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Expanding roles for the Swedish waste management sector in inter-organizational resource management

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In loving memory of our wonderful colleague, teacher, and friend: Leo Baas 07.05.1946–20.11.2016.

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ABSTRACT

Several waste management (WM) professionals see an ongoing shift in the focus of the industry, from that of a transport and treatment sector to that of a more integrated sustainable service provision and material production sector. To further develop such transitional ambitions, WM organizations are increasingly looking toward inter-organizational resource network concepts (such as the circular economy and industrial symbiosis) as models of how they would like to create new value together with their customers and partners.

This article aims to take a step in addressing uncertainties behind such transitions by analyzing barriers for inter-organizational resource management and in turn uncovering some potential opportunities and risks of novel offerings from the WM sector. Obstacles for developing innovative inter-organizational resource networks have been identified based on studies of implementing industrial symbiosis networks. Subsequently, managing executives from Swedish private and public WM organizations were interviewed regarding the sector's capacity to overcome such barriers – opportunities and risks of providing new resource management services – and how their organizations might approach the role of actively facilitating more resource efficient regions.

Eco-Industrial park management and contracting out holistic resource management are some areas in which the respondents see WM organizations offering new services. In relation to such approaches, various risks (e.g. being cut out of investment benefits, or unstable supply) and opportunities (e.g. new markets and enhanced sustainability profiles) were identified. Additionally, it was seen that WM companies would need to make substantial changes to their business approach, becoming less dependent on flows of mixed materials for example, if they are to become even more central value chain actors. To strengthen such approaches, it was seen that the sector will need to find methods to strategically build strong, long term partnerships, expand upon and take advantage of available knowledge resources (i.e. best practice technologies and regional material flows), and explore new business models (i.e. stockpiling, park management, or waste minimization). Additionally, working with sector representatives to argue for a more balanced market conditions next to primary production should assist the viability of new offerings in the wider market.

1. Introduction

1.1. The drive for inter-organizational resource efficiency

Many economies around the world have historically based their growth on inexpensive and plentiful natural resources. In the context of abundance, applying a linear 'take, make, waste' approach to fulfilling society's needs and wants has been practical to a degree. However, it is evident that this approach to the use of resources in our economies is not sustainable in the long term (Dobbs et al., 2013; EC Environment, 2011; Lacy and Rutqvist, 2015). Global trends such as increasing world population, growing consumer affluence, resource scarcity, and environmental pressures have public and private actors calling for a transformation away from traditional linear economies (Allwood et al., 2010; EC Environment, 2011; Genovese et al., 2015; McKinsey Global Institute, 2011; OECD, 2011).

In addition to such drivers, benefits to economies and individual organizations can be realized through increased inter-organizational resource efficiency. Societal benefits such as increased resource security, improved macro economies, and increased employment are among highlighted benefits (Chertow and Lombardi, 2005; European Commission, 2011; Lombardi and Laybourn, 2006; Wijkman and Skånberg, 2015; Zhu et al., 2007). A recent Club of Rome report estimates that taking political and industrial action supporting material

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efficiency could raise the Swedish GDP by more than 2% and create an additional 50,000 jobs in the country (Wijkman and Skånberg, 2015). Potential benefits for companies working with resource efficiency include reduced resource costs, reduced supply risks, improved goodwill, increased competitiveness, and perhaps access to new market segments (Ellen MacArthur Foundation, 2012; Lacy and Rutqvist, 2015; Roy and Cheruvu, 2010). While seen as a major player in enabling a resource transformation on a macro scale, the waste management (WM) sector stands to gain new business opportunities through radically developing their approach to resource management.

1.2. The development of the WM sector

As defined by the EU, the WM sector performs "the collection, transport, recovery and disposal of waste, including the supervision of such operations and the after-care of disposal sites, including actions taken as a dealer or broker"(European Commission, 2008). Acting as such, this sector has for many decades been an important partner to our production and consumption systems, actively working toward the safe and effective treatment and use of waste resources from society. The sector has evolved through the years, expanding from regulation driven end-of-pipe solutions such as landfilling and sanitation to include other high value operations such as material recycling, and energy recovery (Singh et al., 2014). Today, many see the WM sector as a key player in realizing the pressing societal drive for more resource efficient and circular regions (Accenture, 2014; EEA, 2014; Lacy and Rutqvist, 2015).

Most organizations in the WM sector are structured to solve 'the waste problem', giving inadequate attention to the wider systems and value chains within which they are embedded (Singh et al., 2014). In some cases, WM companies can be seen as hindrances to innovative inter-organizational resource efficiency measures. Some of their traditional 'low value' activities such as landfilling, mixed recovery, and energy recovery can be considered as 'lock-ins' to lower stages of the waste hierarchy, where ineffective pathways for materials are kept despite potential for realizing more value through innovative alternative value chains (Corvellec et al., 2013). However, recently in Europe and elsewhere, actors in the WM sector have been rethinking and restructuring their traditional business approaches toward that of innovative systems developers and broader value chain managers. This can be seen in the sector's adoption of the concepts of the circular economy (Ellen MacArthur Foundation, 2012), cradle-to-cradle (McDonough and Braungart, 2010), and industrial symbiosis (Chertow, 2000). The sector faces demanding challenges in developing approaches to realize these aspirations as a portfolio of valuable business offerings. These challenges range from developing new business models that are less dependent on material mass flows to identifying what role a WM organization can play as a core inter-organizational manager.

1.3. Aim of the article

To become more resource efficient, our economies will require new, non-linear and high value, approaches to resource management. This article seeks to identify and evaluate novel value creation approaches for WM organizations aspiring to actively assist in innovative inter-organizational resource management.

Toward this aim, this article addresses the following questions:

1) How can WM organizations assist in overcoming obstacles to innovative inter-organizational resource management?
2) What are the risks and opportunities of developing these activities for WM organizations?
3) How are Swedish WM organizations strategically and practically working toward progressive resource management visions?

2. Methodology

2.1. Literature review

Industrial Symbiosis has been chosen as a representative proxy for innovative inter-organizational resource management in this article's survey of obstacles. Industrial symbiosis was chosen given its array of activities around inter-organizational resource management, as well as its relatively large canon of literature regarding the obstacles to the facilitation and implementation of industrial symbiosis. The expanded background section of this article builds upon a literature review performed by Nilsson and Baumgarten (2014) (in Swedish) which identified obstacles to industrial symbiosis activities. In performing their review, the terms "industrial symbiosis" and "eco-industrial" combined with the terms "barrier", "driver", "lesson" and "facilitation" were searched in Scopus, Google Scholar and Libris. This review of identified obstacles (summarized in Background Section 3.3) is not presented as a formal result in this article. However, it was used in interaction with the authors' collective experience in the field of WM[1] to set the stage and structure the approach of the semi-structured expert interviews.

2.2. Expert interviews

Semi-structured expert interviews were performed to add external insight and validation into the value chain management roles which Swedish WM firms do or could play in overcoming barriers to inter-organizational resource management. Initial interviewees were selected from a list of Sweden's largest public and private WM organizations. Additional interviewees were consequentially included after references from the national WM council (Waste Sweden) and other interviewees. All interviewees held strategic leadership roles (e.g. CEO or Chief development officer) in their respective organizations.

Before the interviews, a list of barriers was identified using the wealth of research on barriers to industrial symbiosis implementation as a proxy for barriers to innovative inter-organizational resource management. This list was used as a semi-structured framework in initiating the in-depth interviews with Swedish WM executives.

Six in depth interviews were performed from February to July of 2014 with high level representatives of two of the largest public[2] and two of the largest private WM organizations in Sweden.[3] To begin the interviews, a focus was put on each respective organization's current approach and perspective on the role of WM. Using the barrier list as a guide the interviewees were then interviewed regarding their current and potential novel approaches to aiding development of inter-organizational resource management. Subsequently, the opportunities, risks, and key success factors related to these approaches were elicited from the interviewees. Throughout the interviewing guidelines from Weiss (1994) were applied. Special care was taken to stay within the goals of the study during the interviews while remaining attentive and reflexive to the participants' responses and seeking clarification where necessary. The interviews of this study averaged two hours in length.

During the analysis of the interview notes and recordings, emerging topics were marked with one or several tags per area of relevance (various barrier categories/opportunities/risks/initiatives/key enablers for further development/etc.). Details from each topic group were then

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[2] The two public WM companies included in the study handled over 1.5 million tons of waste in 2014 combined.

[3] The two private WM companies included in the study handled over 6 million tons of waste in 2014 combined. For more details on the organizations involved in the study see Appendix A.