Jurnal Hexagro. Vol. 10. No. 2. August 2026 P-ISSN: 2459-269E-ISSN: 2686-3316
DOI: 10.36423/hexagro.v10i2.2715

PERFORMANCE OF *ADAN* RICE MARKETING CHANNELS IN KRAYAN DISTRICT, NUNUKAN REGENCY

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Submitted: 28th February 2026; Revised: 31st March 2026; Published: 28st August 2026

ABSTRACT

The Krayan subdistrict in Nunukan Regency is a major production area for adan rice, which has high economic value and strong competitiveness in the Malaysian and Brunei Darussalam markets. This advantage positions Adan Rice as an important contributor to residents' income. However, the success of adan rice farming depends not only on production aspects, but also on a supportive marketing system. This study aims to identify and describe the marketing channels for adan rice and analyze their efficiency in the border region. The research location was selected purposively, taking into account the area's characteristics as a production center and border zone. Data analysis used a qualitative descriptive approach. The results of the study reveal two marketing channels for adan rice. Channel I involves farmers, village collectors, and end consumers, in which farmers receive a price of IDR 16,600/kg, or 83% of the trader price, with an efficiency of 15%. Channel II is direct sales from farmers to end consumers, where farmers receive Rp20,000/kg or 100% of the selling price, with an efficiency of 29.5%. The application of these criteria indicates that both marketing channels are efficient.

Keywords: Adan rice; channels; efficiency; marketing
.

ABSTRAK

Kecamatan Krayan di Kabupaten Nunukan merupakan daerah produksi utama beras adan yang memiliki nilai ekonomi tinggi dan daya saing kuat di pasar Malaysia dan Brunei Darussalam. Keunggulan ini menjadikan beras Adan sumber pendapatan penting bagi warga setempat. Namun, keberhasilan usaha tani beras Adan tidak hanya bergantung pada aspek produksi, melainkan juga pada sistem pemasaran yang mendukung. Penelitian ini bertujuan mengidentifikasi serta mendeskripsikan saluran pemasaran beras adan dan menganalisis tingkat efisiensinya di wilayah perbatasan. Lokasi penelitian dipilih secara purposif dengan memperhatikan karakteristik daerah sebagai pusat produksi dan zona perbatasan. Analisis data menggunakan pendekatan deskriptif kualitatif. Hasil penelitian mengungkap dua saluran pemasaran beras adan. Saluran I melibatkan petani, pedagang pengumpul desa, dan konsumen akhir, di mana petani menerima harga Rp16.600/kg atau 83 % dari harga tingkat pedagang, dengan efisiensi 15 %. Saluran II adalah penjualan langsung dari petani ke konsumen akhir, di mana petani memperoleh Rp20.000/kg atau 100 % dari harga jual, dengan efisiensi 29,5 %. Berdasarkan kriteria yang diterapkan, kedua saluran pemasaran dinyatakan efisien.

***Kata kunci**: Beras adan; efisiensi; saluran pemasaran,*

INTRODUCTION

The agricultural sector still holds significant potential to boost the country's economy. It contributes to labor absorption, foreign exchange earnings, and the provision of raw materials for industry (Sonya et al., 2024). In the food subsector, rice is a

primary necessity for Indonesians, thus playing a crucial role in maintaining the country's economic and social stability. Rice is a crucial component in maintaining food security (Mubarok et al., 2025). Rahim et al. (2024) stated that Indonesia ranks third among countries with the highest rice consumption worldwide, with approximately 90% of the Indonesian population consuming rice. Based on Table 1, Indonesian rice consumption has been gradually declining. In 2020, rice consumption was recorded at 97.6 kg/capita/year, then decreased slightly to 97.1 kg/capita/year in 2021. A more significant decline occurred in 2022, with consumption reaching 93.5 kg/capita/year, suggesting a shift in consumption patterns. In 2023, rice consumption rose slightly to 93.8 kg/capita/year, but declined again in 2024 to 92.1 kg/capita/year. Overall, the data show a downward trend in rice consumption of approximately 5.5 kg per capita per year over the past five years.

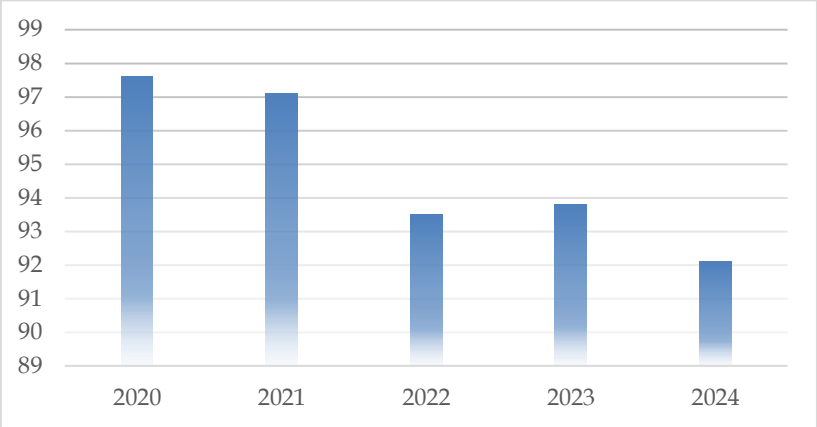


Figure 1. Rice Consumption per Capita per Year in Indonesia (2020–2024)
Source: National Food Agency, 2025.

Wahida et al. (2025) stated that Indonesian rice consumption remains relatively high, although it has been gradually declining since 2020. This decline is related to government efforts to encourage food diversification and shifts in consumption patterns toward alternative carbohydrate sources. In 2024, average national rice consumption was recorded at around 92.1 kg per capita per year, indicating that rice remains a primary food commodity for Indonesians.

Rice is a leading commodity in North Kalimantan. Hendris et al. (2022) stated that Location Quotient (LQ) analysis indicates that from 2017 to 2021, rice was the primary commodity in five

regencies/cities: Malinau, Bulungan, Tana Tidung, Nunukan, and Tarakan. This indicates that these regions can meet their own rice needs and have the potential to supply other regions' needs. However, rice development throughout North Kalimantan Province is still limited to the cultivation phase (on-farm), thus not providing optimal added value.

According to BPS (2024), the rice harvest area in North Kalimantan increased from 6,499.92 hectares in 2023 to 8,282.06 hectares in 2024. Production in 2021 was recorded at 23,598.96 tons and increased by 6,464.92 tons in 2024. In terms of production centers, Bulungan Regency made the largest contribution in 2024, with a total of 11,963.56 tons and a productivity of 3.6 tons per hectare (See Table 1).

Table 1. Production, Harvested Area, and Productivity of Rice Commodities in North Kalimantan 2021-2022

Regency	Rice Production (Ton)		Harvest Area (Ha)		Productivity (Ton/Ha)	
	2023	2024	2023	2024	2023	2024
Malinau	5.064,16	5.672,82	1.451,05	1.512,75	3,49	3,75
Bulungan	10.107	11.963,56	2.632,03	3.323,21	3,84	3,6
Tana Tidung	409,6	295,23	153,41	91,12	2,67	3,24
Nunukan	7.970,84	12.150,05	2.251,65	3.347,12	3,54	3,63
Tarakan	47,36	25,12	11,78	7,85	4,02	3,2
Total	23.598,96	30.063,88	6.499,92	8.282,06	3,63	3,63

Sources: BPS North Kalimantan, 2025

Table 1. Production, Harvested Area, and Productivity of Rice Commodities in North Kalimantan 2021-2022. Nunukan Regency is known for its superior rice variety called "Adan Rice." The center of Adan rice cultivation is in the Krayan region. Krayan is an area within Nunukan Regency, directly bordering Sarawak, Malaysia. The majority of the population is ethnic Dayak Lundayeh, who uphold local customs and wisdom, particularly in land management and social life. Rizal (2015) stated that Adan rice has a distinctive aroma, soft texture, and cultural values and local identity inherent in the community. The traditional cultivation system, without chemicals, produces organic rice with high economic value. Andrian (2017) emphasized that this commodity is cultivated only once a year, during the planting season from July to August, with harvest occurring in January and February.

Asmarantaka et al. (2017) stated that marketing is the most vital component of the agribusiness system,

encompassing the provision of agricultural production facilities (input subsystems), on-farm operations, marketing, agricultural product processing, and supporting subsystems such as research, extension, financing, credit, marketing intelligence or market information, and marketing policies. Essentially, the goal of marketing is to bridge the needs of producers and consumers in the production process. Lapamudi et al. (2023) stated that the choice of different marketing (distribution) channels results in varying prices received by farmers. This occurs because each distribution channel has a varying number of distribution points and incurs additional costs, preventing farmers, as the primary producers, from achieving optimal profits.

In general, the market for Adan rice is for consumers in Malaysia and Brunei Darussalam. The trade system between Krayan and its neighboring countries (Malaysia and Brunei) is informal, disregarding legal requirements such as taxes and certain international trade regulations. This phenomenon aligns with the view of Hustin and Wang (2018), who stated that informal trade is generally carried out by communities in border areas that lack stable regulations and policies, such as those along the borders of China and North Korea. The product's selling price is generally lower and carries a significant risk of legal issues between countries due to perceived violations of government regulations. Despite its superior organoleptic properties and potentially high economic value, the marketing of Adan rice still faces various obstacles. The agribusiness market for Adan rice tends to be inefficient due to several factors, including limited market share stemming from geographic remoteness, inadequate transportation infrastructure, poorly coordinated marketing institutions, and price competition from non-organic rice from the lowlands.

Simultaneously, marketing challenges for Adan rice have weakened farmers' bargaining power and reduced incomes. This situation makes it difficult to open up domestic market opportunities. This problem is particularly felt by Adan rice farmers in Krayan District. A study is needed to examine the marketing channels and performance of Adan rice in Krayan District to improve farmer welfare.

RESEARCH METHODS

This research adopted a mixed-methods (quantitative and qualitative)

approach and was conducted in Krayan District, Nunukan Regency. Krayan District is located in the western part of Nunukan Regency, North Kalimantan, and borders Sarawak, Malaysia, with an area of 2,282.27 km2. The distance from Krayan to one of the villages in Sarawak, Malaysia, is approximately 7 km with a travel time of one hour by motorized vehicle. The distance from Krayan to Nunukan Regency can only be reached by air transportation in 55 minutes. This condition affects the fulfillment of community living needs that must be obtained from Malaysia.

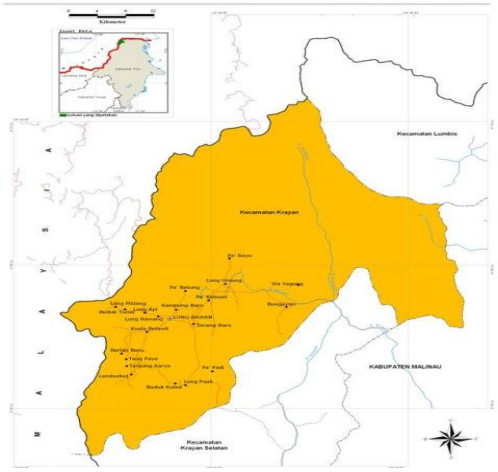


Figure 2. Map of Krayan District. Source: Krayan District Monograph, 2024

Population and Sample

The respondents in this study were 50 purposively selected for their direct involvement in the Adan rice marketing chain. Respondents were divided into two groups. The first group consisted of 30 Adan rice farmers, and the second group included 20 village collectors, selected because they act as the main intermediaries between farmers and the wider market.

Data Collection Sources and Techniques

The data used in this study were both primary and secondary. Secondary data consisted of publications from the Central Statistics Agency (BPS) and other relevant government agencies, and primary data obtained directly from respondents. Data collection techniques included observation, in-depth interviews, and documentation in the form of interview guides for respondents and traders, as well as photographs at the research location.

Data Analysis

A qualitative (descriptive) approach was used to map the marketing channels. The analysis included identifying the institutions and actors involved in the marketing of Adan rice. The marketing performance analysis used a quantitative approach, with marketing margins and efficiency as the key metrics.

The marketing margin is calculated by subtracting the selling price from the purchase price at each marketing institution, or as the

difference between the price received by farmers and the price paid to farmers. To calculate the marketing margin obtained by each marketing agency, the following formula is used:

MP = Hji – Hbi

Where:

MP: Marketing Margin (IDR/Kg)

Hj: Selling Price of the first marketing unit (IDR/Kg)

Hb: Purchase Price of the first marketing unit (IDR/Kg)

Raspati (2020) states that to determine the level of marketing efficiency of local rice, the following formula can be used:

$$Eps = \frac{BP}{He} \times 100\ \%$$

The variables used in the marketing efficiency analysis are as follows:

Eps: Marketing Efficiency

Bp: Marketing Cost

He: Retail Price

Based on the marketing efficiency value, the assessment criteria can be classified as follows:

0% – 30% = Efficient

31% – 50% = Moderately efficient

> 50% = Inefficient.

RESULT AND DISCUSSION

Characteristics of Farmer Respondents

Based on Table 2, the characteristics of farmer respondents are categorized by age, education, farming experience, and land area. The majority of respondents were in the productive age range (15–65 years), namely 76.6% (23 people), while 23.3% (7 people) were in the non-productive age range (>65 years). The dominance of the productive age reflects the availability of an optimal workforce and greater opportunities to adopt innovations. Productive age is associated with work capacity, responsiveness to technology, and more adaptive managerial skills (Sari et al., 2022). Regarding education, all respondents had attended school. The majority had elementary school (43.3%) and junior high school (43.3%), while 13.3% had a high school education. Formal education significantly influences understanding of cultivation technology, risk management, and access to market information (Aryal et al., 2021).

Based on farming experience, 43.3% of respondents had 21–30 years, 33.3% had 11–20 years, and 23.3% had 0–10 years. A longer tenure is associated with greater technical efficiency, adaptability to climate change, and greater maturity in risk management (Cessay et al., 2025). In terms of land area, 66.6% of farmers manage 1–3 ha, 33.3% manage 3–5 ha, and none manage more than 5 ha. This condition indicates

the dominance of small- to medium-scale farmers. Land size affects production capacity, technology investment, and access to financing, so farmers with limited land tend to face obstacles in mechanization and capital (Aryanie et al., 2025).

Table 2. **Characteristics of Farmer Respondents**

Characteristics	Persons	Frequency (%)
Age		
Productive > 15 -65 years old	23	76.6
Non Productive > 65 years old	7	23.3
Education		
Uneducated	0	0
Elementary School	13	43.3
Junior High School	13	43.3
Senior High School	4	13.3
Farming Experiences		
0 - 10 years	7	23.3
11 – 20 years	10	33.3
21 -30 years	13	43.3
Land Area		
1 - 3 Ha	20	66.6
> 3 Ha - 5 Ha	10	33.3
> 5 Ha	0	0

Source: Processed primary data, 2025

Characteristics of Trader Respondents

Based on Table 3, the majority of traders (18, 90%) were in the productive age group (15–65 years), while only 2 (10%) were in the non-productive age group (>65 years). In terms of education, respondents were divided into: 7 (35%) elementary school graduates, 5 (25%) junior high school graduates, 3 (15%) high school graduates, and 5 (25%) bachelor's degree graduates.

Table 3. Characteristics of Trader Respondents

Characteristics	Persons	Frequency (%)
Age		
Productive > 15 -65 years old	18	90
Non Productive > 65 years old	2	10
Education		
Elementary School	7	35
Junior High School	5	25
Senior High School	3	15
Bachelor	5	35
Farming Experiences		
0 - 10 years	7	35
11 – 20 years	9	45
21 -30 years	4	20

Source: Processed primary data, 2025

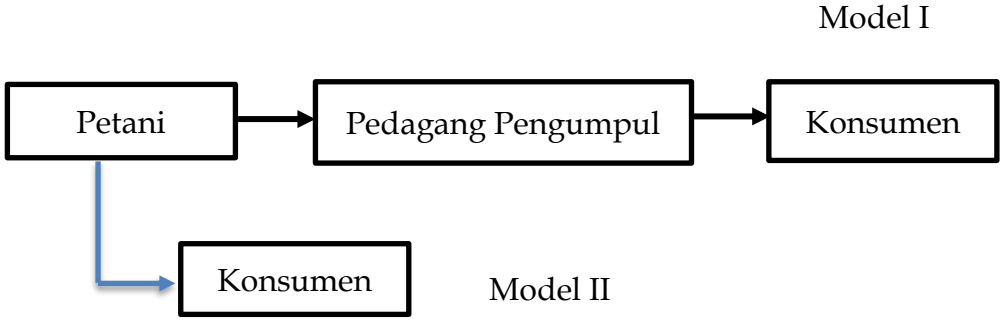
Based on trading experience, 7 (35%) had 0–10 years of work experience, 9 (45%) had 11–20 years, and 4 (20%) had more than 20 years. This analysis indicates that (1) most traders are of productive age, thus they have the potential to maintain high business intensity and adapt to market changes; (2) education level influences managerial skills and the utilization of market information; and (3) length of trading experience is related to operational knowledge and business performance, although capital factors, market access and policy support still influence the final impact on income or business continuity.

a. Adan Rice Market Mechanism

The marketing channel aspect of a product/commodity is highly influential. Marketing channels play a role in delivering products from producers to consumers. Ojulu et al. (2020) stated that marketing channels function not only as physical distribution channels but also as value creation mechanisms through storage, promotion, negotiation, and customer service activities (Ojulu et al., 2020).

Research on Adan rice marketers in Krayan District, Nunukan Regency, revealed two marketing channels: village collectors and end consumers. The resulting marketing patterns are as follows:

a. Marketing Pattern I: Farmers - Village Collectors - End Consumers
b. Marketing Pattern II: Farmers - End Consumers



Gambar 2. Saluran Pemasaran Beras Adan Di Kecamatan Krayan Kabupaten Nunukan

In marketing channel pattern I, the distribution structure involves a single intermediary institution, namely the village collector. In this pattern, farmers sell adan rice to the village collector. Furthermore, the distribution function, including transportation, storage, and distribution to the next

market, is entirely carried out by the collector. This pattern reflects a one-level marketing channel, with a single intermediary between the producer and the next marketing institution. Fatinah et al. (2025) stated that the collector plays a role in carrying out marketing functions such as exchange (purchasing), physical functions (transportation and storage), and facilitation functions (financing and risk bearing). Thus, although farmers are not directly involved in the subsequent distribution process, the product flow continues through the mechanism managed by the village collector.

Farmers sell adan rice to the village collector at IDR 250,000 per can or IDR 250,000 per 15 kg. The sales process takes place in the rice fields. The village collector purchases the adan rice and handles the loading and unloading. Marketing costs borne by Village Collectors include transportation costs, averaging IDR 2,600/kg, and loading and unloading costs, averaging IDR 400/kg. After purchasing Adan rice, Village Collectors sell it to end consumers at IDR 300,000/can or IDR 300,000/15 kg, which can fluctuate depending on market prices. In this marketing channel pattern, farmers incur transportation costs averaging Rp 2,600/kg, loading and unloading costs averaging Rp 3,300/kg, and milling costs, while they handle the harvesting process themselves.

In Channel Pattern II, the distribution structure used is the shortest marketing channel, with farmers selling Adan rice directly to end consumers without intermediaries. In practice, end consumers can approach nearby farmers to purchase pre-ordered Adan rice, especially those in the same village. Adan rice supplies are generally stored at farmers' homes and sold on demand. The average selling price of adan rice through this channel is IDR 300,000 per can (approximately 15 kg), which is relatively higher than the price farmers sell to Village Collectors. This price difference is due to the cost structure borne directly by farmers. In this channel, farmers bear marketing costs, including transportation costs of IDR 2,600/kg and loading and unloading costs of IDR 3,300/kg. Therefore, the higher price serves as compensation for distribution costs that are no longer transferred to intermediaries.

Conceptually, direct marketing channels generally offer higher margins for producers because there is no profit sharing with intermediaries. However, producers must bear all marketing costs and risks (Oktriana, 2025). Other

research shows that for small-scale agricultural commodities, producers often choose direct marketing channels when consumers are geographically close, thereby achieving distribution efficiency despite the costs incurred (Rahman & Lestari, 2021). Furthermore, shorter channels are considered to increase price control for farmers and strengthen direct relationships with consumers (Putri & Kurniawan, 2023). Therefore, the Channel II Pattern reflects a trade-off between increased selling prices and increased marketing costs borne by farmers. Therefore, the choice of channel is highly dependent on market conditions and geographic proximity to consumers.

In both Adan Rice marketing channels, prices and product distribution are controlled by traders. Field evidence indicates that the Adan Rice marketing mechanism in Krayan consists of three flows: product, financial, and information. The linkages and relationships that occur in marketing include the flow of goods/products, services, money or capital, and information from the initial producer to the final producer. The product flow in the marketing channel consists of production output, which begins as input at the farmer level and then produces rice grain.

This cash flow consists of cost components and profits received by each link involved (Indriani et al., 2019). The cash flow (financial) in the Adan Rice supply chain in Krayan represents the distribution of value in rupiah and Malaysian ringgit (RM). The cash flow mechanism emphasizes the transaction system used in each channel. Cash flow in Adan rice marketing between actors is entirely in cash. Information flow is abstract (intangible) because it is the basis for decision-making.

The magnitude of the material and financial flows within the network. Horizontal information flow occurs at the farmer level, with information attributes including discussions on determining planting and harvesting periods and the choice of intermediaries.

Marketing Margin

Marketing margin is the difference between the price the end consumer pays and the price the producer (farmer) receives. This reflects the accumulated marketing costs and profits of the marketing institutions involved in the distribution process of a product. Conceptually, marketing margin reflects the added value arising from marketing functions such as transportation, storage, processing,

sorting, packaging, financing, and risk sharing.

Tabel 4. Margin Pemasaran Beras Adan Di Kecamatan Krayan

Types of Marketing Channels	Pelaku Pemasaran	Biaya (Rp/Kg)	Harga Beli (Rp/Kg)	Harga Jual (Rp/Kg	Margin Pemasaran (Rp/Kg)	Keuntungan (Rp/Kg)
Saluran I	Petani	7900	-	16.600	-	8.700
	Pedagang Desa Long Midan	3.000	16.600	20.000	3.400	400
	Total	3.000			3.400	-
Saluran II	Petani	13.500	-	20.000	-	6.500
	Konsumen	-	20.000	-	-	-
	Total	13.500	-	-	-	-

Source: Processed primary data, 2025

Based on the data in Table 4, adan rice farmers in marketing channel I receive a price of IDR 16,600 per kilogram, equivalent to 83% of the price received by traders. This percentage indicates that farmers receive relatively high prices, so their position in this marketing chain is not disadvantaged. In marketing channel I, all marketing costs are borne by the Village Collector, including transportation costs of IDR 2,600/kg and loading and unloading costs of IDR 400/kg. The gross profit earned by the Village Collector is IDR 400/kg, and the total marketing margin in this channel reaches IDR 3,400/kg of adan rice. Of this total margin, 88.23% is allocated to cover the Village Collector's marketing costs, while the remainder is net profit. The large margin enjoyed by the Village Collector is influenced by the short marketing channel structure, which involves only one marketing entity, so the Village Collector captures the entire margin without sharing it with other parties. Based on the calculation results for marketing channel II, Adan rice farmers received a price of IDR 20,000/kg, or a total profit of 100%. This means that Adan rice farmers did not incur any losses. Farmers bear level II marketing costs. These costs include farming and marketing expenses, including transportation and unloading, totaling IDR 13,500/kg. The resulting profit is IDR 6,500/kg.

Local Rice Marketing Efficiency in Krayan District

Marketing effectiveness is a crucial aspect that must be considered in every marketing activity. Effective marketing occurs when producers, marketing institutions, and consumers are all satisfied with the marketing activities. Inefficiencies in the marketing system

can result in low profit margins for producers and higher consumer costs. Data on rice marketing efficiency in Krayan District are presented in Table 5.

Table 5. Marketing Efficiency of Adan Rice in Krayan District

Types of Marketing Chains	Final Selling Price (IDR/Kg)	Marketing Costs (IDR/Kg)	Marketing Efficiency (%)
Channel I	20,000	3.000	15
Channel II	20,000	5,900	29,5

Source: Processed primary data, 2025

In marketing channel I, total marketing costs reached IDR 3,000 per kilogram, while the product value at the consumer level was IDR 20,000 per kilogram. Marketing efficiency calculations yielded an efficiency level of 15%, within the 0–33% range, thus marketing channel I can be classified as efficient. This low marketing efficiency value indicates a relatively small proportion of costs to product value. This is influenced by the relatively insignificant marketing cost components, primarily transportation, weighing, and packaging. The low-cost structure reflects a simple distribution system and short marketing distances, thereby minimizing additional operational costs.

In marketing channel II, total marketing costs were recorded at IDR 5,900 per kilogram. The marketing efficiency calculation results in an efficiency value of 29.5%. This value remains within the 0–33% range; marketing channel II can still be categorized as efficient. However, this percentage is close to the upper limit of the efficient category, indicating that the proportion of marketing costs to product value is higher than in marketing channel I. This indicates a greater cost burden in the distribution process, so cost control efforts are needed by increasing transportation efficiency, reducing operational costs, or trimming the distribution chain to maintain or improve efficiency. Rumallang et al. (2020) define marketing efficiency as achieved when the proportion of marketing costs is lower than the value of the product being marketed. In other words, the smaller the ratio of marketing costs to product value, the higher the efficiency of marketing activities.

CONCLUSION

Marketing of Adan Rice in Krayan District, Nunukan Regency, consists of two distribution channels. Marketing Channel I involves farmers, village collectors, and end consumers.

This channel generates a marketing margin of IDR 3,400/kg as the price difference between the farmer and consumer levels. Meanwhile, Marketing Channel II operates directly from farmers to end consumers without intermediaries, thus generating no marketing margin.

Based on the calculations, both marketing channels are considered efficient. However, Marketing Channel I is more efficient (15%) than Marketing Channel II (29.5%). The channel's high efficiency, achieved through family labor, influences me by reducing loading and unloading costs. In Channel II, farmers bear their own marketing costs, including hiring higher-cost loading and unloading labor, thus accounting for a larger proportion of costs.

DECLARATION

The authors declare that this manuscript is original, has not been previously published, and is not under consideration for publication elsewhere. All authors have made substantial contributions to the research, approved the final version of the manuscript, and agree to be accountable for all aspects of the work. The authors also declare that there are no conflicts of interest related to this research.

Consent to participate

Authors are agreed

Consent to publication

The authors agree to publish this data

Conflict of interest

The authors declare no conflict of interest

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