Impact of smallholder inclusivity to the sustainability of the marketing channel

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Abstract. Smallholders are a group of oil palm growers in Indonesia, having a share of more than 40% of the Indonesian oil palm plantation area. There are a number of weaknesses that limit their inclusivity in the industry, posing a risk to their sustainability. This study analyses this hypothesis through 3 different types of smallholders representing the highest to the lowest level of inclusivity, namely ex-plasma partner, independent partner, and independent non-partner. Data were collected from 217 smallholders, 8 village collectors, 4 RAM and 2 mills from the province of Riau, Jambi and South Sumatra. Higher selling prices, lower profit margins, and more efficient marketing channel are used to indicate business sustainability. Shepherd, Acharya and Aggarwal, and Composite Index agree that higher selling prices and lower profit margins improve the marketing channel efficiencies, while the Marketing Efficiency Index and Soekartawi marketing efficiency values agree that lower cost of production will do so. The results show that on average, plasma/ex-plasma smallholders present the highest selling price, lowest total profit margin, and high production costs. This is caused by fertilizer usage that follows the recommended amount, improving productivity. Therefore, it can be concluded that inclusivity could improve the sustainability of smallholder marketing channels.

1. Introduction

Smallholders are one of the groups of oil palm growers in Indonesia which has entered the palm oil industry since the 1990s. In 2018, more than 40% of the Indonesian oil palm plantation area consists of oil palm smallholdings. Despite their significant increase in land size, smallholders were often excluded from the palm oil supply chain. In Indonesia, palm oil is still treated as an export oriented product with a long and complex value chain. In general, the value chain approach focuses on vertical integration partnerships. Players along the value chain share ownership, voice, risk, and cost or benefit [1,2]. Both individual and group partnerships will improve the bargaining power of smallholders. Among the various types of smallholder organization, cooperative appears to be widely used in the agro-commodity supply chain. However, cooperative also has a number of limitations, including risk sharing with a partner company. On one hand, this could improve the smallholders' skill to manage risk, but on another hand, this also increasing their possibility to loss [3].

Unlike oil palm companies, there are a number of weaknesses that limit smallholder inclusivity in the industry. Therefore, assistance from major companies is often needed to improve their inclusivity and sustainability. In Riau, Jambi, and South Sumatra, the partnerships can either take ex-plasma or

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independent form. Using 4 components of inclusivity namely ownership, voice, reward, and risk, [4] found that the average inclusivity score of ex-plasma, independent partner, and independent non partner smallholders are 10.44, 8.43 and 3.02, respectively. This shows that partnerships can improve smallholder inclusivity. In an agro-commodity supply chain, this could be related to smallholder participation and profitability. Inclusivity is one of the goals of sustainable development. The higher the smallholder participation and profitability, the more sustainable the marketing channel is expected to be. This study was conducted to analyse the impact of inclusivity to marketing sustainability.

2. Methods

This study was conducted in 3 smallholding centres namely the province of Riau, Jambi, and South Sumatra. Data were collected from 217 smallholders, 8 village collectors, 4 RAM, and 2 mills. The smallholder samples cover every plasma/ex-plasma partner, independent partner, and independent non-partner groups. Sustainability and marketing channel sustainability were calculated using the FFB selling price, profit margin, and marketing efficiency of smallholders. Fresh Fruit Bunches (FFB) was used as products with smallholders and palm oil mills as marketing players. Due to the lack of research permit, only price data was able to be obtained from mills. Marketing margin is the difference between prices at two market levels.

$$M_i = P_i^s - P_i^b \; ; i = 1, 2, 3 \tag{1}$$

In which 1, 2 and 3 are smallholders, cooperation/association/village traders and cooperation/association/supply contract owners, respectively. Marketing efficiency is analysed using 5 different methods namely Shepherd, Acharya and Aggarwal, Composite Index, Marketing Efficiency Index and Soekartawi. Each of them focuses on different players, which are shown in the following equation.

a. Shepherd's Method

$$ME = \frac{P_{i=3}^s}{C} - 1 \; ; C = \sum_{i=1}^3 C_i \tag{2}$$

b. Acharya and Agarwal's Method

$$ME = \frac{P_{i=i}^s}{C+\pi} = \frac{P_{i=i}^s}{M} \; ; \pi = \sum_{i=1}^3 \pi_i \; ; M = C + \pi \tag{3}$$

c. Composite Index Method

$$ME = \frac{R}{3} \; ; R = \sum_{i=1}^3 r_i \tag{4}$$

which uses 3 indicators namely producer share, marketing cost and marketing margin.

d. Marketing Efficiency Index Method

$$ME = 1 + \frac{\pi}{C} \tag{5}$$

e. Soekartawi (2002)

$$ME = \frac{C}{P_{i=3}^s} \times 100\% \tag{6}$$

where M_i = Marketing margin for player i, P_i^s = Selling price for player i, P_i^b = Buying price for player i, C_i = Marketing cost for player i, π_i = Profit for player i, R_i = Marketing rank for player i, and ME = *Marketing* Efficiency

3. Results and discussion

The results show that the three smallholder types have different marketing functions. Ex-plasma covers almost all of the marketing functions through their cooperative/KUD. The KUD directly sells smallholder FFB to partner mills, acting as the collector and supply contract owner. This significantly reduces the middleman marketing margin to only IDR11/kg, compared to the independent non-partner smallholder margin, which on average reaches IDR192/kg. Closely working with the mill partner, ex-plasma smallholders also enjoy higher selling prices. Their high production costs reflect optimal fertilizer usage. Ultimately, ex-plasma smallholders enjoy higher profit margins. Ex-plasma middlemen receive only 2% profit margin, while independent non-partner middlemen receive up to 21%.

Having received assistance from partner mills for extended periods of time, ex-plasma smallholders have improved their harvesting knowledge and skill. Unlike the harvest of independent smallholders, which are mixed with Dura fruits or long stems and reducing their price by 4% - 5%, the harvest of ex-plasma smallholders have zero litter. Independent smallholders have not significantly improved litter cutting, as partnerships have been ongoing for less than 2 years. Moreover, partnership was started after oil palm crops have been cultivated, in which most of them use illegitimate seeds. Therefore, Dura was still found in some of the FFB of independent smallholders. Partners of these independent smallholders need to compensate for the loss of quality because the FFB are sold to mills with strict standards. Ex-plasma smallholders also enjoy extremely cheap transportation compared to independent smallholders despite having a further location and worse road conditions. This indicates that associations and village traders also enjoy profit margins from the transportation service. However, such a condition is not possible to be detected by the Marketing Efficiency Index or the Soekartawi approaches, as they assume higher costs always stem from inefficiencies. In contrast, Shepherd, Acharya and Aggarwal, and Composite Index focus more on producer shares, thus showing that ex-plasma has the most efficient marketing condition. Details are as follows.

Table 1. Marketing margin and efficiencies based on smallholder typology.

No	Description	Unit	ex-plasma	independent partner	independent non-partner
1	**Smallholders**				
	Locations	Province	South Sumatra	Riau, Jambi	Riau, Jambi, South Sumatra
	crop age	Years	21.16	12.23	14.94
	average productivity	ton/ha/month	2	1.46	1.6
	harvesting frequency	Days	14	10 and 14	10 and 14
	average land area	ha/smallholding	2	2.02	1.89
	Type of sales	group/individual	In group	Individual	Individual
a	selling price	idr/kg	1,276	1,162	1,027
b	production costs	idr/kg	423	410	292
c	*Profit margin*	idr/kg	864	752	735
2	**Cooperation/Association/Village traders**				
	average distance to mills	Km	34.38	18.03	20.66
	Average quantity transported to mills	ton/trip	12	7	10
	maximum queuing time at mills	Hour	2	10	48
	average loss (shrink, waste, raw	%	0	4–5	4–5

No	Description	Unit	ex-plasma	independent partner	independent non-partner
	fruit, empty bunch)				
a	Buying price	idr/kg	1,276	1,162	1,027
b	Selling price	idr/kg	1,331	1,441	1,386
c	Marketing costs				
	- Litter cutting (Dura, long stem, water content)	idr/kg	0	72	58
	- Transportation	idr/kg	9	100	94
	- Loading and weighing (on plantation, storage, mill)	idr/kg	35	23	37
	Total marketing costs		44	195	190
d	*Profit margin*		11	85	170
3	**Cooperative/Association/Supply contract owner**				
	average lag period of payment to smallholders to payment from mills	Days	0	30	30
	average interest rate	%/month	1.6	1.6	1.6
a	Buying price	idr/kg	1,311	1,441	1,386
b	Selling price	idr/kg	1,311	1,441	1,425
c	Marketing costs				-
	- Financing	idr/kg	0	18.59	22.18
	Total marketing costs	idr/kg	0	18.59	22.18
d	*Profit margin*		0	-18.59	16.82
4	**Total supply chain**				
	Marketing costs	idr/kg	44	195	286
	Profit margin	idr/kg	875	837	927
	Smallholders		864	752	735
	Middleman		11	85	192
5	**Efficiency**				
	Shepherd		29.24	6.40	6.50
	Acharya dan Aggarwal		23.19	4.16	2.58
	Composite Index Method		1.00	2.00	3.00
	Marketing Efficiency Index		1.25	1.44	2.09
	Soekartawi	%	3.31	13.5	13.3

Table 1 also shows that the ex-plasma marketing channel does not require financing functions, while independent partner and non-partner channels require IDR18.59/kg and IDR22.18/kg, respectively. This is because there is no lag between cooperative FFB payments to ex-plasma smallholders and the cooperative receipt of payment. Ex plasma smallholders harvest every two weeks and receive payment once a month. Differently, smallholder associations and supply contract owners pay independent smallholder harvests upfront while receiving monthly payment from the mill. Assuming an average bank loan interest rate of 1.6%/month and using the opportunity cost approach, it is possible to calculate financing costs for independent smallholders. The negative number of association profit margin does not mean that the association experience losses because the association acts as both a village trader and a supply contract owner. As a village trader, the association enjoys high profit margins. Therefore, in total the association still receives a positive profit margin. In addition, the association may still receive additional profits from transportation costs, as the amount is much higher than that of ex-plasma smallholders.

4. Conclusions and policies implication

The inclusivity and sustainability of smallholders could be improved by partnerships. It cuts through the marketing chain, hence the middleman profit margin. In addition, partnerships could also improve the knowledge and skill of smallholders, improving the quality of their FFB. Therefore, partnerships could be promoted as an alternative to improve the inclusivity and sustainability of smallholders. However, partnerships need to be designed and implemented in a continuous long term program and require time to develop, so that optimal results could be achieved.

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Acknowledgements