

# Notions of Maritime Green Supply Chain Management



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## INTRODUCTION

Intercontinental trade relies heavily on maritime transportations to carry various cargoes for catalyzing global import-export trade. Roughly about 80% of international trade by volume and over 70% by value is carried by maritime operations globally (Cheng, Farahani, Lai, & Sarkis, 2015). As a vital component of life-line trade for various manufacturing companies all over the world, maritime supply chain have established new opportunities and unforeseeable challenges. The challenges faced by maritime supply chain dampened in the increased rate of climate change and global warming during the precedent decade (Lai, Lun, Wong, & Cheng, 2011). In this respect, carbon dioxide (CO<sub>2</sub>) and other greenhouse gases (GHGs) are emitted through the burning of fossil fuels from maritime transportation are responsible for a host of global environmental concerns. Playing the critical role as a major transportation and intermediary to assist trade flows in the global supply chain (Wong, Lai, & Cheng, 2009; Yang, Marlow, & Lu, 2009), many issues have been raised in operational context of maritime supply chain especially on environmental issues. As such, environmental protection has been extensively discussed by stakeholders, businesses, authorities as well as political leaders globally (e.g., Boykoff & Yulsman, 2013; Boykoff, 2009; Revkin, 2009; Rosenthal, 2009). In scholarly field, there has also been a surge in researches committed to address the related issues of environmental issues (e.g., Lee

& Kim, 2011; Ostrom, 2008; Wong, Lai, Shang, Lu, & Leung, 2012). The tightened environmental regulations imposed by International Maritime Organization (IMO) to the maritime sectors also contribute to this rising green trend (Sulaiman, Akmar, & Michel, 2013). As a result of this 'green' pressure, numerous maritime organizations have gradually begun to react to environmental concerns by embracing green supply chain management (GSCM) and other sustainability concept in their supply chain operations (Lai et al., 2011).

To the author's limited knowledge, relatively a small amount of studies have discussed GSCM dimension in the context of the maritime supply chain as well as sustainable notion of maritime green supply chain management (MGSCM). Preceding studies have stressed on tangible aspect of maritime operation such as sewage pollution, air pollution, and greenhouse gas (GHG) emissions (Cariou, 2011; Corbett, Wang, & Winebrake, 2009; Giziakis & Christodoulou, 2012; Hoffmann, Eide, & Endresen, 2012; Lirn, Lin, & Shang, 2014) but no intangible aspect in term of organizational management perspective of internal or external organizational capabilities can be found. If there is, it is literally a new domain in maritime supply chain and it is sensible to fill the gap in the literature by examining the GSCM dimensions that can be conceptualize towards defining the notion of MGSCM. Accordingly, the purpose of this paper is not to investigate empirically the dimension of MGSCM but to identify key GSM capability factors and examine the accountability of the

GSCM concept to be aligned with MGSCM's notion of sustainability in the context of maritime supply chain. Thus, in the subsequent chapters, we would discuss on preceding literature with regard of GSCM definition and theory as well as MGSCM notion conceptualized from GSCM to support this paper.

## **BACKGROUND**

### **GSCM as a Novel Concept of Sustainability**

The issue of sustainability in the context of supply chain management (SCM) has been discussed using various terms in the prior literatures. A number of modern literature reviews on GSCM and sustainability have been published in this respect e.g., (Abbasi & Nilsson, 2012; Carter & Rogers, 2008; Gimenez, Sierra, & Rodon, 2012; Sarkis, Zhu, & Lai, 2011; Seuring & Muller, 2008). Early sustainability practices and concepts tended to stress on environmental impacts but, gradually many latest studies adopted the triple bottom line impact that includes environment, economic, and social dimension. Although similar to the concept of SCM, the boundary of GSCM concept is dependent on the supply chain concurrently with the product; however, adding the "green" and "sustainable" component to SCM involves further aspect of addressing the influence and conceptual relationships between SCM and the environment. Consequently, GSCM distinguish the disproportionate of supply chain processes towards environmental impact in an organization. GSCM practices in this sense, are acting as an environmental and operational structure of improvement to catalyze an operational planning that numerous of organizations nowadays are promoted to tackle (Rao & Holt, 2000). Accordingly, a diverse of definitions of GSCM present in the literature. The subsequent paragraph sum ups some of the definitions of GSCM that have emerged in

the recent literature that can be linked towards this paper's conceptualization of MGSCM concept. For examples GSCM can be interpreted as:

1. Network management of sustainable supply chain (Cruz & Matsypura, 2009);
2. Corporate social responsibility network in sustainable supply and demand (Cruz & Matsypura, 2009; Kovacs, 2004);
3. Environmental management of supply chain (Sharfman, Shaft, & Anex, 2009);
4. Green procurement and green purchasing (Günther & Scheibe, 2006; Min & Galle, 1997);
5. Environmental purchasing (Zsidisin & Siferd, 2001);
6. Green and environmental logistics (Murphy & Poist, 2000); and
7. Sustainability in supply chains (Bai & Sarkis, 2013; Linton, Klassen, & Jayaraman, 2007).

Based on GSCM definition mentioned, GSCM is a resolute effort throughout the organization and is more than plainly putting some green dimensions in place, but rather a consistent and holistic enhancement and improvement of the environmental dimension in all levels of internal and external organizational management perspectives (Davies and Hochman, 2007). GSCM in general can also be used practically in any industrial and business context within the management structural framework. The research on sustainability issues in supply chain has been conducted by numerous scholars in the past regarding the theory and practical contribution in various industrial backgrounds such as manufacturing field (Zhu & Sarkis, 2004), product innovation (Lee & Kim, 2011), organizational management (Alfred & Adam, 2009), automotive (Luthra, Kumar, Kumar, & Haleem, 2011; Olugu & Wong, 2011) and other fields. Therefore, GSCM can also falls within the purview of increasing literature on maritime perspective of supply chain and operational management outlooks.

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