

Vegetable Consumer Behavior in the Hydroponic Village of Surabaya City, Indonesia

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Abstract:

Development of an area is said to be successful if it can provide technical, social, and economic benefits, and can improve the welfare of the surrounding community. This is an indicator of the success of development itself. Hydroponic is a method of cultivation that uses media other than soil. Besides being able to provide economic benefits, hydroponic also provide health benefit since it is planted in clean conditions without using chemical pesticides. The purpose of this study was to analyze the effect of the social environment and individual factors on the vegetables consumer behavior from hydroponic cultivation in Surabaya City, Indonesia. The results showed that social environment factor has a significant positive effect on consumer behavior. Individual factor also has a significant positive effect on consumer behavior.

Keywords: Social environment, Individual factor, consumer behavior

I. Introduction

Surabaya is a metropolitan city with a population of 3,057,766 inhabitants in 2017, which consists of 1,526,583 men and 1,531,183 women. Because of this large population, the development process raises many problems that are not only related to technical, socio-economic, and environmental aspects, but also human resource aspects, especially those related to human welfare. Therefore, good regional development will be able to provide benefits to the physical, economic environment, and more importantly able to improve the welfare of the community. These show the indicators of the success of the development. Soyinka et al. (2016) state that rapid population growth and the reorganize of the social and economic environment using smart technology will be able to create sustainable development in urban areas.

According to Cavallo (2016), development is a part of social ecological system, while agricultural production is an integrated activity that contributes to food security. Gupta (2017) and Shahraki (2017) explain that the natural atmosphere in the urban environment is an important source that can meet human needs and improve the indicators of urban life quality.

Environmentally sound development is a system, control, and support that is planned, responsible, and in accordance with the carrying capacity of the environment for improving environmental quality (Cahyaniet al., 2017). Vertical development will also reduce building coverage on earth, so that the remaining land can be used as green spaces (Nur'aini & Krisdianto, 2017). The strengthening of the destination branding of Kampung Glintung as an environment-based and educational tourism village is carried out using a participatory approach (Utami, 2017). According

to Kuivanenet al. (2016), sustainable development must consider the opportunities and constraints to allagricultural activities.Kontothanasis (2017)adds that with this differentiation, each region is expected to be able to distinguish the social, cultural, economic, and environmental conditions. The slight development of hydroponic system in Indonesia is due to lack of counseling about the advantages of a hydroponic system on a narrow area. Hydroponic is a method of farming using planting media other than soil, such as pumice, gravel, sand, coconut fiber, pieces of wood, or foam. Other than providing economic benefits, the concept of structuring is based on the type, character of plants, planting media, and available places (Roidah, 2014; Titisari & Asikin, 2015). Furthermore, it is also stated by Titisari & Asikin (2015) that vegetable and toga plants can be arranged for the sake of aesthetical importance and environmental quality improvement. Gardening activities can be done on a narrow terrace, house yard, village road, or utilizing unproductive land. The Nutrient Film Technique (NFT) hydroponic system is better than the Deep Flow Technique (DFT) hydroponic system for pak choi cultivation. The combination of the NFT and AB Mix hydroponic system shows the best pak choi results. However, the combination of NFT and NPK hydroponic system can be an alternative in hydroponic pak choi cultivation to overcome the scarcity of AB Mix nutrition in the market (Sesanti &Sismanto, 2016).With more nutrient solutions that can be used for hydroponics, entrepreneurs or small farmers will have a choice of nutrient solutions in cultivating plants hydroponically (Hayati, 2006).

Smit (2016) state the importance of coordinating the role of various actors involved in regulating the urban food system. Leeet al. (2015) predict urban agricultural production become more objectively when measuring the output of crops cultivated by citizens in general. According to Trendov (2018), urban parks make a contribution to be more attractive for people to express

themselves. Froidevauxet al. (2017) discuss in their studies that vegetation cover for organic agriculture in high proportions is recommended to support biodiversity. Farming that uses a roof as a medium has so many benefits compared to conventional roofing systems. Home roofs that are used for agriculture can support the environment by improving air quality, reducing carbon in the atmosphere, and can benefit the community by reducing the cost of rainwater management (Safayet et al., 2017; Ugai, 2016). Ya Kyaw & Keong Ng (2017) add that hydroponic system has proven to be an independent, cost-effective, and environmentally friendly urban agriculture, so that it can attract farmers to be commercialized commercially.

The purpose of this study is to analyze the social and individual environmental factors of vegetable consumer behavior derived from hydroponic cultivation in Surabaya City.

II. LITERATURE REVIEW

Social Environment

The environment makes a positive contribution to knowledge, attitudes, and behavior to buy (Noor et al., 2012). Feng Kao& Chan Tu (2015)state that consumption behavior can be predicted through functional and novelty values and attitudes. Socio-economic differences between urban and rural communities in terms of age, education, job, and income are shown in Ates & Ceylan (2010) study, which influences their consumption behavior. According to Shahzadet al. (2015),the combination of different social and cultural components in soft drink consumers has the consumer group behavior and has a significant mediating role. Li (2015) shows thatintegrating a sustainable environment into business strategy is a profitable business model. Hessami & Yousefi (2013) consider behavior as an important step for corporate organizational survival. Educated consumers tend o be aware of products that are environmentally friendly. Internal and emotional

factors indicate the level of knowledge, attitudes, and subjective norms which control behavior to shape consumer participation in carrying out sustainable consumption (Angelovska *et al.*, 2012; Kim *et al.*, 2014). Furthermore, Zhang & Gu (2015) add that information affects consumer trust which is more inclined in the service context, while the normative influence affects trust in the product context. In gender differences, the results of the study from Gotschiet *al.* (2010) show that girls have more positive attitude and are more willing to consume organic product than boys. Social influence is far more influential compared to personal innovation. This is a part of social motives, which is the need to consider and status (Lu, 2014; Mihic *et al.*, 2013). Golding & Peattie (2005) also add that social marketing contributes effectively to change attitudes towards behavior.

Individual Factor

Nica (2013) found that the combination of five senses and brand produces emotions and creates a relationship of loyalty, trust, and affection between brand and consumers. According to Crocco *et al.* (2013), individual, social, economy, and consumer attitudes factor influence online shopping. Personal or individual values play an appropriate role for market segmentation (Coppola *et al.*, 2015), while personal and social characteristics affect consumer perceptions (Wang & Chou, 2014) which then affect their attitudes (Almoussa, 2011). Reynolds (2013) argues that economic behavior is affected by ethics, market value and local networks. Even so, high stimulus does not contribute highly to consumer response (Goi *et al.*, 2014). Moreover, Chen & Lee (2015; Barkhi & Wallace, 2007) formulated good promotion method and found that one of the best solution is to communicate with consumers, and personalization, which would then increase their purchases. In their study, Shi Wee *et al.* (2014) mentioned the intention to buy organic food is significantly affected by consumer perceptions which include safety, health, and organizational

factors. Organic products require more consideration in terms of packaging. Therefore, environmentally friendly packaging can maximize revenue, customer satisfaction, and environmental protection (Seo *et al.*, 2016). Akın (2012) stated that there is a weak relationship between the loyalty dimension and the consciousness dimension. The relationship between marketing and marketing orientation as explained by Chahal *et al.* (2014) serves as a supplementation factor which accelerates the development of SGMO.

III. RESEARCH METHOD

This study was conducted in 8 (eight) villages in Surabaya City. The eight include: Jemur Wonosari, Simomulyo, Kedungdoro, Mojo, Pagesangan, Karang Pilang, Babatan, and Simolawang.

The sampling was carried out based on respondents' consideration, that informants had knowledge of expertise and competency that is in accordance with the scope of the study, namely hydroponic cultivation, packaging, marketing, and consumers. The sampling technique (respondents) in this study is using Purposive Sampling technique. From each village, 15 respondents were taken, so that the total respondents as a whole are 120. Using the accidental sampling technique, customers or buyers were chosen at the business place in each village that has hydroponic vegetable cultivation.

The data that is obtained is then processed in accordance with the analysis needs. For the purposes of discussion, the data is processed and presented based on the principles of quantitative descriptive analysis. The analysis used to answer the purpose of this study (consumer behavior) is Structural Equation Modeling (SEM) using Warp-PLS version 6.0 software. Warp-PLS is application software developed by Ned Kock. This software can analyze SEM models based on variants, or better known as Partial Least Square.

H1. Social environment factor has a significant positive effect on consumer behavior

H2. Individual factor has a significant positive effect on consumer behavior

$H_0 = 1 = 0$ rejected

$H_1 = 1 \neq 0$ accepted

IV. RESULTS AND DISCUSSION

Social Environment Factor

Based on the analysis result of WarpPLS 6.0, the social environment factor has a significant positive effect on consumer behavior (Y) with a path coefficient of 0.322, in which the value of $p = 0.001$ which is smaller than $\alpha = 0.05$. Vegetables are commodities that have high potential, becoming for most people, especially for vegetarians. Vegetables are the main source of vitamins, nutrients, and fibers. Healthy lifestyle trends that have begun to develop in Indonesia make the market demand for good vegetables. In this case, hydroponic vegetables are considered healthier, have better nutrition, and are also environmentally friendly.

Currently, organic farming becomes a very competitive alternative to conventional agriculture, while the protection of a sustainable and efficient agricultural sector requires the presence of other actors in a chain, one of which is consumers (Binta & Barbier, 2015; Akimowicz et al., 2016). In agricultural sector nowadays, Cahya (2016) found that almost all dimensions were classified as less sustainable, only the institutional and technological dimensions were quite sustainable; and technological dimensions are well applied to hydroponic agriculture. These productive effects in hydroponic agriculture are not only seen in the hydroponic program itself, but also in a broader context (Shankland & Goncalves, 2016).

The most preferred hydroponic vegetables by families in Surabaya City are kale, pak choi, and mustard greens. In selecting these types of vegetables, social status and reference groups

influence the choice of vegetables. The driving factor for consumers to buy hydroponic vegetables is health, hygiene, and is a necessity for certain circles, considering the price of hydroponic vegetables is more expensive than conventionally grown vegetables.

García et al. (2014) stated that there are six assessment criteria that have been analyzed, including accessibility to the area, distance, cost, security of the area, local acceptance of the company, and its needs. So, it can be said that consumers of hydroponic vegetables are a loyal consumers. They buy hydroponic vegetables with various considerations because it is a necessity for them, including health, hygiene, and benefits. According to Amanorand Chichava (2016), China and Brazil have a different history of experience, which affects the nature of technical and development cooperation. From this difference, most solutions for the agricultural sector emerge from an economic, business, and law perspectives. The identification of key points from each company individually enables recommendations to improve the process, allow priority efforts, and resources by the company (Zylbersztajn, 2017; Barra & Ladeira, 2017).

Individual Factor

Based on the analysis result of WarpPLS 6.0, the individual factor has a significant positive effect on consumer behavior (Y) with a path coefficient of 0.189, in which the value of $p = 0.043$ which is smaller than $\alpha = 0.05$.

Nowadays, vegetables are a necessity related to human health, both for men and women. The female respondents, especially the group of young mothers who mostly understand health and have more income usually prefer hydroponic vegetable products. In addition to developing a hydroponic vegetable cultivation business, a small micro hydroponic vegetable business incorporated into the PKK (Family Welfare Empowerment) group has begun to emerge and is well managed in Surabaya City. The management of agricultural

inputs is made in different ways to achieve competitive production and high product quality. Meanwhile, to create innovation, a connection through the development of integrated business network is required (Darmansyah et al., 2014; Papageorgiou, 2015). New policies and practices also need to be considered to assess innovative and sustainable governance models for global agribusiness institutions (Kasim et al., 2013).

The hydroponic vegetables business still has huge opportunities from the younger age group, because their needs for hydroponic vegetables are increasing. According to Toader & Roman (2015; Turina et al., 2016), it is important to encourage the process of reorganizing the agribusiness industry, increasing food security, supporting sustainable rural development, protecting cultural heritage, protecting the environment, and preserving biodiversity vegetable cultivation. Toth & Lakner (2014) describes an approach based on intensive production, the formation of a local food supply, and a short food supply system. The ecological consequences of this strategy are analyzed by the life cycle approach. In addition, Sanjaya & Perdana (2015) stated that a measurable logistical system has effective and cost-effective performance.

V. CONCLUSION

Based on the results of this study, it can be concluded that:

1. Social environment factor has a significant positive effect on hydroponic vegetable consumer behavior in Surabaya City.
2. Individual factor has a significant positive effect on hydroponic vegetable consumer behavior in Surabaya City.

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