

Fig 4.7: Consumers perception about packaging of rice to be attractive

Fourthly, the respondent asked to give their opinion about the statement about "advertising influences the purchasing of rice". The result showed that most of the respondent were somewhat disagree in this point and the percentage was 30%. On the other hand, 7% were strongly agree about the statement, 22% of the respondent were neutral about the statement, 18% of the respondent were somewhat agree about the statement and 24% of the respondent were strongly disagree about the statement.

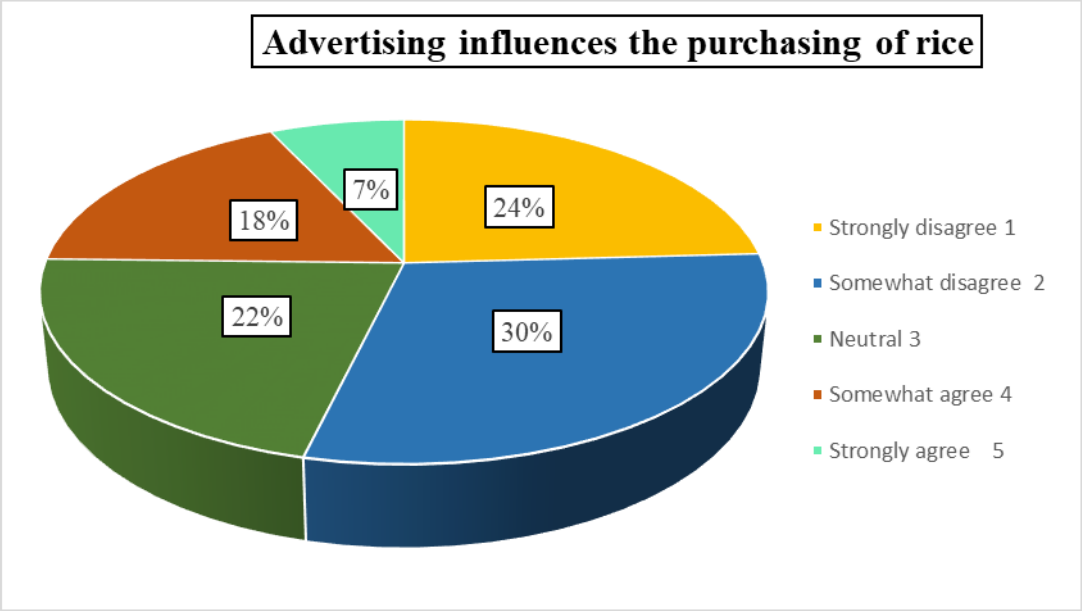

Fig 4.8: Consumers perception about advertising influences the purchasing of rice

Fifthly, the respondent asked to give their opinion about the statement about "price of rice is increasing regularly". The result showed that most of the respondent were strongly disagree in this point and the percentage was 30%. On the other hand, 17% were strongly agree about the statement, 15% of the respondent were neutral about the statement, 24% of the respondent were somewhat agree about the statement and 15% of the respondent were somewhat disagree about the statement.

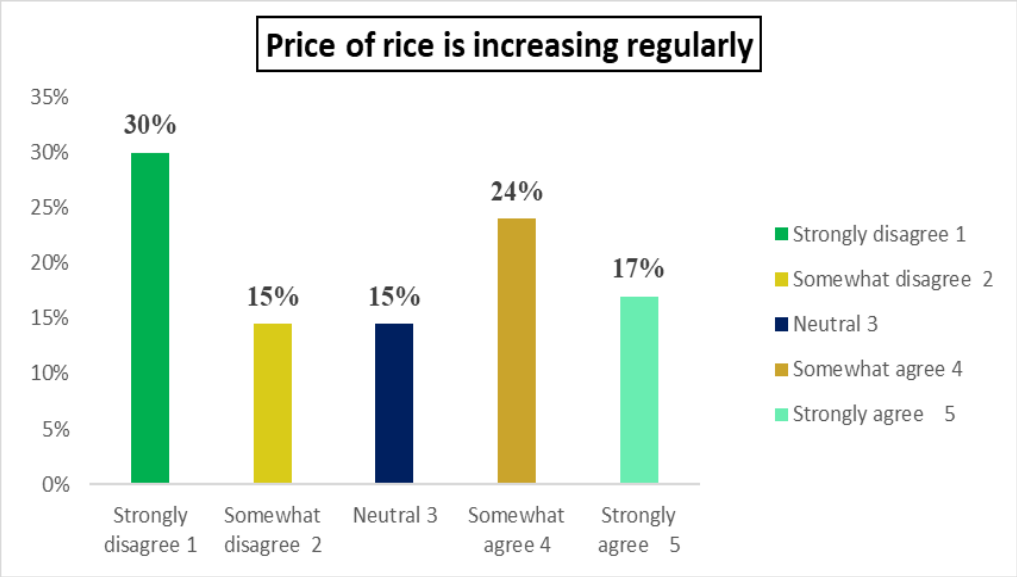

Fig 4.9: Consumers perception about price of rice is increasing regularly

Additionally, the respondent asked to give their opinion about the statement about "government needs to monitor market price of rice". The result showed that most of the respondent were strongly agree in this point and the percentage was 44%. On the other hand, 35% of the respondent were somewhat agree about the statement, 12% of the respondent were neutral about the statement, 5% of the respondent were somewhat disagree about the statement and 5% of the respondent were strongly disagree about the statement.

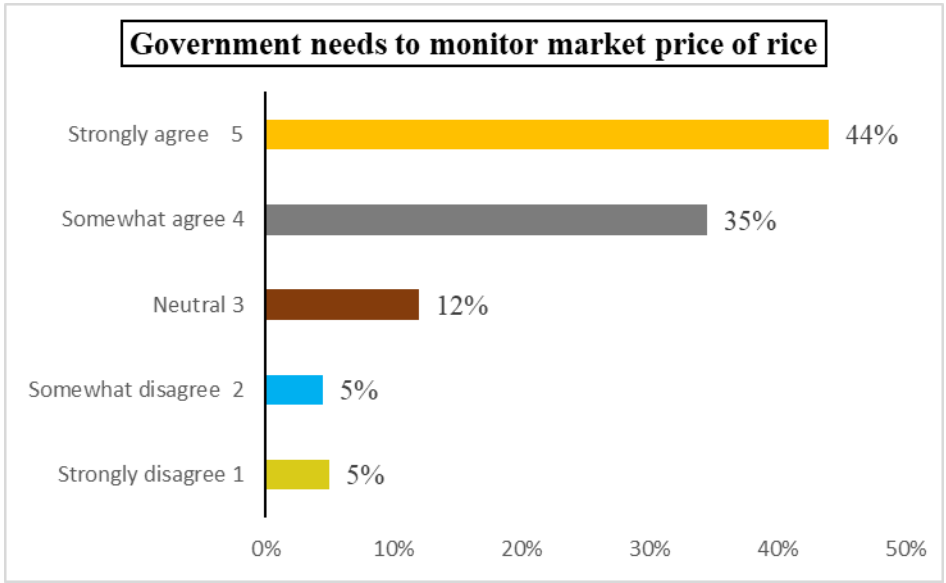

Fig 4.10: Consumers perception about Government needs to monitor market price of rice

Finally, the respondent asked to give their opinion about the statement about "display different prices of rice in the market based on quality, types or origin". The result showed that most of the respondent were somewhat agree in this point and the percentage was 45%. On the other hand, 26% of the respondent were strongly agree about the statement, 14% of the respondent were neutral about the statement, 13% of the respondent were somewhat disagree about the statement and 3% of the respondent were strongly disagree about the statement.

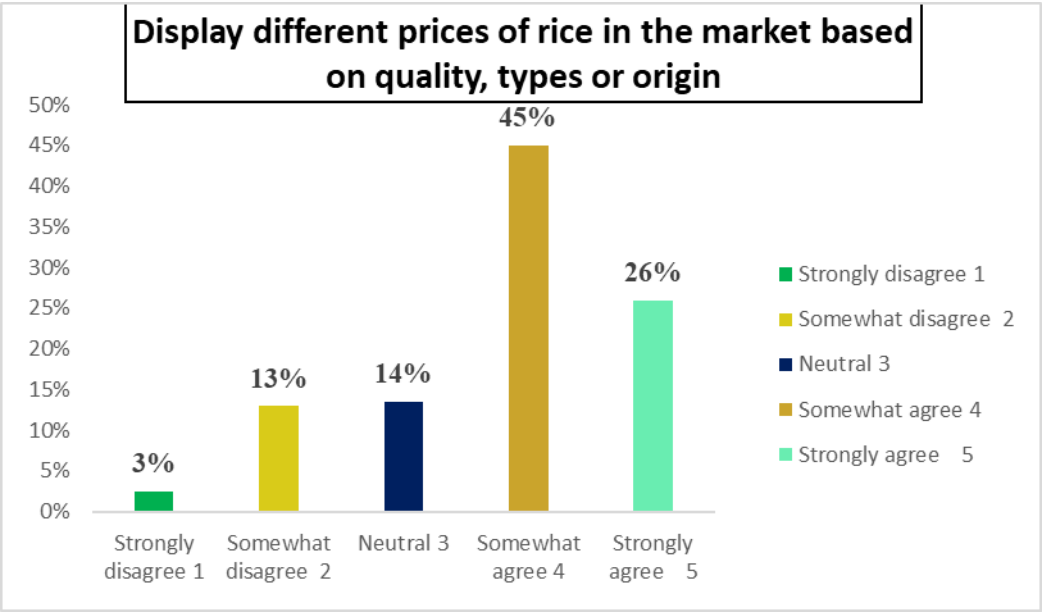

Fig 4.11: Consumers perception about display different prices of rice in the market based on quality, types and origin

4.5.3 About rice quality statement

Firstly, the respondent asked to give their opinion about the statement about "availability of zinc rice". The result showed that most of the respondent were somewhat disagree in this point and the percentage was 23%. On the other hand, 18% of the respondent were somewhat agree about the statement, 19% of the respondent were neutral about the statement, 21% of the respondent were strongly agree about the statement and 21% of the respondent were strongly disagree about the statement.

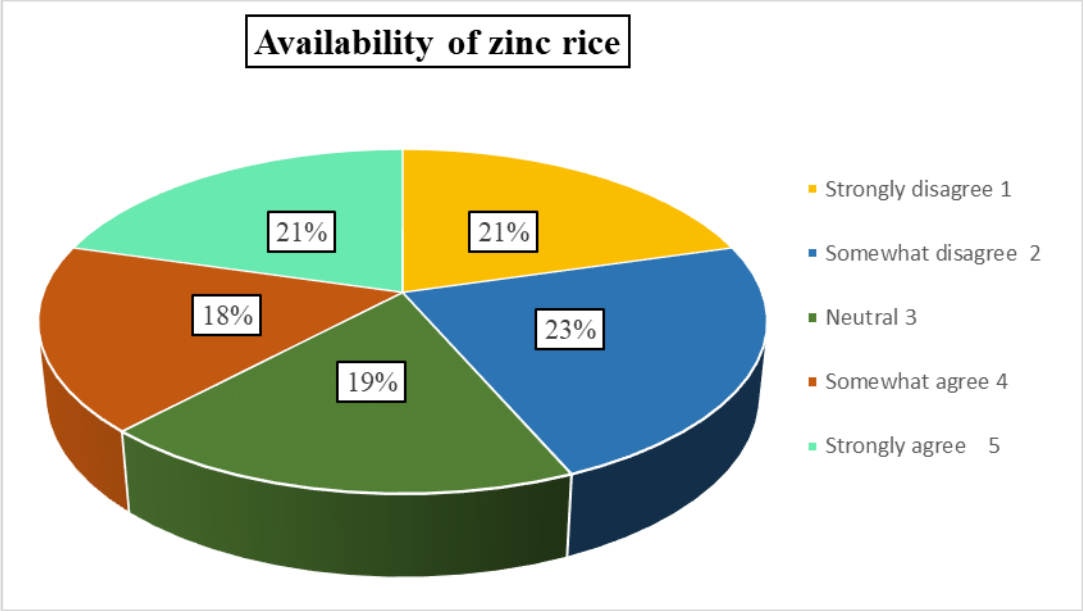

Fig 4.12: Consumers perception about availability of zinc rice

Next, the respondent asked to give their opinion about the statement about "availability of organic rice". The result showed that most of the respondent were somewhat disagree in this point and the percentage was 47%. On the other hand, 10% of the respondent were somewhat agree about the statement, 7% of the respondent were neutral about the statement, 7% of the respondent were strongly agree about the statement and 30% of the respondent were strongly disagree about the statement.

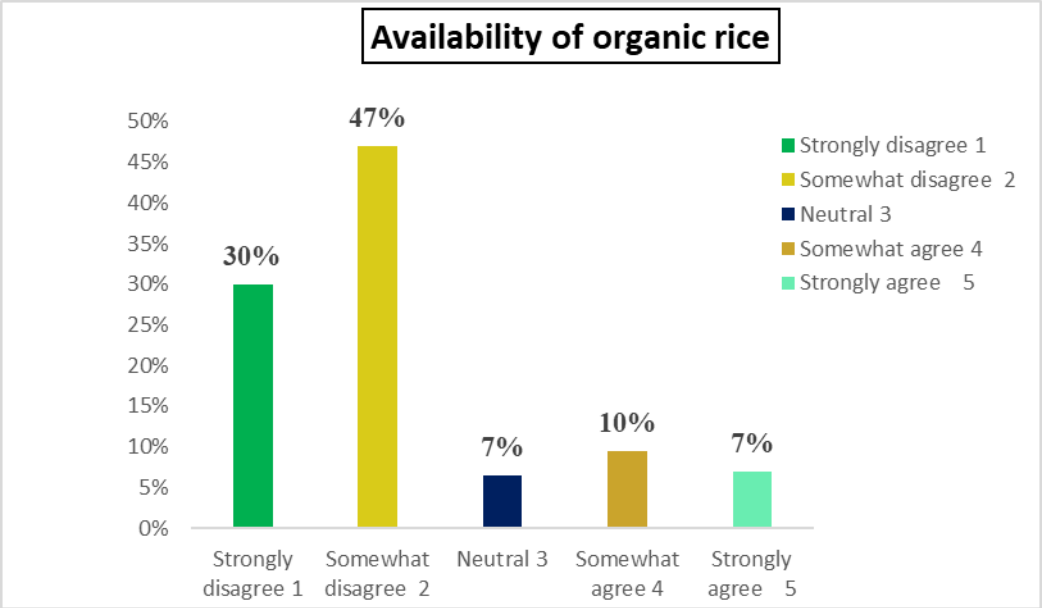

Fig 4.13: Consumers perception about availability of organic rice

Next, the respondent asked to give their opinion about the statement about "availability of diabetic rice". The result showed that most of the respondent somewhat disagree in this point and the percentage was 33%. On the other hand, 14% of the respondent were somewhat agree about the statement, 25% of the respondent were neutral about the

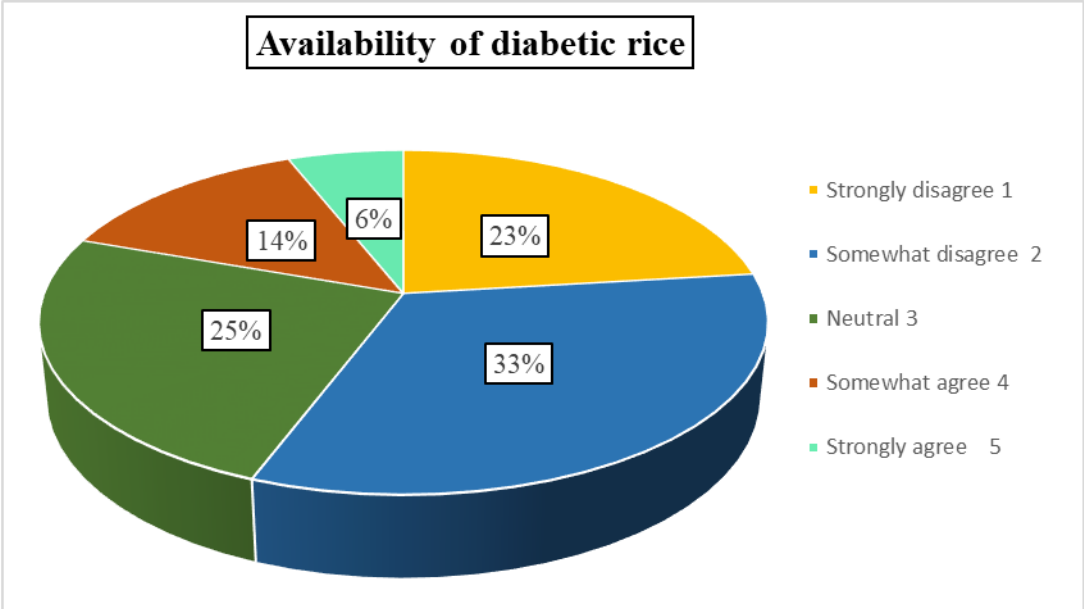

Fig 4.14: Consumers perception about availability of diabetic rice

statement, 6% of the respondent were strongly agree about the statement and 23% of the respondent were strongly disagree about the statement.

Additionally, the respondent asked to give their opinion about the statement about "research need to develop finer varieties". The result showed that most of the respondent were neutral in this point and the percentage was 54%. On the other hand, 8% of the respondent were somewhat agree about the statement, 5% of the respondent were strongly agree about the statement, 1% of the respondent were strongly disagree about the statement and 0% of the respondent were somewhat disagree about the statement.

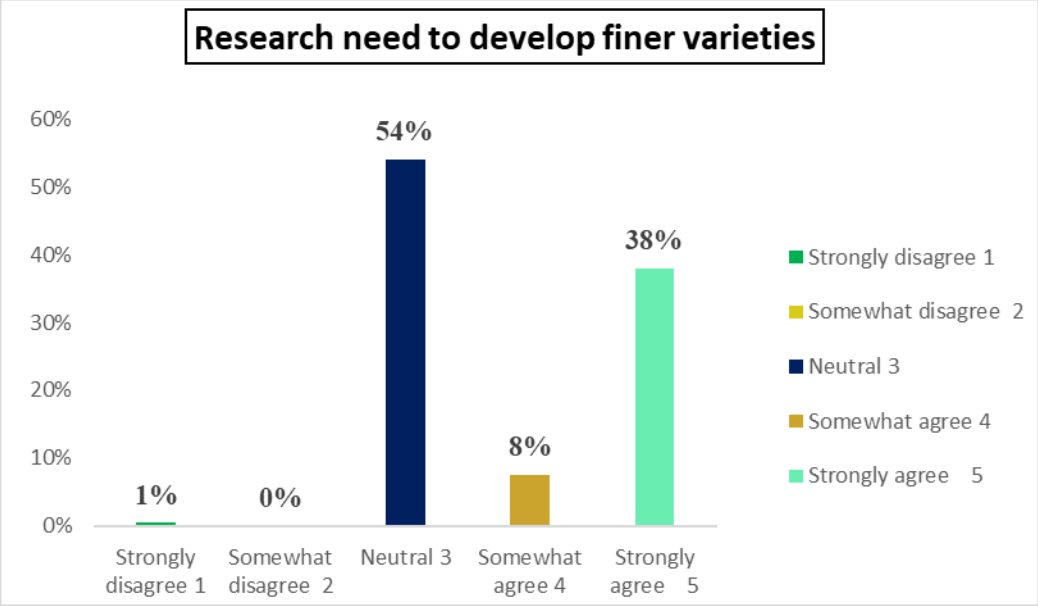

Fig 4.15: Consumers perception about research need to develop finer varieties

Moreover, the respondent asked to give their opinion about the statement about "polishing rice can reduce its quality". The result showed that most of the respondent were strongly agree in this point and the percentage was 84%. On the other hand, 9% of the respondent were somewhat agree about the statement, 7% of the respondent were strongly disagree about the statement, 1% of the respondent were somewhat disagree about the statement and 0% of the respondent were neutral about the statement.

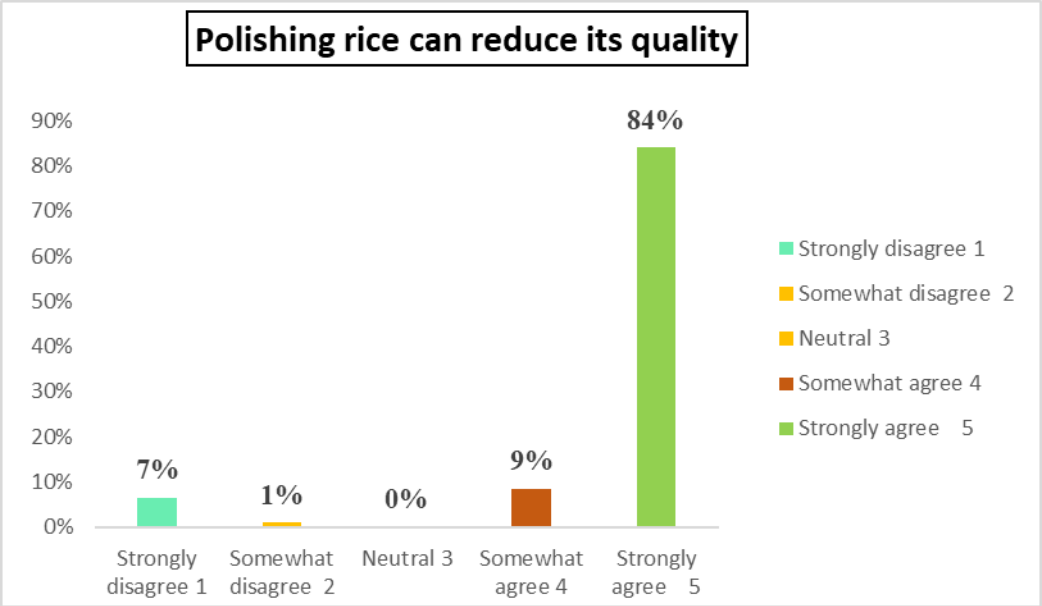

Fig 4.16: Consumers perception about polishing rice can reduce its quality

Then, the respondent asked to give their opinion about the statement about "do not get proper nutrition by eating rice". The result showed that most of the respondent were somewhat agree in this point and the percentage was 62%. On the other hand, 8% of the respondent were neutral about the statement, 0% of the respondent were strongly disagree about the statement, 17% of the respondent were strongly agree about the statement and

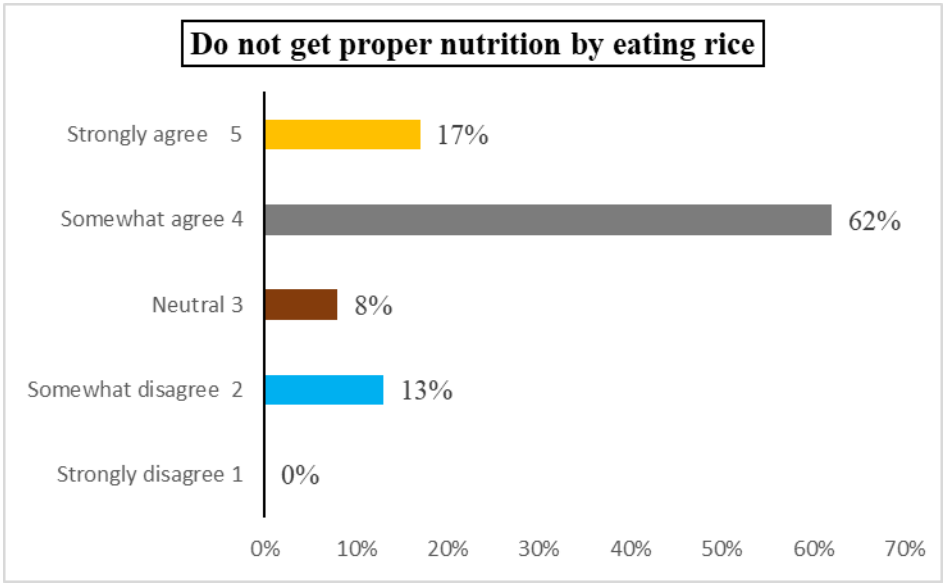

Fig 4.17: Consumers perception about do not get proper nutrition by eating rice

13% of the respondent were somewhat disagree about the statement.

In addition, the respondent asked to give their opinion about the statement about “rice boils too quickly”. The result showed that most of the respondent were strongly agree in this point and the percentage was 71%. On the other hand, 5% of the respondent neutral about the statement, 14% of the respondent were somewhat agree about the statement, 6% of the respondent were somewhat disagree about the statement and 6% of the respondent were somewhat disagree about the statement.

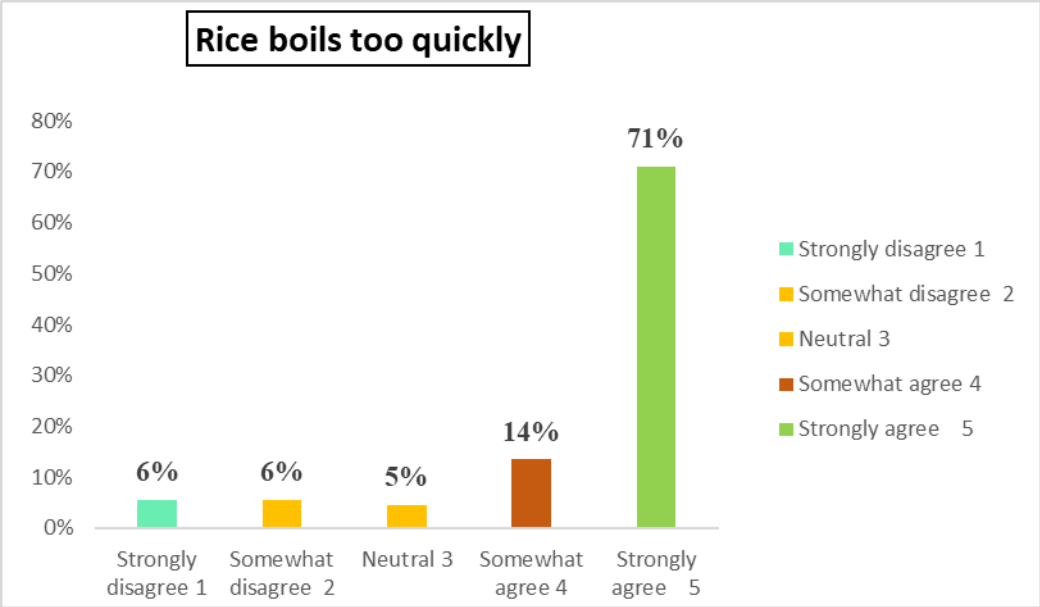

Fig 4.18: Consumers perception about rice boils too quickly

Finally, the respondent asked to give their opinion about the statement about “rice needs to boil long time”. The result showed that most of the respondent were strongly disagree in this point and the percentage was 61%. On the other hand, 4% of the respondent neutral about the statement, 3% of the respondent were somewhat agree about the statement, 3% of the respondent were strongly agree about the statement and 30% of the respondent were somewhat disagree about the statement.

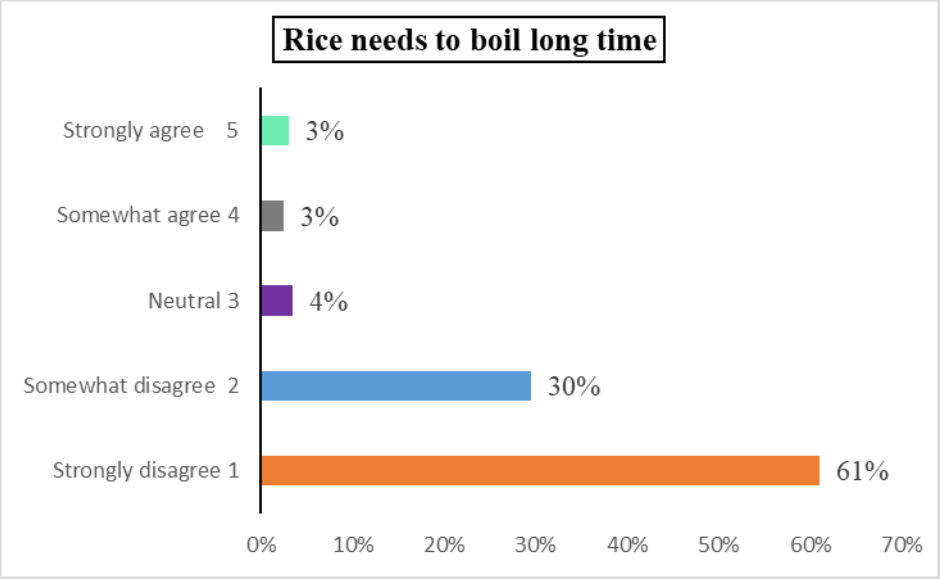

Fig 4.19: Consumers perception about rice needs to boil long time

4.5.4 About consumers' taste and preference of rice statement

Firstly, the respondent asked to give their opinion about the statement about "preference of zinc rice". The result showed that most of the respondent were strongly disagree in this point and the percentage was 49%. On the other hand, 20% of the respondent neutral about the statement, 3% of the respondent were somewhat agree about the statement, 2% of the respondent were strongly agree about the statement and 28% of the respondent were somewhat disagree about the statement.

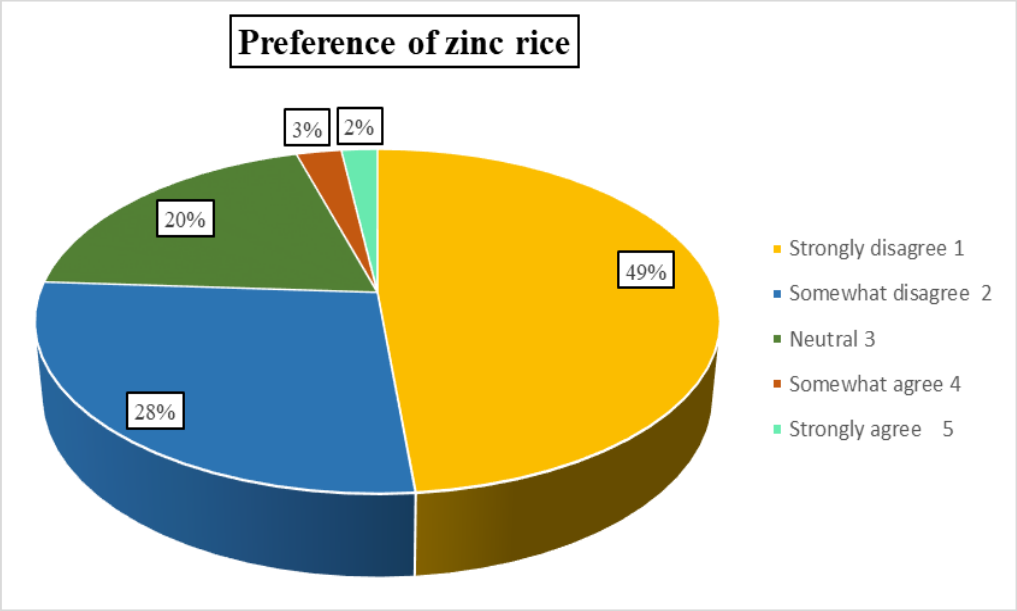

Fig 4.20: Consumers perception about preference of zinc rice

Moreover, the respondent asked to give their opinion about the statement about "preference of organic rice". The result showed that most of the respondent were somewhat disagree in this point and the percentage was 40%. On the other hand, 20% of the respondent neutral about the statement, 8% of the respondent were somewhat agree about the statement, 3% of the respondent were strongly agree about the statement and 29% of the respondent were strongly disagree about the statement.

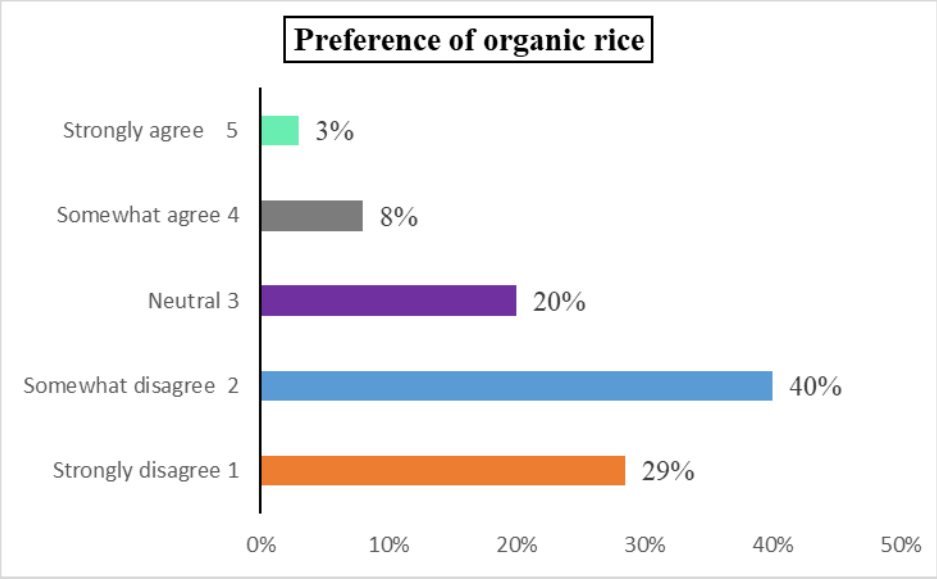

Fig 4.21: Consumers perception about preference of organic rice

Next, the respondent asked to give their opinion about the statement about "preference of finer rice". The result showed that most of the respondent were somewhat agree in this point and the percentage was 37%. On the other hand, 36% of the respondent neutral about the statement, 26% of the respondent were somewhat agree about the statement, 1% of the

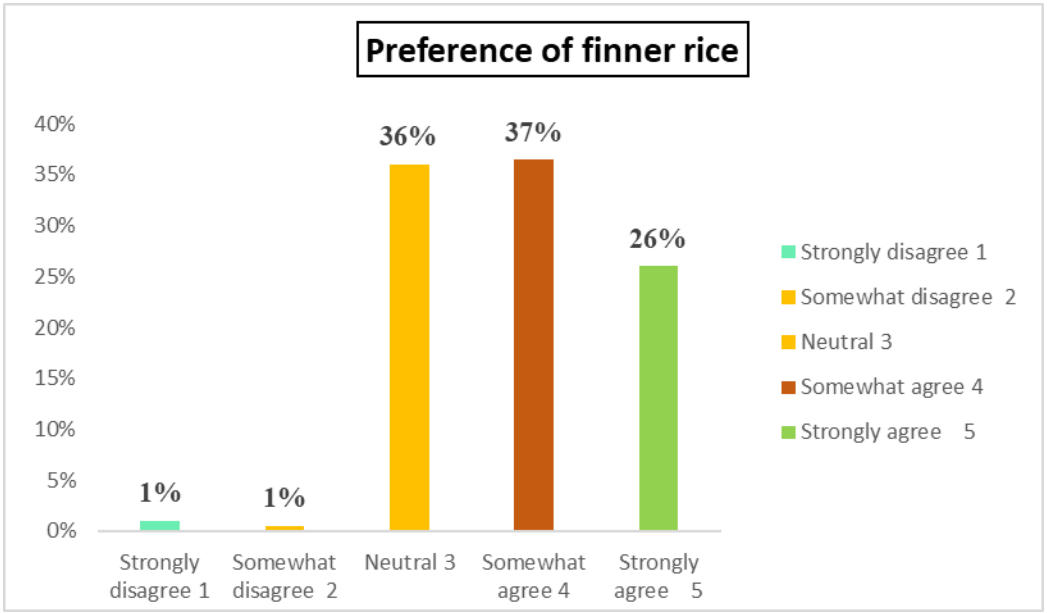

Fig 4.22: Consumers perception about preference of finer rice

respondents were strongly agree about the statement and 1% of the respondent were strongly disagree about the statement.

Then, the respondent asked to give their opinion about the statement about "preference of polishing rice". The result showed that most of the respondent were strongly disagree in this point and the percentage was 60%. On the other hand, 13% of the respondent neutral about the statement, 12% of the respondent were somewhat agree about the statement, 0% of the respondent were strongly agree about the statement and 16% of the respondent were somewhat disagree about the statement.

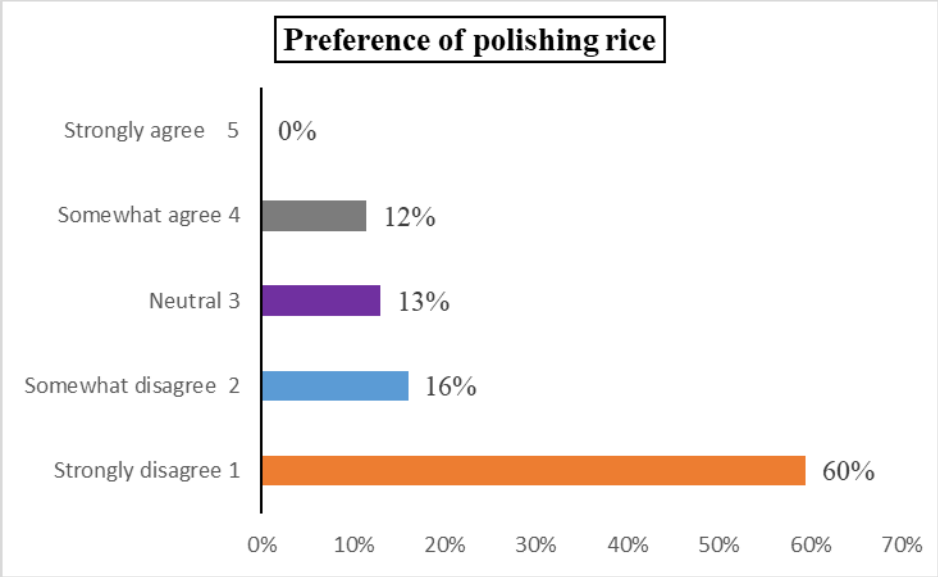

Fig 4.23: Consumers perception about preference of polishing rice

Finally, the respondent asked to give their opinion about the statement about "preference of diabetic rice". The result showed that most of the respondent were somewhat disagree in this point and the percentage was 27%. On the other hand, 22% of the respondent neutral about the statement, 12% of the respondent were somewhat agree about the statement, 14% of the respondent were strongly agree about the statement and 26% of the respondent were somewhat disagree about the statement.

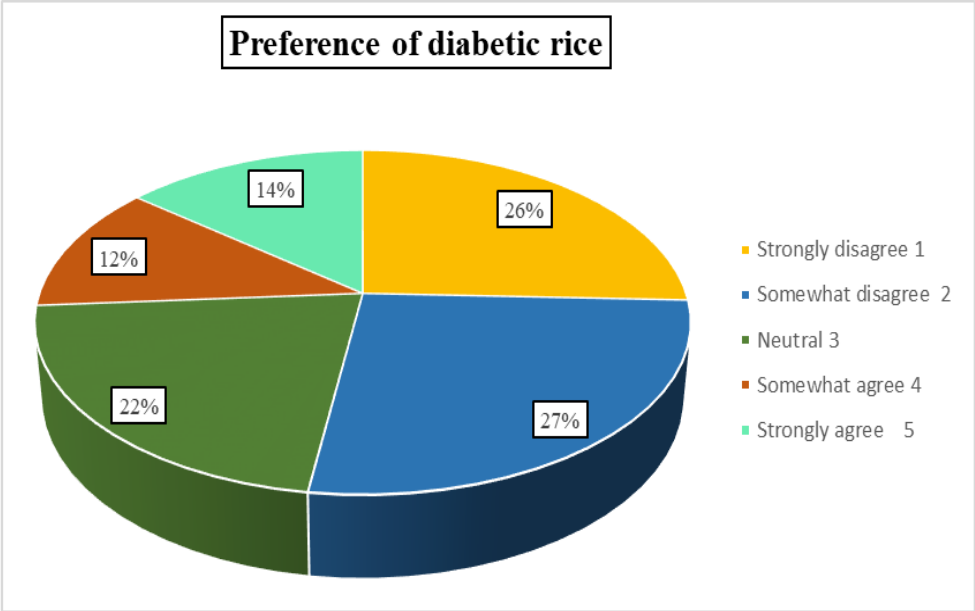

Fig 4.24: Consumers perception about preference of diabetic rice

Chapter Five

CONCLUSION AND RECOMMENDATION

CHAPTER 5

CONCLUSION AND RECOMMENDATION

5.1 Findings

The purpose of this thesis is to explore the relation between rice qualities and customer preferences in order to identify ways for improving rice quality and consumer behavior in Dhaka city. For this goal, we investigate the effects of rice features on consumers' WTP for rice, using the hedonic pricing technique.

The research was concerned with the factors Affecting Consumers' Purchasing Decision of Popular Rice Brands in Dhaka City. Findings in this research are presented below:

60% were female respondents and 40% were male respondents. 35% respondents were from the age group of up to 30 years, 52% respondents were from the age group of 30-50 years, 13% respondents were from the age group of above 50 years. 26% of respondents were service holder, 22% of the respondents were housewife, 21% of the respondents were job holder, 16% of respondents were Businessmen; 8% of the respondents were students and also lower income consumers. 47% of the respondent's family have only one earning member; 47% of the respondent's family have only 2 earning member; 6% of the respondent's family have 3 earning member. 42% of the respondents have 5 to 6 members of the family; 40% of the respondents have 2 to 4 members of the family; 18% of the respondents have above 7 members of the family. 52% of the respondents' qualification was graduate; 26% of the respondents' qualification was secondary level; 18% of the respondents' qualification was postgraduate; 3% of the respondents' qualification was primary level; 2% of the respondents' qualification was illiterate. 75% respondents were married, while 19% respondents were unmarried; 4% respondents were separated/ widowed and 2% respondents were divorced. This shows that the majority of respondents were married. 29% of the respondents were purchased Miniket; 20% of the respondents were purchased Najirshail; 17% of the respondents were purchased Paijam; 14% of the respondents were purchased Shorna; 10% of the respondents were purchased BR28; 6% of the respondents were purchased Katarivog and 5% of the respondents were purchased BR29. This indicates that Miniket brand made up the majority of the sample. 50% were

husband; 39% were wife; 10% were son and 2% were daughter. This indicates that the majority of the sample husband purchased rice. 47% of the respondents were purchased 11-25 kg of rice; 42% of the respondents were purchased 26-50kg of rice; 7% of the respondents were purchased 1-10 kg of rice and 5% of the respondents were purchased above 50 kg of rice. 84% were given "No" for the purchasing chalkiness rice; 80% were given "Yes" for the purchasing white rice; 84% were given "No" for the purchasing brown rice; 88% were given "No" for the purchasing bold grains of rice; 80% were given "No" for the purchasing medium-bold grains of rice; 65% were given "No" for the purchasing medium-slander grains rice; 39% were given "Yes" for the purchasing slander grains rice; 86% were given "No" for the purchasing rice with aroma; 79% were given "No" for the purchasing glutinous rice; 78% were given "Yes" for the purchasing non-glutinous rice and 85% were given "Yes" for the transparent grain of rice. 46% of the respondents were purchased 25 kg of packed rice; 33% of the respondents were purchased 10 kg of packed rice; 17% of the respondents were purchased 50 kg of packed rice and 5% of the respondents were purchased 5 kg of packed rice. 95% of the respondents were consumed rice twice a day; 4% of the respondents were consumed rice triple a day and 1% of the respondents were consumed rice once a day. 94% were given "Yes" for the price is an important factor when purchasing rice; 70% were given "Yes" for the purchase packed rice; 95% were given "Yes" for the cleanness in rice; 84% were given "No" for the current season rice; 92% were given "No" for the any inert matter in rice.

The main findings from this study showed that if consumer's income increased 1 percent, market price of rice would be increased by 11.42 percent. The magnitude is positive and statistically significant at 1% level of probability. This shows that increase consumer income would lead to pay higher rate for purchasing rice. Besides, generally, consumer like to eat white rice. After controlling other variables, if color of rice is white, market price of rice would be increased by 8.81%. This variable found to be positive and statistically significant at 5% level of probability. This shows that increase in demand of white rice would lead to pay higher price for purchasing rice. Additionally, aroma in rice is important trait and consumer pay more for this. After controlling other variables, if aroma exist in rice, market price of rice would be increased by 45.69%. The aroma in rice dummy found to be positive and statistically significant at 1% level of probability. Moreover, some

consumers like to eat glutinous rice and want to pay for this. After controlling other variables, if rice is glutinous, market price of rice would be increased by 9.31%. Glutinous in rice dummy variable found to be positive and statistically significant at 10% probability level. Also, after controlling other variables, if it is medium bold grain rice, market price of rice would be increased by 26.43%. Medium bold rice dummy variable found to be positive and statistically significant in 1% probability level. This shows that increase the demand for medium bold rice, consumer would pay more for it. As well, after controlling other variables, if it is medium slander grain rice, market price of rice would be increased by 19.99%. Medium slander grain rice dummy variable found to be positive and statistically significant at 1% level of probability. This shows that increase in medium slander grain rice dummy would lead to pay higher for it. In addition, after controlling other variables, if it is slander grain rice, market price of rice would be increased by 36.33%. Slander grain rice dummy variable found to be positive and statistically significant at 1% level of probability. This shows that increase in slander grain rice would lead to pay higher for it. The findings are similar with those of previous investigations.

From the study we estimated that HCR is 5%. It is less than national poverty level (18%). Alternatively, PGI is 0.0061%. The mean proportional poverty gap in the population is compared to the non-poor, which has near to zero gap. Poverty depth provide complementary information on the incidence of poverty. It might be the case that in this study area there are a low gap. The measures of SPI is 0.0013%. This poverty severity provides complementary information on the incidence of poverty. It might be the case that in this study area there are a low poverty severity.

Third, we used a Likert scale to assess customer awareness of health, brand and packaging, quality, taste, and rice choice which are collecting of data from 200 customers. Some people firmly believe that the projected findings are compatible with those of previous studies. The respondent asked to give their opinion about the statement about “rice is a source of carbohydrate” and 28% of the respondent were neutral in this point. The respondent asked to give their opinion about “rice can reduce heart disease and stroke” and 37% of the respondent were somewhat disagree in this point. The respondent asked to give their opinion about the statement about “rice is the cause of obesity” and 34% of the

respondent were somewhat agree about the statement. The respondent asked to give their opinion about the statement about “rice is the cause of diabetics” and 26% of the respondent were somewhat disagree about the statement. Also, customers given opinion about rice, brand and packaging statement. The respondent asked to give their opinion about the statement about “price is an important factor while purchasing rice” and 44% of the respondent were strongly agree in this point. The respondent asked to give their opinion about the statement about “brand name is very important when purchasing rice” and 26% of the respondent were strongly disagree and also strongly agree in this statement. The respondent asked to give their opinion about the statement about “packaging of rice to be attractive” and 25% of the respondent were neutral in this point. The respondent asked to give their opinion about the statement about “advertising influences the purchasing of rice” and 30% of the respondent were somewhat disagree in this point. The respondent asked to give their opinion about the statement about “government needs to monitor market price of rice” and 44% of the respondent were strongly agree in this point. The respondent asked to give their opinion about the statement about “display different prices of rice in the market based on quality, types or origin” and 45% of the respondent were somewhat agree in this point. Moreover, customers given opinion about rice quality statement. The respondent asked to give their opinion about the statement about “availability of zinc rice” and 23% of the respondent were somewhat disagree in this point. The respondent asked to give their opinion about the statement about “preference of organic rice” and 40% of the respondent were somewhat disagree in this point. The respondent asked to give their opinion about the statement about “research need to develop finer varieties” and 54% of the respondent were neutral in this point. The respondent asked to give their opinion about the statement about “polishing rice can reduce its quality” and 84% of the respondent were strongly agree in this point. The respondent asked to give their opinion about the statement about “do not get proper nutrition by eating rice” and 62% of the respondent were somewhat agree in this point. The respondent asked to give their opinion about the statement about “rice boils too quickly” and 71%of the respondent were strongly agree in this point. The respondent asked to give their opinion about the statement about “rice needs to boil long time” and 61% of the respondent were strongly disagree in this point.

Alternatively, customers given opinion about consumers' taste and preference of rice statement. The respondent asked to give their opinion about the statement about "preference of zinc rice" and 49% of the respondent were strongly disagree in this point. The respondent asked to give their opinion about the statement about "preference of organic rice" and 40% of the respondent were somewhat disagree in this point. The respondent asked to give their opinion about the statement about "preference of finer rice" and 37% of the respondent were somewhat agree in this point. The respondent asked to give their opinion about the statement about "preference of polishing rice" and 60% of the respondent were strongly disagree in this point. The respondent asked to give their opinion about the statement about "preference of diabetic rice" and 27% of the respondent were somewhat disagree in this point.

5.2 Recommendation

The results of this study suggest that higher income, white rice, improved aroma, slander grain rice, and increased transparency of non-glutinous rice can all lead to a boost in customer demand and market price for rice. To increase rice purchases, consider lowering the amount of brown rice, improving packaging, and reducing rice chalkiness and inert materials. According to the Likert scale, buyers prefer finer rice, regardless of price. However, customers did not favor polishing rice.

Taking into account those considerations, we suggest some recommendations for policy.

- Consumer in the study area prefer white rice and aroma in rice. Researcher need to develop white rice and aroma in rice varieties for the rice consumers. The consumer in the study area also prefers non-glutinous rice.
- Government needs to support the researcher or breeders to invent new rice varieties with more aroma and non-glutinous rice.
- Consumer prefer transparent rice and they also prefer slander rice grain. More research is also need to invent these type of rice varieties.
- It is necessary to improve the rice quality. Department of agricultural marketing need to monitor rice processing in the country. Moreover, government need to

reduce tariff for importing rice processing equipment's which also help to maintain rice quality in this country.

5.3 Conclusion

Identifying fundamental variables influencing customer purchases of popular rice brands is critical in Bangladesh. Appropriate research has not been conducted in this essential field. So, highly thorough and in-depth study efforts are urgently needed to provide information for customers to make decisions about purchasing rice.

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APPENDIX

Questionnaire of the research:

Sl no:

Date:

Socio-economic characteristics of rice consumers in Dhaka city:

1) Name:

   _____

2) Address:

   _____

   _____

   _____

3) Phone number: _____

4) Gender
   a) Male
   b) Female

5) Age: _____years

6) Occupation: _____

7) Income earning member (no.): _____

8) Education level: _____

9) Household size:

   Age below 15 years: _____ Age 15 years and above: _____ Total: _____

10) Marital status
   a) Married
   b) Divorced
   c) Separated or widowed
   d) Unmarried

11) Location of purchase rice:
   a) Traditional bazar
   b) Super shop/chain shop
   c) Wholesale shop
   d) Retailer shop

e) Online shop

f) Others

Purchasing behavior of consumers on rice:

12) Which popular rice brand do you purchase?

a) Najirshail

b) BR28

c) BR29

d) Shorna

e) Katarivog

f) Paijam

g) Miniket

h) Basmati (Bangladeshi)

i) Basmati (India/Pakistan)

j) Others…….

13) Responsibility of rice (brand) purchasing decision:

a) Father

b) Mother

c) Son

d) Daughter

14) Frequency of purchasing rice (brand):

a) Daily

b) Weekly

c) Fortnightly

d) Monthly

15) Amount of Rice purchase each time: _____ kg

16) Do you purchase Indian rice? Yes/No, Name: _____ if yes how much do you pay per kg of rice? ……., Ratio of broken rice (%): _____

17) Do you purchase Thai rice? Yes/No, Name: _____ if yes how much do you pay per kg of rice? …… Ratio of broken rice (%): _____

18) Do you purchase Vietnamese rice? Yes/No, Name: _____ if yes how much do you pay per kg of rice? …… Ratio of broken rice (%): _____

19) Do you purchase Bangladeshi rice? Yes/No, Name: _____if yes how much do you pay per kg of rice? …… Ratio of broken rice (%): _____

20) Do you purchase chalkiness rice? □Yes/ □No

21) Do you purchase white rice? □Yes/ □No

22) Do you purchase brown rice? □Yes/ □No

23) Do you purchase bold grains of rice? □Yes/ □No

24) Do you purchase medium-bold grains of rice? □Yes/ □No

25) Do you purchase medium-slander grains of rice? □Yes/ □No

26) Do you purchase slander grains of rice? □Yes/ □No

27) Size of packaging for purchasing rice

a) 5 kg
b) 10 kg
c) 25 kg
d) 50 kg

28) Consumption of eating rice

a) Once a day
b) Twice a day
c) Triple a day

29) Do you think the price is an important factor when purchasing rice? □Yes/ □No

30) Whether there is any inert matter in your rice? □Yes/ □No

31) Do you think rice availability in the market is important when purchasing rice? □Yes/ No

32) Do you purchase packed rice? □Yes/ □No

33) Do you like cleanness in your rice? □Yes/ □No

34) Do you like current season rice? □Yes/ □No

35) Do you purchase rice with aroma? □Yes/ □No

36) Do you purchase glutinous rice? □Yes/ □No

37) Do you purchase non-glutinous rice? □Yes/ □No

38) Do you purchase transparent grain of rice? □Yes/ □No

39) Whether rice has a presence volume of expansion? □High/ □Low

40) Please rate your agreement about health related statement:

Items	Strongly disagree 1	Somewhat disagree 2	Neutral 3	Somewhat agree 4	Strongly agree 5
Rice is a source of carbohydrate, protein, minerals and antioxidants					
Rice can reduce heart disease and stroke					
Rice is the cause of obesity					
Rice is the cause of diabetes					

41) Please rate the following statement about rice, brand and packaging:

Items	Strongly disagree 1	Somewhat disagree 2	Neutral 3	Somewhat agree 4	Strongly agree 5
Price is an important factor for you while purchasing rice					
The brand name is very important when purchasing rice					
Advertising influences the purchasing of rice					
It is important for the packaging of rice to be attractive					
The price of rice is increasing regularly					
Government needs to monitor market price of rice					
It is necessary to display different prices of rice in the market based on quality, type or origin					

42) Please rate the following statement about rice quality:

Items	Strongly disagree 1	Somewhat disagree 2	Neutral 3	Somewhat agree 4	Strongly agree 5
It is necessary of zinc rice to be available in the market					
It is necessary of organic rice to be available in the market					
It is necessary of diabetics to be available in the market					
Research need to develop finer varieties of rice for consumers					
Polishing rice can reduce its quality					
We do not get proper nutrition by eating rice					
Nowadays, rice boils too quickly					
Nowadays, rice needs to boil long time					

43) Please rate the following statement about your taste and preference of rice:

Items	Strongly disagree 1	Somewhat disagree 2	Neutral 3	Somewhat agree 4	Strongly agree 5
Prefer to buy zinc rice regardless of its price					
Prefer to buy organic rice regardless of its price					
Prefer to buy finner rice regardless of its price					
Prefer to buy polishing rice regardless of its price					
Prefer to buy diabetic rice regardless of its price					

44) Household expenditure (Monthly):

Expenditure items	Amount (Tk.)	Expenditure items	Amount (Tk.)
1) Food: Cereals		11) Washing and cleaning	
2) Food: Non-cereals		12) Transport	
3) Clothing (yearly)		13) Recreation and leisure	
4) Housing		14) Social activities	
5) Education		15) Vegetables	
6) Medical		16) Fish	
7) Leather (yearly)		17) Meat	
8) Fuel		18) Edible oil	
9) Lighting/ electricity		19) Egg	
10) Cosmetics and others		20) Others (…….....)	

45) Monthly income from farm, non-farm and off-farm activities by family members:

Income source	Amount (Tk.)	Income source	Amount (Tk.)
1) Income from Agriculture (yearly)		10) Tutor	
2) Service (GOs)		11) Remittance	
3) Service (NGO)		12) Construction worker	
4) Government assistance		13) Shop keeper	
5) Private job		14) Petty business	
6) Multinational company		15) Van/rickshaw pulling	
7) Banker		16) Wage labor	
8) Business		17) Income from garments	
9) Teacher		18) Others (…….)	

Signature of the interviewer: _____