Influence of Implementation Chain of Custody Forest Management System FSC-STD-40-004 V3-0 to Business Performance of Paper Industries in Banten Indonesia

Priyono Budi Santoso, Agus Purwanto, Masduki Asbari

Abstract: The purpose of this study was to determine the effect of the implementation of the FSC-STD-40-004 V3-0 FSC-STD-40-004 Chain of Custody Forest Stewardship Council (CoC FSC) on business Performance. This research was conducted in several companies that use paper material in Banten Province of Indonesia with 155 respondents from 15 companies that have implemented the FSC CoC Management System for at least 5 years. The research background is due to lack of research on the benefits of CoC FSC in companies in the Banten Province of Indonesia. The data collection was carried out by distributing questionnaires on april until may 2019 and analyzing data processing use Structural Equation Model (SEM) and software Linear Structural Model (LISREL) version 8.70. The results show that the implementation of the CoC FSC Management System significantly influenced business performance such as increase customer satisfaction index, increase sales, increase productivity and safety and employee satisfaction

Keywords : Chain of Custody, Forest Stewardship Council, Business Performance

I. INTRODUCTION

The Forest Stewardship Council (FSC) was established in 1993 by business groups, environmentalists and community leaders to monitor changes towards sustainable forest management around the world [1]. The aim of implementation forest management is to convince consumers that the wood products and forest products they buy come from well-managed forests that meet environmental, social and economic criteria [2]. Chain of Custody (CoC) certification is a certification system developed by the FSC to verify the origin of forest products used in the production process, originating from responsible sources, there are mechanisms that can trace the origin of forest products and ensure they are safe from mixing of uncertified raw materials. Because it relates to forest products, the chain of custody certification is applied to all supply chain companies, from which wood is processed, formed, packaged, and transported to the hands of consumers. Chain of custody certificates can be given to companies if the certification body can verify the origin of the wood used in production comes from FSC-certified sources, in addition to production, converting, handling and packaging,storage until the hands of consumers are not mixed with other raw materials that are not certified (FSC.org, 2019).

Chain of Custody Certification, also known as CoC FSC and applies to FSC certified producers, manufacturers and traders of forest products. Chain of Custody ensures that the raw material for the product comes from FSC-certified forest sources and the production process along the supply chain is not mixed with other uncertified raw materials, except for Controlled Wood. Standard of FSC-STD-40-004 v3-0 is the main standard for FSC CoC certification that sets requirements that applied since april 2017 for all certified organizations covering the scope of processing, labeling, and selling forest-based raw material products as FSC certification. The number of FSC certificates worldwide that have been issued for both forest management and chain of custody (FSC-COC) schemes continues to increase beyond the total area of COC certified FSC is 195,170,660 ha, and the number of countries that have been certified CoC FSC is 84 countries with 1,526 certificates issued in 2017 (FSC.org, 2019)

The purpose of monitoring forest resources is to reduce unplanned deforestation, restore and rehabilitate degraded forests, sustainable management of forests, and evaluate the function of carbon sequestration by forests, forested lands and trees outside the forest to moderate the global climate [3]. Protecting tropical forests is becoming increasingly urgent because of the decline in forest areas by 6% and 17% global carbon dioxide emissions [4] more is needed about ways to reduce forest loss and maintain oxygen stocks [5] [6] [7] [8]. Most of the forest becomes deforestation and high forest degradation [9]. Deforestation contributes greatly to increasing global greenhouse gas emissions and resulting in climate change [10]. Many people who live in or near these forests are highly dependent on forest resources and their livelihoods are threatened by deforestation [11].

WWF (2005) summarizes that working in the forest industry has become the largest beneficiary of FSC certification through improvements in the implementation of health and safety laws and guidelines. Dependence on well-trained staff, supported by increased training and training compliance with social taxation requirements has led to proven working conditions for those working in FSC certified forests.

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[12] examined and found that 91% of FSC-certified CoC companies were required to increase the training of their workers, 82% increase safety, and as much as 64% increase workers' wages. [13] as many as 183 out of 12 Russian forest companies that are FSC CoC certified covering a total area of more than 3.5 million ha found that the results of the FSC certification strengthen work rights for forest company workers. [14] examined the majority of COC FSC-certified regional companies as workers' protection increased and postponement of salary decreased. Workers understand that certification can be used as a social protection tool.

There have been many companies that have certified COC FSC and in 2019 companies in Indonesia have already certified as many as 580 FSC CoCs (FSC.org,2019). many companies that are FSC COC certified and in 2019 companies in indonesia including Banten Province Indonesia which have been certified as many as 580 companies, the main purpose of implementing CoC FSC is to fulfill government regulations and also requests from customers, there are several objectives to be achieved namely increase business performance such as customer satisfaction index, increase sales, increase productivity and safety and employee satisfaction.

The purpose of this study was to determine the effect of the application of CoC FSC on company business performance. The urgency of this study is the first because there has not been any study on the effect of applying CoC FSC specifically on companies in Banten province and as input for the owners of wood-based companies to implement CoC FSC . The novelty of this research is the first study that analyzes the effect of the CoC FSC implementation on business performance of companies in Banten Province Indonesia.

II.   METHODE

Data analysis of this research using the Structural Equation Model (SEM) using a Linear Structural Model (LISREL) version 8.70. [15] using LISREL to test the relationship between the latent variables and indicators - indicators. Construct validity and reliability of the indicators in this study conducted by Confirmatory Factor Analysis (CFA). Testing the validity and reliability of the instrument was performed using confirmatory factor analysis to obtain valid and reliable data. Second-order confirmatory factor analysis (2nd Order CFA) is a measurement model consists of two levels. The first level of analysis performed on the latent constructs all aspects of the indicators and the analysis is done of latent constructs to construct its aspects. Through the CFA not only be done testing the validity of a construct (Construct Validity) but also reliability testing constructs (Construct Reliability). The construct has good reliability is if the value of Construct Reliability (CR) ≥ 0.70 and variance extracted values ≥ 0.50.

Data This study is based on questionnaires distributed in 155 respondents from 15 companies that have implemented the FSC CoC Management System for at least 5 years in Banten Province. Based on the previous studies and the purpose of writing this study, it created a research model as follows:
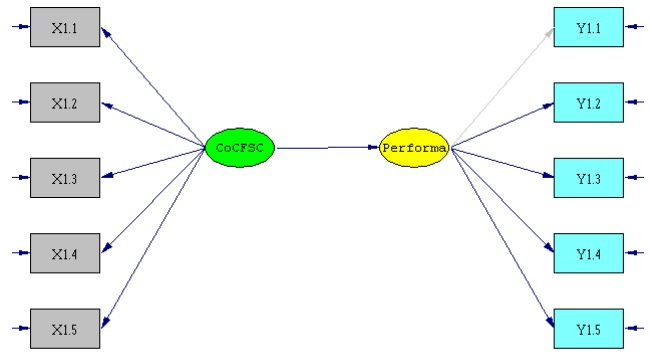
Figure 1 Model of Research

Note : The figure 1 is derived from the output of the Lisrel program (authors, 2019)

Based on the above research model made the following hypotheses:
1. Ho : There is a no significant and positive relationship between the implementation of CoC FSC (X) to the Business Performance (Y).
2. H1 : There is a significant and positive relationship between the implementation of CoC FSC (X) to the Business Performance (Y).

Based on the hypothesis of the indicator - an indicator of the variables used in this study are indicators of Dependent Variables X (Implementation CoC FSC), namely CoC management system (X1), Material sourcing & Handling (X2),FSC material and products records(X3), Sales (X4),FSC labelling requirements (X5) (FSC.org,2019), Indicators of Dependent Variables Business Performance (Y), namely as increase customer satisfaction index (Y1) , increase sales (Y2) , increase productivity (Y3) , safety (Y4) and employee satisfaction (Y5).

Table 1 Profile of Respondents

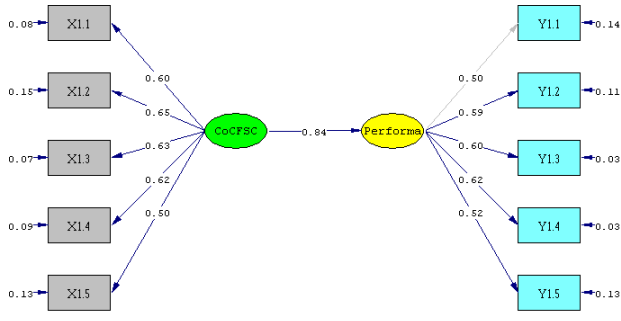| Job Title	Man	Woman	Total
Top Management	15	5	20
FSC Coordinator	24	15	39
Manager	23	12	35
Supervisor	40	21	50
Total	102	53	155

Note : The respondent profile table is derived from a summary of the questionnaire returned (authors, 2019)

The distribution of questionnaire data from March until April 2019, data on companies that implemented the FSC CoC were obtained from info.fsc.org

III.   RESULT AND DISCUSSION

The first step is to create a syntax program on Lisrell software after that the program is run to get the loading factor of CoC FSC variable (X) and Business Performance Variable (Y) and to determine the t value of each variable. Data analysis is done by Structural Equation Model (SEM) using a Linear Structural Model (LISREL) version 8.70 of Joreskog and Sorbom (2008), and the results are in the following figure.:
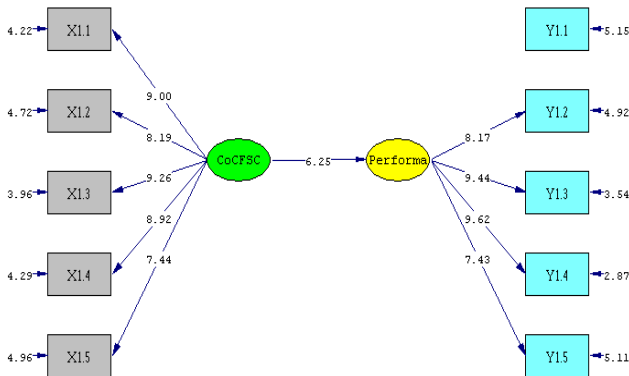
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Figure 2 Loading factor Value Indicator

Note : The figure comes from the output of the Lisrel program processing (authors,2019)

Chi-Square=100.44, df=34, P-value=0.00000, RMSEA=0.182

Figure 3. t-Value Indicator

Note : The figure comes from the output of the Lisrel program processing (authors, 2019)

Based on figure 2 and figure 3 is concluded that no error variance negative value, and the value of the indicator CoC FSC above the loading factor of 0.5 (> 0.5) and for value loading factor < 0.5 will be issued. The entire value of t which to test the significance of the value of the loading factor of greater than 1.96 (> 1.96). It is that all valid and significant indicator. Then the results of the output lisrell of each indicator and loading factor are summarized in the table for analysis of validity and reliability summary of the results of the analysis can be seen in the following table:

Table 2 Results of 2nd Order Analysis Indicators CFA Construct Validity

Variable	Indicator	Loading Factor	T-Value
CoC FSC (X)	X1	0.60	9.00
	X2	0.65	8.19
	X3	0.63	9.20
	X4	0.62	8.92
	X5	0.50	7.40
Busesiness Performance (Y)	Y1	0.50	
	Y2	0.59	8.17
	Y3	0.60	9.44
	Y4	0.62	9.62

	Y5	0.52	7.43

Note The table comes from the output of the Lisrel program processing (authors, 2019)

Based on the above test results showed that the value of the loading factor is obtained entirely above 0.5 (> 0.5), and all the t value obtained is more significant than 1.96 (> 1.96). A summary of the results of the above analyses can be seen in Table 3.

Table 3 Analysis For the 2nd Order CFA OCB Construct Validity

Variable	Loading Factor	T-Value
CoC FSC (X)	0.84	6.25

These results can be concluded that CoC FSC (X) can be summed valid and significant. Results of validity are also reinforced by the value of Chi-Square (r) that generates a value of 100.44. The next step to calculate the value Construct Reliability (CR) and Variance Value entrance (VR), Construct reliability is a measure of the internal consistency of indicators that show the formation of a variable degree in the variable formed. Extracted variance is a measure of how much of the variance of the indicators were removed by the variable created. Two approaches can be made to assess the reliability of the measurement model is test construct reliability and variance extracted for each latent variables (Hair et al. 2010). the next step is to summarize the value of construct reliability and variance extracted from the loading factor value of each variable in the following table.

Table 4 Results of 2nd Order Analysis Construct Reliability.

Indicator	Loading Factor	Loading Factor2	1-Loading Factor2	CR	VE
X1	0.60	0.360	0.640		
X2	0.65	0.423	0.578		
X3	0.63	0.397	0.603	0.75	0.55
X4	0.62	0.384	0.616		
X5	0.50	0.250	0.750		
Total	1.814	3.186	1.814		
Y1	0.50	0.250	0.750		
Y2	0.59	0.348	0.652		
Y3	0.60	0.360	0.640	0.73	0.52
Y4	0.62	0.384	0.616		
Y5	0.52	0.270	0.730		
Total	2.830	1.613	3.387		

Note : Table comes from the output of the Lisrel program processing (authors, 2019)

Based on the calculation formula CR construct reliability was obtained results and indicators VE for CoC FSC (X) of 0.75 (CR) ≥ 0.70 and 0:55 (VE) ≥ 0.50. and concluded that the variable CoC FSC (X) has good reliability and value constructs have good reliability.

Businnes Performance Indicators (Y) of 0.74 (CR) ≥ 0.70 and 0:52 (VE) ≥ 0.50. and concluded that the Business Performance has good reliability and value constructs have good reliability. Therefore, based on the results of the analysis of the reliability calculation can be concluded that the reliability of the whole is a good indicator and conclude that the research meets the requirements of all phases of testing.The next step is to carry out the Analysis of Goodness of Fit (GOF), GOF data obtained from the results of the software execution

Analysis *Goodness Of Fit (GOF)*
Test the suitability of the model in the overall model fit about the analysis of statistical GOF value generated by the program lisrel, for the relevance of the model (model fit) are good enough and for its model fit the criteria as shown in Table 5.

Tabel 5 *Goodness Of Fit*

Indeks Fit	Value	Value Standard	Remark
Chi-Square	100.44	>0.5	Fit
Root Mean Square Error of Approximation (RMSEA)	0.07	<0.08	Fit
Normed Fit Index (NFI)	0.91	>0.90	Fit
Non-Normed Fit Index (NNFI)	0.92	>0.90	Fit
Comparative Fit Index (CFI)	0.94	>0.90	Fit
Incremental Fit Index (IFI)	0.94	>0.90	Fit

Note : Table comes from the output of the Lisrel program processing (authors, 2019)

Based on the results of the analysis above can be seen that all fit indices stated that the model fit. These results indicate that the variable is declared valid and reliable so that it can be concluded that the overall model is still a good match. Model equation (Structural Equations) linear from 8.70 LISREL software obtained as follows:

Structural Equations
Performa = 0.84*CoCFSC, Errorvar.= 0.29 , R² = 0.71
(0.13)   (0.086)
6.25   3.38

Figure 4 Structural Equations
Note : The figure comes from the output of the Lisrel program processing (authors, 2019)

Based on the results from all the above analysis, it can be seen that the application of COC FSC (X) is a positive and significant effect on Business Performance with t value equal to 6.25 The goodness of fit models is produced pretty good with chi-square value of 100.44. For the virtue of fit criteria, the other also already qualified as needed. Rated R Square of 0.71 means the Implementation of CoC FSC affect the business Performance by 71% while other factors influence 29%. So summarized and obtained the following regression equation Y (Business Performance) = 0.84 x CoC FSC Implementation + Error

IV. DISCUSSION AND CONCLUSION

Based on the analysis of the results of research can be concluded that the implementation of the CoC FSC has a positive and significant impact on influenced business performance such as increase customer satisfaction index, increase sales, increase productivity and safety and employee satisfaction so that it will increase the company's profit The research object not only in Banten province but could also be extended to other provinces. The results of this study the application of the FSC CoC management system has an influence on the company's business performance so that companies that have not implemented it are recommended to immediately implement it, this study reinforces the results of previous studies

This study contributes to the research into the benefits of CoC FSC certification, The limitation of this study is that it does not discuss financial performance indicators, so in future research financial performance can be measured over a certain period of time. Other than that,a comparison of the financial performance of FSC CoC Certificate holders can be made. FSC CoC certification applies to all organizations that trade, process or produce wood and forest products. The FSC CoC certificate is valid for all trading, processing activities or making wood and non wood products, The benefits of implementing FSC certification namely maintaining customers are the main benefits of FSC certification, increasing new customers, increase in exports, increase company image, profit and increase, commitment to environmental responsibility which enhance the company's image, promote, sustainable use of forest resources, improve communication with customers, prevent illegal logging, and improvemanagement efficiency.

Overall, this research encourages the implementation of FSC certification. FSC certification can beserves as a signal to customers that the company is implementing standards that ensure traceability of ingredients, FSC certification allows them to be competitive, and they must maintain FSC certificates in order to survive in the market. The results of the study show that FSC certification is a prerequisite for competitiveness for companies. One of the benefits of this research is to convince the owners of timber and processing companies to get COC FSC certified because the benefits of its application have been tested and also as a form of compliance with laws and regulations so as to enhance the good image of the company

LIMITATION

This study has several limitations, the sample not representative of the target population, the number of samples that are not much due to limited time and cost, the object of this study is only industry companies in Banten Province even though more other companies have implemented in othes Provincies. the limited time of the study and the number of respondents who only 155 people have not convinced to generalize the results of researchSoftware used for data analysis is Lisrel and a lot of people not yet familiar with this software. this study does not discuss financial indicators so that it cannot be known the real financial benefits of applying coc fsc, for the following research to discuss financial indocators by comparing the financial condition of CoC FSC certified and uncertified companies. This research only examines the paper industry even though many companies are implementing COC FSC such as wood distributors, wood factories and others. For further research it is advisable to examine companies throughout the FSC CoC chain from wood to end users

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CONFLICT OF INTEREST

The authors certify that they have NO affiliations with or involvement in any organization or entity with any financial interest (such as honoraria; educational grants; participation in speakers' bureaus; membership, employment, consultancies, stock ownership, or other equity interest; and expert testimony or patent-licensing arrangements), or non-fi nancial interest (such as personal or professional relationships, affiliations, knowledge or beliefs) in the subject matter or materials discussed in this manuscript.

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