

Household Income of Chayote Farmers in Fakfak Regency (Case: Utilizing and Not Utilizing the Sea Toll)

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ABSTRACT

This study aims to analyze the difference in household income of chayote farmers who utilize and do not utilize the Sea Toll program as a means of distribution. The results of the study showed that farmers who use the Sea Toll have a higher average production (2,260.95 kg/month) than non-users (1,404.44 kg/month). This difference has an impact on household income, where the average income of farmers using the Sea Toll reaches Rp. 16,619,048 per month, while non-users are only Rp11,244,444.44 per month. These findings confirm that the use of the Sea Toll contributes positively to increasing production, distribution efficiency, and household income of chayote farmers in Fakfak Regency

INTRODUCTION

The agricultural sector is one of the strategic sectors in Indonesia's economic development because it plays an important role in providing food, absorbing labor, increasing community income, and reducing poverty in rural areas. Based on data from the Central Statistics Agency (BPS), the Agriculture, Forestry, and Fisheries sector is still one of the main contributors to the national Gross Domestic Product (GDP) with a value according to the prevailing price of Rp. 869.4 trillion or 14.35%. The growth of the agricultural sector per year was 4.93%. In addition to contributing to GDP, the agricultural sector is also a source of livelihood for most people in rural areas. BPS data (2025) shows that the percentage of labor in the agricultural sector is 27.99%, the majority of which are in rural areas. The agricultural sector also contributes to social stability and national food security, data shows that the production of rice commodities in 2025 will reach 54 million tons. This can support food availability and price stability.

The agricultural sector in West Papua plays an important role as the largest absorber of labor, which is more than 30% of the total workers and a contributor of 1.75% to the Gross Regional Domestic Product (GDP) (BPS, 2025). The development of land area and horticultural production in West Papua Province during the 2022–2024 period shows a fairly positive upward trend. The increase was influenced by the increase in horticultural harvest area, increasing market demand for seasonal vegetable and fruit commodities, and local government support through horticultural area development programs. Commodities that are widely cultivated by the community include chili, tomatoes, mustard greens, long beans, eggplant, cucumbers, and chayote. The land area and production of horticultural crops in West Papua Province are presented in the following table.

Table 1. Land Area and Horticultural Production of West Papua Province in 2022-2024

Years	Area of Horticultural Land (Ha)	Horticultural Production (Quintals)
2022	4.215	128.540
2023	4.586	136.875
2024	4.942	145.320

Source : BPS, 2025

Fakfak Regency is one of the districts in West Papua Province that has sufficient horticultural production. One of the horticultural commodities that is developing and has economic potential in Fakfak Regency is chayote (*Sechium edule*). This commodity is widely cultivated by the community because it has good adaptability to Fakfak's agroclimatic conditions, is easy to cultivate, and has an increasing market demand both at the local and inter-regional levels. When compared to other districts in West Papua Province, chayote in Fakfak Regency

has the highest amount of production, where in 2025 it will reach 1,125 quintals or 39.19% of the total chayote production in West Papua Province.

Chayote is one of the horticultural commodities that has economic value and has the potential to be a source of income for farmer households. This plant has a relatively fast harvest period and can be harvested repeatedly in one planting season, thus providing more regular income opportunities than some other food commodities. The area of cultivated land, the amount of production, the use of production facilities, labor, farming experience, and the ability of farmers to manage their farming business affect the income of farmer households. Farmer households with larger land area and higher productivity tend to earn greater income than small-scale farmers. According to Hernanto (2018), the level of efficiency in the use of production factors greatly determines the amount of income and profits of farming businesses.

According to Soekartawi (2016), farm revenue is all production value received by farmers from the sales of agricultural products in one production period. Farmer household income is an important indicator in measuring the level of farmers' welfare because it is directly related to the ability of households to meet their living needs, education, health, and other socio-economic needs. The greater the income obtained from farming, the greater the opportunity to improve the welfare of farmers' households.

In addition to the production process, there are other factors that are also determining factors for the revenue obtained by farmers, namely marketing and distribution systems. In addition to meeting the needs of the local market in Fakfak Regency, chayote products have also been marketed to several other areas such as Sorong and Timika. This condition shows that chayote has a wide market opportunity and has the potential to increase farmers' household income if managed optimally. However, the main challenges faced by farmers are limited market access and high distribution costs.

The Sea Toll Program is designed to reduce price disparities and strengthen inter-island access, especially in the 3TP area. In January 2024, the Ministry of Transportation affirmed the sustainability of services and mentioned an average price reduction of $\pm 11-12\%$ in eastern Indonesia; the statement of the Minister of Transportation in September 2024 said that in certain commodities the decrease could reach up to 30%, showing real benefits but varying across locations and products (Ministry of Transportation, 2024; Antara/Minister of Transportation, 2024). However, the impact of the program at the farmer level does not automatically occur without improving upstream-downstream operations. An academic evaluation that examines the integration of the Sea Toll pioneer shipping shows that the utilization of return freight is still low on a number of routes (around 31-33% in 2020-2024) so that cost efficiency per kilogram and schedule stability are not optimal (JURRITEK, 2025).

The use of Sea Toll for chayote farmers can be a solution to expand the marketing reach with lower transportation costs. However, not all farmer households take advantage of this facility. Some still use conventional distribution channels due to limited information, access, and marketing networks. This difference in marketing strategy has the potential to cause

differences in farmers' household income, both in terms of income, cost efficiency, and selling price stability. Therefore, it is important to conduct a study on the differences in household income of chayote farmers who use and do not use the Sea Toll as a means of marketing. The purpose of this study is directed to analyze the difference in the income of farmer households who use and do not use the Sea Toll as a means of distributing agricultural products in Fakfak Regency.

RESEARCH METHODS

This study employed a descriptive quantitative research method aimed at analyzing the acceptance of Siamese squash farming households – both those utilizing and those not utilizing the “Tol Laut” program – in Fakfak Regency. The research was conducted in Kayuni and Kramamongga Districts, which have the highest number of Siamese squash farmers. The study period lasted one month. The research subjects were Siamese pumpkin farming households. The sampling technique used was purposive sampling; the farmers selected as respondents were those who cultivated Siamese pumpkins, and respondents were chosen through accidental sampling. The data used consisted of primary data obtained through observation, interviews, and questionnaires, as well as secondary data from relevant agencies such as the Central Statistics Agency (BPS), the Trade Office, and the Fakfak Port Authority (KSOP).

Data analysis was conducted using descriptive analysis to characterize the income levels of Siamese pumpkin farming households. Income was calculated by multiplying the quantity of Siamese pumpkin produced by its selling price. Subsequently, the income of farmers who sold Siamese pumpkins using the sea toll service was compared with that of farmers who did not use the service. The results of the analysis are presented in tables.

RESULT AND DISCUSSION

The identity of the respondents in this study consisted of age, education level, farming experience and the area of the land cultivated. In detail is presented in table 2 below.

Table 2. Identity of Household Respondents of Chayote Farmers

Category: Usia	Number of Farmers	Percentage (%)
Young Age (<35 years old)	2	7
Productive Age (34 - 55 years)	21	70
Senior (>55 years old)	7	23
Total	30	100
Education Level	Number of Farmers	Percentage (%)
SD	17	57
SMP	10	33
SMA	3	10
Total	30	100
Farming Experience	Number of Farmers	Percentage (%)
< 5 years (beginner)	0	0

5 - 15 years (sufficient)	6	20
> 15 years (experienced)	24	80
Total	30	100
Land Area	Number of Farmers	Percentage (%)
< 0.5 ha (narrow)	16	53
0.5 - 1 ha (medium)	11	37
> 1 ha (luas)	3	10
Total	30	100

Source : Primary Data

Based on the identity data of chayote farmers in Fakfak Regency, most of them are in the productive age category, namely 34-55 years old, as many as 21 people or 70% of the total respondents. Elderly farmers (>55 years old) amounted to 7 people or 23%, while young farmers (<35 years old) only 2 people or 7%. This condition shows that chayote farming at the research site is still dominated by workers of productive age who are still physically able to carry out cultivation and marketing activities of agricultural products optimally. According to Soekartawi (2016), the productive age of farmers greatly affects the ability to make decisions on farming, the application of technological innovations, and work productivity. The more productive the farmer's age, the greater the opportunity for farmers to increase production and farm revenue.

Based on the level of education, the majority of respondents received basic education (SD) as many as 17 people or 57%, followed by junior high school level as many as 10 people or 33%, and high school as many as 3 people or 10%. The low level of formal education of farmers shows that most farmers still have limitations in access to information and mastery of modern agricultural technology. However, their farming experience can be an important capital in managing a farming business. Hernanto (2018) explained that the level of education affects farmers' ability to accept innovation, manage farming businesses, and make economic decisions. Farmers with higher education generally have easier access to market information and agricultural technology than farmers with low education.

Based on farming experience, most of the respondents were classified as experienced farmers, namely more than 15 years as many as 24 people or 80%, while 5-15 years of experience as many as 6 people or 20%, and there were no novice farmers with less than 5 years of experience. This shows that chayote farmers in the research area have been pursuing farming business for a long time so that they have sufficient technical skills and knowledge both in cultivation and marketing of agricultural products. According to Mubyarto (2017), farming experience is one of the important factors that affect farmers' ability to manage farming risks, determine the use of production inputs, and improve farming efficiency. The longer the farming experience, the better the ability of farmers to deal with changes in production and market conditions.

When viewed from the land area, most of the respondents have a narrow land area of less than 0.5 ha as many as 16 people or 53%, while the land area of 0.5-1 ha is 11 people or 37%, and farmers with a land area of more than 1 ha are only 3 people or 10%. This condition shows that chayote farming in Fakfak Regency is still dominated by small-scale farming. According to Saragih (2021), land area is one of the main production factors in the agribusiness sector that greatly determines the level of production and income of farmers. The more land that farmers have, the greater the opportunity to increase production volume and farm revenue. However, farmers with narrow land can still get good revenue if they are able to manage their farming business efficiently and have adequate market access. Although the land owned is narrow, the land owned by all respondents is private property. This shows that the respondent has direct control over the agricultural land used, which can support farmers in making decisions related to the management of the farming business.

In general, the characteristics of respondents show that chayote farmers in Fakfak Regency are dominated by farmers of productive age, basic education, have high farming experience, and cultivate small-scale land. These characteristics affect the ability of farmers to manage farming businesses, access market information, and utilize distribution facilities such as the Sea Toll program in increasing farmers' household income.

The results of the study showed that 21 (70%) chayote farmers who use the sea toll road are 21 people (70%), of the 70% of the farmers as many as 2 people (9.52%) also play a role as collector traders. The collecting farmers collect chayote from other farmers and sell it to the Fakfak market or to Sorong using a sea toll boat. The amount of chayote production from farmers who use sea tolls and those who do not use sea tolls in their marketing is presented in the following table.

Table 3. Chayote Production of Farmer Households Who Utilize and Do Not Use the Sea Toll in Fakfak Regency

Production	Utilizing the Sea Toll Road (Kg)	Not Utilizing Sea Toll (Kg)
Minimum	2.040	480
Average	2.260,95	1.404.44
Maximum	2.400	2.240

Source : Primary Data 2026

Based on data on chayote production per month, it is known that farmers who use the Sea Toll have a higher production rate than farmers who do not use the Sea Toll. The minimum production of farmers who use the Sea Toll is 2,040 kg per month, with an average production of 2,260.95 kg per month and a maximum production of 2,400 kg per month. Meanwhile, farmers who do not use the Sea Toll have a minimum production of 480 kg per month, an average production of 1,404.44 kg per month, and a maximum production of 2,240 kg per month.

The difference in average production shows that farmers who use the Sea Toll tend to have greater production capacity than farmers who do not use the distribution facilities. The high production of the Sea Toll farmer group shows that there is an encouragement to increase production volume because of wider marketing access and opportunities for the distribution of agricultural products outside the region to be more open. According to Soekartawi (2016), market size and ease of distribution are important factors that can influence farmers' decisions in increasing farm production. Farmers who have wider market access tend to increase production intensity to meet market demand.

The Sea Toll Program has a positive impact on the smooth distribution of horticultural commodities, especially in eastern Indonesia which has limited access to transportation. The Ministry of Transportation of the Republic of Indonesia (2024) explained that the existence of the Sea Toll is able to reduce logistics costs and improve the distribution system of goods between regions so that it can increase the efficiency of marketing agricultural products. With lower transportation costs, farmers can sell larger quantities of their produce without experiencing an increase in distribution costs that are too high.

In addition to distribution factors, the high production of farmers who use the Sea Toll can also be influenced by economic motivation and a more commercial farming orientation. Farmers with interregional market access tend to be more active in using production facilities such as fertilizers, superior seeds, and labor to increase productivity. Hernanto (2018) stated that farmers' ability to manage production factors greatly affects the level of production and income of farms. The better the management of the farming business, the higher the productivity that can be achieved.

On the other hand, farmers who do not take advantage of the Sea Toll have lower average production because the marketing of agricultural products is still limited to the local market. Limited distribution access causes farmers to face the risk of low market absorption and price fluctuations, so production is carried out on a smaller scale. In addition to distribution access, production is also influenced by the area of land cultivated by farmers. The average area of land cultivated by farmers who do not use sea tolls is 0.38 ha, smaller than the land area of farmers who use sea tolls, where the area of land cultivated is 0.46 ha. The larger area of cultivated land allows for more production.

Table 4. Receipt of Chayote Farmers Households Who Utilize and Do Not Use Sea Toll Roads in Fakfak Regency.

Reception	Utilizing the Sea Toll Road (Kg)	Not Utilizing Sea Toll (Kg)
Minimum	8.000.000	3.840.000
Average	16.619.048	11.235.556
Maximum	19.800.000	17.920.000

Source : Primary Data 2026

Based on the revenue data of chayote farmers, it is known that farmers who use the Sea Toll have a higher level of acceptance than farmers who do not use the Sea Toll. The average revenue reached Rp. 16,619,048. Meanwhile, farmers who do not use the Sea Toll have an average income of IDR 11,235,556, with a difference of 32.4%. The difference in average revenue shows that the use of the Sea Toll has a positive influence on increasing household income of chayote farmers. Farmer

Farmers who sell chayote outside the region use sea tolls, generally through collectors. The selling price of chayote to collectors is Rp. 6,000 – Rp. 7,000 per kilogram. The price is lower than if farmers sell at the local market. The selling price in the local market is Rp. 8,000 per kilogram. Although the price is lower, the amount that can be sold is more so that farmers continue to sell to collectors. Therefore, the high acceptance of farmers using the Sea Toll is due to wider marketing access, and a larger sales volume compared to farmers who only rely on the local market. According to Soekartawi (2016), the revenue of farms is influenced by the amount of production and the selling price of agricultural products. The larger the production volume and the wider market access, the higher the chance for farmers to get greater revenue.

The Sea Toll Program provides ease of distribution of agricultural products between islands, especially in the eastern region of Indonesia which has been facing obstacles of high logistics costs. The Ministry of Transportation of the Republic of Indonesia (2024) explained that the Sea Toll program is able to reduce distribution costs and smooth the flow of goods between regions so that it can increase the efficiency of marketing agricultural commodities. With smoother distribution, farmers can sell their products to regions with better demand and prices than the local market.

In addition to distribution factors, the high income of farmers using the Sea Toll can also be influenced by the scale of business and higher production capabilities. Farmers who have access to markets between regions tend to be more motivated to increase production because of market certainty. Hernanto (2018) stated that the ability of farmers to manage production factors and access to marketing greatly determines the level of income and profits of farming businesses. The better the farm management and marketing system, the greater the income obtained by farmers.

Although most farmers own narrow land, the use of the Sea Toll still provides opportunities to increase revenue through expanding market access and distribution efficiency. With access to marketing between regions, farmers can get better selling prices than just relying on local markets. Saragih (2021) explained that the development of agribusiness is not only determined by production factors, but also by the ability of marketing and distribution systems to connect farmers with the wider market.

CONCLUSION

Based on the results of the study on the household income of chayote farmers in Fakfak Regency, it can be concluded that chayote production of farmers who use the Sea Toll has a higher average production (2,260.95 kg/month) than farmers who do not use the Sea Toll (1,404.44 kg/month). This suggests that wider distribution access encourages an increase in production intensity. The average household income of farmers using the Sea Toll reached Rp. 16,619,048/month, higher than non-users who only Rp. 11,235,556/month. This difference confirms that the use of the Sea Toll has a positive impact on improving the welfare of farmers. Although most farmers have narrow land, the use of the Sea Toll still provides opportunities to increase revenue through market access between regions. Therefore, policy support that strengthens the distribution and access to market information is needed to improve the welfare of horticultural farmers.

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