

# Contribution of Home Gardening to Household Vegetable Consumption During COVID-19 Pandemic

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**Abstract:** This study aimed to investigate growers' perception of home gardening and find out the contribution of home gardening towards household vegetable consumption during the Covid-19 pandemic. This research was conducted in Mandonga and Abeli Subdistricts, Kendari Municipality, Southeast Sulawesi Province, from July to December 2022. Sixty growers were selected as respondents from housewives who have practiced home gardening for at least five years. Data were analyzed using descriptive analysis and chi-square test. Study results showed that growers had positive perception of practices and benefits of home gardening. There were 14 kinds of vegetables planted, contributing to household vegetable consumption. During the pandemic, half of the respondents had increased their home-grown vegetable, while the remaining half decreased compared to pre-pandemic level. Motivation for practicing home gardening was the only factor significantly associated with vegetable consumption during pandemic, whereas age, income, educational level, type of job, size of yard, attendance in training and extension, and years of home gardening experience were not significantly associated. Respondents have a very positive perception of home gardening and the benefits of vegetables from the yard. They tend to maintain this perception and will continue to use their yard to grow vegetables in the future.

**Keywords:** food consumption, COVID-19, home gardening, vegetables, yard.

## 1. Introduction

Threats to food security have become a major concern due to the COVID-19 outbreak. The pandemic is expected to raise food prices, which in turn increases poverty and food insecurity and decreases the nutritional status of low-income households [1]. Restrictions on movement and disruptions to food systems, either on the production or demand side, could reduce food availability, accessibility, and utilization [2]. The pandemic could also affect the market and food value chain in a particular area [3]. In addition, travel and movement limits, partial or total lockdown measures, and other restrictions could alter how and where individuals got their food. Some of these actions have made it more difficult to distribute food to vulnerable groups. [4]. As a result, Covid19 pandemic could also affect food

consumption behavior, including shopping and food consumption behavior [4], [5].

While the government has introduced various programs and policies to improve food security [6]–[9], communities can also play a role by utilizing their yards (*pekarangan*) with various types of plants in the form of home gardens. The practice of home gardening involves cultivating a small plot of ground close to a home with a variety of plants and animals that can serve as a secondary food and income source [10], [11]. Home gardens might be called in the literature as kitchen, mixed, farmyard, backyard, compound, or homestead gardens [11], [12]. The term “home garden” underlines the close relationship connection between the home and the garden [13]. Subsistence families in developing nations have accepted and engaged in home gardening in a variety of settings, including Indonesia [7], [14]. Numerous studies have indicated home gardening to be a crucial component of the local food system and family farming in rural and urban settings to enhance food and nutrition security and livelihood as well [7], [10], [11], [14], [15]. In addition, home gardening is a crucial way to increase food security during the Covid-19 pandemic since it can foster physical activity, peacefulness, and social connection [16], [17].

With the emergence of Covid-19 that threatens food security and potentially affect various aspects of food consumption, there exist opportunities for home gardening to play more important role. As such, there is an increased trend of home gardening activities during the pandemic. According to Noriyanti et al. [18], during COVID-19, at least 1 out of every five city residents used their free time to grow different kinds of plants in their yards. Wulandari et al. [19] identify three motivations for city residents to practice home gardening during the pandemic: existence, social connections, and growth. Home gardening can help families or households maintain four types of resilience needed during the pandemic. They include psychological resilience, economic resilience, social resilience, and religious endurance [20]. Psychological and social resilience are given emphasis as there is a strong need to build

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positive emotions, and to establish communication and friendship that could lead to harmony and synergy in the social environment. However, the primary motivation is to support household food and nutrition security and economic resilience as well [21]–[23]. As such, benefits and advantages of home gardening during the pandemic lie in the products and practices of home gardening itself.

Given the many benefits that home gardening can provide to households during the Covid-19 pandemic, the main objectives of this study were to investigate growers' perception of the benefits of house yard utilization and find out the contribution of home gardening to households' vegetable consumption. The study is expected to provide insights into home gardening and vegetable consumption during the Covid-19 pandemic by taking the context of Kendari Municipality in Southeast Sulawesi province in Indonesia.

## 2. Materials and Methods

This research was conducted in Abeli and Mandonga Subdistricts of Kendari Municipality from July to December 2022. Respondents were selected from households that had started practicing home gardening at least five years ago. Given that the population size is unknown and there is no official data from related institutions, the number of respondents was determined by referring to the opinion of Sekaran and Bouqie [24] that the number of respondents is at least ten times the number of research variables. Considering the adequacy of cells in the Chi-Square test and the four main variables in this study, the number of respondents interviewed was 60. The variables in the study included the characteristics of the respondents, the production of home-grown vegetables, the contribution of the vegetables produced from home garden to the total household consumption of vegetables, and the factors related to the changes in the contribution of home-grown vegetables to the household consumption. Data were collected using interviews based on the questionnaire. During the interview, respondents were asked to assess the contribution of vegetables from home garden to the total household vegetable consumption before and during the Covid-19 pandemic using a Likert scale of 1-5. Based on the responses received, all the statements' mean and grand mean scores were determined [25]. The contribution categories were then determined using a 3-point scale, namely, "low" (1.00-2.33), "fair" (2.34-3.67), and "high" (3.68-5.00) based on the mean and grand mean scores.

## 3. Results and Discussion

### A. Growers' Perception of Home Gardening

Table 1 shows respondents' perceptions regarding the benefits of home gardening. All respondents showed positive perceptions, as indicated by the average score of their responses. Respondents agreed that home gardening helps improve nutrition, improves access to food, increases household income, provides a venue for physical exercises, helps relax to have a more peaceful mind, supports resource conservation, and supports realization of a healthier family. Among these benefits, increasing household income obtained a lower score because many respondents plant crops in their yards with a focus on meeting household needs of vegetables. Therefore, they consume most of their home garden produce rather than selling it to the market.

The above-listed benefits are consistent with the results of various studies. A study in Oman found that the main motives for gardening were: aesthetics, shading, hobby enjoyment, food production, physical activity, and environmental protection [26]. In Nigeria, the major motives for home gardening are increasing food production, improving health and nutrition, getting additional income, using available space, and practicing hobbies [27]. As stated by Silondae et al. [20], the benefits of managing household yards include fulfilling household needs for food and nutrition security, saving expenses, supplementary family income, food diversification, and resource conservation. Home gardens can support the availability of and access to foods, such as vegetables, tubers, fruit, and medicinal plants, which are highly appropriate during the Covid-19 pandemic. Home gardening might help address anxiety and boredom, control emotion, and provide mental benefits. Home gardening can strengthen body physically under sun exposure, providing vitamin D.

### B. Contribution of Home Gardening to Vegetable Consumption

Respondents grew various vegetables and plants in their house yards, consisting of seasonal and perennial crops. Types of vegetables grown included moringa (*Moringa oleifera* Lam. Or drumstick tree), papaya (*Carica papaya* L), cassava (*Manihot utilisima*), long beans (*Vigna unguiculata*), eggplants (*Solanum melongena* L), cucurbits (*Cucurbita moschata*), tomatoes (*Solanum lycopersicum*), bitter melon (*Momordica charantia*), red spinach (*Amaranthus*), water spinach (*Ipomoea aquatica*), maize (*Zea mays saccharata* Sturt), lemongrass (*Cymbopogon citratus*), chili pepper (*Capsicum annuum*), and hot pepper (*Capsicum frutescens*). These types of vegetables

Table 1  
Growers' perception regarding home gardening

No.	Statement	Responses					Score	Category
		SD	D	N	A	SA		
1	Helps improve nutrition	0	0	1	13	46	4.8	High
2	Improves access to food	0	0	1	31	28	4.5	High
3	Increases household income	0	0	20	0	30	4.3	High
4	Provides venue for physical exercises	0	0	0	8	52	4.8	High
5	Helps relax to have peaceful mind	0	0	1	21	38	4.6	High
6	Supports resource conservation	0	0	1	13	46	4.8	High
7	Realizes healthier family	0	0	0	15	45	4.8	High

Notes: SD = Strongly Disagree, D = Disagree, N = Neutral, A = Agree, SA = Strongly Agree

are mostly included in the list of suggested crops to be planted in house yards [28][29]. Cassava is included in the list because respondents regularly consume its leaves as a vegetable. Similarly, maize is also consumed as a vegetable. However, there are some popular vegetables that respondents do not grow, namely cucumber, Weish onion, broccoli, cauliflower, lettuce, pakchoy, sweet pepper, and cabbage. At the same time, the vegetables grown include moringa, a highly popular home-grown food-producing tree in Southeast Sulawesi, especially among Butonese and Munanese ethnicities. Cultivation of moringa has also been reported in many areas in Indonesia, such as in Central Java [30], East Java [31], and South Sulawesi [32], and in other countries, such as Zimbabwe [33], India [34], and the Philippines [35]. Differences in the types of vegetables planted might be due to cultivation techniques, soil and agroclimatic condition, season, and personal preferences. All respondents still use conventional gardening techniques that grow crops directly in the ground rather than in hydroponics, vertical farming, polybag, or pot.

Table 2  
Consumption of home-grown vegetables during pandemic

No.	Vegetables	Consumption during pandemic
1	Moringa	Increased
2	Papaya	Decreased
3	Cassava	Increased
4	Long beans	Increased
5	Eggplant	Increased
6	Cucurbits	Decreased
7	Tomato	Increased
8	Bitter melon	Decreased
9	Water spinach	Decreased
10	Amaranthus	Increased
11	Lemongrass	Increased
12	Maize	Increased
13	Hot pepper	Increased
14	Chili	Decreased

Table 2 shows changes in the consumption of each type of vegetable during the Covid-19 pandemic. Consumption of nine out of the listed 14 grown vegetables was reported to increase during the pandemic, consisting of moringa, cassava, long bean, eggplant, tomato, amaranthus, lemongrass, maize, and hot pepper. In contrast, consumption of the other five vegetables was reported to decrease. Such changes could be attributable to many factors, such as perception of COVID-19 risk, closure of physical workplaces, cafés, and restaurants, presence of children in a home, gender, reduced income [4], less shopping frequency due to lockdown [4], place of residence, region, level of education, living in a family home, and age [36]. In this study, changes in the consumption of home-grown vegetables might be associated with the tendency to eat a healthier diet. This is because vegetables consumed more during the pandemic were those that were socially perceived as healthier or to have medicinal effects, such as moringa, lemongrass, tomato, and hot pepper.

*C. Factors Associated with Vegetable Consumption*

In this study, we tested the association between changes in consumption and some factors (age, level of education, income, experience, size of house yard, attendance to extension and

training, and objectives of house yard utilization) using Chi-Square test. As shown in Table 3, among these factors, the motivation for home gardening was the only factor significantly associated with the changes in vegetable consumption. On the other hand, age, level of education, income, occupation, size of house yard, and attendance to training and extension had no association with the changes of home garden produce consumption.

Table 3  
Factors associated with vegetable consumption

Factors	Chi Square	p value
Age	0,000	1,000
Level of education	0,162	0,688
Income	0,082	0,774
Job	1,002	0,317
Experience	0,098	0,754
Size of house yard	0,000	1,000
Attendance to extension and training	0,341	0,559
Motivation for practicing home gardening	6,667	0,010*

Notes: \* denotes significance at 0.05 level

The study results disagreed with some previous researches. For example, Miura *et al.* [35] reported knowledge of nutrition and per capita income increased the varieties of dark green leafy vegetables consumed, and that age of participants increased the varieties of root vegetables consumed. Talukder *et al.* [37] reported that a home gardening program enhances vegetable production volume and varieties produced, and increases consumption of green leafy vegetables among children to 1.3 higher. Gardening has increased vegetable consumption and improved household diets [35].

Motivation for performing home gardening was significantly associated with changes in vegetable consumption. Kortright and Wakefield [38] distinguished five types of gardens based on gardeners’ motivation to grow foods and other factors, namely cook’s gardens, teaching gardens, environmental gardens, hobby gardens, and aesthetic gardens. These types of gardens affect garden forms and practices, which in turn influence food production and consumption. Wulandari *et al.* [19] identified three kinds of motivation to practice home gardening: existence, social connection, and growth. Existence motivation for home gardening during the Covid-19 pandemic was very high as it can help meet family food needs and fulfill family nutrition.

**4. Conclusion**

Households in the study area produce various vegetables in their yards for consumption. The types of vegetables produced are moringa, papaya, cassava, long beans, eggplant, pumpkin, bitter melon, tomatoes, water spinach, spinach, lemongrass, maize, hot pepper, and chilies. The contribution of home-grown vegetables to the total household consumption of vegetables during the pandemic when compared to the pre-pandemic period varied. Changes of such contribution reflect changes in the consumption of home-grown vegetables. Of the 14 types of vegetables produced, consumption of nine types of vegetables increased during the pandemic, while the consumption of the remaining five decreased. However, when viewed per respondent, the number of respondents whose consumption of

home-grown vegetables increased during the pandemic is the same as the number of respondents whose consumption decreased (50% each). Factors being analyzed to be associated with vegetable consumption during the pandemic were age, income level, type of work, education, experience of gardening, area of yard, counseling and training, and purpose of home gardening. Based on the research results, only the purpose of home gardening is significantly associated with the changes in the consumption of home-grown vegetables during the pandemic. Respondent housewives have a very positive perception of the use of the yard and the benefits of home-grown vegetables. They tend to maintain this perception and will continue to use their yard to grow vegetables in the future.

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