

The Performance of Marketing and Distribution on Rice Supply Chain in Merauke Regency, Papua, Indonesia

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Abstract

Merauke is projected to be the rice barn in Eastern part of Indonesia. Many programmes are implemented to improve rice production. This study was conducted to figure out the number of distribution channels for rice marketing, to find out the efficient rice marketing actor, to recognise the smooth flow of product, money, and information on distribution of rice supply chain. The study was carried out in Merauke, i.e., districts of Semangga and Tanah Miring. Rice traders were sampled using the snowball technique, the initial point of farmers with 239 respondents. The results showed that there were four distribution channels of rice in Merauke. The most efficient rice marketing actor was the rice mill selling its product to Bulog partners. The pattern of the distribution of rice supply chain describing the flow of product, money and information was basically smooth, however, there was an unsmooth part in details.

Keywords: Distribution, Marketing, Rice, Supply Chain

Kinerja Pemasaran dan Rantai Pasok Beras di Kabupaten Merauke, Papua, Indonesia

Abstrak

Kabupaten Merauke dicanangkan menjadi lumbung pangan di Kawasan Timur Indonesia. Untuk mewujudkan hal tersebut telah banyak program dilakukan untuk meningkatkan produksi padi di Kabupaten Merauke. Peningkatan produksi padi tersebut akan lebih baik apabila diimbangi dengan pemasaran beras yang baik, sehingga petani dapat dengan mudah menjual beras hasil produksinya. Tujuan penelitian ini adalah untuk mengetahui jumlah saluran, pelaku pemasaran beras yang paling efisien, dan kelancaran aliran produk, aliran uang dan aliran informasi distribusi rantai pasok beras. Penelitian dilakukan di Kabupaten Merauke pada Distrik Semangga dan Distrik Tanah Miring. Pengambilan jumlah sampel pedagang dilakukan dengan teknik *snowball* sampling. Jumlah responden 216 petani, 16 penggilingan padi, dan 7 pedagang. Hasil penelitian menunjukkan terdapat empat saluran pemasaran beras, dengan pelaku pemasaran beras yang paling efisien adalah pada penggilingan padi yang menjual beras ke mitra Bulog. Pola distribusi rantai pasok beras yang menggambarkan aliran produk, aliran uang dan aliran informasi lancar di empat saluran.

Kata kunci: Beras, Kinerja, Pemasaran, Rantai Pasok

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INTRODUCTION

Agriculture is one of the sectors which plays a crucial role for either developing or developed countries, in addition to economy sectors such as health, food and politics (Cheraghali pour

et al., 2019). Agricultural produce is perishable, seasonal, heavy, large-volume and produced in distant locations from consumers (Darma, 2017). It is categorised into perishable products such as fruit and vegetables as well as non-perishable products, i.e. crops and nuts (Cheraghalipour et al., 2019).

Rice is one of non-perishable agricultural products, which is considered as the staple food for a half of the global population (Fahad et al., 2019, Baloch & Thapa, 2018), staple food for most of Asian population (Jukanti et al., 2020), signature food for most of Indonesian population (Zaeroni & Rustariyuni, 2016, Sari, 2014, Septiadi & Joka, 2019), essential main commodity (Nguyen et al., 2021), and staple food for poor people in Viet Nam, (Van Ha et al., 2015), strategic commodity for the population's food security in South Africa (Soullier et al., 2020, Arouna et al., 2020) income source and food security for small farmers in Tanzania (Mgale & Yunxian, 2020), as well as the most important factor determining rural economy in Bangladesh (Rahman et al., 2006).

One of the established areas for rice centre in Indonesia is Merauke Regency which is located in Papua Province. Geographically, it is situated between 137° - 141°, east longitude and 5° - 9° south latitude. The acreage of this regency occupies 14.67% of Papua Province or about 46,791.63 km. Its boundaries are Mappi and Boven Digoel regencies on the North, Papua New Guinea at the East, Arafura Sea on the South and West (Badan Pusat Statistik Kabupaten Merauke, 2020). It has rice as a superior commodity (Widyantari & Maulany, 2020) and projected as a granary for Eastern of Indonesia by the Central Government. To implement this achievement, many constraints should be overcome, such as low rice productivity, incomplete agricultural infrastructure, irrigation systems relying on rainwater, and inefficient performance of rice farmer of the local transmigrants (Widyantari et al., 2018, Widyantari et al., 2019), but efficient performance of rice mill (Widyantari et al., 2020). Many programmes and subsidies from the Government have been undertaken to increase rice productivity in Merauke Regency. However, this improvement of rice productivity in Merauke Regency will be better when it is followed by smooth, effective, and efficient marketing and distribution of rice supply chain.

Marketing has the most important function since it affects the fluctuation of farmer income, thereby good marketing mechanisms enable all parties to reach profit and then accelerate economic development (Matin et al., 2008). Similarly, rice farming can optimise the profit depending on distribution patterns or marketing channels. Good production yielding farming will face obstacles or even failure if it is not supported by good marketing and supply chain, because its product may not be well marketed. Therefore, the performance of marketing is one of the concerned aspects in marketing as it can be used to measure the success in business and the realisation of a business (Komatina et al., 2019).

In this study, the performance of marketing was measured by calculating the efficiency of marketing and distribution of supply chain. Investigating the efficiency of marketing, the difference in price and the gained profit by each actor in supply chain will be overviewed. Such total gained profit depends on the market structure on each level, bargaining position and efficiency of effort of each marketing actor (Supriatna, 2005). Efficient marketing is capable of raising the farmer from poverty and food insecurity (Panda & Sreekumar, 2012,

Handschuch & Wollni, 2016). Thus, this research was conducted to analyse 1) the total rice channel in Merauke Regency, 2) the most efficient actor of rice marketing in Merauke Regency, 3) the smoothness of product flow, money flow and information flow on distribution of rice supply chain in Merauke Regency. Thus, it will help local governments determine policies suitable for the needs of the field.

This research is essential as a comparative effort of the marketing performance of Merauke with other regions that have advanced in rice marketing. The difference between this research and further marketing research is that this research does not trace to the final consumer because one of the marketing actors is Bulog, where Bulog does not sell rice to consumers but acts as a distributor of rice for civil servants, Indonesian Army, National Police, social services, and food stock management. Another reason is that most rice millers prefer to sell their rice to Bulog, and Bulog is the largest buyer of rice production in the Merauke district.

METHOD

This research is analytical descriptive research, and it had been conducted for three months. We used the purposive method to determine the location based on rice-producing areas in Tanah Miring District and Semangga District. Furthermore, seven villages were selected with the classification of the provisions of three villages for the most local farmers, four villages for the most transmigrant farmers, and one village consisting of local farmers and transmigrant farmers. Thus, to make the population obtained amounted to 7,213 people. According to Yount, (1999) if the population size is between 5.001-10.000 then the sample size taken is 3%; for this case, the sample of farmers is as many as 216 respondents. A random sampling technique using a random sampling technique used to select a selection of farmers.

The samples of traders were collected using the snowball sampling technique, i.e., sample selection according to the recommendation of prior respondents (rice farmers). A total of 239 respondents consisted of 216 farmers, 16 rice mills, and seven traders. This study used primary data from questionnaires and secondary data from the Statistics of Merauke Regency., The researchers used the questionnaires to obtain data on the number of channels, channel margins, monopoly index, and channel efficiency. Meanwhile the secondary data is on the area and regional borders. Performance was measured using marketing margin, monopoly index and efficiency of marketing. The marketing margin was calculated using the following formula (Limbong & Panggabean, 1985):

Marketing Margin:

$$MP = P_{ji} - P_{bi} \dots \dots \dots (1)$$

Remarks:

- MP : marketing margin
- P_j : sale price of marketing actor
- P_b : purchase price of marketing actor
- i : marketing actor

Component of marketing margin comprised of:

- a. Marketing cost, transportation cost, unloading, sorting, packaging, and storing.
- b. Profit for marketing actor

The monopoly index was estimated using the simplification of the Lerner index (Jamhari & Yonekura, 2003):

$$MI = \frac{MP}{VC} \dots\dots\dots (2)$$

Remarks:

- MI = Monopoly index
- MP = Marketing margin
- VC = Variable cost (transportation cost, unloading cost, sorting cost, packaging, and bag cost).

The efficiency on each rice marketing actor in Merauke Regency was analysed using the following formulation:

$$EP = \frac{\text{Marketing Cost}}{\text{Value of Marketed Product}} \times 100\% \dots\dots\dots (3)$$

Remarks:

- If $EP > 1$ means not efficient
- If $EP < 1$ means efficient
- If $EP = 1$ means reaching Break Event Point (BEP)

In order to recognise the distribution patterns of rice supply chain describing product flow, money flow and information flow, Likert scale analysis was utilised with scores ranging from 1 to 5, namely not appropriate, less appropriate, quite appropriate, appropriate and most appropriate for product flow, money flow and information flow of rice supply chain. Indicators for product flow were product, rice quality, package, appropriateness in the quantity of rice orders and delivery accuracy. Transaction site, method of payment, payment time, total payment and method of capital collection were considered as indicators for money flow. Meanwhile, information flow involved the indicators of production information, product demand, purchase price, sale price, quality, rice delivery time, payment time and consumer preference. The smoothness of product flow, money flow and information flow amongst actors of rice supply chain was determined using categorisation, namely not smooth, less smooth, quite smooth, smooth, and the smoothest under the categorisation scales of 1.00 – 1.80, 1.81 – 2.60, 2.61 – 3.40, 3.41 – 4.20, and 4.21 – 5.00, respectively.

FINDING AND DISCUSSION

Rice Marketing

This research found four channels in distribution of rice marketing as illustrated in Figure 1. Meanwhile, there were five channels in Sleman Regency (Charisma, 2017), 12 channels in Banyuwangi (Purwono et al., 2013), as well as three channels in Zimbabwe (Musara et

al., 2018) Also, the number of rice marketing channels in the Merauke district is more than those in Zimbabwe and less than those in Sleman Regency and Banyuwangi.

1. Channel 1



2. Channel 2



3. Channel 3



4. Channel 4



Figure 1. Channel for distribution of rice marketing in Merauke Regency

Dawe et al. (2008) summarised that farmers preferred to sell their rice to certain traders since they had known each other. Similarly, this research found the preference of farmers in selling their rice to well-known rice mills. Rice mills became alternative for farmers to sell their rice since they had capability of buying farmer’s rice in large number, complying with the report of (Sudiadnyana, 2015) that farmers tended to select intermediary traders who might offer their products in large volume and for long time period. Total actor of rice marketing for each channel in Merauke Regency is presented in Table 1 as follows.

Table 1. *Total of Rice Marketing Actor in Merauke Regency*

Channel	Total					
	Farmer	Rice mill	Bulog Partner	Bulog	Reseller	Traders inter regency
1	122	9	-	1	-	-
2	62	3	1	1	-	-
3	42	3	-	-	-	5
4	10	1	-	-	1	-

Table 1 exhibited channel 1 as the most channel used by farmers in Merauke Regency, in which farmers sold their rice to rice mills and then rice mills forwarded it to Bulog.

Meanwhile, the least used channel was channel 4, describing that farmers sold their rice to the rice mills, then the rice mills sold it to resellers.

Table 2. *Mean for margin of rice marketing actor in Merauke Regency*

No	Actor	Channel				Mean
		1	2	3	4	
1.	Farmer					
	Sale price (IDR)	7,272	7,294	7,325	7,310	7,300
2.	Rice mill					
	Purchase price	7,272	7,294	7,325	7,310	7,300
	Sale price	8,030	7,625	7,750	7,700	7,776
	Marketing cost (IDR/kg)	199	200	190	190	195
	Profit	559	131	235	200	281
	Margin	758	331	425	390	476
	Monopoly index	3.80	1.65	2.24	2.05	2.44
	Efficiency of marketing	0.02	0.03	0.02	0.02	0.03
3.	Bulog Partner					
	Purchase price		7,625			7,625
	Sale price		8,030			8,030
	Marketing cost (IDR/kg)		200			200
	Profit		205			205
	Margin		405			405
	Monopoly index		2.03			2.03
	Efficiency of marketing		0.02			0.02
4.	Bulog					
	Purchase price	8,030	8,030			8,030
5.	Traders inter regency					
	Purchase price			7,750		7,750
	Sale price			9,533		9,533
	Marketing cost (IDR/kg)			694		694
	Profit			1,089		1,089
	Margin			1,783		1,783
	Monopoly index			2.57		2.57
	Efficiency of marketing			0.07		0.07
6.	Reseller					
	Purchase price			7,700		7,700
	Sale price			10,000		10,000
	Marketing cost (IDR/kg)			500		500
	Profit			1,800		1,800
	Margin			2,300		2,300
	Monopoly index			4.60		4.60
	Efficiency of marketing			0.05		0.05

The marketing margin is a gap between sale price and purchase price in marketing institution (Amsyah, 2002, Sudiyono, 2002). This marketing margin channels consisted of marketing cost and marketing profit. Marketing cost itself included transportation cost, unloading and packaging cost. Table 2 indicated that the largest margin was found in resellers and the smallest one in Bulog partners, i.e., 2,300 and 405, respectively. The largest

margin of resellers was due to the sortation of rice by resellers according to variety, broken content, and rice colour prior to selling to the consumer. Rice from the varieties of Raja Lele, Mentik Wangi and Pandan Wangi were sold under IDR 12,000/kg, whereas the sale price of other varieties was lower. The smallest margin on Bulog partners occurred when they bought the rice through rice mills under more expensive price compared to that of farmers.

Similarly, the largest and smallest mean of monopoly index were also subsequently recorded from resellers and Bulog partners, namely 4.60 and 2.03, respectively. However, referring to each actor of rice marketing, the smallest monopoly index (1.65) was found in rice mills which sold rice to Bulog partners.

The actor of rice marketing in Merauke Regency had been efficient since every actor of rice supply chain had an efficiency value of <1 . The smallest mean of efficiency value was 0.02 on Bulog partners. However, according to the rice marketing actor, the smallest efficiency value of 0.02 was documented on rice mills and Bulog partners. The marketing channels was considered to be efficient depending on margin value, the value of marketing efficiency and monopoly index value. In this study, the smallest margin value of 331 was revealed by rice mills selling the rice to Bulog partners with value of marketing efficiency of 0.03 and monopoly index of 1.65. Thus, the most efficient actor of rice marketing was rice mills selling the rice to Bulog partners. Contrarily, other previous researchers reported that the most efficient marketing actor was the farmers which sold their commodities to final consumers (Nahumury & Widiastuti, 2015, Arifuddin et al., 2020, Gebre et al., 2021, Panda & Sreekumar, 2012). Meanwhile, Saputro et al. (2020) concluded that the most efficient marketing channels were obtained with the supply chain form farmer-collector merchant of village-wholesalers-reseller-final consumer.

Distribution patterns of rice supply chain

The distribution patterns of rice supply chain describing product flow (Table 3), money flow (Table 4) and information flow (Table 5) in Merauke Regency was basically smooth on four channels. However, in details, the marketing of rice to out of Merauke Regency was less smooth on channel 3, i.e., channel of traders inter-regencies with the items of accuracy in delivery and arrival time (Table 3) as well as transaction payment (Table 4) with the score of 2.20. It was less smooth under the categorisation score but involved in smooth category under obtained mean value.,

The rice shipment to out of Merauke Regency might be conducted using two pathways, i.e., land and sea pathways. Land pathway was conducted using trucks, in which the condition of road connecting Merauke Regency with other regencies in Papua was unpaved so that it was dusty during dry season but muddy and difficult to pass during wet or rainy season. Such conditions resulted in delay and longer delivery time and then postponed the payment since the payment system was depending on the arrival time of product. On the other hand, the shipment of sea pathway was less smooth due to there was no direct route to the destination regions of rice. Consequently, the arrival and the payment of rice were longer since it was paid when it arrived. More explaining illustration for product flow, money flow and information flow were displayed in Figure

Table 3. Score For Average Value Of Statement Items On Product Flow Of Rice Supply Chain In Merauke Regency

Item	Channel 1				Channel 2						Channel 3					Channel 4				
	P-PG		PG-B		P - PG		PG - MB		MB-B		P-PG		PG-PAK		PAK-PLK		P - PG		PG - PP	
	P	PG	PG	B	P	PG	PG	MB	MB	B	P	PG	PG	PAK	PAK	PL K	P	PG	PG	PP
Product	3.78	4.00	4.00	4.00	3.87	3.50	4.00	4.00	4.00	4.00	3.97	3.33	4.00	4.00	4.00	-	3.90	3.00	4.00	4.00
Rice quality	3.77	3.78	4.00	4.00	3.60	4.00	4.00	4.00	4.00	4.00	3.85	3.67	4.00	4.00	4.00	-	3.90	3.00	4.00	4.00
Packing	3.83	4.00	4.00	4.00	3.75	4.00	4.00	4.00	4.00	4.00	3.94	4.00	4.00	4.00	4.00	-	4.00	4.00	4.00	4.00
The compliance on quantity of rice order	3.76	4.22	4.11	4.00	3.96	3.50	4.00	4.00	4.00	4.00	3.89	4.00	4.67	4.00	4.00	-	4.00	4.00	4.00	4.00
Accuracy	3.75	4.22	4.22	4.00	3.89	4.00	4.00	4.00	4.00	4.00	3.95	4.33	4.67	2.60	2.20	-	4.00	4.00	5.00	4.00
Total	18.89	20.22	20.33	20.00	19.07	19.00	20.00	20.00	20.00	20.00	19.59	19.33	21.33	18.60	18.20	-	19.80	18.00	21.00	20.00
Mean	3.78	4.04	4.07	4.00	3.81	3.80	4.00	4.00	4.00	4.00	3.92	3.87	4.27	3.72	3.64	-	3.96	3.60	4.20	4.00
Category	Smooth		Smooth		Smooth		Smooth		Smooth		Smooth		Smooth		Smooth		Smooth		Smooth	

Table 4. Score For Average Value Of Statement Items On Money Flow Of Rice Supply Chain In Merauke Regency

Item	Channel 1				Channel 2						Channel 3				Channel 4					
	P-PG		PG-B		P - PG		PG - MB		MB-B		P-PG		PG-PAK		PAK-PLK		P = PG		PG - PP	
	P	PG	PG	B	P	PG	PG	MB	MB	B	P	PG	PG	PAK	PAK	PLK	P	PG	PG	PP
Transaction site	3.74	3.89	3.89	4.00	3.79	4.00	4.00	4.00	4.00	4.00	3.94	4.00	4.00	4.00	4.00	-	4.00	4.00	4.00	4.00
Payment method	3.87	4.00	4.00	4.00	3.88	4.00	4.00	4.00	4.00	4.00	3.99	4.00	4.00	3.20	3.20	-	4.00	4.00	4.00	4.00
Payment time	3.81	3.89	3.89	4.00	3.81	4.00	4.00	4.00	4.00	4.00	3.96	4.00	4.00	2.80	2.20	-	4.00	4.00	4.00	4.00
Total payment	3.92	3.89	4.00	4.00	3.95	4.00	4.00	4.00	4.00	4.00	3.99	4.00	4.00	4.00	4.00	-	4.00	4.00	4.00	4.00
Capital collecting method	3.59	3.89	3.89	4.00	3.47	4.00	4.00	4.00	4.00	4.00	3.56	4.00	4.00	4.00	4.00	-	3.60	4.00	4.00	4.00
Total	18.94	19.56	19.67	20.00	18.90	20.00	20.00	20.00	20.00	20.00	19.43	20.00	20.00	18.00	17.40	-	19.60	20.00	20.00	20.00
Mean	3.79	3.91	3.93	4.00	3.78	4.00	4.00	4.00	4.00	4.00	3.89	4.00	4.00	3.60	3.48	-	3.92	4.00	4.00	4.00
Category	Smooth		Smooth		Smooth		Smooth		Smooth		Smooth		Smooth		Smooth		Smooth		Smooth	

Table 5. Score For Average Value Of Statement Items On Information Flow Of Rice Supply Chain In Merauke Regency

Item	Channel 1				Channel 2						Channel 3						Channel 4			
	P-PG		PG-B		P - PG		PG - MB		MB-B		P-PG		PG-PAK		PAK-PLK		P = PG		PG - PP	
	P	PG	PG	B	P	PG	PG	MB	MB	B	P	PG	PG	PA K	PA K	PL K	P	PG	PG	PP
Product information	3.63	3.89	3.78	4.00	3.56	4.00	4.00	4.00	4.00	4.00	3.33	4.33	4.67	4.00	4.00		3.20	4.00	4.00	4.00
Product demand	3.71	3.78	3.89	3.50	3.53	4.50	4.00	4.00	4.00	3.50	3.51	4.67	4.67	4.00	4.00	-	3.50	4.00	4.00	4.00
Purchase price	3.57	3.78	3.89	4.00	3.54	4.00	4.00	4.00	4.00	4.00	3.48	4.67	4.67	4.00	4.00	-	3.50	4.00	5.00	4.00
Sale price	3.67	3.78	3.89	4.00	3.63	4.50	4.00	4.00	4.00	4.00	3.46	4.33	4.00	4.00	4.00	-	3.40	4.00	4.00	4.00
Time																				
Delivery/reception	3.80	4.00	4.00	3.50	3.71	4.50	4.00	4.00	4.00	3.50	3.73	4.33	4.00	4.00	4.00	-	3.90	4.00	4.00	4.00
Payment time	3.83	3.78	3.89	4.00	3.79	4.50	4.00	4.00	4.00	4.00	3.85	4.67	4.67	3.40	2.80	-	4.00	4.00	4.00	4.00
Consumer preference	3.80	3.33	4.00	4.00	3.61	4.50	4.00	4.00	4.00	4.00	3.89	4.00	3.33	4.00	4.00	-	4.00	4.00	4.00	4.00
Total	26.01	26.33	27.33	27.00	25.38	30.50	28.00	28.00	28.00	27.00	25.25	31.00	30.00	27.40	26.80	-	25.50	28.00	29.00	28.00
Mean	3.72	3.76	3.90	3.86	3.63	4.36	4.00	4.00	4.00	3.86	3.61	4.43	4.29	3.91	3.83	-	3.64	4.00	4.14	4.00
Category	Smooth		Smooth		Smooth		Smooth		Smooth		Smooth		Smooth		Smooth		Smooth			

Remarks:

P, ,, = Farmer

PP,, = Reseller

PG,, = Rice mill

MB = Bulog partners

B, ,, = Bulog

PAK = Inter-regency traders

PLK = out-of-regency buyers

Category: 1.00-1.80 = not smooth; 1.81-2.60 = less smooth; 2.61-3.40 = quite smooth, 3.41-4.20 = smooth, 4.21-5.00 = smoothest

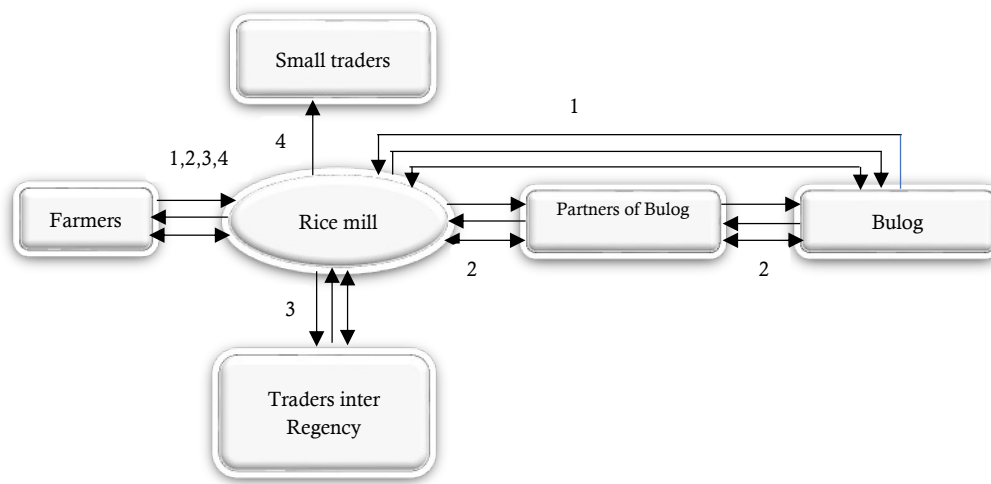
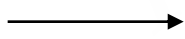
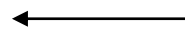


Figure 2. The flows of product, information, and money for rice supply chain in Merauke Regency

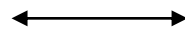
Remarks:



: Product flow



: Money flow



: Information flow

1,2,3,4

: The marketing channel of rice

CONCLUSION

The research results suggest that there are four rice marketing channels in Merauke Regency:

- 1) Farmers-Rice mill-Bulog,
- 2) Farmers- Rice mill -Bulog Partners-Bulog,
- 3) Farmers- Rice mill -Traders inter regency,
- 4) Farmers- Rice mill -Small traders.

The most efficient rice marketing actor is "Rice mill partners of Bulog" (Millers who sell rice to Bulog Partners) which is found in the second marketing channel compared to other marketing channels because this study did not examine the marketing channel to the

final consumer. Theoretically, more actors involved in a process will cause the efficiency level to decrease. However, in this case, the second marketing channel, which has many marketing actors, has the best level of efficiency because Bulog's final actors are rice price regulators with the ability to store large amounts of rice, and by adding Bulog partner actors, it can reduce the rice marketing margin.

The distribution patterns of the rice supply chain run smoothly in all four rice channels in Merauke Regency. However, there are several obstacles in the distribution of rice, namely 1) Delivery by land is constrained because there are still unpaved roads, which in the rainy season are often muddy, hampering the delivery of rice. 2) Shipping by sea takes a long time to reach the destination because it follows the shipping route carried out by the transport ship. Therefore, future research needs to focus on matters related to the marketing and distribution patterns of the rice supply chain up to the final consumer level.

Suggestions

With the results of the research above, the presence of the government is essential in Good investment on land, sea and air infrastructures should be implemented by constructing land routes to connect all regencies in Papua, developing special sea toll for Papua region, and building the airports in each regency of Papua, to enable the distribution of food materials to all areas in Papua Island. The expanse of online and offline marketing network is required to ease the farmers in determining the buyers with their desired number and price.

One recommendation from this study's results is private companies' involvement in rice marketing so that farmers and rice millers have other alternatives for selling rice.

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