

Sustainable Supply Chain Performance Model of Thai's Pharmaceutical Business

Chayanan Kerdpitak¹, Napassorn Kerdpitak², Kai Heuer³ and Lee Li⁴

Abstract

With the growing environmental awareness, the role of green initiatives and organizational determinants becomes very important for all sectors. It becomes very crucial for organizations to minimize their contribution to environmental degradation process. The foremost objective of the given study is to determine the impact of green motivation and top management support on sustainable supply chain performance with the help of work culture, green innovation and teamwork as mediating variables. In the following study, the survey questionnaire technique is used to collect the data. Almost all pharmaceutical employees respond to the survey questionnaires. Five-point Likert measure scales are used under the questionnaire technique and the final sample size was 438. Additionally, under the analysis, the significant SEM technique is used which has demonstrated that all hypothesis is accepted. The tables and figures indicated that green practices and top management support regarding innovation practices help in enhancing the performance of the companies. Similarly, the results provide that positive work culture, green innovation, and teamwork all have a positive mediating role in enhancing the relationship of top management support, green motivation with supply chain performance. Finally, it is examined that the given study is important and beneficial for the pharmaceutical sector and its related firms.

Keywords: Top Management Support, Green Motivation, Supply Chain Performance, Work Culture, Green Innovation, Teamwork.

INTRODUCTION

The rising environmental hazards and greenhouse gas emission has raised the concern about environmental protection across the world. Different organizations are also considering green practices in execution of their business to promote sustainable performance of organization (Bon, Zaid, & Jaaron, 2018; Mousa & Othman, 2020; Zaid, Jaaron, & Bon, 2018). Moreover, top management are also contributing in innovation of green services and products by persuading employees to adopt environmental friendly practices in operations of business (Luu, 2020; Tuan, 2020). Moreover, various studies have also emphasized on sustainable supply chain performance, which is referred to managing capital flows, information, material, and cooperation among firms in supply chain by chasing economic, environmental and social goals of firm. This study aims to empirically explore the impact of management support and green motivation of employees in promoting sustainability supply chain performance, by considering the mediating role of teamwork, green innovation, and work culture. Top management support to employees by motivating them to adopt the green practices and reinforce green innovation in firm, along with providing the culture of team work will improve the sustainability SC performance (Muduli et al., 2020). The rising environmental concern in Thailand drawn our attention to identify the factors of sustainably SC performance. According to environmental performance index, the ranking of Thailand among ASEAN region is lowest. Figure 1 indicates that Thailand ranks 121 at the index of environmental performance among 190 countries. Whereas its immediate neighbors' such as Malaysia, Singapore, and Indonesia have relatively higher ranking in terms of environmental performance index.

¹ Suan Sunandha Rajabhat University, Thailand, Email: chayanan.ke@ssru.ac.th

² Suan Sunandha Rajabhat University, Thailand, Email: napassorn.ke@ssru.ac.th

³ Wismar University, Germany, Email: kai.heuer@hs-wismar.de

⁴ York University, Canada, Email: leeli@yorku.ca

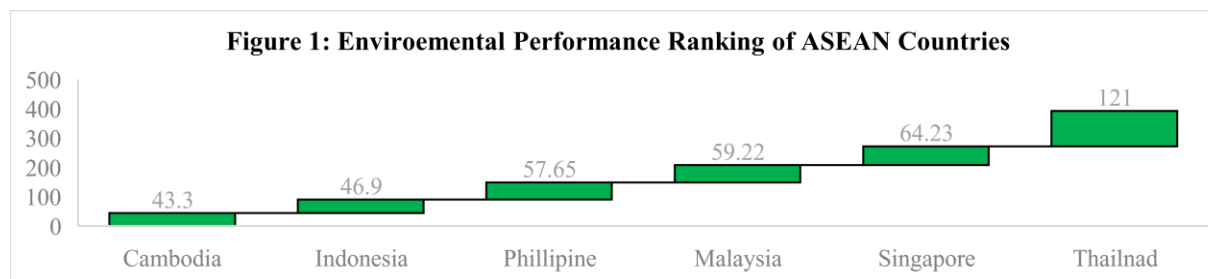


Table 1 depicts that Thailand's rankings in Air quality, water and sanitation, environmental performance index, environmental health, forest and eco-system are not encouraging. Thus, the study empirically investigated the factors that promote sustainable SC performance in Thailand's through the green innovation. The study adds into literature by empirically exploring the impact of management support and green motivation on sustainably supply chain performance. Moreover, the study fills gap in existing literature by considering the mediating role of teamwork, work culture, and green innovation in promoting supply chain performance of pharmaceutical firms in Thailand.

Table: 1 Environmental performance of Thailand	
Environment Index	Ranking of Thailand
Environmental performance Index	121
Environmental Health	133
Water and Sanitation	71
Air quality	167
Eco-system vitality	94
Forest	102
Air pollution	92

Existing studies support the role of green motivations of employees by management supports motivate the sustainability performance of supply chain management (Liu, Eweje, Lin, & He, 2020). Also, the few studies have supported the role of work culture that promotes environmental friendly practices also improves the sustainability supply chain performance. Those studies have significant importance for initiating reforms and adopting remedial measures to control environmental degradation in order to reinforce sustainable supply chain performance. This study also aims to contribute in literature by proposing strong theoretical and practical implications for reforms in SSCM. This paper based on five section: section two comprised on literature review and theoretical background, section three discusses the conceptual framework and empirical model, section four comprised on results, and section five based on discussion and conclusion.

Literature Review and Theoretical Background

Drawing upon the resource based view theory various studies have emphasized on the importance of environmental performance in enhancing the sustainable performance of firm. The study based on the assumption of Resource Based View (RBV) theory aims to explain the sustainable performance of pharmaceuticals in Thailand. Promoting green practices in supply chain and environmental protection in firm promotes the competitiveness in firm, which consequently promotes the sustainability performance in firm. The theory based on assumption that the competitiveness derived from the resources that are valuable and difficult to emulate, and also dispersed across firms that includes path dependency and embeddedness, etc. (Barney, 2000). The study aims to explore the impact of management support and green motivation in enhancing the supply chain performance of firms.

Top Management Support and Sustainable Supply Chain Performance

The increasing importance of environmental protection has drawn the attention of policy makers to focus of sustainable supply chain performance in firm. Organizations are tend to improve their competitiveness due to

increasing competition and customers pressures, which consequently make it requisite to keep balance between environment and economic performance of firm (Shultz & Holbrook, 1999; Shultz & Peterson, 2019). To promote the culture of protecting environment, the role of management support has been stressed in literature (Hu & Hsu, 2010; Roy & Khastagir, 2016; Yen & Yen, 2012). Top management through promoting culture of green practice motives employees in adopting the environmental initiatives in organization. Muduli et al. (2020) by building upon Resource Base theory empirically identify the role of human related factors and green motivation in promoting the supply chain performance of mining firms in India. Thus based on above discussed the following hypothesis is proposed:

H1: management support has significant impact on sustainable supply chain performance in pharmaceutical firms in Thailand.

Green Motivation and Sustainable Supply Chain Performance

Motivation always engender positive outcomes either in term of organizational performance or to achieve any set targets. Various studies have supported the positive outcomes of motivation in business (Geng, Long, Chen, & Li, 2017; Junsheng, Masud, Akhtar, & Rana, 2020; Olanipekun, Xia, & Nguyen, 2017). Thus, green motivation of employee by persuading them to adopt green practices, likely to promote the sustainability performance in firm. Olanipekun et al. (2017) also indicate that how the motivation enhance the performance of green construction project in constructing industry. The study by conducting survey identified that green motivation of employees promotes the performance of green construction projects. Yang, Sun, Zhang, Wang, and Cao (2017) also supported the mediating role of green motivation in enforcing sustainability in corporate through green innovation system. The study to explore the mediating role of motivation in sustainable performance of corporates conducted a survey in China and USA. The study based on empirical findings proposed that best way to achieve corporate sustainability is to promote collaboration among employees through motivating them for environmental performance and green practices. Hence, in the light of based discussion the following hypothesis is proposed:

H2: Green motivation of employees has significant impact on sustainable supply chain performance in pharmaceutical firms in Thailand.

Mediating Role of Teamwork

The management support of environmental practices and green motivation of employees promotes sustainability in supply chain through collective effort and team work of employees. Hilson and Naye (2002) indicates the management role on motivating employees encourages employees to collectively participate in environmental performance and environmental practices in firm. Yu, Chavez, Feng, Wong, and Fynes (2020) also proposed that how the green human resource management in firm promotes environmental cooperation among employees through motivating them to adopt environmental friendly practice in firm. Besides, Vanpoucke, Quintens, and Van Engelshoven (2016) indicate that how motivation of green supply chain management in firm is associated with collaborative effort and team work of employees to promote green supply chain performance. Therefore, in the light of based discussion the following hypothesis is drawn:

H3: Team work has significant mediating impact on the relationships of top management support and Green motivation of employees with sustainable supply chain performance in pharmaceutical firms in Thailand.

Mediating Role of Green Innovation

Green innovation in firm by promoting the production of goods and services which has positive implication on environment. Management support and green motivation of employees reinforce green innovation in corporates, which consequently enhance the sustainability performance of firm. The quality management in firm by supporting employees promotes green innovation. D. Li, Zhao, Zhang, Chen, and Cao (2018) also supported the role of quality management in reinforcing green innovation in construction at employee and organizational level. W. Li et al. (2020) also proposed that role of extrinsic and intricate motivation on employees' green creativity in organization. Therefore, top management and leadership may bolster green

motivation of employees in firm so that they may produce environmental friendly innovated products and services. Thus, in the light of aforementioned discussion the following hypothesis is drawn:

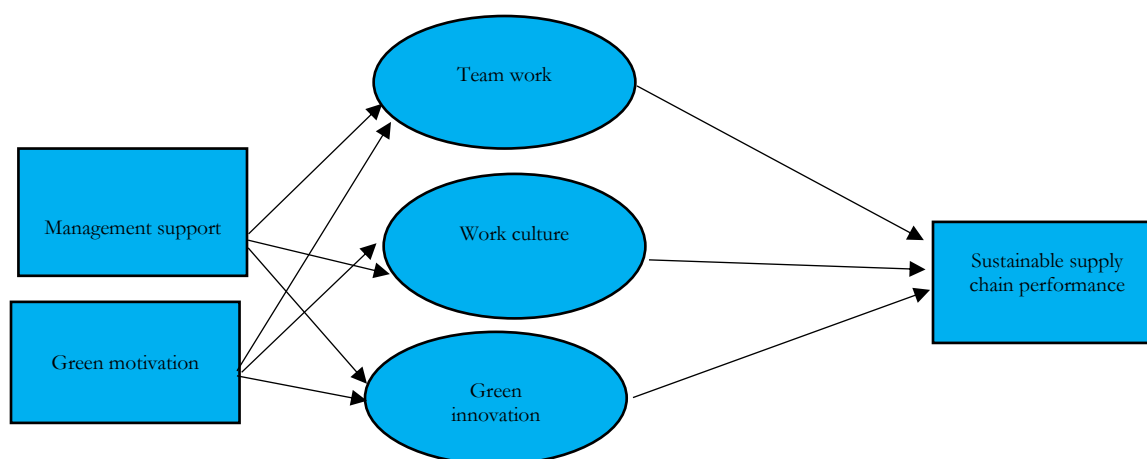
H4: Green innovation has significant mediating impact on the relationships of top management support and Green motivation of employees with sustainable supply chain performance in pharmaceutical firms in Thailand.

Mediating Role of Work Culture

Work culture of green practices is key indicators to promote sustainable supply chain performance. Positive culture of environmental friendly practices is required from top management by empowering employees to assure sustainability in supply chain management (Muduli et al., 2020). Management support to employees by offering them rewards and training, and empowering employees for environmental protection may create the culture of environmental friendly practices in firm (Gupta & Sharma, 1996). Hence, building upon above discussion the following hypothesis is proposed:

H5: Work culture has significant mediating impact on the relationships of top management support and Green motivation of employees with sustainable supply chain performance in pharmaceutical firms in Thailand.

Theoretical Framework



METHODS

Sample Characteristics

The research instrument utilized for the survey was a questionnaire. Snowball sampling was employed in order to trace managerial employees belonging to the pharmaceutical industry of Thailand. The respondents were first given a brief introduction regarding the content and reason of the study and then the questionnaires were distributed. The respondents were assured about the anonymity of their answers. The researcher applied the item response theory, following the criteria of 20 responses against each item i.e. $27 \times 2 = 540$. A total of 540 questionnaires were distributed throughout various pharmaceutical companies, after getting permission from concerned authorities. Out of these only 438 were fit for use for the analysis. Out of the remaining 112, 50 weren't received back and the remaining missing values so they were terminated.

Measures

The scale items were finalized after extensively reviewing the literature. The scales that have been incorporated into this study have been previously validated in a number of studies. These scales were pretested and verified by the studies of fellow researchers. All scale items have been measured on a five point Likert scale, ranging from "1=strongly disagree" to "5=strongly agree".

Top Management Support

The top management support scale was adapted by the studies of Olugu, Wong, and Shaharoun (2011), Rao, Ragu-Nathan, and Solis (1997) and Tseng, Lin, Chiu, and Liao (2008) according to the requirements of the present study. A sample item includes “Management's priority to recruit and retain environmentally conscious employees enhances SSCM effectiveness”.

Green Motivation

The items for green motivation were developed and adapted from the studies of Nalini and Bonnie (2004), Daily and Huang (2001) and Hilson and Nayee (2002). A sample item includes “If employees are recognized and rewarded for their GCSM-related accomplishments, they will be encouraged to perform better to fulfil organizational green objective”.

Teamwork

The scale for measuring teamwork was developed and adapted from the studies of Johansson, Greif, and Fleischer (2007), Humes and Reilly (2008), Jabbour and Santos (2008) and Massoud, Daily, and Bishop (2011). A sample item includes “Effective communication between various teams and among the team members regarding environmental initiatives and issues faced accelerates GCSM success”.

Green Innovation

Green innovation was developed and adapted from the studies of Franceschini, Galetto, Grover, Agrawal, and Khan (2006), Jabbour and Santos (2008) and Barve, Kanda, and Shankar (2009). A sample item includes “Learning attitude towards GCSM issues encourages innovation of greener process”.

Work Culture

Work culture was measured on the basis of the scale adapted from the studies of Harris and Crane (2002), Fernández, Junquera, and Ordiz (2003) and Jabbour and Santos (2008). A sample item includes “Mutual respect and trust among stakeholders helps employees in taking risk for GCSM initiatives with management ensuring more responsive duties for the employees”.

Sustainable Supply Chain Performance

The sustainability practices were measured by compartmentalizing the sustainability metrics provided by Sustainalytics into three components following the direction of Tamayo-Torres, Gutierrez-Gutierrez, and Ruiz-Moreno (2019), the study analyzed sustainability factors by dividing them into three components as well environment, social and governance sustainability practices.

RESULTS

Demographics

A sample consisting of 438 respondents were finalized to be used for the analysis. A total of 55.3 percent of the respondents identified themselves as males whereas 44.7 percent identified themselves as females. The working experience of 74.7 percent of the respondents was in between 2 and 8 years while the age of 74.5 percent participants were up to 35. The managers, supervisors and assistant managers belonging to operations department were the constituents of the sample therefore the age and experience figures are high.

Descriptive Statistics

The mean values of all variables are leading towards 4, showing the agreement of survey participants with the statements of the variables. The skewness values are also within the prescribed ranges of -1+1, conferring the normality of the data. The outliers weren't found in any of the variables' data as the maximum and minimum values are in accordance with the values of the utilized scale, a five point Likert scale.

Table 1: Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation	Skewness	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error
TopMangS	438	1.00	5.00	3.1884	1.05426	-.163	.117
GreenMoti	438	1.00	5.00	3.2631	.98601	-.313	.117
SusSCPerf	438	1.00	5.00	3.5208	1.15591	-.547	.117
TeamWork	438	1.00	5.00	3.1925	1.20880	-.251	.117
GreenInno	438	1.00	5.00	3.5360	1.13969	-.467	.117
WorkCult	438	1.00	5.00	3.3486	1.15129	-.436	.117
Valid N (listwise)	438						

KMO and Bartlett's

The sample is adequate as the KMO measure is close to 1. The sphericity of Bartlett's is also significant and exhibits the non-relevance amongst the construct items, thus they can be used for factor testing.

Table 2: KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.938
Bartlett's Test of Sphericity	Approx. Chi-Square	12019.819
	Df	325
	Sig.	.000

Factor Loading

All of the individual scale items are significant and impact the variance of the construct, as the values of loadings are greater than 0.7 (Hassan, Hameed, Basheer, & Ali, 2020; Iqbal & Hameed, 2020). The conundrum of cross-loading hasn't been observed as well.

Table 3: Rotated Component Matrix^a

	Component					
	1	2	3	4	5	6
TM1			.792			
TM2			.872			
TM3			.834			
TM4			.783			
GM1				.736		
GM2				.749		
GM3				.789		
GM4				.826		
SCP1	.830					
SCP2	.849					
SCP3	.822					
SCP4	.889					
SCP5	.905					
SCP6	.895					
SCP7	.901					
SCP8	.881					
TW1					.837	
TW2					.863	
TW3					.849	
GI1		.820				
GI2		.834				
GI3		.867				
GI4		.854				
WC1						.776
WC2						.774
WC3						.814

Convergent and Discriminant Validity

Self-correlation coefficients are greater than those of the variable-variable correlation, the MSV values are less than the AVE values and the AVE and CR values are greater than 0.7 and 0.5, as demonstrated in tabl 4. Thus the discriminant and convergent validity is present.

Table 4: Convergent and Discriminant Validity

	CR	AVE	MSV	GI	TM	GM	SCP	TW	WC
GI	0.936	0.784	0.228	0.886					
TM	0.919	0.741	0.297	0.404	0.861				
GM	0.891	0.673	0.297	0.478	0.545	0.821			
SCP	0.928	0.845	0.236	0.422	0.473	0.418	0.919		
TW	0.931	0.819	0.567	0.247	0.342	0.324	0.444	0.905	
WC	0.943	0.848	0.567	0.376	0.412	0.453	0.486	0.753	0.921

Model Fitness

CFA test is used to check the model fitness. All values are in accordance with the threshold ranges, CMIN is less than 3, GFI is more than 0.8, CFI and IFI are above 0.9 and RMSEA is less than 0.08., therefore the model is declared fit.

Table 5: Confirmatory Factors Analysis

Indicators	Threshold range	Current values
CMIN/DF	Less or equal 3	2.432
GFI	Equal or greater .80	.896
CFI	Equal or greater .90	.970
IFI	Equal or greater .90	.970
RMSEA	Less or equal .08	.055

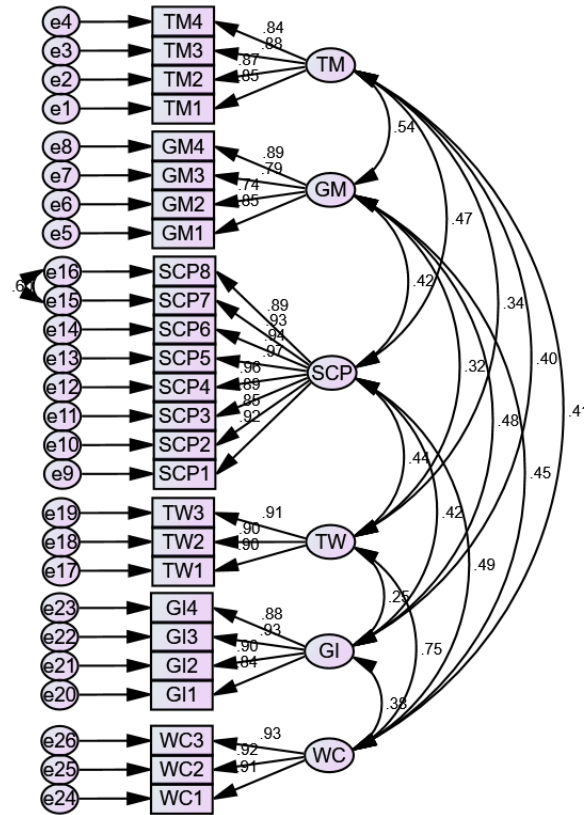


Figure 1: CFA

SEM

The path coefficients and the general structure of the hypothesized model is demonstrated in figure 2. A unitary increase in top management support and green motivation produces an effect of 18.1 percent and 11.7 percent in sustainable supply chain performance. The hypotheses are accepted as the relationships are significant. The mediation of work culture, green innovation and Teamwork successfully mediate the associations with SSCP and produce an effect of 16.6, 19.2 and 20.1 percent. The hypotheses are accepted as the relationships are significant.

Table 6: Structural Equation Modeling

Total Effect	GreenMoti	TopMangS	WorkCult	GreenInno	TeamWork
WorkCult	.303***	.228**	.000	.000	.000
GreenInno	.393***	.218**	.000	.000	.000
TeamWork	.158**	.232**	.000	.000	.000
SusSCPerf	.275**	.308***	.166**	.192**	.201**
Direct Effect	GreenMoti	TopMangS	WorkCult	GreenInno	TeamWork
WorkCult	.303***	.228**	.000	.000	.000
GreenInno	.393***	.218**	.000	.000	.000
TeamWork	.158**	.232**	.000	.000	.000
SusSCPerf	.117*	.181**	.166**	.192**	.201**
Indirect Effect	GreenMoti	TopMangS	WorkCult	GreenInno	TeamWork
WorkCult	.000	.000	.000	.000	.000
GreenInno	.000	.000	.000	.000	.000
TeamWork	.000	.000	.000	.000	.000
SusSCPerf	.158**	.126**	.000	.000	.000

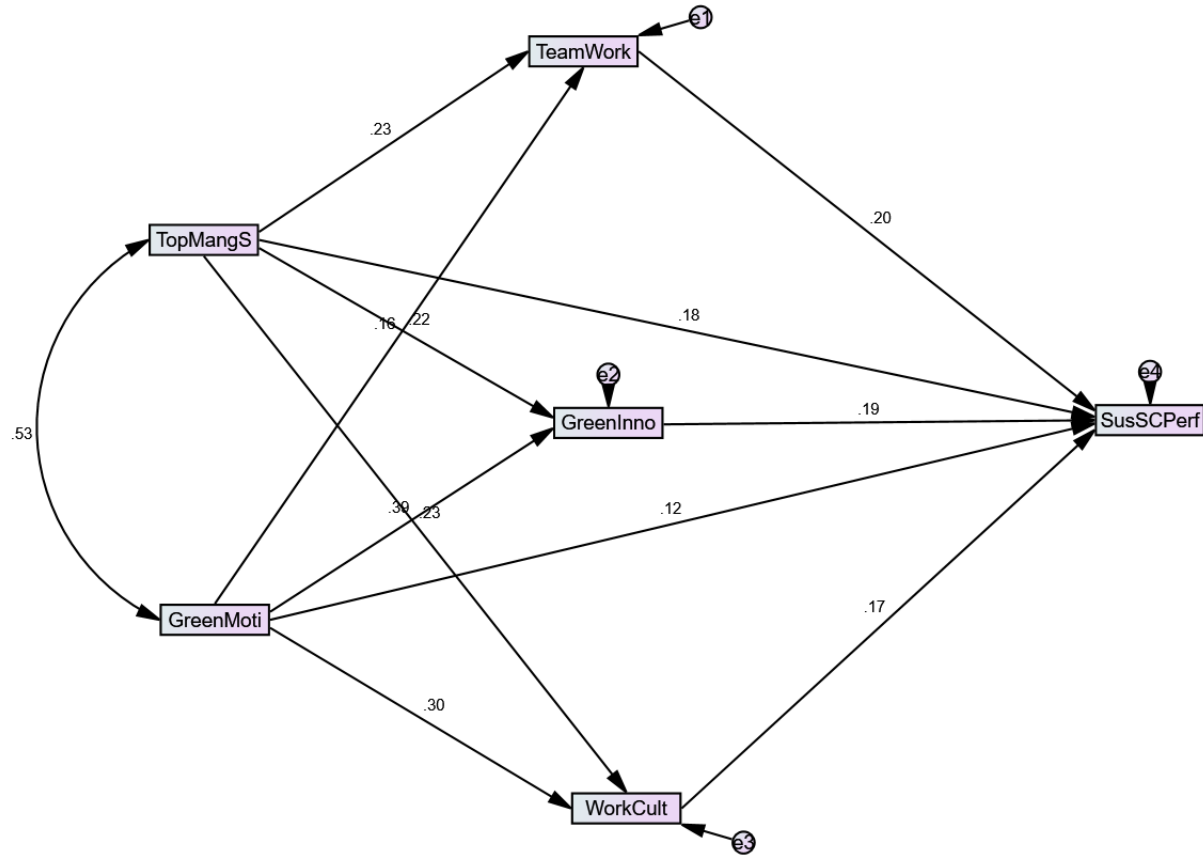


Figure 2: SEM

DISCUSSION

Kunapatarawong and Martínez-Ros (2016) Manifest that green initiatives and innovation is the development of new methods and procedures within the sector to develop opportunities for better and sustainable supply chain performance. Management support provides significant opportunities for the firm to enhance its sustainable supply chain performance because management system can enable a firm to identify the areas that are not performing and also leads to better business productivity and that further lead to better SCP (Reusen & Stouthuysen, 2017). Therefore, the first hypothesis of the study has been accepted. The measurements of the results also indicate that the mediating role of work culture and teamwork positively mediates the relationship between sustainable SCP and management support; this is mainly because teamwork fosters the degree of creativity and also provides an effective environment that supports sustainable supply chain performance of the sector. The entire results of the study indicate that all the hypotheses of the study were accepted and supported. Work culture also positively mediates the process of SCP because a study by Bose (2019) demonstrates that a positive degree of work culture raises the process of the supply chain.

CONCLUSION

The major goal of this research study is to empirically evaluate the impact of top management support and the green motivation in enhancing the sustainable supply chain performance of pharmaceutical firms and organizations of Thailand. The study also aims to understand the mediating impact of green initiatives which includes teamwork, work culture, and green innovation. For this design, the data set of this research mainly consists of 438 employees of pharmaceutical firms of Thailand, out of which 242 were male and 196 were female. The given study adopted KMO, confirmatory and SEM techniques for the calculation of collected data.

Implications and Limitations

The findings and verdicts of the given study will be very helpful for Pharmaceutical firms and companies of Thailand because the results will enable them to evaluate the sections of the firm mainly requires their attention for improving sustainable SCP. The given research also helps the managers of pharmaceutical firms in focusing on developing green initiatives for the firm for further enhancement of sustainable SCP. The verdicts of the study also guide managers and policymakers of the firm in the future to gain effective results in terms of supply chain performance.

The sample size of the given study is limited and restricted to the employees of some pharmaceutical firms, therefore, future studies recommend that they should involve other individuals in the sector in sample size. Another limitation of this research is that the research only focused on the arena of supply chain performance in Thailand, so, future studies should focus on other aspects of the sector as well.

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