Chapter 7
Building an Eco-Innovation Cluster: Water Cluster in the Brazilian Amazon Region

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ABSTRACT

This paper discusses the creation of an innovation water cluster in the Brazilian Amazon region, capitalizing in the region’s unique global competitive advantage in the development of a water innovation economy. The existence of academic institutions, research agencies, a manufacturing park, and unique natural resources offer the right environment for the creation of this water eco-innovation cluster in the city of Manaus. The development of an innovation economy in the city of Manaus in the Amazon will promote a new cycle of economic development in the region, and induce a new cycle of attraction of environmental technology companies to the Amazon region of Brazil. In addition, it will also address social objectives of the Amazon region, increasing social-economic welfare and promoting eco-competitiveness as a cornerstone of the nation’s economy. This paper outlines a link between cluster theory and a water diamond model with sustainability as its major goal.

I. WATER AND INNOVATION

Water is the foundation of economic growth and development for all nations around the globe. However, recent global economic, environmental, and social developments are stressing water resources on a global scale; water stress is one of today’s most pressing global issues, already affecting economies around the globe (Hoffmann, 2009; Lawson, 2008; Schulte, 2007; OECD, 2009; Villiers, 2000).

A new water global divide is being created between countries that have major water resources and countries that do not have enough to sustain
themselves. This increasing gap between countries will dictate in the near future investment and international trade trends. Increasingly, water-intensive products and commodities will migrate to water-rich countries, generating additional natural competitive advantages for these countries as the water divide gap widens (Hoffmann, 2009; Palaniappan & Gleick, 2009).

It is also becoming clear that countries facing shortages of water resources will have to find innovative, technological and creative solutions to address this resource-related economic and social stress. Countries rich in water resources will need to devise strategies that maximize the returns on their water resources, strategies which rely heavily on innovation and technological solutions. It is also important to acknowledge that these strategies need to have a sustainable envelop that will assure the availability, security, quality, and safety of water resources. Thus, the future economic development and growth of economies around the globe are closely tied to their access to usable water resources (Lawson, 2008; Lobato, 2008; Rogers, 2008; Wood, 2008).

In the past fifty years, the global population has doubled, but the demand for water has tripled. Global water consumption is doubling every twenty years, indicating that shortages of water resources are already developing and becoming more widespread across nations. Thus, water resources promise to play in the 21st century the role that oil played in the 20th century: it is the commodity that affects the wealth of nations. Water is the most plentiful commodity on earth; however, 97% is seawater, 2% is found in glaciers, ice, and snow, and only 1% is available for use (Araia, 2009; Clarke, 1993; El-Ashry, 1998; Gleick, 2008; Lavelle, 2007; Lawson, 2008; OECD, 2003).

Water has no substitutes, and global weather patterns are increasingly putting more stress on global water resources, modifying patterns of water availability and dispersion on a global scale. Economic and social disruptions at the national and international levels can be a side effect of increasing global water stress, resulting in security instabilities and the migration of economic and social activities (Elhance, 1999; Haddad, 2000; Leobet, 2001; Merret, 1997; Postel & Wolf, 2001; Roger, 2008; Villiers, 2000).

In this paper, we propose a cluster “water diamond” model based on Porter’s (1990) that is applied to water resources. The Amazon region is used as an example of its application. The Amazon is a water-intensive region; however, water is not used as a resource that can add value to the region’s products and services. Water resources are still not perceived as a source of competitive advantage for the Amazon region. Integrating water resources of the Amazon region into an eco-cluster using the water diamond model can help not only this region and the country of Brazil, but also potentially the entire globe, to thrive.

II. A WATER CLUSTER

Figure 1 introduces a conceptual framework for depicting the interrelationships between the different factors in a water model. Sustainability of water is the goal and security, safety, availability and quality are the factors that affect the sustainability. For each of the factors firm the factors from Porter’s model are used: firm strategy, industries, demand conditions and factor conditions. Technology, world issues and governmental/world policies affect the model.

As shown in Figure 1, the water diamond has a symbiotic relationship with the local, national and global industries, but at the same has a symbiotic relationship to the ecosystem in which it is located. Thus the water cluster will impact the local business and ecosystem environments, but at the same time, will be affected and shaped by their forces and dynamics. The four dimensions of Porter’s forces model interacts with the four dimensions of the water diamond. In order for us to depict the model’s capabilities, we will use the
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