

A Theoretical Perspective into Green Supply Chain Management

By

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Abstract

Green Supply Chain Management (GSCM) is a cross-disciplinary field of research that has been continuously growing in both academia and practice. GSCM research has followed different directions, and as the research progresses new arguments, insights, and interpretations have emerged. These research directions have explored GSCM from different theoretical perspectives rather than one dominant theoretical perspective. As GSCM literature continues to grow, the need to evaluate the different theoretical perspectives becomes manifest in order to advance our knowledge and understanding about GSCM, and to identify new research directions. While it is frequently acknowledged that GSCM has been explored from a variety of theoretical perspectives, only few studies have summarized or classified these theoretical perspectives. This research aims to provide an overview of the popular theories that have been often used to investigate several issues related to GSCM.

Keywords: GSCM, RBV, Stakeholder Theory, Institutional Theory, Dynamic Capabilities, NRBV.

Introduction

GSCM has gained the attention of both academics and practitioners in the last three decades (Abdellatif and Graham, 2019; Abdellatif, 2022a, b, c). The profound challenges of pollution, climate change, and global warming are plaguing the entire globe (Abdellatif, 2021; Abdellatif and Shahroury, 2022). A staggering number of research studies have been published so far attempting to investigate different aspects of GSCM (Al-Qudah, 2018; Alqudah et al., 2020; Almajali, 2021; Abdellatif, 2022c). As this body of research continues to accumulate, there is an imperative need to look at this phenomenon through different theoretical lenses and evaluate the several theoretical perspectives that have been utilized to explore various aspects of green supply chain management.

In this context, the greatest contribution has been made by Sarkis et al. (2011) who categorized the literature into nine organizational theories that have been utilized to investigate several issues related to GSCM. The nine theories are; Complexity theory, Ecological Modernization (EMT), Information theory, Institutional theory, Resource Based View (RBV), Resource Dependence theory (RDT), Social Network theory (SNT), Stakeholder theory, and Transaction Cost Economics (TCE). In the same vein, Dubey et al., (2017b) extended the work of Sarkis et al. (2011) and added five more theories namely; Knowledge-based view (KBV), Strategic Choice theory, Agency theory, Systems theory, and Network perspective. Similarly, a very recent contribution was made by Liu et al., (2018) who identified nineteen theories that have been applied in GSCM research which are; DOI, Theory of Industrial Symbiosis, Social Capital theory, Social Exchange theory, Theory of

Production Frontier, Contingency theory, Path dependency theory, in addition to the theories mentioned earlier.

Interestingly, despite this growth of research, most of GSCM studies do not explicitly adopt any theory (Dubey et al., 2017). Many theories are only mentioned in literature reviews and not properly applied, without any discussion or evaluation, whereas applying theory means utilizing theory to build a conceptual model, develop analytical models, and then perform theoretical or data analysis (Liu et al., 2018). Dubey et al., (2017) stated that within the extant literature of GSCM there is a dearth of studies that provide theoretical support to explain the existence and the boundaries of GSCM. Therefore, researchers yet call for the application of a wider range of theories in the field of GSCM with the aim of extending existing theories or building new theories tailored for GSCM research (Carter and Easton, 2011; Sarkis et al., 2011; Touboulic and Walker, 2015; Reefke and Sundaram, 2017, Liu et al., 2018).

Popular theories in GSCM research

RBV, Stakeholder theory, and Institutional theory are the dominant theories in SSCM/GSCM research (Touboulic and Walker, 2015; Liu et al., 2018). These theories have been widely applied by many researchers in the field of GSCM such as; (Gavronski et al., 2011; Beske, 2012; Shi et al., 2012; Wu et al., 2012; Zhu et al., 2013; Beske et al., 2014; Zeng et al., 2017; Hong et al., 2018).

Resource Based View (RBV)

RBV is one of the dominant theories in the environmental management and GSCM research. RBV was introduced in the field of economics by Penrose (1959). It suggests that organizations can generate and sustain competitive advantage through the acquisition and integration of valuable, rare, inimitable, and non-substitutable (VRIN) resources (Barney, 1991; Sirmon et al., 2011). Resources are both tangible and intangible assets that facilitate the production and delivery of goods and services (Amit and Schoemaker, 1993). Additionally, these resources are associated with competitive advantage once they are a source of atypical profits (Wernerfelt, 1984; Peteraf, 1993; Wernerfelt, 1995). The key argument of RBV is that some organizations can generate more profits than others because of their control of scarce resources, these organizations have lower costs and thus attain abnormal profits compared to their competitors; therefore, they have a competitive advantage. Their returns in excess of breakeven are called rent. VRIN resources can generate rent when properly utilized. Rent and VRIN resources are the core of RBV (Seddon, 2014). Further, once other organizations can control their scarce resources and cut down their costs, the low-cost organizations rent will fall to zero, and thus squander their competitive advantage. In this situation the competitive advantage is considered temporary and not sustained due to the resources being Inimitable or Non-substitutable, the “I” and “N” elements of VRIN (Barney, 1995).

The concept of VRIN resources that could enable organizations to attain sustainable competitive advantage has been discussed by many researchers (Barney, 1991; Peteraf, 1993; Rungtusanatham et al., 2003). First, resources must be valuable in terms of improving the efficiency or effectiveness of the organization. Second, resources should be rare which means organizations can control it and use it to the disadvantage of their competitors. Third, resources have to be inimitable to prohibit competitors from developing such resources. Finally, resources must be non-substitutable which means competitors are unable to find

equivalent resources that could serve the same purpose. The acquisition and control of valuable and rare resources can generate a temporary competitive advantage. However, organizations can sustain this advantage over longer time periods once they are able to protect these resources from imitation and substitution. RBV considers intangible resources that are organization-specific more valuable in generating competitive advantage and thus significant profit generators, because their value is difficult to emulate and their function is difficult to replace (Hitt et al., 2001; Taylor-Coates and McDermott, 2002).

RBV has been applied in SCM research where Rungtusanatham et al., (2003) suggests that once supply chain linkages are viewed as capabilities they can be considered as connections that enable organizations to obtain VRIN resources. RBV is also used to describe supplier selection (Squire et al., 2009; Lewis et al., 2010) and outsourcing decisions (Dekkers, 2011). Generally, RBV helps in identifying and highlighting how to manage supply chains in a way that generates competitive advantages (Jones and Riley, 1985). Research by Barney (1991) and Sirmon et al. (2007) state that the main competition between organizations is on the ownership of unique resources and strategic capabilities, and that heterogeneous capabilities among organizations can explain performance differences. Therefore, the ownership of VRIN resources and the development of capabilities may be demonstrated by improvements in organizational performance and attaining competitive advantages.

Through the lens of RBV, some GSCM practices can be considered as strategic capabilities because they are valuable, rare, inimitable and able to be exploited by an organization (Shang et al., 2010; Shi et al., 2012). Additionally, some GSCM practices can be seen as an intangible strategic capability that is difficult to replicate (Chan et al., 2012). Research has shown the importance of GSCM practices as a strategic resource for organizations to create a competitive advantage, for instance, Shang et al. (2010) highlights that organizations with better GSCM attain higher performance. Similarly, Kumar et al., (2012); Li et al., (2015); Dubey et al. (2017b) emphasized that the adoption of GSCM practices enable organizations to obtain competitive advantage.

Extensions of RBV such as the Natural Resource-Based View (NRBV) have been developed to highlight the potential for organizations to attain sources of competitive advantage through taking the natural environment into consideration throughout the production process (Hart, 1995). Another extension of the RBV is the dynamic capabilities perspective, which considers the ability of organizations to adapt to changing environments by building upon their existing processes and capability base (Teece et al., 1997). NRBV and dynamic capabilities perspective emphasize the role of factors that might facilitate the link between resources and competitive advantage. These two extensions are of particular interest for GSCM research as they provide a theoretical lens to understand the link between the adoption of GSCM practices and performance (Hart and Dowell, 2011; Graham and McAdam, 2016) by investigating the factors that facilitate the adoption of GSCM practices.

Natural Resource-Based View (NRBV)

The NRBV is an extension of the RBV which emphasizes the natural environment as a core element in the quest of competitive advantage. Hart (1995) postulates that a combination of investments can be made to enhance the environmental capabilities of an organization, including investments in systems, technologies, processes, guiding strategies, and training. The underlying premise of the NRBV is that organizations can develop

environmental capabilities that will lead to potential sources of competitive advantage (Pullman et al., 2009; Hart and Dowell, 2011; Hajmohammad et al., 2013). NRBV argues that there are three key strategic capabilities namely; pollution prevention, product stewardship, and sustainable development (Pullman et al., 2009; Hart and Dowell, 2011).

The first environmental strategy is pollution prevention, which continuously aims to prevent the generation of unnecessary waste, emissions, and effluents in their internal business processes instead of managing and cleaning them 'at the end of the pipe' (Hart and Dowell, 2011; Maas et al., 2012). Second, Product stewardship which is an externally oriented environmental strategy that expands the scope of pollution prevention beyond the boundaries of the organization to include the entire life cycle of the product, by addressing environmental concerns throughout the different stages from sourcing until the product end of life (Hart, 1995; Hart and Dowell, 2011; Graham and McAdam, 2016). Finally, sustainable development which aims to produce and meet present needs without hindering future generations from achieving their needs (Kemmler and Spreng, 2007). It calls for the involvement of different stakeholder groups in dealing with environmental concerns to reduce the negative effect on the ecosystem in a way that does not endure substantial and permanent changes (Michalisin and Stinchfield, 2010; Dhahri and Omri, 2018), and is not limited to environmental concerns only but also focuses on economic and social concerns (Hart and Dowell, 2011).

Through the lens of NRBV, GSCM practices can be categorized into intra-organizational environmental practices, and inter-organizational environmental practices (Shi et al., 2012). First, intra-organizational practices relate to proactive environmental practices that organizations adopt internally which reduce waste, emissions, and consumption of resources and energy. For instance, organizations that have a proactive approach and adopt pollution prevention, they develop specific knowledge and experience over time through continuous learning and repeated practices. This knowledge and experience will generate a causally ambiguous resources that are unique to the organization. Additionally, the intra-organizational practices also involve all management routines that are developed within the organization over time that are unique to this organization. Second, inter-organizational practices which relates to practices that involve external stakeholders and requires environmental collaboration with different SC members such as green purchasing, eco-design, and green distribution. These practices generate socially complex resources for the organization. Therefore, organizations which adopt GSCM practices will develop causally ambiguous and socially complex resources that are expected to improve environmental and operational performance that may further lead to improvements in financial performance (Shi et al., 2012).

The link between environmental practices including GSCM practices and performance has been explored by many researchers (Zhu and Sarkis, 2004; Rao and Holt, 2005; Kumar et al., 2012; Narasimhan and Schoenherr 2012; Golicic and Smith 2013; Laari et al., 2018; Cankaya and Sezen, 2018). However, results have been mixed and inconclusive (Golicic and Smith 2013; Li et al., 2015; Lucas and Noordewier, 2016) but generally positive (Zailani et al., 2012; Kusi-Sarpong et al., 2016; Huang et al., 2017; Famiyeh et al., 2018; Cankaya and Sezen, 2018). Additionally, researchers argue that the link between environmental practices and performance is not unconditional and might be affected by different complementary factors such as; training (Sarkis, 2010), top management support (Daily et al., 2012), change management practices (Ronnenberg et al., 2011), and quality management (Zhu et al., 2013). Further, Hart and Dowell (2011) highlighted the significance of dynamic capabilities perspective in extending and supplementing NRBV to generate more

understanding about how organizations adjust their capabilities in rapidly changing business environment.

Dynamic Capabilities

The dynamic capabilities perspective is another extension of the RBV (Coates and McDermott, 2002) that is defined as “the firm’s ability to integrate, build, and reconfigure internal and external competences to address rapidly changing environments” (Teece et al., 1997, p. 516), and consist of “difficult-to-replicate enterprise capabilities required to adapt to changing customer and technological opportunities” (Teece, 2007, pp. 1319/1320). Dynamic capabilities represent the ability of managers and employees to make continuous adjustments in resource allocation and integration to generate new value-creating strategies and build new organizational thought to adapt to changing environments and shape the ecosystems they occupy (Eisenhardt and Martin, 2000; Teece, 2007). Dynamic capabilities are “processes and routines used by managers to adapt, alter, deploy, and protect the resources of the firm in efforts to establish or maintain them as a source of competitive advantage in the context of dynamic” (Tashman and Marano, 2009, p. 501). Dynamic capabilities focus on the process of adapting and configuring resources rather than resources themselves which are the core of the RBV (Ambrosini and Bowman, 2009). Therefore, dynamic capabilities are built over time rather than bought from the market.

Researchers claim that the mere existence of appropriate bundles of resources is insufficient to sustain competitive advantage under conditions of rapid and unpredictable market change (Teece et al., 1997; Eisenhardt and Martin, 2000). Therefore, researchers claim that the ability to integrate, build and reconfigure internal and external organizational skills and resources is essential in sustaining competitive advantage under environmental volatility (Teece et al., 1997; Eisenhardt and Martin, 2000). Effective dynamic capabilities contribute to the organization’s competitive advantage by permitting a sequence of temporary advantages, which enable the organization to stay ahead of its competitors and sustain a competitive advantage (Eisenhardt and Martin, 2000; Teece, 2007).

Teece et al., (1997, 2009) introduced three types of dynamic capabilities namely; integration, learning, and reconfiguration. First, integration which relates to knowledge, the ‘know-how’, and routines utilized in organizations to merge resources in synergetic manner (Tashman and Marano, 2009). For instance, product development routines by which managers combine their skills, resources, and expertise to develop new products and services (Helfat and Raubitschek, 2000) are such a dynamic capability. Toyota provide a superior example of utilizing product development to attain competitive advantage in the automotive industry (Eisenhardt and Martin, 2000). Second, learning which entails the development of knowledge and insights about how to generate innovative ways to deal with existing and emerging problems (Tashman and Marano, 2009; Jimenez-Jimenez and Sanz-Valle, 2011). It encompasses the acquisition of new knowledge, the distribution of knowledge within the organization, the interpretation of knowledge, and finally storing the knowledge for future use (Weerd-Nederhof et al., 2002). Learning is associated with organizations that are flexible and empower its employees to think and act creatively (Tashman and Marano, 2009). Organizations that are capable of learning are in a better position of sensing events and trends in the marketplace, and responding to new challenges than competitors (Tippins and Sohi, 2003), which enables them to maintain long-term competitive advantages (Dickson, 1996). Finally, Reconfiguration capabilities refers to the organization ability to ‘orchestrate’ its assets, transform resources and processes to new valuable combinations, and optimize

resources allocation in response to changes in the external environment and efficiency problems (Jantunen et al., 2018).

Interestingly, Defee and Fugate (2010) applied the Dynamic capabilities perspective into the SCM context and introduced the concept of dynamic supply chain capabilities (DSCC), which refers to the ability of adjusting supply chain. Similarly, Beske (2012) argued that DSCC represents the ability of the supply chain respond to environmental changes, and internal complex relationships. DSCCs make organizations more flexible and more responsive and adaptive to market trends and volatility, and thus more capable of attaining competitive advantage (Gimzauskiene et al., 2015). Additionally, DSCCs have a positive impact on organization's performance, growth, and customer satisfaction (Eckstein et al., 2015). DSCCs involve various sub-capabilities namely; supply chain reconstruction, knowledge evaluation, co-evolvement, flexible supply chain control, and supply chain partner relationship development (Beske, 2012; Beske et al., 2014).

In the context of environmental management and GSCM/SSCM, Aragon-Correa and Sharma (2003) stated that proactive environmental strategy is a dynamic capability because it depends on specific, embedded, path-dependent processes and embedded within the organization. In the same vein, Russo (2009) claimed that creating environmental skills is an example on the development of dynamic capabilities because these skills require the integration of organization's resources such as professional knowledge, information systems, and technical systems. In the same line, Graham and McAdam, (2016) viewed pollution prevention as a dynamic capability that require support from internal processes (integration, learning, and reconfiguration) leads to improvements in environmental performance. Kim and Han (2012) concluded that dynamic learning capability can effectively mediate the relationship between sustainability practices and performance. Further, organizations that adopt SSCM practices often have stronger DSCCs to cope with environmental changes than other organizations (Hong et al., 2018).

The link between the RBV and GSCM is well established and explains organization's competitive position and performance improvement. However, this link is not without flaws and some questions are still unanswered. The RBV has been criticized for its failure in explaining how resources are transformed into competitive advantage (Priem and Butler 2001). For instance, it is still unclear how the specific types of GSCM practices would translate into an organization's strategic resources that in turn will lead to competitive advantage and performance improvement (Shi et al., 2012). One problem is that there are many attempts to define GSCM in terms of just one practice such as; green purchasing (Green et al., 1998), or green logistics (Murphy and Poist, 2003). Or eco-design, green purchasing, internal environmental management, cooperation with customers and investment recovery (Zhu and Sarkis, 2004). Similarly, green purchasing, internal environmental management, and reverse logistics (Rao and Holt, 2005). Despite these efforts, research has fallen short to recognize the importance of GSCM in terms of its natural resource-based attributes, for example, in how a particular type of GSCM practice generates VRIN resources that would further lead to competitive advantage.

Stakeholder Theory

Stakeholder theory considers the relationship between an organization and its stakeholders and suggests that an organization's success depends on how well it manages its relationships with stakeholders (Freeman, 1984). The basic premise of Stakeholder theory is

that stakeholders influence organizational practices (Sarkis et al., 2011). Stakeholder theory has been widely utilized to investigate the motivations and drivers for the adoption of GSCM practices. However, Stakeholder theory has been criticized for being difficult to capture and apply in practice (Mitchell et al., 1997). Another criticism is how to prioritize stakeholders (Schwartz and Carroll, 2008).

The relationship between Stakeholder theory and GSCM is not fully understood and gaps are still existing. For instance, further research is still needed to examine the impact of stakeholder pressure on the selection of environmental practices (Vachon, 2007) and to consider the impact of international stakeholders since globalization of supply chains have expanded the concept of stakeholders (Sarkis et al., 2011). Stakeholder theory can provide a lens to understand organizations response to stakeholders' pressures through the adoption of environmental practices. However, organizations responses to these pressures are heterogeneous (Darnall, 2006) which could be explained through other theories such as RBV due to the lack of necessary resources and capabilities. Therefore, Stakeholder theory is often introduced as an explanatory theory to investigate the motivational drivers for the adoption of various GSCM practices and could be used in conjunction with other theories in the GSCM research (Sarkis et al., 2010; Sarkis et al., 2011; Geng et al., 2017).

Institutional Theory

Institutional theory states that organizations adopt initiatives or practices to gain legitimacy or acceptance within society. Institutional theory examines how external pressures influence organizations to adopt certain practices (Zhu and Sarkis, 2007). Institutional theory has been widely utilized to investigate the motivations and drivers for the adoption of GSCM practices. However, the influence of each institutional pressures (coercive, mimetic and normative pressures) on the adoption of each GSCM practice is not clear, neither how these pressures shape GSCM decisions (Sarkis et al., 2010). For instance, Zhu et al. (2005) studied GSCM pressures and practices; though, they did not provide any analysis regarding how different pressures and different practices are related. Interestingly, Tachizawa et al. (2015) attempted to fill this gap by analyzing the contribution of different pressures in the adoption of different GSCM practices (monitoring and collaboration). Their results suggest that pressures can be categorized into two groups; coercive (regulations, environmental standards) and non-coercive (competitors, financial institutions), and concluded that the impact of coercive pressures on the adoption of each GSCM approach is more diverse when compared to the impact of non-coercive drivers. Despite this effort, yet little is known about the effect of each institutional pressure on each GSCM practice since Tachizawa et al. (2015) focused on two GSCM practices (monitoring and collaboration) which are related to suppliers, therefore less is known about the impact on other GSCM practices that are adopted internally in the focal organization and on the entire supply chain.

Overall, research on the adoption of practices from an institutional perspective investigate when and why organizations adopt new practices. Generally, organizations adopt new ideas and practices and often adapts them to increase their fit with the technology, culture, strategy, and politics of the organization by recombining elements of "templates" that are commonly accepted at the time of adoption (Kennedy and Fiss, 2009; Canato et al., 2013). Thus, research on the adoption of GSCM practices which follow the institutional perspective, investigates the pressures that lead organizations to adopt different GSCM practices by which answering when or why organizations adopt GSCM practices (Zhu and

Sarkis, 2007; Zhu et al., 2013; Agi and Nishant, 2017), leaving the question how organizations adopt GSCM practices unanswered.

Conclusion of theoretical perspective on GSCM

GSCM has been a subject of much debate among academia and practitioners. Increased environmental awareness has triggered one of the greatest revolutions in human thought by uniting the entire world in a battle against the emissions which are produced during economic activities. A review of GSCM literature demonstrates that researchers have followed different theoretical perspectives, and rarely attempted to integrate these perspectives. The lack of dominant theory in GSCM research is evident by the different nineteen theories that have been applied in GSCM studies so far. Further, it is worth mentioning that some researchers utilized more than one theory to investigate some aspects of GSCM, such as; (Gavronski et al., 2011; Wu et al., 2012). While there is a rich body of literature on GSCM, the research on GSCM theory building is scarce (Dubey et al. 2015). The existing literature on GSCM has mostly followed deductive approaches through which various theories have been tested. This approach sometimes fails to explore some important aspects of the phenomena, or limit the scope of the research. Thus, future research should turn to follow inductive approach with the attempt to build theory (Dubey et al. 2015).

Theory building and theory testing are closely interrelated and mutually important in the process of knowledge creation within any field of research (Colquitt and Zapata-Phelan, 2007) since knowledge is a continuous cycle of theory and data (Parkhe, 1993). Further, theory building and theory testing are mutually important, Parkhe (1993) states that “The importance of rigorously testing existing theory cannot be minimized. Yet there is an equally important role for the reverse direction, that of discovering theory from systematically obtained and analyzed data, for theory development is an iterative combination of theory generation and theory testing” (p. 293).

There is an ongoing debate on the role of theory in research, while theories represent “a way of seeing”, they are also a way of “not seeing”, because each theory is limited by its own scope (Poole and Van de Ven, 1989). One major argument by Schmenner et al., (2009) is that research can be independent of theory “Good empirical work does not need to be based on theory. It can be independent of theory” (p. 341). On the contrary, Ketokivi (2009) comments on Schmenner’s perspective, and states that absolute abandon of theory will leave research in confusing position “Independent of theory should not be read independent of all theoretical consideration. Yes, we need to revisit our views of theory, but abandonment is not an option” (p. 12). Therefore, researcher must find a fine balance between theory building which enables original ideas to emerge, and theory testing which shape our understanding and may hinder the development of a new phenomenon by applying lenses of old paradigms (Touboullic and Walker, 2015). As such, the distinction between theory building and theory testing is a “false dichotomy” (Bacharach, 1989, p. 512).

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