



Environmental innovation and the role of stakeholder collaboration in West Coast port gateways

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ABSTRACT

The paper explores the role of stakeholder collaboration in the adoption of innovations as part of the environmental and sustainability agenda of port gateways. We do this through a comparative assessment of the port of Vancouver, British Columbia, and the twin ports of Los Angeles and Long Beach, California. An inductive research approach is used to identify and assess the initiation and implementation process behind exemplary innovations. Innovation includes new technologies and processes for handling and moving cargo, mechanisms for planning and policy making, as well as financing, implementing, upgrading, managing and operating infrastructure systems. A relatively new arena for competition on the basis of innovation concerns environmental performance. The conceptual framework and empirical evidence suggest that while there may be intense demand for and supply of innovation in port gateways, the complex dynamics of the logistics chain are such that successful innovation requires conscious involvement and collaboration of stakeholders.

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1. Introduction

In this paper we report on inductive, qualitative research into several related cases of environmental innovation. Our goal is to look at the processes by which innovations are adopted in the contemporary ports context. Our findings highlight a widely underappreciated but nevertheless important finding. It is that stakeholder collaboration, facilitated and structured through a variety of inter-organizational forums, learning and information-sharing, and formal and informal institutional arrangements is central to the successful initiation and implementation of innovations pursued as part of the environmental and sustainability agenda of port gateways in the era of global supply chains. We believe our approach to

be significant because it uses a supply chain framework, and not a port community framework, for analysis.

The forces of economic, cultural and ecological globalization and networked communications have exposed a myriad of interconnections that often serve to complicate efforts to find innovative solutions to challenges facing society. Local actions are now subject to broader considerations; yet appropriate local responses to these challenges are more important than ever. This inherent complexity and interconnectedness is especially challenging in the context of ports and gateways. There is more to this challenge than investing in the right infrastructure to ensure efficient movement of goods and people in and through a port. There are interconnections in the gateway involving many policy arenas (from international trade to environmental sustainability) operating at many levels and across many jurisdictions (from the international to the neighbourhood) and involving a range of stakeholders including government, NGOs and the private sector.

Two points form the focus of our research. First, innovation has become an increasingly important factor in maintaining

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competitiveness and delivering a high quality of life (Porter, 1990). This is particularly true for innovations that can deal with the increasingly interconnected nature of economic life (Coe, Hess, Yeung, Dicken, & Henderson, 2004). As a result, there is need for innovation in multiple and overlapping arenas, including innovative policies, regulations, technologies, and operating practices. Second, there is a crucial need for real collaboration among stakeholders to create the right environment for the adoption of these innovations.

Our interest lies at the intersection of the need for innovation and collaboration. While the density of stakeholders and interactions in a port gateway may confer upon these places a special advantage in terms of innovation, there are nonetheless challenges posed by collaboration involving multiple, independent stakeholder demands (Rowley, 1997). Locally appropriate innovations, especially with regard to environmental performance, cannot be taken for granted in the context where ports are elements in global supply chains (Hall & Jacobs, 2010). Hence, our specific research question: how do organizations and stakeholder dynamics contribute to the adoption of innovation in port gateways?

Innovation is one means by which stakeholders seek to create and capture value, but this concept has particular meaning in the seaports and freight industry context. In a context where the product is a transportation service that is organized in the form of increasingly integrated logistics chains, innovation includes new technologies and processes for handling and moving cargo, mechanisms for planning and policy making, as well as financing, implementing, upgrading, managing and operating infrastructure systems. While this is a routine yet complex function under normal operating conditions, it is not routine when any sort of change or disruption occurs. In studying innovation, the challenge is knowing for sure that “implementation of a new or significantly improved product (good or service), or process, a new marketing method or a new organizational method in business practices, workplace organization or external relations” (OCED/Eurostat, 2005: 46) is going to succeed (in the market or some other arena) before it has been tested, adopted and proven.

Environmental innovation is a sub-category of innovation overall, and can be defined as consisting of “new or modified processes, techniques, systems and products to avoid or reduce environmental damage” (Kemp, Arundel, & Smith, 2001; cited in Horbach, 2007: 163). It is a relatively new arena for competition within the seaport and freight sectors but is considered vital for securing public and regulatory support for infrastructure investment, as well as reducing costs in the light of resource constraints (Comtois & Slack, 2009). This response to changing regulations and public perceptions, as well as the threat of litigation, is prompting innovations targeted at the (local) mitigation of negative externalities such as pollution and congestion.

We explore the question of environmental innovation through a comparative assessment of two of North America’s major West Coast Gateways: the port of Vancouver, British Columbia and the twin ports of Los Angeles/Long Beach (LA/LB), California. Both gateways form part of the same system of ports along the West Coast of North America and hence compete in the same markets. As such, they are confronted by many of the same pressures and opportunities, including the need to compete effectively with Gulf Coast and East Coast ports while improving quality of life in port communities. While they are exposed to many of the same innovations, stakeholders in both places confront different national and local institutional-legal contexts. Organizational responses in one setting may provide valuable lessons for and about responses in the other.

We make no claims about the outcomes of the innovations adopted in either gateway, whether they reduce environmental externalities or even whether they deliver a positive benefit-to-cost

return. This raises important questions that are beyond the scope of this paper. Instead, we employ an inductive research method to understand the process by which innovations which are widely regarded as successful were actually initiated and implemented. We identify exemplary innovations drawn from the areas of policy, technology and operations with an emphasis on those directly related to environmental considerations, and then examine the initiation and implementation processes behind these in greater detail. In other words, the innovations discussed in this paper represent what was possible, not necessarily what is ideal. Before we present these cases we consider the potential role of stakeholder groups in innovation in the context of logistics chains.

2. Stakeholders and innovation in logistics chains

The process of innovation adoption in the port sector involves balancing and negotiating the often conflicting demands of interested parties. This can mean the port itself as an organization, private sector technology developers, investors, the environmental community, local residents, and regulatory agencies. Not all of these are equal actors (or the balance of power can change at any given time) but stakeholder theory posits that any or all of these can influence the innovation process (Windsor, 2010). We choose to use the term stakeholder, rather than actor, in exploring innovation in the port sector because it captures both active decision makers as well as more passive respondents to innovation (and everyone in between) or those with a stake in its outcomes. Stakeholder dynamics refers to the variable nature of the interaction between the various stakeholders at any given time prior to, during, or after innovation adoption.

Stakeholder theory helps to define the relationship of the firm or organization to its shareholders, employees, customers, suppliers and the public (Freeman, 1984; Lorca & Garcia-Diez, 2004). The recognition that stakeholders have varying interests poses a problem for the organization because it makes interactions, and therefore outcomes, unpredictable. Despite the fact that certain stakeholders may lack sophistication or power (Winn, 2001), their presence among a broad range of stakeholders helps to legitimize the organization and its processes. In pursuing specific goals or outcomes, the organization will need to actively engage (as opposed to merely accommodate) its stakeholder partners (Beaulieu & Pasquero, 2002). This expands the organization’s resources and helps to enhance its resiliency (Truijens, 2003).

While stakeholders can help confer a social licence on an organization, stakeholder dynamics complicate innovation development and adoption because of the difficulties in assessing outcomes. This means in part measuring the economic and social benefits and costs for a wide array of individuals and institutions (Dew & Sarasvathy, 2007). The complicating factors and constant negotiation also contribute to an environment in which innovations tend to be adopted in a more incremental fashion (Roberts & Bradley, 1991). This is true of the port sector as well.

In his history of containerization, *The Box*, Marc Levinson (2006) traces the story of what is without doubt the most important innovation in the ports industry in the past century. The opportunity for this innovation arose in the context of the post-WWII increase in economic activity and the transition from national to internationally oriented trade. But as Levinson (2006) makes clear, this innovation was not in response to this single factor or to a single event, nor indeed does the box itself represent the totality of the innovation. The supply of this innovation can be traced to multiple influences including experiments with standardization by the military and entrepreneurs. Indeed, the physical container, while an effective way of protecting goods from the elements, is by itself not particularly revolutionary. The box became revolutionary

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