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Employee's Past Environmental Related Experience And Green Supply Chain Management Practice: A Study Of Malaysian Chemical Related Industries

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Abstract. Little empirical work has been done on the effects of employee's past environmental related experience and firm's green supply chain management (GSCM) practice. The literature of GSCM practice suggests employee's expectation increasingly concern firm supply chains. This study aims to examine the relationship between employee's past environmental experience and GSCM practice including proactive and reactive practice. Grounded by natural resource-based view, this study utilised a research model examining the relationship between employees' past environmental related experiences (e.g. past tertiary education involved environmentally-related fields or disciplines; work experience in environmental related roles; received any award or honour related to environmental sustainability practices; and past or current membership or management role in local community events, foundations and institution such as NGO) and proactive and reactive GSCM practice among employee's in Malaysian chemical related industries. Questionnaires were distributed through postal survey to manufacturing plant employees from eight chemical manufacturing industries from four regions in Malaysia including northern, central, east-coast, and southern. A total of 202 employees participated in the study. The data collected were analysed using partial least squares structural equation modelling. Based on the analysis, the study revealed that employee's past environmental experience have positive significant relationship with GSCM practice where proactive GSCM practice have the stronger effect than reactive GSCM practice. This study extends previous research by highlighting the importance of employee with past environmental related experience in driving firm's behaviour in GSCM practice. Doing so, it reinforces the recent conceptual definition that firms should align and leverage on employees' past environmental related experience for GSCM practice effectiveness.

INTRODUCTION

Chemical industries play an important role in Malaysian economy by stimulating the economic growth and creating enormous job opportunities [1]. Beside its importance, chemical industries generated hazardous wastes such as chemical substance which can lead to environmental problems and dangerous to human if not been controlled properly [2]. Chemical industries in Malaysia can be categorized into 1) petrochemicals; 2) oleochemicals; 3) fertilizers; 4) biodiesels; 5) pesticides; 6) industrial gases; 7) coating resins; and 8) paints [3]. The integration of environmental aspect in business operations, improvement of performance, and fulfilment of commercial and other stakeholders approach is becoming main agenda for chemical related industries nowadays [2]. The implementation

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of this agenda including specific elements including supply chain management, transportation, stakeholder engagement and product stewardship that focused on to mitigate the impact of this industry to environmental sustainability [4]. Recently environmental principles have been integrated in supply chain management practices which focused on internal process (e.g. production focused) and external process (e.g. supplier and collaborators focused) implemented across a industry's supply chain [5]. This kind of integration can be regarded as GSCM practice [6]. In chemical related industry, GSCM practice is important in promoting a sound chemical management towards sustainability by assisting the industry to perform efficiently while reducing the negative impacts from its production [2].

Previous study has revealed that employee's through a sound human resource management practices, has become important factors in driving firm GSCM practice [7]. Employee's involvement in firm's green initiative is indisputable [8]. Nevertheless there are less debate on the contribution of employees on sustainable supply chain management practices. Thus this study aim to study the influences of employee's past environmental related experience and GSCM practices (e.g. proactive and reactive). The results of this study later could help the policy makers, employers of chemical related industries, and suppliers to better understand the influence of employee's past environmental experience on GSCM practice. The remainder of paper is structured as follows. This study first review the relevant literature. The following section details the research methodology applied. The third part is to discuss the findings and the last part is the conclusion.

LITERATURE REVIEW

GSCM Practices

Basically, supply chain management is an activities which involves the upstream (purchasing and procurement), downstream(outbound logistic, transportation, marketing, distribution, packaging and warehousing) and internal organizational activities (research and design, quality, inventory, materials, and technology management [6], while GSCM practice is the inclusion of environmental aspects in supply chain management process [9]. The implementation of GSCM usually taken two measures which is firm proactive pro-active practice and re-active practice [10].

These include:

- Firm proactive practice – green purchasing practices, Eco-design practice, reverse logistic practices and,
- Firm reactive practice- legislation and regulation.

As far as proactive GSCM practice is concerned, firm must take full consideration aspect in environmental sustainability practices in all their production process from raw materials to the final disposal of the product [11]. On the other hand, reactive GSCM practice, firm comply with the legislation and regulation that imposed by responsible body in GSCM practices [12].

Employee's Past Environmental Related Experience

Due to technical requirements of OpenType font technology, Microsoft Word's "New Style" Equation Editor works only with fonts specially designed for mathematical typesetting. Unless you have obtained and configured new OpenType math fonts, it is highly likely that your installation of Word will use the Cambria Math font for all mathematics created with the "New Style" editor. Using the Cambria Math font for mathematics and Times Roman for your text will cause a mismatch in the visual appearance of your article, so, for consistency, we prefer authors to use the "Old Style" Equation Editor because it is straightforward to amend the size/style of the fonts it uses. Employee's past environmental related experience shape their thinking styles and behaviour as well as permit them to develop specific skills and procedural knowledge regarding to GSCM practices [13]. Employee's past experience can be derived by their educational background, and through internal and external social capital [14]. GSCM practice can be implemented in organization with the involvement of employees by sharing their expertise, motivation, knowledge and skills through their peers [15]. Among the dimensions of employee's past environmental related experience including their 1) past tertiary education involved environmentally-related fields or disciplines; 2) work experience in environmental related roles; 3) received any award or honour related to environmental

sustainability practices; and 4) past or current membership or management role in local community events, foundations and institution such as NGO [16].

Natural Resource Based View (NRBV)

To understand how employees' past environmental related experience creates value for a firm GSCM practice, NRBV can be one of theoretical paradigm [17]. NRBV is an augmentation of the resource based view of the company, which stresses on internal resources and capabilities such as employee's past experience, when valuable, rare, inimitable, and without equivalent substitutes, can lead to sound GSCM practice whether proactive or reactive [18]. Thus, the following hypotheses are proposed:

Hypothesis 1: Employee's past environmental experience have a positive relationship with proactive GSCM practices.
Hypothesis 2: Employee's past environmental experience have a negative relationship with reactive GSCM practices.

The conceptual framework of this study is shown in the Figure 1.

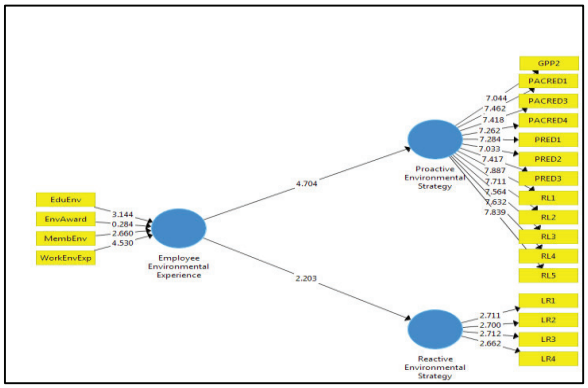

FIGURE 1. Conceptual Framework

RESEARCH METHODOLOGY

Required data for this study was collected through questionnaire via post using prepaid envelope. As the study consisted of employees in major petrochemical feedstock producers in Malaysia (e.g. Petronas; Malaysia Refinery Co.; Shell Refinery Co; Petron Malaysia Refining & Marketing; Kemaman Bitumen Co.; Malaysian LNG; MLNG; Lotte Chemical Titan Holding). By using stratified random sampling, the sample of employees were chosen from eight companies located in four region of Peninsular Malaysia including Northern, Central Region, East-Cost and Southern. To collect the data, the researcher contacted each firm's HR manager or senior HR senior personnel in some cases and after coordinating with them, the HR manager or senior personnel distributed the 50 questionnaires allocated for one firms to the targeted employee. After one follow up, 202 usable questionnaire were returned from eight selected major petrochemical feedstock producers in Malaysia, yielding a response rate of 50.1 percent which was considered satisfactory for subsequent analysis. Table 1 presents the sample demographics. Recommendations from the literature were followed to minimize and control for common method biases arising from using the same source of data for assessing both the predictors and the criteria [19].

This study was able to obtain 202 employees from eight chemical manufacturing industries in Malaysia. All measures were rated on a five-point Likert-type scale, ranging from 1(strongly disagree) to 5 (strongly agree). All of the GSCM Practices were measured using measurement scale adopted from [10] while the measurement for past environmental experiences were adopted from [16]. The questionnaire contains three sections including: Section A,

asked respondents about the respondent information; Section B asked about green supply chain management (GSCM) practices; and Section C asked respondents about environmental performance variables.

TABLE 1. Demographic

Description	Frequency (N=202)	%	Description	Frequency (N=202)	%
Gender			Work Experience		
Male	140	69.31	Less than 5 years	42	20.79
Female	62	30.69	5 to 10 years	54	26.73
			11 to 15 years	41	20.30
Races			16 - 20 years	33	16.34
Malay	193	95.54	Greater than 20 years	32	15.84
Chinese	4	1.98			
Indian	2	0.99	Organization Size		
Bumiputera Sabah/Sarawak	3	1.49	Less than 50 employees	9	4.46
			51-250 Employees	25	12.38
Professional Qualification Level			Greater than 250 Employees	168	83.17
Graduate	155	76.73			
Post Graduate	19	9.41			
Doctorate	4	1.98			
Others	24	11.88			

FINDINGS

A Partial Least Squares path-modelling approach was occupied employing the SmartPLS 3 software [20]. Following the standard recommended by [21], first the measurement model was presented and second structural model for path testing was highlighted. Table A2 shows the validation score and latent variables correlation of measurement model. Based on Table A2 all the items used for the study have satisfactory indicator reliability according to [21] and met the criterion of Fornell and Larcker which argue that each construct must distinct from one another [22].

Table 2. Validation Score and Latent Variable Correlation for Measurement Model

	Proactive Environmental Strategy	Reactive Environmental Strategy	AVE	CR	Cronbach's Alpha
Proactive Environmental Strategy	0.784		0.615	0.95	0.943
Reactive Environmental Strategy	0.433	0.89	0.792	0.938	0.916

Path coefficients of the structural model can be obtained through PLS algorithm calculation [20;21]. Path coefficients indicated the hypothesised relationships among the variables, whether is positive or negative. PLS bootstrapping calculation was run after PLS algorithm calculation in the structural model to obtain t-value. Commonly used critical values for one-tailed tests are 1.645 with the significance level at 95%, and 2.33 with the significance level of 99% [20;21]. When the t-value is greater than the critical value, it is concluded that the path coefficient is significant. The results in Table A3 signify that all hypotheses were supported by significant relationships at $p < 0.05$ level.

Table 3. Hypothesis Testing

Hypothesis	Relationship	Std. Beta	Std. Error	T value	Decision
H1	Employee Environmental Experience -> Proactive Environmental Strategy	0.337	0.072	4.704	Supported*
H2	Employee Environmental Experience -> Reactive Environmental Strategy	0.263	0.12	2.203	Supported*

*=$p<0.001$

DISCUSSION AND CONCLUSION

The results of this study shows that employee's past environmental experiences (e.g. past tertiary education involved environmentally-related fields or disciplines; work experience in environmental related roles; received any award or honour related to environmental sustainability practices; and past or current membership or management role in local community events, foundations and institution such as NGO) have a positive relationship with proactive GSCM practices (e.g. green purchasing practices, product related eco-design, packaging related eco-design, and reverse logistic) and reactive GSCM practices (e.g. legislation and regulation) with the relationship is stronger for proactive GSCM practices. The results of this study are consistent with [13] where employee's past environmental experiences can incite firms to deviate positively in their corporate environmental management practices. The employees of Malaysian chemical related industry which possessed environmental experiences and competencies have strong understanding on the potential of GSCM practices can increase the impact of company's long term profitability [23]. Moreover, the organization support is also important in motivating the employee with past environmental experience to provide the green incentive and facilitates the green behaviour [15]. This study provides academician and practitioners to design the infrastructure and strategies to inculcate proactive GSCM practices by providing training related to environmental sustainability practices.

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