

# 10

## Sustainable Logistics and the Supply Chain

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### Learning outcomes

By completing this chapter, the reader will be able to:

- Discuss the importance of logistics and supply chain management (SCM) for business success
- Understand the role of logistics and SCM in the context of project management
- Discuss the key attributes of sustainable logistics and SCM in green ports and maritime logistics
- Discuss the application of the integrated framework for sustainable port and maritime logistics

### Introduction

In today's global business environment, logistics has become one of the key determinants of sustainable competitive advantage. In the context of sustainable project management, every project will have to embrace a sustainable logistics system. Port and maritime logistics is classified as the most significant logistics system since it is considered to be the backbone for facilitating global trade. Around 80% of the world trade by volume, and 70% by value, is done by sea and is managed by seaports across the globe. It is evident that managing the pressures of sustainability is one of the critical challenges for creating value and ensuring growth across all businesses. Port and maritime industry is required to ensure high level of accountability and transparency on sustainability concerns including waste management, climate change and global warming, energy efficiency, employee health, safety and security, impacts on local society and coastal and local environmental health. Because of the global nature of the port and maritime sector, it encounters more challenges in improving sustainability performance. This chapter covers sustainable port and maritime logistics. It starts by presenting an overview of logistics, supply chain management and maritime logistics. The

second section discusses sustainability in the context of supply chain and logistics management. The third section explicates green port and maritime logistics aspects. The fourth identifies sustainability issues and introduces an integrated framework for sustainable port and maritime logistics. It wraps up with a brief section on suggested areas for future research.

## Logistics, SCM and maritime logistics

Logistics is an essential function for various types of businesses. It encompasses all the activities involved in managing the flow of inventory throughout a supply chain including raw materials, work in progress and final products. These activities incorporate order fulfillment, inbound and outbound transportation management, fleet management, inventory management, warehousing, material handling, third-party logistics service (3PL) management, product returns, supply and demand planning and logistics network design. The logistics process is extended to cover information management, supplier integration, environmental management, customer service, maintenance, quality and human resources management. Logistics is defined as *“the process of planning, implementing, and controlling procedures for the efficient and effective transportation and storage of goods including services, and related information from the point of origin to the point of consumption for the purpose of conforming to customer requirements”* (Mangan et al., 2012). Logistics is included in all levels of planning and implementation including strategic, tactical and operational.

Supply chain is a broader term than logistics. It encompasses the coordination between organisations involved via upstream and downstream linkages in a network, in various processes and activities that produce customer’s value (Chopra and Meindl, 2007). The Council of Supply Chain Management Professionals (CSCMP, 2018) defines the supply chain management (SCM) function as:

*“the planning and management of all activities involved in sourcing and procurement, conversion, and all logistics management activities. Importantly, it also includes coordination and collaboration with channel partners, which can be suppliers, intermediaries, third party service providers, and customers. In essence, supply chain management integrates supply and demand management within and across companies.”*

Rushton, et al. (2010), identified four main features of SCM which support successful planning and implementation of logistics operations. The four factors incorporate the following:

- The supply chain is seen as a single unit in which suppliers and end users are part of the planning process of integrated functions including procurement, manufacturing and logistics;
- Supply chain management is seen as a strategic planning process which deals with strategic decisions;
- Supply chain management considers inventory as a means to balance the flow of product through the chain;

- Visibility of product demand in the downstream supply chain and stock levels in the upstream supply chain supported by integrated IT infrastructure is a key success factor.

## Logistics and SCM: competitive drivers

Since 2000, logistics and supply chain management have been considered key factors for business success. The logistics objective is to get the right product in the right way, in the right quality and quantity, in the right location at the right time, at the right cost for the right customer. To this end, logistics management is seen as an integrated function through which all logistics activities, as well as other activities encompassing sales, marketing, finance, manufacturing and information technology, are coordinated and optimized.

Over the last two decades, the role of logistics activities in managing business performance has maximized and the logistics function has shifted from cost center to profit center. (Christopher, 2011). A number of factors has contributed to this shift including:

- Supply chain competition rather than individual firm competition,
- Globalisation of industry,
- Industrial deregulation, personalization and customers taking control.

The transformation in business models has also been driven by the advancement in information communication technology, supply chain applications and industrial automation, including smart mobility, sensors, robotics and 3D printing, which have changed the competition drivers towards speed and short lead-time (Chartered Institute of Logistics and Transport, 2018). Figure 10.1 illustrates examples of sources of pressure on logistics systems.



**Figure 10.1:** Sources of pressure on logistics systems.

The logistics management system is one of the major determinants of today's competition which requires managing responsiveness, reliability, resilience and