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SINTA 2

The Impact of Farmer Partnerships on Arabica Coffee Farming in Simalungun Regency, North Sumatra Province, Indonesia

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ABSTRACT

Coffee is one of Indonesia's main economic activities for foreign exchange. An increase in exports of 8.11%, and a decline in imports of 58% in 2019, opened up export opportunities and large domestic markets. The government has implemented efforts to improve coffee farmers' welfare, one of which is agricultural business partnerships that can solve smallholder problems in developing countries and expand subsistence or traditional agriculture to high production value and export-oriented. This research aimed to analyze (1) the factors influencing coffee farmers' participation in agricultural partnerships and (2) the impact of the agricultural partnership on coffee farmers' performance in Simalungun Regency, North Sumatra Province. The Propensity Score Matching (PSM) technique analyzed the partnership's influence on coffee farming and agricultural income, productivity, and prices. The results showed that number of dependents household members and land area influence farmers' partnership participation. Participation increases coffee farming and agricultural income, productivity, and prices.

Keywords: *Arabica Coffee, Partnership, PSM, Coffee Performance, Simalungun Regency*

INTRODUCTION

Coffee is Indonesia's major economic activity for foreign exchange earnings besides oil and gas. The exports increased by 8.11%, while the imports decreased by 58% in 2019 (BPS, 2020a). This shows increased open export opportunities and a large domestic market.

Simalungun Regency is the second-largest Arabica coffee producer in North Sumatra Province after North Tapanuli Regency (BPS Sumatera Utara, 2020), with the highest productivity level of 1,225.47 kg/ha. It is among the important specialty Arabica coffee production areas in North Sumatra Province. Arabica coffee is an essential income source for farmers in Simalungun Regency highlands. The farmers in this regency also have partnered with coffee companies.

Indonesia's coffee productivity is below Vietnam, Malaysia, Laos, Thailand, and the Philippines. Simalungun Regency's production at 1,225.47 kg/ha was higher than the country's average at 794 kg/ha but below Vietnam with 2,278 kg/ha in 2019 (BPS, 2020b). The low productivity of Indonesian coffee plants is thought to be due to the use of random seeds, the age of the plants, and the low

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quality of the coffee produced (Purba, et al., 2013),

The current challenges must be solved, such as productivity, quality, and inconsistent coffee supply. The government has made various efforts to improve the welfare of coffee farmers. One of them is by encouraging the development of partnership models. The farmer partnership here is a mutually beneficial relationship between farmers and processing companies and farmers and exporters. Where farmers get market certainty, and processing companies and exporters get assurance of raw material supply. The partnership can be one way to solve the problems of small farmers in developing countries (Report & England, 2004). The influencing factors for partnerships between coffee processing companies and exporters with the farmers include consumer quality demand, quantity, and constant supply. Agricultural business partnerships solve various challenges for small farmers, such as lack of product information, market methods and opportunities, limited capital and credit access, subsistence farming, and market uncertainty (Minot & Sawyer, 2014), (Daryanto A, 2006) Partnerships increase production, productivity, and farmers' household income (Maertens & Vande Velde, 2017).

Research on the development of coffee farming in Simalungun Regency has been widely carried out, including (Saragih, 2012) study to know the influence of socioeconomic and ecological factors on the production of specialty Arabica coffee in Simalungun Regency. Siandari et al., (2020) Researched the Arabica Coffee Agribusiness Development Strategy in Simalungun Regency. While Hasibuan (2016) conducted a study on agribusiness partnerships for coffee farmer groups with partner companies at Starbucks Coffee Outlets in Simalungun Regency. However, there has been no research on the factors influencing farmer participation in business partnerships and their impact on coffee farming performance in Simalungun Regency. Therefore, it is necessary to conduct a study to analyze the effects of factors influencing farmers' business partnerships and coffee farming performance.

METHODOLOGY

Research Location

This explanatory research explains the relationship, influence, or the existence of a causal relationship and a causal relationship. This study was designed using a survey method with a quantitative approach and supported by qualitative data. This research is conducted in Simalungun Regency, the largest Arabica coffee-producing center in North Sumatra Province, and partnerships between farmers, processing companies, and farmers and exporters (as a buyer from the farmers).

Data and Sample

Primary data was applied to source Arabica coffee farmers. Data was collected through interviews with coffee farmers following the structured questions. Preliminary data was also obtained from discussions and interview results of partnering companies with coffee farmers and the Joint Venture Cooperative (KUB), a business group representing coffee farmers in cooperation with companies. Meanwhile, secondary data was collected from the Central Statistics Agency, the Plantation Service of Lampung Province, the Association of Indonesian Coffee Exporters (AEKI), and the International Coffee Organization (ICO).

The sample in this research is 171 farmers, including partnered and non-partnered coffee farmers. Cluster sampling was used for partnered farmers, while the selection was for non-partnered farmers using the snowball sampling method. The snowball sampling method was used to obtain non-partnered respondents in the partnered closest area to avoid regional bias.

Analysis Method

The analysis of partnership impact on coffee farming performance applied the

Propensity Score Matching (PSM) technique. This technique corrects selection bias and calculates farmer participation impact on partnerships (Maertens & Vande Velde, 2017) (Wainaina et al., 2014). The PSM analysis technique is based on (Baker, 2000), as follows:

First, the observations were divided into two groups then the estimation model and variables were determined. Finally, the logit regression model calculated the propensity score (treatment) and non-partnered farmers (control). The general form of the logit model is as follows (Hosmer, D. W., & Lemeshow, 2000) :

$$P_i = Ln\ \frac{P_i}{1-P_i} = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \cdots + \beta_i x_i$$

The farmers' participation in partnerships is valued at 0 and 1, where partnered farmers have a value of 1 and non-partnered have a 0 value. The independent variable (xi) that affects the farmers' participation is education (year), number of dependents (person), land area (Hectare), number of trees per ha (trunk), farming experience (Dummy), and Dummy counseling activeness.

Second, after obtaining the propensity score, the partnered and non-partnered farmers' observations were matched using the Nearest Neighbor Matching (NNM) method. This method applies a similar weight to each unit, and the matching follows the closest propensity score.

Third, the common support analysis was performed, matching partnered and non-partnered farmers' characteristics based on their distribution of propensity scores. The observations result of propensity scores beyond range were excluded from the covariates. The covariate balancing tested the mean propensity score after matching did not differ between the two groups.

Fourth, the treatment effect calculations compared the Average Treatment on Treated (ATT) of various farming performance indicators between partnered and non-partnered farmers with the following equation:

$$ATT = E\{E[Yi \mid p(Xi); D=1] - E[Yi \mid p(Xi); D=0] \mid D=1\}$$

Where D=1 represents the partnered farmers and D=0 the non-partnered. Xi represents coffee and agricultural income, productivity, and prices

RESULTS AND DISCUSSION

Characteristics of Sample Farmers

The research sample included farmer households conducting coffee farming. Table 1 shows farmers' and families' characteristics with the household average difference test and partnered and non-partnered farmers' farm characteristics. The results showed that partnered and non-partnered farmers have significant differences in the number of dependents, land area, farming experience, and activity in extension.

Table 1
Average Difference Test of Household and Coffee Farming Characteristics of Partnered and Non-Partnered Farmers

Variable	Partnered Average	Non-Partnered Average	Sig
Education (year)	10,13	10,14	0,52
Number of Dependents (person)	0,77	0,49	0,01***
Coffee Land Area (ha)	0,81	0,56	0,005 ***
Number of Trees per Ha (trunk)	1257,39	1247,97	0,29
Coffee farming experience (*Dummy*)			0,006 ***
Activeness in Counseling (*Dummy*)			0,08*

***Significant at 0.01 level; **Significant at 0.05 level; *Significant at 0.10 level
Source: Primary data processed (2020)

The family head's average age for partnered and the non-partnered coffee farmer was 52 and 53 years, respectively; hence, they were still in their productive age. There was an average of 4 family members, and those with one dependent were categorized as small families. The average education is ten years, meaning they have completed junior high school, are literate, and can accept innovation.

Land is the most important natural resource in agricultural cultivation. Arabica coffee farmers in Simalungun Regency use their land. The average range of cultivated land was 0.08-4 ha with an average of 0.77 ha for partnered farmers, 0.49 ha for non-partnered, and 89% of land ownership was below 1 ha. Furthermore, farmers applied polyculture and monoculture cropping patterns with the average number of plants for partnered farmers as 1,257 trees per ha and non-partnered at 1,248, with 11 years average age. This shows that the area's Arabica coffee trees are at a productive period.

68% of farmers had more than ten years of coffee farming experience. However, despite the long experience, they did not apply formal education but increased their farming knowledge through Counseling and training and participated in farmers' groups. Farmers' group members collectively acquire agricultural inputs, savings and loan facilities, and Counseling and training. The groups also facilitate partnership activities and consist of a chairperson, administrator, and members. Therefore, farmers have benefited from farmers groups with 70% active members and 59% extension activities. The results showed that outreach activities help farmers to acquire organic coffee cultivation technology information and the benefits of manure, composting, and vegetable pesticides. It is necessary to increase the human resources of Arabica coffee agribusiness actors in the Simalungun Regency so it has a good ability to manage the business (Siandari et al., 2020).

Coffee Farming Performance of Sample Farmers

The coffee farming performance was analyzed through total cost, coffee and agricultural income, number of workers, productivity, and price. Table 2 shows the different test results, indicating that partnered farmers' performance significantly differs from non-partnered through coffee and agricultural income and productivity.

Table 2
Test of Average Differences in Coffee Farming Performance Indicators for Partnered and Non-Partnered Farmers

Variable	Partnered Average	Non-partnered Average	Sig
Total Cost per Ha (Million IDR)	3,95	5,13	0,32
Coffee Income per Ha (Million IDR)	74,18	33,89	0,000 ***
Agricultural Income per Ha (Million IDR)	87,00	39,31	0,000 ***
Labor per Ha (Workdays)	29,30	36,09	0,66
Productivity (ton/ha)	2,39	1,97	0,038**
Price (IDR)	21.924	19.615	0,43

***Significant at 0.01 level; **Significant at 0.05 level; *Significant at 0.10 level
Source: Primary data processed (2020)

The average coffee and agricultural income for partnered farmers is more than twice higher as that for non-partnered (153 Million IDR and 73 Million IDR respectively). Similarly, their productivity is 21.32% higher than non-partnered farmers. The results showed that the highest coffee productivity in the area was under 2 tons/ha at 49%. In contrast, the average coffee productivity

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was 2.23 tons/ha, indicating that it can be optimized.

Table 2 also shows that the partnered farmers' production and productivity are higher than those non-partnered. Therefore, partnerships positively impact production and productivity through seeds and production facilities provision during the planting period and technical assistance and guidance on effective coffee cultivation thrice a month for the first three years. This is in line with research by Rosanti et al. (2020), stating that contract farming increases the coffee plant's productivity by 24.14% of the average productivity.

Impact of Partnership on Coffee Farming Performance

The best logit regression model results estimated the propensity score (Table 3), the propensity score distribution (Figure 1), and covariate balancing (Table 4). Meanwhile, Table 5 shows partnership impacts on coffee farming performance.

The first step involved determining the model variables (covariates). The second step was the logistic regression estimation model selection for propensity score. Finally, the model estimated the influencing factors for farmers' partnerships participation, validated by the Pearson goodness of fit test. The results showed the probability value of the chi-square statistical test as 167.88, greater than = 0.05. Hence, the logistic regression model is feasible for predictions. Table 3 shows the influencing factors for farmers' partnership participation results.

Parameter testing was conducted simultaneously and partially. Simultaneous testing applied the likelihood ratio test. The results showed a 12.88 chi-square L.R. value with an -107.12 estimated log likelihood value and Prob > chi2 of 0.0450; hence, the model is statistically significant.

Table 3
Estimation Results of the Logit Regression Model

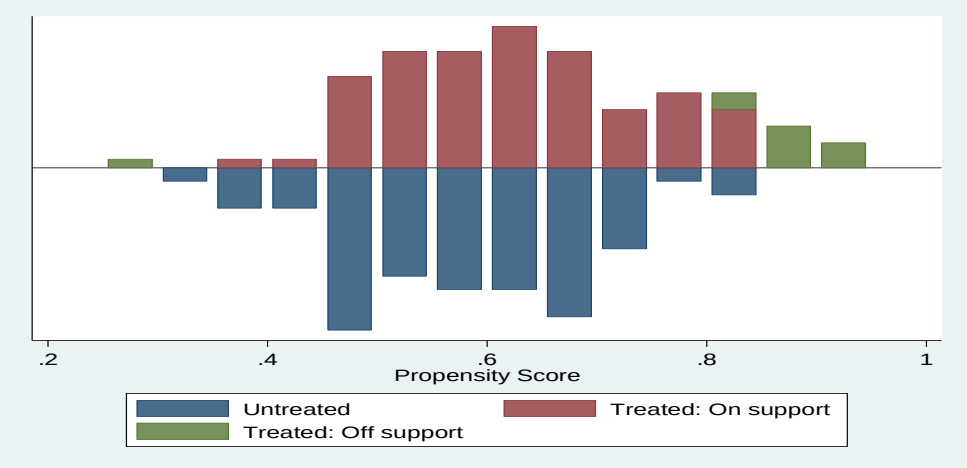
Variable	Coefficient	S.E	P > | z |	Marginal Effect
Education (year)	-0,0197	0,0652	0,763	-0,0046
Number of Dependents (Pearson)	0,3358 *	0,2021	0,097	0,0781
Coffee land area (ha)	0,5406 *	0,2954	0,067	0,1257
Number of Trees per Ha (trunk)	0,0003	0,0003	0,307	0,0001
Farming experience (*dummy*)	0,5714	0,3671	0,120	0,1355
Activity in Counseling(*dummy*)	0,5428	0,3389	0,109	0,1269
Constant	-0,9686	0,9156	0,290	
Log-*likelihood*	-107,12	LR chi2 (6)		12,88
Pseudo R^2	0,0567	Prob > chi2		0,0450

***Significant at 0.01 level;**Significant at 0.05 level;
*Significant at 0.10 level
Source: Primary data processed (2020)

The logit regression results that estimated the propensity score (Table 3) showed that the number of dependents and land area affect the farmer's partnership participation. These two factors positively affect the farmers' partnership participation. Furthermore, the marginal effect showed the farmer participation probability with changes in the independent variable. The value illustrated that a higher number of dependents and a wider owned land area increases the farmers' probability of partnerships participations. This follows

Rosanti, et al., (2019) that the number of family members affects the participation of coffee farmers in contract farming in Lampung. Ariyani et al. (2020) that the pond size affects farmers' decision to adopt geosiolator technology in salt farming in Madura. Sitorus et al. (2020) stated that the pepper-harvested area positively affects farmers' decisions to implement GAP in Bangka Belitung. Rahman et al. (2020) showed that land size in Bangladesh significantly influences effective practices adoption. Murage et al. (2019) explained that land area positively affects the adoption of soybeans.

The logistic regression results in Table 3 estimated the trend score to show its distribution. The trend score for partnered farmers ranged from 0.2863 - 0.9150 at an average of 0.6460, while for non-partnered ranged from 0.3140 - 0.8381 at an average of 0.5773. in addition, Figure 1 shows propensity scores distribution, with the top half of the graph representing the scores for partnered farmers and the bottom half for non-partnered.



Source: Primary data processed (2020)

Figure 1
Distribution of partnered farmers and non-partnered Trend Scores Before and After Matching

The third step determines the matching method for the observed values of partnered and non-partnered groups using the Nearest Neighbor (NN) with replacement. It matches one individual non-partnered farmer with more than one partnered individual. The trend score was obtained from 171 farmers consisting of 106 partnered and 65 non-partnered.

The fourth step performed the covariate imbalance testing of the hypothesis, showing similar distribution after matching both groups. The results indicated significant differences in the partnered and non-partnered farmers' variables before matching but no differences after matching. The matching process involved removing covariates with a higher bias percentage, including the number of dependents. Table 4 shows the covariate imbalance results before and after matching.

Table 4
Covariate Balancing Before and After Matching

Variable	Sample	Mean		% bias	% bias reduction	t-test	
		Partner	Non-partner			t	p-value
Education	Unmatched	10,132	10,138	-0,2		-0,01	0,988

	Matched	10,042	9,9684	2,7	-1053,8	0,19	0,847
Coffee land area	Unmatched	0,80528	0,564	34,2		2,05	0,042
	Matched	0,62842	0,578	7,1	79,2	0,66	0,512
Number of trees per Ha	Unmatched	1257,4	1247,9	1,6		0,10	0,919
	Matched	1298,5	1291	1,3	21,2	0,08	0,934
Farming experience	Unmatched	0,7264	0,6154	23,6		1,52	0,131
	Matched	0,7368	0,7158	4,5	81,0	0,32	0,746
Activity in Counseling	Unmatched	0,61321	0,5231	18,2		1,16	0,249
	Matched	0,61053	0,5263	17,0	6,6	1,17	0,244

Source: Primary data processed (2020)

The covariate balancing test showed that the matching covariates have similar distribution for partnered and non-partnered farmers. Hence, the impact calculation of farmer partnership participation is not constrained by selection bias. The following stage involved the common support analysis, which showed that 14 individuals in partnered group (treatment) had an out-of-range propensity score. Hence, it should be excluded. Finally, 157 out of the 171 samples were used to calculate the partnership's impact on coffee farming performance.

Table 5
Impact of Partnership on Arabica Coffee Farming Performance

Variable	Partnered	Non-Partnered	Deviation	S.E.	t-stat	sig
Coffee income	79,35	29,76	49,59	10,08	4,92	***
Agricultural Income	91,67	35,10	56,57	10,61	5,33	***
Productivity	2,510	1,743	0,7674	0,3474	2.21	***
Price	21.934,78	19.510,87	2.423,91	308,43	7.86	***

***Significant at 0.01 level; **Significant at 0.05 level; *Significant at 0.10 level
Source: Primary data processed (2020)

The estimation results showed that farmers' partnership participation significantly affects coffee and agricultural income, productivity, and prices. Furthermore, Table 5 shows that coffee and agricultural income are positive and significant at p<0.10. Hence, partnerships increase coffee farming income. The impact level of increased farmers' coffee income is estimated at IDR 49.59 million/ha/year or a 62.5% increase in average income. This follows Bolwig et al. (2009) that organic coffee farmers' participation in Africa's contract farming increases their net income by 75% of the average coffee receipts. Minot & Sawyer, (2014) found that smallholder participation in contract farming increased income by 25-75% in developing countries. Similarly, Ariyani et al., (2020), Rosanti et al., (2020), Sitorus et al., (2020), Manda et al., (2020), Ali et al., (2018), and Challa & Tilahun, (2014) stated that technology adoption increased farmers' income and welfare.

Productivity is positive and significant at p < 0.01; partnership increases productivity by 767 kg/ha or 30.56% of the area's average coffee productivity. The sampled farmers' observations showed that companies provide technology guidance, increasing coffee productivity, quality, and price. This finding is higher than that (Rosanti et al., 2020), stating that contract farming increases the coffee plant's productivity by 24.14% of the average productivity. (Bolwig et al., 2009) showed that contract farming increased the coffee plant's productivity by 7% of the average productivity. Sitorus et al., (2020) stated that the white pepper farming productivity was 318 kg/ha, or a 37% increase. Maertens & Vande Velde, (2017) found that partnership increased Benin rice

productivity by 0.25 tons/ha or 13% of the average productivity.

Price has a positive and significant sign at $p < 0.01$; hence farmers' partnership participation increases the farm coffee prices by 11.05% more than the area's average price. The partnered farmers' price increase is due to increased coffee quality. It shows that the partnership increases competitiveness, and farmers' welfare. Rosanti et al., (2020) stated that contract farming increases farmers' coffee prices by 4.51%. In contrast, Ariyani et al., (2020) showed that geoisolators application increased coarse salt prices by IDR 220 thousand or 20.86% of the average price. Sitorus et al., (2020) stated that the GAP implementation increased the selling price of white pepper farmers by 4%. Maertens Maertens & Vande Velde, (2017) and Miyata et al., (2009) showed that contract farming increases the average price of Benin rice farmers by 11% and increases China farm apple prices by 8%.

CONCLUSION

Based on the results, it can be concluded that the number of dependents household members and land area influences farmers' partnership participation; and The farmers' partnership participation increases coffee farming and agricultural income, productivity, and prices. Therefore, partnerships enhance the government's target achievement of increased coffee productivity, competitiveness, and farmers' welfare.

The suggestion is the participation of farmers in partnership activities must be increased through the efforts of all parties. The government can encourage companies to cooperate with farmers based on fair principles and mutually beneficial. To ensure farmers receive benefits from the activity partnership, the company needs to develop a cooperation model to be implemented.

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REFERENCES

Ali, A., Hussain, I., Rahut, D. B., & Erenstein, O. (2018). Laser-land leveling adoption and its impact on water use, crop yields and household income: Empirical evidence from the rice-wheat system of Pakistan Punjab. *Food Policy*, *77*(March), 19–32.

Arief Daryanto. (2006). *Empowering Farmer's Economic Walfare through Development of Oil Palm Industry in the Regional Autonomy Era: Lessons Learnt from Siak District.* (pp. 113–125). Jurnal Manajemen dan Agribisnis. 3(2).

Ariyani, A. H. M., Harianto, H., Suharno, S., & Syaukat, Y. (2020). Factors Affecting Technology Adoption of Geoisolator on Solar Saltworks in East Java Province. *Agriekonomika*, *9*(1), 28–37.

Baker, J. L. (2000). *D I R E C T I O N S I N D E V E L O P M E N T D I R E C T I O N S I N D E V E L O P M E N T Evaluating the Impact of Development Projects on Poverty A Handbook for Practitioners*.

Bolwig, S., Gibbon, P., & Jones, S. (2009). The Economics of Smallholder Organic Contract Farming in Tropical Africa. *World Development*, *37*(6), 1094–1104.

BPS. (2020a). Analisis Komoditas Ekspor 2012 - 2019. In *BPS*.

BPS. (2020b). *Statistik Kopi Indonesia*.

BPS Sumatera Utara. (2020). *Provinsi Sumatera Utara dalam Angka*.

Challa, M., & Tilahun, U. (2014). Determinants and Impacts of Modern Agricultural Technology Adoption in West Wollega: The Case of Gulliso District. *Journal of Biology, Agriculture and Healthcare*, *4*(20), 63–77.

Hasibuan, H. F. (2016). *Kemitraan Agribisnis Kelompok Petani Kopi dengan Perusahaan Mitra (Kasus :*

Kelompok Petani Namanis Desa Sinaman II Kecamatan Pamatang Sidamanik, Kabupaten Simalungun dengan Gerai Kopi Starbucks). USU.

Hosmer, D. W., & Lemeshow, S. (2000). *Applied Logistic Regression Second Edition. In Applied Logistic Regression* (second).

Maertens, M., & Vande Velde, K. (2017). Contract-farming in Staple Food Chains: The Case of Rice in Benin. *World Development*, *95*, 73–87.

Manda, J., Alene, A. D., Tufa, A. H., Abdoulaye, T., Kamara, A. Y., Olufajo, O., Boukar, O., & Manyong, V. M. (2020). Adoption and Ex-post Impacts of Improved Cowpea Varieties on Productivity and Net Returns in Nigeria. *Journal of Agricultural Economics*, *71*(1), 165–183.

Minot, N., & Sawyer, B. (2014). Contract Farming in Developing Countries : Theory , Practice ,. *Innovation for Inclusive Value-Chain Development: Successes and Challenges*, *May*, 127–155.

Miyata, S., Minot, N., & Hu, D. (2009). Impact of Contract Farming on Income: Linking Small Farmers, Packers, and Supermarkets in China. *World Development*, *37*(11), 1781–1790.

Murage, F. M., Mucheru-Muna, & Mugendi, D. N. (2019). Adoption of soybean by smallholder farmers in the Central Highlands of Kenya. *African Journal of Agricultural Economics and Rural Development*, *7*(5), 1–012. www.internationalscholarsjournals.org

Novi Rosanti, Bonar M. Sinaga, Arief Daryanto, K. K. (2019). Faktor-faktor yang mempegaruhi partisipasi petani dalam CONTRACT FARMING: STUDI KASUS PETANI KOPI DI LAMPUNG. *Jurnal Ekonomi Pertanian Dan Agribisnis (JEPA)*, *3*(4), 853–863.

Rahman, M. S., Kazal, M. M. H., & Rayhan, S. J. (2020). Improved Management Practices Adoption and Technical Efficiency of Shrimp Farmers in Bangladesh: a Sample Selection Stochastic Production Frontier Approach. *Bangladesh Journal of Agricultural Economics*, *41*(1), 47–58. https://www.researchgate.net/publication/343477092

Raya, K., & Simalungun, K. (2013). Produktivitas Kopi Arabika (Coffea arabica L.) Rakyat di Kecamatan Raya Kabupaten Simalungun. *Produktivitas Kopi Arabika (Coffea Arabica L.) Rakyat Di Kecamatan Raya Kabupaten Simalungun*, *1*(2), 67–77.

Report, T., & England, N. (2004). *Contract farming in Indonesia : Smallholders and agribusiness working together*. *54*(54).

Rosanti, N., Sinaga, B. M., Daryanto, A., & Kariyasa, K. (2020). Dampak Contract Farming terhadap Kinerja Usahatani Kopi di Lampung. *Agriekonomika*, *9*(2), 140–149.

Saragih, J. R. (2012). Pengaruh Faktor sosial ekonomi dan ekoligi terhadap produksi kopi arabika spesialti dalam pengembangan ekonomu lokal di kabupaten simalungun. In *disertasi*.

Siandari, U., Jamhari, J., & Masyhuri, M. (2020). Strategi Pengembangan Agribisnis Kopi Arabika di Kabupaten Simalungun. *Jurnal Kawistara*, *10*(1), 32.

Sitorus, R., Harianto, H., Suharno, S., & Syaukat, Y. (2020). The Application of Good Agricultural Practices of White Pepper and Factors Affecting Farmer Participation. *Agriekonomika*, *9*(2), 129–139.

Wainaina, P. W., Okello, J. J., & Nzuma, J. M. (2014). Blessing or evil? Contract farming, smallholder poultry production and household welfare in Kenya. *Quarterly Journal of International Agriculture*, *53*(4), 319–340.