

-RESEARCH ARTICLE-

THE EFFECT OF GREEN SUPPLY CHAIN MANAGEMENT PRACTICES ON ENVIRONMENTAL, OPERATIONAL AND ORGANIZATIONAL PERFORMANCES OF SEAFOOD MANUFACTURERS IN THAILAND

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—Abstract—

The objectives of this research are to 1) study the levels of green supply chain management practices (GSCMP), environmental performance, (ENP), operational performance (OPP), and organizational performance (ORP) and 2) study the effects of GSCMP, ENP, OPP, and ORP on each other in the context of seafood manufacturers in Thailand. The study used quantitative method research. The sample in the quantitative research was 340 Thailand seafood manufacturers, arisen from stratified sampling by area. The instruments used in the research were questionnaires. The statistics used for quantitative data analysis were frequency, percentage, mean, standard deviation, confirmative factor analysis and structural equation modeling. The findings revealed that the levels of GSCMP, ENP, OPP, and ORP were at a high level. In addition, GSCMP had a direct positive effect on ENP and OPP and a positive indirect effect on OPP and ORP with mediation effects of ENP and OPP, respectively. Besides, ENP had a positive direct effect on OPP and a positive indirect effect on ORP with mediation effect of OPP.

Citation (APA): Pintuma, S., Aunyawong, W. (2021). The Effect of Green Supply Chain Management Practices on Environmental, Operational And Organizational Performances of Seafood Manufacturers In Thailand. *International Journal of eBusiness and eGovernment Studies*, 13 (2), 33-48. doi: 10.34111/ijepeg.202113203

Such findings can be a guideline for seafood manufacturers to improve their organizational performance. Government agencies, furthermore, can use the study results to formulate a policy for helping entrepreneurs. Academicians and interested people, moreover, can bring the research results to study and conduct further research.

Keywords: Green Supply Chain Management Practices, Environmental Performance, Operational Performance, Organizational Performance, Seafood Manufacturers

1. INTRODUCTION

More strategic alignment and coordination and integration of end-to-end business chain processes are needed for the SC (supply chain) in order to meet the demands of the final customers (Acquah et al., 2021). Business processes that must be coordinated include logistics, purchasing, marketing, and the manufacturing of goods (Aunyawong et al., 2020). It is critical to align the strategic imperatives of efficiency, responsiveness, quality, customer focus, and/or environmental sustainability (Aunyawong et al., 2020). Reverse logistics, green marketing, eco-labeling, and green advertising are some of the recent green supply chain practices that companies are implementing in their end-to-end business processes in order to reduce customer and government pressure and for better reputation (Choudhary et al., 2019). Environmentally friendly practices are encouraged by customers, and companies respond by enhancing their own operations (Gomez-Conde et al., 2019). Additionally, an investment in environmentally friendly technologies provides a competitive advantage and increases economic performance (Gomez-Conde et al., 2019). Many researchers have found that green supply chain practices have been adopted in an effort to improve both environmental and financial performance of the company (Jernsittiparsert et al., 2020). According to the stakeholder theory, a company's performance and/or the effects of company actions can be affected by groups and individuals who are stakeholders. Using this theory, stakeholders can put pressure on companies to reduce the negative effects of externalities that they produce (Wang et al., 2020). Commitment to environmental responsibility can be bolstered by stakeholder pressure (Geng et al., 2018). Because companies have no choice but to produce green products to satisfy customer demand, customer pressure has always been recognised as a key motivating factor (Golpîra et al., 2017). Aside from this, suppliers may decide to stop selling their materials to a manufacturing company because they fear losing their own public image if the purchasing manufacturing company is well-known for polluting the environment and employing poor or non-green business practices in their operations (Prachayapipat et al., 2020).

Green supply chain management is of interest to all industries, such as clothing, automobile, electronics, furniture, plastics, etc., in many countries. This can be seen in the application of green supply chain management practices (GSCMP) to enhance firms' environmental, operational, and organizational performances these days. When considering the way to promote and drive green logistics and supply chain management at the macro level, it found that countries have different strategies and forms of

promotion and pushing (Development, 2021). Multinational companies in Asian countries tends to adopt GSCMP to reduce the generation of Waste (Choudhary et al., 2019) While US international firms tends to minimize environmental damage (Prachayapipat et al., 2020). These GSCMP are in line with the development of relevant regulations and can increase the business opportunities (Huang et al., 2021). This reflects that Thai business entrepreneurs, especially seafood manufacturers, must be paid attention to green supply chain management and support for government environmental policies to meet the needs of current users and compete with competitors from foreign countries so that seafood manufacturers in Thailand can survive their business under the COVID-19 outbreak that has negatively impacted the growth of the global and Thailand manufacturing businesses (Aunyawong et al., 2021; Commerce, 2021) and can sustain operational aspects to meet the environmental standard of global market (Development, 2021).

At present, seafood is Thailand's top priority export product, with a production potential of approximately 3million metric tons per year. The export value is approximately USD 9billion. However, Thailand's processed seafood industry in 2019-2021 is likely to grow only12% per year due to processed seafood exports (89 percent of the production volume) faces intense competition in the global market. In addition, major trading partners tend to produce their own products and import more products from countries in the same region (Intra-region Trade), while the domestic market (11% share) is still driven by consumption that tends to expand in urban community according to restaurant growth, especially the fast-food business since due to the change in life style, consumers turn to focus on convenience and speed of cooking. If considering the export potential of processed seafood by country, China is the world's largest exporter with a market share of 13.7 %, followed by Norway 7.6 %, Vietnam 5.7 %, India 4.9 % and Thailand 4.0 %, respectively (Commerce, 2021).

From the above information, it can be seen that the seafood industry in Thailand is important to the country's economy. However, the business needs to adapt to cope with today's fierce competition. Past studies have shown that green supply chain management plays an important role in enhancing firm's operational performance (Acquah et al., 2021; Choudhary et al., 2019; Younis et al., 2020) and environmental performance (Acquah et al., 2021; Choudhary et al., 2019; Huang et al., 2021), which will lead to organizational performance (Rajaguru et al., 2019; Ullah et al., 2020; Zhai et al., 2020). Therefore, this research aims to study green supply chain management practices that can improve environmental, operational, and organizational performance of Thailand seafood manufacturers and propose guidelines for enhancing their organizational performance. The results of the research reflect effective corporate management based on environmental protection at all stages and activities within the supply chain, by which creating an image and good environmental performance will help the businesses grow profits and increase market share. The results can also create a competitive opportunity in the seafood business or other similar industries in Thailand to be more effective.

2. LITERATURE REVIEW

2.1 Stakeholder Theory

A win-win relationship between a company and its stakeholders is defined by stakeholder theory (Wang et al., 2020). Firms can benefit from the resources provided by its stakeholders, and the performance of the firm can also benefit those who have invested in it (Fasan et al., 2021). According to stakeholder theory, corporate social responsibility activities are a means of assisting corporations in achieving greater performance through the development of constructive stakeholder relationships (Geng et al., 2018). According to existing literature, pressures exerted by stakeholders such as the media, consumers, employees, the government, non-governmental organisations (NGOs), and competitors are powerful motivators for businesses to engage in environmental sustainability (Fasan et al., 2021; Liu et al., 2021; Wang et al., 2020). Stakeholder theory asserts that in order for supply chains to remain competitive, they must meet the demands of their customers and stakeholders (Quintana-García et al., 2021). Stakeholder pressures can have an impact on a company's green practices, as well as on its ability to achieve corporate performance goals. The theory also explains how to overcome stakeholder pressures in order to achieve corporate performance goals (Islam et al., 2021). Researchers generally agree that stakeholder pressures may have an impact on green initiatives and corporate performance, but their findings on the outcome of such pressures differ, with some arguing that the effects are insignificant or negative (Fasan et al., 2021; Geng et al., 2018; Wang et al., 2020).

A suitable theoretical perspective on shareholder interactions is provided by stakeholder theory, which has emerged as the dominant paradigm in business literature over the last several decades (Quintana-García et al., 2021). From the standpoint of stakeholder theory, it is vital to provide answers to issues such as how GSCM occurs and what the consequence of GSCM is in the Thai context, since if we do not, the unknowns of these difficulties will limit our entire knowledge of GSCM and its implications. GSCM outcomes can be investigated collaboratively from the perspective of environmental performance, which can provide valuable insights for enterprises in the process of adopting and implementing GSCM, which can ultimately improve firm performance.

2.2 Green Supply Chain Management Practices

Green Supply Chain Management Practices (GSCMP) refers to the practices that combine the concept of supply chain management with the concept of environmental management, involving in the relationship since the design process, raw material sourcing, production, packaging, storage, transportation, distribution, consumption, reuse, and disposal of goods. All processes must show awareness of environmental friendliness throughout the product lifecycle and focus on building green supply chain integration among suppliers, internal departments, and customers to create added value for efficient operations, obtain a competitive advantage, and reduce the environmental impact of the business in a sustainable way (Green et al., 2012). Teixeira et al. (2016),

Namagembe (2019), Cousins et al. (2019), and Prachayapipat et al. (2020) found that the critical components of business enterprise GSCMP comprises internal environmental management, green purchasing, cooperation with customers, and eco-design.

Companies implementing GSCMP in processes of design, production, distribution and logistics management will result in higher operational performance than companies that do not implement GSCMP (Choudhary et al., 2019). Managing the internal environment of the company that is standardized and certified by the government's environmental agencies is a strategic imperative based on the needs of the customers (Younis et al., 2020). In addition, GSCMP is able to affect operations in the fields of marketing, finance, social, economic and environmental (Acquah et al., 2021). It is, thus, hypothesized that:

H1: Green supply chain management practices have a positive direct effect on operational performance.

GSCMP will help build a positive image of the business organization to society (Choudhary et al., 2019) and develop environmental operations (Acquah et al., 2021). Current study, besides, found that GSCMP driven by stakeholder pressures and corporate green resources have a significant positive impact on the organization's environmental and economic performances (Huang et al., 2021). It is, therefore, hypothesized that:

H2: Green supply chain management practices have a positive effect on environmental performance.

2.3 Environmental Performance

Environmental performance (ENP) means efficient performance to make people around the organization have a good quality of life, that is, action must be taken to prevent pollution problems that will affect the well-being livelihood (Younis et al., 2016). In other words, ENP refers to the results of a business in shaping the size and direction of resource control in environmental systems to be able to contribute to society sustainably and the impact on the environment and external communities by controlling and preventing pollution or minimizing pollution (O'Donohue et al., 2016). As suggested by Griffin et al. (2017) Tan et al. (2017) Acar and Temiz (2020) and Tadros et al. (2020), ENP comprises Emission Reduction (ER), Resource Reduction (RR), and Product Innovation (PI).

Environmental innovation practices, including reducing emissions to the environment and energy or fuel consumption, will lead to the effective operational performance (Gomez-Conde et al., 2019), which will help businesses survive and compete in the market (Taghizadeh et al., 2021). Furthermore, the setting of strategic environmental goals not only drives the environmentally-friendly design of the product, but also plays an important role in enhancing environmental and operational performances (Yang et al., 2020). It is, consequently, hypothesized that:

H3: Environmental performance has a positive effect on operational performance.

2.4 Operational Performance

Operational Performance (OPP) refers to the quality, cost, productivity, and delivery outcomes of an organization (Nawaniret et al., 2013), or the ability of an organization to reduce costs or expenses in managing operations according to the time of the order cycle, improve the efficiency of raw material utilization, and meet customer delivery requirements (Ataseven et al., 2014). Assessment of OPP is very important to manufacturers because it will lead to the effectiveness of producing high quality products. This results in greater customer satisfaction and increased revenues and profits. OPP indicators, moreover, are indirectly measured by the turnover rate or the rate of absenteeism which is an effect of the efficiency of human resource management (Wisedsin et al., 2020). According to a review of previous studies by Abdallah (2016) and Adem and Virdi (2020), the OPP dimensions of a business organization that are important issues are Cost (CO), Quality (QUA), and Delivery Time (DT).

Rajaguru et al. (2019) portray that resource integration between supply chain partners help organizations in operation to achieve supply chain capabilities and competitive corporate performance, while Zhai et al. (2020) found that an efficient operating system had a greater effect on business performance in developing countries than developed countries. Ullah et al. (2020), moreover, depict that the adoption of customer-centered operational management had a significant positive impact on organizational performance with higher customer satisfaction. It is, as a result, hypothesized that:

H4: Operational performance has a positive effect on organizational performance.

2.5 Organizational Performance

Organizational Performance (ORP) is an outcome measure of success, comprising productivity, profit, service quality, and customer/employee satisfaction. ORP indicators, in addition, include employee safety, suitable rewarding, fair compensation, appropriate working environment, and quality of work life to build employee's company engagement (Al Issa, 2021; Ilmudeen et al., 2019). Kurniawan et al. (2021) has divided ORP into two dimensions: Financial and non-financial performances, while this study divides ORP into 3 dimensions based on the concepts of Kurniawan et al. (2021) and Ilmudeen et al. (2019), consisting of financial achievement (FA), customer intimacy (CI), and marketing performance (MP).

The relationship of variables based on above hypotheses, as shown in Figure 1, allows this study to consider the mediation effects of operational performance and environmental performance, as suggested by Hayes (2017), Phrapratanporn et al. (2019), and Aunyawong et al. (2020). It is, accordingly, hypothesized that:

H5: Operational performance positively mediates the effect of green supply chain management practices on organizational performance.

H6: Operational performance positively mediates the effect of environmental performance on organizational performance.

H7: Environmental performance positively mediates the effect of green supply chain management practices on operational performance.

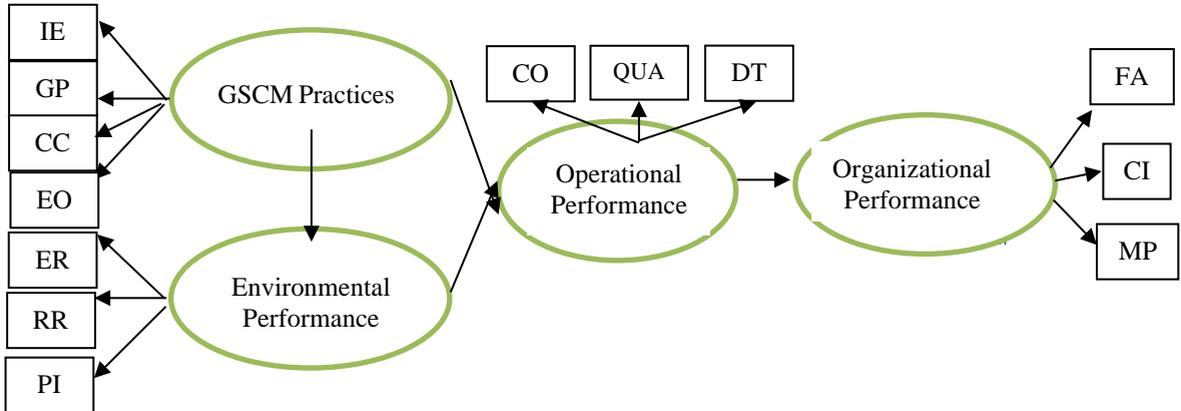


Figure 1: Conceptual framework

Note: GSCM: Green Supply Chain Management, IEM: Internal Environmental Management; GP: Green Purchasing; CC: Cooperation with Customers; ED: Eco-Design; ER: Emission Reduction; RR: Resource Reduction; PI: Product Innovation; CO: Cost; QUA: Quality; DT: Delivery Time; FA: Financial Achievement; CI: Customer Intimacy; MP: Marketing Performance

3. RESEARCH METHODOLOGY

The population was 711 Thailand seafood manufacturers registered with the Ministry of Commerce (Development, 2021). The sample consisted of 340 Thailand seafood manufacturers, calculated from the sample size according to the condition for statistical analysis of the Structural Equation Modeling (SEM) not less than 20 times the observed variables in the model (Hair Jr Joseph et al., 2009). From the research conceptual framework, there were 4 latent variables and 13 observable variables, totaling 17 variables. Therefore, a sample of not less than or equal to 340 samples (17 x 20) was required. The sampling was done by stratified sampling by area.

A questionnaire was used as a research instrument to collect data. The construct of GSCMP was operationalized by four dimensions namely Internal Environmental Management (IEM), Green Purchasing (GP), Cooperation with Customers (CC) and Eco-Design (ED) with seven, four, three and three items respectively (Vijayvargy et al., 2021). The construct of environmental performance (EP) was operationalized by three dimensions namely Emission Reduction (ER), Resource Reduction (RR), Product Innovation (PI) with three items each (Tan et al., 2017). The construct of Operational Performance was operationalized by three dimensions namely Cost (CO), Quality

(QUA), and Delivery Time (DT) with two, three, and three items respectively (Nabass et al., 2019). Finally, the construct of Organizational Performance was operationalized by three dimensions namely Financial Achievement (FA), Customer Intimacy (CI), Marketing Performance (MP) with two, three, and four items respectively (Agha et al., 2012). The instrument accuracy was checked for validity and reliability. The validity consisted of content validity using IOC >0.5 and construct validity using confirmatory factor analysis (CFA), while the reliability was checked for Cronbachs' alpha coefficient >0.7 . The five-point Likert scale questionnaire comprised the items related on research variables and based on the concepts of past studies as discussed in literature review. For quantitative data interpretation, the criteria were recommended by Best (2006).

For data analysis, first, the level of variables in the research were analyzed using descriptive statistics, including mean, standard deviation (S.D.), Skewness (Sk), and Kurtosis (Ku) to measure the normal distribution of data in the analysis of SEM. Second, discriminant validity was tested based on Maximum Shared Variance (MSV) $<$ Average Variance Extracted (AVE) and Average Squared Shared Variance (ASV) $<$ AVE; Also, the latent variable's AVE should be greater than the squared correlation between the latent variable and all other variables. In addition, the convergent validity was tested taking into account that the composite reliability value must be greater than 0.7 and AVE $>$ 0.5 (Fornell et al., 1981). Third, CFA was used to check the construct validity of the questionnaire. Forth, path analysis was used to examine the research hypotheses. Fifth, model fit indicators and the criteria of t-value >1.96 were based on hypothesis proposition by Diamantopoulos et al. (2000).

4. RESEARCH RESULTS

4.1 Testing Results of Measurement Model

The results showed that the observed variables averaged between .410 – 4.46, which was at a high level and had a standard deviation between .53 and .72, by considering the skewness with values between -3 and +3 and kurtosis of $<$ 8 indicating a normal distribution (Kline, .(2005The factor loadings of all variables were positive and significantly different from zero at the .001 level. The variable with the most factor loading was marketing performance (MP) with a factor loading of .931 and the variable with the least factor loading t was cooperation with customers (CC) with a factor loading of .691. In addition, R^2 was from .478 to 8.66, as shown in Table.1

4.2 Path Analysis Results

The results indicated that structural equation model had a construct validity due to the following indices: Chi-Square) CMIN) = 54.149, df = 41, p-value = .082, $\chi^2/df = 1.321$, GFI = .978, AGFI = .951, TLI = .994, CFI = .997, RMSEA = .006, RMR = .031, so it.

Table 1: Testing Results of Measurement Model

Variable	\bar{x}	S.D.	Remark	Sk	Ku	b	β	S.E.	T	R ²
GSCMP	4.33	.09	High	-	-	-	-	-	-	-
IEM	4.30	.64	High	-.885	1.517	.910	.812	.048	18.792***	.660
GP	4.23	.64	High	-.874	1.366	1.000	.881	<- ->	<- ->	.776
CC	4.45	.55	High	-.903	.493	.658	.691	.045	14.512***	.478
ED	4.32	.59	High	-.634	.332	.787	.752	.051	15.581***	.565
ENP	4.18	.08	High	-	-	-	-	-	-	-
ER	4.27	.53	High	-.395	.338	.746	.873	.037	19.724***	.763
RR	4.14	.68	High	-1.168	2.727	.925	.835	.040	23.217***	.697
PI	4.13	.72	High	-.952	1.278	1.000	.856	<- ->	<- ->	.734
OPP	4.22	.01	High	-	-	-	-	-	-	-
CO	4.22	.66	High	-.742	.551	.986	.753	.061	16.096***	.567
QUA	4.22	.57	High	-.525	.174	.805	.708	.049	16.569***	.501
DT	4.23	.60	High	-.828	.738	1.000	.839	<- ->	<- ->	.703
ORP	4.15	.11	High	-	-	-	-	-	-	-
FA	4.22	.60	High	-.400	.676	.942	.876	.044	21.516***	.768
CI	4.10	.63	High	-.454	.467	.980	.855	.043	22.878***	.731
MP	4.14	.60	High	-.580	.711	1.000	.931	<- ->	<- ->	.866

As a result, H1-H7 was accepted with statistical significance at the .001 level, by which GSCMP had a positive direct effect on OPP, with an effect size of .641, GSCMP had a positive direct effect on ENP with an effect size of .889, ENP had a positive direct effect on OPP with an effect size of .335, OPP had a positive direct effect on ORP with an effect size of .949, ENP positively mediated the effect of GSCMP on OPP with an effect size of .298, OPP positively mediated the effect of GSCMP and ENP on ORP with an effect size of .608 and .318, respectively. Moreover, GSCMP predicted ENP by 79.1%, GSCMP and ENP together predicted OPP by 90.4%, as well as GSCMP, ENP and OPP jointly predicted ORP by 90.0%, as shown in Figure 2 and Table 2.

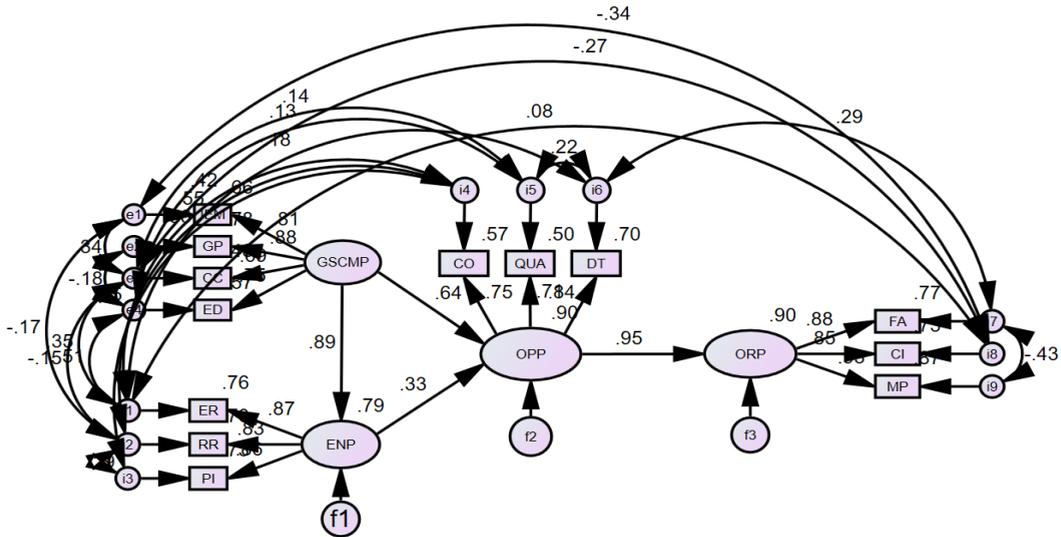


Figure 2: Structural Equation Modeling

Table 2: Path Analysis Results

H	Independent Variable	Mediating Variable	Dependent Variable	β	p-value	S.E.	t-value	R ²
H1	GSCMP	-	OPP	.641	.000	.076	7.158	.791
H2	GSCMP	-	ENP	.889	.000	.066	4.375	.904
H3	ENP	-	OPP	.335	.000	.079	3.456	.904
H4	OPP	-	ORP	.949	.000	.051	20.612	.900
H5	GSCMP	ENP	OPP	.298	.000	-	-	.904
H6	GSCMP	OPP	ORP	.608	.000	-	-	.900
H7	ENP	OPP	ORP	.318	.000	-	-	.900

Note: Threshold of acceptable hypothesis: t-value > 1.96

5. DISCUSSION

The study found that green supply chain management practices, environmental performance, operational performance, and organizational performance of Thailand

seafood manufacturers are at a high level. It shows that these four factors are essential for the success of Thailand seafood manufacturers (Ilmudeen et al., 2019; Prachayapipat et al., 2020). Tadros et al. (2020), by which customer cooperation is the most important. This portrays that at present, most of the Thailand manufacturers collaborate with customers in environmental design, clean services, environmentally friendly packaging and energy saving during delivery, consistent with past studies on automobile Aunyawong et al. (2020) and garment (Jermstittiparsert et al., 2020) industries in Thailand.

In addition, the results reveal that green supply chain management practices have a direct positive influence on operational performance, in accordance with Choudhary et al. (2019), Younis et al. (2020), Acquah et al. (2021) and environmental performance, consistent with Choudhary et al. (2019) Acquah et al. (2021), and Huang et al. (2021). Moreover, environmental performance has a direct positive effect on operational performance, in line with Gomez-Conde et al. (2019), Taghizadeh et al. (2021), and Yang et al. (2020). Furthermore, operational performance has a positive direct effect on organizational performance, as proposed by Rajaguru et al. (2019), Zhai et al. (2020), and Ullah et al. (2020). Besides, mediation testing results depict that operational performance mediates the effect of green supply chain management practices and environmental performance on organizational performance plus environmental performance mediates the effect of green supply chain management practices on operational performance, in relation to Hayes (2017), Phrapratanporn et al. (2019), and Aunyawong et al. (2020)S.

6. CONCLUSION

The present research was conducted in the context of seafood manufacturers in Thailand. Based on stakeholder theory, this study aims to assess the relationships of GSCMP, environmental performance, operational performance and organizational performance. In addition, the mediating effect of environmental performance between the relationship of GSCMP and operational performance was assessed. Likewise, the mediating effect of operation performance between the relationships of GSCMP and environmental performance with organizational performance. The analyses of the study supported all the research hypothesis, thus confirming the significant relationships of all the variables.

7. RESEARCH IMPLICATIONS

The present research has several theoretical and practical implications. This study adds knowledge to the existing literature by explaining the relationships of GSCMP, environmental performance, operational performance and organizational performance under the theoretical grounds of stakeholder theory. Moreover, such findings can be a guideline for seafood manufacturers to improve organizational performance. Entrepreneurs should adopt green supply chain management practices and focus on improving environmental and operational performances. In addition, government

agencies can apply the results of research to formulate policies for helping entrepreneurs. Academicians and interested persons, additionally, can bring the research results to conduct further research.

8. ACKNOWLEDGEMENT

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