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WILLINGNESS TO PAY FOR HYDROPONIC VEGETABLES IN SAMBAS DISTRICT

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Abstract

Hydroponics is one of the vegetable cultivation techniques that is beginning to develop in Sambas. In addition to its stable price range of IDR 5,000 - IDR 6,000 per 200 gram package, consumers prefer it because the vegetables tend to be healthier and cleaner than similar vegetables grown in soil. This study aims to analyze consumer willingness to pay (WTP) for hydroponic vegetables in Sambas District. The research method used is the Contingent Valuation Method (CVM) with data collection through surveys of consumers who have purchased or are interested in hydroponic vegetable products. Data collection was carried out in several locations that are centers for hydroponic vegetable cultivation. The results of the study show that the average WTP that consumers are willing to pay for hydroponic vegetables in Sambas is IDR 6,980 per 200 gram package. Household income and expenditure have very little influence on the purchase of hydroponic vegetables. These findings indicate the market potential for hydroponic vegetable products in Sambas, even though the WTP value of consumers in this region is relatively lower than the results of studies in other regions, which are generally influenced by factors such as health awareness, product quality, and environmental concerns. The results of this study are expected to serve as a reference for business actors and policy makers in the development of the hydroponic vegetable agribusiness in Sambas, particularly in determining pricing and promotion strategies that are in line with the purchasing power and preferences of local consumers.
Keywords: Hydroponics, Price, Availability.

INTRODUCTION

The demand for healthy and environmentally friendly food is increasing along with growing public awareness of the importance of consuming pesticide-free, high-quality food. One agricultural innovation that addresses this need is hydroponic vegetable cultivation, which offers the advantages of fresher, cleaner products with minimal soil and pesticide contamination (Dian Sari, Wilis Widi Wilujeng, Uray Dian Novita, 2023). These advantages have made hydroponic vegetables increasingly popular among consumers, especially in urban areas and regions that are beginning to develop modern agriculture, including Sambas Regency. Hydroponics itself is a model of plant cultivation that uses water as the growing medium.

In Sambas Regency, the hydroponic farming system has been developed since 2015. The crops that were initially cultivated were various types of vegetables such as mustard greens, kale, and spinach. The types of vegetables grown are those that are favored by the community. However, despite the considerable market potential,

hydroponic businesses in Sambas face significant challenges in the form of market competition from similar products grown conventionally. The following is a table of the production and selling prices of conventionally grown vegetables in Sambas District.

Table 1 Vegetable Production and Selling Price of Vegetables in Sambas District at 2024

Vegetable Type	Production (Ton/Year)	Selling Price (IDR/Kg)
Spinach	120	10.000 – 15.000
Kale	95	7.000 – 10.000
Mustard	80	10.000 – 15.000
Caisim	60	10.000 – 15.000

Source : BPS Sambas Sub-district in Figures 2024

The table above shows that the selling price for conventionally grown vegetables is almost the same and tends to be cheap. Meanwhile, the current selling price for hydroponic vegetables ranges from IDR 25,000 to Rp 30,000 per kilogram, depending on the grower. In addition, hydroponic vegetables are usually sold in packages at a selling price of IDR 6,000 per 200-gram package. Although the price is expensive, it tends to be stable because it is not affected by the season. With this difference, a deeper understanding of the extent to which consumers in Sambas District are willing to pay (willingness to pay/WTP) for these hydroponic products needs to be studied further.

The concept of willingness to pay (WTP) itself is the maximum price that consumers are voluntarily and willingly willing to pay to obtain a desired product or service (Uray Dian Novita and Wilis Widi Wilujeng, 2021). The WTP value is greatly influenced by the perception of benefits, product quality, health awareness, as well as economic and social factors of consumers (Nurul Nafisah, Netti Tinaprilla and Netti Tinaprilla, 2024). Previous studies have shown that consumers are willing to pay more for hydroponic vegetables because they are considered healthier and more environmentally friendly, with minimal use of chemicals. However, the amount of WTP and the factors that influence it can vary from region to region, depending on consumer characteristics and local market conditions.

In Sambas District itself, vegetable consumption is quite high and business opportunities for vegetable producers are very promising (Dian Sari, Wilis Widi Wilujeng, Uray Dian Novita, 2023). However, most of the vegetable needs are still supplied from outside the region, so the development of local agribusiness, especially hydroponics, has great potential to increase food self-sufficiency and the income of local farmers. Therefore, it is important to conduct a study on consumer willingness to pay (WTP) for hydroponic vegetables in Sambas District. The results of this research are expected to provide strategic information for business actors, local governments, and other stakeholders in formulating pricing policies, marketing strategies, and the development of sustainable hydroponic agribusiness in this region.

LITERATURE REVIEW

2.1. Hydroponics

Hydroponics is a method of growing plants without soil, where plants are grown in a nutrient-enriched water solution. This system replaces soil with other media such as water, gravel, or rockwool, which serve to support the plant roots and provide direct access to the nutrients they need. In hydroponic systems, commonly used growing media are water enriched with nutrients (nutrient solution) and solid media such as gravel, sand, charcoal husks, or rockwool.

Advantages of Hydroponics:

1. Water use efficiency: Water use in hydroponics is more efficient than in conventional agriculture because water can be recycled in a closed system.
2. Faster plant growth: Plants in hydroponic systems can grow faster because nutrients are directly available and optimally absorbed by the roots.
3. More flexible land use: Hydroponics can be done in various places, including narrow spaces or even indoors, because it does not require large areas of land like conventional farming.
4. Better crop quality: Hydroponic plants tend to be cleaner, free from pests and diseases commonly found in soil, and have higher yield potential.
5. Environmentally friendly: Hydroponics can reduce the use of pesticides and chemical fertilizers, making it more environmentally friendly.

2.2. Definition of Willingness To Pay

Willingness to pay (WTP) is the highest price that consumers or customers are willing to pay to obtain a product or service. This concept describes the extent to which consumers are willing to spend money based on the value they perceive in the product or service. WTP is also often referred to as the willingness or readiness of consumers to accept the predetermined payment burden, which reflects how much consumers value the benefits of the goods or services. In addition, willingness to pay is very important in pricing because it helps businesses determine the highest selling price that customers are still willing to pay, thereby maximizing profits without losing sales (Damanik, 2019).

2.3. Determinants of Willingness to Pay

Determinants of willingness to pay (WTP) are variables or conditions that influence how much a person is willing to pay for a product or service. Several factors that determine a person's willingness to pay include the following:

1. Sociodemographic characteristics These include age, education level, income, number of dependents, and home ownership status. Research shows that age, income, and number of dependents have a positive and significant effect on WTP, for example in studies on users of transportation and public services.

2. Consumer Knowledge The higher the consumer's knowledge of a product or service, the higher their WTP. This knowledge has a positive and significant effect on attitudes and decisions to pay more.
3. Service Quality Consumers' perceptions of the quality of service provided greatly influence WTP. Good service quality encourages consumers to be willing to pay more.

RESEARCH METHOD

3.1. Research Location

This research was conducted in Sambas District. This location was deliberately chosen because there are several hydroponic vegetable cultivation sites in Sambas District and the market covers the entire Sambas District.

3.2. Type of Data and Sample Determination

The types of data used here are primary and secondary data. Primary data was obtained by distributing questionnaires to respondents. Meanwhile, secondary data was obtained from data references from other agencies, journals, and so on.

The research sample was determined using non-probability sampling through convenience sampling, meaning that the sample selection was not done randomly, and the sample was selected based on ease of access or availability of respondents. The respondents here were those who were buying, had bought, and were buying hydroponic vegetables again. A sample of 100 people was taken to represent other hydroponic vegetable consumers.

3.3. Data Analysis Method

The analysis tool used in this study is the Contingent Valuation Method (CVM). The Contingent Valuation Method (CVM) is one of the commonly used approaches to estimate the economic value of goods or services that do not have a market price, including in the context of sustainable agriculture such as hydroponic vegetables. This method is based on a survey that presents hypothetical scenarios to respondents, in which they are asked to state their willingness to pay (WTP) for the proposed benefits or changes (Mitchell, R. C., & Carson, R. T, 1989). CVM has the advantage of measuring total economic value, including both direct use values such as the consumption of healthy, pesticide-free hydroponic vegetables, and non-use values such as satisfaction with environmentally friendly agricultural practices. In Sambas District, the application of CVM can help illustrate the value that the community places on hydroponic products, which are not yet widely known and do not have a fixed market price.

RESULTS AND DISCUSSION

Respondent Characteristics

The majority of respondents in this study were female (75%) and male (25%), all of whom were from Sambas District. The age range of respondents was from 18 to 60 years old. Most were aged between 18 and 30 years old. From this age range,

respondents could be further classified into occupational groups based on their reasons for purchasing hydroponic vegetables.

Table 2. Table of Occupations of Respondents who Buy Hydroponic Vegetables

Work	Amount
Student	37
Housewife	21
Entrepreneur	15
Laborer	9
Private	8
Trader	4
Farmer	3
Civil Servant	3
Total	100

Primary Data Source 2024

Table 2 shows that students are the group that purchases the most hydroponic vegetables, followed by housewives and entrepreneurs. The rest are in small numbers. The large number of students who buy them is based on the fact that on campus, where they study, hydroponic vegetables are one of the products sold on campus. This makes them easier to access. Housewives also buy them because they are easy to clean and safer in terms of security as they contain minimal pesticides.

Income

Income usually influences consumers to buy something. Based on research conducted on 100 respondents, it turns out that regardless of high or low income, consumers still buy hydroponic vegetables. The following is a table showing the respondents' income.

Table 3. Respondents' Income Table

Revenue (IDR)	Amount
Rp 500.000 - Rp 1.500.000	27
Rp 1.500.000 - Rp 2.500.000	26
Rp 2.500.000 - Rp 3.500.000	22
> Rp 3.500.000	25
Total	100

Primary Data Source 2024

Table 3 shows that the average income of respondents in the first and second classes, namely those with incomes between IDR 500,000 and IDR 1,500,000 and IDR 1,500,000 and IDR 2,500,000, is the highest. However, it is actually evenly distributed across all income classes.

Willingness to Pay Analysis for Hydroponic Vegetables

A total of 56 respondents out of 100 stated that they were willing to pay more than the offered price. They argued that hydroponic vegetables are healthier because they contain minimal pesticides. Furthermore, the quality obtained is also better than that of similar vegetables. Meanwhile, 43 people were willing to pay the price they had been paying. This is because the price of hydroponic vegetables is already quite high compared to regular vegetables. Table 4 shows the tabulation of respondents' willingness to pay more and their perceived reasons for paying more.

Table 4. Tabulation of Respondents' Willingness and Perceived Reasons to Pay More

	Willingness to Pay More		
	Willing	Not Willing	Amount
Expensive	23	21	44
Not Expensive	34	22	56
Total			100

Primary Data Source 2024

In addition to being expensive and inexpensive, the ease of obtaining hydroponic vegetables makes consumers willing to pay more for hydroponic vegetables. Hydroponic vegetables will always be available in the market regardless of the season and weather, unlike non-hydroponic vegetables. In addition, the price of hydroponic vegetables also tends to be stable.

The willingness of consumers to pay more for hydroponic vegetables using the CVM (Contingent Valuation Modeling) method is determined through several stages, including:

1. Building a hypothetical market

Respondents were given information about the advantages of hydroponic vegetables and the ease of obtaining them. They were also told about the growth of hydroponic vegetables, which are becoming increasingly popular among the general public. This was done so that respondents would be willing to spend a certain amount of money on hydroponic vegetables.

2. Obtaining WTP bids

The WTP value of respondents is obtained using a bargaining method, which is carried out by asking respondents whether they are willing to pay a certain amount of money proposed as a starting point. The starting point value begins with the price that has been obtained by consumers. If they are willing, the amount of money is increased to the agreed or maximum level.

3. Calculating the estimated average WTP value

The estimated average WTP value of respondents is calculated based on the distribution data of respondents' WTP. The result of the WTP average calculation for hydroponic vegetables sold in the market is that consumers are willing to pay IDR 6,980 per 200-gram package. This means that they are willing to pay a thousand rupiah more than the usual price of vegetables. The total WTP of 100 respondents is IDR 698,000.

CONCLUSION

Based on the results of the study, it can be concluded that respondents who buy a lot of hydroponic vegetables are in the 18-30 age range, most of whom are students. Fifty-six respondents were willing to pay more than the offered price, with a WTP value of Rp 6,980, on the grounds that it was in line with the quality of the vegetables obtained and their health value.

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