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Optimizing the Role of Traders Collector in Expanding Vegetable Market Access Local Organic in Wamena Papua Mountains

Herlyani S[1,*], and Putra Astaman[2],
[1]Land Resources Management Study Program, Amal Ilmiah Yapis Wamena University, Jayawijaya Regency, Indonesia
[2]Faculty of Agriculture, Muhammadiyah University of Sinjai, Sinjai Regency, Indonesia
herlyanis1984@gmail.com

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Corresponding Author: Herlyani S, Amal Ilmiah Yapis Wamena University,
Email: herlyanis1984@gmail.com

ABSTRACT

Collecting traders in Wamena play a crucial role in enhancing farmers' welfare. This study explores how these traders can boost the availability of organic vegetables while adapting to local conditions. The research identifies challenges, opportunities, and best practices specific to Wamena, using a qualitative approach with in-depth interviews and participatory observations of farmers and collectors. Collecting traders act as a key link between rural farmers and urban consumers, directly collecting harvests from fields. They also manage post-harvest tasks such as sorting, classifying, and packaging to ensure quality. However, several obstacles hinder their full potential. Limited infrastructure, such as poor road access, presents a significant challenge, as does the lack of capital for buying large quantities and maintaining stock. The use of traditional measurement units like tokens leads to inaccurate weight estimates, disadvantaging both farmers and traders. Additionally, high shipping costs burden traders and reduce their profit margins. To optimize the role of collecting traders, improvements in service quality, market network expansion, and vegetable distribution are needed. Addressing these challenges will help enhance the welfare of farmers, ensure the availability of quality organic vegetables, and meet consumer demand in Wamena. Improving distribution methods for organic vegetables is essential to support this goal.

Keywords: *Post-harvest, Trader Challenges, Availability, Local Market*

INTRODUCTION

The agricultural sector has tremendous potential to become a locomotive for equitable economic growth. With the right approach, agriculture is not only a food provider but also a job creator and driver of the rural economy. The sector can open up wider export opportunities through increased productivity, commodity diversification, and market development. This will not only increase the country's foreign exchange but also boost economic growth at the local level. Furthermore, by creating rural employment, agriculture can reduce urbanization and even out development between urban and rural areas.

Environmental issues and society's increasingly critical consumption patterns have prompted businesses to change their approach. Many companies are starting to adopt sustainable and environmentally friendly business models. This is in line with the findings of Dulbari et al. (2021), which show a business paradigm shift towards activities that pay more attention to environmental sustainability. One popular company strategy to capitalize on environmental issues is offering organic products. Organic products, as part of the green product category, have natural characteristics and are free from harmful chemicals. Thus, organic products provide benefits to consumers and contribute to preserving the environment.

The fundamental difference between organic and conventional products lies in the production process and pricing. Organic products are cultivated using methods that avoid the use of synthetic chemicals and pesticides.

This more rigorous and natural production process requires higher costs than conventional production. As Yun and Kurniawan (2014) explained, higher production costs in organic products are reflected in higher selling prices. Nevertheless, environmentally conscious consumers are generally willing to pay more for organic products because they understand their added value for their health and the environment.

Organic farming offers several significant benefits to people and the environment in the long run. Gamage et al. (2023) outlined some of the main advantages of this farming system. First, organic farming can sustainably improve soil fertility. Second, organic farming effectively controls pests and plant diseases without harming the environment. Chemical pesticides that harm humans and the environment are replaced with natural pest control methods, such as crop rotation, using natural enemies of pests, and biological control. Third, organic farming contributes to the preservation of water quality. The use of organic fertilizers and the minimal use of chemical pesticides reduce the risk of ground and surface water pollution. Fourth, organic farming encourages the utilization of local resources owned by farmers. Farmers can reduce dependence on high-cost agricultural production inputs by using organic fertilizers derived from agricultural waste and animal manure. This not only saves production costs but also improves food security. Finally, organic farming produces high-quality agricultural products. Crops produced from organic farming generally have higher nutrient content than conventional crops. In addition, organic farming products are also free from pesticide residues, making them safer to consume. This high product quality allows farmers to sell their crops at a better price.

Rapid population growth is driving an increase in demand for food products, especially vegetables, as a source of essential nutrients. Vegetables are rich in vitamins and minerals needed by the human body and cannot be fully replaced by staple foods. Modern agricultural technology has succeeded in increasing agricultural production to meet the increasing demand for food. However, the intensive use of chemical fertilizers and pesticides in the long run has caused various environmental problems. In addition, chemical residues in agricultural products also have the potential to contaminate food and endanger consumer health.

It is important to emphasize that agricultural development must be oriented towards the welfare of farmers. By increasing farmers' income through increased product selling prices and production efficiency, we not only improve their quality of life but also encourage investment in the agricultural sector. This aligns with the findings of Wiryawaand and Djatna (2020), who emphasized that increasing farmers' productivity and income is the key to achieving welfare. In other words, sustainable agricultural development is a long-term investment that will benefit all levels of society.

As the public's awareness of the importance of health and well-being increases, interest in healthy lifestyles is growing. One tangible manifestation of this trend is the significant growth in demand for organic products, especially vegetables. Organic vegetables are considered safer to consume than conventional vegetables as they are free from synthetic pesticide residues and chemical fertilizers that can harm health. In addition, many studies have shown that organic vegetables have higher nutritional content, such as vitamins, minerals, and antioxidants, than non-organic vegetables. These advantages encourage people to choose organic vegetables as a healthy diet.

The increasing market demand for organic vegetables has had a positive impact on the agricultural sector. Many farmers see promising business opportunities in organic vegetable cultivation. This encourages them to shift from chemical-intensive conventional farming methods to more environmentally friendly organic farming practices. Organic farming produces healthier products and contributes to environmental conservation by maintaining soil, water, and air quality. However, despite the huge market potential, organic farmers face various challenges, such as limited access to organic farming technology, lack of knowledge of organic cultivation techniques, and market price fluctuations.

The benefits of organically produced fresh vegetables as a source of vitamins and minerals have been widely recognized to raise public awareness of a healthy lifestyle (Annurdiansyah et al., 2023). Preferences for organic vegetable products can be determined based on quality and price. Quality can be determined based on the freshness of the newly harvested organic vegetables. Vegetable prices also play a role in determining preferences for vegetable products. Preferences for organic vegetable products are significant in improving the quality of vegetables and supporting a healthy lifestyle (Alamsyah, 2014).

Although market demand for organic vegetables continues to increase, farmers face obstacles in marketing their products, especially those in remote areas such as Wamena. Limited market access is a significant challenge for organic vegetable farmers in the region. Some factors that cause limited market access include long distances to distribution centers, inadequate infrastructure, and lack of market information. As a result, many organic vegetable farmers in Wamena struggle to get a fair price for their produce.

Organic vegetables, as one of the organic farming products, are increasingly in demand as they are considered healthier and free from chemical residues. The use of organic fertilizers such as compost and manure is considered better for maintaining soil quality and plant health and reducing the risk of crop contamination. Thus, organic farming offers a more sustainable alternative to meet the food needs of a society increasingly concerned about health and the environment.

One of Indonesia's regions with great potential for organic farming development is Wamena, Mountainous Papua Province. Located in the highlands, Wamena offers natural conditions that strongly support the development of organic farming. Fertile soil, regular rainfall, and cool temperatures create an ideal growing environment for various types of organic vegetables, such as cabbage, broccoli, and carrots. Clean and natural water quality further enriches the potential of organic farming in the region. With this great potential, Wamena can become a production center for high-quality organic vegetables that not only meet local needs but also have the potential to be marketed to other regions and even abroad.

Table 1. Production Commodity Horticulture (Vegetables) in the Regency Jayawijaya 2013-2018

NO	COMMODITY	UNIT	YEAR					
			2013	2014	2015	2016	2017	2018
1	Red onion	Ton	53.97	53.97	19.9	11.9	18.1	19
2	Lab Siam	Ton	97.3	97.3	96.8	68.9	69.4	70
3	Onion	Ton	178.41	178.31	134	77.1	81	10
4	Bayam	Ton	83.77	93.65	45.7	26.1	30	9
5	Buncis	Ton	14	13.5	38.3	27.3	35	12
6	Chili	Ton	13	13.49	12	23.7	17.7	10
7	Long beans	Ton	30.43	29.26	2	1.4	6.6	9
8	Cabbage	Ton	27.87	27.68	34.5	94.85	95.52	20
9	Cucumber	Ton	33.74	39.74	24.3	18.5	20.1	100
10	Red beans	Ton	6	6	7	20.1	22	76
11	Potato	Ton	12	14	7.2	28.2	35.3	10
12	Mustard	Ton	8	10	8.5	10.5	12,8	27
13	Terung	Ton	5	5	6	4,8	8,9	8
14	Tomat	Ton	78,57	78,4	17,9	16,7	31,6	12
15	Wortel	Ton	40	47	47,2	41,7	63,4	80
16	Petsai	Ton	170	447,34	176.2	151.4	151.3	100

Source : Regency Jayawijaya in Figures 2021.

Most of the area in the Papua Mountains is a highland called the Central Mountains. These mountains extend from Central Papua, Papua Mountains, to Papua New Guinea, with various peaks reaching more than 4000 meters above sea level. The western side of the Central Highlands in Indonesia is called the Jayawijaya Mountains. Some of the mountains in the Papua Pegunungan province include Puncak Trikora (4,760 meters above sea level) and Puncak Mandala (4,750 meters above sea level). Between these mountains, there are valleys with elevations of more than 1,500 meters above sea sweet potato level, which have high fertility, so they are used as settlement sites and plantation land, especially as they are the staple food of local tribes. Valleys in this region include the Baliem Valley in Jayawijaya Regency and the Toli Valley in Tolikara Regency. These mountains are the water source for major rivers on the island of Papua, such as the Mamberamo River and Digul River, which flow north and south, respectively.

Infrastructure challenges and limited distribution networks often hinder farmers from marketing their products directly to broader consumers. Inadequate infrastructure, limited access to transportation, and limited distribution networks make it difficult for agricultural products to reach a broader market. Due to limited market access, the selling price of agricultural products is often below the price that farmers should receive. This makes it difficult for farmers to increase their income and welfare. In this situation, the role of collectors as intermediaries between farmers and end consumers becomes crucial. Collectors can help farmers reach out to a broader market so that the selling price of agricultural products can increase. Thus, farmers can earn a more stable and sustainable income.

Previous studies have made important contributions to understanding the complexity of the value chain in organic vegetable agribusiness. However, the crucial role of intermediary traders in expanding market reach, especially in 3T areas with accessibility constraints, such as Wamena, still requires further study. This study aims to explore in depth how the role of intermediary traders can be optimized in increasing the availability of organic vegetables in Wamena, focusing on identifying best practices, challenges, and opportunities.

Collectors function as collectors of products from farmers before they are distributed to larger markets or consumers. In organic vegetables, collectors are not only responsible for collecting and distributing products. However, they must also ensure that the products meet the quality standards required by the market. Thus, increasing the capacity of collectors in terms of knowledge about organic products and marketing techniques can help expand market access. The purpose of this study is to explore in-depth and comprehensively how the role of intermediaries can be optimized in increasing the availability of organic vegetables in Wamena, including understanding the challenges, opportunities, and best practices.

RESEARCH METHODS

Time and Location of Research

This research was conducted intensively for three months, from September to November 2024. The research focused on organic vegetable collectors' activities in Jalan Trikora, Wamena, Jayawijaya Regency, Papua Mountain Province.

Data Types and Sources

This research prioritizes using qualitative data as the primary source of information. Qualitative data was chosen because it allows researchers to explore an in-depth understanding of complex social phenomena, such as the distribution of organic vegetables. With qualitative data, researchers can better understand the motivations, perceptions, and experiences of the various parties involved in the distribution process. One of the main methods of collecting qualitative data in this research is in-depth interviews. Interviews were conducted with various parties, such as collective traders and farmers, who are important in distributing organic vegetables. Through interviews, researchers can explore in-depth information about the challenges, opportunities, and factors that influence the distribution process of organic vegetables. In-depth interviews allow researchers to understand informants' perspectives and direct experiences deeply.

In addition to interviews, researchers also used the observation method to collect data. Observation is carried out by directly observing the daily activities of collectors in the market and distribution sites. Through observation, researchers can obtain more prosperous and more detailed data about the practices that occur in the organic vegetable distribution process. Observation also allows researchers to identify aspects that may not be revealed in interviews, such as social interactions, physical conditions of distribution sites, and actual market dynamics.

Determination Informant Key

In this study, the population of focus was all local organic vegetable collectors operating in Wamena, Papua Mountains. Three collectors who have been in business for more than a decade were selected as research informants. The choice of informants was based on the consideration that they are the third generation of a family in the vegetable collecting business since 1984. The informants were considered relevant because they have in-depth knowledge of the history and development of the local organic vegetable market and have faced challenges unique to the region.

Data Collection Techniques

This research adopts a qualitative approach involving various data collection techniques to understand the distribution dynamics of organic vegetables in Wamena. In-depth interviews will be conducted with collectors, traders, and organic farmers. Through interviews, researchers will explore the perspectives, experiences, and challenges each related party faces. In addition, participatory observations will be conducted in traditional markets, storage warehouses, airports, and farmers' fields to understand firsthand the daily activities of the organic vegetable supply chain. By combining these two techniques, rich and comprehensive data is expected to be obtained to illustrate the complexity of the organic vegetable distribution system in Wamena.

Data Analysis Method

In this study, qualitative data analysis using the Miles, Huberman, and Saldana (2014) model was chosen because this model is considered the most suitable for revealing the deep meaning of descriptive data. This model consists of three main stages: data condensation, data presentation, and conclusion drawing. Data condensation reduces raw data into a more structured form through coding and categorization. The condensed data was then presented as visual and interactive data displays. Conclusions were drawn by comparing and synthesizing all the information we obtained from various sources. This will be presented in Figure 1 below.

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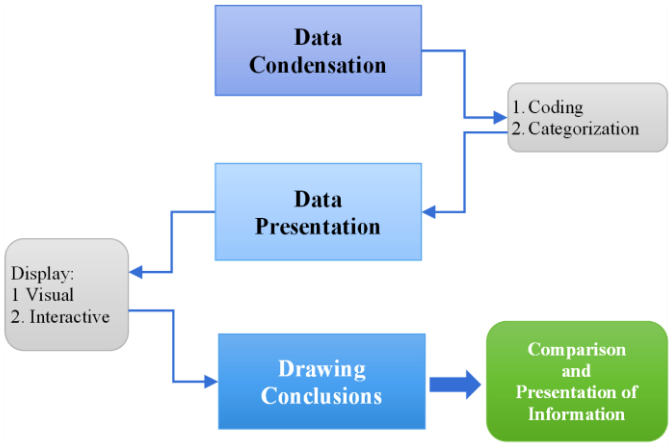

Figure 1. Research Data Flowchart

RESULTS AND DISCUSSION

The research results on optimizing the role of the collecting sword can be described as follows.

Number of Trader Collector

Three collectors on Jalan Trikora, Wamena, who have been in the business for over a decade, were selected as the research sample. Jalan Trikora was chosen as the research location because it is the center of the vegetable delivery trade for spring onions, carrots, chayote, cabbage, cauliflower, and avocado in Wamena. Hence, the traders there have in-depth knowledge of trade history in Wamena and have faced various market changes and diverse experiences ranging from the first generation to the third generation. The purposive sampling technique was used with the consideration that traders with many years of experience are expected to provide richer and more relevant qualitative data, especially related to price changes, demand patterns, and challenges faced in running a business as well as their role in the food distribution system in Wamena. In addition, the traders selected also have diverse characteristics, such as the scale of their business, to gain a more comprehensive perspective.

Table 2. Identity Informant

No	Name	Age	Education
1.	Mr. S	45	Senior High School
2.	Mr. R	42	Senior High School
3..	Mr. B	40	Senior High School

Source: Research data after processed.

The data on optimizing the role of collectors in Table 2 has been collected from three key informants. Based on the research findings, age (average 42 years) and education (average high school) are variables. In other words, the age category is still classified as productive; they are still maximized in running a merchant business and building business networks.

Service quality of Collecting Traders

Shortening the food supply chain can create a more equitable, sustainable, and resilient food system. Direct links between farmers and consumers can build a more transparent and accountable food system. Farmers can earn a decent income, while consumers enjoy healthier and safer food. In addition, this system can also reduce dependence on food imports and improve the food security of a region.

Farmers can sell their crops directly or through fewer intermediaries, such as intermediaries. These intermediaries play an important role as they buy the crops at a reasonable price and help farmers sell their products in larger quantities. The prices received by farmers are thus more stable and profitable. In addition, intermediary traders often offer additional services such as storage or processing, increasing the value of agricultural products and farmers' income. The short food system also opens up new job opportunities in the villages. Gatherers, shops, and other businesses associated with the system require many workers. This helps reduce unemployment and

increase community income. With better local economic growth, the demand for other goods and services also increases, creating a positive domino effect that benefits the entire community, especially in the village areas.

To meet consumer demand for fresh, quality produce, the collectors have built a strong network of partnerships with farmers in villages such as Muai, Kurima, and Wales. These partnerships are not only limited to the area of origin of the commodities but also include local markets in Wamena, such as Wouma Market and Hom-Hom New Market. With this extensive network, the wholesalers can guarantee a sustainable supply of organic fruits and vegetables. In order to maintain a smooth supply and strengthen good relations with farmers, wholesalers are committed to providing fast and efficient payments. The cash payment system provides farmers with financial certainty and builds solid trust. Thus, farmers will be more motivated to continue improving the quality and quantity of their crops, which will ultimately benefit all parties in the supply chain, from farmers and traders to consumers. Organic vegetable marketing must adjust to consumer needs with consideration of sales sustainability (Paradiba et al., 2017).

The partnership between wholesalers and farmers in Wamena is not limited to meeting customer needs. More than that, wholesalers play an active role in supporting agricultural development in the area. One form of support provided is the provision of quality seeds for partner farmers. With the availability of superior seeds, agricultural productivity is expected to increase significantly. This aligns with efforts to meet the growing market demand within and outside the Wamena area. Through this mutually beneficial partnership, fresh and organic agricultural products from partner farmers are increasingly recognized and demanded by consumers. Guaranteed product quality, supported by superior seeds and good agricultural practices, is a unique attraction for consumers increasingly concerned about health and the environment. Thus, this partnership provides economic benefits to farmers and contributes to improving the community's overall welfare.

The relationship between farmers and collectors is very close, characterized by mutual trust and respect. Farmers feel comfortable transacting with collectors because they are buyers and reliable partners. One of the key factors that build this trust is transparency in pricing. The prices offered by collectors are always adjusted to the quality of the products produced by the farmers and follow market dynamics. This makes farmers feel they are being treated fairly and not at a disadvantage. In addition to price transparency, information disclosure is important in building strong relationships between farmers and collectors. Collectors actively provide clear and accurate information on market conditions and product price trends. With this complete information, farmers can better plan their production, choose profitable commodities, and ultimately increase their income. The involvement of collectors in providing market information is beneficial for farmers and contributes to the overall improvement of the quality and quantity of agricultural production.

Aufanada et al. (2017) emphasize the importance of the "spirit of partnership" in establishing successful partnerships. This concept includes several key elements, including the existence of a common goal that all parties involved want to achieve. In addition, a healthy partnership is also characterized by mutual benefit, where each partner benefits from this cooperation. Trust in each other is a strong foundation for building long-term partnerships. Transparency in communication and actions is also crucial to maintaining a good relationship. Finally, a spirit of continuous improvement in product or service quality and cost efficiency is key to maintaining the competitiveness of the partnership over a long period.

Figure 2. Forms of partnership: farmers and traders and collector

Figure 2 shows the forms of partnerships entered into between organic vegetable farmers and collectors. In supply chain management (SCM), partnerships with suppliers and distributors are key to success. This partnership is not just an ordinary business relationship but a long-term commitment that requires cooperation from all parties involved. The concept of reengineering in SCM supports forming strong partnerships where each partner is interdependent and works together to achieve common goals. Sa'diyah and Dyanasari (2017) identified several important aspects of building a successful partnership. First is the willingness to share control and sacrifice short-term gains to achieve more significant long-term goals. Second is fair and balanced resource-sharing and profit-sharing between all partners. Third, a change in the supplier's role to be more proactive in supporting the customer's success. Finally, all parties in the supply chain network must be actively involved to achieve mutual benefits.

Network owned by Collecting Trader

Wholesalers play a crucial role in Wamena's agricultural product distribution system. They act as an important link between farmers as producers and end consumers. After collecting crops from various farmers, wholesalers carry out a series of processes to improve product quality, such as sorting. Thus, agricultural products produced by farmers can be marketed more widely and reach consumers in various regions, both inside and outside. One of the advantages of the collective trader network is its ability to distribute agricultural products quickly and in large quantities. Thanks to an extensive and stable marketing network, farmers' crops can be marketed to various destinations, such as the Hamadi central market, the Abepura autonomous market, and markets in Timika. This assures farmers that the fruits of their labor will be sold quickly and at a fair price. Thus, farmers can focus more on increasing productivity without worrying about marketing issues.

The existence of the collective trader network provides a number of benefits to farmers. First, farmers no longer need to bother looking for buyers for their crops. Collectors with large storage and distribution capacities can accommodate products in large quantities. Second, farmers can obtain more stable and competitive prices as collectors have access to wider market information. Third, with market security, farmers can better plan their production and increase their income. The collector trader network benefits farmers and contributes positively to the local economy. By facilitating the distribution of agricultural products, wholesalers help ensure food availability for the community. In addition, the trading activities carried out by collectors can also create jobs and increase the income of communities around production areas.

Figure 3. Buying and selling activities at Wamena market

Jibama New Market, shown in Figure 3, is a strategic location for finding fresh vegetables at affordable prices. Here, visitors can find a wide variety of vegetables produced by local farmers, making it a top choice for people who prioritize quality and freshness. In addition, this market is also a gathering place for mama-mama traders from various villages in Wamena. The interaction between traders and buyers creates a lively and friendly atmosphere and strengthens community ties. Thus, Jibama New Market functions as a trading center and an important social space for the local community.

According to Utami and Wiguna (2022), business networking results from entrepreneurs' decisions and efforts to increase competitiveness through cooperation with other business units. Thanks to trusted partners, this network enables increased efficiency, reduced transaction costs, and increased flexibility. Business networks also function as economic organizations that regulate coordination and cooperation between elements, both business and non-business units, which can be formal or informal. Producers often use intermediaries in production and marketing activities to create efficiency in providing goods to target markets. The business network formed by entrepreneurs aims to facilitate the running of the business from the production process to distribution to consumers, by utilizing cooperation to achieve maximum profit.

Figure 4. Structure Network Trader Collector

The structure of the organic vegetable marketing network, as presented in Figure 4, shows the flow of goods from the upstream sector: farmers, collecting traders, retailers, and final consumers downstream of the supply chain. The social network theory proposed by Albizua et al. (2020) explains that social relationships can be understood as pathways that connect individuals through which goods, services, and information can flow. (Poongodi, 2022) emphasizes that the main focus of sociologists is to study social structure. Network analysts seek to identify regular patterns in networks that are hidden behind complex social systems. In this context, individual behavior is influenced by these structures, so more attention is paid to structural coercion than deliberate action. In their research, Rahman et al. (2020) provide an in-depth understanding of the concept of efficient marketing. According to him, marketing is said to be efficient if it meets two main criteria. First, efficient marketing must minimize the costs of channeling agricultural products from farmers to consumers. This means that all processes in the supply chain, from processing to packaging to distribution, must be optimized so that production and

marketing costs can be reduced to a minimum. Secondly, in addition to being cost-efficient, efficient marketing must be fair in sharing sales proceeds with all parties involved. Every party contributing to the production and marketing process, from farmers, processors, and distributors to retailers, is entitled to a balanced share by the added value they provide. Thus, fairness in revenue sharing is an important indicator in assessing the efficiency of a marketing system.

Frequency Distribution

Vegetable distribution in Wamena is a unique logistics system, mainly due to its high dependence on air transportation. Vegetable delivery schedules in Wamena generally take place daily, except on Sundays. The regularity of this delivery schedule is crucial to ensure a continuous supply of fresh vegetables for customers outside Wamena. Previous studies on food logistics in remote areas have often highlighted the importance of delivery frequency in maintaining product quality and availability. Reliance on air transportation for vegetable distribution in Wamena brings several unique challenges. Factors such as airplane availability, inclement weather, and airfares can significantly impact smooth deliveries.

Demand for vegetables and fruits in Wamena is highly volatile, influenced by factors such as seasonality, holidays, and the availability of local produce. These dynamic consumer preferences make demand in this area difficult to predict (Annurdiansyah et al., 2023). Collecting traders, as the link between farmers and retailers or end consumers, must be able to adapt quickly to significant changes in demand. By having an extensive network and in-depth knowledge of the market, they can act as a buffer between producers and consumers, ensuring the availability of diverse and quality products to meet the needs of retailers and final consumers in Wamena. Their ability to manage risk and build good relationships with farmers and retailers will largely determine the success of their business and contribute to regional economic stability.

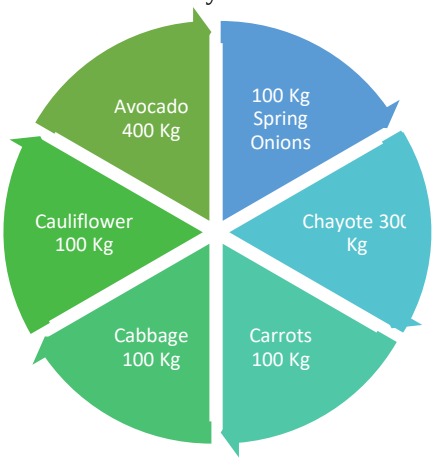

Figure 5. Types and Quantity of Vegetables Sent Per Day

Figure 5 presents the types and quantities of vegetables delivered daily as a Pie chart. The types of vegetables distributed to Jayapura and Timika are diverse and follow the rhythm of the seasons. Everything is available according to the harvest season, from fresh green leafy vegetables to nutrient-rich root vegetables. Flexibility in delivery quantities allows the supply to constantly be adjusted to fluctuations in market demand, ensuring the availability of fresh, quality products to meet the needs of consumers and retailers in both cities. Avocados from Wamena have become a customer favorite in Jayapura due to their good taste, thick flesh, and savory flavor. These advantages make Wamena avocados much sought after, especially for culinary preparations such as juices and other foods.

Distribution Method

Shipping vegetables directly from farmers to markets often faces significant logistical challenges. One of the biggest challenges is the perishable nature of vegetables. Poorly maintained vegetable quality during transportation will decrease their selling value in the market. To overcome this problem, vegetable traders must choose a mode of transportation that can guarantee speed and safety of delivery. It is important that vegetables arrive at the market fresh and ready for consumption. To overcome these problems, vegetable traders must choose a mode of transportation that can guarantee the speed and safety of delivery. This is important so that vegetables can arrive at the market fresh and ready for consumption.

Nowadays, air transportation is the most effective solution to overcome the challenges in vegetable delivery. The high speed of delivery is the main advantage of this mode of transportation. With a very short travel time, even less than an hour for certain distances, vegetables can arrive at the market fresh and ready for consumption. The time efficiency offered by air transportation allows vegetables to be directly marketed without going through a long storage process. This is very important to maintain the quality and selling value of vegetables to meet the increasingly high market demand.

While offering high time efficiency, using air transportation for vegetable delivery has one major drawback: it is costly. Air freight costs an average of IDR 10,000 per kilogram, much higher than other modes of ground transportation. These high shipping costs are an additional burden for farmers and traders. This could increase the selling price of vegetables in the market, burdening consumers. On the other hand, high costs can also hinder farmers' access to broader markets, especially for commodities with low selling points.

Agricultural products have unique characteristics that set them apart from manufactured products. Their seasonal nature, susceptibility to spoilage, and direct impact on consumer health make the logistics management of agricultural products more complex. In addition, agricultural products also have a significant impact on the environment. Sutarni et al. 2012 identified some unique characteristics of agricultural products, especially horticulture. In addition to their seasonal nature, agricultural products are highly concerned with safety, nutrition, and health: their short lifespan and susceptibility to physical and chemical damage challenge logistics management.

Figure 6. Distribution Method Vegetables Organic Wamena

Anjangmas (2019) analyzed the logistics characteristics of agricultural products based on the role of each actor in the supply chain. Figure 6 shows that Farmers, traders, and industry have different challenges. Farmers, for example, face high production variability, while the industry needs to pay attention to product traceability and have specialized storage facilities. The horticultural supply chain system, especially in Indonesia, involves many actors. Each actor has different roles and challenges. This shows that logistics management of horticultural products requires a comprehensive approach and involves all relevant parties.

CONCLUSION

Optimizing the role of organic vegetable collectors can be realized to improve farmers' welfare and meet consumer needs for quality organic products in Wamena. These efforts can be made by improving service quality, optimizing and expanding market networks, increasing vegetable distribution, and paying attention to organic vegetable distribution methods.

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