

Urban Consumer Perception and Willingness to Pay for Organic Vegetables: Insights from Gampaha District in Sri Lanka

Wijesinghe A.G.K* and Senarathna M.M.D.

*Department of Agribusiness Management, Faculty of Agriculture and Plantation Management,
Wayamba University of Sri Lanka, Makandura, Gonavila (NWP), 60170*

**Corresponding Author:
Email: kusum_wijesinghe06@yahoo.com*

ABSTRACT

Organically grown vegetables are more beneficial due to prevailing health issues and environmental matters of non-organic farming. Organic farming sustains the health of people, ecosystems, and soils. The objectives of this research are to find the: consumers' perception on organic vegetables, consumers' willingness to pay for organic vegetables over non-organic vegetables, and the effects of socio-demographic characteristics on willingness to pay for organic vegetables in the case of Gampaha District in Sri Lanka. A questionnaire survey was conducted at the household level with randomly selected 260 respondents covering randomly selected four divisional secretariats in the Gampaha district. Data were analyzed using the contingent valuation method in R statistical software. Results revealed that 100 percent of consumers are willing to buy organic vegetables instead of non-organic vegetables at the same bid price. Seventy percent of consumers agreed to pay an additional amount for organic vegetables over non-organic vegetables. Demographic variables i.e. monthly income and education level significantly influence willingness to pay for organic vegetables. Perception factors i.e. organic vegetables are healthier, certified organic vegetables are real organic, and organic vegetables are more nutritious, significantly influence willingness to pay for organic vegetables. Through these findings, organic farmers can get an idea about premium price levels that can be assigned to organic vegetables. Policymakers can get an awareness of consumers' willingness to pay and the cross-price effects that refers to organic and non-organic vegetables.

KEYWORDS: Consumer perception, Contingent valuation, Organic vegetables, Willingness to pay

Introduction

As an agricultural country, farmers cultivated vegetables in “Chena” in early times in Sri Lanka. They used traditional methods and all most all the vegetable productions were organic. But in recent decades all the agricultural lands were commercialized to cater to the demand for food consumption by the increasing population in Sri Lanka (Weerakkody and Mawalagedara, 2020). Vegetable cultivation is one of the major farming practices in the agriculture sector in Sri Lanka.

Normally beans, beetroot, cabbage, capsicum, carrot, knol-khol, leeks, and radish are grown upcountry, and pumpkin, snake gourd, tomato, cucumber, bitter gourd, okra, brinjal, luffa, mace, winged bean, and *kekiri* are mainly grown in the low country. Totally 22739 ha of land have been used to cultivate vegetables in 2019 (Department of Agriculture, 2019).

The population in Sri Lanka was estimated at 21.8 million in 2019 and out of that, the population of the Gampaha district was 2417000 persons (Department of Census and Statistics, 2019). It is the second-largest population according to the district basis in Sri Lanka. This high population creates a big demand for vegetables in the Gampaha district where the current research was focused.

Chemical fertilizers and pesticides are applied by commercial farmers to boost productivity and avoid pest attacks. Various types of agrochemicals are introduced to the market and researchers observed that farmers use them without considering recommended limitations on certain occasions. Further, any agrochemicals can be purchased from the market with no control or any monitoring at the time this study was conducted. Researchers have identified the negative effects of such agrochemicals on human health like chronic kidney disease; neuron disease; cancers and environmental issues like contamination of soil and water with toxic heavy metals in agrochemicals (Wimalawansa and Wimalawansa, 2014; Willer, 2019).

Due to these various negative consequences of non-organic productions, today's food consumption patterns are changing towards organic products all over the world (Gracia and Magistris, 2007; Sangkumchaliang and Huang, 2012; Narmilan and Amuthenie, 2015). Further, researchers have mentioned that consumers concern more about their health so they tend to use organic products widely (Jaroenwanit and Kantatasiri, 2014; Muhammad et al., 2015; Wijesinghe and Nazreen, 2020).

Due to the several negative aspects of using in-organic fertilizers and agrochemicals i.e pesticides and weedicides, the whole world promotes organic agriculture instead of conventional farming. Therefore, organic food and beverages are a rapidly growing food market in the world (Smith and Paladino, 2010; Reganold and Wachter, 2016).

Nowadays in Sri Lanka, there is a positive trend for organically grown vegetables due to the health-related consequences of consumption of non-organic vegetable productions. Consumers prefer to consume vegetables that are grown in their home gardens. But due to the minimum spaces in urban home gardens, people are unable to cultivate vegetables extensively. Some of the farmers cultivate vegetables organically in the protected houses to avoid pest attacks. The yield is limited for organic farmers who are growing vegetables organically in open fields and a considerable amount of yield has to be removed due to pest attacks because of not using pesticides.

The organic farmers have to bear the high initial cost of the protected houses and the extra costs for getting certificates like organic certification, pesticide residue test reports, and other services (Muhammad et al., 2015). As well as organic farmers gain lower yields instead of higher costs per acre when compared to non-organic farming (Wyman and Diercks, 2003).

Researchers have pointed out that organic farmers need higher break-even prices and price premiums for organic vegetables compared to non-organic vegetables (Muhammad et al., 2015). Therefore, consumers have to pay extra money for organic vegetables. According to the literature, there are several contributing factors to the willingness to pay for organic products. Green products and green marketing are the common concepts that are being used by researchers in organic products (Rex and Baumann, 2007).

Rex and Baumann further mentioned that consumers' knowledge of environmental values of using eco-friendly products and improving demand and supply balance is the essential attributes to improve the green market (Rex and Baumann, 2007). Further, a study has mentioned that the factors that influence the willingness to buy organic products are demographic factors, knowledge about the advantages of organic farming, and some values of customers (Laroche et al., 2001; Phillip and Dipeolu, 2010).

Many studies have mentioned that age of the consumer, gender, marital status, level of income, and level of education of the consumer is the main demographic factors influencing the willingness to pay for organic attributes (Laroche et al., 2001; Nagy-Percsi and Fogarassy, 2019; Wijesinghe and Nazreen, 2020). Further, Rao and Bergem, (1992) have mentioned that the price premium for a product should be fair to the added value to that product. Several studies have mentioned that the unavailability of organic products, lack of the required facts on the label, and higher price cause unwillingness to buy organic products (Padel and Foster, 2005; Akaichi et al., 2012; Teng and Lu, 2016).

Based on this literature, the present study was focused to find consumers' willingness to pay (WTP) for organic vegetables over non-organic vegetables in the Sri Lankan market. WTP has been defined as the maximum limit a consumer is willing to pay or sacrifice to purchase a given product instead of undesired or uninterested productions (Wijesinghe and Nazreen, 2020).

Researchers found that there is not sufficient latest statistical information about Sri Lankan consumers' preference and willingness to pay for organic vegetables. The objectives of this study were to determine the consumers' perception on organic vegetables, consumers' willingness to pay for organic vegetables over non-organic vegetables, and the effects of socio-demographic characteristics on willingness to pay for organic vegetables in the Gampaha District in Sri Lanka as an urban case.

Methodology

According to the literature and the best knowledge of the researchers, as there is no sufficient latest statistical information on Sri Lankan consumers' preference and willingness to pay for organic vegetables this study employed a concept as illustrated in figure 1. Figure 1 shows the factors that determine the consumers' perception on organic vegetables, consumers' willingness to pay for organic vegetables over non-organic vegetables, and the effects of socio-demographic characteristics on willingness to pay for organic vegetables.

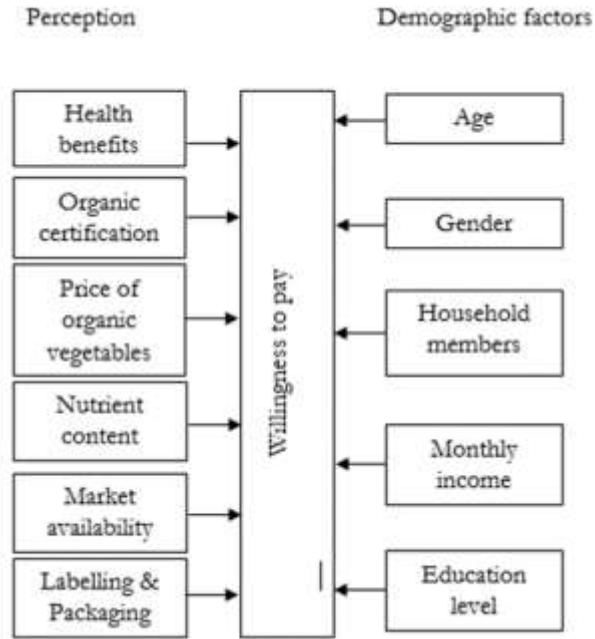


Figure 1: Conceptual Framework of the Study

Data Collection

Primary data were collected from 260 consumers who were living in the Gampaha district by using a pretested questionnaire. Multi-stage sampling technique was used to select the respondents covering four Divisional Secretariat Divisions (DSD) in the first stage. From each DSD, five Grama Niladhari Divisions (GND) were selected as the second stage. Thirteen households were selected from each GND and one family member (head of the household or housewife) of each house was interviewed in the third stage (Figure 2).

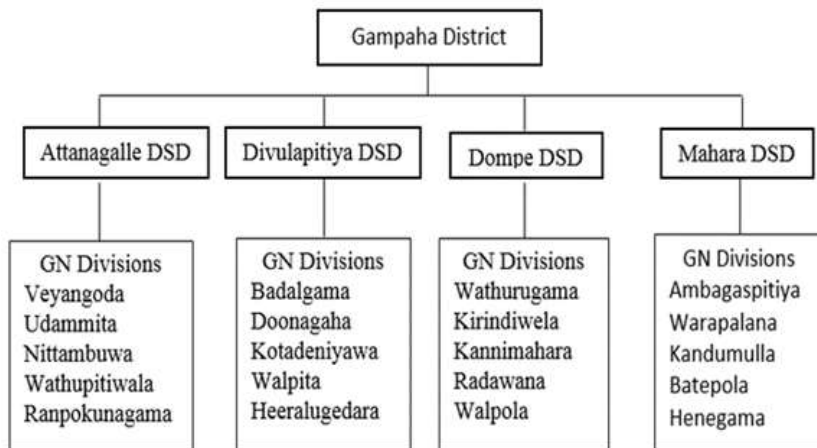


Figure 2: Multistage Sampling Frame

The survey questionnaire consisted of information on consumers' socio-demographic factors i.e. age, gender, number of household members, monthly household income, education level, and consumers' perception of organic vegetables.

Consumer perception was measured by six criteria i.e. health benefits of organic vegetables (benefit of not containing chemicals), level of nutrient content (freshness and content of nutrition), organic certification, price of the organic vegetables, availability at the market and labelling & packaging. Measurements were done using a five-point Likert scale ranging from strongly agree (1) to strongly disagree (5). Measurement items that were used to evaluate the perception factors are as in Table 1.

Table 1: Items Used to Measure the Perception Factors

Perception factors	Items
Health benefits	Organic vegetables are generally safe to consume. The use of synthetic chemicals in agriculture has a negative effect on the environment. The use of synthetic chemicals in agriculture has a negative effect on human health. I believe that there is no any chemical residual in organic vegetables.
Certification	It is important to me for a product to be certified as “organic” rather than the seller telling me that it is organic. I trust certified organic vegetables. Certified organic vegetables are really organic.
Price	Organic vegetables are typically expensive. The cost of production for organically grown vegetables is higher than for inorganically grown vegetables.
Level of nutrient content	Organic vegetables have more freshness than the non-organic vegetable. Organic vegetables are found to be more nutritious, than the non-organic vegetable.
Market availability	Organically grown vegetables are not sufficiently available in the market. I like to buy organic vegetables if they are readily available.
Labelling & packaging	It is difficult to identify organic vegetables from non-organic vegetables at the market without labels. Organic vegetables should have specific labels. Organic vegetables should have specific packaging.

Data Analysis

Descriptive Statistics of the Sample

According to the studied population, the majority of the respondents were women (58%). The population included 26% and 31% in the age group of 20-30 and 31-40 respectively. Among the sample population, 27% of respondents had higher education levels up to postgraduate and 8% of respondents have completed only up to grade 10. In the survey population, 75% were employed and the majority of the respondents (20%) were above the income level of LKR 100000. According to the survey data majority of the respondents (42%) had four members in their family.

Willingness to Pay Analysis

Data were analyzed by using the R 3.6.2 statistical software. Logistic regression was used to determine the impact of independent variables on willingness to pay. The contingent valuation (CV) method was performed to evaluate the consumer preference for organic vegetables. CV method is used as a tool to evaluate the value of environmental goods, especially where there is no market price or products with special attributes (Seip and Strand, 1992, Loureiro and Hine, 2002; Kaneko and Chern, 2005; Fogarty and Aizaki, 2019). The product in this research is vegetable and the specific attribute considered of this product is organic. During the survey, the consumers were asked questions in a dichotomous choice format i.e. every respondent was asked whether they are willing to buy organic vegetables if organic and non-organic vegetables are at the same bid price that has zero price difference (Hanemann et al., 1991). If the respondent selected “yes”, then the respondent was asked another question i.e., “do you willing to pay an additional amount for organic vegetables (WTP)”. If the respondent selected “yes” then the respondent was asked to choose a premium bid, either price differential greater than zero. If the respondent selected “no” then the respondent had to choose a lower bid, for either price differential less than zero.

The percentage values used for premium bids that the respondents were willing to pay additional for organic vegetables over non-organic vegetables were 5%, 10%, 15%, 20%, 25% and 30% above non-organic vegetable prices. The lower bids used for those who were not willing to pay an additional or equal amount for organic vegetables over non-organic vegetables were 5%, 10%, 15%, 20%, 25%, and 30% below non-organic vegetable prices.

$$WTP^* = \begin{cases} 1 & \text{if } WTP^* > 0 \\ 0 & \text{if } WTP^* < 0 \end{cases} \quad [1]$$

The general form of a model for the research is,

$$Y = \beta_0 + \beta X + \epsilon \quad [2]$$

Where Y is the willingness to pay (response variable), X is the vector of independent variables (Table 2), β_0 is the intercept, β is the conformable vector of coefficients and ϵ is the error for the various observations.

Table 2: Independent Variables in the Equation as Follows

Variables	Description
Age	Age in years
Gender	Male, Female
Number of household members	Members in numbers
Monthly Household Income	<10000
	11000 – 20000
	21000 – 30000
	31000 – 40000
	41000 – 50000
	51000 – 60000
	61000 – 70000
	71000 – 80000
	81000 – 90000
91000 – 100000	
100000<	
Education level	Grade 1-10
	O/L
	A/L
	Diploma
	Graduate
	Postgraduate
Perception factors	Health benefits
	certifications
	Nutrient content
	Price
	Market availability
Labelling	

According to this study, the logistic regression model is,

$$Y = \beta_0 + \beta_1AGE + \beta_2GEN + \beta_3NFM + \beta_4INC + \beta_5EDU + \beta_6HLB + \beta_7CER + \beta_8LON + \beta_9PRC + \beta_{10}AVL + \beta_{11}LAB + \epsilon \quad [3]$$

The logistic model explains,

Y : Willingness to pay
 β_0 to β_{11} : Regression coefficients
AGE : Age
GEN: Gender
NFM : Number of household members
INC : Monthly household income
EDU: Education level
HLB : Perception on health benefits
CER : Perception on certifications
LON : Perception on level of nutrient content
PRC : Perception on price
AVL : Perception on market availability
LAB : Perception on labelling & packaging
 ϵ : Error term

Results and Discussion

The coefficient of the independent variables indicates the change in the willingness to pay an additional amount for organic vegetables.

The study found that 100 percent of consumers have chosen organic vegetables instead of non-organic vegetables at an equal price. The results revealed that seventy percent of vegetable consumers agreed to pay an additional amount for organic vegetables. The majority of them (32%) selected a 5% price premium for organic vegetables than non-organic vegetables.

Another 22% of consumers are willing to pay 10% of price premium for organic vegetables, 20% of consumers willing to pay 15% of a price premium, 17% of consumers willing to pay up to 20% additional, 6% of consumers willing to pay 25% of price premium and 3% of consumers willing to pay 30% of price premium for organic vegetables than non-organic vegetables.

When bid prices are increased the consumers' willingness to pay decreases. Further, the results revealed that 30% of consumers disagreed to pay any additional amount for organic vegetables even though there are benefits as defined in the research.

Monthly income and education level significantly influence on willingness to pay for organic vegetables (Table 3). When the level of income is getting increased power of purchasing will be increased thus contributes to purchase more. As well as, consumers who are educated may have good awareness about the health benefits of consuming organically grown vegetables thus contributes to consumption more. Perception factors i.e. "organic vegetables are healthier, certified organic vegetables are real organic, and organic vegetables are more nutritious" significantly influence the willingness to pay for organic vegetables. The reason of getting negative co-efficient values for the above perception factors is due to the reversed corded questions used in the questionnaire i.e. 1 denoted strongly agree and 5 denoted strongly disagree in the Likert Scale.

Therefore, negative values showed positive effects. Age, gender, and the number of household members do not show any significant impacts on willingness to pay for organic vegetables.

The indicators used to measure the perception of the healthiness of organic vegetables were, organic vegetables are safe to consume, have negative effects of synthetic chemicals on the environment, have negative effects of chemicals on human health and belief no chemical residue in organic vegetables. The indicators used to measure the perception of organic certification were, it is important for a product to be certified as organic, organic vegetables are more expensive and the cost of production for organic vegetables is higher. The indicators used to measure the perception of organic vegetables are more nutritious were, organic vegetables have more freshness and organic vegetables have more nutritive values than non-organic.

Consumers prefer to consume organic vegetables due to the belief of not contain residues of pesticides. As well as they prefer to purchase certified organic vegetables due to their trust in certified organic products. Consumers who are willing to buy organic vegetables need an assurance of whether they are really organic. Hence, certification is more important for selling organically grown vegetables in the market. Consumers accepted that the procedure of getting certificates is expensive and therefore they are willing to pay an additional amount for the organic attribute. Consumers trust organic vegetables if there are certifications done by a responsible authority.

Organic farmers and policymakers can get an idea about consumers' willingness to pay attributes for organic vegetables. Policymakers can identify cross-price effects that refer to organic and non-organic vegetables. Accordingly, they can set pricing policies for organic products.

Table 3: Full Model of Contingent Valuation Method for Organic Vegetables

Variable	Co-efficient	SE	P-value
Age	0.36	0.19	0.06
Gender	0.40	0.50	0.43
Number of household members	0.11	0.23	0.65
Monthly income	0.22	0.09	0.01*
Education level	0.35	0.16	0.03*
Perception on health benefits	-2.70	0.51	0.00***
Perception on certification	0.84	0.41	0.04*
Perception on price	0.43	0.35	0.21
Perception on nutrient content	-0.85	0.31	0.01**
Perception on market availability	0.83	0.50	0.10
Perception on labelling & packaging	-0.63	0.40	0.12

Note: SE-Standard error, *P < 0.05, **P < 0.01, ***P < 0.00

Conclusions

Seventy percent of consumers agreed to pay an additional amount for organic vegetables and thirty percent of consumers do not agree to pay any additional amount for organic vegetables. Farmers who are unwilling to pay extra for organic vegetables believe that producing organic vegetables is not costly and vegetables can be grown organically even in their home gardens for their own consumption.

Monthly income and education level significantly influence willingness to pay for organic vegetables. Consumers' income level was the most significant variable for willingness to pay an additional amount for organic vegetables. When consumers' income is increased price premium for organic vegetables is increased. Perception factors i.e. "organic vegetables are healthier, certified organic vegetables are real organic, and organic vegetables are more nutritious" are the factors that contribute to extra pay decisions for organic vegetables. However, age and gender do not show significant impacts on willingness to pay decisions for organic vegetables.

As the majority of consumers (70%) were willing to pay an extra price for organic vegetables, there is a huge potential to expand the organic vegetable market. Organic foods are the new market concept in the world. This is the best time to introduce new market strategies to extend the market segment in organic vegetables in Sri Lanka. Through these findings, organic farmers and policymakers can get an idea about consumers' perceptions of organic vegetables. Further, policy-makers can understand consumers' expectations in organic production and cross-price effects referring to organic and non-organic vegetables.

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