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Leveraging resource ecologies for sustainability transitions - a waste management case Deliberation Models Featuring Youth Participation

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**Leveraging Resource Ecologies for Sustainability Transitions
-
A Waste Management Case**

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Leveraging Resource Ecologies for Sustainability Transitions -

A Waste Management Case

Abstract

Addressing fundamental sustainability challenges has now become a strategic issue for multinational corporations. However, such challenges are by their very nature complex and require resources that are frequently beyond those traditionally accepted as relevant and crucial to a firm's core business operations. The aim of this paper is to improve knowledge about sustainability transitions through the development of resource ecologies in interactions of diverse actors. The research question explores how relational resources are developed into resource ecologies through interactions among diverse actors in sustainability transitions. The empirical contribution is based on qualitative single-case-study research on a packaging company and its waste management program. The findings of the study show that organizing to advance a transition toward sustainability requires business activities to be conceptualized as a continuous process of project building. Such projects involve various actors in diverse settings and responsibilities divided thematically and spatially forming nets within a network to solve problems collectively. This study illustrates how resources are identified, created, and shaped through socially intelligent nets during transitions toward sustainability.

Keywords: Sustainability, Transition, Networks, Resources, Ecology, Social intelligence

Introduction

Sustainability has increasingly attracted interest among both practitioners and business network scholars (e.g., Lacoste, 2016; Johnsen *et al.*, 2017; Press *et al.*, forthcoming). The challenges

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2
3 related to climate change, pollution, waste, and growing inequality are difficult to resolve as they
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5 are deeply embedded in societal structures and institutions (Grin *et al.*, 2011; Loorbach *et al.*,
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7 2011; Loorbach *et al.*, 2010; Dirven *et al.*, 2002). The globalization process has intensified
8
9 sustainability challenges like global warming, chemical pollution, ocean acidification, water
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11 scarcity, and biodiversity (Folke *et al.*, 2010). These challenges are often understood as
12
13 consequences of globalized production and consumption systems and have invited questioning of
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15 the legitimacy of businesses (Buckley and Ghauri, 2004; Kramer and Porter, 2011) and calls for a
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17 new way of looking at resources.
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25 Transitions toward sustainability require new ways of thinking and acting (Medrano *et al.*, 2020).
26
27 Issues related to production, distribution, and consumption of goods and services are putting
28
29 pressure on the operations of corporations (Czinkota *et al.*, 2014; Scherer *et al.*, 2011). The
30
31 multiple causes and consequences extend across a range of societal domains, actors, and scales,
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33 which implies the presence of a diverse range of nets and also brings into focus the resources that
34
35 could be leveraged across networks to address complex challenges (Loorbach and Wijsman, 2013).
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37 Press *et al.* (forthcoming) find that heterogeneity in ecosystems related to sustainability leads to
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39 increased sharing of creative ideas, which in turn tend to stimulate opportunities for innovation
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41 and success.
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46 Existing research on corporate sustainability remains anchored in firm and industry level behavior
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48 with an inadequate integration of systems thinking in empirical designs (Whiteman, *et al.*, 2013).
49
50 Sustainability challenges are interrelated in complex, non-linear ways and could be better
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52 addressed through a multiple network-related actor perspective. A study by Tura *et al.* (2019),
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54 discusses how organizational decisions, with the objective of implementing sustainable business
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3 practices, could lead to tensions and conflicts when a single stakeholder makes such decisions.
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5 Goals related to sustainability cannot be attained by the action of a single firm alone, and instead
6
7 require action by networks of interacting actors of various kinds, such as businesses, governmental
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9 institutions, and consumers (Patala *et al.*, 2014; Öberg *et al.*, 2012). Networks provide actors with
10
11 resources that otherwise would be difficult to develop or acquire (Ahuja *et al.*, 2012). Research
12
13 has shown that both business networks and resources may enable and benefit sustainability
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15 activities (Lacoste, 2016; Patala *et al.*, 2014). Sustainability in business require a host of things
16
17 related to actors, resources, and activities, and extends beyond a firm's own business operations
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19 (Høgevoid and Svensson, 2012). Combinations of resources to advance sustainability can be seen
20
21 as resource ecologies that comprise the totality or pattern of relations between resources and the
22
23 environment of actors within which they exist (Odum and Barrett, 2004). The heterogeneity of
24
25 ecosystems enmeshed in imaginings of sustainability (Press *et al.*, forthcoming) indicate relational
26
27 elements among the required resources, thus implying an ecology (see Lejano and Stokols, 2013).
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29 The term *ecology* is commonly applied in relation to sustainability and environmental issues to
30
31 bring into focus the various relationships that are related to such issues, and based on the work of
32
33 Lejano and Stokols (2013), we suggest it is also applicable in the context of sustainability in
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35 business networks.
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46 Resource ties of networked firms have been a core focus area of the business network approach
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48 (Axelsson and Johanson, 1992; Håkansson and Snehota, 1995) that refers to aspects of the RBV
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50 in its perspective of resource interactions (Baraldi *et al.*, 2012). However, research on
51
52 sustainability within the business network approach and the IMP (Industrial Marketing and
53
54 Purchasing) perspective is scarce. Waluszewski *et al.*, (2019) call for more IMP related research
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3 capturing continuous and emergent phenomena, such as those related to climate change and
4 environmental threats.
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11 Most of the research on sustainability within the business network approach relates to purchasing,
12 supply management (e.g., Johnsen *et al.*, 2017), or supply chain management (Frostenson and
13 Prenekert, 2015). The authors are aware of no studies focusing on how firms can facilitate
14 transitions to sustainability by leveraging resource ecologies through a process of upstream
15 activities and interactions of a diverse group of actors. Such a study would have the potential to
16 illustrate how the configuration of actors comes about as the transition process unfolds over time.
17 This dimension lends an understanding of how time is conceptualized within business networks
18 (Halinen *et al.*, 2012) and could have a profound impact on business sustainability (see Bansal and
19 DesJardine, 2014). Studies exploring the dimensions of time and process during resource
20 interactions are important within interorganizational networks (Baraldi *et al.*,
21 2012). Conceptualizations of time imply change and emergence are part of a continuous process in
22 which social entities are seen as temporary stabilized clusters organized around projects (Nayak
23 and Chia, 2011). Therefore, in this study, we attempt to fill this research gap by adopting a network
24 view on the development of resource ecologies.
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47 The aim of this paper is to improve knowledge about sustainability transitions through the
48 development of resource ecologies in interactions of diverse actors. The research question explores
49 how relational resources are developed into resource ecologies through interactions among diverse
50 actors in sustainability transitions. We draw upon Goleman and Boyatzis's (2008) notion of social
51 intelligence as a set of interpersonal competencies geared towards inspiring others to frame our
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3 understanding of the term, in this context, as the ability for building resource ecologies. The
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5 empirical part of the study is based on single-case-study research on the waste management
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7 program of multinational packaging company operating in India. We contribute to business
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9 network research by enhancing the knowledge related to sustainability, and more particularly that
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11 on how resource ecologies are shaped from a process perspective through interactions of relational
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13 resources of diverse actors.
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21 The paper is structured as follows: In the following section, the theoretical background of the paper
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23 is presented. First, the context for a network approach to sustainability transition is created before
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25 the methodology is described. Thereafter, the findings of the empirical study are presented and
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27 analyzed. This is followed by a discussion comparing the key findings with prior literature. The
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29 final section presents the conclusions, including the study's contribution and suggestions for future
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31 research.
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37 **A theoretical framework for a network approach to sustainability transitions**

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43 Context of sustainability transition

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46 The social responsibilities of firms have been important issues for decades (Scherer *et al.*, 2007).
47
48 The discussions have focused on how these responsibilities should be defined and the best ways
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50 in which firms incorporate ethical concerns within traditional management activities (Jones and
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52 Wicks, 1999). In the context of a globalized business environment characterized by a diverse range
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54 of institutional and cultural dimensions, firms need resources that help them support their
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3 legitimacy claims while managing to sustain competitive advantage. One of the biggest shifts in
4
5 the competitive landscape is currently evident in the growing expectation that firms take
6
7 responsibility for the impact of their production and consumption systems. This is why, while it is
8
9 important to remember a network perspective is helpful when studying sustainability, it is still
10
11 relevant to scrutinize a focal firm (Frostenson and Prenkert, 2015).
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15 Firms have a basic area of competence they hone through learning and experience over a period
16
17 of time; enabling that competence to become their source of competitive advantage. However,
18
19 there is also a paradox to this: Overextending into diverse domains could dilute competence and
20
21 increase costs due to lack of expertise and competence in those domains. One suggested remedy
22
23 is leveraging resources to perform closely related activities that could cut costs (Madhok, 2002).
24
25 When firms make their transition toward sustainability, their focus shifts to how they compete in
26
27 organizing activities related to the transition process and their efficiency in doing so. The process
28
29 could uncover the reasons for cost differences in organizing particular activities among firms and
30
31 reveal the institutional structure of production in the system as whole. The cost of organizing any
32
33 activity within a firm depends on the kinds of activities that are already being conducted within
34
35 the firm and therefore, some activities facilitate, while some hinder, and these relationships
36
37 determine the actual organization of production (Coase, 1990). Sustainability should be viewed
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39 from a wider perspective, as consumers not only value a product's physical attributes, but
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41 increasingly place importance on *values* (Medrano *et al.*, 2020).
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50 Long *et al.* (2018) argue that a sustainable future relies on change happening on multiple levels,
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52 specifically, the individual, organizational, and the systems level. Long *et al.* (2018) find that
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54 collaboration is a critical success factor in transitions to sustainability. To achieve the necessary
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3 collaboration, firms should seek cooperation opportunities and interact in networks in order to
4
5 continuously coordinate resources dedicated to sustainability transitions. In this context, relational
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7 resources acquire relevance.
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10 11 12 13 Relational resources

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16 The RBV has influenced the development of the view on resources within the business network
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18 approach (Baraldi *et al.*, 2012). The ARA (activities-resources-actors) model captures the idea of
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20 resources that become specific through adaptation in the course of interactions (Choi and Hara,
21
22 2018). It is important for business-to-business scholars to explore complementarity and the
23
24 combination of resources, as the performance of the resources of one firm is dependent on the
25
26 resources of the other firm (Choi and Hara, 2018).
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32 The network perspective highlights the importance of common resources that cannot be generated
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34 independently (Dyer *et al.*, 2018; Arya and Lin, 2007; Lavie, 2006). From a network perspective,
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36 resources such as products and services are seen and valued as a part of the network. Spring and
37
38 Araujo (2017, p. 127) argue that products should be viewed as “open-ended propositions subject
39
40 to constant re-definition and re-valuation as they are attached to and detached from successive
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42 contexts and networks.”
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46 Zhang and Wu (2017) stress the importance to the development of dynamic capabilities of the
47
48 interplay between firm-internal resources and external network-embedded resources. Network
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50 resources have been described as assets existing in networks within which firms are embedded
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52 (Gulati, 1999). Important attributes of network resources are their utility, rarity, appropriability,
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54 and complementarity (e.g., Gulati *et al.*, 2011). Alinaghian and Razmdoost (2018) also found
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3 accessibility, usability, scalability, and versatility to be essential network resource attributes that
4 influence firm performance and conclude that firms need to interact with actors within their
5 network to identify, create, and develop value-creating resources. Given that these resources are
6 created in networks of different actors, we call them relational resources.
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12 Relational resources are unique sources of competitive advantage (Gulati, 1999) and generate
13 value for the organizations within the networks (Shan *et al.*, 1994) especially when the network
14 consists of organizations with diverse resources (Rothaermel, 2001). When analyzing these
15 relational resources, it is not sufficient merely to look at snapshots or outcomes at a certain point
16 in time, for we need to understand how resources develop over time through interaction among
17 actors (Håkansson and Ford, 2002; Håkansson and Snehota, 1989).
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27 Cantù *et al.* (2012) argue that it is important to consider resources from both the provider's and
28 users' perspectives. The same study also stresses that resources have no meaning without actors
29 that conceive, activate, and use them. In order to combine resources to find solutions, it is necessary
30 to integrate resources across the boundaries of business organizations. The findings of Cantù *et*
31 *al.*'s study show that combining resources is a process and an ongoing accomplishment based on
32 the interaction between the actors involved.
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45 Sustainability through networks

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47 Most research on sustainability from a B2B perspective relates to purchasing and supply (Johnsen
48 *et al.*, 2017). The most common theoretical perspectives applied are stakeholder theory,
49 institutional theory, and the RBV (Johnsen *et al.*, 2017). For instance, Ferro *et al.* (2017), try to
50 determine the extent to which a firm's efforts towards sustainable business practices consider
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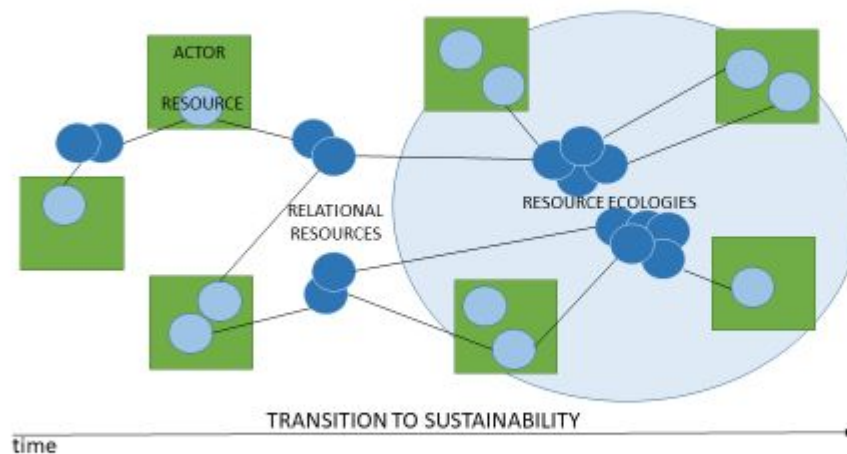
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3 stakeholders in their organizations and business networks, the market place and society. While
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5 Svennson *et al.* (2016), propose a framework for assessing the general status of stakeholders in a
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7 firm's sustainability efforts within their networks. There are few available studies applying an IMP
8
9 approach (e.g. Ritvala and Salmi, 2010; Aarikka-Stenroos and Ritala, 2017), although IMP-based
10
11 research could advance research on sustainability in business networks (Johnsen *et al.*, 2017).
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15 From a business network perspective, the IMP approach provides an understanding of issue
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17 networks—or nets—that emerge and change over time to pursue collective goals specific to
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19 networks (Mouzas and Naudé, 2007). Another function of such nets is to explore challenges related
20
21 to legitimacy and Crespín-Mazet and Dotenwill (2012) illustrate how the IMP ARA model and
22
23 supply network frame of Gadde and Håkansson (2001) could be used to analyze legitimacy as an
24
25 element of sustainability development within supply networks. In a business network, the nature
26
27 of a resource is not only created in interaction among actors, but is also dependent on the actor's
28
29 perceptions of how the resource can be used in combination with other resources (Abrahamsen
30
31 and Håkansson, 2015). Such perceptions are critical during sustainability transitions as resources
32
33 required for sustainability embody complexities that require creative and unique combination of
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35 networks.
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41 There have been attempts to discuss the potential of the IMP interaction approach, for instance, to
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43 underpin studies of sustainable purchasing and supply management (see Johnsen *et al.*, 2017). The
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45 interorganizational dimension of this approach, along with its focus on interdependence in
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47 relationships (Håkansson and Snehota, 1995; Dubois *et al.*, 2004) and network effects (Ritter,
48
49 2000) mean it can offer rich insights into networks and the relationships that underpin them.
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51 Accordingly, the analysis has often expanded beyond business networks to incorporate multiple
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53 layers of actors including those from political and civil society (see Ritvala and Salmi, 2010). In
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3 addition, collaborative arrangements for value creation have led to the exploration of ecosystems
4 in B2B and business network literature (Aarikka-Stenroos and Ritala, 2017). This presents the
5 opportunity to frame transition stories by incorporating change while retaining sight of the
6 continuity of the process, and its social dimensions, something that is vital for understanding
7 sustainability transitions (Kuzemko *et al.*, 2016).
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18 The tentative theoretical framework is illustrated in Figure 1 and is described below.
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51 Figure 1. Tentative theoretical framework: Transition to sustainability through networks of
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6 The focus of this study lies on the transition to sustainability aided by relational resources and
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8 resource ecologies developed in interactions between various actors. Value creating relational
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10 resources are formed when actors in a network interact. The transition process enables an evolution
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12 from relational resources toward resource ecologies that takes account of the time and space when
13
14 specific resource configurations come together. The transition is a social process that calls for a
15
16 certain flair for what we understand as social intelligence, to harness the imagination and creativity
17
18 of the interacting actors in networks for identifying and combining resources targeting building
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20 resource ecologies. Next, we present the empirical case study that illustrates the key ideas of this
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22 tentative framework.
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33 **Methodology**

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38 A qualitative single-case study was considered the most appropriate research approach for this
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40 study because the research focuses on a new subject (Eisenhardt, 1989). A single-case study
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42 approach facilitates exploring dynamics across different levels (Bansal and Corley, 2011).
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44 Although single-case-study research has been criticized for lacking external validity and for
45
46 offering poor generalizability of its results, the method can be useful when investigating complex
47
48 structures because it facilitates an extensive description and analysis of rich data and context
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50 dependent issues (see e.g., Dubois and Gadde, 2014). A case can comprise an individual, an
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3 organization, an event, or a process, and in our study, the case involves a waste management
4 program of a firm that encompasses several projects.
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10 The case was purposefully selected. According to Lincoln and Guba (1985, p. 202) purposive
11 sampling concerns “maximizing information instead of facilitating generalization.” The case
12 centers on a waste management program of a multinational packaging company operating in India,
13 catering mainly to firms selling beverages. The packaging material is a composite of paper, plastic,
14 and aluminum. The chosen focus meets the definition of a case proposed by Stake (1995), who
15 referred to a case as “a bounded system” with working parts. First, the case context is Indian cities,
16 a context that rarely features in research related to sustainability from a network perspective.
17 Second, the case offered a unique opportunity to study a sustainability transition process from the
18 perspective of a firm with freedom of network access. Such network access enabled the analysis
19 to capture the transition process beyond the perspective of the firm to include the evolving
20 relations, making the level of analysis at the level of interactions. This helped in understanding the
21 transition process as it advanced within the case, including the waste management program and
22 the emerging projects attached to that program. The focus of the analysis is particularly on the
23 process of activities and interactions related to creating and combining resources for sustainability.
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44 Our research follows a narrative approach and is based on using ethnography to acquire a
45 perspective on learning and the use of sociological and organizational imagination (see Gaggiotti
46 *et al.*, 2017) because we are attempting to capture a transition process as it emerged. The narrative
47 approach captures the emergence of network processes in terms of interactions between
48 individuals from diverse network actor organizations. The approach permits an examination of the
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3 motives and activities of those individuals and their interplay within contexts (see Makkonen *et*
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5 *al.*, 2012).
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10 The research methods applied are unstructured interviews and participant observation. The
11 empirical study was carried out between 2011 and 2015 (with a one-year gap 2012–2013, and short
12 monthly gaps in between). In total 50 interviews were conducted. The informants were five senior
13 and mid-level managers of the focal company, six small recycling business owners, six non-
14 governmental organizations (NGOs) that work with issues related to the waste ecosystem, ten
15 members of civil society, five activists focused on waste, five waste workers, five waste
16 aggregators and recyclers, eight school and college teachers and students. The informants were
17 chosen because they were part of the stakeholder network of the focal firm and were instrumental
18 in establishing further projects including networks for sustainability, thereby enabling the
19 continuous emergence of the waste management program. One of the researchers acted as a
20 participant observer in five workshops and engagement forums involving both direct and indirect
21 stakeholders of the waste management program, over six years. In addition to the interviews, data
22 were drawn from extensive field notes, internal documents, and news reports.
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42 While it is common to view ethnography merely as a research method (see Dahles *et al.*, 2014),
43 we adopt a much broader perspective to include what it is like to be embedded in the research
44 environment (Czarniawska, 2014; Watson, 2001; Van Maanen, 1998). That level of embeddedness
45 was possible with the consent of the organization and the objective was neither to be subjective
46 nor objective but to proceed interpretively. Therefore, it was important to get to know the actors,
47 be party to their interactions, and to understand the personal networks, the socializing, and the
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3 institutional and the social structures that influenced how actors came together to organize the
4 transition toward sustainability.
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10 One of the researchers worked within the waste management team at the case company, yet the
11 role did not have a clear title, which offered opportunities to interact with diverse stakeholders, as
12 they did not attach any singular identity to the researcher. The firm's staff sometimes treated her
13 as an observer and as a conduit through which to convey messages to other stakeholders that they
14 could not reach themselves. At other times, they identified her as an expert, and asked for
15 suggestions, and also sometimes involved her in certain core activities. The broad scope of the
16 researcher's involvement meant she participated in seeing, understanding, problematizing,
17 practicing, and learning within the case context; a level of involvement that opened up ways of
18 understanding change and continuity within transition processes.
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33 Qualitative content analysis (Mayring, 2000) was applied to understand the empirical material. It
34 was a reflective process that consisted of reading and constantly referring back to interview,
35 discussion, and conversation notes, material distributed during workshops, and internal reporting
36 documents of the focal company.
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45 The interviews offered the first level of information about the actors, their relationships, and the
46 resource connection that led them into the network. The distributed stories captured through
47 extended interactions during workshops, presentations, news reports and other documents
48 facilitated the identification and mapping of different relational networks that emerged along with
49 the need for resources. The analysis began with the focal company and later as the stories
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3 unraveled, it became clear that the relational resources and how the focal firm was able to sense
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5 and configure them, could reveal the organizational logic of the resource ecology networks. The
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7 analysis indicated that as the need for resources became apparent, actors tapped into available
8
9 networks to access them and many of these initiatives progressed toward resource ecology
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11 networks.
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17 The focus was on understanding how the issues relating to waste affect actors with different
18
19 dispositions and in different situations in order to identify the intertwined causality of the various
20
21 resource relationships. These resource relationships emerged from a complex combination of
22
23 personal stories and contexts and other events and activities related to the evolving waste
24
25 management program. The process helped identify an overarching theme through distilling
26
27 meanings, which involved condensing the text to be reflected by the use of code words and sorting
28
29 them into categories according to who, what, when, and where questions.
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35 Thereafter, the empirical material was coded based on the aim and research question. With a focus
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37 on relational resources, resource ecologies and interactions among diverse actors, it was possible
38
39 to code the empirical material into three categories: need for recycling resources, locating synergy
40
41 for recycling, and matching value for recycling. The need for recycling resources was for example
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43 coded based on the following quotes: a) “Nobody would like to buy a beverage in a pack that
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45 creates waste, therefore the motivation to take it on even before the volumes grow to create a viable
46
47 recycling chain.” and b) “...we began to hear some noise not from the market but internally, global,
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49 that we needed to start thinking about post-consumer...”. Locating synergy for recycling was for
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51 example related to quotes like “They offer a great platform with limitless possibilities...”, and the
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3 matching value for recycling was coded based on excerpts like "...you want an opportunity to
4 learn, we can help you...". In the following coding-stage, these three categories were from a time
5 perspective coded based on the involved actors and the resource combinations. Based on that, we
6 were able to identify the transition to sustainability that could be divided into five phases based on
7 various combinations of actors and resources, which through the interactions among the diverse
8 actors evolved from relational resources to resource ecologies for sustainability.
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19 Findings

24 The Role of Networks in Developing Resource Ecologies for Sustainability Transitions

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28 Phase 1: Internal waste recycling: From transfer of technology to leveraging resources through
29 consumer connect
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35 Initially, waste recycling was not high on the agenda of the focal company in India. The initiatives
36 on waste were driven by global best practice for dealing with factory waste, which involved simple
37 technology transfers and drawing on knowledge from the company's existing global recycling
38 networks.
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44 *So there again, it wasn't as though we were starting from scratch, markets like Brazil were*
45 *already down that road, and before Brazil there were other markets, so one of the good*
46 *things about being in a multinational set up is that you keep learning from within the global*
47 *linkages. (Manager 2)*
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3 The company's production facilities were primed for both waste reduction and recycling and
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5 factory waste recycling began in 1998. The idea of waste recycling had a strategic intent but as the
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7 interactions evolved and the network expanded, the scope of this strategic intent not only widened
8
9 but also acquired depth. The initial trigger was the proactive global initiative on waste that pushed
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11 the local managers to formulate a local waste management strategy for managing waste. According
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13 to a senior manager, factory waste was recycled into panel board through a simple process. He
14
15 describes it as follows "*It was simple tech transfer from other parts of the world. The recycler was*
16
17 *taken to these recycling plants to show how this was being done.*" This acted as an incentive for
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19 both the company and the recycler. The recycler saw a business opportunity and the company a
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21 partner for managing waste.
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26 The company's new practices of waste reduction and recycling were not only influenced by the
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28 global network but also by the customers.
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33 *If I take a global perspective, a lot of this is being driven by the sentiments of the consumer*
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35 *(this was also substantiated earlier when we conducted a global survey and consumer*
36
37 *feedback indicated a growing concern about the waste generated by used cartons). Nobody*
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39 *would like to buy a beverage in a pack that creates waste, therefore, the thrust of our focus*
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41 *has been on this specific thing, which is always...in any research we do it always comes*
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43 *out pretty predominantly, out of all the different environmental factors, the recyclability*
44
45 *and extent of recycling, that I guess is the motivation for the company in India also, to take*
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47 *it on even before the volumes looked good (high) enough to create a viable recycling value*
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49 *chain. (Manager 3)*
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5 In 2003–2004, the company realized the importance of creating a customer connection. From a
6 strategic perspective, it was important for the company to build the right image and to gain trust
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8 in the context of customer relationships.
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17 *Our business is to produce cartons not to manage or recycle waste, but we understand our*
18 *responsibility in the larger context, in the system, and also in terms of the business*
19 *perspective, this is a growth market for us so there is a need to connect with individual*
20 *customers as well. Direct dealing is with institutional customers, we need to be able to*
21 *connect with the end consumer and one of the ways of building an image is not just as a*
22 *company that makes packaging but as a company that cares. The consumption experience*
23 *of the customer is the stuff that is inside the packaging, food, a deeply intimate experience*
24 *that has health and cultural implications. In such a scenario, trust is a key element of*
25 *beginning the conversation with the customer. Incidentally, the waste management project*
26 *was not designed with that in mind but as the project evolved it developed these dimensions.*
27 *We are creating awareness related to waste by opening up our system and empowering*
28 *partners. (Manager 1)*
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49 It is apparent from the findings that, initially, activities and resources related to sustainability
50 occurred on a firm level and were directed toward internal waste reduction and recycling. The
51 global network contributed to this undertaking by providing resources in the form of knowledge,
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3 connections, and ideas. These activities and resources led the company to extend its sustainability
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5 operations to include recyclers and primary customers (mainly beverage companies) through
6
7 technology and knowledge resource transfers. Over time, secondary customers (ones who buy the
8
9 beverages in cartons) were identified as important resources and thus the meaning of resources
10
11 also progressed from being related to internal knowledge and networks, and technology, to opening
12
13 up these internal systems to leverage wider capabilities, thus furthering engagement and trust. The
14
15 waste management strategy of the company progressed as the needs of the process evolved. From
16
17 leveraging internal knowledge and networks, the strategy evolved into a process of identifying
18
19 waste management needs in cooperation with existing network actors and letting those needs guide
20
21 the identification of added resources and subsequent network building. As this network of
22
23 secondary customers expanded to address the waste management issues, these engagements also
24
25 played an important role in creating a direct connection related to the value of the packaging with
26
27 this class of customers. The secondary customers through their preference for beverages packaging
28
29 determine a brand's choice of packaging, an important step toward making inroads into a market
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31 where price consciousness is an important factor.
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40 Phase 2: Relational resources: Developing waste recycling through resources of non-business
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42 actors.
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47 The search for efficient post-consumer recycling proved the process was far more complex than
48
49 the straightforward recycling of factory waste. The resource mix needed was beyond the scope of
50
51 the best practice for resolving PCC (Post Consumer Cartons) recycling issues as the context was
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53 very different.
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6 *Even when households segregate waste, by the time the segregated waste reaches the municipal*
7 *collection centers, it is frequently mixed up. In terms of planning, this situation threw up a*
8 *completely different challenge – that of unpredictability and loss of control over the quality of the*
9 *waste. (Manager 2)*
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19 There was a fundamental change in the process as it meant moving away from full material
20 recycling of clean factory waste to contaminated used carton waste, and that demanded
21 understanding India's unorganized and complex waste management and recycling system. It was
22 difficult to find any recycler who would take the contaminated PCCs, as waste segregation at the
23 household level is not common in India.
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33 The managers needed to understand the waste management system, so they researched the waste
34 stream and system of waste management in India. The managers identified the resources required
35 and the actors that could deliver them: NGOs, individual civil society members, the informal
36 recyclers (who buy recyclable waste from waste pickers), and the paper industry.
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45 The NGOs had resources for working with the most important unit of the informal waste system
46 in India—the waste pickers—who comb through waste at the municipal collection centers or at
47 landfill sites and sell the recovered materials to the local recyclers. The NGOs work with waste
48 pickers on issues like health and safety, education, exploitation, and the right to a livelihood. The
49 company was interested in engaging the waste pickers to increase post-consumer carton collections
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3 by diverting them from the landfills and the most efficient way to do so was to involve the NGOs
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5 who had access to the waste picker networks. One of the partners in this particular network was a
6
7 street theater performance group who became instrumental in conveying important messages
8
9 relating to waste, health, education, and livelihoods. Another was a stay-at-home mother who
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11 became involved because of her interest in waste management, and who had social ties with local
12
13 retailers. She later established an NGO to manage the growing interactions.
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19 Over a period of time, the company engaged with the NGOs and through them the community
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21 leaders of the waste pickers to explain the value of the PCCs. Simultaneously, it was also working
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23 with various recyclers and the paper mills to fulfill the promise of realizing the recycling value of
24
25 the PCCs. In doing so, it was creating an ecology of resources through networks across Indian
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27 cities to increase collection of PCC.
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33 In this phase the company expanded its operations targeting sustainability through interaction with
34
35 various non-business actors. These actors, either directly or indirectly facilitated the creation of
36
37 relational resources related to recycling. These resources are the actors themselves, their
38
39 knowledge, contacts, and influence on a societal level. These interactions increased the profile of
40
41 the focal company and its product offering and also won over institutional customers who
42
43 instructed their beverage vendors to switch to the focal company's packaging.
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49 Phase 3: Resource ecosystem management: From network builder to ecosystem orchestrator
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3 Phase 3 overlapped with the previous phase; as the company and its network partners learned about
4 the waste management process, the added layers of complexity became evident. By 2008–09, the
5 company actively encouraged recyclers to accept PCCs by offering them access to clean and dry
6 waste from the factory at a lower rate as a subsidy. The company also began engaging with its
7 primary customers (mainly beverage companies) and encouraged them to send waste from their
8 filling machines to the recyclers. At one end, there were the recyclers and at the other the NGOs
9 connected with waste pickers who collected the PCCs along with other waste. The firm supported
10 the NGOs with resources such as funds and equipment in order to initiate the recycling process.
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24 The focal company interacted with both downstream and upstream actors in order for them to
25 facilitate the development of necessary resources for waste recycling. Producing value related to
26 sustainability requires an interconnected and collaborative network and as the awareness
27 increased, the company was able to focus on strategies enabling designing for ecosystems. The
28 shift in focus created opportunities to develop a number of networks performing tasks designated
29 as projects that contributed toward the main goal. The focal company took the role of key
30 orchestrator of these networks.
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42 *“Our business is to produce or manufacture the packaging material and recycling is not our*
43 *business, but it is our business to make recycling work” (Manager 1)*
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3 As network orchestrator, the firm also looked for separated material (paper, plastic, and aluminum)
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5 recycling options to generate additional value for waste collectors and segregators, an action
6
7 intended to help increase collection rates. While solutions for paper recycling were readily
8
9 available, few existed for the aluminum and plastic mix. The unsegregated material was already
10
11 being recycled into composite boards and the recyclers were happy to continue making them
12
13 without paper as the sheets deteriorated faster with paper included. The focal company's search
14
15 for additional innovations related to waste recycling was linked with its intention to incentivize
16
17 collections. Over a period of time, the range of recyclable products has expanded, and this has
18
19 incentivized network partners to commit additional resources in terms of time, funds, space, and
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21 equipment to promote waste collection.
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28 The recycling process involves envisaging a new ecosystem, where the materials and their
29
30 recyclability determine the ecosystem building process. The network of recyclers continues to
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32 work with the company on these innovations. The network partners have over time, become
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34 invested in the initiative through projects that range from collection, to storage to recycling, and
35
36 have brought their own connections, both personal and professional.
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42 This phase of ecosystem management is characterized by the focal firm's role as an orchestrator
43
44 of networks of actors pooling resources into relational resources for sustainability. Those networks
45
46 of actors characterized by their championing of innovative ecological products grew from the
47
48 intentions of both the focal firm and the network actors. A consequence of this was the inclusion
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50 of the focal company in policy level discussions on waste that improved its chances of being part
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52 of waste policy frameworks.
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8 Phase 4: Emergent resource ecosystem design: Leveraging network resources through social
9 intelligence
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15 By 2010–11 a resource ecosystem was emerging. The ecosystem design is determined by the need
16 for resources as the waste management process matures, therefore it is emergent. These resources
17 at the network level act as a repository for capabilities that all network partners, including the focal
18 company can draw upon. The firm made a conscious decision to facilitate this process as it enables
19 the company to address evolving needs related to consumer perspectives on business
20 responsibilities, the environmental and social impacts of products and services, and regulatory
21 demands.
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33 The capability to design ecosystems requires a keen understanding or “sensing” of opportunities
34 facilitated by actions in an environment where creativity is critical. The resource that enables
35 creative action in this context can be categorized as social intelligence, that is, an awareness of
36 contexts, social dynamics, and strategic interactions that help achieve objectives. Issues related to
37 sustainability and sustainable development are tied to their context: For instance, the focal firm
38 has identified waste related to packaging as an issue that is common across markets, yet each
39 market has its own unique context that requires specific solutions to be designed. Generic
40 approaches only work to a certain extent, after which local imperatives take over. This calls for a
41 process of emergent design of ecosystems, each of which is conceived as a project.
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3 In practice, the PCC carton collection can serve as an example. Recycling PCCs always occurs in
4 a broader context, whether it is waste management as a system or sustainability as a motivator for
5 action. This is a conscious strategy for building an ecosystem consisting of networks that find
6 value in association because the actors involved perceive they own their space within these
7 interactions. Consequently, while the focal firm may anchor many of these interactions and
8 facilitate them, the effort is always directed toward finding a way to make the interactions relevant
9 within the existing context.
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21 *And whenever we have gone and met people we have never talked or presented just one*
22 *dimension or one side of the issue at hand. For instance, when there was a food safety*
23 *forum, we would always dutifully talk about food safety within the context of environment.*
24 *In an environment forum we'd present the various aspects that contribute to the*
25 *environment and that could include food safety, for example. (Manager 4)*
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35 Similarly, the social intelligence applied by the focal company can also be identified through
36 trustful product narratives linking the production, consumption, and disposal of the products.
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42 *With this company, I was energized and immediately felt comfortable, they admitted that*
43 *they did not have the answers. Also, they never talked specifically about the product, it was*
44 *always in the context of how we use it and how we can use it better, make it work longer.*
45 *(A student)*
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3 The emergent and context-driven way of leveraging resources was also evident when the PCC
4 recycling plan was evolving and the focal firm realized that it needed some credible studies to
5 establish the quality of the paper derived from a PCC; a requirement for communicating the
6 qualities of the paper to the paper mills. One of the recycling partners helped identify a credible
7 research organization (Central Pulp and Paper Institute) and also conducted workshops with paper
8 mills. The research institute leveraged its network to involve almost 50 paper mills in the workshop
9 showcasing the recycling opportunities with PCCs, and the participants in turn involved their
10 network of waste paper suppliers who were interested in setting up recycling facilities, thus
11 expanding the network further.
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26 *We would start something in a new city or new recycler with no particular plan in mind.*

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28 *The approach was more like “let’s just start and we will help you as you go along. You*
29 *need a bit of financial support, we can help you with that, you want to know how something*
30 *works, we will show you or find someone who can help, you want an opportunity to learn*
31 *we can help you with such opportunities in countries similar to India, be it in Iran, Egypt,*
32 *Pakistan, Thailand.” That is how it happened, during our interactions. (Manager 5)*
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45 The members of the network also support each other by conducting or participating in workshops,
46 linking organizations to resources relevant to waste within particular contexts, and at times sharing
47 their own. The network looks for solutions, whether for issues around collection, storage,
48 transportation, or recycling. Even NGOs who feel the company could do more to scale up the
49 recycling process acknowledge that it has developed the ability to understand and identify the
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3 systemic nature of issues like waste and has proved itself capable of building networks equipped
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5 to address those issues systematically.
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10 *Our organization is focused on the environment and we had no past experience with the*
11 *kind of interventions they were talking about, yet they gave us the platform to explore our*
12 *larger goals along with their specific ones. We work with schools, colleges, and companies*
13 *on the issue of waste and we are now using the company's program as a tool for explaining*
14 *what recycling actually means. The program is so solid that people believe in it and it fires*
15 *their imagination about waste and recycling; it makes recycling more tangible for*
16 *everyone. People actually witness what is possible and this helps them set benchmarks for*
17 *their own initiatives. They think, if the company can do this, why can't we? They offer a*
18 *great platform with limitless possibilities and that has helped us grow and mature as an*
19 *organization. (NGO Partner)*
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35 The collaborative action that the company supports provides all actors in the network with the
36 necessary space and opportunity to contribute ideas and perspectives and also to critique the
37 program. Several network partners reported the interactions were inclusive and felt they were
38 collaborators and partners and a part of the solution.
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47 Phase 4 is characterized by social intelligence and how it is leveraged as a resource for
48 contextualizing, developing, and connecting other resources to facilitate ecosystem design. At this
49 stage, the process of transition to sustainability was no longer limited to the focal firm, the
50 connected network actors, and value chains of products and innovations: It had spread to the
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3 emergent context-driven ecosystems as well. The skill for sensing and orchestrating activities that
4
5 allow for social, environmental, and economic elements to emerge require what we understand as
6
7 social intelligence.
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12 Phase 5: Resource ecologies for waste management: Diffusion of sustainability through
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14 transparency, discourse, and mimicking
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22 In 2011–2012, as the network evolved, transparency became important. Transparency encourages
23
24 trust and enables the focal firm to go beyond adhering to societal expectations to participate in a
25
26 broader discourse on how norms and rules should evolve to address the complex issues arising
27
28 owing to current systems of production and consumption. The company has become an important
29
30 partner and stakeholder in policy discussions relating to waste. These activities have also resulted
31
32 in lucrative business relationships for both the focal company and its business customers; for
33
34 instance, individual consumer beverage preferences and institutional shifts in procurement policies
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36 that favor beverages sold in the focal company's packaging.
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42 Partners value transparency. When a recycler was uncomfortable about inviting NGOs for a plant
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44 visit, a team from the focal firm convinced the recycler to treat the visit as an opportunity to learn
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46 from the experience and improve. The recycler hosted the visit and the sincerity and openness was
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48 appreciated by the visiting NGOs and consequently the relationships established have thrived.
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3 The NGOs always help by lending support to the businesses that are part of the network, by helping
4 them connect with those parts of the value chain they understand best, the waste pickers and
5 workers in the informal garbage collection and segregation function. There are for-profit
6 businesses, social businesses, NGOs, educational institutions, and even the odd theater group, but
7 all actors sense their role and purpose, and understand the connections.
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17 Partners also mirror each other's actions, and that helps extend best practice and to establish those
18 practices so they become part of normal routines.
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24 *Interaction with other schools gave us access to many ideas. For example, we saw a school in*
25 *Delhi making their school handbooks out of recycled paper from the beverage package and*
26 *thought it was a great idea to do the same for our own. Children also contribute to changing*
27 *behavior by constantly questioning and discussing. (A teacher)*
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35 The school level programs are instrumental in encouraging questions and debates on sustainable
36 development; the college level programs are pushing ideas on sustainability leadership, and
37 specifically within the context of PCC recycling, these programs are preparing the ground for ideas
38 and discussions on the circularity of materials and conceptualizing waste as wealth. These
39 interactions and engagement arenas at times exude an atmosphere of transition, where people
40 irrespective of their identities (as managers, NGOs, garbage collectors, etc.) discuss some of the
41 fundamental social, economic and environmental issues and how they can collectively address
42 them within their own network's area of expertise and how they might involve more actors. A
43 result of one such discussion was the *two bins* awareness program to encourage the separation of
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3 household waste. The program showcased how municipalities could leverage local networks to
4
5 spread awareness of the benefits of household waste separation.
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10 The company encourages an entrepreneurial environment with an open space for recycling
11 experimentation. The experimentation involving new processes and products focuses on learning
12 and is highly tolerant of mistakes. Business plans are not a prerequisite for funding an idea or an
13 initiative, as they are not clearly visible in the beginning. The managers recognize that each partner
14 or stakeholder has their own strength in the way they work toward the goal.
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24 *There is never any one best way of doing things, we encouraged our partners to deploy*
25 *their own models for collection and recycling and internally, we followed our own way of*
26 *building the network, designing engagement processes and enabling support for the*
27 *network. We were very clear that we want to be inclusive because we knew those were the*
28 *guys we had to work through, they were the backbone, the basic support for what needed*
29 *to be done. By engaging with them, we help each other. (Manager 1)*
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40 In creating such resource ecologies the network allowed for imagining and putting into practice
41 activities that blend in the social, environmental, and economic elements. The unit of analysis for
42 creating such resource ecologies is not restricted to one notion of value, it takes into account the
43 distributed nature of value spread across social, environmental, and economic aspects of activities,
44 and letting network interactions evolve in time.
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54 The findings of the empirical study are illustrated in Figure 2.
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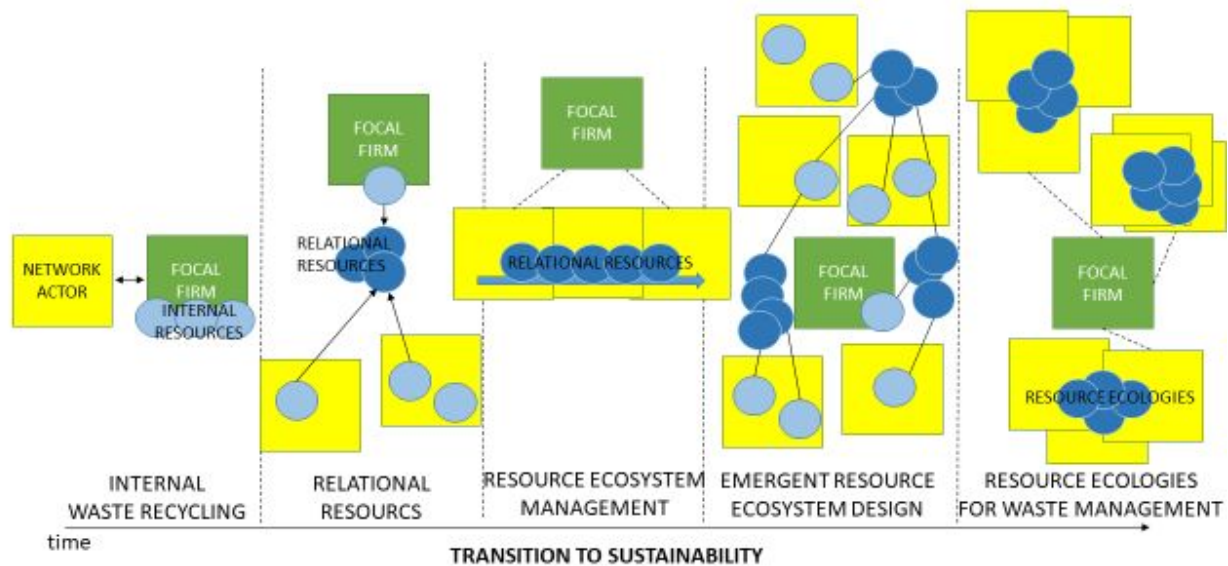


Figure 2 Transition to sustainability – From internal waste recycling to resource ecologies for waste management

Figure 2 illustrates the different phases of a transition process to sustainability. It is apparent from our findings that the process starts with internal waste recycling activities of a focal firm that in the second phase interacts with diverse actors and thereby relational resources are developed. These relational resources are managed and orchestrated by the focal firm. Eventually resource ecosystems are emergently developed through formal and informal interactions among diverse actors, and these ecosystems shape into resource ecologies consisting of networks of diverse interacting actors and relational resources that are combined for sustainability.

Discussion

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3 From a business network perspective, the findings of our study indicate that the process
4
5 underpinning a transition to sustainability evolves from utilizing internal resources to creating
6
7 networks of resource ecologies for waste management. As far as the development of resources for
8
9 sustainability is concerned, our findings are in line with those of Abrahamsen and Håkansson
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11 (2015), who argue that the nature and value of a resource is dependent on the actor's perceptions
12
13 of how it can be used with other resources. Moreover, in line with the results of Choi and Hara
14
15 (2018), our findings show that it is important to explore complementarity and the combination of
16
17 resources, as the performance of the resources of one firm is dependent on the resources of the
18
19 other firm. However, the findings show that although a network perspective is highly relevant for
20
21 transitions to sustainability, the activities and strategy of a focal firm remain central (Frostenson
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23 and Prenekert, 2015). In business networks value is created through interaction with other firms and
24
25 matching a company's offering to specific user contexts that are characterized by certain resource
26
27 combinations (Baraldi *et al.*, 2012).
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35 Interorganizational approaches have often been applied to capture relational interdependence
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37 (Håkansson and Snehota, 1995; Dubois *et al.*, 2004) and the resulting network effects (Ritter,
38
39 2000) even beyond business networks (see Ritvala and Salmi, 2010). However, the sustainability
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41 context that considers a wider system view, the connectedness and entanglement of our social,
42
43 economic, and ecological existences requires a reframing of contexts. Such a reframing would
44
45 encourage a better understanding of how a firm's success is increasingly determined by its ability
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47 to adapt, integrate, reconfigure, and leverage internal and societal skills, resources, and functional
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49 competences to address complex problems arising from its production and consumption system.
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54 As the case shows, in such situations, firms invest in internal resources that are in turn able to
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3 identify and operationalize resources to address impacts of the production and consumption
4 system. Research on business networks has expanded over time to include the underlying
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6 formation of networks of business relationships, their interdependencies, and connectedness, their
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8 consequences for business landscapes and implications for politics, policy, and society
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10 (Waluszewski *et al.*, 2019). This case captures what Waluszewski *et al.* (2019) describe as
11
12 emergent phenomena of a decentralized economic exchange that is important for efficiency and
13
14 innovation and fosters economic and societal prosperity. Such decentralization is critical as single
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16 organizational efforts towards fostering sustainability without taking into account other network
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18 partners' values and objectives could result in economic, structural, psychological, and behavioral
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20 tensions (Tura *et al.*, 2019).
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28 From the perspective of sustainability, we find that leveraging resource ecologies for sustainability
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30 requires a combination of network configurations. In that respect, our findings are in line with
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32 Long *et al.* (2018) who argue that collaboration is a key aspect of sustainability. The matching of
33
34 value requires a framing that takes into consideration the past, present, and the future. The focal
35
36 case illustrates that transition processes revolve around developing abilities for social intelligence
37
38 primed to facilitate resource ecologies, and that nurturing such abilities expands a firm's
39
40 competitive landscape from the traditional focus on developing operational, organizational, and
41
42 technological capabilities. These interconnected networks form diverse configurations within
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44 dynamic contexts to address problems as they emerge. There is an element of continuity where
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46 becoming is prioritized over being as the process of transition unfolds (Nayak and Chia, 2011).
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3 Our findings indicate that there is a fundamental analytical problem of integrating a diversity of
4 value spheres, and society has a set of rational methods for planning and action where decisions
5 are made to privilege one aspect to the exclusion of others. This has led to an artificial separation
6 of activities that are in reality interdependent, and failure to allow for these activities to evolve
7 through interactions in time and space is resulting in the issues that threaten sustainability. The
8 notion of resource ecologies enables the reconciliation of activities by acknowledging their roles
9 in network building for transitions to sustainability. Our findings show that resource ecologies for
10 sustainability transition emerge directly and indirectly over time within specific contexts and nets
11 of interacting actors creating, developing and sharing resources in order to find valuable solutions
12 for sustainability.
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28 **Conclusion**

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33 From a theoretical perspective, this article contributes to business network research by adding
34 knowledge related to the connection between relational resources, resource ecologies and
35 sustainability transition. The findings indicate that sustainability transitions occur by leveraging
36 appropriate network resources and enabling connections using social intelligence, between such
37 networks within contexts, thus creating solution-oriented ecosystems.
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45 From a managerial perspective, the findings of the study reveal a need for managers to adopt an
46 entrepreneurial and creative problem-solving mindset. The question for managers needs to shift
47 from *how to be sustainable?* (an inward focused approach) toward *what are the conditions that*
48 *deter sustainability?* (a networked system approach). That shift involves visualizing sustainability
49 issues that are specific to the firm within their wider contexts and developing social intelligence
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1 abilities that contribute to building networks for managing issues within their appropriate contexts.

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5 Social intelligence is an ability that is critical to help firms identify, match, and combine the
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7 complex resources that is essential during sustainability transitions. Social intelligence offers
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9 managers options to experiment with transitional pathways that match the objectives of diverse
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11 network actors and provide unique resource combinations for building competitive advantage. For
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13 managers it is important to recognize and appreciate the interconnectedness of such resource
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15 ecologies, but also that interactions resulting in joint actions can often have different rewards and
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17 benefits for the diverse range of actors integrated into such networks. There is only so much that
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19 is under the control of managers, or even firms, which means both must embrace uncertainty and
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21 the phenomenon of emergence. It is important that firms involved in a transition toward
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23 sustainability have an attitude of openness and transparency. Key tasks are related to learning and
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25 sharing best practice to nurture sustainability.
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31 From a societal perspective, the findings of our study show how the open and transparent activities
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33 to advance sustainability of one firm spread through different layers of the society through
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35 connecting, sharing, and developing resources. Therefore, it is important for societies to enable
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37 and support the open sharing of resources for sustainability. Investments in large programs
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39 supporting transitions to sustainability tend to spread from a focal company into various
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41 sustainability projects involving several layers of actors within society. In this way, awareness,
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43 behaviors, and attitudes related to sustainability become rooted in society and give rise to valuable
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45 innovations.
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51 It is not possible to generalize the findings of a single qualitative case study that took place within
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53 a specific context, and therefore ways of orchestrating resource ecologies for sustainability from a
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3 network perspective should be explored further. Avenues for future research might include
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5 studying the interrelatedness of different networks/ecosystems. Another suggestion for future
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7 research would be to focus on the individual level, by exploring practices of individuals involved
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9 in transitions toward sustainability.
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