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Sustainable supply chain management: A case study of British Aerospace (BAe) Systems

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ABSTRACT

Sustainability is viewed as possessing environmental, economic and social dimensions. The sustainability approaches adopted by individual businesses and the supply chains to which they belong must include these facets. These three components of sustainability are collectively termed the "triple bottom line" or 3BL. The idea of a triple bottom line, which originated in the 1990s, implies attending to the traditional financial aspects of an organisation as well as to the social and environmental criteria. The economic aspect of the 3BL refers to profit making and attaining and sustaining competitive advantage through sustainability. The environmental dimension involves factors relating to climate change, global warming, air, land and water pollution (or preservation) and ozone layer depletion. The social aspect involves health and safety issues, community well-being, employment opportunities, charities, cultural sensitivities and requirements and organisational behaviour. As global warming, climate change and depletion of resources are on a rise alongside greater demand for improvement in business processes, economic standards and technology, it has become necessary to sustain processes along the value chain in order to contribute to sustainability. This paper examines the drivers of sustainability and related key features based on extant literature and a case study. An overview is given of the British Aerospace (BAe) Systems' sustainability initiatives and activities. On the basis of the BAe Systems case study, two resultant frameworks emerge that display the interdependence of the triple bottom line and the essential elements required for a sustainable supply chain.

1. Introduction

Today's business world exhibits elements of intense competition, globalisation, as well as the quest for economic development and higher standards of living by all nations. This comes at a time of dwindling natural resources. Indeed, some writers have argued that relentless consumerism, and the consequent endless search for resources to satisfy the needs and wants of the growing world population that is becoming predominantly middle class, is surely increasing resource depletion and accelerating the negative effects of climate change. Climate change due to carbon emissions and the resultant global warming are on the rise, thereby threatening the ability to sustain the world for future generations. Outsourcing of products and services has become a key factor in the search for increased competitiveness. This involves the ever-increasing need to bring products and services from across various parts of the world, together with the need for political and economic adaptability and understanding of work culture and ethics. The crisis the world faces today regarding resource depletion and the attendant sharp decline of social well-being poses great challenges (but also opportunities) for supply chains. The need to sustain supply chains through energy efficient technologies, resource restoration, green procurement, recycling, carbon emission control, social responsibilities, employee recognition and overall triple bottom line protection has since been recognised by the academia and latterly by the various industries and sectors of the global economy. The globalisation of operations has propelled businesses to work together in dealing with natural disasters and depleting natural resources. Many businesses and their trading partners are currently restructuring their functions and processes into more sustainable shapes and forms (Norman and MacDonald, 2004; Markley and Davis, 2007; Willard, 2002).

Over the decades, supply chains have had significant impacts on the global society and its environment and economy. Because resources are fast dwindling, tomorrow's businesses will be awarded not only on the grounds of economic benefits but also on the basis of sustainability (Markley and Davis, 2007). Firms will win business and boost their share values not just on how well they perform on margins but also on how much they are prepared to protect the environment and adopt sustainable production and distribution initiatives. According to the Brundtland Report (1987) to the World Commission on Environment and

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Development (WCED, 1987), "sustainable development (SD) is the development that meets the needs of the present without compromising the ability of future generations to meet their own needs." This generic definition, however, still carries a degree of uncertainty as to what is most appropriate to a sustainable supply chain. This paper adopts Norman and MacDonald's (2004) definition of a sustainable organisation, namely, that a sustainable supply chain is one that realizes development by acknowledging the social, economic and environmental aspects of its policies and actions and that while creating financial benefits and attending to stakeholder's preferences, supply chains must also care to shield the environment from the detrimental effects of their policies and actions.

This paper seeks to address the gap in literature concerning the social and environmental practices of supply chains. Acknowledging the need to sustain resources for future uses, the study focuses on carbon emissions, stakeholder recognition, environmental standards and social welfare of organisations. Owing to the importance of recognising and supporting the interdependence of the triple bottom line, the paper is unique in the way that it investigates and reports from the existing literature the potential benefits of deploying sustainability in supply chains in an integrated manner. It also provides, by way of a case study of BAe Systems, a best practice guide for the deployment of sustainability in supply chains. The paper's findings and conclusions corroborate earlier studies that concluded that a strong focus on the integration of the social, economic and environmental facets of the supply chain could act as an answer for a sustainable future.

2. Literature review

According to Carter and Rogers (2008), the operationalization and efficacy of the triple bottom line (see Fig. 1) lies in approaching it in an integrated manner. There have been extensive debates among authors from various backgrounds (organisational behaviour, technological innovation, politics and government, strategic management and international business) on how best to capture and implement the most essential requirements for an organisation or an entire supply chain to integrate the economic, social and environmental dimensions of sustainability (Anand and Sen, 2000; Torras, 2003; Banerjee, 2003; Aguilera et al., 2007; Linton et al., 2007; Sharma and Henriques, 2005; Barin-Cruz et al., 2006; Cruz and Boehe, 2008). This is essential due to the increased over-dependence of businesses on other trading partners and organisations, resulting in vertical integrations and strategic alliances. However in reality the integrated approach to the triple bottom line is still fragmented.

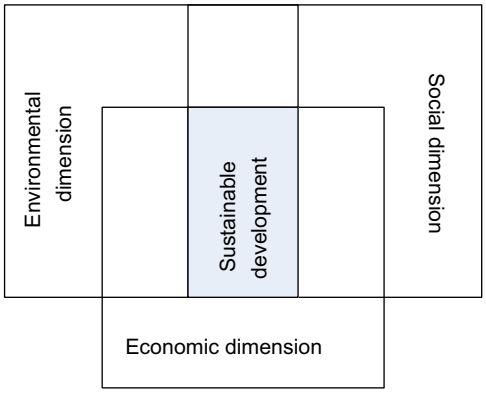

Fig. 1. The triple bottom line.

By acknowledging the fragmented aspects of the 3BL, Markley and Davis (2007) state that it is evident that the environmental impacts due to procurement decisions, inventory operations, transportation, waste accumulation, extensive pollution, resource depletion and carbon emissions are on the rise, thereby leading to climate change and global warming (Carter et al., 1998). Organisations must contribute to environmental sustainability by restructuring products and services, aligning core company values by making operations environmentally friendly, implementing environmental programmes that assist in resource alteration, recycling and efficient waste disposal and finally conforming to government legislations (Andersen and Larsen, 2009). In terms of the social aspects, the rise of Corporate Social Responsibility (CSR) in companies enhances the infusion of ethical trading by businesses, safety, human rights and diversity into core strategic values (Beske et al., 2008; Spence and Bourlakis, 2009).

Due to the need to integrate the three dimensions of 3BL, sustainability in operations has been viewed as a costly investment. It has been doubted for a number of years if environmental and social sustainability can bring about economic benefits. This has tended to lead to the perception of an inverse relationship between the sustainability dimensions implicated in the 3PL. However, according to Mollenkopf et al. (2010), environmental initiatives increase efficiency and productivity, reduce risks and costs, thereby increasing profits for businesses. These initiatives include reduced packaging, carbon emissions accounting for energy efficiency and use of renewable sources and social programmes like increased employee involvement, workplace benefits, diversity and equality for workers and contribution to communities around the organisations (Keating et al., 2008; Holmes et al., 1996; McElroy et al., 1993, Hervani and Helms, 2005). Integration of the 3BL increases reputation among customers, suppliers, employees and shareholders, hence favouring economic benefits (Ellen et al., 2006; Capaldi, 2005). Carter and Dresner (2001) suggest that organisations should become proactive towards sustainable operations. This will improve their competitive positions because their initiatives will prove difficult to replicate. In their survey of Spanish firms, Leal et al. (2003) found a strong correlation between environmental consciousness and a firm's competitiveness. In a large survey of firms in the United States, Sroufe (2003) found a positive relationship between the application of environment management systems, the environmental practices a firm deploys and operational performance metrics.

Therefore, on successful integration of the three aspects of the triple bottom line, economic benefits can be gained by improving social standards and preserving the environment for future generations. This makes the adoption of the 3BL by supply chains highly worthwhile. Supply chains are just beginning to imbibe this spirit and substance. It is essential that sustainable supply chains consider and use the interrelationships between the actors (supply chain players), resources and activities and interfaces comprising of coordination, interaction, cooperation and competition (Svensson, 2007). Walker and Brammer (2009) and Rajesh (2008) suggest that before implementing sustainable strategies in the supply chain, the various players must ensure the following, which act as influencing factors during the implementation of sustainability:

(a) Understand the concept of sustainability, government and social policies and legislations.
(b) Ensure they have the potential to implement sustainability in terms of cost, quality and culture.
(c) Financial capabilities, since social/green production methods are expensive at adoption.
(d) Appropriate organisational culture and avoidance of resistance to change.