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COLLABORATION AMONG FARMER'S AND INTERMEDIARY TRADERS IN MARKETING OF GREENHOUSE HYDROPONIC PRODUCTS IN GREATER MALANG

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ABSTRACT

The emergence of negative effects associated with conventional agriculture encourages a transition from conventional to modern agriculture. Hydroponic farming, which utilizes water as a growing medium, is one form of modern agriculture. This research aimed to find out the management of farming business governance of hydroponic greenhouse products in Greater Malang, which includes commodities marketed, marketing institutions involved, the form of marketing channels that occur, and marketing functions used by analyzing marketing margins and farmer's share and knowing the corporate system between traders of hydroponic greenhouse products in Greater Malang. This study analyzed the data using qualitative and quantitative descriptive methods. Moreover, this study utilized ten samples determined by purposive sampling with consideration the aim of this research is clear, namely to find out the marketing of hydroponics greenhouse products in Greater Malang. In addition, the sample for this study was selected using the snowball sampling method, which sampled the marketing channels of the previous ten samples. The results of this study indicate that the management of hydroponic greenhouse vegetables in Greater Malang begins with the most frequently traded product, in this case, lettuce. Participating marketing institutions included farmers, collecting traders, retailers, restaurant consumers, and end consumers. Level 1 marketing channel is the channel with the most consumers. The marketing functions used are the exchange function, the procurement function, and the facilitating function. Level 0 marketing channels have no marketing margin value because the price farmers receive is identical to that of consumers. Marketing channel level 0 for all commodities and marketing channel level 1 for all commodities are deemed efficient for the farmer's share. The cooperative system among hydroponic greenhouse vegetable sellers in Greater Malang is harmonious, contributing to a healthy market atmosphere.

Keywords: *farmer's share, hydroponic greenhouse vegetables, management governance, marketing margin, trader cooperative system*

BACKGROUND

The application of conventional agriculture has negatively affected farmer behavior, farmer income, and environmental quality, as documented by Fadlina et al. (2013). This situation has resulted in a paradigm shift towards modern agriculture in agricultural development. In addition to the negative effects of conventional agriculture, land conversion propels conventional agriculture towards modern agriculture. Increased population growth necessitates more space for activities,

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resulting in land conversion (Kusumastuti et al., 2018). Apart from the increase in population, economic development and growth also contribute to land conversion (Dewi & Sarjana, 2015). Increased population and economic growth will increase the demands placed on nature and the environment (Dewi & Syamsiyah, 2020). Increasing demands and declining food security pose a significant problem, necessitating an alternative solution.

A hydroponic cultivation system is one example of modern agriculture that can be developed in Indonesia and solve concrete problems (Dewati et al., 2023). The hydroponic cultivation method in a greenhouse is a plant cultivation system using water as the plant medium (Roidah, 2014). This method has numerous benefits, including saving land, assuring pest control, cleaner and more abundant results, and higher selling prices (Linda et al., 2021). The advantages of this land-saving method allow hydroponic cultivation to be performed anywhere, even in the yard (Ramadan et al., 2023). In fact, hydroponic farming offers auspicious opportunities. According to Kilmanun and Ndaru (2020), hydroponic vegetable farming in Malang is profitable and feasible. This opinion is also supported by Kholis et al. (2022), who state that the hydroponic greenhouse vegetable business can be employed as a home business with a promising business feasibility analysis. According to the feasibility study results, the hydroponic greenhouse business offers an excellent investment return ratio.

However, business owners should also be wary of the actual monthly return, as it may not meet their expectations for the investment in hydroponics. Hydroponic greenhouse farming for vegetables will generate greater and more satisfying profits, however, if a sustainable and well-planned development strategy is paired with overall market development. The market is not only a site for interaction and transactions between sellers and buyers but also a key economic driver in agribusiness development (Hudha et al., 2020). Concerning the need for sustainable development of hydroponic greenhouse farming in tandem with market expansion, it is necessary to conduct research on the Marketing of Hydroponic Greenhouse Products in Greater Malang with the following objectives. The first (1) objective is to determine the governance management for marketing hydroponic greenhouse products in Greater Malang, including the products marketed, the marketing institutions involved, the form of marketing channels, and the marketing functions employed. The second (2) objective is to examine the marketing margin and farmer's share of greenhouse hydroponic products in Greater Malang. The third (3) objective is to find out the collaboration system among farmers and traders of hydroponic greenhouse products in Greater Malang.

RESEARCH METHODS

Place and Time of the Study

The study was conducted in Greater Malang, which comprises Malang City, Batu City, and Malang Regency. The location of this study was chosen based on previous research on the feasibility of hydroponic vegetable farming in Malang City by Kilmanun and Ndaru (2020), which concluded that it is feasible to farm hydroponically grown vegetables. Moreover, Greater Malang is the epicenter of hydroponic farming in East Java. Thus, Greater Malang is an ideal setting for this study. This study spanned five months, from March to July 2023.

Sample Selection

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The sampling determination in the study began with the purposive sampling method, which consisted of visiting respondents who, according to the researcher, were eligible to be chosen as samples. The criteria for determining the sample of this study are: farmers who come from the Greater Malang area, market their products in the Greater Malang area, the farming system utilizes a hydroponic system in the greenhouse and willing to be interviewed during the data collection period. This study eventually utilized ten samples of farmers. Subsequently, a sample of marketing intermediaries was traced using the snowball sampling method. From the results of tracing marketing intermediaries through this method, a sample of marketing intermediaries was obtained, consisting of 4 collectors, 4 retailers, dan 7 restaurant customers. So, the total overall sample in this research amounted to 25 sample.

Data Collection Methods

This research utilized both primary and secondary data collected using distinct methodologies. Using a literature review method, secondary data was collected from journals, books, theses, and educational videos about marketing agribusiness products, specifically hydroponic greenhouse products. Meanwhile, primary data collection utilized observation and interview methods. The observation method is a method of making observations of the object under study, which is the hydroponic greenhouse vegetable farming actors who do marketing in the Greater Malang area. The interview method was conducted in a structured manner (structured interview) guided by a questionnaire regarding the products being marketed, marketing institutions, marketing functions, marketing channels, marketing margins, farmer's share, and colaboration systems among farmer's and intermediary traders.

Data Analysis

1. Data Analysis of Objectives (1) and (3). The first objective (1) is to understand the agricultural business governance of hydroponic greenhouse products in Malang Raya, including the commodities marketed, marketing institutions involved, the form of marketing channels, and marketing functions employed. The third objective (3), which is to find out the corporate system among hydroponic greenhouse product traders in Greater Malang, was analyzed using a qualitative descriptive method. The qualitative descriptive method commenced with the tabulation of respondent data to determine the number of values and percentages. The tabulation results were then presented in table format.
2. Data Analysis of Objective (2). The second objective (2) intends to analyze the marketing margin and farmer's share of hydroponic greenhouse products in Malang Raya using a quantitative descriptive method incorporating marketing margin and farmer's share analysis. The following are the formulas for marketing margins and farmer's share:

$$\mathrm{Mi} = \mathrm{Pji} - \mathrm{Pbi}$$

Information:
Mi : Margin of marketing channel level 0, level 1, and level 2
Pji : Selling price for marketing institutions in level 0, level 1, and level 2 channels
Pbi : Purchase price for marketing institutions in level 0, level 1, and level 2 channels

$$\mathrm{Fs} = \frac{\mathrm{Pf}}{\mathrm{Pr}} \text{ x } 100\%$$

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Information:
Fs : Farmer's share
Pf : Price at farm level
Pr : Price at consumer level

RESULT AND DISCUSSION

Governance Management for Marketing of Hydroponic Greenhouse Products in Greater Malang

The following are the results of the data analysis for governance management of the marketing of hydroponic greenhouse products in Malang Raya, including the commodities marketed, the marketing institutions involved, the form of marketing channels, and the marketing functions utilized:

Greenhouse Hydroponic Vegetable Commodities Marketed in Greater Malang

Table 1 states that there are thirteen types of hydroponic greenhouse vegetable commodities marketed in Greater Malang, including spinach, bok choy, caisim, samhong, gai lan, pagoda mustard, romaine lettuce, lettuce, kale, butterhead, kale, peppers, and cherry tomatoes. Lettuce is the most frequently marketed commodity, as much as 90% due to its high demand on the market. The farmers choose commodities to cultivate and market based on the demand that comes from each farmer. The results of this investigation are similar to those of previous studies on commercially available hydroponic products. According to Dewati et al., (2023), mustard greens, lettuce, and bok choy are the hydroponically grown vegetable products marketed in the Greater Solo area. According to Melinda et al. (2022), PT Hanumart Utama Mulia Samarinda marketed lettuce, bok choy, caisim, and gai lan grown hydroponically. Meanwhile, according to Don Piran et al. (2022), tomatoes, mustard greens, beans, and kale are marketed in Manggarai Regency. The only distinction is that beans are not sold in Greater Malang.

Table 1. Greenhouse Hydroponic Vegetable Commodities Marketed in Greater Malang

Respondent Number	Commodities												
	bcy	**pm**	**ltc**	**spn**	**ws**	**csm**	**gln**	**sh**	**kale**	**rl**	**bl**	**ppr**	**ct**
1	1	1	1	1	1	1	1	1	0	0	0	0	0
2	1	0	1	1	1	1	0	0	1	1	0	0	0
3	1	0	1	1	1	0	0	0	1	0	0	0	0
4	0	0	1	0	0	0	0	0	0	0	0	0	0
5	1	0	1	1	0	1	1	0	0	0	0	0	0
6	0	0	1	0	0	0	0	0	0	0	0	0	0
7	1	0	1	0	1	1	1	0	0	1	1	0	0
8	0	0	0	0	0	0	0	0	0	0	0	1	1
9	1	0	1	1	0	1	0	0	0	0	0	0	1
10	1	0	1	1	1	1	0	0	0	0	0	0	0
Total	7	1	9	6	5	6	3	1	2	2	1	1	2
Percentage (%)	70	10	90	60	50	60	30	10	20	20	10	10	20

Source: Processed Primary Data (2023)

Information:

bcy	: Bok choy	pm	: Pagoda mustard
ltc	: Lettuce	spn	: Spinach
ws	: Water spinach	csm	: Caisim
gln	: Gai lan	sh	: Samhong

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rl : Romaine lettuce bl : Butterhead lettuce
ppr : Peppers ct : Cherry tomato

Marketing Institutions Involved in the Marketing Process in Greater Malang

Table 2 shows that marketing institutions are involved in the hydroponic greenhouse vegetable marketing process in Greater Malang. The involved institutions are farmers, collecting traders, retailers, restaurant consumers, and end consumers. Farmers are the producers of greenhouse hydroponics. The collecting trader is a trader who collects hydroponic greenhouse products, which are then resold to other traders in large quantities. In this research, collecting traders resell items to restaurant retailers and restaurant consumers. Retailers are traders who sell hydroponic greenhouse products in small quantities to end consumers. This study had two categories of retailers: supermarkets and vegetable shops. For restaurant necessities, restaurant consumers purchase hydroponic greenhouse products. Restaurant consumers will convert agricultural products into new products for sale. Meanwhile, end consumers are users of hydroponic greenhouse products for personal needs. The marketing institutions involved coordinate according to their respective channels via groups or personal chat to convey request to producer namely farmer, then the requested a re send or picked up by the next marketing institution and then marketing again.

The results of this study are similar to previous studies on marketing institutions. According to Azhari et al. (2019), farmers, collecting traders, retailers, and consumers are among the marketing entities participating in the hydroponic vegetable marketing process in Sidoharjo Village. According to Don Piran et al. (2022), farmers, middlemen, retailers, and consumers are among the marketing institutions involved in the vegetable marketing process in Manggarai Regency. Farmers, retailers (including vegetable stores and supermarkets), and consumers are the marketing institutions involved in the marketing process of hydroponic vegetables in the Greater Solo, according to Dewati et al. (2023). The only difference is the use of the term "middlemen," which is synonymous with "collecting traders," which are marketing institutions that collect hydroponic greenhouse products and resell them in bulk to other traders.

Table 2. Marketing Institutions Involved in the Marketing Process in Greater Malang

Respondent Number	Marketing Institutions				
	Farmer	Collecting Trader	Retailer	Restaurant Consumer	End Consumer
1	1	0	0	0	1
2	1	1	0	1	0
3	1	0	1	0	1
4	1	0	0	1	0
5	1	0	1	0	1
6	1	0	1	0	1
7	1	0	1	0	1
8	1	0	0	1	0
9	1	0	1	0	1
10	1	0	1	0	1
Total	10	1	6	3	7
Percentage (%)	100	20	70	30	70

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Source: Processed Primary Data (2023)

Forms of Marketing Channels for Hydroponic Greenhouse Products in Greater Malang

According to Figure 1, there are three levels of marketing channels for hydroponic greenhouse-grown crops in Greater Malang. Level 0 is a direct marketing channel in which farmers offer their products directly to consumers, including end consumers and restaurant customers. Three farmers utilize level 0 marketing channels because they feel they get more profit than partnering with marketing institutions. In the marketing process, a level 1 marketing channel is defined as marketing that flows through one marketing institution. The collecting trader who sells their items to restaurant customers is the only marketing institution engaged in this study. In addition to collecting traders, some retailers sell their products to end consumers; supermarkets and vegetable shops are two examples of retailers. Six farmers rely on level 1 marketing channels because they feel get convenience by partnering. They don't need to think about where their product should be marketed, because that is the task of the next marketing institution. Level 2 marketing channels, on the other hand, involve more than one marketing institution in the marketing process. Farmers in this study sold their vegetables to collecting traders, who then sold them to retailers, who finally sold them to the end consumers. One farmer uses level 2 marketing channels because the farmer want their product to reach a wide market reach. The level 1 marketing channel has the most users because farmers get more convineince, such as they don't need to think about where their product will be sold because they have partnered with collecting traders ang retailers and farmers can focus on cultivation so they can control the quality and quantity of the product. Furthermore, because level 1 marketing channels only go through one intermediary institution, their operational expenses are lower than those of level 2 marketing channels.

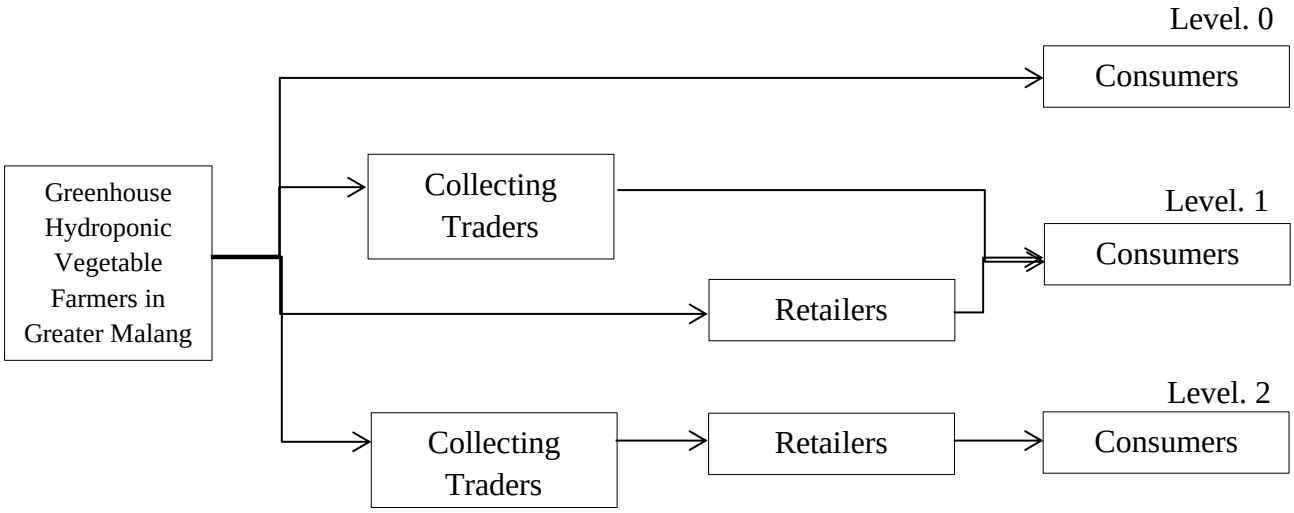

Figure 1. Marketing Channels of Greenhouse Hydroponic Vegetables in Greater Malang
Source: Processed Primary Data (2023)

The results of this study are consistent with previous studies on marketing channels. According to Azhari et al. (2019), in Sidoharjo Village, there are three types of hydroponic vegetable marketing channels: marketing channel 1, which is a marketing channel that does not involve

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marketing channels, i.e., from farmers directly marketed to consumers; marketing channel 2, which is a type of marketing channel that passes through two marketing institutions, i.e., from collecting traders sold to retailers and resold to consumers; and marketing channel 3, which is a marketing channel by passing through one marketing institution, i.e., from producers sold to retailers and then resold to consumers. According to Don Piran et al. (2022), three types of marketing channels exist in Kabupaten Manggarai: channel 1 is a marketing channel where the process is from producers directly marketed to consumers; channel 2 is a marketing channel where the process is from producers sold to middlemen and resold to consumers; and channel 3 is a marketing channel where the process is from producers sold to middlemen resold to retailers and then sold to consumers. According to Dewati et al. (2023), in the Greater Solo, there is one type of marketing channel in which farmers sell to retailers such as vegetable shops and supermarkets, then resell to consumers.

Marketing Process of Greenhouse Hydroponic Vegetables in Greater Malang

Table 3 depicts the marketing process of hydroponic greenhouse for vegetable cultivation in Greater Malang, which occurs on a regular basis over a set period of time with its partners. Six farmers supply items to partners once a week, three farmers deliver products once a day, and one farmer does not distribute products on a regular basis. Farmers distribution activities are aligned with the requests received from respective marketing institutions. With the scheduled nature of incoming demands, farmers can contemplate the planting cycles of each commodity.

Table 3. Marketing Process of Greenhouse Hydroponic Vegetables in Greater Malang

Respondent Number	Marketing Process	
	Routine	Not routine
1	1	0
2	1	0
3	0	1
4	1	0
5	1	0
6	1	0
7	1	0
8	1	0
9	1	0
10	1	0
Total	9	1
Percentage (%)	90	10

Source: Processed Primary Data (2023)

Marketing Functions Utilized in the Marketing Process of Hydroponic Greenhouse Products in Greater Malang

Table 4 shows that the marketing functions used during the marketing process in Greater Malang are the exchange function, which includes the sales and purchasing functions; the physical procurement function, which includes the storage, distribution, and facility functions; and the facilitating function, which includes the financing, price, and market information, and risk-bearing functions. The marketing function is designed and executed by marketing institution to develop,

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promote, and distribute hydroponic greenhouse products to customer. Marketing functions are interrelated with each other and must operate in tandem to create a structured marketing approach.

Table 4. Marketing Functions Utilized in Greater Malang

Respondent Number	Marketing Functions							
	Purch.F	Sales.F	Sto.F	Distri.F	Faci.F	Cost.F	PMI.F	RB.F
1	1	1	1	0	1	1	1	1
2	0	1	0	1	1	1	1	1
3	0	1	1	0	1	1	1	1
4	0	1	0	1	0	1	1	1
5	0	1	0	0	1	1	1	1
6	0	1	0	1	1	1	1	1
7	0	1	1	1	1	1	1	1
8	0	1	0	1	0	1	1	1
9	0	1	0	1	1	1	1	1
10	1	1	1	1	1	1	0	1
Total	2	10	4	7	8	10	9	10
Percentage (%)	20	100	40	70	80	100	90	100

Source: Processed Primary Data (2023)

Information:

Purch.F	: Purchasing Function	Sales.F	: Sales Function
Sto.F	: Storage Function	Distri.F	: Distribution Function
Faci.F	: Facility Function	Cost.F	: Cost Function
PMI.F	: Price and Market Information Function	RB.F	: Risk-bearing Function

Marketing Margin and Farmer's Share of Greenhouse Hydroponic Products in Greater Malang

Marketing margin is a component of the added value of marketing institutions' products. Thus, marketing margin can be defined as the difference between the product's selling and buying prices. The farmer's share is a percentage of the final income received by farmers. The following are the results of this research's analysis of marketing margins and farmer's share:

Table 5. Marketing Margin and Farmer's Share at Three Levels of Marketing Channel for All Commodities in Greater Malang

No	Channel Level	Commodity	Type of Consumer	Farmer		Collecting Trader		Retailer		Consumer		Marketing Margin	Farmer's Share
				P.P	S.P	P.P	S.P	P.P	S.P	P.P	S.P		
1	Level 0	Spinach	End Consumers	-	25,000	-	-	-	-	25,000	-	-	100%
			Restaurant Consumers	-	-	-	-	-	-	-	-	-	-
		Bok choy	End Consumers	-	25,000	-	-	-	-	25,000	-	-	100%
			Restaurant Consumers	-	-	-	-	-	-	-	-	-	-
		Letttuce	End Consumers	-	25,000	-	-	-	-	25,000	-	-	100%
			Restaurant Consumers	-	16,000	-	-	-	-	16,000	-	-	100%

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		Caisim	End Consumers	-	25,000	-	-	-	-	25,000	-	-	100%
			Restaurant Consumers	-	-	-	-	-	-	-	-	-	-
		Gai lan	End Consumers	-	33,000	-	-	-	-	33,000	-	-	100%
			Restaurant Consumers	-	-	-	-	-	-	-	-	-	-
		Samhong	End Consumers	-	33,000	-	-	-	-	33,000	-	-	100%
			Restaurant Consumers	-	-	-	-	-	-	-	-	-	-
		Pagoda mustard	End Consumers	-	40,000	-	-	-	-	40,000	-	-	100%
			Restaurant Consumers	-	-	-	-	-	-	-	-	-	-
		Water spinach	End Consumers	-	25,000	-	-	-	-	25,000	-	-	100%
			Restaurant Consumers	-	-	-	-	-	-	-	-	-	-
		Peppers	End Consumers	-	-	-	-	-	-	-	-	-	-
			Restaurant Consumers	-	52,000	-	-	-	-	52,000	-	-	100%
		Cherry tomato	End Consumers	-	-	-	-	-	-	-	-	-	-
			Restaurant Consumers	-	20,000	-	-	-	-	20,000	-	-	100%
2	Level 1	Water spinach	End Consumers	-	26,500	-	-	26,500	47,167	47,167	-	20,667	56%
			Restaurant Consumers	-	-	-	-	-	-	-	-	-	-
		Bok choy	End Consumers	-	24,600	-	-	24,600	50,500	50,500	-	25,900	49%
			Restaurant Consumers	-	15,000	15,000	25,000	-	-	25,000	-	10,000	60%
		Lettuce	End Consumers	-	24,833	-	-	24,833	39,867	39,867	-	15,034	62%
			Restaurant Consumers	-	15,000	15,000	20,000	-	-	20,000	-	5,000	75%
		Spinach	End Consumers	-	25,570	-	-	25,570	44,458	44,458	-	18,888	58%
			Restaurant Consumers	-	-	-	-	-	-	-	-	-	-
		Caisim	End Consumers	-	25,570	-	-	25,570	43,833	43,833	-	18,263	58%
			Restaurant Consumers	-	-	-	-	-	-	-	-	-	-
		Gai lan	End Consumers	-	41,500	-	-	41,500	48,500	48,500	-	7,000	86%
			Restaurant Consumers	-	-	-	-	-	-	-	-	-	-
		Romaine lettuce	End Consumers	-	56,000	-	-	56,000	64,000	64,000	-	8,000	88%
			Restaurant Consumers	-	-	-	-	-	-	-	-	-	-
		Butterhead lettuce	End Consumers	-	56,000	-	-	56,000	64,000	64,000	-	8,000	88%
			Restaurant Consumers	-	-	-	-	-	-	-	-	-	-
		Cherry tomato	End Consumers	-	60,000	-	-	60,000	65,000	65,000	-	5,000	92%
			Restaurant Consumers	-	-	-	-	-	-	-	-	-	-
3.	Level 2	Lettuce	End Consumers	-	16,000	16,000	18,000	18,000	46,000	46,000	-	30,000	35%
			Restaurant Consumers	-	-	-	-	-	-	-	-	-	-

Source: Processed Primary Data (2023)

Information:

P.P : Purchase Price

S.P : Selling Price

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According to Table 5, the marketing margin value of each commodity at each level of the marketing channel varies. The marketing channel level with the highest marketing margin value for each commodity is marketing channel level 2, while marketing channel level 0 has no marketing margin value. The marketing margin for lettuce commodities in level 2 marketing channels is Rp 30,000/kg because lettuce products pass through two marketing institutions before reaching consumers, i.e., collecting traders and retailers, thereby incurring greater marketing costs such as transportation, rental, and labor expenses. Thus, the pricing received by the end consumer in level 2 of the marketing channel is Rp 45,000/kg. Level 0 marketing channels are marketing channels that have no marketing margin value because no intermediary institutions are involved in the marketing process. Therefore, the price received by farmers and the price paid by consumers are identical. Marketing margins are efficient if the costs of marketing are less than the profits generated. The lengthier the marketing channel chain, the greater the marketing expenses. The unequal net marketing margin that occurs in level 2 marketing channels is the result of a lengthy chain of marketing channels, making level 2 marketing channels inefficient. Nonetheless, level 0 and level 1 marketing channels are efficient.

This research's results resemble those of previous studies on marketing margins. According to Azhari et al. (2019), in Sidoarjo Village, there are three categories of hydroponic vegetable marketing channels with varying marketing margins. Marketing channel 2 has the highest marketing margin value. Prior to reaching the final consumer, the product passes through two marketing institutions, in this case, collectors and retailers, with a marketing margin value of Rp 10,000. The marketing channel with the lowest marketing margin value is 1, which connects producers directly with consumers and has a marketing margin value of Rp 0. According to Don Piran et al. (2022), of the three marketing channels in Manggarai Regency, channel 3, which involves two marketing institutions, namely collecting traders and retailers, has the highest marketing margin value, while channel 1, which involves producers marketing directly to consumers, has the lowest marketing margin value. According to Dewati et al. (2023), there is a single form of vegetable marketing channel in the Greater Solo region, which passes through a single marketing institution consisting of vegetable shops and supermarkets. The marketing channel through vegetable stores has a lower marketing margin than supermarkets for all commodities.

Farmer's Share of Greenhouse Hydroponic Products in Greater Malang

Table 5 demonstrates that marketing channel level 0 has the highest farmer's share value, at 100% for all commodities, while marketing channel level 2 has the lowest, at 35% for lettuce commodities. The difference in farmers' share value is due to differences in marketing costs and differences in commodities, as the production costs of each commodity differ, resulting in varying selling prices. For instance, lettuce farmers have production costs of Rp 100,000 and sell their produce at Rp 150,000, resulting in a farmer's share of Rp 50,000. Tomato farmers, on the other hand, face production costs of Rp 120,000 but sell their tomatoes for Rp 200,000, leading to a farmer's share of Rp 80,000. The difference in farmer's shares between these groups can be attributed to varying production costs. Tomatoes often require more intensive care and maintenance, leading to higher expenses. However, the higher selling price for tomatoes also contributes to a larger farmer's share.This discrepancy in farmer's shares highlights the complex interplay of production costs, selling prices, and crop-specific factors in agricultural economics, with implications for income distribution and sustainable farming practices.Thus, the farmer's share value can be considered efficient if the

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value is greater than or equal to 40% so that level 0 marketing channels for all commodities can be regarded as efficient, and level 1 marketing channels for all commodities can be declared efficient.

The results of this study are close to those of previous research on farmers' share. According to Azhari et al. (2019), three types of hydroponic vegetable marketing channels in Sidoharjo Village are efficient because the farmer's share value exceeds 40%, including marketing channel 1, with a value of 100%, marketing channel 2, with a value of 66.67%, and marketing channel 3 with a value of 71.43%. According to Miftah et al. (2019), the average value of the farmer's share of commodities in Bogor City's traditional market is 41.7%, indicating that it is efficient because it exceeds 40%. According to Don Piran et al. (2022), all three types of vegetable marketing channels in Manggarai Regency are efficient because the farmer's share value exceeds 40%, with the exception of kale and mustard greens commodities in channel 3, which have a farmer's share value of 22.55% and 30%, respectively.

Collaboration System among Hydroponic Vegetable Traders in Greater Malang

The merchant collaborations system is a group of merchants or traders who collaborate for mutual benefit. In this system, merchants in an association share responsibilities, risks, and profits equitably. The following are the results of an analysis of the corporate system among hydroponic vegetable merchants in Greater Malang:

Table 6. Market Interaction of Greenhouse Hydroponic Vegetables in Greater Malang

Respondent Number	Market Interaction	
	Established	Not Established
1	1	0
2	1	0
3	1	0
4	0	1
5	1	0
6	1	0
7	0	1
8	1	0
9	1	0
10	1	0
Total	8	2
Percentage (%)	80	20

Source: Processed Primary Data (2023)

Table 7. Market Interaction in Greater Malang

Respondent Number	Interactions Occured	
	Harmonious	Disharmonious
1	1	0
2	1	0
3	1	0
4	0	0
5	1	0
6	1	0
7	0	0

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8	1	0
9	1	0
10	1	0
Total	8	0
Percentage (%)	80	0

Source: Processed Primary Data (2023)

Table 8. Collaboration Among Hydroponic Greenhouse Farmers and Traders in Greater Malang

Respondent Number	Collaboration occurred		
	P.RM	C.P	T.A
1	1	0	1
2	1	1	0
3	1	0	1
4	0	0	0
5	1	1	1
6	1	1	1
7	0	0	0
8	1	0	1
9	1	0	1
10	1	0	1
Total	8	3	7
Percentage (%)	80	30	70

Source: Processed Primary Data (2023)
Information:
P.RM : Procurement of Raw Materials,
C.P : Cooperation in Promotion,
T.A : Traders Association

Table 6 shows there are market interactions in Greater Malang. The intended market is a modern market catering to the upper-middle-class community. Interaction take place within a WhatsApp group that includes farmer's and intermediary traders involved. Table 7 demonstrates that market interactions in Greater Malang are harmonious, resulting in cooperation among hydroponically grown vegetable product traders with farmers. Table 8 illustrates the collaboration between traders and farmers resulting from market interactions in the form of raw material procurement, cooperation in the promotion of goods, and trader associations, in which traders share information on the most recent trends, business strategies, pricing decisions, and market developments. With the existence of WhatsApp group, farmers experience several conveniences such as not being confused when their product have not been completely sold, and if there are farmers whose products are insufficient to meet market demand, they are not confused in searching for product to fulfill market needs.

This study demonstrates nearly identical outcomes to previous studies, particularly in results from studies on the trader's corporate system. According to Rusdi et al. (2021), vegetable traders in Buru Regency cooperate with one another by entrusting unsold products to other merchants. This condition occurs when the owner of the products has other obligations and is unable to sell them. According to Pani et al. (2021), vegetable traders in Landak Regency cooperate similarly to those in Buru Regency, specifically by entrusting unsold products to other traders when the owner trader lacks

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time to sell them. In addition, vegetable traders in Landak Regency work together to determine each product's selling price, so there is no price monopoly. According to Setiawan et al. (2022), vegetable traders in Pontianak City cooperate in maintaining their stalls and sharing price information. In addition to cooperation, vegetable traders in Pontianak City compete in terms of selling price competition, competition in the quality of goods, competition in the completeness of goods, and competition in the provision of services. This study differs from others in that there is no cooperation in the form of maintaining traders' stalls, and there is also no competition between traders.

CONCLUSION AND SUGGESTION

Governance management for the marketing of hydroponic greenhouse vegetable cultivation in Malang Raya is comprised of a variety of vegetable commodities, including bok choy, pagoda mustard, lettuce, spinach, kale, caisim, gai lan, samhong, kale, romaine lettuce, butterhead lettuce, peppers, and cherry tomatoes. The most frequently marketed product is lettuce. Farmers, collecting traders, retailers, including supermarkets and vegetable stores, restaurants, and end consumers are the marketing institutions involved in the distribution of hydroponic greenhouse vegetables in Greater Malang. In Greater Malang, there are three types of marketing channels for hydroponic greenhouse vegetable commodities: marketing channel level 0, marketing channel level 1, and marketing channel level 2. In this study, the marketing channel with the greatest number of consumers is level 1. The marketing functions utilized in the marketing of hydroponic greenhouse vegetables in Greater Malang are the exchange function, which consists of the sales function and the purchase function; the physical procurement function, which consists of the storage function, the distribution function, and the facility function; and the facilitating function, which consists of the financing function, the price and market information function, and the risk-bearing function.

From the analysis of marketing margins and farmer's share of hydroponic greenhouse vegetables in Greater Malang, it can be concluded that marketing channel level 0 for all commodities is efficient, as it has no marketing margin value and a farmer's share value of 100%. Level 1 marketing channels can be considered efficient because the value farmers share for all commodities exceeds 40%. Level 2 marketing channels are less efficient because the farmer's share value is less than 40%, and the marketing margin value is the highest among the other marketing channels. There is interaction in the collaboration system between hydroponic greenhouse vegetable merchants or traders in Greater Malang. The interaction between traders is harmonious, characterized by mutual support and cooperation. Cooperation formed as a result of market interaction consists of the procurement of raw materials, cooperation in the promotion of products, and the association of traders cooperating by exchanging information regarding the most recent trends, price information, business strategies, and market developments.

Based on the abovementioned results, it is recommended that the marketing of hydroponic greenhouse goods in Greater Malang should prioritize lettuce due to its high demand in the market. Consequently, farmers should allocate sufficient attention to the production of lettuce vegetables, focusing on both quality and quantity. The appropriate marketing channel for hydroponic vegetables is a level 1 marketing channel characterized by the involvement of a single marketing agency. This arrangement allows farmers to control the quality of products that reach consumers. Furthermore, the analysis of marketing margins and farmer's share also indicates that level 1 marketing channels can

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be regarded as efficient. The corporate system of hydroponic product traders has been established harmoniously and must be maintained, as a harmonious market impacts sales volume.

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