

Green Operations Management with Green Business and Green Marketing Perspective

Dewi Nusraningrum¹, Sugeng Santoso², Jajang Gunawijaya³, Delita Kusuma Gading

^{1,2,4}Universitas Mercu Buana, ³Universitas Indonesia, ¹dewinusraningrum@mercubuana.ac.id, ²sugeng.santoso@mercubuana.ac.id, ³j_gunawijaya@yahoo.com, ⁴delitakusuma@gmail.com

ABSTRACT:

Management operations of the company as a necessity that is not inevitable by the company both manufacturing and services, cannot avoid the global trend of green operations in which the company's operations must not damage the environment or should be environmentally friendly, although it is required to benefit the company in order to awake its business sustainability with orientation on save the Earth, profit and humanity. The research was conducted to determine the influence of green operations management on green marketing, green operations management of green business and green business towards green marketing. The results show that the influence of green operations management on the influential green marketing is not significant, green operations management positively influence the green business and green business effect positively on green marketing.

Keywords:

green operations management, green business, green marketing, green company

Article Received: 18 October 2020, Revised: 3 November 2020, Accepted: 24 December 2020

INTRODUCTION

Green and environmental or environmentally friendly become something important for the company in carrying out corporate operations. Industrial awareness will be environmentally friendly making the emergence of various governance with green concept or environmentally friendly. This is driven by the rapid flow of information about matters relating to management of environmentally friendly operations around the world, causing industry actors to apply the concept of green to maintain its business sustainability. In accordance with law No. 05 year 1984 Article 3 concerning environmental concern and increase in public awareness of the importance of environmental protection and supported research results (Baihaqi & Bramanti, 2018) explains the risks that arise in the whole business process sustainably from environmental aspects. Environmental expert Emil Salim and SWA Magazine initiated awarding awards to companies that apply green principles to operations management of its company to keep the environment awake (Pratiwi, 2013). Environmentally friendly green business part of its long supply chain performance (Chinander, 2000; Beamon, 1999; Labuschagne and Van Erck,

2005) and on Green Operations management company.

Companies in Indonesia that have implemented green operations management are; a) PT Indonesia Power UBP Perak Grati - reduce fuel mix of fuel to 2% by gas-based green power plant. b) PT Gajah Tunggal - make eco-friendly car tires so fuel-efficient up to 11%, lower noise, and the grip (gear) of the tyre is more durable. c) PT Summarecon Agung - providing housing with tree facilities, biopori, water, and waste management facilities. d) PT Holcim Indonesia - Electricity Prespicator to capture the smoke powder and cement dust. e) PT Martina Berto - cultivate over 500 organic medicinal plants through Indonesian farmers to be produced into herbs, cosmetics and aromatherapy. f) PT Bank Negara Indonesia - include risk calculation or environmental mitigation as a form of strategy of sustainable banking business management through green lending, green funding, green mortgage, and green CSR. g) PT Garuda Indonesia - Implement improve technology, bio fuel usage, effective operations, and infrastructure efficiency (fuel) that impacts Carbon reduction through aircraft rejuvenation less than 5 years to be more energy

efficient, low carbon, and environmentally friendly. h) PT Bio Farma -Implement raw material efficiency, innovation of production facilities, available clean to avoid contamination

from outside, save energy, water, and electricity, ISO 14001 standard, and have International standard quality assurance.

Table 1. Ratings Green Company in Indonesia

No.	Company	Product
1.	PT Bio Farma (Persero)	Pentavalent vaccine for treating diphtheria, artitis, tetanus, hepatitis A, and hepatitis B.
2.	PT Garuda Indonesia (Persero) Tbk	Domestic and international aviation services
3.	PT Bank Negara Indonesia (Persero) Tbk (BNI)	Banking
4.	PT Martina Berto Tbk	Cosmetics, herbs, aromatherapy
5.	PT Holcim Indonesia Tbk	Concrete, Cement
6.	PT Summarecon Agung Tbk	Housing
7.	PT Gajah Tunggal Tbk	Wheel Tires
8.	PT Indonesia Power UBP Perak Grati	Fuel

Source: [2]

From the green rankings table companies in Indonesia showed that there are many other companies in Indonesia that have not implemented green business or green business in Indonesia. Hence, the author is interested in conducting research on the influence of green operations management on green business, the

influence of green operations management on green marketing and green business influence on green marketing. This research is very important considering many companies in Indonesia who have not fully adopted green principles in operations management, and its marketing.

LITERATURE REVIEW

Green Operations Management Research has been conducted previously about green supply chains, green products, green and lean operations management (Kleindorfer, et.al., 2005; Corbett & Klassen, 2006; Bai & Sarkis, 2010). Green operations management starts from planning, the production process until the management of waste that all are managed in green (Srivastava, 2007), so that all decision-making in business operations use green size (Golicic, 2010). Almost all operations management manufactures goods and services (Slack & Lewis, 2017) including the operation of supply chain management which is a system of places from the combination of organizations that distribute their production goods or services to customers (Darojat & Yunitasari, 2017). Integration of environmental perspectives into supply chain management

includes product design, selection and selection of raw material sources, manufacturing processes, delivery of final products to consumers, as well as the management of products after their lifetime (Rohdayatin, 2018). So that environmental governance is based on environmental perspective, which is how to reduce waste and environmental impact caused by supply chain activities which is a long-term non-financial aspect important to the environment in maintaining good relations for the sustainability of supply chain activities.

Eco-friendly production, environmentally friendly procurement, environmentally friendly purchasing, environmentally friendly management, environmentally friendly design, environmentally friendly architects, environmentally friendly culture, eco-friendly

productivity and so forth as a green business (Hasan, 2016), where the green supply chain management oriented on long-term survival but also impactful for long-term profitability, company image as well as competitive advantage will increase in the future (Azari,et.al., 2018).

Green Marketing encompasses the marketing of products that are considered safe for the environment, development and marketing of products designed to minimize the negative impacts on social environments and improve quality (Karl & Kinnear, 1976), the company's strategic efforts to produce environmentally friendly goods and services (Grewal & Levy, 2020), satisfying the wider community (Kumar, 2016) involving stakeholders (Hult, et.al., 2008).

The goal of Green marketing to communicate that brand or company cares about the environment, commercialization to improve and maintain the environment by changing environmentally conscious lifestyles (Grant, 2007), such as; paper saving, water saving, electricity saving, air conditioning saving, etc. Other objectives of product development production, use, the results of sales for environmental interests, and disposal process positively impact the environment (Hawkins, 2010).

From phenomena and previous research results the hypothesis of this research are:

- H1 : There is an influence between green operations management and green business.
- H2 : There is an influence between green operations management and green marketing.

H3: There is an influence between green business and green marketing.

RESEARCH METHOD

The study used a quantitative approach by disseminating questionnaires online. The variables used are perceptions, attitudes and purchasing decisions of functional food products outlined in indicators and subsequently relegated to question items in research instruments. The population is an entire object of unknown research (Hair, et al., 2014) suggesting that the minimum sample size is 30. The affordable sample in this study was 34 companies.

Data analysis techniques using Structural Equation Modeling (SEM), are performed to thoroughly explain the relationship between variables. SEM is a set of statistical techniques that allow simultaneous testing of a series of relationships. The relationship was built between one or more independent variables (Yamin & Kurniawan, 2019). The analysis tool used is Partial Least Square (PLS), which in its data processing is an alternative model of SEM-based covariance. PLS is intended for Causal-Predictive Analysis in situations of high complexity and low theoretical support (Ghozali, 2014). The purpose of PLS is to find the optimal predictive linear relationships that are in the data. Although PLS can also be used to confirm the theory, it can also be used to explain the existence or absence of relationships between latent variables.

RESULTS

Table 2. Characteristics of Respondents

Characteristics		Total	Percentage
Age	< 25 year	3	9%
	25 – 30 year	8	24%
	30 – 35 year	10	29%
	35 – 40 year	2	6%
	> 40 year	11	32%

Position	Top Management	3	9%
	Middle Management	16	47%
	Lower Management	11	32%
	Medical Doctor	1	3%
	Supervisor	1	3%
	Staff	1	3%
	Type of company	Manufacturing	13
Services		21	62%
Length of work	< 5 year	7	21%
	5 – 10 year	13	38%
	10 – 15 year	6	18%
	15 – 20 year	8	23%

The results of the study showed that most of the participants were over 40 years old (32%), intermediate management (47%), working in a

service company (62%) and has been working for 5 – 10 years (38%).

Table 3. Convergent validity test

Variables	Indicator	Outer Loadings	Note
Green Business	GB1	0.718	Valid
	GB2	0.756	Valid
	GB3	0.775	Valid
	GB4	0.609	Not Valid
	GB5	0.763	Valid
	GB6	0.697	Not Valid
Green Marketing	GM1	0.607	Not Valid
	GM2	0.652	Not Valid
	GM3	0.803	Valid
	GM4	0.892	Valid
	GM5	0.899	Valid
	GM6	0.503	Not Valid
	GM7	0.938	Valid
	GM8	0.878	Valid
	GM9	0.847	Valid
Green Operations Marketing	GOM1	0.770	Valid
	GOM2	0.733	Valid
	GOM3	0.496	Not Valid
	GOM4	0.833	Valid
	GOM5	0.817	Valid
	GOM6	0.506	Not Valid
	GOM7	0.769	Valid

It can be concluded that there are some invalid indicators, namely indicator GB4 (0609), GB6 (0697), GOM3 (0496), GOM6 (0506), GM1

(0607), GM2 (0652), and GM6 (0503) that have a loading factor of less than 0.7. Based on the above

description, any invalid indicator will be removed from the model.

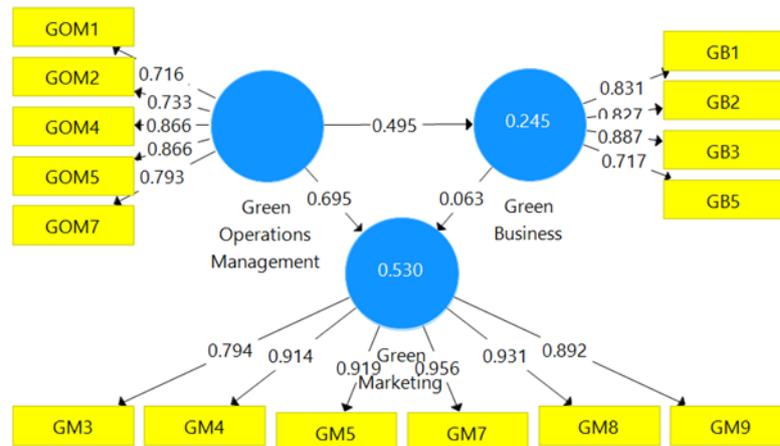


Figure 1. Algorithm PLS result (modified)

Table 4. Convergent Validity Test (AVE)

Variable	Average Variance Extracted (AVE)	Note
Green Business	0.669	Valid
Green Marketing	0.815	Valid
Green Operations Management	0.636	Valid

As there is no problem in convergent validity, the next step to be tested is a problem related to the discriminant validity that is done by looking at the square root of the average extracted

variant (AVE) value for each construction with the correlation value between the construction in the Fornell Larcker model.

Table 5. Test the Fornell-Larcker criteria

	Green Business	Green Marketing	Green Operations Management
Green Business	0.818		
Green Marketing	0.407	0.903	
Green Operations Management	0.495	0.726	0.797

It can be seen that the square root of the average value of the extracted variance is 0818, 0903, and 0797. These values are greater than the

correlation of each construction and have fulfilled the criteria for discriminant validity.

Table 6. Discriminant validity Test (Cross Loading)

	Green Business	Green Marketing	Green Operations Management
GB1	0.831	0.305	0.307
GB2	0.827	0.312	0.290

GB3	0.887	0.320	0.391
GB5	0.717	0.361	0.539
GM3	0.392	0.794	0.566
GM4	0.221	0.914	0.618
GM5	0.338	0.919	0.705
GM7	0.403	0.956	0.739
GM8	0.471	0.931	0.655
GM9	0.370	0.892	0.628
GOM1	0.514	0.484	0.716
GOM2	0.247	0.634	0.733
GOM4	0.264	0.649	0.866
GOM5	0.454	0.616	0.866
GOM7	0.478	0.505	0.793

It is concluded that the value of the loading of each construction is greater than the value of loading with the other construct, so that

all indicators are valid and there are no problems in discriminant validity.

Table 7. Composite Reliability Test Results

	Cronbach's Alpha	Composite Reliability	Note
Green Business	0.836	0.889	Reliable
Green Marketing	0.954	0.963	Reliable
Green Operations Management	0.854	0.897	Reliable

It can be seen that the results of composite reliability tests indicate that all latent variable values have a composite reliability value and the Alpha Cronbach test result also indicates that all

latent variable values have a value of ≥ 0.7 so that it can be concluded that the construct has good reliability or the questionnaire used as a tool in this study is reliable or consistent.

Table 8. R²/Endogenous

Variable	R²	R Square Adjusted
Green Business	0.245	0.221
Green Marketing	0.530	0.499

The adjusted value of R² or the coefficient of determination of green Business is 0.221 and for the construct of Green Marketing is 0.499. These results show that Green Business's endogenous variables can be described by the exogenous variable i.e. Green Operations Management of 22.1% and for the endogenous variables of Green Marketing can be explained by the exogenous variables of Green Operations Marketing and Green Business by 49.9% while the remaining 28% is described by other exogenous variables.

Testing the Goodness of FIT structure model on models using predictive relevance (Q²). The Q-square value is greater than 0 (zero), indicating that the model has a relevance prediction value. The R-squared value of each endogenous variable of this research is:

$$Q^2 = 1 - (1 - R^2) \quad Q^2 = 1 - (1 - 0.72) \quad Q^2 = 1 - (0.28) \quad Q^2 = 1 - 0.28 \quad Q^2 = 0.72$$

This calculation result displays a predictive relevance value of $0.72 > 0$. This states that the 72% variation in the green marketing variable (dependent variable) is interpreted by the

variable used. Therefore, this model is said to be worthy to have a relevant prediction value.

Table 9. Hypothesis Test

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (O/STDEV)	P Values
GB -> GM	0.063	0.202	0.340	0.186	0.853
GOM -> GB	0.495	0.541	0.113	4.383	0.000
GOM -> GM	0.695	0.602	0.274	2.536	0.012

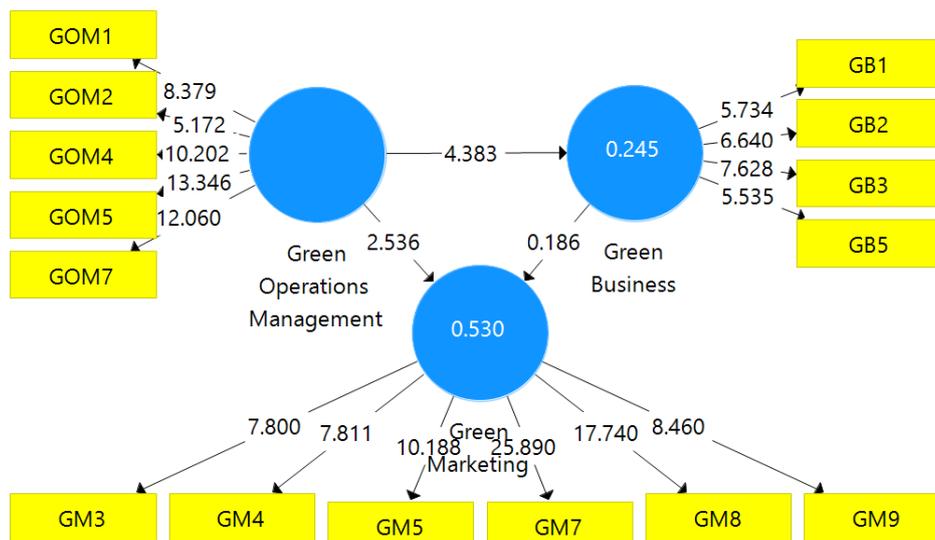


Figure 2. Result Bootstrapping PLS

DISCUSSION

Green business has a positive but insignificant impact on green marketing at the company. This is in line with the results of previous studies (Eneizan, 2019) mention that green business has an influence on the green marketing of the company, (Yadav, 2018) states that green business can affect the overall corporate image which will attract the consumer to re-use the company’s products/services.

Green Operations Management has a positive and significant influence on the company’s green business it is in line with the results of previous research (Ezanee, 2013; Tiyaningsih et al, 2020) found that green operations management variables have a positive and significant influence on the company’s green business (Kassinis & Soteriou, 2003), the companies today must integrate their supply chains with environmental management

(Karagülle, 2012; Saddhono & Ermanto, 2020). So that organizations can generate more business opportunities than their competitors if they can address environmental issues successfully.

The green Operations management variable has a positive and significant influence on green marketing at the company. This is in line with the results of previous studies (Gupta, 1995) found that green operations management variables have a positive and significant influence on green marketing at the company. Also, (Kumar, 2016) states that the marketing dynamics of environmentally friendly products can achieve an effective company performance. In this study, green business and green marketing were influenced by green operations management. This can be seen from some examples of companies that have been doing business operations become

greener like Garuda Indonesia, Bio Farma, Gadjah Tunggal, etc. It can be done by the company to support their green operational management including the building that has been certified LEED, using solar panels, and a more environmentally friendly parking system. Better implementation of green operations management will result in green marketing and green business that are more trusted by consumers who understand and care about the environment.

CONCLUSIONS

Green Operations management has a positive influence on the company's green business, therefore when the company conducts its business operations with attention to the concept of environment will produce green business with many opportunities that can be developed. Similarly, companies implementing green business concepts will improve green marketing anyway. Green Operations management has a positive influence on green marketing. Thus, it can be concluded that green operations management can make green marketing increased. Companies in Indonesia can improve operational management by using corporate facilities in an environmentally friendly way and regulate supply chain system that carries a green concept. It will make green business and green marketing company better. As such, the company will have an environmentally friendly imagery that can attract the attention of consumers who care about the environment.

REFERENCES

- [1] Azari, S. Baihaqi, I. and Bramanti, G. W. (2018). Identifikasi Risiko Green Supply Chain Management di PT Petrokimia Gresik. *Jurnal Sains dan Senu Pomits*. Vol. 7, No. 1, pp. 2337-3520.
- [2] Bai, C. and Sarkis. (2010). Green Supplier Development: Analytical Evaluation Using Rough Set Theory," *Journal of Cleaner Production*, Vol. 18 No. 12, pp. 1200-1210.
- [3] Beamon, B.M. (1999). Designing the Green Supply Chain. *Logistics Information Management*. Vol. 12 No. 4, pp. 332-342.
- [4] Chinander, K. R. (2001). Aligning Accountability and Awareness for Environmental Performance in Operations", *Production and Operations Management*. Vol. 10 No. 3, pp. 276–291.
- [5] Corbett, C. J. and Klassen, R.D. (2006). Extending the Horizons: Environmental Excellence as Key to Improving Operations. *Manufacturing & Service Operations Management*, Vol. 8 No. 1, pp. 5–22.
- [6] Darajat and Yunitasari. 2017. Pengukuran Performansi Perusahaan dengan Menggunakan Metode Supply Chain Operation Reference (SCOR). *Seminar dan Konferensi Nasional IDEC*.
- [7] Eneizan B. Alhamad A. Zukime M. Salha T. (2019). Green Marketing Strategies: Theoretical Approach. *American Journal of Economics and Business Management*, 2(2), pp.77-94.
- [8] Ezanee M E, Nadarajan S and Norlila M. (2013). Green Business Management and Green Supply Chain Practises: A Case Study In A Manufacturing Organization. 1, pp.15–33.
- [9] Ghozali I. 2014. Analisis Aplikasi Multivariat SPSS. Semarang. Badan Penerbit UNDIP.
- [10] Golicic, S. L., Boerstler, C. N. and Ellram, L. M. (2010). Greening' Transportation in the Supply Chain. *Sloan Management Review*, Vol. 51 No. 2, pp. 47-55.
- [11] Grant J. 2007. The Green Marketing Manifesto. Willey.
- [12] Grewal D. and Levy M. (2020). Marketing. McGraw Hill.
- [13] Gupta M C. (1995). Environmental management and its impact on the operations function. *Int. Journal Operation Prododuction Management*. vol.15. pp. 34–51.

- [14] Hair, et al. (2014). *Multivariate Data Analysis*, New International Edition. New Jersey. Pearson.
- [15] Hasan, A. 2016. Green Management System. *Jurnal Media Wisata*, Vol. 16, No.1, pp. 317-332.
- [16] Hawkins, Del I. and David L. Mothershaugh. (2010). *Consumer Behavior Building Marketing Strategy*. New York. McGrawHill.
- [17] Hole, Y., & Snehal, P. & Bhaskar, M. (2018). Service marketing and quality strategies. *Periodicals of engineering and natural sciences*, 6 (1), 182-196.
- [18] Hole, Y., & Snehal, P. & Bhaskar, M. (2019). Porter's five forces model: gives you a competitive advantage. *Journal of Advanced Research in Dynamical and Control System*, 11 (4), 1436-1448.
- [19] Hult G. Tomas M. Ketchen. Griffith. (2008). An Assessment of the Measurement of Performance In International Business Research. *Journal of International Business Studies*, vol. 39, no.6, pp.1064-1080.
- [20] Karagülle A Ö. (2012). Green business for sustainable development and competitiveness: an overview of Turkish logistics industry. *Procedia - Social Behavior Science*. vol. 4, pp.456-460.
- [21] Karl E., H., and Kinnear, T. C. (1976). *Ecological Marketing*. American Marketing Association. p. 168.
- [22] Kassinis, G.I. and Soteriou, A.C. (2003). Greening the Service Profit Chain: The Impact of Environmental Management Practices. *Production and Operations Management*. Vol. 12 No. 3, pp. 386-403.
- [23] Kleindorfer, P.R., Singhal, K. and Van Wassenhove, L.N. (2005). Sustainable Operations Management. *Production and Operations Management*, Vol. 14 No. 4, pp. 482-492.
- [24] Kumar P. 2016. State of green marketing research over 25 years (1990-2014): Literature survey and classification. *Marketing Intell. Plan*, No. 34, pp.137-158.
- [25] Labuschagne C., Brent, A.C. and van Erck, R. P. G. (2005). Assessing the Sustainability Performances of Industries. *Journal of Cleaner Production*. Vol. 13 No. 4, pp. 373-385.
- [26] Pratiwi, Ria. (2013). Prinsip Green Company Harus Menyatu dalam Pola Manajemen Perusahaan. <https://swa.co.id/swa/headline/emil-salim-prinsip-green-company-harus-menyatu-dalam-pola-manajemen-perusahaan>. accessed 17 December 2019.
- [27] Rohdayatin, A. Sugito P. Handayani. K. (2018). Green Supply Chain: Studi Keterkaitannya dengan Kinerja Lingkungan dan Kinerja Finansia. *Jurnal Manajemen & Kewirausahaan*. Vol. 6, No. 2, pp. 103-114.
- [28] Saddhono, K. (2020). Indonesian Online Media's Construction of 'Maritime': A Critical Discourse Analysis. *Pomorstvo*, 34(1), 16-23.
- [29] Slack, Nigel. and Lewis, Mike. (2017). *Operations Strategy*. Pearson.
- [30] Srivastava, S.K. 2007. Green Supply Chain Management: A State-of-the-art Literature Review. *International Journal of Management Reviews*, Vol. 9 No. 1, pp. 53-80.
- [31] Tiyaningsih, T., & Suyitno, Saddhono, K. (2020). Sustainable Technology in Marine Fisheries in Cilacap Regency, Central Java, Indonesia. Journal homepage: <http://iieta.org/journals/ijjne>, 15(3), 401-407.
- [32] Yadav R, Dokania A and Pathak G. (2018). The influence of green marketing functions in building corporate image: evidences from hospitality industry in a developing nation. *Eletronic Library*. 34, pp. 1-5.
- [33] Yamin S. and Kurniawan H. (2009). *SPSS Complete: Teknik Analisis Statistik Terlengkap dengan software SPSS*. Jakarta. Salemba Infotek.

[34] Yogesh Hole et al 2019 J. Phys.: Conf. Ser.
1362 012121