

# External Supply Chain Management Factors and Social Performance in Thai Manufacturing Industry: Moderating Role of Green Human Resource Practices

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**Abstract-** The prime concern of present study is to explore the dimension of sustainable performance by evaluating the relationships with external green supply chain actors. The study addresses an important dimension of sustainable performance known as social performance, the objectives of the study entails to explain the relationship between external green supply chain factors including environmental cooperation and reverse logistics. The green aspect of supply chain has gained attention of various research scholars and practitioners to explore the influence on various organizational performance related outcomes. The present study addresses the relationship between dimensions of green supply chain management and social performance with moderating role of green human resource management, greening aspect of HR entails basic functions of HR including green hiring, green training and development and green performance and compensation management. The results of the study demonstrates that there is positive and significant relationship between environmental cooperation and social performance of manufacturing firms of Thailand, hypothesis H1 accepted on statistical grounds. The relationship between reverse logistics and social performance was also found to be positive and significant on the base of statistical grounds, further, study examined the moderating role of green HR practices between the relationships of constructs, the hypothesis H3 moderating effect between environmental cooperation and social performance was found significantly positive on the base of statistical grounds, but hypothesis H4 was rejected on statistical grounds as no moderating effect was examined between the relationship of reverse logistics and social performance.

**Keywords;** *Sustainable Supply Chain Performance (SSCP), Social Performance (SP), Environmental Cooperation (Env. CoP), Reverse logistics (RL)*

## 1. Introduction and Background

The environmental issues are prime concern today among manufacturing sector and highlighted since early 90s [54]. Environmental management concerns identified and included requirements for suppliers to meet environmental benchmark and criteria in selection,

monitoring and collaboration with suppliers and customers for selection [1]. The practices of effective supply chain consists of two aspects including integration of environmental issues in supply chain members for environmental management practices [55-57], the second highlights the need for develop theoretical grounds for recognizing integration practices and performance issues [1, 2].

Operational success of firm largely depends on effective supply chain management (SCM). The SCM is associated with strategic decision making for integration of stakeholders; including suppliers, buyers, consumers and partners for information sharing and planning. Effectively managed supply chain enable firms in cost reduction, production increase, flexibility in operations, introducing innovative solutions and customer satisfaction [3, 4]. The operations of firm consists of various organizational networking among different segments and add value through effective supply chain management [5, 6].

Research scholars argued that coordinated activities among different phases of business from supplier to consumer referred as supply chain management (SCM). These nodes included procurement, production, marketing, HR, Finance, logistics and consumer relation [7]. Effective supply chain assists firms in timely information sharing and communication to take decisions among the network of different activities. Research scholars have argued that supply chain depends upon information flow, optimize flow of raw material, cost reduction and poor flow of information negatively impact the firms' objectives for reduction in cost and being efficient [8]. Supply chain management has been equipped with technology and innovation to perform activities more efficiently. With the passage of time supply chain actors has been revised and extended its wings beyond an individual firm to inter-organizational activities that entails communication and transactions with suppliers,

customers, related partners, logistics services, retailers, producers and transportations.

Research scholars have focused on operational performance of firm in supply chain perspective and referred as outcome of efficient and effective flow of information and material from one actor to other for processing goods and services [9]. Trade also receives affect from supply chain as effective supply chain influences trade to high ratio due to effective logistic, agility, operations and lean as supply chain has emerged as source of competitive advantage and assists firms to sustain their competitive edge. Due to its multiple level importance and level of affect it has attracted attention of various research scholars [10].

The determination of performance of supply chain considered as reliability, flexibility, cost, responsiveness and asset management [11]. The studies have been conducted by various scholars on different aspects of supply chain performance including operational performance, environmental performance, economic performance and social performance. Basically, the prime concern of supply chain is to deliver raw material on time in required quality on competitive price and efficiently deliver the finished goods to the consumers in limited or decided time period with required and agreed quality standard. Firms must identify their key success factors in order to avoid any failure and to gain success and accomplish objectives. The supply chain must it role in lowering the cost, maintain higher quality, reliability, flexibility and quick response to query [12].

The standard of performance usually associated with effectiveness of system and efficiency in operations. The internal standards of performance are related to efficiency and external standards are linked and referred as effectiveness. The firms strive to be efficient and effective in their business operations such as in modern supply chain management concerns [12]. Research scholars have identified six components to examine effectiveness and efficiency, these factors includes reliability of product, employee satisfaction, customer demand fulfillment, timely delivery, work efficiency and profitable margins [10]. The above scenario and explanation can be justified with the example of Just-in-Time delivery and production as efficiency and meeting demand of customer and supplier through innovative ideas referred as effectiveness. Previous studies largely focused on cost and profit margins to determine the performance of firm, currently, scenario has been changed as products and services has gone on global scale with higher competitions therefore, firms has to consider and relay on their supply chain for keeping cost low while improvements in profit and quality. The impact of manufacturing industry is point of concern today due to its environmental consequences. The firms consider their operations as suitable practices

for environmental perspective, economic perspective and social perspective [13].

It is hard and complex to assess environmental and social performance of an organization based on its operations of supply chain management. The supply chain has its influence on sustainable performance including environmental performance, social performance and economic performance of firm [14]. The studies have been conducted to examine the challenges and approaches to describe the ideology of green SCM as cross functional function manner across the all departments [15]. Research scholars have stated the need to investigate relationship between GSCM and its outcomes in terms of performance, as studies are required to be conducted on cross-functional research [16]. The studies have stated the need to investigate and explore green management and various factors among mutual relationship [16].

Previous, just few studies have been conducted on investigation of green aspect of management functions and their relationship. Positive role of green HR and green supply chain practices has been explained in increasing performance and few studies investigated both practices together [16]. There is lack of empirical evidence to explain relationship and influence of supply chain management practices as two reasons has appeared in literature, theoretically acknowledgement of HR and SC practices are prominent as internal drivers [17], few addressed the external issues and challenges [18]; the second reason most of the studies examined the relationship between HR and SCM practices in general with greening aspect [19, 20].

The research scholars have stated that there is need to conduct studies on influence of GSCM on performance of firms as different dimensions of performance [21]. The current study intends to determine the social performance of Thai manufacturing sector influenced by Green supply chain practices related to external factors. The study is unique in empirically examine the relationship between external green supply chain management factors and social performance.

## 2. Literature Review

### 2.1. Supply Chain Sustainable Performance:

Effective supply chain management practices involve and connect its suppliers, manufacturing units, distributors and consumer to achieve long term goals of performance [22]. Supply chain management entails the key aspect of information sharing among required participants on-time that assist and form effective supply chain integration. Research scholars have given common objectives to implement successful supply chain practices. The goals of effective supply chain management includes removal of barriers in communication and elimination of redundant activities as declared by [23]. Later various other activities

defined by scholars as integrated with supply chain including reduction of wastage material, sync operations, performance to deliver, quality control and flexibility at production unit [24]. In addition to that, other activities including customer satisfaction, cost & time of warehouse facilities and relations with suppliers considered as supply chain management practices [25]. Since last decade, SCM has gained much importance and has become crucial task for businesses to be successful and effective in achievement of their goals by incorporating above mentioned activities on long-term basis [26]. SCM now considered and given importance due to its impact and role in success of business to gain competitive edge among competitors in global business environment to enhance effectiveness.

Today, scholars have recognized the importance of sustainable performance of firms to remain in competition and to sustain competitive edge for long term. Previously, studies have been conducted on diverse context and sectors to determine the sustainability of firms' performance for successful business. The importance of supply chain management has also recognized as crucial factor in sustainable performance of firm to harvest long term benefits [27]. The firms focus on sustaining their competitive edge through capitalizing on their resources and opportunities by avoiding any negative impact and risk of failure to maintain required standards to remain competitive. Firms must be accountable for their actions as their response towards their supply chain activities in accordance with global supply chain for business partners [28, 29]. The importance of supply chain can also be accessed through different studies such as the study conducted in Brazil that company was charged due to poor working conditions of suppliers [29], also study conducted on Indonesian firms that was involved in illegal activities such as damaging towards environment [30]. The reason of above mentioned studies is to demonstrate the importance of suppliers and their working conditions as suppliers considered as important participant of supply chain. The participants such as suppliers, distributors, manufacturers and customers play important role in achievement of long term objectives and goals [22]. The integration of supply chain plays key role in whole system of efficiency and in achievement of goals [31].

For sustainable competitive advantage firms strive to focus on various different issues including environmental issues [32]. Firms must perform positive towards environment and society for safety of environment due to business. Literature has referred sustainability as action that impact social aspect of organization, maintain welfare of society and renew ability for environmental protection, freedom and humanity [33]. Further, sustainability referred as effective way to perform business functions innovatively and constructively as organizational culture.

Research scholars have defined sustainable performance as environmental, economic and social aspect to perform high to gain objectives [33]. Research scholars have stated economic, environmental and social sustainable performance to determine and explain sustainable performance [34]. The sustainability of supply chain management referred as managing and integrating various activities such as economy, environment and society which included procurement unit, production unit, packaging and transportation units storage with prime objective to achieve goals and objectives of firm [35]. Studies have defined that sustainability performance has different dimensions that includes economical and environmental perspective [36]. Further, research scholars have focused on three pillars of sustainable performance that address the environmental, economical and social sustainability for effective business operations [37]. The social aspect is crucial in today's business environment for developing friendly relation among society. Social sustainability performance has referred as to determine the working conditions, commitment for social responsibilities, and participate for better society through quality education and training and development of employees [38, 39]. In addition to that, research scholars have defined social sustainability performance for social welfare for their stakeholders, integration with suppliers and customers with society as various benefits [36].

The current study intends to focus on social aspect of sustainable performance as it needs to address in detail as in present research the relationship between external supply chain management factors to be influential on social performance of Thai manufacturing industry.

## **2.2. External Green Supply Chain Management (Environmental cooperation) and sustainable performance (Social aspect):**

The current study explains the phenomenon of external green supply chain management by discussing its dimensions including reverse logistic and environmental cooperation. The study determines the social performance as sustainable supply chain performance, the relationship between external-green SCM and social performance is explained and empirically examined. The concept of external green supply chain was described in literature, and examined relationship between green supply chain management and environmental performance and economic performance [40, 41]. Previously studies have proposed to examine the green procurement as green supply chain management to motivate suppliers to adopt green SCM practices in their operations to become eco-friendly products and avoid undesired behavior that leads towards positive attitude and influence positive consequences such as sustainable performance [20].

In fact, firms need to organize educational programs to their business partners including suppliers and customers to assist them to understand the importance of green SCM and its impact on environment. The firms strive to shape their activities and business operations in according to greening aspect of supply chain to protect environment. Previously, studies have been conducted to determine the relationship between green SCM practices and performance of firms and found positive significant relationship [42].

According to the discussion following hypothesis is developed:

**H1:** *External green supply chain management (Environmental cooperation) influences the Social Performance*

### **2.3. External Green Supply Chain Management (Reverse logistic) and sustainable performance (Social aspect):**

Research scholars have defined external green SCM practices as partial cooperation and transaction with participants of supply chain such as suppliers and customers for the purpose of environmental protection, procurement and greening aspect of logistics named as reverse logistics [43].

Empirical studies have been conducted by various research scholars and reported positive link and influence of green SCM practices to economic performance and found to be effective in gaining competitive advantage [40]. Another study was conducted on manufacturing sector of developing countries to investigate the relationship between economic performance and green supply chain practices. The study addressed the aspect of green purchasing, cleaner and greener production and green management for the improvement of green supply chain activities with the intention to gain competitive advantage and benefits [44]. It is believed largely that green practices improve the working and employees conditions, protection of local community for their healthy life [45].

Manufacturing units of firms closely related to environmental issues such as pollution due to heavy production, the production units influence negatively to the environment and social dimension of performance by increasing pollution [46]. The firms adopt green supply chain practices for the purpose to achievement of social goals by cooperation between firms and customers by providing transparent information and environmental protection. The integration of greening aspect of supply chain in business operations positively influence the performance of firms specifically related to social aspect and named as social performance. There is scarcity of studies to investigate the relationship between green SCM and social performance of firms, the existing studies

investigated relationship between eco-friendly procurement and eco-friendly to promote customer loyalty [47]. Further studies have been conducted to determine the corporate image, equal opportunities, safe production, safe working conditions and healthcare [48].

The above discussion leads to develop the following hypothesis:

**H2:** *External Green Supply Chain Management (Reverse logistics) influence the sustainable performance (social performance)*

### **2.4. Moderating Role of Green HR practices:**

Research scholars have given attention recently to the greening aspect of HR practices in management system and supply chain functions. Literature has shows positive relationship and influence of green HR on business management and supply chain practices which ultimately influence the performance of firm. There are just few studies that have investigated relationship between HR practices and performance of supply chain of firm [16]. The literature on HR management and its relation to supply chain practices have been investigated in general context [19]. The green version of HR management is under discussion in present study as it is rarely investigated in discussed in previous studies [20].

No one can deny the importance of human resources management and its role in enhancing the performance of firm of any aspect including environmental, economical and social [49]. The literature has depicted that HR practices contribute in enhancing performance and positive aggressive consequences for the firms [15]. The effectiveness of HR practices inclines due to greening aspect of HR and its influence for environmental performance and social performance sustainability, as firms adopt green HR practices that assisted by management initiatives [16]. Various empirical studies embarked on cluster of HR practices and bundle of green HR practices that improves environmental performance [50]. The green HR bundle of practices found to be positively associated with performance and consequences like competitive advantages among manufacturing firms. The bundle of HR practices includes i) green hiring, ii) green T&D, iii) Green performance management and compensation management. The concept explains that inclusion of green behavior and environmental friendly attitude at workplace among employees and business units [51].

The studies have considered these HR practices and found effective in outcomes by adopting greening aspect of ideology [52]. The literature has published in criticism on practices of HR [53]. In contrast, studies have found that HR practices improve organizational performance. Studies on green HR practices focused on environmental

dimension and link between GHRM and performance [43].

The present study intends to investigate the relationship between external Green Supply Chain Management (Environmental Cooperation, Reverse Logistics) and Sustainable Performance (Social Performance) with moderating role of Green HR practices among Thai manufacturing firms.

On the basis of above discussion following hypothesis is formulated:

**H3:** *Green HR practices moderate the relationship between Environmental cooperation and Social Performance*

**H4:** *Green HR practices moderate the relationship between Reverse Logistics and Social Performance*

## 2.5. Research Framework:

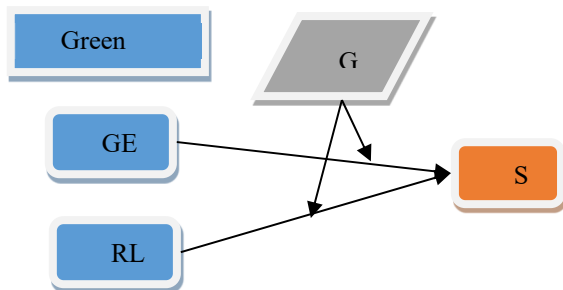


Figure 1. Proposed Framework

## 3. Research Methodology:

For hypothesis examination and testing survey was conducted on manufacturing firms of Thailand, with best understanding of Green HR and Green SCM practices. The senior managers of HR and SC managers were respondents of the study; the method entails two questionnaires for HR and SC respondents with sustainable performance as social performance aspect. The feedback of respondents determined the effect and role of Green SC and Green HR practices on social performance. Data was collected from Thai manufacturing sector; the questionnaires were given to 220 firms, but response was received from 160 firms. The measurement scale of each construct was adopted from the previous studies, as the detail is given next sector of the present study.

### 3.1. Measurement development:

The present research developed framework of study based on four variables including two dimensions of Green Supply Chain Management i) environmental cooperation, ii) reverse logistics and social performance as dependent variable and moderating variable green HR

management. The current phase of the study discusses the items of each measurement variable scale and the source of scale. All items of each construct were examined on 5-point Likert scale, whereas 1 demonstrate strongly disagree and 5 strongly agree, 3 as neutral.

## 4. Green Supply Chain Management:

### 4.1. Environmental Cooperation:

The scale of environmental cooperation was adopted from the study of [44]. There are six items in the scale to determine the level and examine the hypothesized relationship.

### 4.2. Reverse Logistics:

The measurement scale of reverse logistics consists of three items and was adopted from previous study of [44].

### 4.3. Green HR management:

The scale to measure green HR practices consists of 11 items that addresses three basic functions including green hiring, green T&D and green performance and compensation as described in earlier part of the present study. The measurement scale was adopted from the study of [52].

### 4.4. Social Performance:

The construct has previously appeared as dimension of sustainable performance, but the present study determined social performance influenced by Green supply chain practices for the first time. The measurement scale of the construct consists of five items. The scale was adopted from the study of [47].

### 4.5. Analysis and discussion:

The present study in current part demonstrate the analysis of collected data as it was examined by using SMART-PLS. the Measurement Model and Structural Equation Modeling techniques are used for data analysis.

### 4.6. Measurement Model:

The measurement model presents the cronbach alpha ( $\alpha$ ), results of convergent validity as suggested by Gefe, Straub and Boudreasu (2000); the resulted values of both measure convergent and composite reliability must be higher than 0.7 and AVE must be higher than 0.5. The analysis is shown in the table below.

Table 1.

S#	Constructs	Alpha $\alpha$	CR
1	Social Performance	0.812	0.811
2	Env. Cooperation	0.723	0.701
3	Reverse logistic	0.710	0.703
4	GHR	0.735	0.714

#### 4.7. Discriminate Validity:

The current table demonstrates the discriminant validity as suggested by [45]. Discriminate validity and shared AVE is demonstrated in table below.

**Table 2.**

S#	Constructs	SP	Env.CoP	RL	GHR
1	SP	0.913			
2	Env. CoP	0.723	0.891		
3	RL	0.710	0.623	0.818	
4	GHR	0.735	0.762	0.761	0.714

### 5. Structural Equation Model:

#### 5.1. Hypothesis test: Direct effects:

This part of the study investigates the relationship between independent and dependent variables. The table 3 below demonstrates the relations along with statistical figures. The hypothesis 1 has been investigated on the basis of collected data, that external green supply chain (environmental cooperation) and its influence on social performance (DV). The results of hypothesis H1 presented the statistical figures as  $\beta = 2.134$  where  $p < 0.005$  and t-value as 4.782; the positive  $\beta$ -value shows its positive influence and higher t-value shows its significant influence on social performance. Therefore, on the base of statistical values H1 is accepted. The second direct hypothesis demonstrates the relationship between reverse logistics and social performance at manufacturing industry of Thailand. The results demonstrate the  $\beta$ -value as 3.456, whereas  $p < 0.000$  and t-value as 5.431. The statistical figures of t-value and  $\beta$ -value shows significant positive results of hypothesis H2, hence H2 accepted on statistical grounds. The table 3 below presents the summary of results.

**Table 3.**

H#	Relations	$\beta$	t-value	Remarks
H1	Env.Cop $\rightarrow$ SP	2.13	4.78	Supported
H2	RL $\rightarrow$ SP	3.45	5.43	Supported

#### 5.2. Moderating Role of Green HRM: Indirect Relations

Moderating role of green HR practices as described earlier in present study between independent variables as dimensions of green supply chain including environment cooperation and reverse logistics and dependent variable social performance as dimension of sustainable performance. The statistical figures of moderating role of green HR between dependent and independent variable the first hypothesis of moderating variable examined the moderating effect of Green HR practices on the relationship of environment cooperation and social performance, the statistical figures demonstrate that  $\beta = 5.223$ ,  $p < 0.000$ ; whereas t-value was observed as 6.99; on the base of statistical figures they hypothesis H3 accepted as it found to be positively influential and moderating effect between the constructs of proposed framework. Hypothesis H4 was also examined with moderating effect of green HR practices between reverse logistics and social performance the statistical values of results depicted the  $\beta = 2.136$ ,  $p < 0.005$ ; whereas t-value was found as 1.69;

hence hypothesis H4 was rejected, as moderating effect was not found between the relationship of reverse logistics and social performance, therefore, H4 was rejected on statistical grounds.

**Table 4.**

H#	Relation	$\beta$	t-value	Results
H3	Env.Cop*GHR $\rightarrow$ SP	5.223	6.99	sig
H4	RL*GHR $\rightarrow$ SP	2.136	1.69	In-sig

### 6. Conclusion:

The present study was conducted to determine the social performance due to influences of external-green supply chain factors including environmental cooperation and reverse logistics as dimensions of green supply chain management. The data was collected from the manufacturing industry of Thailand. The proposed framework of present study was established by explaining the relationship between environmental cooperation and reverse logistics to dependent variable social performance which is dimension of sustainable performance. The moderating effect was also examined as one of prime concern of present study, the moderating role of green HR practices including green hiring, green training and development and green performance management and compensation. The present study is unique to examine the relationship of proposed framework by explaining the link of external factors of green supply chain including environmental cooperation and reverse logistics, previous studies have focused internal factors of supply chain, the influence of external SCM was examined with dependent variable of social performance. The study also incorporate the moderation role of green HR practices, the green HR practices found to be influential for performance of firms, the study is novel in determining the moderating role of green HR practices between proposed variables of present study.

The data was collected from 160 firms of manufacturing industry of Thailand with questionnaire as data collected tool based on green supply chain, green HR and social performance. The results found that there is positive significant relationship between environmental cooperation and reverse logistics with dependent variables social performance, therefore, H1 and H2 were accepted on statistical grounds. The next phase of study determines the moderation role of green HR between independent and dependent constructs of the study, the H3 found to be significant and found moderating role between environmental cooperation and social performance by green HR practices. Therefore, H3 was accepted on statistical grounds, whereas H4 was rejected on statistical grounds, the hypothesis H4 was found to be insignificant and was rejected on statistical grounds. The present study provides the grounds and recommends for manufacturing sector of Thailand to integrate and incorporate external green supply chain actors to fulfill requirements of green aspect of supply chain to protect the environment with effective HR practices to influence the social performance.



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