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The Effect of Sustainable Supply Chain Management on the Performance of Certified Organic Coffee at Malang Regency

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ABSTRACT

This study aims to analyze the effect of sustainable supply chain management on the performance of organic Robusta coffee in the Farmers Group, Amadanom Village, Malang Regency. The impact of sustainable supply chain management in this study is identified from the supplier, manufacture, and consumer variables. Supply chain performance is known through economic, environmental, and social dimensions. The approach used in this research is quantitative. The data was collected from 50 respondents. These respondents are all elements of Farmer Group's sustainable supply chain. Sampling was done by census and snowball sampling. The research used the Structural Equation Modeling-Partial Least Square (SEM-PLS) method to analyze. This study showed that the supplier does not significantly affect economic performance but has a positive and significant impact on environmental performance and social performance. The manufacturing variable has a positive and significant effect on financial and social performance but does not substantially impact environmental performance. Consumers in a sustainable supply chain have a positive and significant effect on economic performance, environmental performance, and social performance.

Keywords: sustainable; supply; chain; management; performance

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1. Introduction

The demand for coffee has been increasing over time (Hutabarat, 2018; Maciejewski & Mokrysz, 2019). Due to the popularity and appeal of coffee, mainly due to its unique taste and supported by historical, traditional, social, and economic interests (Ayelign & Sabally, 2013), it is proven that many new coffee entrepreneurs have emerged in various regions (Haryati et al., 2021). Along with increasing awareness of the importance of living healthy and free from chemical contamination, consumer interest in organic products is rising (Kamakhya, 2017; Ridzuan et al., 2018). This applies to the consumption of coffee commodity products, especially organic coffee products (Castillo et al., 2018).

"Harapan Tani" Farmer group is the only farmer group in Malang Regency that applies the concept of organic coffee cultivation and has several certificates, including Organic Agriculture Certification Thailand, LeSOS, and ICERT. One of the problems in the supply of organic Robusta coffee is supply chain management. It is because the supply chain is related to the flow and transformation of goods and services from the stage of providing raw materials to the final product and into the hands of consumers (Hong et al., 2018; Matthews et al., 2016). Business actors are required to realize that the competition that occurs is competition between supply chain networks (Gardas *et al*., 2019; Sayed *et al*., 2017). It means that business actors must be able to deliver products that satisfy consumers' wishes in terms of quality, quantity, price, and the right time and place (Furqon, 2014).

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The role of all parties in the supply chain flow is needed to provide products that consumers want and win the competition (Ortas *et al*., 2014). Management of supply chain cooperation requires good coordination and integration within the company and between stakeholders to achieve effective supply chain management (Ramadhan & Amie, 2017). Supply chain management must evolve towards Sustainable Supply Chain Management (SSCM) (Sarkis, 2019). SSCM refers to the integration of sustainable economic, social, and environmental dimensions into supply chain management practices (Narimissa *et al*., 2020; Ahi & Searcy, 2013).

The success of implementing integrated supply chain management with economic, environmental, and social dimensions can be seen through sustainable supply chain performance (Narimissa *et al*., 2020). Along with the development of consumers of coffee commodities increasing day by day, research on Sustainable Supply Chain Management (SSCM) is still rarely carried out, and the application of the concept of sustainable supply chain management is very much needed. Based on this description, this study aims to analyze the definition of supply chain management and performance and the effect of sustainable supply chain management on sustainable supply chain performance on organic Robusta coffee commodities in Malang.

2. Theoretical Underpinning

Coffee cultivated with an organic farming system, where the cultivation process does not use chemicals other than natural, is called organic coffee (Kosasih *et al.*, 2017). Organic coffee cultivation techniques do not use inorganic inputs such as pesticides, inorganic fertilizers, and growth regulators (Sridanti, 2017). Robusta coffee is a type of coffee that is resistant to hot climates, so it can be grown in the lowlands at an altitude of 300–600m above sea level (DITJENPEN, 2019). Robusta coffee has a more bitter taste with almost twice the caffeine content than Arabica coffee, at around 1.5%-3.3% (Van der Vossen *et al.*, 2000).

Sustainable Supply Chain is the main component of sustainable development. Supply chain members must meet environmental and social criteria so that competitiveness is expected to be maintained by meeting customer needs and related economic standards (Taticchi *et al.*, 2013). SSCM practices include stakeholder involvement, product/process design, life cycle assessment (LCA), selection of materials and sources, manufacturing processes, waste management, final product management, and closed-loop systems (Sroufe and Melnyk, 2013). The supply chain is sustainably seen from three aspects: namely economic, environmental, and social; in each dimension of a sustainable supply chain, namely suppliers, manufacturers, and customers (Sopadang *et al.*, 2017).

Its performance will be affected by sound and sustainable supply chain management. The existence of good supply chain performance will make the industry more focused and provide benefits for both the agroindustry and its suppliers, retailers, and consumers (Alim *et al*., 2018). The economic, environmental, and social dimensions are variables to measure the performance of sustainable supply chain management (Sopadang et al., 2017).

This study uses primary and secondary data. Primary data collection techniques were through observation, interviews, and questionnaires. Secondary data was obtained from related agencies, namely the Farmers Group "Harapan Tani" and the Center for Plant Seed and Plant Protection (BBPPTP).

3. Research Method

This study used a quantitative approach and was located in Amadanom Village, Dampit District, Malang Regency, with the unit of analysis for organic robusta coffee companies in Malang Regency. The researcher chose the research location because the Harapan Farmers Group is the only farmer group that applies the concept of sustainable agriculture, namely using organic cultivation. They also have national and international certificates. This research was conducted in March-May 2020. Sample selection used census and snowball sampling.

Primary data collection was carried out by interviewing techniques, online questionnaires via Google forms, and personal chat via WhatsApp social media with members of the Harapan Farmers Group and supply chain elements related to the Harapan Farmers Group. Researchers also conducted observations directly to determine the conditions and situations at the research site. At the same time, secondary data from the Harapan Farmers Group, BBPPTP, reference books, journals, and previous research were also used. The data analysis technique used in this study was both descriptive analysis techniques and statistical analysis methods. The Structural Equation Modeling-Partial Least Squares (SEM-PLS) method was used to analyze the data in the study. This study used SSCM as the independent variable

and performance as the dependent variable. Variables and measurement indicators in this study can be seen in table 1.

Table 1. Research Variables and Indicators

Variables	Indicator	
Supplier	X1.1	Supplier quality
	X1.2	Energy usage
	X1.3	Supplier development
Manufacture	X2.1	Product quality management
	X2.2	Management of the environment
	X2.3	Social responsibility
Consumer	X3.1	Product stability
	X3.2	Sharing information
	X3.3	Building relationships with consumers
Economic performance	Y1.1	Stability and Profitability
	Y1.2	Income distribution
	Y1.3	Continuous expenditure
Environmental performance	Y2.1	Land use
	Y2.2	Material efficiency
	Y2.3	Recycling and waste
	Y2.4	Environmental regulation
	Y2.5	Certificate ownership
Social Performance	Y3.1	Social compliance
	Y3.2	Human resource management
	Y3.3	Consumer satisfaction

The data were analyzed using the Structural Equation Modeling-Partial Least Square (SEM-PLS) method. SEM-PLS analysis was used to determine the effect of exogenous latent variables, namely suppliers, manufacturers, and consumers; on endogenous variables, namely economic, environmental and social performance. The research model can be seen in Figure 1.

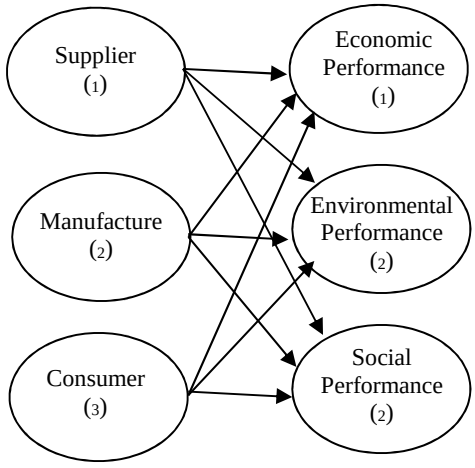

Figure 1. Research Model

4. Results and Discussion

4.1. Evaluation of Measurement Models

This study used reflective and formative indicators. The evaluation of the outer model is used to test the instrument's reliability. The variable can be identified by three criteria: convergent validity, discriminative validity, and composite reliability. These three conditions must meet the requirements. The outer model also specifies the relationship between the latent construct and its indicators.

A. Convergent Validity

The validity test is measured using factor loading for the reflective indicator model; if the factor loading is 0.30 and the P-value is < 0.001, the validity test is accepted (Solimun *et al.*, 2017).

Table 2. Convergent Validity

Item	Loading	P-value
Supplier		
X1.1	0.913	<0.001
X1.2	0.816	<0.001
X1.3	0.857	<0.001
Manufacture		
X2.1	0.771	<0.001
X2.2	0.786	<0.001
X2.3	0.755	<0.001
Consumer		
X3.1	0.845	<0.001
X3.2	0.820	<0.001
X3.3	0.791	<0.001
Economic performance		
Y1.1	0.740	<0.001
Y1.2	0.716	<0.001
Y1.3	0.795	<0.001
Environmental performance		
Y2.1	0.560	<0.001
Y2.2	0.768	<0.001
Y2.3	0.847	<0.001
Y2.4	0.895	<0.001
Y2.5	0.810	<0.001
Social performance		
Y3.1	0.834	<0.001
Y3.2	0.879	<0.001
Y3.3	0.876	<0.001

Based on table 2, we can see that the loading factor value is 0.30, which means the convergent validity in this study is fulfilled. The P-value on each indicator indicates <0.001, so the result can

say that all variables have met the requirements and are declared valid by Discriminant Validity.

According to the discriminant validity criteria, the outer loading indicator on the related construct must have a better value than all the loads on other constructs (Hair et al. 2017). The results of the Square Root of the AVE obtained by each construct are greater than the correlation value between constructs and other constructs in the same column, and the discriminant validity conditions are met.

Table 3. Cross Loading Value

	X1	X2	X3	Y1	Y2	Y3
X1.1	(0.913)	0.087	0.009	-0.117	0.024	-0.096
X1.2	(0.816)	-0.616	-0.256	0.584	0.223	-0.097
X1.3	(0.857)	0.493	0.234	-0.431	-0.187	0.195
X2.1	0.485	(0.771)	0.461	-0.326	-0.179	-0.235
X2.2	-0.287	(0.786)	-0.223	0.246	0.497	-0.293
X2.3	-0.196	(0.755)	-0.239	0.058	-0.334	0.545
X3.1	-0.303	0.060	(0.845)	-0.145	-0.063	0.116
X3.2	0.218	-0.220	(0.820)	0.149	0.054	0.202
X3.3	0.097	0.163	(0.791)	0.000	0.012	-0.334
Y1.1	0.115	-0.330	0.251	(0.740)	-0.032	-0.351
Y1.2	-0.150	-0.194	-0.317	(0.716)	-0.237	0.671
Y1.3	-0.028	0.482	0.052	(0.795)	0.244	-0.278
Y2.1	0.217	-0.654	-0.259	0.246	(0.560)	-0.513
Y2.2	-0.213	0.269	0.301	-0.369	(0.768)	0.156
Y2.3	-0.159	0.401	0.120	-0.506	(0.847)	0.389
Y2.4	0.164	-0.021	0.155	-0.174	(0.895)	-0.204
Y2.5	0.037	-0.200	-0.403	0.210	(0.810)	0.025
Y3.1	-0.058	-0.217	-0.544	0.151	0.387	(0.834)
Y3.2	0.135	0.051	0.052	0.201	-0.013	(0.879)
Y3.3	-0.080	0.156	0.466	0.346	-0.356	(0.876)

Based on table 3, all exogenous and endogenous variables in the study show that each indicator measuring the construct has a more significant cross loading to its construct. The discriminant validity criteria on all research variables are valid. The next test is the Square Root of AVE with the correlation coefficient of the other variables concerned. The Square Root of the AVE is good if the variable is > 0.5.

Table 4. Discriminant Validity

	X1	X2	X3	Y1	Y2	Y3
X1	(0.863)					
X2	0.715	(0.771)				
X3	0.639	0.717	(0.819)			
Y1	0.537	0.762	0.795	(0.751)		
Y2	0.658	0.611	0.724	0.620	(0.785)	
Y3	0.711	0.731	0.740	0.677	0.779	(0.863)

Table 4 shows that the Square Root of the AVE value obtained by each construct is greater than the correlation value between constructs and other constructs in the same column. The AVE value > 0.5 means that 50% or more of the variance of the indicators can be explained well.

B. Weights Indicators

Formative constructs are measured by evaluating two criteria, namely reliability indicators through significant weight (p-value) and collinearity through Variance Inflation Factor (VIF) values (Latan & Ghozali, 2016).

Table 5. Weights Indicator

Y Indicator	P-value	VIF
Y1.1	<0.001	1.213
Y1.2	<0.001	1.183
Y1.3	<0.001	1.289
Y2.1	0.047	1.375
Y2.2	0.029	1.853
Y2.3	0.018	2.705
Y2.4	0.013	2.943
Y2.5	0.022	1.979
Y3.1	0.002	1.698
Y3.2	0.001	2.070
Y3.3	0.001	2.043

Based on table 5, all indicators of the Y variable have a p-value of less than 0.05, which means that they are significant. It means that these indicators meet the criteria for reliability indicators. The VIF value for each variable also shows a value of less than 3.3. It means that the indicator in the study does not have collinearity problems. All indicators of the Y variable are reliable or consistent and have met the requirements for formative constructs.

C. Composite Reliability and Cronbach's Alpha

Composite reliability testing is used to identify the variables that are said to explain the data. The criteria used in this test are that the combined reliability value must be > 0.7 and Cronbach's Alpha value > 0.6 to indicate that the questionnaire used is reliable (Solimun *et al*., 2017). The composite reliability and Cronbach's alpha can be seen in table 6.

Table 6. Composite Reliability and Cronbach's Alpha

Variable	X1	X2	X3	Y1	Y2	Y3
Composite Reliability	0.897	0.814	0.859	0.795	0.887	0.898
Cronbach's Alpha	0.827	0.658	0.754	0.613	0.837	0.829

Based on table 6, the composite reliability test of all research variables has a value of more than 0.7, while the results of Cronbach's alpha test have a value of more than 0.6. All research variables have met the reliability test criteria, which means they have strong reasons to be tested in the structural model (inner model).

4.2. Evaluation of the Structural Model

Evaluation of the structural model aims to see the relationship between latent variables hypothesized previously. The expected structural model assessment includes R-square value, Q-square predictive relevance, effect size (f^2), Goodness of Fit Model test, and Path Coefficient results.

A. The determination coefficient

The value of the coefficient of determination (R^2) measures the variance of the endogenous variables that exogenous variables can explain. In general, R^2 values of 0.75, 0.50, or 0.25 for endogenous variables can be described as indicating that the model is good, moderate, or weak. The results of the coefficient of determination in this study can be seen in table 7.

Table 7. R-square and Adj. R-square Result

	Y1	Y2	Y3
R-Squared	0.868	0.623	0.693
Adj.R square	0.860	0.599	0.673

The R-square value interprets the effect of exogenous variables on latent variables. Based on the data in table 7, the results of the R-square values for the variables Y1, Y2, and Y3, respectively, are 0.868, 0.623, and 0.693. This value can be interpreted as the supplier or supplier variable that can explain 86% of the Y1 variable. In contrast, the remaining 14% is explained by other variables outside the model that were not used in the study. Likewise, the variables Y2 and Y3, 62% and 69%, can be explained by the variance in the manufacturing and consumer variables. The remaining 38% and 31% are defined by other variables outside the model that were not used in the study. The Y1 variable produces an R^2 of 0.868, so the endogenous variable has a reasonable variance. Simultaneously, the variables Y2 and Y3 resulted in R^2 of 0.623 and 0.693, respectively. The endogenous variable has a moderate conflict with the exogenous variable.

B. Q-square Predictive Relevance and Effect Size (f^2)

The Q-square value is used to validate the predictive ability of the model. Endogenous variables with Q^2 values of 0.02, 0.15, and 0.35 indicate that exogenous variables have small, medium, and large predictive relevance for endogenous variables. Effect size is used to see the contribution of exogenous variables to endogenous variables (Hair *et al.* 2017).

Table 8: Predictive Relevance and Effect Size

Using Q-Square	X1	X2	X3	Y1	Y2	Y3
Q-Squared				0.719	0.626	0.697
Effect Size	0.075	0.206	0.254			

The Q-square values for the variables Y1, Y2, and Y3 in this study are 0.719, 0.626, and 0.697, respectively, so the exogenous variables have great predictive relevance for endogenous variables. The effect size values for the variables X1, X2 and X3 are 0.075, 0.206, and 0.254, respectively. The exogenous variables have a small and medium contribution to the endogenous variables. The effect size value or f^2 0.02, 0.15, and 0.35 indicates that exogenous variables have small, medium, and large contribution effects on endogenous variables, respectively.

C. Evaluating the Goodness of Fit Model

The following structural model is evaluated using GoF (Goodness of Fit). The results of the goodness of fit evaluation can be seen in table 9.

Table 9. The Goodness of Fit Model Evaluation

Model Fit and Quality Indices	Fit Criteria	Result	Note
Average path coefficient (APC)	$p < 0.05$	0.326 P=0.003	Fit
Average R-squared (ARS)	$p < 0.05$	0.728 P<0.001	Fit
Average adjusted R-squared (AARS)	$p < 0.05$	0.710 P<0.001	Fit
Average block VIF (AVIF)	Acceptable if ≤ 5, ideally ≤ 3.3	2.483	Fit
Average full collinearity VIF (AFVIF)	Acceptable if ≤ 5, ideally ≤ 3.3	3,434	Fit
Tenenhaus GoF (GoF)	Small ≥ 0.1, medium ≥ 0.25, large ≥ 0.36	0.691	Fit
Sympson's paradox ratio (SPR)	Acceptable if ≥ 0.7, ideally =1	1.000	Fit
R-squared contribution ratio (RSCR)	Acceptable if ≥ 0.9, ideally = 1	1.000	Fit
Statistical suppression ratio (SSR)	Acceptable if ≥ 0.7	1.000	Fit
Nonlinear bivariate causality direction ratio (NLBCDR)	Acceptable if ≥ 0.7	1.000	Fit

Based on the Goodness of Fit (GoF) results in Table 9, the model has a good fit value and a P-value that presents ten indicators of fit. An Average Path Coefficient (APC) measures the average path coefficient contained in a research model. The expected value limit for the APC value by the resulting P-value is <0.05. Based on table 9, the APC value is 0.326 and P = 0.03, so the model formed in this study meets the requirements for significance. Average R-square (ARS) measures the average value of R-square (R2) contained in a research model. The resulting P-value's expected value limit for the ARS value is <0.05. Based on table 9, the ARS value of 0.728 and P<0.01. The model formed in this study meets the requirements of significance.

Average Adjusted R-squared (AARS) measures the average adjusted R-square (R2) value contained in a research model. The resulting P-value's expected value limit for the ARS value is <0.05. Based on table 9, the ARS value of 0.710 and P<0.01. The model formed in this study meets the requirements of significance. Average Block Variance Inflation Factor (AVIF) measures the research model's fit to evaluate multicollinearity problems in a model. The limit of the superior value of AVIF is 3.3, and it is still acceptable/tolerated at a value of 5 (Hair *et al.* l,

2017). Based on table 9, the AVIF value is 2.483; this value is in an ideal category, so the model formed in this study does not have multicollinearity problems.

Tenenhaus GoF (GoF) is similar to Average R-squared (ARS) and defines GoF from the square root of average communality multiplied by R-squared (ARS); when viewed from the calculation formula. The result can conclude that the higher the GoF value, the better a research model (Muhsin, 2016). The expected value limit for Tenenhaus GoF (GoF) has three categories, namely a tiny category if the GoF value is 0.1, a medium type if the GoF value is 0.25, and a large variety if the GoF value is 0.36. Based on table 9, the value of Tenenhaus GoF (GoF) = 0.691 is included in the large category, so the model's power in making predictions in this study is strong. The resulting values for the measurement of model fit are SPR = 1, RSCR = 1, SSR = 1, and NLBCDR = 1, with the limit of the ideal value being 1 and the four measurements of model fit are fulfilled. Conclusion: The ten goodness of fit model measures that the inner model is accepted.

4.3. Path Coefficient and Significance

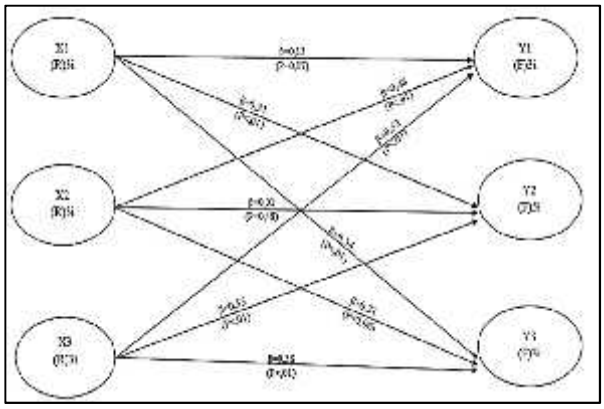

Figure 2. Path Coefficient

Based on Figure 2, the path coefficients on the seven constructs have a positive and significant effect, while the two do not have a considerable impact. The supplier variable on economic performance has a significant effect with the path coefficient value of 0.13 or 13% and has a p-value of less than 0.01 (P<0.01), so the 13% of the supplier variable contributes and has a significant effect on economic performance.

4.4. Equation Model

The model in this study consists of two equations: the measurement model's equation and the structural model's equation. The structural model equation describes the effect of exogenous latent variables on endogenous variables. In contrast, the measurement model equation describes the relationship between exogenous and endogenous latent variables on the indicators.

a. Inner model

$$\eta_1 = 0.13\xi_1 + 0{,}31\xi_2 + 0{,}34\xi_3 + \zeta$$
$$\eta_2 = 0.48\xi_1 + 0.01\xi_2 + 0.21\xi_3 + \zeta$$
$$\eta_3 = 0.52\xi_1 + 0.55\xi_2 + 0.38\xi_3 + \zeta$$

b. Outer Model

1) Exogenous latent variable (supplier)

$$X_{11} = 0.913\xi_1 + \delta_1$$
$$X_{12} = 0.816\xi_1 + \delta_2$$
$$X_{13} = 0.857\xi_1 + \delta_3$$

2) Exogenous latent variable (manufacture)

$$X_{21} = 0.771\xi_2 + \delta_4$$
$$X_{22} = 0.786\xi_2 + \delta_5$$
$$X_{23} = 0.755\xi_2 + \delta_6$$

3) Exogenous latent variable (consumer)

$$X_{31} = 0.845\xi_3 + \delta_7$$
$$X_{32} = 0.820\xi_3 + \delta_8$$
$$X_{33} = 0.791\xi_3 + \delta_9$$

4) Endogenous latent variable (economic performance)

$$Y_{11} = 0.740\eta_1 + \varepsilon_1$$
$$Y_{12} = 0.716\eta_1 + \varepsilon_2$$
$$Y_{13} = 0.795\eta_1 + \varepsilon_3$$

5) Endogenous latent variable (environmental performance)

$$Y_{21} = 0.560\eta_2 + \varepsilon_4$$
$$Y_{22} = 0.786\eta_2 + \varepsilon_5$$
$$Y_{23} = 0.847\eta_2 + \varepsilon_6$$
$$Y_{24} = 0.895\eta_2 + \varepsilon_7$$
$$Y_{25} = 0.810\eta_2 + \varepsilon_8$$

6) Endogenous latent variable (social performance)

$$Y_{31} = 0.834\eta_3 + \varepsilon_9$$
$$Y_{32} = 0.879\eta_3 + \varepsilon_{10}$$
$$Y_{33} = 0.876\eta_3 + \varepsilon_{11}$$

4.5. Hypothesis Testing

The central hypothesis determined in this study is to assess the effect of sustainable supply chain management on sustainable supply chain performance; hypothesis testing used the WarpPLS software application. The decision rule for hypothesis testing is that if the p-value of 0.10 is said to be weakly significant if the p-value of 0.05 is substantial. If the p-value is 0.01, it is highly significant (Solimun *et al.*, 2017). The path coefficient and p-value are in table 10.

Table 10. Path Coefficient and P-value

Path Coefficient	path coefficient	p-value	Explanation
Supplier – Economic performance	0.128	0.173	Rejected
Supplier – Environmental performance	0.313	0.008	Accepted
Supplier – Social performance	0.343	0.004	Accepted
Manufacture – Economic performance	0.483	<0.01	Accepted
Manufacture – Environmental performance	0.006	0.484	Rejected
Manufacture – Social performance	0.211	0.056	Accepted
Consumer – Economic performance	0.523	<0.01	Accepted
Consumer – Environmental performance	0.551	<0.01	Accepted
Consumer – Social performance	0.381	0.002	Accepted

The results of the path coefficient test and p-value indicate that the supplier variable with environmental performance, supplier variable with social performance, and processing variable with social performance have a positive and significant effect with estimates of 0.08, 0.04, and 0.056 at a significance level of p<0.1 (alpha 10%) weakly significant. The consumer variable with social performance has a positive and significant effect with an estimated value of 0.002 at a significance level of p <0.05 (alpha 5%) significant. Processing variables with economic performance, consumer variables with processing performance, and consumer variables with environmental performance have a positive and significant effect with estimated values of 0.483, 0.523, and 0.551 at a significance level of p<0.01 (alpha 1%) highly significant. Different results are shown in the supplier variable with economic performance and processing with environmental performance. Both have no significant effect because their values exceed the three hypothesis testing rules. Overall, there are two rejected hypotheses, namely the effect of suppliers on economic performance and the effect of manufacturing on environmental performance.

4.6. Effect of Suppliers on Sustainable Supply Chain Performance

The results of the supplier variable do not have a significant effect on the economic performance variable. The results of the path coefficient test are 0.128 and the P-value, which has a value of more than 0.1, which means the hypothesis rejected the first hypothesis (H1). Economic performance indicators used instability and profitability, income distribution, and sustainable expenditure. The result cannot achieve sustainable economic performance only through supplier development or assessment based on sustainability indicators and increasing knowledge in a supply chain.

Soil quality research to create smooth coffee production at Farmers Group has never been carried out. The educational facilities provided to farmer group members are still limited due to limited funds. The certification renewal, which is required every three years, also requires many funds. Previous research conducted by Rahmani *et al.* (2018) found that sustainable economic performance requires costs associated with supplier evaluation and management and requires a significant allocation of resources.

Table 10 also shows that the supplier variable has a positive and significant effect on the environmental performance variable. Supplier variable on environmental performance with a value of 0.313 and calculated P which has a value of 0.008; means the second hypothesis is accepted (rejected H0). Environmental performance indicators used are material efficiency, land use, waste recycling, and environmental regulations. The Farmers Group participates, supports, and complies with all forms of activities related to the environment. The Farmers Group's compliance by possessing ICERT and Thai Agricultural Certificate on organic farming systems. Previous research conducted by Rahmani *et al.* (2018) obtained similar results: sustainable environmental performance by developing and accessing accurate suppliers based on sustainable environmental performance indicators used in a study.

The supplier variable has a positive and significant effect on social performance. Table 10 shows that the results of the path coefficient test of the supplier variable on social performance have a value of 0.343 and a P-value of 0.004, so the third

hypothesis is accepted (rejected H0). Social performance indicators are used in human resource management, social compliance, and customer satisfaction. The Farmer's Group improves the ability of its members by planning training and education for farmer groups to support advanced agriculture; besides that, the farmer group also forms an ICS (Internal Control System) which aims to comply with all organic farming regulations. Consumer satisfaction is strived for by establishing direct communication with consumers for the continuity of organic coffee production.

Meetings with all members of the Farmers Group are held once a month to discuss internal conditions, marketing progress, and all problems or obstacles. Previous research by Rahmani *et al.* (2018) states that sustainable supplier management practices positively affect social performance. Suppliers in the supply chain can improve social performance. Suppliers also increase social responsibility among staff and managers in the supply chain. supply is related to the product offering.

4.7. Effect of Manufacture on Sustainable Supply Chain Performance

Based on table 10, manufacturing has a positive and significant effect on economic performance variables. The path coefficient test of the manufacturing variable on the economic performance of 0.483 and P-value <0.001. It means that the fourth hypothesis is accepted (rejected H0). The manufacturing variable indicators used are product quality management, environmental management, and social responsibility. The result can achieve sustainable economic performance through product quality management and other manufacturing indicators. The Farmers Group has its SOP for its production. The Farmers Group also has a cost calculation for the coffee production process in the books. Following the statement of Ferrero *et al.* (2015) that quality management is concerned with improving the quality of products and processing processes, maintaining equipment and productivity levels, and optimizing the production processes of supply chain companies.

The results of this study indicate that the manufacturing variable does not have a significant effect on the environmental performance variable. The results of the path coefficient test, which is positive at 0.006 and has a P-value of more than 0.1, mean the fifth hypothesis (H5) is rejected. This study cannot achieve sustainable environmental performance through product quality management or assessment based on sustainability indicators from other manufacturing variables. The Farmers Group uses fermented coffee husk waste as organic fertilizer, even though Farmers Group has several organic certificates stating that the farming system used is included in the organic category, but the packaging and fuel processing machines used are still not environmentally friendly.

The Robusta coffee product of the Farmers Group still uses aluminum foil as packaging. However, aluminum foil has a complicated structure to decompose by soil, so it takes longer and needs to be recycled so as not to pollute the earth. Anggraeni *et al.* (2017) stated that aluminum foil could cause environmental pollution. It takes approximately 400 years for aluminum to decompose in the soil. Burning is one way to destroy it, but this method is considered ineffective because it will cause air pollution (CO2), and the aluminum foil will still be left behind (Fernando, 2012). The product processing machine uses diesel fuel to cause noise and air pollution. The Farmers Group has not yet carried out a manufacturing environment design or design for the environment, so a certificate for the domain has not been obtained. The method of the manufacturing environment is the systematic planning of the overall engineering design details that is appreciative of the environment, while the main target is environmental safety and health over the entire material life cycle, product production, and distribution processes for the sustainable use of products by consumers (Rizal, 2018).

The manufacturing variable has a positive and significant effect on social performance. Table 10 shows that the results of the path coefficient test of the manufacturing variable on social performance have a value of 0.211 and a P value of 0.056, so the sixth hypothesis is accepted (rejected H0). Social performance indicators in human resource management, social compliance, and customer satisfaction. The Farmers Group has its own way of carrying out its social responsibilities, namely by using labor from the surrounding community to reduce unemployment. In the production process and when picking coffee, Farmers Group uses local community workers to provide appropriate salaries. It has social programs for the surrounding community, one of which is ecotourism. The Farmers Group's coffee ecotourism, which is currently still in the

form of educational tours, hopes to involve young people and women's farmer cooperatives. One of the training sessions for members of the Indonesian Coffee and Cocoa Research Center, Jember. As *et al.* (2016), sustainable operations management improves employees' health, safety, and overall salaries by reporting quantitative and qualitative information on the company's sustainable performance and humanitarian commitment to social groups.

4.8. Effect of Consumers on Sustainable Supply Chain Performance

The consumer variable has a positive and significant effect on economic performance. Table 10 shows that the results of the path coefficient test of the consumer variable on financial performance have a value of 0.532 and a P-value of <0.01, so it can be said that the seventh hypothesis is accepted (rejected H0). Consumer variable indicators are used in product stability, sharing information, and building relationships with consumers. The Farmers Group adheres to the principle of maintaining the distinctive taste of Kopi Dampit. The mechanisms for ordering organic coffee products from Farmers Group are traditional marketing and group marketing.

Traditional marketing sells coffee products directly from individual farmers to consumers. Group marketing sells organic coffee products in groups at Farmers' Group; then, the collected coffee is sent to partner or export companies (Europe, America, and the Netherlands). Farmers. Promotion of coffee products online and offline. Online advertising is carried out through social media, such as Facebook, and WhatsApp, while offline promotion is carried out by participating in coffee exhibitions. Post-purchase communication of organic coffee products was conducted to determine consumer perceptions of Farmers Group's organic coffee products. According to Rahmani *et al.* (2018), by collecting customer information and sharing consumer knowledge to find consumer expectation, consumer management can lead to sustainable economic performance in the supply chain.

Based on the results of this study in table 10, the consumer variable has a significant effect on the environmental performance variable. These results can be seen through the results of the path coefficient test, which is positive at 0.551, and a P-value of less than 0.01, which means that the eighth hypothesis is accepted (rejected H0). Consumers of Farmers Group buy organic coffee products for various reasons, one of which is the taste and environmental friendliness of the product. The Farmers Group also processes coffee husks or cascara waste so that all parts of the fruit in the coffee are used. Rahmani *et al.* (2018) show that customer expectations about environmental factors such as pollution control and environmental resources can be met by collecting and managing customer information to design products with environmental aspects in mind.

Table 10 also shows that the consumer variable has a positive and significant effect on the social performance variable. These results can be seen through the results of the path coefficient test of the supplier variable on social performance, which has a value of 0.381 and a calculated P which has a value of 0.002, which means that the ninth hypothesis is accepted (rejected H0). The communication carried out by Farmers Group to consumers regarding products, and customer satisfaction is an attempt to build relationships with consumers. Through this communication, the farmers' group can dig up information about consumer needs and receive opinions from consumers to improve product quality. Rahmani *et al.* (2018) found that customers play an essential role in moving organizations towards sustainable performance. By observing consumer behavior, there will be confirmation of the need for sustainability in an organization. The successful collaboration between Farmers Group and several sales partners, both local and international, results from successful communication and promotion. Following Brik et al. (2011), social responsibility causes organizations to move towards sustainability and sustainable performance by providing information to customers and suppliers about sustainability.

5. Conclusion

This study was conducted to determine whether there is an effect between sustainable supply chain management and sustainable supply chain performance. The researcher conducted a primary construct test of the components of the sustainable supply chain management variable, namely suppliers, manufacturers, and consumers. In contrast, the sustainable supply chain performance variables included economic, environmental, and social performance. The raw materials used for organic coffee products come from internal suppliers, using organic Robusta coffee harvested by members of the Farmers Group. The organic Robusta coffee beans are then processed independently with the help of

processing machines. In addition to processing Farmers Group coffee beans, they also process coffee husks, or cascara. The Farmer Groups of coffee products include roasted beans, ground coffee, and cascara. Products are marketed through two events, namely individuals and groups. Individual marketing is carried out with the consumer system directly contacting the Farmer Group of coffee. In contrast, group marketing is carried out with the design that all the harvests of Farmers Group members are collected and then sent to the company or exporter.

The supplier variable does not have a significant effect on economic performance. This is evidenced by the P-value results that exceed the 10% significance limit. This occurs due to limited funds to conduct soil quality research for the smooth production of coffee and educational facilities provided to members of farmer groups. But the supplier variable has a positive and significant effect on environmental and social performance. The manufacturing variable has a positive and significant impact on economic and social performance but does not substantially affect environmental performance. P-value results exceed the 10% significance limit; this happens because the packaging is still made of aluminum foil and other materials. The fuel processing machine used is diesel, so it is still not environmentally friendly. Consumer variables have a positive and significant effect on economic performance, environmental performance, and social performance. Because consumers are users of organic coffee products, Farmers Group can adjust to consumer tastes.

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