

A Framework of Performance for Sustainable Supply Chain Management: Thai Cement Industry.

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Large-scale factories focus on improving supply chain management (SCM) in order to add to the value of products and services, and reduce the total of SCM cost. As a result, this SCM process supports the industrial sector and the overall economic system. However, in performing SCM activities, environmental and social problems are created. Therefore, this research on sustainable development (SD) is brought to integrate with SCM towards sustainable supply chain management (SSCM). This paper aims to explore the conceptual framework of performance for sustainable supply chain management (P-SSCM) in Thai Cement Industry. The methodology of this paper uses content analysis which is peer-reviewed journals, secondary data and in-depth interviews for investigating the conceptual framework. The result of this conceptual framework shows main dimensions, indicators, and the relationship among P-SSCM dimensions. The main dimensions are Environmental – SCM, Social – SCM, Economics – SCM Performance, and P-SSCM dimension. This framework presents a guideline for operational planning to develop the SCM towards P-SSCM of Thai Cement Industry.

Field of Research: Management (Supply Chain Management)

1. Introduction

Most countries are interested in environmental issues. Also, large-scale industries are developed to increase production capacity in order to respond to free markets. This development produces pollution emissions that effect the environment and the community living around the factories (Fabbe et al. 2011; Jamshidi 2011).

In Thai industry, the main environmental and social problems are resource consumption, air pollution and contaminant dust. Clearly, the cement industry leads to environmental problems with burning processes and social problems with quarry processes (Office of the National Economic and Social Development Board 2013). With this regard, each ton of cement produced demands 1.4 tons of raw materials that use 8.8 million kilo calories of fuel power. Energy-costs represent fifty percent of overall costs. (Thai Cement Manufacturers Association 2011).

Thus, this industrial sector creates a significant impact on the environment and emissions of carbon dioxide in the vicinity of the community. Moreover, the cement industry produces air and noise pollution that are major environmental problems (Thai Cement Manufacturers Association 2011).

The concept of supply chain management (SCM) is widely embraced attended by public and private sectors (Chopra 2007; Styles et al. 2012; Testa & Iraldo 2010). Adding value in

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the supply chain uses a variety of natural resources and energy. What remains are waste and pollution in the community and environment (Department of Primary Industries and Mines 2011).

In an industrial manner, many companies reorganize the green supply chain management (GSCM) that is strategic issue for achieving the sustainable company (Diabat & Govindan 2010). The GSCM is an important approach in order to achieve profit, add value of product and decrease environmental effect (Li et al. 2011). The GSCM begins with attempting to reduce carbon dioxide emissions from transportation activity (Mckinnon 2010). Subsequently, reverse logistics is used for returning products to destroy (Srivastava 2006; Hazen et al. 2011). At present, SSCM is integration of the SCM and sustainable development (SD) which is environmental, social and economic factors. (Faisal 2010; Hall & Matos 2009; Koplín et al. 2007). Furthermore, the scope of SSCM is more general than the GSCM. The GSCM is managed with environmental factors only. But SSCM is managed with the environmental factors together with the social and economic factors as well (Carter & Easton 2010; Cetinkaya et al. 2008; Dao et al. 2011).

Also, there is request for balance of the three SD factors to SSCM. (Bjorlelund et al. 2012; Green et al. 2012). However, there is very little literature about performance for sustainable supply chain management (P-SSCM) and most of them consider only two factors. Therefore, P-SSCM conceptual framework with these three factors needs to be developed. This conceptual framework is a direction for operational planning to help companies in decreasing environmental effects, being community friendly and still being profitable.

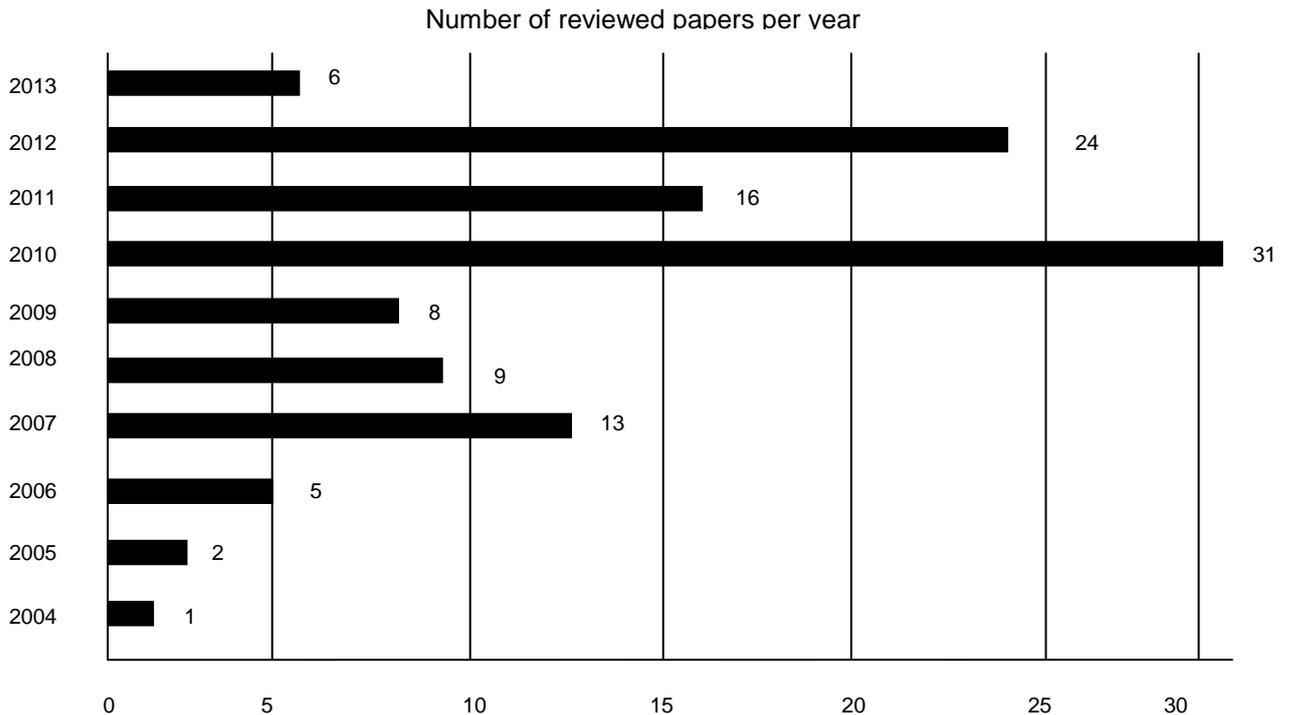
The purpose of this paper is to explore the P-SSCM conceptual framework of Thai Cement Industry. The remaining paper is in four sections. Firstly, the literature review determines the P-SSCM knowledge and indicators of P-SSCM. Secondly, the methodology of this research shows process in order to achieve research results. Thirdly, findings and discussion are shown within the conceptual framework and the information applied to business practices. Finally, the conclusion summarizes all sections within this paper.

2. Literature Review

The Literature Review encompassed a total of 115 articles which were academic peer-reviewed journals published between 2004 - 2013. Three keywords of "Performance of Supply Chain Management", "Sustainable Development" and "Performance of Sustainable Supply Chain Management" were searched in the following three databases; Emerald, SpringerLink, and ProQuest. The number of articles on the A.D. year basis can be summarized as shown in Figure 1.

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Figure 1: Number of reviewed papers per year



During the period of 2004-2006, there were not many articles regarding the key words. Furthermore, the numbers of P-SSCM papers are the least among the three keyword papers (Hampreeht et al. 2005; Jurgensen & Knudsen 2006). During the year 2007, there was a significant increased in the number of the reviewed papers. Most articles were about performance of supply chain management (P-SCM) that focused on finding main factors of operational measurement (Aramyan et al. 2007; Shepherd & Gunter 2007). In addition, some papers reviewed the concept of performance of green supply chain management (P-GSCM) (Aref et al. 2007; Jeong & Hong 2007; Green et al. 2007). During the year 2008, the concept of P-GSCM was applied in practical planning and strategic business (Green 2008; McCormack et al. 2008; Lorentz 2008). The research on P-SSCM introduced the SD concept, as key element in the development of SCM. Most articles were developed from literature reviews (Costes & Jahre 2008; Khan & Pillania 2008).

During the period 2009-2013, there were a significant growing number of articles. Most articles were P-GSCM and P-SSCM (Forslund & Jonsson 2009; Selbst et al. 2009). The papers of P-GSCM were achieved by conceptual frameworks that showed operational measurement and primary models (Xia & Tang 2011; Peters et al. 2011; Long et al. 2010; Lee et al. 2012; Gopalakrishnan et al. 2012). The P-SSCM papers were achieved by literature reviews and conceptual frameworks with one or two factors that were not balance of the three SD factors (Wu et al. 2013; Santos et al. 2013; Wang 2013).

From the literature review, it can be seen that the conceptual framework of balance P-SSCM did not appear. Therefore, the three main factors of P-SSCM and relationships among the factors are reviewed in this research.

The literature reviews of P-SSCM indicators were developed from peer-reviewed journals, secondary data which is sustainable reports of top three companies, and SSCM expert

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interview in the top company of Thai Cement Industry as shown in Table 1-3. The three dimensions of P-SSCM are Environmental-SCM Performance, Social-SCM Performance, and Economics-SCM Performance dimensions.

The first dimension of Environmental-SCM Performance has four main indicators that are greenhouse gas emission and environmental pollution, natural resources utilization, waste and recycling and GSCM. The important indicators of environmental-SCM performance dimensions are shown in Table 1. The second, dimension is Social-SCM Performance that includes four main indicators; Health and safety, Human right, Employment equity, and Quality of life. The significant indicators are shown in Table 2. Finally, Economics-SCM Performance is Quality of products and service, Utilization in resources and materials, Efficiency in productivity, and Cost of supply chain activity. Table 3 shows the main indicators of Economics-SCM Performance dimensions.

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Table 1: The Indicators of Environmental-SCM Performance

Environmental-SCM Performance		
Environmental-SCM Indicators		References
1.Greenhouse gas emission and environmental pollution	1.1 Co2 emissions rate 1.2 Steam emissions rate 1.3 Methane emissions rate 1.4 Nitrous oxide emissions rate 1.5 Ratio of water pollutants 1.6 Ratio of air pollutants 1.7 Ratio of soil pollutants	Zhu et al. 2009/ Isaksson & Steimle 2009/ Zhu et al. 2010/ Roy & Chan 2011/ Halldorsson & kovacs 2010/ Hall & Matos 2010/ Santos et al. 2013/ Colicchia et al. 2011/ Closs et al. 2010/ Roa & Holt 2005/ Winroth et al. 2012/ Lebacqz et al. 2012/ Banterle et al. 2013/ Mikkila et al. 2009/ Harvani et al. 2005/ Delai & Takahashi 2011/ Miemczyk & Johnsen 2012/ Shaw et al. 2010/ Piotrowicza & Cuthbertson 2009/ Perotti et al. 2012/ Walsh 2011/ Miemczyk & Johnsen 2012/ Green et al. 2012/ Zhu et al. 2004/ Diabat et al. 2013/ Vasileiou & Morris 2006/ Lehtinen 2012 / Zhu et al. 2010/ Kim & Min 2011/ Wu & Haasis 2013
2.Natural resources utilization	2.1 Water consumption rate 2.2 Fuel consumption rate 2.3 Energy consumption rate 2.4 Ratio of natural-material consumption	Hamprecht et al. 2005/ Jurgensen & Knudsen 2006 / Hong et al. 2009/ Holt & Ghobadian 2009/ Hugg et al. 2013/ Halldorsson & kovacs 2010/ Hall & Matos 2010/ Santos et al. 2013/ Colicchia et al. 2011/ Kim & Min 2011/ Isaksson et al. 2010/ Kim et al. 2012/ Winroth et al. 2012/ Presley & Meade 2010/ Closs et al. 2010/ Halldorsson et al. 2009/ Roa & Holt 2005/ Banterle et al. 2013/ Lehtinen 2012/ Harvani et al. 2005/ Vasileiou & Morris 2006/ Delai & Takahashi, 2011/ Shather et al. 2011/ Shaw et al. 2010/ Perotti et al. 2012/ Piotrowicza & Cuthbertson 2009/ Roy & Chan 2011/ Corsten et al. 2005/ Zhu et al. 2004
3.Waste and recycling	3.1 Number of recycling 3.2 Number of waste-cleaner technology 3.3 Number of material reuse 3.4 Number of material reduction 3.5 Ratio of hazardous/toxic material consumption	Zhu et al. 2009/ Holt & Ghobadian 2009/ Zhu et al. 2010/ Winroth et al. 2012/ Halldorsson & kovacs 2010/ Hall & Matos 2010/ Roa & Holt 2005/ Johnsen & Macquet 2012/ Colicchia et al. 2011/ Walsh 2011/ Kim & Min 2011/ Presley & Meade 2010/ Closs et al. 2010/ Halldorsson et al. 2009/ Delai & Takahashi 2011/ Harvani et al. 2005/ Miemczyk & Johnsen 2012/ Shather et al. 2011/ Perotti et al. 2012/ Piotrowicza & Cuthbertson 2009/ Colicchia et al. 2011/ Zhu et al. 2004
4.GSCM	4.1 Having of green transportation management 4.2 Having of green warehousing management 4.3 Having of Reverse logistics management 4.4 Having of Eco-design and green packaging 4.5 Having of green manufacturing	Holt & Ghobadian 2009/ Hugg et al. 2013/ Santos et al. 2013/ Johnsen & Macquet 2012/ Colicchia et al. 2011/ Closs et al. 2010/ Halldorsson et al. 2009/ Banterle et al. 2013/ Perotti et al. 2012/ Colicchia et al. 2011/ Wu & Haasis 2013/ Kim et al. 2012 Lehtinen 2012/ Shather et al. 2011/ Perotti et al. 2012/ Green et al. 2012/ Halldorsson et al. 2009/ Shaw et al. 2010/ Diabat et al. 2013/ Zhu et al. 2010/ Harvani et al. 2005/ Colicchia et al. 2011/ Halldorsson et al. 2009/ Zhu et al. 2004/ Shather et al. 2011/ Perotti et al. 2012

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Table 2: The Indicators of Social-SCM Performance

Social-SCM Performance		
Social-SCM Indicators		References
1.Health and Safety	1.1 Accident rate 1.2 Number of injured 1.3 Number of occupational ill-health 1.4 Having of health and accident insurance	Jurgensen & Knudsen 2006/ Santos et al. 2013/ Hugg et al. 2013 / Walsh 2011/ Winroth et al. 2012/ Banterle et al. 2013/ Lehtinen 2012/ Mikkila et al. 2009/ Wolf 2013/ Delai & Takahashi 2011/ Piotrowicza & Cuthbertson 2009/ Roy & Chan 2011/ Closs et al. 2010
2.Human right	2.1 Having of employees right 2.2 Having of procurement justice 2.3 Having of ethical trading	Hampreeht et al. 2005/ Jurgensen & Knudsen 2006/ Awaysheh & Klassen, 2010/ Hall & Matos 2010/ Kim et al. 2012/ Johnsen & Macquet 2012/ Winroth et al. 2012/ Halldorsson et al. 2009/ Presley & Meade 2010/ Corsten et al. 2005/ Walsh 2011/ Mikkila et al. 2009/ Delai & Takahashi 2011/ Wolf 2013/ Miemczyk & Johnsen 2012
3.Employment equity	3.1 Female and male employment rate 3.2 Average wages per person 3.3 Number of task per person 3.4 Having of compulsory labor	Jurgensen & Knudsen 2006/ Awaysheh & Klassen 2010/ Hong et al. 2009/ Hall & Matos 2010/ Santos et al. 2013/ Hugg et al. 2013/ Isaksson et al. 2010/ Johnsen & Macquet 2012/ Winroth et al. 2012/ Halldorsson et al. 2009/ Closs et al. 2010/ Chen & Wang 2011/ Banterle et al. 2013/ Mikkila et al. 2009/ Delai & Takahashi 2011/ Shather et al. 2011/ Piotrowicza & Cuthbertson 2009/ Lebacq et al. 2012/ Miemczyk & Johnsen 2012
4.Quality of life	4.1 Having of social welfare 4.2 Ratio of training and educated opportunity 4.3 Employees turnover rate 4.4 Having of relationship with local community	Vasileiou & Morris 2006/ Lebacq et al. 2012 / Wolf 2013/ Wu & Haasis 2013/Chen & Wang 2011/ Awaysheh & Klassen 2010/ Santos et al. 2013/ Banterle et al. 2013/Mikkila et al. 2009/ Delai & Takahashi 2011/ Hugg et al. 2013/ Lehtinen 2012

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Table 3: The Indicators of Economics-SCM Performance

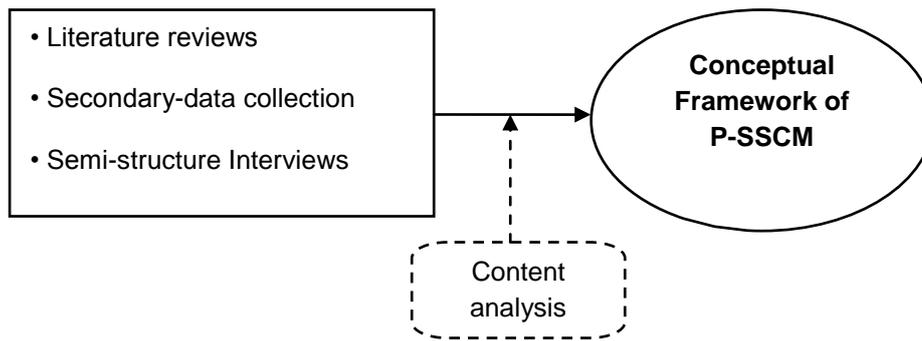
Economics-SCM Performance		
Economics-SCM Indicators		References
1. Quality of products and service	1.1 Having of quality awards 1.2 Customers satisfying rate	Hamprecht et al. 2005/ Zhu et al. 2009/ Hong et al. 2009/ Zhu et al. 2010/ Isaksson et al. 2010/ Presley & Meade 2010/ Halldorsson et al. 2009/ Delai & Takahashi 2011/ Piotrowicza & Cuthbertson 2009
2. Utilisation in resources and materials	2.1 Recycling revenues rate 2.2 Reusing revenues rate 2.3 Number of product damage with process	Zhu et al. 2009/ Zhu et al. 2010/ Halldorsson et al. 2009/ Winroth et al. 2012/ Green et al. 2012/ Shather et al. 2011/ Piotrowicza & Cuthbertson 2009/ Harvani et al. 2005/ Wang 2013/ Diabat et al. 2013
3. Efficiency in Productivity	3.1 Output per worker 3.2 Operating costs rate 3.3 Ratio of cost Productivity	Vasileiou & Morris 2006/ Harvani et al. 2005/ Shather et al. 2011/ Diabat et al. 2013/ Zhu et al. 2010/ Santos et al. 2013/ Halldorsson et al. 2009/ Winroth et al. 2012
4. Cost of Supply chain activity	4.1 Ratio of costs in warehouse activity 4.2 Ratio of costs in inventory activity 4.3 Ratio of costs in procurement activity 4.4 Ratio of costs in transportation activity 4.5 Ratio of costs in customer service activity	Zhu et al. 2009/ Hall & Matos 2010/ Zhu et al. 2010/ Santos et al. 2013/ Hugg et al. 2013/ Walsh 2011/ Kim et al 2012/ Presley & Meade 2010/ Closs et al. 2010 / Winroth et al. 2012/ Halldorsson et al. 2009/ Wu & Haasis 2013/ Diabat et al. 2013/ Roy & Chan 2011

3. The Methodology

This research is completed by content analysis with the triangulation data. The content analysis is a qualitative technique that determines empirical documentation to quantity and analyzes the dimensions and their relationships (Klaus 2004; Bernard & Ryan 2010). Triangulation data is more than two source data that apply in a study (Altrichter et al. 2008). The objective of triangulation data is to increase the credibility and validity of the research results (Denzin 2006; Bogdan 2006). Therefore, this technique is applied to find a conceptual framework (Shields 2013; Earl 2010; Kakutani 2009).

This conceptual framework is developed with peer-reviewed journals going back 10 years from 2004 to 2013. Subsequently, secondary data is used with sustainable reports in top three companies in Thai cement industry. Finally, the semi-structure interviews are used by SSCM experts in the top company in Thai cement industry (Thai Cement Manufacturers Association 2013). The methodological design is shown in Figure 2 as follows:

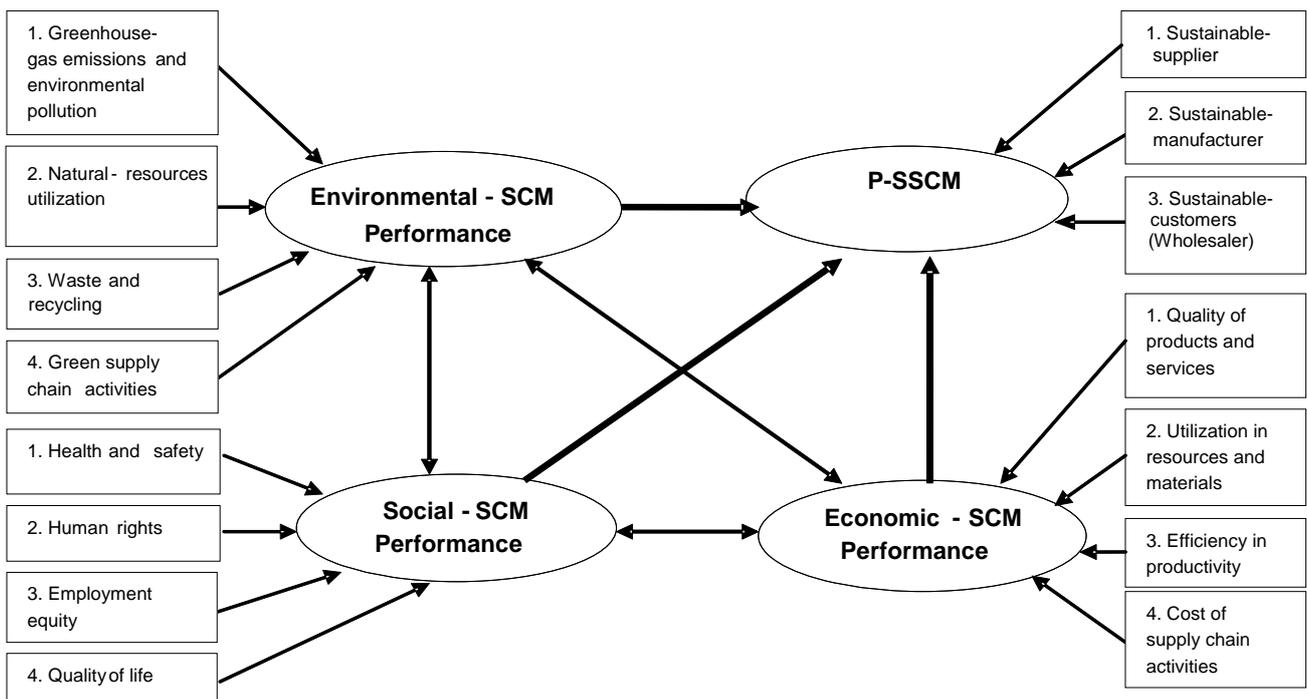
Figure 2: The methodological design



4. The Findings and Discussion

This conceptual framework shows the main dimension of P-SSCM which integrate SD and SCM toward SSCM. The P-SSCM has three dimensions; Environmental-SCM, Social-SCM, and Economics-SCM Performance, as shown in Figure 3.

Figure 3: The conceptual framework of P-SSCM



4.1 Environmental-SCM Performance

This dimension refers operationally to the supply chain to reduce the environmental effect. The adding value of supply chain activities effects on the environment is the emission of pollution in air, water, soil (Isaksson & Steimle 2009; Zhu et al. 2010; Roy & Chan 2011). The main indicators of this dimension are greenhouse gas emissions and environmental pollution, natural resource utilization, waste and recycling and green supply chain activity.

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These indicators are information for operational planning to practice in the company towards green company (Halldorsson & Kovacs 2010; Hall & Matos 2010; Santos et al. 2013).

The first indicator, greenhouse gas emissions and environmental pollution is developed by reducing greenhouse gas emissions and environmental pollution in air, water and soil (Colicchia et al. 2011; Winroth et al. 2012; Lebacqz et al. 2012). The second indicator, natural-resources utilization is to decrease the usage of water, fuel and energy with valuable consumption (Hamprrecht et al. 2005; Jurgensen & Knudsen 2006; Hong et al. 2009; Kim et al. 2012; Banterle et al. 2013). The third indicator, waste and recycling is company operation with cleaner technology (Halldorsson & Kovacs 2010; Walsh 2011; Presley & Meade 2010). Moreover, these indicators are achieved in reusing, reducing and recycling of material (Delai & Takahashi 2011; Perotti et al. 2012). Finally, green supply chain activities are operational activities for managing green-transportation management, green-warehousing management, eco-design and green-packaging, reverse logistics management and green manufacturing (Hugg et al. 2013; Johnsen & Miemczyk 2012; Shaw et al. 2010; Halldorsson et al. 2009).

4.2 Social-SCM Performance

This dimension determines the managing of supply chain that considers social factors to operational practice (Santos et al. 2013; Woft 2013; Hugg et al. 2013). In the past, SCM focused on reducing the total cost, adding value and customer satisfaction for products but the chain did not consider social responsibility (Mikkila et al. 2009; Lehtinen 2012). The Social-SCM Performance is a concept to resolve this problem with an achieved excellence in social responsibility and SCM. This operation affects the positive image of an organization. (Walsh 2011; Winroth et al. 2012). The main indicators in achieving this dimension are health and safety, human rights, employment equity and quality of life. These are planning direction that conduce best practices. (Lebacqz et al. 2012; Santos et al. 2013).

The first indicator, health and safety is the health and safety of employees and local people. This indicator is achieved by decreasing accident rates, number of injuries and occupational ill-health and also having health and accident insurance from the company (Jurgensen & Knudsen 2006; Dalai & Takahashi 2012; Piotrowicza & Cuthbertson 2009). The second indicator, human rights relates to the fundamental rights to employees, suppliers and customers. These indicate employee rights, procurement justice and ethical trading (Hamprrecht et al. 2005; Kim et al. 2012). This indicator is completed with good policies and practice planning (Corsten et al. 2005; Mikkila et al. 2009). The third indicator, employment equity is related to equality of employees, including the areas of gender, wages per person, number of tasks per person and compulsory labor (Piotrowicza & Johnsen 2012; Chen & Wang 2011; Awaysheh & Klassen 2010). Finally, quality of life is the social welfare, training works, educational opportunity and having a good relationship in the local community (Vasileiou & Moris 2006; Lehtinen 2012).

4.3 Economics-SCM Performance

This dimension refers to the entire SCM that is achieved by cost efficiency (Hong et al. 2009; Zhu et al. 2010). Companies can achieve this dimension through quality of products

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and service, utilization of resources and material, efficiency in productivity and the cost of supply chain activity (Winroth et al. 2012; Santos et al. 2013).

The first indicator, quality of products and service is the improvement of products to the high-quality that is assessed by quality awards (Zhu et al. 2009; Presley & Meade 2010; Delai & Takahashi 2011). A company service can be achieved by customer satisfaction rating (Isaksson et al. 2010; Hong et al. 2009). The second indicator, utilization of resources and materials is the operational usage of resources and materials to achieve the highest-benefit from consumption (Green et al. 2012; Shather et al. 2011). Also, companies operate with the recycling and reducing of product damage (Diabat et al. 2013). The third indicator, efficiency in productivity refers to the capability of output per unit of input. This needs to be accessed for the improving of benefits (Vasileiou & Morris 2006; Zhu et al. 2010). The main indicators are output per the worker, operating costs rate and ratio of cost productivity (Santos et al. 2013; Harvani et al. 2005). Finally, the cost of supply chain activity relates to the activity cost of warehouses, inventory, procurement, transportation and customer service. These are the main effects to the total cost of the supply chain (Hall & Matos 2010; Closs et al. 2010; Wu & Haasis 2013). Businesses can reduce the cost of main activities for achieving the high-profits (Roy & Chan 2011; Winroth et al. 2012).

4.4 P-SSCM

P-SSCM is the operation of supply chain towards P-SSCM which the SD dimensions are the environment, social and economic factors in managing the supply chain activities (Carter & Rogers 2008; Carter & Easton 2011; Beske 2012). The P-SSCM focuses on three elements which are sustainable-supplier, sustainable-manufacturer and sustainable-customer management. P-SSCM is considered with three main dimensions of the SD to integrate with the three main dimensions of the SCM (Keating et al. 2008; Ashby et al. 2012).

The first indicator, sustainable procurement relates to material management of procurement activities that is used by three SD factors. Sustainable procurement promotes having green initiatives and social responsibility in companies (Fink et al. 2007; Jiao et al. 2008; Chuah et al. 2010). Second indicator, sustainable transportation relates to the movement of materials, products and services from upstream to downstream for reducing environmental effects and adding social friendly practices (Uma et al. 2005; Kiesel 2006; Stadler et al. 2012). The third indicator, sustainable warehousing, refers to storage of materials, products and services with consideration for sustainable planning, control cargo and inside movement (Pham et al. 2012; Kotzab et al. 2005; Levi et al. 2008). Finally, sustainable distribution relates to the delivery of products and service to end customers with green marketing and cooperative social responsibility (Tortosa et al. 2008; Nagati & Rebolledo 2011; Munnukka et al. 2012).

4.5 SSCM Achievement

The concept of SD is environment, social and economic dimensions that are the triple bottom lines (Hall & Matos 2009; Halldorsson & Kotzab 2009). The triple bottom lines are correlated with each other (Closs et al. 2010; Winroth et al. 2012). The environmental dimension has a relationship with the social dimension that also has relationship with the economic dimension. Additionally, the environmental dimension relates to the economic

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dimension (Piotrowicz & Cuthbertson 2009; Lehtinen 2012). The SCM is the managing of the company for linking upstream and downstream flows. Moreover, SCM is to move products, services, and information from the first supplier to the end customer (Sather et al. 2011; Lebacqz et al. 2013). Thus, the SSCM is the operational of a chain which considers of the three SD factors.

The business achieves the P-SSCM that considers dimensions and indicators of the Environmental-SCM, Social-SCM and Economic-SCM performance to manage the SCM towards P-SSCM. The benefits of P-SSCM are SCM to reduce the environment effect, social responsibility and maintain company profits (Aras et al. 2009; Chen & Wang 2011; Banterle et al. 2013; Hugg et al. 2013).

4.6 SSCM Application

This P-SSCM conceptual framework focuses on main dimensions and show structure of P-SSCM towards sustainable business (Wolf et al. 2013; Wang 2013). The company can utilize knowledge from this framework for application to practical planning of business process (Green et al 2012; Kim & Hokey 2011). However, the business needs to consider this framework together with business factors, objectives of the company and operational planning as well (Holt & Ghobadian 2009; Shaw et al. 2010; Perotti et al. 2012; Zhu et al. 2010; Hong et al. 2009).

5. Conclusions

The environmental and social problems are emerged from an industry sector but most companies focused on developing SCM to support other economic sectors. However, the operational SCM find the environment impact and social influence. The P-SSCM is the concept to resolve these problems with balancing the three elements of SD toward SSCM. The purpose of this paper is to explore the conceptual framework which is P-SSCM in Thai Cement Industry. This research is completed with content analysis that uses triangulation data for increasing credibility and validity. The finding is a conceptual framework to explain the dimensions, indicators and relationship among P-SSCM dimensions. The limitation of this paper is to focus on the main indicators of Environmental - SCM, Social - SCM, and Economics - SCM Performance and P-SSCM dimension. This paper is developed from secondary data and experts interviewed in the Thai Cement Industry. This framework may be confined with other industries because there is dissimilarity of business factors. Future research in this conceptual framework is demanded with confirming of quantitative method.

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