

SUPPLY CHAIN ANALYSIS OF NUTMEG IN NORTH MALUKU PROVINCE

Rusiana^{*1}, Siti Jahroh^{*}, Riskina Juwita^{**}

^{*}) School of Business, IPB University

SB IPB Building, Padjajaran Road, Bogor 16151, Indonesia

^{**}) Department of International Food and Agricultural Science, Tokyo University of Agriculture
Sakuragaoka 1-1-1, Setagaya-ku, Tokyo 156-8502 Japan

Article history:

Received
14 September 2024

Revised
11 November 2024

Accepted
27 December 2024

Available online
31 March 2025

This is an open access
article under the CC BY
license



OPEN ACCESS

Abstract

Background: North Maluku has been known worldwide as a nutmeg-producing area in Indonesia since the fifteenth century. The quality and potential aflatoxin issues that have become global issues certainly have an impact on the price of national nutmeg and North Maluku.

Purpose: The purpose of the study was to analyze the supply chain and marketing margins by looking at the efficiency of nutmeg marketing in North Maluku.

Design/methodology/approach: Using qualitative analysis and quantitative analysis. Determination of samples by purposive side and snowball sampling. Respondents numbered 110 people consisting of 100 farmers and 10 traders. Descriptive data processing, mathematical calculations of marketing margins, farmers' share, profit-to-cost ratios, and marketing efficiency.

Findings/Result: The results of the study indicate that the nutmeg supply chain network in North Maluku has five marketing channels, many actors involved, and unstable prices so farmers' income is low as shown by the marketing margins and efficiency of more than $< 50\%$ for marketing dry nutmeg and dry mace. Marketing of nutmeg in marketing channel III, marketing margin of Rp 0 with Eps 55.189%. In marketing channel V, the margin is Rp 0 with Eps 68.112%. The marketing margin of mace in marketing channel III is Rp 0 with Eps 78.243%. The marketing margin of mace in marketing channel V is Rp 0 with Eps 60.061%. Marketing channels of nutmeg I, II, III, and IV are inefficient, and marketing of mace I, II, and IV is inefficient because Eps $> 50\%$.

Conclusion: Based on the analysis of profitable nutmeg marketing efficiency in channels III and V for marketing dry nutmeg seeds and channels III and V for marketing mace.

Originality/value (State of the art): This study explains that supply chain analysis has a positive impact on increasing farmer income with farmer decision-making to market their crops directly without going through collectors. Marketing efficiency can be achieved if there are few actors involved, low marketing costs, and high farmers' share.

Keywords: marketing margin, marketing efficiency, network chain supply, nutmeg, nutmeg marketing

How to Cite: Rusiana R., Jahroh S., & Juwita R. (2025). Supply Chain Analysis of Nutmeg in North Maluku Province. *Jurnal Manajemen & Agribisnis*, 22(1), 29. <https://doi.org/10.17358/jma.22.1.29>

¹Corresponding author:

Email: rusianarusiana@apps.ipb.ac.id

INTRODUCTION

Indonesia is known for its abundant natural resources, one of which is spices (KEMENLU RI, 2021). Indonesia is a nutmeg exporting country of 60-70% and is even nicknamed the “Mother of Spices” because of its geographical advantages (Sulaiman, 2018). According to the calculation results of the Grubel-Lloyd Index (GLI), the demand for spices, one of which is nutmeg, tends to increase between Indonesia and partner countries in the international market, which are export destinations for China (37.65%), Vietnam (10.74%), India (9.99%) United States (5.56%) and Germany (4.51%). The increase in demand for nutmeg will determine the competitiveness of Indonesian nutmeg in the national and world markets. Indonesian nutmeg trade is generally more export-oriented than for domestic consumption. This has triggered the openness of the global market and increased competition between world nutmeg exporting countries (Pusdatin, 2022). The European Union has set higher and stricter export quality standards. In 2012–2021, the volume of nutmeg exports tended to increase with an average growth of 8.79% per year (Pusdatin, 2022). The volume of nutmeg exports during the COVID-19 pandemic in 2020 increased to 22.82 thousand tons. In 2021, nutmeg exports increased by 26.46 thousand tons (Pusdatin, 2022). Based on data on Indonesian nutmeg imports, many were rejected by the destination countries. Indonesian nutmeg exports that were rejected in 2020 amounted to 139 tons, decreasing in 2021 to 104 tons. Meanwhile, the centers of nutmeg production in Indonesia are spread across several provinces, including North Sulawesi, Aceh, North Maluku, Maluku, West Papua, and West Sumatra, in the development of nutmeg farming, it is still traditional, such as North Maluku.

North Maluku is known as a nutmeg-producing area in Indonesia which became the largest contributor in 2020 (BPS, 2020). IQFast data (Quarantine Full Automation System) states that nutmeg produced by North Maluku is the second largest spice commodity after Papua (Arianti, 2020). Indonesia meets seventy percent (70%) of the world's nutmeg needs, which then shows that the role of North Maluku in the nutmeg marketing chain in Indonesia is very important to develop (Hasan and Sabuhari, 2022). Based on the provisions and warnings from the RASFF (Rapid Alert System Food and Feed), North Maluku Nutmeg received 9 to 10 cases related

to food hygiene and safety set by the European Union. In 2014-2016, nutmeg exports were rejected 54 times due to quality problems and potential aflatoxins in the European Union, United States, and Japanese markets (Rahayu et al. 2020).

From 2012 to 2014, North Maluku's nutmeg exports experienced an increase in demand, but from the end of 2015 to 2016, the level of demand for North Maluku's nutmeg exports to the Netherlands decreased. In 2018, North Maluku's nutmeg exports to the Netherlands decreased by 356,362 kilograms (trademap.org 2019). In addition, the decrease in North Maluku's nutmeg exports to the Netherlands was due to aflatoxin exceeding the threshold set by the European Union (cib.ue 2018). The aflatoxin content in nutmeg that affects the quality of nutmeg was identified at all levels of marketing actors (Supriadi, 2017). The problem of quality and potential aflatoxin which is a global issue certainly has an impact on the national nutmeg price and the price of nutmeg in North Maluku (Lawalata, 2017). In addition to the issue of aflatoxin and the low quality of nutmeg globally, North Maluku also faces regional problems such as traditional nutmeg cultivation, government policies, infrastructure, marketing, quality of human resources, and prices. In 2019-2020, North Maluku's nutmeg exports to the Netherlands increased by 515,477 kilograms, experiencing a slight decrease of 370,760 kilograms in 2020 (trademap.org, 2019). Indahwaty et al. (2023) in their study on the “response of supply and demand for Indonesian nutmeg in the international market” found that the combination of policies related to increasing prices and production areas can encourage increased supply and increase nutmeg prices at the farmer level.

The unstable development of nutmeg prices in North Maluku in 2017–2021 (Pusdatin, 2022). The average price per year is IDR54,556, only experiencing a not-so-low decline in 2018. The price of nutmeg in 2017 was IDR53,093 and the price of nutmeg in 2021 was IDR60,058. In 2022-2023 the price of nutmeg at the farmer level and the price of nutmeg at the consumer level. In 2022 the price of nutmeg at the farmer level was IDR90,000 per kilogram and the price of nutmeg at the consumer level was IDR200,000 per kilogram. In 2023 the price of nutmeg at the farmer level was IDR95,000 per kilogram and the price of nutmeg at the consumer level was IDR150,000 per kilogram. Unstable prices can affect the nutmeg distribution system in North Maluku Province.

This is influenced by the many actors in the supply chain. In a study on the nutmeg market chain in North Maluku, Hasan et al. (2022) stated that distribution affects the supply chain, triggering large margins, disparities in nutmeg prices between regions, and integration of logistics services. Meanwhile, the supply chain has a very large role with the presence of actors at each level of the supply chain that distribute products to consumers or buyers.

Therefore, an analysis of the marketing supply chain is needed to find a profitable marketing position in a farming business or in a price position at the trader level that is competing directly. According to Ariwibowo (2013), the problem of limited market information results in farmers not knowing where their products should be sold to get the best profit. Therefore, the effectiveness of the supply chain is needed for each agricultural commodity. If the supply chain network is too long, then farmer income will be small. This is because at every transfer of agricultural products in the supply chain, there is a difference in product prices which makes farmers' profits low (Annisa, 2020).

Analysis of the nutmeg marketing supply chain by analyzing the nutmeg marketing margin to determine the marketing margin obtained by marketing actors, this farmers' share is inversely proportional to the marketing margin, the higher the farmer's share, the more profitable it is, the calculation of the profit ratio to marketing costs to determine the R/C in the supply chain for each marketing actor and marketing efficiency analysis is to determine efficient marketing channels to obtain high revenue. Based on the background explanation above, the researcher hopes that there needs to be action in terms of the North Maluku Provincial Government's policy to support the economy by improving the infrastructure of trade routes so that the distribution system is smooth and efficient and prices can be obtained at high selling prices at the farmer level.

The research topic taken is "Supply Chain Analysis in North Maluku Province". This research is part of the strategic management theory that discusses the analysis of the marketing supply chain to answer the research problem. This research aims to analyze the supply chain and marketing margin of nutmeg that benefits nutmeg farmers in North Maluku Province.

METHOD

The types of data used in this study are primary data and secondary data. Primary data is data obtained from respondents after going through stages of observation or interviews using research instruments in the form of questionnaires. Secondary data is data that has been made available in various forms by related government agencies and is also obtained by reading textbooks, journals that support research, and the internet related to research.

This research will be conducted in February-March 2024. The location of the research was determined purposively in North Maluku Province with the focus of the research location in Ternate City and North Halmahera Regency considering that Ternate City and North Halmahera Regency are the centers of nutmeg production. The research used primary and secondary data. The respondents of each region were 50 nutmeg farmers, so the total respondents were 100 farmers and 10 traders, 6 traders in North Halmahera and 4 in Ternate City. Data were collected through a research questionnaire that had been created in accordance with the research objectives. Interviews with farmers and traders using questionnaires. Determination of samples by snowball sampling and purposive sampling. Snowball sampling of 10 traders was taken considering the difficulty of getting respondents and purposive sampling of 100 farmers. The research respondents used in the study were 100 respondents.

Data analysis is done by qualitative and quantitative analysis. Qualitative data is presented descriptively to analyze the supply chain network. Quantitative data analysis is presented with equations that can be calculated mathematically to determine the margin of each actor in the supply chain, Farmer's Share analysis, profit-to-cost ratio, and marketing efficiency.

Calculating margin by looking at marketing channel efficiency

a. Marketing margin

$$MP = Pr - Pf$$

Description: Mp (marketing margin); Pf (price at the producer level); Pr (price at the final consumer level)

Marketing profit margin

$$P = Mi - Ci$$

$$Mi = Pr - Pf$$

Description: C_i (Marketing cost of institution i)

b. Farmer's Share

$$Sm = (Pf/Pr) \times 100\%$$

Description: Sm (Share margin calculated in percent (%)); P_f (price at farmer/producer level (IDR)); P_r (purchase price at trader level (IDR))

c. Profit-to-cost ratio

$$\text{Profit to cost ratio} = (\pi_i/C_i) \times 100\%$$

Description: π_i (profit received by the institution I); C_i (costs incurred by the institution)

d. Marketing efficiency

$$Eps = (TBP/HA) \times 100\%$$

Description: Eps (Marketing Efficiency (%)); TBP (Total Marketing Cost (IDR/Kg)); HA (Final Exporter Price (final consumer) (IDR/Kg))

$Eps < 50\% = \text{efficient}$

$Eps > 50\% = \text{inefficient}$

The operational framework of this research is to observe the process of business activities in the nutmeg marketing trade (Figure 1). The focus of this research on the supply chain begins with a descriptive analysis. To determine the involvement of actors in the nutmeg supply chain. After knowing the involvement and condition of the supply chain, the next step is to conduct a marketing margin analysis to determine the marketing margin at each level of the supply chain to determine the amount of margin for actors in the supply chain, conduct a Farmers Share analysis to measure the amount of the portion received by marketers against the final selling price in a supply chain with a large Farmers Share value depicting an efficient supply chain. Then to determine marketing profits, a profit-to-cost ratio analysis can be carried out where the costs incurred are the same as the profits. To see an efficient supply chain, an efficiency analysis needs to be carried out if $Eps \leq 50\%$ then the supply chain is efficient, and if $Eps \geq 50\%$ is not efficient.

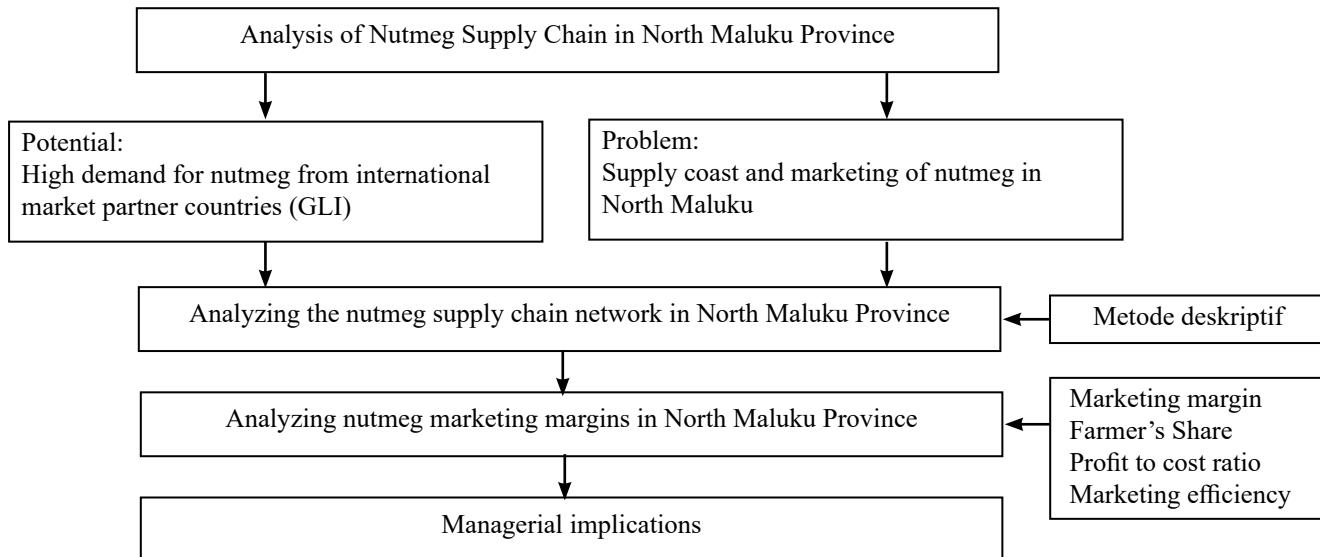


Figure 1. Research framework

RESULTS

Supply Chain Network

The nutmeg supply chain network based on its level starting from farmers, village collectors, and sub-district collectors to district and city collectors shows different nutmeg selling prices or fluctuates tend to be unstable. Therefore, an analysis of the nutmeg supply chain network is needed to determine the number of actors involved in the nutmeg supply chain. There are two major players or two business actors who play an active role in marketing dry nutmeg and dry mace, namely from India and China. These business actors cooperate with collectors to facilitate the buying and selling system of dry nutmeg and dry mace at the village, sub-district, district, and city levels. The following is a picture of the nutmeg supply chain network in North Maluku Province.

Figure 2 explains the nutmeg supply chain network in North Maluku based on research results, many farmers still do not understand market management, price changes, fluctuations in demand, nutmeg product quality, and the right target market. People who cultivate nutmeg still experience many obstacles in developing cultivation, starting from less supportive nutmeg production factors to nutmeg certification to label North Maluku nutmeg products that do not yet exist in the international spice market or world market. The North Maluku nutmeg supply chain network has five marketing channels.

Three marketing channels in North Halmahera Regency and two marketing channels in Ternate City with different selling prices in each marketing channel. The nutmeg marketing channel is the relationship between nutmeg marketing institutions involved in distributing nutmeg from producers to end consumers. The nutmeg marketing channel from producers to end consumers involves several marketing actors, namely farmers and traders at various levels. The most efficient marketing channel can be seen from the length of the product marketing activities. The longer the marketing activities, the less efficient the marketing. Farmers who sell their nutmeg to traders at various levels according to the wishes, satisfaction, and service of the buyers. So it can be seen in the table below the percentage of nutmeg farmers who sell nutmeg at the marketing channel level.

The selling price of dried nutmeg is quite varied, starting from IDR80,000 to IDR95,000 per kilogram, while the price of dried mace is IDR200,000 to IDR220,000 per kilogram. However, farmers are also dissatisfied with the selling price offered by village collectors to farmers, the selling price of raw seeds is IDR30,000 to IDR35,000 per kilogram, dried nutmeg is IDR80,000 per kilogram and dried mace is IDR200,000 per kilogram. They also sell their harvest to sub-district collectors at a price that is relatively slightly higher than the price offered by village collectors. The prices offered by sub-district collectors are IDR30,000 to IDR35,000 per kilogram for raw seeds, IDR80,000 to IDR85,000 per kilogram for dry seeds, while the price of mace or nutmeg is IDR210,000 to IDR215,000 per kilogram.

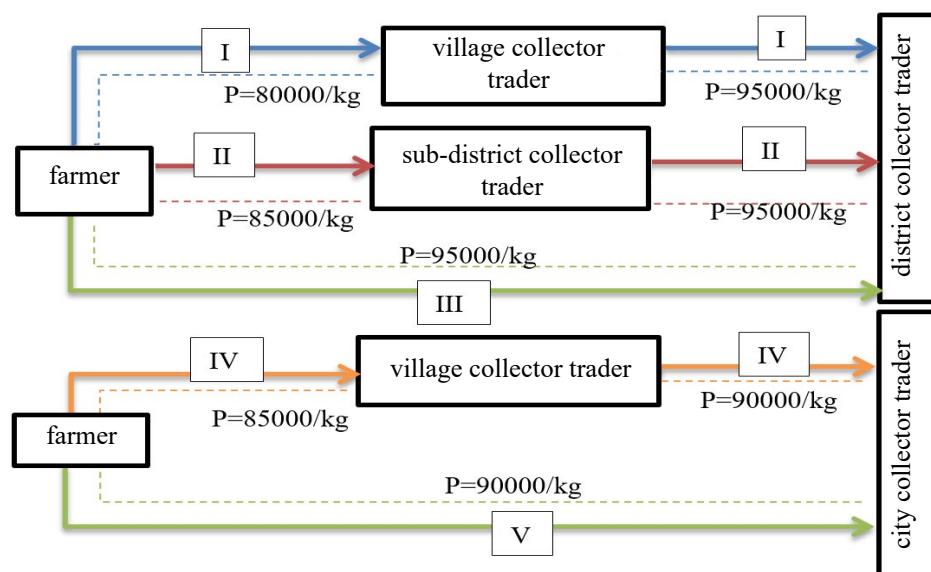


Figure 2. Nutmeg supply chain network in North Maluku Province

Farmers not only sell their harvest to village collectors or sub-district collectors but also sell it directly to district collectors or wholesalers with a high selling price of dried nutmeg seeds of IDR85,000 per kilogram to IDR95,000 per kilogram and a selling price of mace or mace flowers of IDR220,000 per kilogram. The district collector or wholesaler in North Halmahera Regency is the only one, which is located in the capital city of Tobelo. Based on the results of interviews with farmers, the district collector or wholesaler sells directly to Surabaya and North Sulawesi through Tanjung Perak Port and Bitung Port.

Then the supply chain network of North Maluku in Ternate City is based on the results of interviews with farmers in several sub-districts with high nutmeg productivity. The sub-district that we used as the location of this research is one of the sub-districts in Ternate City. After interviews with Ternate City farmers and several related agencies, namely the North Maluku Agriculture Service and the North Maluku Industry and Trade Service. At the farmer level, nutmeg marketing is still carried out domestically, namely in Ternate City. The price of nutmeg in Ternate City is not much different from North Halmahera Regency. The price of wet or raw nutmeg is IDR30,000 to 35,000 per kilogram, the price of dry nutmeg is IDR80,000 to IDR85,000 per kilogram and the price of mace or mace is IDR210,000 to IDR215,000 per kilogram. This is the selling value of nutmeg offered by village collectors. Farmers are beginning to understand the concept of developing prices and they realize that they will earn more income if they sell directly to city collectors or wholesalers. The price offered by city collectors or wholesalers is quite high so it can increase farmers' income. The price of dry nutmeg is IDR85,000 to 90,000 per kilogram and the price of mace or mace is IDR215,000 to 220,000 per kilogram. This selling price makes farmers satisfied with the price of nutmeg. However, what is worrying farmers and traders is that direct exports cannot be carried out other than carrying out transit logistics from North Maluku to Surabaya and Bitung to carry out exports so that export retribution costs are obtained by Surabaya and Bitung as world nutmeg export ports. From the research results, there are marketing actors involved in the marketing of nutmeg seeds, including village collectors, sub-district collectors, sub-district collectors, district collectors, and city collectors. In terms of marketing, nutmeg farmers in North Maluku can choose marketing channels according to the benefits

that farmers consider can generate high profits and income. From the results of the research in interviews with farmers and traders, there are 4 actors in the nutmeg and mace marketing channel in North Halmahera and 3 actors in the nutmeg and mace marketing channel in Ternate City. Each actor in the marketing supply chain is an actor who has collaborated with large traders who control the nutmeg business in North Maluku, two major actors in the nutmeg business are nutmeg business actors from India and nutmeg business actors from China. The big figures selling nutmeg in North Halmahera and Ternate City are mostly controlled by these two business actors. However, for the smooth running of their business, these two business actors partner with village, sub-district, and sub-district collectors to facilitate the fulfillment of production and distribution capacity.

Based on Table 1, many farmers sell nutmeg and mace to traders at every level considering the large profits received by farmers. However, based on the results of the study, the location of the market and the spatial planning of the North Maluku region are still limited in terms of access, both from infrastructure, market information, and nutmeg marketing management are still low. Some farmers in selling their crops must make decisions by considering the conditions of access and the location of the market which is far away. The percentage seen in Table 1 illustrates that each farmer marketed his harvest based on the level in the supply chain. Marketing starts from the village, sub-district, village, district, and city levels to obtain profitable income for farmers by knowing the margin and efficient marketing channels.

Marketing Margin

Marketing margin is the accumulation of profits received by each actor in the marketing chain from the commodities handled, expressed as a percentage of the producer's selling price. The profit received from each link in the marketing chain is the difference between the selling price minus the marketing costs incurred to market nutmeg. The purchase price is the price paid by the buyer of nutmeg seeds expressed in rupiah per kilogram. While the selling price is the price received by the seller and expressed in rupiah per kilogram. Marketing actors are individuals who organize marketing activities and distribute agricultural products to end consumers.

Marketing Channel I

The first marketing channel involves marketing actors, namely village collectors, sub-district collectors, and district collectors in Tobelo. Table 2 shows that out of 50 farmers who were respondents, 16 farmers (0.16%) chose Marketing Channel I to sell their crops to consumers (district collectors or wholesalers). The nutmeg seed margin is IDR15,000, profit is 14,642/kg, and R/C is 0.408, with farmer share of 84.213% and Eps of 12.667%. The mace margin is IDR20,000, the profit is 17,138/kg, R/C is 0.598, with a farmer share of 90.909% and Eps of 29.333%.

Marketing Channel II

The second marketing channel involves three marketing actors, namely farmers, sub-district collectors, and district collectors or wholesalers located in Tobelo. The form of Marketing Channel II can be seen in Table 2. Of the 50 farmers who were respondents, 23 (0.23%) farmers chose Marketing Channel II to sell their crops.

The marketing margin of nutmeg seeds is IDR10,000, profit is 9,767/kg, and R/C is 0.042, with a farmer share of 89.473% and Eps of 10.982%. Marketing margin of mace IDR5,000, profit is 3,141/kg, R/C is 0.016, with a farmer share of 97.727% and Eps of 25.433%.

Marketing Channel III

The third Marketing channel involves two marketing actors, namely farmers and district collectors or wholesalers located in Tobelo. Of the 50 farmers who market their crops in Marketing Channel III, 11 people (0.11%). The marketing margin for nutmeg seeds is IDR 0 with a farmer share of 100% and Eps of 46.341% and the marketing margin for mace is IDR 0 with a farmer share of 100% and Eps of 107.317%. In the marketing channel for nutmeg seeds with Eps of >50%, the marketing cost is greater than the selling price of nutmeg seeds of IDR95,000/kg. However, for the marketing of mace with Eps of <50%, the selling price is IDR220,000/kg which is able to reduce marketing costs.

Table 1. Nutmeg farmers in each marketing channel in North Maluku

Trader	Farmer	Share (%)
North Halmahera		
Village collector trader	16	0.16
Sub-district collector trader	23	0.23
District collector trader	11	0.11
Ternate City		
Village collector trader	12	0.12
City collector trader	38	0.38
Total	100	1

Table 2 Marketing channels for dried nutmeg and mace in North Maluku Province

Product	Channel	Margin	II	R/C	FS (%)	Eps (%)
Nutmeg	I	15.000	14.64	0.40	84.21	12.66
	II	10.000	9.76	0.04	89.47	10.98
	III	0	0	0	100	55,189
	IV	5.000	4.73	0.01	94.44	15.38
	V	0	0	0	100	68,112
Mace	I	20.000	17.13	0.59	90.90	29.33
	II	5.000	3.14	0.01	97.72	25.43
	III	0	0	0	100	78,243
	IV	10.000	7.86	0.03	95.45	37.60

Marketing Channel IV

Marketing channel four involves farmers, village collectors, and city collectors or wholesalers located in Ternate City. Of the 50 farmers who were respondents, 12 (0.12%) farmers chose Marketing Channel IV to sell their crops to village collectors and resell them to city collectors. Marketing margin of nutmeg seeds IDR5,000 Profit 4,733 per kilogram R/C 0.017 with a farmer share of 94.444% and Eps 15.384%. Marketing margin of mace IDR10,000 Profit 7,863/kg, R/C 0.003 with a farmer share of 95.454% and Eps 37.606%.

Marketing Channel V

Marketing channel five involves two marketing actors, namely farmers and city collectors or wholesalers located in Ternate City. Of the 50 nutmeg farmers who were respondents, 38 (0.38%) farmers chose Marketing Channel V to sell their harvest to city collectors. The marketing margin of nutmeg seeds is IDR0 with a farmer share of 100% and Eps 54.545% for marketing of nutmeg seeds Eps <50% Strategic marketing location so that marketing costs are smaller than Marketing Channel III. The marketing margin of mace is IDR0 with a farmer share of 100% and Eps of 133.333%.

Farmer share

Farmer share is the percentage of price received by each marketer in the supply chain. The greater the farmer-share value, the more profitable it will be for farmers as producers. The farmer share value in each marketing channel formed from nutmeg marketing activities in North Maluku can be seen in Table 2. It shows that the highest farmer share value is in channels III and V, each at 100% with a price difference at the producer level, namely farmers and consumers, namely district or city collectors. This is done by farmers by selling their harvest directly to district and city collectors. Meanwhile, the low farmer share value for marketing dry nutmeg seeds in Marketing Channel I is 84.210%. Marketing mace, the highest farmer share value can be seen in Marketing Channels III and V, which is 100% involving farmers, district collectors, and city collectors. Meanwhile, the low farmer share value for marketing mace in Marketing Channel I is 90.90% involving farmers, village collectors, and district collectors.

Marketing efficiency

Marketing efficiency is a comparison between the total costs in each marketing channel with the final price of each marketing channel. The smaller the percentage of marketing costs obtained, the more efficient the marketing activity is. The marketing activity of a marketing channel is said to be efficient if the total marketing cost is <50% of the final price in each marketing channel. This is inversely proportional to the total marketing cost of >50% of the final price, then the marketing activity is inefficient.

Table 2 shows that the marketing of dry nutmeg seeds in Marketing Channel V is efficient because the total marketing cost is lower than Marketing Channels I, II, III, and IV with a final price of Rp95,000 per kilogram Eps V of 54.54%. In this marketing channel V, farmers, and city collectors are involved so that the Marketing Channel V is efficient with a marketing cost of Rp165,000. Marketing Channels I, II, III, and IV are not yet efficient because many are involved in the dry nutmeg marketing chain, high marketing costs and prices received by farmers or producers are not yet appropriate so many farmers are not satisfied with the average price of nutmeg on the market in Marketing Channels I, II, III, and IV which are not yet efficient. Table 2 shows that efficient marketing is in Marketing Channels III and V with low marketing costs from Marketing Channels I, II, and IV. The percentage of Marketing Channel III is 107.31%, and Marketing Channel V is 133.333%. In each marketing channel, there are actors involved in the marketing chain. In Marketing Channel III, farmers and district collectors for dry mace marketing is efficient because it can reduce marketing costs incurred by farmers. Marketing Channel V involves farmers and city collectors so this channel is efficient because the marketing costs are small and those involved are few. Then based on an interview with the head of the North Maluku Industry and Trade Service, nutmeg export activities have not been directly exported. However, the marketing of nutmeg and mace is still carried out by large traders in North Maluku with exports still within the country, namely East Jakarta, North Sulawesi, and Jakarta.

Managerial Implications

Supply chain analysis with marketing margin calculations and seeing marketing efficiency. Then strategic steps can be taken to support the economy

of nutmeg farmers in North Maluku province. The strategic steps are carrying out marketing branding by improving the quality of nutmeg, developing drying technology, developing trade route infrastructure to be more effective and efficient, procuring national and international nutmeg marketing programs, and building cooperation with nutmeg-importing countries.

CONCLUSIONS AND RECOMMENDATIONS

Conclusions

There are five nutmeg marketing channels involving farmers and village-level traders, sub-district-level traders, village-level traders, district-level traders, and city-level traders in North Maluku Province. The five nutmeg marketing channels in North Maluku include three marketing channels in North Halmahera Regency and two marketing channels in Ternate City.

- Marketing channel I Farmers- village collector trader- district collector trader
- Marketing channel II Farmers- sub-district collector trader- district collector trader
- Marketing channel III Farmers- district collector trader
- Marketing channel IV Farmers- village collector trader- city collector trader
- Marketing channel V Farmers- city collector trader

Each level of marketing channels in North Maluku shows marketing margins and marketing efficiency of more than <50% which is profitable for farming businesses in marketing channels III and V for marketing nutmeg seeds and marketing channels III and V for marketing mace.

Recommendations

The local government should form a BUMD to organize marketing and prices of nutmeg in North Maluku. The government provides facilities to support nutmeg drying so that the drying process does not depend on sunlight. Further research can be conducted on the supply chain from producers to exports and strategies for developing nutmeg farming human resources.

ACKNOWLEDGMENTS

I would like to thank the Yamazaki Spice Promotion Foundation and Tokyo University of Agriculture

for providing financial support for this research and also thank the Ministry of Education and Culture for providing educational funding assistance through the outstanding community scholarship program. I would also like to thank Dr. Siti Jahroh, BSc, MSc, and Riskina Juwita, BSc, MSc, Ph.D., as the supervisory committee who have guided and involved me as a young researcher.

FUNDING STATEMENT: This research received a special grant from Ministry of Education and Culture, Republic of Indonesia.

CONFLICTS OF INTEREST: The authors declare no conflict of interest.

REFERENCES

Analia, D. (2018). Strategi pengembangan pala (Myristica fragan haiti) di Kecamatan Tanjung Rakyat Kabupaten Agam (Studi kasus: Kelompok Tani Sabik Tajam Nagari Tanjung Sani). *Jurnal AGRISEP*, 14(1), 1–10.

Arafah, N., Iskandar, E., & Fauzi, T. (2017). Analisis pemasaran bawang merah (*Allium cepa*) di Desa Lam Manyang Kecamatan Peukan Bada Kabupaten Aceh Besar. *Jurnal Ilmiah Mahasiswa Pertanian*, 2(1), 134–140. <https://doi.org/10.17969/jimfp.V2i1.2259>

Hasan, N., & Sabuhari, R. (2022). Analisis potensi agribisnis pala (*Myristica fragrans houtt*). *Jurnal Ekonomi dan Manajemen*, 19(4). <https://doi.org/10.29303/abdiinsani.v10i4.1153>

Handayani, D. W. D., Damayanti, C., & Dewi, U. N. M. (2022). Diplomasi perdagangan pala Maluku Utara ke Belanda pada tahun 2015–2020. *Jurnal RIR*, 4(1). <https://doi.org/10.24252/rir.v4i1.28214>

Hari, P. D., & Taib, G. (2020). Analisis rantai pasok dan pemasaran biji kopi di Sumatera Barat. *Jurnal EMBA*, 12(2).

Heru, I., Rahayu, E. S., & Apurwanti, E. D. (2020). Analisis efisiensi rantai pasok bawang merah di Kabupaten Bantul. *Jurnal EMBA*, 14(2). <https://doi.org/10.33964/jp.v29i1.463>

Khaswarina, S., Kusumawaty, & Eliza. (2018). Analisis saluran pemasaran dan marjin pemasaran bahan olahan karet rakyat (Bokar) di Kabupaten Kampar. *Unri Conference Series*, 1, 88–97. <https://doi.org/10.31258/unricsagr.1a12>

Lawalata, M., Thenu, S. F. W., & Tamaela, M. (2017). Study of the development of Banda nutmeg plantation potential in Banda Neira District, Central Maluku Regency. *Journal of Islands Agribusiness REVIEW*, 5(4), 132–150. <https://doi.org/ISSN 2302-5352>

Lerah, R., Wullu, M., & Sumaraw, J. S. B. (2018). Analisis manajemen rantai pasok komoditas pala pada Desa Sawang Kecamatan Siau Timur Selatan. *Jurnal EMBA*, 6(3), 1558–1567. <https://doi.org/10.35794/emba.v6i3.20262>

Lawalata, M. (2019). Analisis saluran pemasaran pala Banda (*Myristica fragrans houtt*) di Kecamatan Banda Neira Kabupaten Maluku Tengah. *AGRIC: Jurnal Ilmu Pertanian*, 31(1), 1–14. <https://doi.org/10.24246/agric.2019.v31i1.p1-14>

Noer, I., & Handayani, S. (2023). Supply chain of coffee bean (Case study of coffee production centers in West Lampung Regency). *Jurnal Penelitian Pertanian Terapan*, 23(2), 262–271. <http://dx.doi.org/10.25181/jppt.v23i2.2762>

Mappangaja, R., Rosada, I., & Radjaloa, V. H. A. (2021). Analisis dan strategi pemasaran komoditas cengkeh (*Syzygium aromaticum*) (Studi kasus: Usahatani komoditas cengkeh di Kelurahan Kalaodi, Kota Tidore Kepulauan, Maluku Utara). *Jurnal Agrotek*, 5(1). <https://doi.org/10.33096/agrotek.v5i1.158>

Piran, D. R., Payong, P., & Cordanis, A. P. (2022). Analisis pemasaran sayuran di Pasar Inpres Ruteng Kabupaten Manggarai. *Jurnal Forum Agribisnis (Agribusiness Forum)*, 12(2), 151–160. <https://doi.org/10.29244/fagb.12.2.151-160>

Rahayu, W. P., Prasetyawati, C., Arizona, Y., & Adhi, W. (2020). Economic losses estimation due to rejection of Indonesian exported food. *Jurnal Manajemen Transportasi dan Logistik*, 7(1), 13–24. <https://doi.org/10.54324/j.mtl.v7i1.368>

Ronaldus, D. P., Payong, P., & Cordanis, A. P. (2022). Analisis pemasaran sayuran di Pasar Inpres Ruteng Kabupaten Manggarai. *Jurnal Forum Agribisnis (Agribusiness Forum)*, 12(2), 151–160. <https://doi.org/10.29244/fagb.12.2.151-160>

Sari, I. P. (2018). Analisis efisiensi pemasaran pinang dengan pendekatan structure conduct and performance (SCP) di Kecamatan Betara Kabupaten Tanjung. *Program Studi Agribisnis Fakultas Pertanian*, 10(5), 1–6.

Sulaksana, J., Andayani, S. A., & Hidayat, A. (2018). Analisis rantai pasok jagung (Studi kasus pada rantai pasok jagung hibrida (*Zea mays*) di Kelurahan Cicurug Kecamatan Majalengka Kabupaten Majalengka). *Jurnal Ilmu Pertanian dan Peternakan*, 5(1).

Samapakang, E., & Maramis, J. B. (2020). Evaluasi kinerja rantai pasokan komoditi pala pada Desa Treman Kabupaten Minahasa Utara. *Jurnal EMBA*, 8(1), 411–419.

Setyowati, N., Kusnandar, & Puspito, D. P. (2018). Analisis rantai nilai ubi kayu (*Manihot esculenta Crantz*) di Kabupaten Pati. *Journal of Sustainable Agriculture*, 31(2), 94–101.

Takasihaeng, M., Rengkung, L. R., & Lolowang, T. F. (2022). Analysis of marketing channels and marketing margins for nutmeg seeds in Belengang Village, Manganitu District, Sangihe Islands Regency. *Unsrat Agri-Socio Economic Journal*, 18(1), 205–218. <https://doi.org/10.31258/unricsagr.1a12>