UNIVERSITY OF GHANA

COLLEGE OF BASIC AND APPLIED SCIENCES

ANALYSIS OF CONSUMERS’ WILLINGNESS TO PAY PREMIUM FOR CERTIFIED ORGANIC CABBAGE IN THE ACCRA METROPOLITAN AREA

BY

TERRY KWABENA JUMAH

10352541

A THESIS SUBMITTED TO THE UNIVERSITY OF GHANA IN PARTIAL FULFILMENT OF THE REQUIREMENT FOR THE AWARD OF THE DEGREE OF MASTER OF PHILOSOPHY IN AGribusiness

DEPARTMENT OF AGRICULTURAL ECONOMICS AND AGribusiness

JULY, 2017
DEDICATION

I dedicate this piece of work to God for His goodness, my mother Mrs. Mercy Jumah for her encouragement every step of the way, and my siblings, Nicola and Euene whom the very thought of them alone spurred me on to do this.
DECLARATION

I, TERRY KWABENA JUMAH, author of this thesis titled, “ANALYSIS OF CONSUMERS’ WILLINGNESS TO PAY PREMIUM FOR TRACEABLE ORGANIC CABBAGE IN ACCRA METROPOLITAN AREA” do hereby declare that with the exception of references to past and current literature duly cited, the research presented in this thesis was done entirely by me in the Department of Agricultural Economics and Agribusiness, University of Ghana, Legon from August 2016 to July 2017. This work has never been presented either in whole or in part for any other degree of this university or elsewhere.

...........................................
TERRY KWABENA JUMAH
(STUDENT)

...........................................
DR. HENRY ANIM-SOMUAH
(MAJOR SUPERVISOR)

...........................................
PROF. RAMATU ALHASSAN
(CO-SUPERVISOR)
ACKNOWLEDGMENT

Words cannot describe my unending gratitude to the One who made this happen; from the enthusiasm in the beginning of the work, through the struggle of getting the work done and meeting deadlines- GOD. For His grace, strength, provision, and opportunity of daily life to do the thesis work was a privilege, and I am most grateful for that. My thanks also goes to my family, my mum Mrs. Mercy Jumah for her support in every way possible to see that I complete this work successfully. A special gratitude goes my uncle and aunt Mr. and Mrs. Ato Essel Mensah for the love they showed to me during my programme in cash and kind. I am eternally appreciative of their efforts, and God bless them.

My sincerest gratitude goes first to my major supervisor Dr. Henry Anim-Somuah, for his help in this thesis work, especially in focusing on exactly what to do. Secondly to Prof. Ramatu Alhassan, for her constant direction, guidance and patience she had towards me, and the counsel she gave. I’m extremely grateful for their efforts even in their tight moments, still ensuring the work was done and not losing hope in and for me.

I also thank my friends Emmanuel Nyinaku, Philip Agyemang Duah, Terry Akyea, Kwadwo Sarfo Siaw-Adane, Ralph Blaboe, Jacob Ankamah, just to mention a few, for their help and friendly support in their own unique ways.
ABSTRACT

Taking into account the danger in the continual use of synthetic chemicals in the production of vegetables and the increase in demand for organic products, this research set out to ascertain the perception of consumers on organic products, and estimate consumer willingness to pay for organic cabbage in the Accra metropolitan area of Ghana. Furthermore, the study identifies the factors that influence the consumers’ willingness to pay premium for organic cabbage. A face-to-face household-level survey of 260 respondents was conducted in Accra, Ghana in 2017 with a structured questionnaire. About 68 percent of the respondents know what organic products are by definition but 57.3 percent claim to have not consumed organic cabbage before especially because they cannot identify one. The double-bounded dichotomous choice contingent valuation method (CVM)-bidding game, was employed to elicit consumers’ WTP information. The study found that, most consumers had positive perception on organic fruits and vegetables with benefit perception index (BPI) of 0.656, quality perception index (QPI) of 0.44. The empirical results also show that age, education, income, gender, and household size significantly influence consumers’ WTP. Also product characteristics such as size, freshness and cleanliness statistically influence consumers’ WTP for organic fruits and vegetables positively.
# TABLE OF CONTENT

DEDICATION .................................................................................................................. i

DECLARATION ............................................................................................................... ii

ACKNOWLEDGMENT ..................................................................................................... iii

ABSTRACT ....................................................................................................................... iv

TABLE OF CONTENT .................................................................................................... v

LIST OF TABLES ........................................................................................................... viii

LIST OF FIGURES ......................................................................................................... ix

LIST OF ABBREVIATIONS ............................................................................................ x

CHAPTER ONE ............................................................................................................ 1

1 INTRODUCTION ........................................................................................................ 1
  1.1 Background of Study ............................................................................................... 1
  1.2 Problem Statement ................................................................................................. 4
  1.3 Objectives ............................................................................................................... 7
  1.4 Justification ............................................................................................................ 8
  1.5 Organisation of the study ....................................................................................... 9

CHAPTER TWO ............................................................................................................ 11

2 LITERATURE REVIEW ............................................................................................ 11
  2.1 Introduction ........................................................................................................... 11
  2.2 Theory of consumer behaviour ............................................................................. 11
    2.2.1 Concept of Consumers’ willingness to pay for organic products ...................... 12
    2.2.2 Measurement of WTP .................................................................................... 13
    2.2.3 Consumer preferences and WTP for and demand organic products ................. 16
  2.3 Product Attributes Affecting Consumers’ WTP for Organic Products .................. 17
  2.4 Empirical Studies on Consumer Behaviour .......................................................... 18
  2.5 Consumer Attitude and Perception towards Organic Products ............................ 20
2.6 Empirical studies on Consumers’ Willingness to Pay Premium for Organic Products. 24

CHAPTER THREE .............................................................................................................. 27

3 METHODOLOGY ........................................................................................................ 27
3.1 Introduction ............................................................................................................. 27
3.2 Conceptual Framework ....................................................................................... 27
    3.2.1 Consumer’s Utility ....................................................................................... 30
3.3 Contingent Valuation Method and Consumers’ willingness to Pay .................. 30
3.4 Empirical discussion on the Binary logit regression model ......................... 31
    3.4.1 Definition of variables and their a priori expectation ............................... 33
3.5 Determining Consumer’s Willingness to Pay Premium for Organic Products ... 36
    3.5.1 Determining Mean Willingness to Pay Amount ..................................... 41
3.6 Data Collection .................................................................................................... 41
    3.6.1 Sampling Procedure, sample size and survey instrument ....................... 42
    3.6.2 Pre-Testing ................................................................................................. 44
3.7 The Study Area .................................................................................................... 44

CHAPTER FOUR ............................................................................................................. 47

4 RESULTS AND DISCUSSION .................................................................................. 47
4.1 Introduction ............................................................................................................. 47
4.2 Socio-economic Characteristics of respondents ............................................. 47
4.3 Consumer Awareness Level on Organic Food Products and Source of information .. 51
4.4 Consumers’ Perception of Organic Products in the area ................................ 53
4.5 Determining Consumers’ Willingness to Pay Premium for Organic Cabbage ...... 59
    4.5.1 Determination of Consumer’s WTP Amount ........................................... 61
4.6 Factors that influence willingness to pay premium for traceable organic cabbage in the area ............................................................................................................. 64

CHAPTER FIVE ............................................................................................................. 69

5 SUMMARY, CONCLUSION AND RECOMMENDATIONS ........................................ 69
5.1 Introduction ............................................................................................................. 69
5.2 Summary of major findings ................................................................................. 69
LIST OF TABLES

Table 3.1 Bid Design for organic cabbage ................................................................. 40
Table 3.2 Household distribution within the Sampled Towns ........................................ 43

Table 4.1 Distribution of socio-demographic Characteristics of respondent .................. 48
Table 4.2 Classification of Key Characteristics (Household Size, Level of education and Household Income Based on Income Strata) ................................................................. 49
Table 4.3 Knowledge on organic products and sources of information ............................ 52
Table 4.4 Respondents’ Perception of organic products .................................................. 54
Table 4.5 Consumers’ Perception of Organic Products Based on Income Strata ................. 57
Table 4.6 Willingness to Pay Premium Price Distribution for Organic Cabbage ............... 60
Table 4.7 Mean Willingness to Pay for Organic Cabbage (LIH) ...................................... 61
Table 4.8 Mean Willingness to pay for organic cabbage (MIH) ........................................ 62
Table 4.9 Mean Willingness to Pay for Organic Cabbage (HIH) ...................................... 63
Table 4.10 Binary Logitistic Regression Result: WTP premium for Organic Cabbage .......... 64
LIST OF FIGURES

Figure 3. 1 Framework showing the behavior of consumers toward food products................. 29
Figure 3. 2 Four Possible outcomes of the bidding game....................................................... 39
Figure 3. 3 Map showing the sampled communities for respondents...................................... 46

Figure 4. 1 Distribution of Sources of Awareness................................................................. 53
**LIST OF ABBREVIATIONS**

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Full Form</th>
</tr>
</thead>
<tbody>
<tr>
<td>AMA</td>
<td>Accra Metropolitan Area</td>
</tr>
<tr>
<td>CVM</td>
<td>Contingent Valuation Method</td>
</tr>
<tr>
<td>FAO</td>
<td>Food and Agriculture Organization</td>
</tr>
<tr>
<td>FiBL</td>
<td>Swiss Research Institute of Organic Agriculture</td>
</tr>
<tr>
<td>GOAN</td>
<td>Ghana Organic Agriculture Network</td>
</tr>
<tr>
<td>HIS</td>
<td>High Income Suburb</td>
</tr>
<tr>
<td>IPM</td>
<td>Integrated Pest Management</td>
</tr>
<tr>
<td>IFOAM</td>
<td>International Federation of Organic Agriculture Movements</td>
</tr>
<tr>
<td>LIS</td>
<td>Low Income Suburb</td>
</tr>
<tr>
<td>MIS</td>
<td>Middle Income Suburb</td>
</tr>
<tr>
<td>MoFA</td>
<td>Ministry of Agriculture</td>
</tr>
<tr>
<td>NGO</td>
<td>Non-governmental organization</td>
</tr>
<tr>
<td>RUAF</td>
<td>Resources Centre on Urban Agriculture Foundation</td>
</tr>
<tr>
<td>WTP</td>
<td>Willingness to Pay</td>
</tr>
</tbody>
</table>
CHAPTER ONE
INTRODUCTION

1.1 Background of Study

Agriculture is an important part of a Ghana’s economy and this consists of two key cropping systems; organic and conventional (inorganic) production. There have been increases in the interest and patronage of organic food production and its products lately. This is due to very important reasons like environmental problems, human health problems, issues related directly and indirectly through food and other biotic mechanisms, and the like, resulting therefore in the shift in preference sequence of food products from the conventional to the organically grown. Additionally, Kleeman (2011) states with organic pineapple as an example that organic products are priced more than the conventional types on the market, resulting in the small-scale farmers moving on from conventional to organic production, which might contribute to reaping increase in profits from their investments. Although the organic sub-sector in Ghana is relatively underdeveloped, the area of land allocated for the cultivation of organic food stuffs augmented from an estimated 13474.66 acres (5,453 hectares) to 47276.20 acres (19,132 hectares) in the 2003 and 2006 years respectively (Yussefi & Willer, 2003). However, the 19,132 hectares accounts for only 0.13 % of the total area under agricultural production in Ghana (IFOAM and FiBL 2006). In spite of that, the conventional method employed in the production of foods is controlled largely by companies or corporations engage in foreign direct investments, have and control chapters of their businesses in other nations, and own large-scale plantations. There is the incidence of monopoly making small scale farmers suffer in the long run, and are not able to penetrate and compete fairly in the market.
Organic farming is the type that only does not involve using synthetic pesticides, genetically modified foods, large amounts of fertilizer, etc. but a system fashioned to effectively make use of available input resources for productivity and to develop enterprises that are sustainable and beneficial to the environment (Valerian, Domonko, Mwita, & Shirima, 2011). Examples of fruits and vegetables preferred by consumers, when going in for organic products depending on the target group are pineapples, apples, mango, lettuce, oranges, potatoes, carrots and cabbage. The market for organic fruits and vegetables is a niche not yet monopolized by few large firms in the clear case of pineapple in Ghana, however, demand for these products increase by time, and are becoming more popular among consumers (Kleeman, 2011). This indicates the potential growth and benefits organic farming and consumption of its products has to offer for Ghana if adopted. However, in the trend, increase in the demand of organic foods by the Europeans, the Americans and other countries is more steady. The organic food industry on the international front continue to grow, estimating organic food and drink sales at about 64 billion US dollars in 2012. The demand is mainly concentrated in Europe and North America, comprising of about 90 percent of total sales globally (Sahota, 2013).

In Accra, Ghana, ordinary consumers of uncooked vegetables is estimated to be more than 280,000 apart from the household daily consumption from food purveyors like restaurants, food vendors, fast food outlets, etc. (Obuobie, et al., 2006). Again, the authors forwarded that food vending businesses in the city Accra alone purchase or consume 98 percent of all lettuce brought to market. This has encouraged growing vegetables in the cities and more developed areas in Ghana and Greater Accra region, and now become one business known and accepted. This is evident as farmers’ can be found in local markets, open areas along water bodies and even
around lanes of airports from production of vegetables in large quantities (Assogba-Komlan F.,
2005; Brock, 1999; Obuobie, et al., 2006).

Records to prove without a reasonable doubt the dangerous risks associated with acute and
chronic exposure is limited, but gives all the more reason for uncertainty and anxiety. In Amoah
et al., (2006) and Assogba-Komlan and Anihouvi (2007) research, high levels of different
pesticides exceeding minimum residue requirements are applied to vegetables in Accra and
Cotonou respectively; and a more recent study in Cotonou uncovered illegal pesticides and high
residue levels in vegetable samples (Sæthre, Assogba-Komlan, Svendsen, Holen, & Godonou,
2011). In order to also help curb this recurring problem it is worth considering the option of
basing the organic products on the assurance system and certification.

A good example is the certification of farms that grow some of Ghana’s main export products
such as fresh fruits, cocoa, cashew, vegetables and oil palm (International Federation of Organic
Agriculture Movements (IFOAM), 2003). Traceability and certification with regard to food is
particularly important when a food safety triggering event happens. It enables prompt and easy
identification, separation and proper disposition of damaged food stuffs from the market, only if
practiced fully. The potential number of sicknesses, rate of deaths and damage to the markets can
then be diminished or avoided as a positive turnout. Rembialkowska (2007) in that light agreed
that certified organic production with appropriate marketing strategies communicates to
consumers a more believable system of safety, ensuring a reduction of risk regarding agro-
chemical contamination. Additionally, systems established under certified organic farming have
more solid and trusted provisions to keep food safer than conventional production systems
(Hansen et al, 2002). This is realized when synthetic pesticides are excluded from production and
post-harvest handling activities.
In Benin (Presidence de la Republique du Benin, 1991), Ghana (Parliament of the Republic of Ghana, 1965) and Burkina Faso (President du Faso, 1998) the distribution and use of pesticides are tightly controlled by full functioning regulations. Projects in Benin for instance on integrated pest management (IPM) and sustainable urban farming have focused on formulating strategies to effectively protect plant life in Cotonou and Porto Novo, respectively (James et al., 2006; RUAF Foundation, 2010). In Ghana, the World Bank (2008) and MoFA have drafted the “‘Revised Food Safety Action Plan,’” and several institutions involving urban farmers have established projects that included training on integrated pest management, e.g. “‘From Seed to Table’” (RUAF Foundation, 2010). Burkina Faso has also taken the bold step by adopting an IPM program which works closely with partners like the Food and Agriculture Organization (FAO) to solve various problems concerning plant protection in urban farming systems (Nacro, 2007, 2008).

1.2 Problem Statement

The health benefits from the consumption of vegetables couldn’t be overemphasized; risk reduction of heart disease including stroke and heart attack, protection against some types of cancer, lower blood pressure, may reduce the risk of developing kidney problems just to name a few. In a converse perspective, production methods used by vegetable farmers, particularly for this study on cabbage, has amounted to a lot of issues. Part of the reasons why farmers employ the conventional style of production using large amounts of synthetic pesticides and other chemical products is because of the seemly high demand for cabbage in the urban areas. This speeds up the growth levels of the vegetable, consequently affecting environmental quality, food
safety and health of the final consumer. The advocacy to go in for fruits and vegetables is laudable but is a cause to lift eyebrows on its health implications due to the methods used by farmers (Obuobie, et al., 2006). Brempong-Yeboah (1992) observed that large quantities of synthetic chemical pesticides were applied to the crop in high and unknown volumes, and different mixtures by cabbage farmers in the Accra plains to destroy the notorious diamondback moth. Not only were the dosages applied in these high and unknown proportions, but also detected that the growers also sprayed at 2-3 day intervals. Some of the insecticides documented to have been used in Ghana include Permethrin (Brempong-Yeboah, 1992) and chlorpyrifos (Mawuenyegah, 1994). The increased use of insecticides has been compounded by a large number of pesticides on the Ghanaian market. Although organic farming without a shadow of doubt has been considered an effective way to improve food safety and environmental quality (Wang & Sun, 2003) its adoption in most sub-Saharan African countries is highly determined by the market potential (size) and marketing prospects (demand) for organic food products (Hine & Pretty, 2007).

Furthermore, study trends observed show that general purchase consumer-behaviour differ from pro-environmental behaviour. The benefits and cost of a product is first assessed by the consumer, which in turn drives his or her behavior towards the product. By contrast, an environmentally conscious behavior is mainly focused on the positive long term effects for people and the environment; even though it does not provide personal satisfaction or gratification instantly, it makes the total well-being of the society priority and everyone enjoys the benefits (McCarty & Shrum, 2001; Kim & Choi, Advances in Consumer Research, 2005). However, during very recent periods, it can be observed that consumer health and wellbeing all over the world is severely threatened by dangerous and unpleasant conditions of the environment.
Consumers have therefore began considering their perception and attitude towards the environment, the choices they make in terms of the products they prefer, as well as their purchases (Sarigollu, 2009).

Nouhoheflin et al. (2004) and Norman (2007) indicated that opportunities for gainful employment, wealth creation avenues hence drastic poverty reduction levels are some of the advantages organically produced vegetables and fruits could significantly contribute to wellbeing of Ghanaians. It is also advantageous for producers in terms of increased income opportunities as it provides raw materials for both local and foreign food industries, eating joints like, chop bars, restaurants, etc. and the retail market points, supermarkets especially.

In addition, the method of organic production and its marketing system in sub-Saharan Africa including Burkina Faso, Ghana and Benin is weak (Willer & Yussefi, 2006). Ghana does not have the domestic market for organic foods to merit as important for consideration, causing the development of the sub-sector to depend on the demand abroad for premium food products. In that regard, organic production directives are given to the local producers by the European agencies that be, to pass them and exporters they work with for trade overseas. This puts the local market in a disadvantaged position of enjoying the benefits organic production of vegetables or food can bring; like ensuring food safety.

A number of research works and papers on consumer studies have been done; consumption of organic food products examined particularly in developed countries (Wier and Calverly 2002; Cranfield and Magnusson 2003). However, only a handful of these studies of consumers and their interests in organic food products are available in Ghana, (Nouhoheflin T. , Coulibaly, Cherry, Al-Hassan, & Adegbola, 2004) and other countries that are developing (Piyasiri and
Ariyawardana 2002; Rodriguez et al. 2007; Aryal et al. 2009). Issues pertaining to consumer willingness to pay (WTP) a premium for organic vegetables compared to the conventional ones in Ghana have not been thoroughly addressed, hence the need to have reliable information from the consumers on what they know about organic production (and awareness), how they perceive organic products, whether they will be willing to pay an extra amount for them and the factors that inform their willingness to pay.

This therefore leads the researcher to ascertain willingness to pay premium for organic cabbage based on a quality assurance and certified system through the following questions:

1) To what extent are consumers aware of certified organic cabbage?

2) What are the consumers’ perceptions of certified organic cabbage in the Accra Metropolitan Area?

3) Are consumers willing to pay for certified organic cabbage in the area?

4) What are the factors that determine consumers’ willingness to pay premium for organic cabbage?

1.3 Objectives

The main objective is to analyze the consumer’s willingness to pay premium for certified organic cabbage in the Greater Accra metropolitan area. The specific objectives are;

1) To find out the level of consumer awareness on organic products in the Accra Metropolitan area.
2) To ascertain the consumers’ perception of certified organic cabbage in the area.

3) Estimate the consumers’ willingness to pay for certified organic cabbages in the area based on quality assurance systems like traceability.

4) To identify the factors that influence willingness to pay premium for certified cabbage in the area.

1.4 Justification

The continuity of the organic sector depends on whether there is strong demand by consumers for it and their rationale for paying premium for such products, as compared to the conventionally grown ones (Lockie, Lyons, Lawrence, & Mummery, 2002). The study will be therefore imperative as it attempts to find out the perceptions and attitudes of consumers concerning organic cabbage proffered to them based on the traceability system. This will provide researchers and policy-makers information to form effective strategies for agri-food ventures, the actors involved, and the particular target markets.

The general public is all the more worried about the safety of food products, seeing the misapplication and/or the excessive use of chemical fertilizers, growth inducing hormones, pesticide residues, GM organisms, etc. This has resulted in consumers not trusting the food products cultivated these days because of the awareness of environmental quality issues spreading by the moment, which has led to an expanding demand for naturally grown food products. (Thompson, 1998; Rimal & Moon, 2005). Cheftel (2005) elucidated that organic fruits and vegetables (in this case cabbage) consumption would help cut down on public health costs for indigenes in a country as well as the country in general.
This study thereupon seeks to heighten the benefits of organic vegetable or food production to mass consumer segment (the nation) and encourage the selected consumer segment for this study patronize more organic products for their businesses, if not all the time.

The empirical results of this study would provide quantitative WTP estimates, and the availability of monetary estimates on individuals WTP for organic vegetables would help in the design and execution of suitable national incentive programme for the diffusion and adoption of more environmentally friendly agricultural practices. The findings from this study would be useful to organic food industry players in designing and implementing programs relating to organic fruits and vegetable production. The study would provide insights to producers and retailers with regard to how much the consumer would be willing to pay at marketplaces and food industries for reductions in perceived risk.

Last but not least, the analysis is relevant for the emerging organic food industry and to furnish them with information to formulate marketing plans and identify the target groups.

1.5 Organisation of the study

The study is gathered and arranged in five chapters. The first chapter introduces the research work with the problem, research questions, objectives and the justification of the study. Chapter two gives an extensive review on literature concerning the theory of consumer behavior, under which the concept of consumer’s willingness to pay for organic products, measurement of WTP, and consumer preferences and WTP for and demand organic products will be discussed. The product characteristics affecting consumers’ WTP will also be discussed, followed by empirical studies on consumer behaviour, consumers’ attitudes and perceptions on organic food market
potential and marketing prospects, and finally empirical studies on consumers WTP premium for organic products. The factors that influence the consumers’ willingness to pay premium for certified organic cabbage (Some socio-economic variables and product properties that affect consumers’ willingness to purchase the organic products inclusive) ends the chapter. Chapter three discusses the conceptual framework on willingness-to-pay (WTP) premium, which includes consumers’ utility and willingness to pay, willingness to pay and contingent valuation method, the estimation of mean WTP, empirical discussion on the factors influencing WTP, the sampling techniques taken and used for data collection and the sample size of the study. It finally describes the study area. Chapter four discusses the data collected and the empirical findings. Chapter five provides a summary of the research findings, conclusion and some policy recommendations.
CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter is made up of five main sections. The first section explains the theory of consumer behaviour, with specifics on the general concept of willingness to pay, measurements of willingness to pay, consumer preferences with regard to willingness to pay and demand for organic products as sub-sections. Section two outlines the product characteristics (attributes) affecting consumer’s willingness to pay for organic products. The third section covers empirical studies on consumer behavior and the fourth on the consumer attitude and perception towards organic products in a general perspective. The fifth and final section throws light on empirical studies of consumer WTP premium including the effect of knowledge and perceptions on behaviour.

2.2 Theory of consumer behaviour

Consumer behavior theory has been one of very interesting areas to researchers. It has an effect on the consumer’s final decision on a particular product. For instance three economists namely John von Neumann, Oskar Morgenstern and Nicholas Bernoulli (lead economist) in 1953 examined the basis of consumer decision making and found out, from the use of the most apt model (Utility theory), that the expected outcomes of consumers’ decisions is as a result of the choices they make (Richarme 2005).
From Lancaster’s (2001) perspective, consumer buying behaviour includes activities involved in the purchase and use of products or services for reasons of personal interests and for the household. The consumer buying behaviour is affected by factors such as; psychological (perception, motivations and attitude), lifestyle, demographic and economic variables. It is also worth noting that this finding by Padberg, (2002) that emotions, attitudes and motives are the fundamental determinants or forces of consumer behavior, hence the stronger the emotion the stronger and clearer the motive, and the more positive (negative) the attitude is toward the product, the higher (or lower) the chance of purchase.

The hierarchy of needs or theory of motivation by Maslow in agreement with the above theories makes clear that human needs function based on a willingness of action (motivation) at the subconscious level, and finally results in the conscious part of the mind evaluating making decisions based on the motivation (Seeley, 1992).

2.2.1 Concept of Consumers’ willingness to pay for organic products
There are quite a number of different ideas employed made appealing in order to properly study consumers’ thoughts or impressions on prices. In considering the process of consumer price perception, it is important to establish that WTP relates closely with how high or low the consumer sees the price of the particular product to be (reference price, acceptable price) and is joined with other factors that will affect decision making (satisfaction, loyalty and culture). Consumer’s willingness to pay for a particular product refers to the maximum amount a consumer of that product is willing to sacrifice for one unit of the product; the amount of money a person would be willing to tender for higher level of quality. Willingness to pay is also
described to be the reservation price – (Kalish and Nelson, 1991; Kristensen and Gärling, 1997; Krishna et. al, 2006) or the “floor reservation price” when the latter is formed as a concept of margin (Wang, Venkatesh and Chatterjee, 2007). The “floor reservation price” therefore corresponds to the maximum price at 100 percent which the consumer is certain to purchase the product for. The concept of willingness to pay also means the amount of money representing the difference between the consumer surplus before and after adding an attribute to the product in question. (Lusk and Hudson, 2004) explains that the WTP function considers an individual’s readiness to buy a product at a given quality, q, at a price level, p, and his satisfaction/ utility u.

2.2.2 Measurement of WTP
Many of the scientific and economic variables related to food safety and food quality prove difficult to measure, i.e. it is quite challenging for consumers to quantify the advantages from curtailing food risks in monetary terms - to transform and interpret a qualitative perception into estimable values of measure. There are many approaches to calculating or measuring consumer’s willingness to pay premium for a product. The main methods used in literature (the classification framework for methods to measure consumers’ willingness to pay) to assess consumer’s WTP are the stated and revealed preferences. Samuelson (1948) opines that the revealed preference is an approach which consists of taking note of the price that consumers pay for goods in various markets, or observing individual expenditures to obtain goods and preventing cases of loss. It is a method by which it is possible to discern the best possible option on the basis of consumer behaviour. However, the stated preferences approach elucidates the basis of direct enquiry of values from consumers, rather than inferring of values of consumers from their actions. The stated preference method use direct and indirect surveys while the revealed preferences use
market data and experiments (King et al., 2000). Direct surveys consist of asking for expert points of view or judgments or conducting customer surveys. The indirect survey type employs conducting discreet choice analysis or conjoint analysis (assessing products described by their characteristics, price inclusive). These models are based on Lancaster Demand Theory (Lancaster, 1966) where it is hypothesized that consumers derive satisfaction not from the consumption of the goods directly, but from a collection of characteristics those goods have.

Tools for measuring Willingness to pay

1) Hedonic pricing

Based on a linear or non-linear regression of certain characteristics of the offer’s price derived from statistical data on the market, this method does not provide the WTP of consumers, but rather information on elements of the offer that are valued by them (Desmet and Hendaoui, 2000). The hedonic price of a characteristic is defined as the derivative of the product price in relation to the corresponding attribute. In the context of perfect competition, it is explained as the value consumers ascribe to a supplementary unit of the attribute. If it is close to zero, either the characteristic is not perceived or it is not considered important and therefore not valued by consumers. Other, less aggregated, measurements can be useful in setting prices.

2) Conjoint analysis

Conjoint analysis is a method that can be used to estimate both price elasticities and WTP. The interest lies in revealing compromises made between different product attributes, including price
Evaluating other alternatives also result in the WTP computation: ranking or rating, expression of a preference or choices. Calculation of WTP is dependent on simulating the real market to enable determination of the price of the product in question for each individual consumer, without comparing that product with a competing one, and using the utility function of the consumer, which even takes on different forms depending on the hypotheses formulated by the analyst (Ben-Akiva and Lerman, 1985). WTP can also be expressed directly as that sum of money that leaves respondents indecisive as whether to purchase the product (because it’s worth the price considering the good attributes it has) or not (because it is too expensive for the little attributes it has) (Kalish and Nelson, 1991; Carmon et al., 2001; Jedidi and Zhang, 2002). However, conjoint analysis can suffer from hypothetical bias. This type of bias appears when, placed in a hypothetical situation, particularly in the context of a questionnaire, the respondent does not take into consideration all the constraints that would affect his choice in a real situation (budget available, financial consequences of a poor choice, availability of the product or competitor's products, etc.). Therefore, there is a difference between what the respondent says and what he would accept to pay in a real situation.

3) Contingent Valuation Method

It is a method developed in economics which requires the respondent to be direct with his responses on his willingness to pay for a product. This involves two modes: the open-ended contingent value type (which requires that you indicate the highest price you would accept to pay for this offer) or answer several successive questions on whether he
would, or would not, buy the product at a given price—and closed-ended contingent valuation is the type which involves whether consumers will be willing to pay a specific amount for the product in question). The disadvantage with this method, even though easy to employ, is the little it does to enhance the true reflection of WTP in their responses (Wertenbroch and Skiera, 2002; Völckner and Sattler, 2006).

2.2.3 Consumer preferences and WTP for and demand organic products

There has been a substantial increase in the consumer demand for niche products like organic foodstuffs in past years (Dimitri and Greene, 2002). Consumers have come to value organic foods due to the health benefits that can be derived from the product, and how environmentally friendly they are. This preference may well be factor that will influence a consumer’s willingness to pay a premium price for organic product. There have been various studies conducted in relation to finding out the demand and willingness to pay for organic products in developing countries, and many stuck with the study of consumer willingness to pay for organic products. Consumer preference studies especially in reference to safety of organic food stuff and quality attributes have been priority in the developed economies with a few conducted in the developing countries, especially Africa. Food safety and quality assurance still remains a big issue to be tackled in the developing countries (Africa) although the demand for organic products increases and as forwarded by Owusu-Sekyere (2014), the very important market information on consumer preferences and willingness to tender for food safety and quality assurance labels for extremely important products like beef are limited.
2.3 Product Attributes Affecting Consumers’ WTP for Organic Products

There are many investigations that have been carried out on what attributes consumers consider before making the purchase. One by Nouhoheflin et al., (2004) revealed that the following characteristics in quality vegetables are what the normal Ghanaian consumer look for: damage free, freshness, size, bright colour, cleanness and hardness. Some consumers are ready and willingness to pay for vegetable free of chemicals and their decision is mostly influenced by factors like the awareness of chemical residue, the availability, the label and the taste. Poole and Martínez-Carrasco (2007) studied the relationship between information (such as fruit quality perceptions and consumer satisfaction) and WTP. It was found that participants’ purchasing decisions of a fruit were based mainly on the freshness and appearance, colour, firmness, aroma and fruit size. In Bonti-Ankonah & Yiridoe (2006), Wolf (2002) came up with attributes such as fresh looking, fresh tasting, high quality, seedless, reasonably priced, healthy, high in nutrition, looks sweet, free of insects, sale priced, and free of pesticides that are desirable to consumers. The conjoint analysis was used by Van der pol and Ryan (1996) to establish consumer preferences for fruit and vegetables in Scotland. Their results reveal that factors which influence consumption of fruit and vegetables are freshness, appearance, season and nutritional value. A study by Fotopoulos and Krystallis (2002) examine the organic products as —eco-products suitable for —green consumers. Their results reveal that consumers consider attributes such as appearance, size, colour, freshness and other intrinsic attributes like taste, and nutritional value during purchase of organic products.
2.4 Empirical Studies on Consumer Behaviour

Environmental issues have gradually but steadily increased over the past three decades, and has become a public problem (Kim & Choi, 2005). Linking to consumer behavior, over 70 percent of Americans, for instance, have reported in support of environmental protection, and 49 percent indicated that consumers avoid purchasing products that are potentially harmful to the environment would not be a choice for them (Hueber, 1991). Traders made good use of the opportunity to increase environmental consciousness by developing ‘environmental friendly’ products as it proved useful for the niche market (Kohl, 1990). However, there seemed to have existed a cognitive discord as only a few ‘green’ products were successful (Reitman 1992), despite the vast majority of consumers who reported that their purchases were influenced by environmental concerns (Chase and Smith, 1992).

Numerous surveys regarding consumer behaviour towards food products (vegetables and fruits) have been carried out. In Croatia, fruit and vegetable buyers consider freshness and quality as most important characteristics of fruits and vegetables during purchases (Kovacic et al., 2002). In a study to investigate the role of trust as a determinant of consumer behaviour in Germany, Dierks (2006) found that in the situation of a food scandal, trust is a very important variable and proves to also influence the behaviour of consumers. It was also deduced that consumers will be satisfied and extremely motivated to purchase organic products if there was information on producers and their plant or farms, brief production methods, outlets and other handlers along the supply chain to enable consumers track product back to the origin for changes and improvement (Naspetti et al. 2005). This will also set a benchmark for a strong traceability system. A study by Mukiibi et al. (2006) revealed that income, education, age of household head, household size,
price and quality of produce were the determining variables that seem to be strongly correlated with consumer purchasing behaviors and attitudes toward shopping at public markets. Vermeulen (2007) found that price premiums and consumer behaviour associated with organic production is significant in consumers' willingness to pay for intangible product attributes such as health, and this reflect the current supply and demand imbalance in the organic sector.

In a number of studies, environmental concern has been identified to be a major part of determining organic and green food purchase (e.g. Grunert, 1995). Hines, Hungerford & Tomera (1987) argued that environmental concern has a direct relationship with pro-environmental behavior. Predictably, willingness to buy green products as a result of the interest of consumers is more than not linked to how much they are concerned about the environment (Biswas, Liecata, Mckee, Pullig and Daughtrige, 2000; Mainieri, Barnett, Unipan and Oskamp, 1997; and Schwepker and Cornwell, 1991). In the light of the effect of knowledge on consumer’s willingness to pay premium for organic products, it signifies a positive correlation. A study conducted by Kempton (1995) explained that because the lot of the consumers do not have adequate knowledge about their environment, they do not act responsibly to the environment. Environmental knowledge in this case means the concepts, factual general knowledge, and relationships concerning the natural environment, related food products and its major ecosystems (Fryxell & Lo, 2003). It was found that a very good knowledge of the environment helps the people in question behave more responsible pro environmentally (Rokicka 2002). Moreover, environmental knowledge has a positive significant impact on a consumer’s intention to purchase green products (i.e.}
vegetables that are produced under methods that have less negative environmental impact and less detrimental to human health).

Identifying products, and most importantly encouraging consumers to make the decision to pay premium for those products appears to be a long standing issue. Empirical evidence shows there’s a void in the flow of information concerning organic products, and consumers are finding it challenging locating them to patronize (Brown and Wahlers, 1998). Other studies on the unavailability of organic products have argued inadequate or possibly the lack of special storage systems for the environmentally friendly grown food is considered as one of the barriers to consumer purchase (Byrne et.al, 1991; Davies, 1995).

### 2.5 Consumer Attitude and Perception towards Organic Products

Attitude in this case is the positive or negative inclination to a proffered item (organic product); his (customer or farmer) evaluation about the product or innovation. There is undoubtedly the established relationship between attitude and perception, which ultimately affects a producer or customer behavior towards a product. The awareness and understanding (perception) of producer or consumer instigates the kind of attitude either actor will have towards the product, and consequently determine their behavior towards the product. Consumers’ attitude is a function of their perception hence the positive correlation between the two (Padberg & Ritson, 2002). Other research works have also indicated that consumers are ready to pay based on their respective perceptions and therefore attitude towards organic food and its attributes. Consumers’ willingness to pay premium for organic products is driven by how environmentally friendly and susceptibility to small-scale agriculture (Underhill & Enrique, 1996; Williams, Pamela, D., & Hammit, 2001). An assessment of consumer choice of eco-labelled, organic and conventional
apples, and socio-demographic characteristics affecting the choice among the aforementioned attributes were also investigated (Loureiro, McCluskey, & Mittelhammer, 2001). They found out that to increase the likelihood a consumer will prefer an organic product, there should be genuine concerns for higher food safety, and having a positive outlook about the environment with regard to our actions. Thus consumers with weaker environmental and food safety concerns will prefer regular apples, while those with strong environmental and food safety concerns will prefer organic apples.

An assessment of consumers’ perception and willingness to pay for organic vegetables was conducted in Accra and Tema, all of Ghana (Nouhoheflin et al., 2004). The hedonic price mechanism was used to identify the factors that are paramount in affecting willingness to pay premium for bio-vegetables by consumers. They showed that consumers are aware of health complications that the excessive application of chemical or synthetic fertilizer can bring. The study also ascertained that as a major factor in buying vegetables in Accra, consumers do not take into account the possible danger or risk of health hazards due to heavy chemical residues. These studies have contributed to the understanding of consumer demand, perception and willingness to pay for organic products in the food industry.

**Perspective of the farmer (urban)**

In Kumasi, about eight to eleven lettuce and spring onion harvests, alternating with three cabbage harvests, all in one year, are common for an urban farmer. To at worst keep, and at best augment production levels on generally marginal city soils, access to manure/fertilizers water and pesticides in the dry season as well as high amounts of seeds, are required. Knowledge increase in the health problems that the science of synthetic farming or synthetic farm products
pose to consumers and urban farmers (Birley and Lock 1999, Mensah et al. 2001) has made it possible and convenient to consider biological or organic farming. For example, GOAN supports actively biological production methods, especially Integrated Pest Management (IPM) and compost. Other organizations, such as the International Water Management Institute (IWMI) began looking into other ways of reducing risk beyond the farm level, i.e. at markets and households, as it became clear that the adoption rate of biological farming methods remained very low among vegetable growers. Even though urban farmers are very familiar with traditional or indigenous pest control methods for staple crops, they are still adamant in using these methods. On the other hand, health risks awareness is low and seems not to be a motivating factor to change practices. An example is the tomato production in Akumadan, Ghana, with high dosages of pesticide applied and the detrimental health impacts on the farmers - from headaches to even impotency (Mensah et al. 2001).

Farmers do not only expose themselves to pesticides by not wearing protective clothing, etc., but some by opening pesticide sachets with their mouths or testing appropriate pesticide mixtures by putting a finger in the cocktail and then in the mouth.

In the same Akumadan study area, IPM campaigns were accompanied with research on the use of biological pesticides to show that tomato farmers can produce similar figures in terms of quantity or even more than those using chemical pesticides (Appiah 2001). However, IPM decreased returns to labour and tomatoes that were biologically cultivated appeared to be less beautiful, thus did not meet the requirements in quality to attract premium prices like conventional tomatoes. Some of the reasons why farmers are not changing to biological farming are the challenges of low awareness of how a problem it is and insignificant economic benefits but perceived higher risk of failure.
Conversely, farmers particularly involved in urban agriculture who were interviewed showed interest in flexibility, and adapting to changing prices (especially in the choice of crops) and market demands. This could give organic farming the opportunity and also initialize related input and output markets. A clear example was where some urban farmers quickly took advantage of this niche of an opportunity when expatriates living in Kumasi expressed interest and demand for organic crops, because of the motivation of higher revenue package. But this situation is still the exception. In the case where there is no demand for organic products for a related continual production to meet consumer needs, farmers will still be at a disadvantage of losing production time and be worried.

**Perspective of the consumer**

In the first instance on consumers’ perspective, reports from Kumasi indicate that even though most of consumers were not privy of such an alternative, more than 70 percent still expressed positive perception towards organic products (Balamatti 2000). In finding out the perceptions and attitudes of respondents, the IFOAM in a survey defined organic farming / products to be read out to them or be read by them, and were then asked to react to it.

Based on this definition, a great number of about 93 percent expressed that organic products were a good thing. This finding is identical to a similar procedure that was carried out in 2006. The positive response was the same in the five countries, towns, age groups and socio-economic classes of different respondents. The respondents were also asked to indicate the specific parts of the description they agreed with and one they disagreed with. A country by country, and town by
town analysis of likes was given which shows that, in Wave II, the majority of about 78 percent were not sure. The importance of consuming organic products were rated by respondents based on a specific statement on a rating scale of 1 to 10 (where 1 is the least important, and 10 the most important). In all, the majority ranked consumption of organic products high hence a mean score of 8.8 up from 8.1 in 2006. With Rwanda and Burundi added, the mean score derived was 8.7. The implication for the result is that the lack of awareness of organic products is what leads to low or non-consumption of organic products.

2.6 Empirical studies on Consumers’ Willingness to Pay Premium for Organic Products

WTP is a measure for signifying the maximum monetary contribution an individual is willing to make in order to balance for a rise in his utility. This change in utility is classically evoked by a change in the level of some or several attributes of a good. According to Millock, (2002); Carlberg et al., (2007); Aryal et al., (2009) exogenous or independent variables that affect consumers’ WTP are processing, packaging, certification, product price, labeling, product brand and consumers’ knowledge and awareness about the products. They perceive organic products to be more environmentally friendly and healthier and therefore value these products. This indicates preference and ultimately, willingness to pay premium for the product.

Several studies have investigated consumers demand and their willingness to pay for organic products (vegetables and fruits) in developed countries.

However, some studies have focused on the willingness of consumers’ to tender for organic, pesticide-free and non-genetically modified produce. Gill et al., (2000) employed contingent valuation method to value Spanish consumers’ willingness to pay for organic products. Their
results indicate that consumers were willing to pay higher premium for organic fruits and vegetables. In a study among Canadian consumers, the consumer willingness to pay for pesticide-free food products was examined using the contingent valuation method (CVM) (Cranfield & Magnusson, 2003). Here, they also found out that consumers will be ready to pay premium as compared with the food products grown with excessive fertilizer.

The contingent valuation method was also used to analyze consumers’ willingness to pay for pesticide-free fresh fruits and vegetables (Boccaletti & Nardella, 2000). Moon and Balasubramanian (2002) examined willingness to pay a premium for non-genetically modified (non-GM) food among US and UK consumers, and how the subjective risks and benefit perception relate. Their results from their studies turned out that US consumers were significantly less willing to pay a premium to avoid GM foods than UK consumers; the UK consumers were actually more willing to make purchase.

Furthermore, a consumer demand and preference study for organic apples and milk was carried out using the conjoint analysis in the United States. It was anticipated that there was likely a defined group of people, a niche market for organic milk and apples and many consumers, especially people who normally patronize organic food products, are willing to pay the premium for the product grown locally and certified.

A study conducted by Munene, C. (2006) to analyze consumer attitudes and their WTP for foods using the probit model and the CVM, results showed that the health, concern about chronic diseases, eating patterns and attitude towards organic foods were the factors determining WTP premium. In a study by Prathiraja and Ariyawardana (2003), the influence of the use of nutritional labelling on products had on consumers was positive; in that, consumers always
looked out for the nutritional labelling on the product before purchasing. They further revealed that the majority of respondents were willing to pay the extra amount for the nutritional information on food items (Nouhoheflin et al., 2005). Similarly, Bhatta et al. (2008) discovered some factors as having an influence on the WTP for organic food products. The main factors he found to be influencing WTP are higher prices of the organic products over the conventional ones, limited supply of organic food products and lack of information. He estimated that about 88 percent of the respondents expressed dissatisfaction about supply of organic food products not forth coming, while they also could not differentiate between inorganic and organic products. This is also in agreement with Oviahon et al. (2011) findings where the major factors that influence consumer’s WTP for safety labels on bread in Oredo Local Government area are the educational level, new price of the product, source of information and marital status. Although Bhatta (2008) concluded on the determinants named above, Oviahon (2011) and Rodriguez et al. (2008) found out, in a survey on consumer’s willingness to pay for organic foods in Argentina, that consumers who are very well aware of organic products were willing to purchase them with premium. The reasons for low consumption of organic foods in Argentina were unreliable quality control systems, inadequate stores or constant places to sell, rather than price.
CHAPTER THREE

METHODOLOGY

3.1 Introduction

This chapter is made up of two main parts. The first part presents the conceptual framework of the study. This includes a discussion on Contingent Valuation Method (CVM) employed in the analysis of consumers’ willingness to pay (WTP) premium for organic cabbage, after which the empirical models on factors influencing consumers’ willingness to pay for organic vegetables is specified. The second part describes the study area, followed by an elaboration on how the data employed in the study was collected.

3.2 Conceptual Framework

In a general sense, as premium price increases, willingness to pay premium on any good decreases in concord with the law of demand. Consumers therefore make critical decisions to balance the marginal price of one unit of quality-food products and marginal health utility (Xia & Zeng, 2006). Going on in this study, an adopted framework will be used to examine the behavior of a consumer towards food products, with the willingness to pay subject. The Consumers’ decision to purchase a product or not is influenced by knowledge, perception and intention. Knowledge and awareness have respective direct and indirect influence on perception of consumers toward products, and consequently the willingness to pay a premium price; so they are important factors determining the demand for a commodity. As such, awareness and knowledge about these environmentally friendly foods produced is critical in the consumer willingness to pay price premium for the product, and necessary to assess to help make
decisions. Consumers garner knowledge based on the type and quality of information made available to them.

One of the important factors that can positively affect consumers’ willingness to pay premium for a product is to feed them with proper information by quality packaging, advertisement and the all-important assurance quality system (traceability) hence enhancing them with the knowledge base that will eventually inform them adequately. This also has an influence on their overall perception about the product, and consequently have an effect on the willingness to pay premium on the product.

It is expected that the level of education, product differentiation, income level, household size, have some influence on the consumers’ attitude, perception and behavior towards the product. Even though the aforementioned factors have an effect on the willingness to pay premium, they hang especially on the product price and the household income. The moment the consumer is willing to purchase the product, the immediate thing is to ascertain how much he or she is willing to pay for the product.
Figure 3.1 Framework showing the behavior of consumers toward food products

Source: Adopted from Millock (2002) and Bonti-Ankomah and Yiridoe (2006)
3.2.1 Consumer’s Utility

Willingness to pay could also be analyzed as a consumer choice problem. Following Cranfield & Magnusson (2003), let us assume that a regular consumer who buys and consumes a conventionally produced food product comes into contact with the same food product, only this time, in an organic form on the market. The consumer, who decides to purchase an organic product instead of the conventional one, does so because it is assumed that his/her consumption utility is higher for the organic product (Magnusson et al., 2005). If the utility decreases as a result of price increase, the rational consumer will not be willing to purchase the organic product. Conversely, if the level of satisfaction for organic products increases, the consumer may be willing to pay for the product on the premise that price increase does not cause satisfaction to decline beyond the base level.

3.3 Contingent Valuation Method and Consumers’ willingness to Pay

For a new product to thrive on the market, especially in phase of competition, the demand for the product and the cost of production are key factors that should be taken into consideration. The contingent valuation model from studies evaluates products that are not known on the market by asking consumers to value the product based on its availability (Kimenju and De Groote, 2005; Quagrainie, 2006). It primarily involves estimating the value consumers place on the particular product, how much they are willing to pay for the product on knowing its characteristics. This also aids in determining the nature of consumers’ demand in the hypothetical market situation. It is used to find the non-use values and non-market use values. Willingness to pay from a market in the hypothetical situation is considered estimates of the value of the non-market service or good, so long as the hypothetical market has been established. These markets are set up using Contingent Valuation Methods (CVM) where consumers are asked to value a new product (Lusk
and Hudson, 2004). That is directly asking consumers in a survey on how much they would be willing-to- pay for the new product. The Contingent Valuation method is a survey-based technique used to examine how consumers evaluate goods and services not found in the market place (Venkatachalam, 2004). This framework to guide the obtainment of concrete and meaningful results is strongly based on a consumer maximization one (Hanemann & Kanninen, 1996). This framework maximizes the utility of the consumer subject to his or her budget constraint.

In CVM, willingness to pay can be obtained using two main methods; Open-ended questions, where respondents are asked to on their own free-will give the premium they are willing to pay on the product in question, and closed- ended questions, where respondents are asked whether or not they are willing to pay a fixed amount (Hanky, Shogren, & White, 1997). This is known as dichotomous choice response. The Open ended questions give straight (raw) estimates for easy analysis of responses. However, it could pose challenges since the respondent might not have complete market information to help in their decision making in the extent of their addition of their willingness to pay premium. Comparably, closed-ended questions provide realistic values upon search and or constant patronage of the product by respondents, and has the clear cut decision to make for the product on a “yes or no” basis (Kimenju & Hugo, 2008).

3.4 Empirical discussion on the Binary logit regression model

Even though price is inversely related to quantity demanded of a product generally, the demand for differentiated products (organic products for example) is in addition determined by different sets of variables from the normal market demand analysis. The perception of consumers in terms of quality products are different, and will always find that as one consumer’s satisfaction
decreases for the same quality, another consumer’s satisfaction increases with the same quality product irrespective of the price sometimes (Kimenju & Hugo, 2008). Moreover, consumer’s WTP may also be influenced by a consumer’s household characteristics, income, tastes, etc. (Cranfield & Magnusson, 2003)

Formally, the logistic model explaining consumers’ WTP premium for organic products is specified as:

$$ WTP = \alpha + \beta \theta + \gamma Z + \varepsilon \ldots (3.1) $$

Where:

WTP= {1 if the consumer is willing to pay the extra amount for an organic food product or 0 otherwise

β= price bid

Z= a vector of explanatory variables (Kimenju & Hugo, 2008)

The logit regression that will explain the consumers’ WTP for organic product is therefore specified as:

$$ WTP = \beta_0 + \beta_1 (MARITALSTAT) + \beta_2 (AGE) + \beta_3 (GENDER) + \beta_4 (EDULEV) + \beta_5 (Y) + \beta_6 (Knw.ORG) + \beta_7 (SIZE) + \beta_8 (Env.CONCERN) + \beta_9 (TASTE) + \beta_{10} (HCON) + \varepsilon_i \ldots \ldots (3.2) $$

Where WTP, the dependent variable represents the willingness to pay premium for organic Cabbage and it takes the value of 1 if the respondent is willing to pay and 0 if otherwise. β0, β1, β2, β3, β4, β5, β6, β7, β8, β9, β10 are the parameters of the functions to be estimated and εi refers to the error term.

AGE is the age of the respondent, GENDER is the sex of the respondent, MARITALSTAT is the marital status of the respondent, EduLev is the highest level of education attained by the respondent, Y is the income of the household head used as a proxy for household income,
Knw.ORG refers to respondents who are aware of organic products already, HCON represents health concern of consumers on organic cabbage.

3.4.1 Definition of variables and their a priori expectation
In order to satisfy or suit the Ghanaian environment on the matter, the appropriate set of explanatory variables most probable to influence to affect consumers’ willingness to purchase organic cabbage were identified from empirical literature, and the necessary adjustments made to see the effect. This subsection discusses the variables included in equation 3.1. These variables have been classified into various headings in order to add clarity and simplicity to the analysis and discussions.

Dependent Variable
The Willingness to pay for the organic product is the dependent variable. It is a categorical or a dichotomous choice variable; it takes the value of 1 if the respondent is willing to pay and 0 if otherwise.

Explanatory /Independent Variables
Age: Age represents the actual number of years of the respondent. It is expected that age exhibit both a positive and negative effect on consumers’ willingness to pay for organic cabbage. In the sense that, younger consumers have a greater affinity to demand organic cabbage, but beyond a certain threshold age, willingness to pay diminishes. Then as the age advances, health concern increases and thus the demand for health enhancing foods.
**Gender:** Gender of the respondent is measured as a dummy; it takes on the value of 1 if the respondent is a female and 0 if a male. Because females are expected to do majority of the food shopping in the household, gender is expected to have positive sign on willingness to pay.

**Marital Status:** It is categorized into 4, married, single, separated/divorced and widowed; it takes on the value of 1 if the respondent is married, 2 for singles, etc. Married couples are expected to be more willing to purchase the organic product as compared to singles most especially because of health of the family. As such this variable is expected to have a positive relationship with willingness to pay.

**Education (EduLev):** Education is measured in years. It is anticipated that since the number of years gained in school can positively influence one’s decision to purchase organic products, it will have a positive relationship with the willingness to pay premium for the product.

**Price:** This refers to price of organic cabbage at 50% (GHS 2) above the base price, i.e. above the price of its conventional one. In concord with the law of demand price is expected to have an inverse relationship with willingness to pay for a product. As the price premium increases, consumers may be less willing to pay for organic cabbage. Thus price is expected to have a negative sign.

**Size:** Whether or not the respondent considers/will consider size of organic cabbage when making purchase decision. It is measured as a dummy; it takes the value of 1 if respondent consider/will consider size of organic cabbage in relation to their conventional counterpart before
making purchase decision and 0 if otherwise. It can assume a positive or negative sign on willingness to pay premium for organically produced cabbage.

**Household Income:** Income of household head is used as a proxy for household income. It is measured in GHS. Household income is categorized into three dummy variables (LOWINC, MEDINC and HIGHINC). LOWINC refer to the average monthly income of household head being below GHS 500. MEDINC implies that the average monthly income of household head is in the range of GHS 500 - GHS 2500, and HIGHINC means that the average monthly income of household head is beyond GHS 2500. To be in tune with economic theory, it is expected that as income increases, consumers are likely to demand organic cabbage. Income is expected to have a positive effect on willingness to pay for the product for all the income dummies.

**Taste:** this refers to whether or not the respondent considers/will consider taste of organic cabbage when making purchase decision. It is measured as a dummy; it takes the value of 1 if respondent consider/will consider taste in relation to the inorganic product before making purchase decision and 0 if otherwise. It can assume a positive or negative sign on willingness to pay premium.

**Insect Damage (INSD):** Insect damage refers to whether or not the respondent considers/will consider insect damage on organic cabbage when making purchase decision. It is measured as a dummy; it takes the value of 1 if respondent consider/will consider insect damage on organic cabbage in relation to their conventional counterpart before making purchase decision and 0 if otherwise. It can assume a positive or negative sign on willingness to pay premium for organically produced cabbage.
Health Concern: Health concern is if respondent is concerned about health matters related to use of synthetic fertilizer and pesticides in the production of the organic cabbage. It is measured as a dummy; it takes the value of 1 if respondent is concerned and 0 if otherwise. It is expected to take a positive sign in relation to willingness to pay premium for organically produced cabbage.

Environmental Concern (Env. Concern): Environmental concern is respondents concern about issues that centers on the effect of the use of synthetic fertilizer and pesticides in production on the environment. It is measured as a dummy; it takes the value of 1 if respondent is concerned and 0 if otherwise. It is expected to relate positively to willingness to pay premium variable.

Knowledge (Knw.Org): This refers to the respondent having a prior knowledge of organic products. It is measured as a dummy; it takes the value of 1 if respondent has a prior knowledge of organic products and 0 if otherwise. It is expected that if a consumer know of organic products, his/her purchasing decision would be favorable towards organic cabbage. Therefore knowledge is anticipated to have a positive sign in relation to willingness to pay its premium.

3.5 Determining Consumer’s Willingness to Pay Premium for Organic Products

The study focuses on a hypothetical market instance because the current situation on organic cabbage is that there is little or no market for it in the Accra Metropolitan Area, making it difficult to observe consumers’ willingness to pay premium. To solve the problem, the contingent valuation method was chosen to gauge households’ demand for organic cabbage by
presenting respondents with a scenario in which they can obtain the aforementioned product so that in this case they show their willingness to pay without seeing the actual product.

The double bounded dichotomous contingent valuation method (DC CVM) has been found to well approximate markets in which consumers have some experience (Calia & Strazzera, 2000; Campiche, Holcomb, & Ward, 2004) with the product in question. It is better used for contingent valuation studies because it obtains evaluation data on non-market products through inquiry from respondents and their thoughts on hypothetical markets. It also involves the use of open-ended question method to allow for the respondent to give information that will be easy to choose from and relevant for the study, hence the reason for selecting it. To delineate more finely respondents’ WTP, other questions were asked to obtain their take on the varying premiums they will be ready to purchase, after a given (set) premium was asked. In the method of inquiry for willingness to pay studies, the respondents were provided with information on the difference between conventional and organic cabbage, focusing specifically on the method of production. This enabled the respondent to garner clear understanding of the baseline product (conventional cabbage) and the alternative that it is being compared to organic cabbage. In order to avoid biased answers, the information given about organic cabbage was carefully selected and fashioned as objective as possible. Hence, only the method of obtaining organic cabbage was explained and comments about consequences of synthetic fertilizer and/or pesticide application in production were carefully avoided. This was to let respondents come up with the answers on their own.

In the dichotomous choice questions households were asked to consider two scenarios: Organic cabbage with certain quality and cost attributes, versus conventional cabbage. The First question
posed to the respondent was whether he/she would be willing to purchase Organic cabbage in preference to conventional cabbage. If the respondent indicates willingness to pay, he/she is then offered a bid price in cedi, over the base price for conventional cabbage. Two consecutive bids were proposed to a consumer. The first bid was the base (initial) bid to see whether the respondent would go in for it or not. The second bid was contingent upon the response to the first bid; that is, the response to the first determined which direction the next bidding took. The consumer who responded ‘yes’ to the first bid is presented with a second higher bid (a bid is the price of the organic food proposed to the respondent). If the response to the first bid is no, the respondent is presented with a second lower bid. The responses are the possible outcomes.

Fifty percent over the base price (price of conventional cabbage) was used as the starting bid, then follow up bids of 20 percent and 80 percent as the lower and upper bound respectively. If the respondents agreed to pay the initial bid (50 percent) the price of the chosen alternative was raised (higher bid) or the price of the forgone alternative was discounted (lower bid) if otherwise. Thus there are four possible outcomes: YY, YN, NY, and NN.
Aside the initial bid and the two follow up bids (Upper and Lower bound), two other bids referred to as the extreme bids were introduced in this study. The upper extreme bid was set at 100 percent price premium while the lower extreme bid was set at 10 percent price premium.

The essence of the upper extreme bid is to capture the proportion of respondents willing to pay the follow up upper bid of 80% price premium who will further reveal a WTP of up to 100 percent price premium. Whereas the lower extreme bid is significant in finding out that percentage of respondents who indicated an unwillingness to pay a price premium of 20 percent but who may be willing to pay if the price premium will be as low as 10 percent. These two extreme bids are of great importance.
The different bids indicating levels of WTP was presented to respondents in actual monetary amounts, as opposed to percentages. This helped to eliminate respondents’ need to make mental calculations, and to be reflective of a retail market situation; however for ease of understanding and clarity, the result is explained in percentages.

**Table 3. 1 Bid Design for organic cabbage**

<table>
<thead>
<tr>
<th>Percentage Premium</th>
<th>Amount (GHS)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0% (Base Price)</td>
<td>2</td>
</tr>
<tr>
<td>10%</td>
<td>2.2</td>
</tr>
<tr>
<td>20%</td>
<td>2.4</td>
</tr>
<tr>
<td>50%</td>
<td>3</td>
</tr>
<tr>
<td>80%</td>
<td>3.6</td>
</tr>
<tr>
<td>100%</td>
<td>4</td>
</tr>
</tbody>
</table>

The doubled-bounded approach employed in this study is more often used in valuing non-market goods because it includes more information on individuals WTP. Also it provides more efficient estimates and tighter confidence intervals (Hanemann et al. 1991). The CV methodology has the highest validity when the hypothetical scenario is similar to a familiar market choice situation (Buzby et al., 1998).

One problem with regards to the choice experiments (CV) is that different food quality attributes are assumed to be independent of attributes that are not provided to respondents in the survey.
(Gao & Schroeder, 2009). For this study, issues about hypothetical bias are minimal because it is not difficult for consumers to relate to the scenario.

3.5.1 Determining Mean Willingness to Pay Amount
The willingness to pay elicitation method used in this survey is bounded; the maximum willingness to pay from a bidding game is elicited. If the respondent shows a willingness to pay either the initial bid, the upper bid or the upper extreme bid, the maximum amount (bid) agreed on is used for that respondent in calculating the mean value. Likewise if the respondent is unwilling to pay the initial bid offered but willing to pay the lower bid amount or the lower extreme bid amount, the amount agreed on is used for that respondent in calculating the mean value. The formula to be used in estimating the mean value is:

\[ MWTP = \frac{\sum_{i=1}^{n} EBV_i \times F_i}{N} \]  \hspace{1cm} (3.3)

Where; MWTP denotes mean willingness to pay amount, EBV denotes the elicited bid value i.e. willingness to pay elicited for each respondent (point estimate where the final amount a respondent is WTP is used), F denotes frequency of respondents willing to pay a particular bid amount and n is the sample size (total number of respondents willing to pay).

3.6 Data Collection
This part of the study elaborates the sampling procedure, sample size, and survey instrument employed to gather data.
3.6.1 Sampling Procedure, sample size and survey instrument

The data used was obtained from a survey conducted in households of different income levels in Accra. The surveyed population was selected based on income groups of households. Income groups were used because of the important theory of consumption level being a function of income level (Edgmand, 1987). Based on the income groupings of households in Accra, a multistage sampling technique was used to in the study to select respondents. This was done to project just a representation of various consumer household groups in the Accra Metropolis. The towns were then grouped into low, middle and high income clusters according to data from the Ghana Statistical Service.

A multi-stage sampling procedure was used in this study to select the respondents, based on the income stratification of households in the metropolis. The income stratification supports the widely-held view that income of households influences their consumption patterns (Boccaletti and Nardella 2000).

For the initial stage, 3 towns each were randomly sampled from each of the 3 income suburb levels in the Accra Metropolitan Assembly. This makes up 9 towns chosen randomly in total. Secondly, a selection of the enumeration areas was based on a list with well-defined maps and boundaries as established by the Ghana Statistical Service. The areas considered for the survey in relation to the various income stratifications were selected using random sampling.

A total of 260 households were obtained. The table below shows the towns and the number of households sampled for the study. The information gathered from the individuals in the sampled houses were ones who have above fair knowledge in vegetables, their corresponding market prices and have a fair command of food preparation.
<table>
<thead>
<tr>
<th>INCOME</th>
<th>TOWN</th>
<th>NO. OF HOUSEHOLDS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low Income</td>
<td>Odorkor</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td>Kwashieman</td>
<td>40</td>
</tr>
<tr>
<td></td>
<td>Bubiashie</td>
<td>30</td>
</tr>
<tr>
<td>Middle Income</td>
<td>Achimota</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td>North Kaneshie</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td>Dansoman</td>
<td>30</td>
</tr>
<tr>
<td>High Income</td>
<td>East legon</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td>Airport Residential Area</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td>Dzorwulu</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td>Spintex</td>
<td>25</td>
</tr>
</tbody>
</table>

Source: Survey data (2017)

Within houses which contain several households, systematic random sampling method was applied. If the household did not consume cabbage at all the household is dropped and the next household immediately selected instead. The face-to-face interview technique was used alongside structured questionnaire. This provides the opportunity to explain questions a little difficult for some, to obtain the exact information needed for the study, and also to afford the interviewer the opportunity to educate the respondents. In agreement to the assertion, Carson (2002) opined that a direct contact or interview with respondents guarantees success in analyzing consumer’s willingness through contingent valuation study. The survey was not incentivized and had respondents’ benevolence of their time.
The analysis was carried out using the Stata 14, SPSS version 21 and Microsoft Excel 2013 version.

3.6.2 Pre-Testing
Anticipating the misunderstanding that the questions might cause among respondents, especially regarding the meaning of organic cabbage, how to identify it on the market and the willingness to pay premium for a product not really considered by many consumers, a pre-test was conducted before the administration of the questionnaires. This was done to assess the relevance of some questions, respondents understanding of definitions of the agricultural terms and concepts used, and to see how they react to them; whether difficult or not. The necessary corrections were made and a number of improvements effected. The complete version was administered to 260 households and interviewed from the three income strata (HIS, MIS and LIS).

3.7 The Study Area
The study was conducted in parts of the Accra Metropolitan Area located in the Greater Accra region of Ghana; Accra being the capital city. The city is sub-divided into 11 different administrative entities largely referred to as sub-metros. These are Ablekuma Central, Ablekuma North, Ablekuma South, La, Okaikoi North, Ashiedu Keteke, Ayawaso East, Ayawaso West, Ayawaso Central, Okaikoi South, and Osu Klottey (GSS 2010).

The region’s capital has a population of slightly over 2 million from estimated residential population however, total may be above 3.5 million people due to the influx of people from the north of Ghana and other countries nearby. It is estimated that the population in Accra is growing
at a rate of 4.4 percent per annum, and proves that commuters may come in from radial areas almost every day to work in all manner of capacities from education through commercial marketing to administrative work. This indicates that the City’s population is a youthful one, in tandem with the nation’s growth rate (World Bank, 2010). 817,373 of the population in the city constituting forty nine percent are males, whereas 841,564 constituting fifty one percent are females.

The major or primary economic activities prevailing in the City are wholesale and retail; repair of motor vehicles and motorcycles (GSS 2014). The other major activities that particularly make the City a hub for migrants in Ghana are manufacturing, accommodation and food service activities, construction, other service activities, education, and the professional, scientific and technical activities.

Accra has quite a well-educated resident adult population. Over 21 percent have university level education and 45 percent finished their education with secondary school. About 6 percent ended their education with basic level education. Just 17 percent of residents report ending their schooling at the primary level, and a very small percentage (6 percent) have less than primary education (World Bank, 2010). The report captures 4 percent of the population to have enrolled in the technical / vocational education, and 1 percent for post graduate studies.

The majority (47 percent) of households in the City report a monthly income of between GHS 100-GHS 500. Around 21 percent of households report having a very low monthly income of less than GHS 100. Approximately 16 percent of households report very high monthly incomes of GHS 1,000 or more.
Figure 3. Map showing the sampled communities for respondents.
CHAPTER FOUR
RESULTS AND DISCUSSION

4.1 Introduction
This chapter presents and discusses the results obtained in the study. This chapter is sectioned into three main parts. The descriptive report covers the socio-economic characteristics of the sampled households, the knowledge of consumers on organic products and their sources of information, purchase frequency and how they will like to have organic products readily available. The subsequent sections present the results based on the specific objectives of the study; consumers’ perceptions of organic products in AMA; level of consumers’ knowledge of organic products in AMA; consumers’ willingness to pay premium price for organic cabbage and the factors that influence that decision.

4.2 Socio-economic Characteristics of respondents
In total 267 respondents were sampled. However, 9 questionnaires were sidelined due to the incomplete and incoherent responses given by respondents, and was reduced to 258. Most of the respondents are females, and most women in the survey across the three income strata purchase foodstuffs more from the market than men, and were in the house during the period of data collection. The household size readings show that most across the income strata fall into the 0-4 category, making up 70.1 percent of the lot. The data set also shows that the respondents are mainly youth between the ages of 17 to 30 years, with 47.7 percent of the total age brackets. Consistent with household size, the majority of respondents are married (126), making up 48.8 percent of the total number of people interviewed. On the educational level, enrollment up to the
senior secondary level dominates as the highest level with 29.1 percent and followed by the Tertiary (specifically the Bachelor’s level). The monthly income earned by respondents suggests that most earn between GHS 500 and GHS 1000. The following tabulated information presents the socio-economic background of the respondents.

Table 4.1 Distribution of socio-demographic Characteristics of respondent

<table>
<thead>
<tr>
<th>SOCIO-ECONOMIC CHARACTERISTICS</th>
<th>FREQUENCY</th>
<th>PERCENT (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age (years)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>17-30</td>
<td>123</td>
<td>47.7</td>
</tr>
<tr>
<td>31-50</td>
<td>114</td>
<td>44.4</td>
</tr>
<tr>
<td>&gt;51</td>
<td>21</td>
<td>8.4</td>
</tr>
<tr>
<td>Total</td>
<td>258</td>
<td>100.5</td>
</tr>
<tr>
<td><strong>Marital Status</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Single</td>
<td>118</td>
<td>45.7</td>
</tr>
<tr>
<td>Married</td>
<td>126</td>
<td>48.8</td>
</tr>
<tr>
<td>Separated/Divorced</td>
<td>6</td>
<td>2.3</td>
</tr>
<tr>
<td>Widowed</td>
<td>8</td>
<td>3.1</td>
</tr>
<tr>
<td>Total</td>
<td>258</td>
<td>100</td>
</tr>
<tr>
<td><strong>Gender of respondent</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>179</td>
<td>69.4</td>
</tr>
<tr>
<td>Male</td>
<td>79</td>
<td>30.6</td>
</tr>
<tr>
<td>Total</td>
<td>258</td>
<td>100</td>
</tr>
<tr>
<td><strong>Religion of respondent</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Christianity</td>
<td>228</td>
<td>88.4</td>
</tr>
<tr>
<td>Islam</td>
<td>28</td>
<td>10.9</td>
</tr>
<tr>
<td>No religion</td>
<td>2</td>
<td>0.8</td>
</tr>
<tr>
<td>Total</td>
<td>258</td>
<td>100</td>
</tr>
<tr>
<td><strong>Level of education of respondent</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Primary</td>
<td>10</td>
<td>3.9</td>
</tr>
<tr>
<td>JHS</td>
<td>59</td>
<td>22.9</td>
</tr>
<tr>
<td>SHS</td>
<td>75</td>
<td>29.1</td>
</tr>
<tr>
<td>Teacher training/Nursing training</td>
<td>9</td>
<td>3.5</td>
</tr>
<tr>
<td>Technical training/Vocational training</td>
<td>36</td>
<td>14</td>
</tr>
<tr>
<td>Tertiary</td>
<td>58</td>
<td>22.5</td>
</tr>
<tr>
<td>Other</td>
<td>11</td>
<td>4.3</td>
</tr>
<tr>
<td>Total</td>
<td>258</td>
<td>100</td>
</tr>
<tr>
<td><strong>Household size</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0-4</td>
<td>181</td>
<td>70.1</td>
</tr>
<tr>
<td>5-7</td>
<td>73</td>
<td>28.3</td>
</tr>
<tr>
<td>8-10</td>
<td>4</td>
<td>1.6</td>
</tr>
<tr>
<td>Total</td>
<td>258</td>
<td>100</td>
</tr>
</tbody>
</table>

**Monthly HH Income**
<table>
<thead>
<tr>
<th>Socio-economic characteristics</th>
<th>LIS</th>
<th>MIS</th>
<th>HIS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Frequency</td>
<td>Percent (%)</td>
<td>Frequency</td>
</tr>
<tr>
<td><strong>Household Size</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0-4</td>
<td>65</td>
<td>64.4</td>
<td>39</td>
</tr>
<tr>
<td>5-7</td>
<td>34</td>
<td>33.7</td>
<td>15</td>
</tr>
<tr>
<td>8-10</td>
<td>2</td>
<td>1.9</td>
<td>2</td>
</tr>
<tr>
<td>TOTAL</td>
<td>101</td>
<td>100</td>
<td>56</td>
</tr>
<tr>
<td><strong>Level of Education</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No school</td>
<td>9</td>
<td>8.9</td>
<td>1</td>
</tr>
<tr>
<td>Primary</td>
<td>8</td>
<td>7.9</td>
<td>3</td>
</tr>
<tr>
<td>JHS</td>
<td>35</td>
<td>34.7</td>
<td>15</td>
</tr>
<tr>
<td>SHS</td>
<td>31</td>
<td>30.7</td>
<td>12</td>
</tr>
<tr>
<td>Teacher/Nursing training</td>
<td>3</td>
<td>3.0</td>
<td>4</td>
</tr>
<tr>
<td>Technical/Vocational training</td>
<td>3</td>
<td>3.0</td>
<td>8</td>
</tr>
<tr>
<td>Bachelor</td>
<td>11</td>
<td>10.9</td>
<td>11</td>
</tr>
<tr>
<td>Post Graduate</td>
<td>1</td>
<td>0.9</td>
<td>2</td>
</tr>
<tr>
<td>TOTAL</td>
<td>101</td>
<td>100</td>
<td>56</td>
</tr>
<tr>
<td><strong>Household Income</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Greater than GHS</td>
<td>0</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>5000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5000&lt;x&gt;2500GHS</td>
<td>4</td>
<td>4.0</td>
<td>3</td>
</tr>
<tr>
<td>2500&lt;x&gt;1000GHS</td>
<td>21</td>
<td>20.8</td>
<td>8</td>
</tr>
<tr>
<td>1000&lt;x&gt;500GHS</td>
<td>31</td>
<td>30.7</td>
<td>21</td>
</tr>
<tr>
<td>500&lt;x&gt;250GHS</td>
<td>29</td>
<td>28.7</td>
<td>16</td>
</tr>
<tr>
<td>250&lt;x&gt;100</td>
<td>14</td>
<td>13.9</td>
<td>4</td>
</tr>
<tr>
<td>Less than 100</td>
<td>2</td>
<td>2.0</td>
<td>1</td>
</tr>
<tr>
<td>TOTAL</td>
<td>101</td>
<td>100</td>
<td>56</td>
</tr>
</tbody>
</table>

Source: Survey Data, (2017)
In considering the major characteristics of respondents, a large proportion of the sampled household sizes generally (across the three income strata) have total numbers less than or equal to 4 category. The 8-10 household category records the least number or frequency among the categorization. About 64.4 percent make up household category that is between 0 and 4, followed by the 5-7 group with 33.7 percent in the low income stratum. About 70 percent of the respondents fall into 0-4 household group, and followed by 5-7 group of about 26.8 percent for the middle income group. Both income strata (the low and middle income strata) recorded two different households each that have 8-10 people in the respective families. They recorded 1.9 percent and 3.6 percent respectively due to the different number of respondents gathered for both strata. The high income stratum recorded about 78.8 percent of household of the 0-4 group, 21.2 percent for the 5-7 group and none for the 8-10 group as expected.

The Junior High School (JHS) level of education dominates (34.7 percent) as the highest attained by the respondents from the low income suburb, while 30.7 percent of the respondents has acquired Senior high school education (SHS). Bachelor’s degree follows up with about 10 percent and 8.9 percent of the respondents from this income strata have not gained any formal education. About 26.8 percent of the respondents from the middle income suburb indicate JHS as their highest level of education. This is followed by the SHS level with 21.4 percent, and the Bachelor’s degree coming close with a 19.6 percent. The middle income stratum recorded the technical/Vocational training participant respondents with a 14.3 percent. The teaching/ Nursing training, Primary, post graduate degree, recorded low levels as 7.1 percent, 5.6 percent and 3.6 percent respectively, whereas only a small amount of 1.8% of the respondents from this strata have not gained any formal education. A greater proportion of people in the high income group fall into tertiary level with about 35.4 percent. This has been categorized into the Bachelor’s and
Post degree levels of 27.3 percent and 8.1 percent respectively. It was also observed that no respondent in the high income bracket reported no lack of formal education.

Average monthly earnings of most respondents from the low income suburb recorded GHS 500-GHS1000 at 31 percent. About 44.6 percent make up the majority who earn less than GHS 500. However, 24.8 percent earn between GHS 1000 and GHS 5000 which signifies some level of economic growth in the suburb as compared to the income years ago to socio-economic studies conducted. In this particular survey where not many of the people were interviewed for this group, about 38.2 percent, making the bulk of the respondents from the middle income suburb (MIS) has an average monthly household income within the range of GHS 500- GHS 1000. About 29.1 percent of the respondents from the MIS indicated their average monthly income ranging between GHS250- GHS 500, whereas 20.0 percent have average monthly income ranging between GHs1000- GHS 5000. About 3.6 percent earn over GHS 5000.

The highest average monthly income is indicated by respondents from the high income suburb (HIS), just as anticipated. Largest percentage (40.4 percent) of respondents from HIS revealed earning on average GHS 1000- GHS 2500 per month, 13.1 percent earn between GHS 2500 and GHS 5000, and 2.0 of the respondents from the HIS indicate an average monthly income above GHs5000- earnings that was not indicated by even a single respondent in the other stratum (LIS and MIS).

### 4.3 Consumer Awareness Level on Organic Food Products and Source of information

As shown in table 4.3, about 67.8 percent are aware of the existence of organic food products and what they are. They are aware through mostly radio (23.3 percent) followed closely by
knowledge through family and friends (20.9 percent). This could be attributed to the close interaction in the social system in the region. The others became aware through newspapers, television and school at 2.3 percent, 7.8 percent and 13.2 percent respectively.

Table 4.3 Knowledge on organic products and sources of information

<table>
<thead>
<tr>
<th>Variable</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Respondents</td>
<td></td>
<td></td>
</tr>
<tr>
<td>awareness about Organic Products</td>
<td>Yes</td>
<td>175</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>83</td>
</tr>
<tr>
<td>Source of information</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Radio</td>
<td>60</td>
<td>34.48</td>
</tr>
<tr>
<td>Newspapers</td>
<td>6</td>
<td>3.45</td>
</tr>
<tr>
<td>Television</td>
<td>20</td>
<td>11.49</td>
</tr>
<tr>
<td>Friends/Relatives</td>
<td>54</td>
<td>31.03</td>
</tr>
<tr>
<td>School</td>
<td>34</td>
<td>19.54</td>
</tr>
</tbody>
</table>

Source: Field Survey, 2017

The increase in the number of media houses, especially the medium of the radio (fm stations) in the country have contributed higher awareness of organic products.
4.4 Consumers’ Perception of Organic Products in the area

A five-point Likert scale with perception indices of coded responses; strongly disagree, disagree, neutral, agree and strongly agree was used to interview the respondents and making a selection of their choice.

The indices measured on consumers’ perception are the quality and benefit perception indices.

The benefit perception index indicates a positive sign while the quality perception index
indicates otherwise. Table 4.4 clearly shows the perception of the respondents on the benefits and quality attributes of organic products.

About 65.5 percent of the respondents strongly agree while 29.5 percent agree that organic products are healthy. Organic products are perceived to have a superior quality by 63.32 percent of the respondents agreeing while 29.5 percent strongly agree. The results from organic products not having harmful effects according to the respondents show 62.8 percent agreement and 28.7 percent in strong agreement, which are in tandem with Michaelidou and Hassan (2008) iteration that consumers are more likely to develop positive interest and approval for attributes of organic food that enhance good health.

**Table 4.4 Respondents’ Perception of organic products**

<table>
<thead>
<tr>
<th>Statement</th>
<th>Strongly disagree (score=-1)</th>
<th>Disagree (score=-0.5)</th>
<th>Neutral (score=0)</th>
<th>Agree (score=-0.5)</th>
<th>Strongly Agree (score=1)</th>
<th>WMI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Organic Products are healthier</td>
<td>3</td>
<td>1</td>
<td>9</td>
<td>76</td>
<td>169</td>
<td>0.789</td>
</tr>
<tr>
<td>Organic products are tastier</td>
<td>1</td>
<td>10</td>
<td>28</td>
<td>156</td>
<td>63</td>
<td>0.523</td>
</tr>
<tr>
<td><strong>BPI</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td><strong>0.656</strong></td>
</tr>
<tr>
<td>Organic Products have no harmful effects</td>
<td>0</td>
<td>10</td>
<td>12</td>
<td>162</td>
<td>74</td>
<td>0.581</td>
</tr>
<tr>
<td>Organic Products are of great quality</td>
<td>3</td>
<td>2</td>
<td>17</td>
<td>160</td>
<td>76</td>
<td>0.589</td>
</tr>
<tr>
<td>Organic Products have more insect damage</td>
<td>1</td>
<td>29</td>
<td>66</td>
<td>146</td>
<td>16</td>
<td>0.285</td>
</tr>
</tbody>
</table>
Organic Products are more expensive than conventional ones

| Organic Products are worse than conventional ones |
|--------|--------|--------|--------|--------|--------|
| 2      | 60     | 47     | 104    | 45     | 0.252  |
| 39     | 147    | 36     | 28     | 8      | -0.351 |

OVERALL WMI 0.381229

In critical analysis of the respondents’ benefit perception, more than half (almost about 90 percent) agree generally, that organic products are healthier, have no harmful effect and tastier.

About 29.5 percent and 60.5 percent agree and strongly agree accordingly that organic products are healthier while 28.7 percent and 29.5 percent respectively agree that organic products are of good quality and have no harmful effects as compared to conventionally produced food products.

Averaging the scores for health and taste perceptions led to a positive benefit perception index, BPI=0.66 and averaging the scores for quality perceptions gave a positive quality perception index, QPI=0.298. This presupposes that organic food products are tastier and healthier than the conventional ones. WTP price premiums of consumers are influenced by their perceptions on the benefits from consuming the organic food products (Hughner e. al 2007), and in concord with the results obtained above.

About 57 percent of the respondent disagree with the statement that organic products are worse than the conventional, while about 15.1 percent agreement was revealed by the respondents.

These findings is in agreement with a report advanced by Bourn and Prescott (2002), that besides
health, food safety and environment considerations, several other product characteristics like nutritive value, taste, freshness, colour, ripeness, and other attributes influence consumer choice.

It is important also to note that a sizable number of respondents were neutral for some the defining statements. In concord with Lawi et al., (2014) a possible and sound exposition for this result is the low level of awareness regarding organic products. Although only participants that responded in the affirmative to prior knowledge of organic products answered the defining statements, the results indicate some of those that claim to have prior knowledge of organic products may just have peripheral knowledge which inclined them towards a neutral stand.
Table 4.5 Consumers’ Perception of Organic Products Based on Income Strata

<table>
<thead>
<tr>
<th>No</th>
<th>Statement</th>
<th>LIS</th>
<th>MIS</th>
<th>HIS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Strongly (%)</td>
<td>Disagree (%)</td>
<td>Neutral (%)</td>
</tr>
<tr>
<td>1</td>
<td>Organic products are healthier</td>
<td>0</td>
<td>0</td>
<td>5.0</td>
</tr>
<tr>
<td>2</td>
<td>Organic products are tastier</td>
<td>0</td>
<td>5.0</td>
<td>7.9</td>
</tr>
<tr>
<td>3</td>
<td>Organic products have no harmful effects</td>
<td>0</td>
<td>4.0</td>
<td>4.0</td>
</tr>
<tr>
<td>4</td>
<td>Organic products are of great quality</td>
<td>0</td>
<td>2.0</td>
<td>12.9</td>
</tr>
<tr>
<td>5</td>
<td>Organic products have more insect damage</td>
<td>1.0</td>
<td>9.9</td>
<td>22.8</td>
</tr>
<tr>
<td>6</td>
<td>Organic products are more expensive than</td>
<td>0</td>
<td>37.6</td>
<td>6.9</td>
</tr>
<tr>
<td></td>
<td>conventional ones</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Organic products are worse than</td>
<td>19.8</td>
<td>56.4</td>
<td>7.9</td>
</tr>
<tr>
<td></td>
<td>conventional ones</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MIS</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Organic products are healthier</td>
<td>5.4</td>
<td>0</td>
<td>3.6</td>
</tr>
<tr>
<td>2</td>
<td>Organic products are tastier</td>
<td>0</td>
<td>5</td>
<td>8</td>
</tr>
<tr>
<td>3</td>
<td>Organic products have no harmful effects</td>
<td>0</td>
<td>0</td>
<td>1.8</td>
</tr>
<tr>
<td>4</td>
<td>Organic products are of great quality</td>
<td>5.4</td>
<td>0</td>
<td>1.8</td>
</tr>
<tr>
<td>5</td>
<td>Organic products have more insect damage</td>
<td>0</td>
<td>23.2</td>
<td>21.4</td>
</tr>
<tr>
<td>6</td>
<td>Organic products are more expensive than</td>
<td>0</td>
<td>28.6</td>
<td>14.3</td>
</tr>
<tr>
<td></td>
<td>conventional ones</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Organic products are worse than</td>
<td>17.9</td>
<td>64.3</td>
<td>8.9</td>
</tr>
<tr>
<td></td>
<td>conventional ones</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HIS</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Organic products are healthier</td>
<td>1.0</td>
<td>1.0</td>
<td>3.0</td>
</tr>
<tr>
<td>2</td>
<td>Organic products are tastier</td>
<td>0</td>
<td>5.1</td>
<td>17.2</td>
</tr>
<tr>
<td>3</td>
<td>Organic products have no harmful effects</td>
<td>0</td>
<td>4.0</td>
<td>7.1</td>
</tr>
<tr>
<td>4</td>
<td>Organic products are of great quality</td>
<td>0</td>
<td>0</td>
<td>3.0</td>
</tr>
</tbody>
</table>

57
Table 4.3 indicates that, on the average, respondents from the three income strata have a positive perception on the health benefits, quality and the environmental advantages of organic products. The largest proportion of respondents (169) from the LIS agrees with the defining statement; organic products define a healthy lifestyle while 78.6% and 67.7% of respondents from the MIS and HIS also show strong agreement that organic products define good health. The respondents from the LIS and MIS agreed organic products to have great quality by 80.0 % and 73.2% respectively, whereas the HIS had 39.4 percent agreeing, but 57.6 percent of respondents strongly agreeing to the defining statement.

Generally across the three income strata, about 92 percent of the respondents agreed to the defining statement of organic products not having harmful effects with LIS, MIS and HIS recording 60.4 percent, 75 percent and 62.6 percent respectively. This indicates that above average in number of respondents on the subject of awareness of organic products also know they do not cause any environmental harm or harm to humans on consumption. For the same defining statement, respondents who remained neutral generally to the three income strata were low; 4 percent, 1.8 percent and 7.1 percent for LIS, MIS and HIS respectively. The statement about organic products having more insect damage saw a general trend of above average percentage in agreement with 50.5 percent, 51.3 percent and 63.4 percent for HIS, MIS and LIS.

<table>
<thead>
<tr>
<th></th>
<th>Organic products have more insect damage</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td></td>
<td>0</td>
<td>6.1</td>
<td>33.3</td>
<td>50.5</td>
</tr>
<tr>
<td></td>
<td>Organic products are more expensive than conventional ones</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td></td>
<td>0</td>
<td>3.0</td>
<td>32.3</td>
<td>48.5</td>
</tr>
<tr>
<td></td>
<td>Organic products are worse than conventional ones</td>
<td></td>
<td>10.1</td>
<td>55.6</td>
<td>22.2</td>
</tr>
</tbody>
</table>

58
respectively. It is also worth noting that a few respondents in the LIS and HIS income strata recorded a low percentage to the defining statement; about 10 percent for LIS and 6.1 percent for HIS. MIS recording quite some percentage of 23.2 signifying disagreement to the statement.

For the defining statement of organic products more expensive than conventionally produced ones, most of the respondents in all three income strata generally agree to the defining statement; 35.6 percent agreeing and about 20 percent strongly agreeing for LIS, 39.3 percent agreeing and 17.9 percent strongly agreeing for MIS, and 48.5 percent agreeing and 16.2 percent strongly agreeing for HIS. In comparison, those who agreed and disagreed was close, considering about 37.6 percent and 35.6 respondents disagreeing and agreeing accordingly from the LIS, 28.6 percent and 39.3 respondents disagreeing and agreeing from the MIS respectively, and 3.0 percent and 48.5 respondents disagreeing and agreeing from the HIS. The exception to the close comparisons between the two defining statements is the massive percentage difference computed for in the HIS. Even though almost a half of the respondents agreed to organic products being more expensive, about 32.3 percent of the respondents of HIS remained neutral to the statement.

Generally, respondents answered to organic products being more expensive. Reason given that was consistent throughout was since it takes longer to grow to desired shape, size, weight, nutritional value (content) etc. using natural based fertilizer, it should be more expensive than the conventional and worth its while.

4.5 Determining Consumers’ Willingness to Pay Premium for Organic Cabbage

This section discusses the results obtained from the survey, which aimed at determining the amount households are willing to offer in order to obtain organically produced cabbage. The result is presented based on the 3 income strata (LIS, MIS, and HIS) as well as consolidated.
In all, 10 people (3.9 percent) mainly from the LIS in table 4.6 expressed unwillingness to pay for the organic cabbage at any premium. However, 248 respondents (96.1 percent) expressed willingness to pay at varying premiums or percentage premiums. Over 3 percent of the respondents who are willing to pay premium for organic cabbage are willing to offer a maximum premium of 10%. Whereas 12.4%, 30.2% and 50.4% of the participants are willing to purchase organic cabbage at 20%, 50% and 80% price premium respectively. Surprisingly, about 33 percent are willing pay premium in the instance of a double base price premium added.

<table>
<thead>
<tr>
<th>Weight of product (kg)</th>
<th>Cabbage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not willing to pay</td>
<td>3.9% (10)</td>
</tr>
<tr>
<td>Willing to pay 10%</td>
<td>3.1% (8)</td>
</tr>
<tr>
<td>Willingness to pay 20%</td>
<td>12.4% (32)</td>
</tr>
<tr>
<td>Willingness to pay 50%</td>
<td>30.2% (78)</td>
</tr>
<tr>
<td>Willingness to pay 80%</td>
<td>19.4% (50)</td>
</tr>
<tr>
<td>Willingness to pay 100%</td>
<td>31.0% (80)</td>
</tr>
</tbody>
</table>

**Bidding Game Results**

- Yes-Yes Responses: 50.4% (130)
- Yes-No Responses: 30.2% (78)
- No-Yes Responses: 12.4% (32)
- No-No Responses: 7.0% (18)

Source: Survey data (2017)

The double bounded dichotomous contingent valuation method (bidding game) was used to find out respondents willing to pay amounts. In general, 80.6 percent consumers expressed willingness to pay more for organic cabbage than going in for the conventional one. Table 4.6 explains the distribution of the responses derived from the bidding game. The numbers in
parentheses refer to the frequencies at which respondents are willing to buy at what premium percentage. For instance, the results show that 30.2 percent of the consumers are willing to purchase organic Cabbage at 50 percent premium and no more. Results also show that 12.4 percent of the respondents were not willing to purchase organic Cabbage at 50 percent but less than or at 20 percent. It was interesting to note that 50.4 percent of the respondents were willing to go in for the product on a YES-YES basis at 80%. The reason most respondents (especially the cabbage lovers) gave for this is their health being of grave importance to them than spending more.

4.5.1 Determination of Consumer’s WTP Amount
This aspect set out to calculate the mean willingness to pay premium on organic cabbage for the three income levels. The computations explain the amounts that each income strata is capable of paying.

<table>
<thead>
<tr>
<th>Premium (%)</th>
<th>Elicited Bid Value (EBV) (GHS)</th>
<th>No. of Respondents WTP (F)</th>
<th>EBV*F (GHS)</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>2.2</td>
<td>3</td>
<td>6.6</td>
</tr>
<tr>
<td>20</td>
<td>2.4</td>
<td>12</td>
<td>28.8</td>
</tr>
<tr>
<td>50</td>
<td>3.0</td>
<td>30</td>
<td>90</td>
</tr>
<tr>
<td>80</td>
<td>3.6</td>
<td>23</td>
<td>82.8</td>
</tr>
<tr>
<td>100</td>
<td>4.0</td>
<td>28</td>
<td>112</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>96</td>
<td>320.2</td>
</tr>
<tr>
<td>0</td>
<td></td>
<td>5</td>
<td></td>
</tr>
</tbody>
</table>

Source: Survey Data 2017

\[ MWTP = \sum \frac{EBV*F}{F} \]

\[ = \frac{320.2}{96} \]

\[ = 3.34 \]
On average consumers in the LIS of the Accra Metropolitan Area are willing to pay GHS 3.34 for 1kg organic cabbage. This implies that averagely consumers are willing to purchase organic cabbage at 65% price premium, considering the average price of conventional cabbage computed from the various prices given by consumers and market women at GHS 2, at the time of this survey.

Table 4. 8 Mean Willingness to pay for organic cabbage (MIH)

<table>
<thead>
<tr>
<th>Premium (%)</th>
<th>Elicited Bid Value (EBV) (GHS)</th>
<th>No. of Respondents</th>
<th>EBV*F (GHS)</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>4.4</td>
<td>1</td>
<td>4.4</td>
</tr>
<tr>
<td>20</td>
<td>4.8</td>
<td>9</td>
<td>43.2</td>
</tr>
<tr>
<td>50</td>
<td>6</td>
<td>22</td>
<td>132</td>
</tr>
<tr>
<td>80</td>
<td>7.2</td>
<td>10</td>
<td>72</td>
</tr>
<tr>
<td>100</td>
<td>8</td>
<td>13</td>
<td>104</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>55</strong></td>
<td></td>
<td><strong>355.6</strong></td>
</tr>
</tbody>
</table>

MWTP = \sum_{F} \frac{EBV*F}{F} 

= \frac{355.6}{55} 

= 6.47

A mean willingness to pay of GHS 6.47 was computed for organic cabbage consumers in the middle income strata. This explains that on average consumers in MIS are willing to purchase
1kg organic cabbage at 61.8% price premium, on the premise of a computed average price of conventional cabbage at GHS 4 from data.

Table 4.9 Mean Willingness to Pay for Organic Cabbage (HIH)

<table>
<thead>
<tr>
<th>Premium (%)</th>
<th>Elicited Bid Value (EBV) (GHS)</th>
<th>No. of Respondents WTP (F)</th>
<th>EBV*F (GHS)</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>7.7</td>
<td>5</td>
<td>38.5</td>
</tr>
<tr>
<td>20</td>
<td>8.4</td>
<td>10</td>
<td>84</td>
</tr>
<tr>
<td>50</td>
<td>10.5</td>
<td>25</td>
<td>262.5</td>
</tr>
<tr>
<td>80</td>
<td>12.6</td>
<td>11</td>
<td>138.6</td>
</tr>
<tr>
<td>100</td>
<td>14</td>
<td>42</td>
<td>588</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>93</strong></td>
<td></td>
<td><strong>1111.6</strong></td>
</tr>
<tr>
<td><strong>0</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Survey Data 2017

\[
MWTP = \frac{\sum EBV*F}{F} = \frac{1111.6}{93} = 11.95268817
\]

A mean willingness to pay of GHS 11.95 was obtained for organic cabbage in the HIH. This explains that on average consumers are willing to purchase 1kg organic cabbage at 70.7% price premium, on the premise of a computed average price of conventional cabbage at GHS 7 from data.
4.6 Factors that influence willingness to pay premium for certified organic cabbage in the area

The results of the binary logistic regression, from the double-bounded dichotomous choice contingent valuation survey aimed at determining the variables that most determine households’ willingness to pay premium price for organically grown cabbage is presented in this section.

Table 4.10 shows the coefficient estimates, the robust standard errors, the significant values (p-values) and the marginal effects of these estimates. Incorporated are some statistical figures like the Pseudo $R^2$, log likelihood, Wald Chi$^2$ and probability ratio.

Table 4.10 Binary Logistic Regression Result: WTP premium for Organic Cabbage

| Variable       | Co-efficient | Robust std. error | T    | p>|t| | Marginal Effect |
|----------------|--------------|-------------------|------|-----|-----------------|
| Maristat       | -0.8195      | 0.512             | -1.60| 0.110| -0.006          |
| Age            | -0.0069      | 0.033             | -0.21| 0.834| -0.000073       |
| Gender         | 0.369        | 0.658             | 0.56 | 0.575| 0.0030          |
| EduLev         | -0.659**     | 0.313             | -2.11| 0.035| -0.0058         |
| Taste          | -0.900*      | 0.496             | 1.82 | 0.069| -0.007          |
| HH Income      | -0.137       | 0.292             | -0.47| 0.637| -0.002          |
| Knw. OrgF      | 0.895        | 1.127             | 0.79 | 0.427| 0.0092          |
| Size           | 2.111*       | 0.972             | 2.17 | 0.030| -0.022          |
| Health concern | -1.0202      | 0.853             | -1.20| 0.232| -0.010          |
| Env. Concern   | 0.2459       | 0.967             | 0.29 | 0.772| 0.135           |
| cons.          | 4.5827       | 3.430             | 1.63 | 0.103|                 |

Log pseudolikelihood $= -28.22309$
Wald chi$^2$ $= 24.42$
Prob>F $= 0.0037$
Pseudo R$^2$ $= 0.2771$

Source: Survey data 2017

Note: ***, **, *, indicates that the estimated coefficient is significant at 1%, 5% and 10% levels respectively.

To explain better the significant coefficients of factors that affect the willingness to pay premium by consumers for organic cabbage, the marginal effects is used.
Marginal effects measure the impact of a unit change in each of the independent variables on the probability of a respondent indicating a willingness to pay at least a 10 percent price premium for organic cabbage. In doing so, the independent variables - other than the one being examined - were held constant at their mean values. These marginal effects are useful as they lend themselves to a more straightforward interpretation in a similar manner to the usual classical least square coefficients.

The MARISTAT variable (Marital status) was specified as positive function as part of the dependent variables i.e. being married increases a household’s likelihood to pay premium price for organic cabbage. This variable has a negative coefficient; however, this is apparently not a strong enough effect, since the MARISTAT variable is not statistically significant in influencing willingness to pay for organic cabbage. This revealed that this socio- demographic variable does not explain organic cabbage purchase in the study area.

The AGE factor was hypothesized to have either a positive or negative effect on willingness to pay. The coefficient for age is negatively related to willingness to pay, albeit insignificantly. Implying that the age of the respondent did not influence significantly their willingness to pay for organic cabbage in the study area.

GENDER as hypothesized to be positively correlated with the dependent (willingness to pay premium) implying female respondents will be more willing to purchase than males conformed to expectation. The positive coefficient indicates that males are less likely to express a WTP for organic cabbage compared to their female counterparts, all things being held constant.
Put differently, the likelihood of WTP for organic cabbage increases towards the female respondents. The analytical marginal effect for the variable is 0.003, portraying that, females on average are 0.3 percent less likely to pay premium for the product.

This result is in agreement with findings by other researchers (Cranfield & Magnusson, 2003; Loureiro et al. 2009). This is an expected outcome, considering that females are the main food purchase decision-makers in households. Another plausible explanation is because females are probably more “family oriented” and therefore more sensitive to safety problems. On the other hand, Novotorova and Mazzocco (2008) found that gender was irrelevant in the case of preference for genetically modified apples.

For the education factor, a negative relationship was derived between willingness to pay for organic cabbage. The coefficient for the education variable are both positive and significant as expected, and with a negative marginal effect. The results show that EduLev is statistically significant at 5 percent with marginal effect of -0.005 explaining that respondents with a maximum of education are approximately 0.5 percent less likely to pay a premium for organic cabbage. A plausible explanation to this is that educated consumers are naturally expected to exhibit a positive willingness to pay for products that are healthier (organic cabbage in this case) better than the uneducated. To validate the result obtained, other studies also found a positive correlation between willingness to pay premium on a product and education (Du Toit et al. 2003; Liu e al. 2009). However, other studies did not find any significant impact of education on the dependent variable WTP, and in fact, an inversely proportional relationship (Akgüngör et al. 2007; Novotorova and Mazzocco 2008).
The household income on the whole was seen to have negative relationship and an insignificant statistic with WTP. The results didn’t conform to a priori expectation of income having a positive relationship with the dependent variable WTP. However, other studies arrived at the same result opining that income is not a significant variable of consumer’s willing to pay for the organic cabbage (Novotorova and Mazzocco 2008).

PRICE is hypothesized to have a negative effect or impact on willingness to pay, where increasing price premiums will discourage consumers to patronize the attributed product (in this case the organic cabbage), hence the decline of the willingness to pay. Price in this analysis conformed to a priori expectation. However, it was not statistically significant. The number of respondents that indicated willingness to purchase did so because they want good health, and are ready to spend than to go to the hospital with extra costs. Secondly, prices differed from market to market and from one consumer to another due to the different suburbs or areas sampled. 50 percent premium for the high income suburb was not the same computed for middle and low income suburbs.

The coefficient of the variable KNW.ORGF is positively related to willingness to pay premium price for organic cabbage as hypothesized, but not significant. This indicates that prior knowledge of organic products is a decisive element of households’ willingness to pay premium price for organic cabbage. It has a marginal effect of 0.0092, which implies that, prior knowledge of organic products increases the respondent’s tendency of opting for organic cabbage by 0.92 percent.
ENV. Concern is hypothesized to be positively related to willingness to pay, i.e. respondent who are concerned about issues that borders on environmental protection and sustainability are more likely to indicate a willingness to pay premium price for organic cabbage. In accordance with anticipation, the coefficient for Env. Concern is positively related to willingness to pay premium price for the product. The coefficient for the variable Env. Concern is however not significant, indicating that environmental concern of the respondent is not relevant in explaining households’ choice of organic cabbage (Kimenju & Hugo, 2008).

The health concern (HCON) is hypothesized to be positively related to willingness to pay, i.e. respondent who are concerned about issues that borders on health issues and sustainability are more likely to indicate a willingness to pay premium price for organic cabbage. In contrast with literature, the coefficient for HCON is negatively related to willingness to pay premium price for the product. The coefficient for the variable health Concern is however not significant, indicating that consumers do not consider really health concern health concern of the respondent is not relevant in explaining households’ choice of organic cabbage.
CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

The Chapter gives a summary and conclusion of the study. Policy recommendations based on the findings of the study is also made to create awareness among the populace in the areas in terms of its health benefits and cost reduction on hospital bills, etc., increase production and more importantly encourage the patronage of organic products. There were limitations in the course of the study which are also forwarded, with suggestions to explore in future research.

5.2 Summary of major findings

The five point Likert scale was employed to ascertain clearly the perception of consumers in the Accra Metropolitan area concerning organic products and organic cabbage in particular. Consumers’ socio-economic variables, general behavior and knowledge of organic products were examined in relation to their impact on organic products purchase. Product attributes was considered in this study to confirm or find out whether consumers will indeed be largely influenced to be willing or not to purchase organic cabbage.

In estimating the consumer’s willingness to pay, the contingent valuation method with the dichotomous double bounded approach was used to determine the various willingness to pay premiums of the income strata. The mean willingness to pay premium for the organic cabbage
was also computed for the three different income strata sampled areas, and finally the factors that affect consumers’ willingness to pay premium was identified using the binary logistic model.

Majority of the respondents are females with a 69.4 percent, and relatively young a sample population considering a mean age of 34.3 was computed. About 48.8 percent of the population are married, the Christian religion dominating with about 88 percent of the sample and SHS being the highest level of school attained generally by the respondents with a total of 75 (about 30 percent). The average monthly income earned by the respondents is between GHS 500 and GHS 1000.

On the level of awareness of consumers about organic products, about 69.7 percent and 30.3 percent attest to knowing about them and not knowing about them respectively.

About 65.5 percent of respondents strongly agree that organic products are healthy whereas 29.5 percent agree. They also strongly agree and agree that organic products have great quality by 29.5 percent and 62 percent respectively. About 28.7 percent and 62.8 percent strongly agree and agree accordingly, that organic products have no harmful effect on the environment. Conversely 11.2 percent of respondents disagree with the statement that organic products have more insect damage in addition to the 0.4 percent that strongly disagree. For the defining statement; organic products are more expensive than the conventional ones 0.8 percent of the respondents disagree while 23.3 strongly disagree. 57 percent of the respondent disagree with the statement that organic products are worse than their conventional counterpart, on the other hand a strong disagreement was revealed by 15.1 percent of the respondents.
A little over 80 percent (80.2%) of respondents from the low income strata attested to having prior knowledge of organic farming as well as organic products. About 69.6 percent and 30.4 percent of respondents from the middle income strata declared being aware and unaware of organic products in that order whereas 51.5 and 48.5 percent of the respondents from the high income strata have prior knowledge of organic products accordingly.

The media (Radio, television and newspaper) is the major source of knowledge for 49.4 percent of the respondents who expressed knowledge of organic product; with radio being the highest at 23.3 percent. Source of knowledge through family and friends accounts for 20.9 percent. The “Other” coded variable which means respondents acquiring knowledge on organic product through school and personal reading recorded a 13.2 percent.

It was also computed that on average, the various income suburbs, low, middle and high income suburbs will be willing to pay GHS 3.34, GHS 6.67 and GHS 11.95 for 1 kg of organic cabbage respectively if there was the market for organic cabbage at the various markets they patronize.

In all, 8 people making a 3.1 percent of the total respondents indicated their willingness to pay premium for organic cabbage at 10 percent at the extreme lower limit. About 12.5 percent, 30.2 percent and 19.4 percent of respondents revealed to pay premium at 20 percent, 50 percent and 80 percent respectively. The extreme upper limit revealed 31 percent of the respondents show interest in willingness to pay double the premium for the organic cabbage.

From the binary logit regression results in Chapter 4, table 4.10, educational level, freshness of the product, price at 50% premium and the size of the product were deduced to be significant factors that affects willingness to pay premium.
On the issue of traceability, respondents in general do not really consider or take into account the source of the products they purchase from the market, hence are not able to link back to exact origin of production if anything should happen.

5.3 Conclusion

To conclude based on the results obtained and the objectives set, this study assessed consumers’ level of awareness of organic products to be above average, and not to the point of consuming as a necessity. The media was found out to be the main source of information flow responsible for the number of respondents who are aware of organic products.

The respondents perceived that organic products are not harmful to the environment and may cause less of a negative health effect to humans compared to the conventionally grown food products. They also explained their decision to go in for the organic product because of the evidence of long life of the older generation. Given the positive relationship between awareness and willingness to pay from the results, there is indeed an advantage in creating awareness every way possible to get consumers to patronize organic cabbage by also solving any health problem associated with the food they consume.

The study also revealed that most of the respondents (81.4 percent), for the purpose of consuming a product they are able to track if anything should happen upon consumption, opt for proper labelling and packaging of the organic cabbage by the producer and the quality assurance authorities.
Most interviewed respondents are willing to pay a premium of at least 10 percent for organic cabbage, surprisingly revealing about 97 percent willingness to pay premium in all.

The results from the bidding game also show us that respondents across the income suburbs are more likely to be willing to pay premium for the product.

It was deduced that educational level, taste of the organic cabbage and the size of the product are significant factors that affect the consumers’ willingness to pay premium for the product.

5.4 Policy Recommendations

The government in collaboration with the stakeholders of organic vegetable (cabbage in this case); farmers, agribusiness consultants, consumers, marketers, etc. should encourage a rigorous participation campaign for organic cabbage. The organic food stuff should be produced in larger quantities with the conventionally produced ones, to make up part of mainstream agriculture.

The agencies that be FAO, MoFA, GOAN should help create awareness on the public since their authentication and expertise carries more weight to help disseminate the information.

Educational platforms on television, conferences for stakeholders in agriculture, especially with farmers, on-field demonstrations, and relevant discussions should be championed to see how organic farming can be incorporated into Ghana’s mainstream agriculture.

A consequence of the likelihood of reduced consumption levels of organic cabbage deduced from the results proves that consumers are not satisfied with its quality. One way to solving the problem could be to apply minimum quality/safety standards on markets in Ghana and enforce a ban on all vegetables that do not meet these standards (Penau, 2006). While this intervention
could be costly for society, as it increases the cost of production and prohibits consumer choice (Lusk & Marette, 2010), this may be balanced by lower health costs and increased economic productivity from healthy workers.

Upon discovering a high willingness to pay premium for food products with minimal use of chemical fertilizer, the government should also introduce some form of subsidies on product to enable consumers make healthy purchases easily.

Furthermore, the respondents did not even know how to distinguish between conventional and organic cabbage before this study. Creating special markets, labelling products in proper packages especially, and certified by the authorities for sale will help differentiate between the organic cabbage and the conventionally produced one. This process will also help the consumer be able to track the product to source for more purchases if so desired, or to make important reports on the products so that changes in production can be made as such. In order for consumers to be able identify what is organic and what is not (IFOAM), there is need for increased awareness of organic guarantee systems (standards, mark, verification & control).

### 5.5 Limitations of the Study

A limited number of at least 3 suburbs were chosen from each strata; 3 for LIS, 3 for MIS and 4 for HIS, making a total of 10 suburbs. The data is not as close to the population of Ghana to be able to draw a substantial conclusion for the country and this was due to limited financial might and time.
Another limitation of this study which is also true of all WTP surveys is the inability of the study to tell the real behavior of consumers in the market place. It does rely on stated as opposed to revealed preferences. It is possible that a respondent by committing himself or herself by saying “yes” to the initial bid goes ahead to say “yes” to the upper bid offer. It is also possible that a “no” response to the initial bid offer, made the respondent feel guilty about his or her unwillingness to pay and therefore likely said yes to the follow up bid offer. Therefore, these estimates of WTP should be treated with more caution than those generated from actual consumer choices, as such the results should be interpreted with these caveats in mind.

5.6 Suggestions for future research

Firstly since the Accra metropolitan area alone was examined, future studies can be replicated for other areas in the country to determine the overall market size and consumers’ WTP for other organic vegetables. Also, some of the variables tested in the WTP model were not statistically significant probably due to the sample size. To address this statistical limitation, future studies should consider a large sample size in order to increase the degree of freedom.
REFERENCES


84
APPENDIX: QUESTIONNAIRE  
UNIVERSITY OF GHANA  
DEPARTMENT OF AGRICULTURAL ECONOMICS &  
AGRIBUSINESS  

SURVEY ON ANALYSIS OF CONSUMER’S WILLINGNESS TO PAY PREMIUM FOR CERTIFIED ORGANIC CABBAGE IN THE ACCRA METROPOLITAN AREA.

Please rest assured that the information gathered will be used only for academic study.

A. **SOCIO-ECONOMIC CHARACTERISTICS OF RESPONDENTS**  
Please tick or fill in the blank space as appropriate

<table>
<thead>
<tr>
<th>NO.</th>
<th>Question</th>
<th>Key</th>
<th>Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>What is your marital status?</td>
<td>1 Single</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>2 Married</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>3 Separated/Divorced</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>4 Widowed</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>5 Other ___________________</td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>Age</td>
<td>In years</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>Gender</td>
<td>1 Male</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>0 Female</td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>Religion</td>
<td>1 Christianity</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>2 Islam</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>3 Traditionalist</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>4 Buddhist</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>5 No religion</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>6 Other ___________________</td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>Level of education</td>
<td>1 Primary</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>2 JHS</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>3 SHS</td>
<td></td>
</tr>
</tbody>
</table>
B) CONSUMER’S AWARENESS AND KNOWLEDGE LEVEL OF ORGANIC PRODUCTS

12. Which of the following is your main source of weekly food shopping? ...........
   (1) Supermarket
   (2) Open Market (Market retailers)
   (3) Farm gate
   (4) Street hawkers
   (5) Internet
   (6) Other (Please State) …………………………………

13. Have you ever heard of the term organic food products? (1) Yes (2) No

14. If yes, where/how did you hear about it? ..............
   (1) Radio
   (2) Newspapers
   (3) Television
   (4) Through friends /family members
   (5) Others (specify)…………………………………………………………………………
15. Could you briefly explain what an organic food product is?

16. Have you ever bought and/or consumed any organic vegetables before? (1) Yes (2) No

17. a) If yes, select the type of organic vegetable(s): (1) pears (2) onion (3) spinach (4) Cabbage (5) Lettuce (6) tomato (7) Garlic (8) Bean (9) pepper (10) carrot (11) others, (Please specify…………………)

b) If no, why not?
(1) Too expensive
(2) Not enough choice
(3) Don’t like taste
(4) Poor Packaging
(5) Not available on the Ghanaian market
(6) Other (please specify) …………………

C) CONSUMERS’ PERCEPTION AND ATTITUDE TOWARDS ORGANIC PRODUCTS

18. Do synthetic chemicals in agricultural production has a negative effect on the environment?
(1) Positive [ ] 2) Negative [ ]

19. State two of the effects you think synthetic chemicals have on the environment?
a) __________________________________________________________
b) __________________________________________________________

Kindly indicate your perception/ thoughts about the following on Organic Products

Show level of agreement using the scale of agreement or disagreement (on a scale of 1 to 5 where 1= strongly disagree, 2= disagree, 3= neutral, 4= agree, 5= strongly agree)

<table>
<thead>
<tr>
<th>No</th>
<th>Statement</th>
<th>1 strongly disagree</th>
<th>2 disagree</th>
<th>3 neutral</th>
<th>4 agree</th>
<th>5 strongly agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>20</td>
<td>Organic products are healthier</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>Organic products have great quality</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>22</td>
<td>Organic products have no harmful effects to the environment</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>23</td>
<td>Organic products have more insect damage</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

87
24. Organic products are worse than conventional products

25. Organic products are more expensive than the conventional ones

26. Organic products are tastier

Kindly show by choice of “yes or no” the attributes you look out for when making the decision to buy cabbage

<table>
<thead>
<tr>
<th>No.</th>
<th>Attribute</th>
<th>Do you look for attribute?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>YES</td>
</tr>
<tr>
<td>27</td>
<td>Size</td>
<td></td>
</tr>
<tr>
<td>28</td>
<td>Freshness</td>
<td></td>
</tr>
<tr>
<td>29</td>
<td>Insect damage</td>
<td></td>
</tr>
<tr>
<td>30</td>
<td>Greenish leaves</td>
<td></td>
</tr>
<tr>
<td>31</td>
<td>Ripeness</td>
<td></td>
</tr>
<tr>
<td>32</td>
<td>Environmental concern</td>
<td></td>
</tr>
<tr>
<td>33</td>
<td>Health concern</td>
<td></td>
</tr>
</tbody>
</table>

34. How often do you buy organic cabbage a month?

(1) 0  (2) 1-2  (3) 3-4  (4) more than 4 times

35. What is the current price of a head of a conventional cabbage? ............... 

36. In your opinion, how would you like organic products to be differentiated from the conventional ones?

(1) Labeling  (2) Selling in special markets/stores  (3) other
(specify).................................
D) CONSUMER WILLINGNESS TO PAY PREMIUM FOR CERTIFIED ORGANIC CABBAGE

Description of an Organic Product

An organic produce for the purposes of this study is agricultural produce that is produced with minimal or no use of synthetic compound fertilizers, pesticides, growth regulators and livestock feed additives to the maximum extent feasible. It rather includes crop rotation, residues, animal manure, legumes, green manure, off-farm organic wastes, and the aspects of biological pest control measures, soil productivity and tilt, to supply plant nutrients and to control insects, weeds and other pest.

HYPOTHETICAL SITUATION

37. If you are willing to buy, are you willing to pay 50% over the price of conventional cabbage? If respondent answers no to the starting bid the lower follow up bid of 20% is then offered, if still the respondent is not ready to pay that premium then lower extreme bid of 10% is offered. But if on the other hand the respondent respond to the affirmative to the starting bid of 50%, then the follow up upper bid of 80% is presented, if the respondent still indicates willingness to pay of up to that proportion then the extreme upper bid of 100% is presented.

<table>
<thead>
<tr>
<th>Price</th>
<th>Premium</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>10%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>50%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>80%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>100%</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>