

INTEGRATING WASTE MANAGEMENT INTO SUSTAINABLE SUPPLY CHAIN PERFORMANCE: A RESOURCE-BASED AND ISLAMIC ETHICAL PERSPECTIVE IN MALAYSIA'S PRINTING INDUSTRY

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Abstract: *This paper proposes a conceptual integration of the Resource-Based View (RBV), Waste Management Theory (WMT), and Islamic ethical principles in examining the Sustainable Supply Chain Performance (SSCP) of Malaysia's printing industry. Given the sector's substantial contribution to paper-based waste, sustainability in this domain has become critical. While prior literature has emphasized tangible and intangible resources in achieving SSCP, this paper introduces the Islamic worldview—including concepts such as amanah (trust), khalifah (stewardship), and maslahah (public interest)—as a complementary framework. Through a comprehensive review of academic and policy literature, we propose an enhanced conceptual model that aligns environmental, operational, and ethical imperatives. The proposed framework aims to support the development of Islamic-inspired sustainable strategies in waste management and resource utilization.*

Keywords: *Resource-Based View (RBV), Supply Chain performance, Sustainability, Islamic Ethical principles, Waste Management in Printing*

Introduction

The Malaysian printing industry plays a significant role in the national economy, with a gross output of RM 2.153 billion and over 54,000 employees in 2021 (Department of Statistics Malaysia, 2022). However, it is also one of the largest contributors to paper-based waste, with estimates suggesting that nearly 15% of Malaysia's total solid waste composition originates from this sector (Zainal, 2024). The increasing accumulation of paper waste presents environmental, operational, and policy challenges, making waste management an urgent priority within the printing supply chain (Eghbali et al., 2022).

Sustainable Supply Chain Management (SSCM) has been widely applied as a framework for improving resource efficiency, reducing environmental impact, and achieving long-term competitiveness (Kumar et al., 2023). Within this domain, existing models such as the Resource-Based View (RBV) and Waste Management Theory (WMT) emphasize the strategic use of internal resources and systemic waste reduction, respectively (Carter et al., 2017; Pongrácz, Phillips, & Keiski, 2004). While these perspectives have contributed to conceptualizing sustainability in supply chains, they remain limited in addressing broader ethical obligations and stewardship values that shape sustainability in cultural and religious contexts (Govindan & Hasanagic, 2018).

In particular, current SSCM frameworks often overlook the role of Islamic ethics, which emphasize principles of amanah (trust), khalifah (stewardship), and maslahah (public interest). These principles align closely with the objectives of sustainability by promoting balanced consumption, resource conservation, and accountability for intergenerational equity (Abidin & Haseeb, 2018; Khalid & Gari, 2022). Neglecting these dimensions risks reducing sustainability to a technical or economic exercise, detached from the moral and social responsibilities embedded in Malaysia's socio-religious fabric (Dusuki & Abdullah, 2007).

Therefore, this paper argues for a culturally tailored sustainability framework that integrates RBV and WMT with Islamic ethical perspectives. By embedding ethical stewardship alongside economic and environmental imperatives, the proposed model aims to bridge theoretical gaps and support more holistic Sustainable Supply Chain Performance (SSCP) in Malaysia's printing industry (Fantazy, Tipu, & Ikram, 2020; Nascimento et al., 2019).

Problem Statement

The Malaysian printing industry contributes significantly to economic output but also generates a disproportionately high amount of paper-based waste. Estimates suggest that nearly 15% of Malaysia's solid waste composition originates from this sector, placing heavy pressure on landfill capacity and escalating environmental degradation (Zainal, 2024; Department of Statistics Malaysia, 2022). Despite national efforts to improve waste management, current practices remain largely linear—centered on disposal rather than prevention, reduction, or circular utilization (Eghbali et al., 2022). This creates both ecological and economic inefficiencies, as valuable recyclable resources are lost while landfill costs continue to rise.

At the theoretical level, Sustainable Supply Chain Management (SSCM) frameworks such as the Resource-Based View (RBV) and Waste Management Theory (WMT) provide useful lenses for addressing sustainability in supply chains (Carter et al., 2017; Pongrácz et al., 2004). However, these models primarily emphasize operational and resource-based measures, often

overlooking ethical, cultural, and religious dimensions that shape organizational practices. In Muslim-majority contexts such as Malaysia, this omission is particularly problematic, as Islamic principles such as *amanah* (trust), *khalifah* (stewardship), and *maslahah* (public interest) play an integral role in guiding responsible consumption and production (Abidin & Haseeb, 2018; Khalid & Gari, 2022).

The lack of integration between conventional SSCM theories and Islamic ethical principles represents a critical gap in the literature. Without embedding stewardship and moral accountability into supply chain frameworks, sustainability risks being reduced to a technical or compliance-driven exercise detached from cultural legitimacy and societal values (Govindan & Hasanagic, 2018). Addressing this gap is particularly urgent in Malaysia's printing industry, where waste intensity is high, environmental pressures are mounting, and culturally tailored sustainability frameworks remain underdeveloped.

Methodology

This paper adopts a qualitative, exploratory methodology grounded in an extensive literature review. The objective is to synthesize theoretical perspectives on Sustainable Supply Chain Performance (SSCP) and waste management in the Malaysian printing industry by integrating the Resource-Based View (RBV), Waste Management Theory (WMT), and Islamic ethical principles (Govindan & Hasanagic, 2018; Fantazy, Tipu, & Ikram, 2020). A structured search was conducted using major academic databases, including Scopus, Web of Science, ScienceDirect, and Google Scholar, accessed via institutional subscriptions. Keywords applied in various combinations included "*sustainable supply chain*", "*waste management*", "*Islamic ethics*", "*resource-based view*", and "*printing industry Malaysia*". Boolean operators (AND, OR) and truncations were employed to broaden or narrow results, consistent with established literature review practices (Snyder, 2019).

In the selection and inclusion criteria, the review focused on peer-reviewed journal articles, conceptual and empirical studies, and policy reports published between 2000 and 2024. Inclusion criteria required that studies to address sustainability, waste management, or supply chain strategies. Thus next is to offer theoretical or conceptual frameworks relevant to RBV, WMT, SSCM, or Islamic perspectives. Subsequently, the study will provide applicability to developing or Muslim-majority countries; and highlight implications for manufacturing or printing-related industries. This approach is aligned with systematic review protocols such as PRISMA, which emphasize transparency in inclusion and exclusion criteria (Moher et al., 2009). In this study, special attention was given to conceptual frameworks from established literature (e.g., Fantazy et al., 2020; Govindan & Hasanagic, 2018). Models were assessed on three criteria: (i) theoretical grounding, (ii) relevance to waste management and supply chain performance, and (iii) potential compatibility with Islamic ethical perspectives. This comparative evaluation allowed identification of theoretical gaps and opportunities for integration, echoing calls for multi-theory integration in sustainability research (Genovese et al., 2017).

In synthesis approach, the analysis applied a thematic synthesis process, which is suitable for conceptual integration studies (Thomas & Harden, 2008). Studies were grouped into three broad themes: (i) Sustainable Supply Chain Performance (SSCP), (ii) integration of RBV and WMT, and (iii) Islamic ethical principles in environmental stewardship. Through cross-

comparison, linkages and conceptual convergences were identified, enabling the development of a proposed framework that bridges operational, ecological, and ethical dimensions. This methodology ensures both transparency and replicability while providing a robust foundation for proposing a new conceptual model tailored to the Malaysian printing industry.

Literature Review: Bridging Sustainability, Waste Management, and Islamic Ethics

Sustainable Supply Chain Performance (SSCP)

Sustainable Supply Chain Performance (SSCP) refers to the ability of supply chains to operate efficiently while minimizing negative environmental and social impacts. It represents the evolution of traditional supply chain management toward a multidimensional system that integrates environmental, economic, and social sustainability (Kumar et al., 2023). Fantazy, Tipu, and Ikram (2020) identified six major attributes of supply chain openness that affect SSCP: cooperation among supply chain partners, integration and alignment, bilateral communication and information sharing, collective flexibility and adaptability, combined agility, and joint learning and knowledge creation. These attributes highlight that long-term supply chain performance cannot be achieved by operational efficiency alone but requires collaborative, adaptive, and knowledge-driven partnerships.

Prosperity and competitiveness often depend on sustainable growth, but such growth also leads to increased waste generation (Winkler & Kaluza, 2006). In Malaysia, this challenge is particularly visible in the printing sector, where a high proportion of solid waste is paper-based. Data from the Solid Waste and Public Cleansing Management Corporation (SWCorp) indicate that paper accounts for approximately 15% of total municipal solid waste, with much of it linked to industrial activities such as printing and packaging (Zainal, 2024). Poor management of these resources results in high landfill dependency, which in turn escalates environmental degradation and operational costs (Lee, 2024). These realities underscore the pressing need to integrate waste management strategies into SSCM frameworks to achieve sustainable outcomes.

However, critics have noted that many SSCM models, including those grounded in the Resource-Based View (RBV), often emphasize operational measures such as cost-efficiency and resource utilization while overlooking the broader ethical, cultural, and socio-religious dimensions that also influence sustainability (Govindan & Hasanagic, 2018). For example, while SSCM studies acknowledge environmental risks, they rarely embed ethical stewardship or moral accountability as part of supply chain performance measures. This omission limits the transformative potential of SSCM, especially in Muslim-majority contexts like Malaysia, where Islamic ethical values strongly influence organizational behavior.

Therefore, in addition to the operational attributes of SSCP described by Fantazy et al. (2020), this paper emphasizes the need for ethical and cultural dimensions in sustainability models. Embedding waste management and stewardship principles within SSCP not only strengthens ecological outcomes but also ensures that supply chain practices align with social and religious values, providing a more holistic framework for sustainable development (Dusuki & Abdullah, 2007; Abidin & Haseeb, 2018).

According to Gawankar et al. (2017), further research is required to shed more light on the supply chain performance metrics (SCMP) and their positive correlation. In order to know about the SSCP, the conceptual model by Fantazy et. al (2020) can be adopted. In this context, Fantazy et al. (2020) propose a conceptual model which shows the effects of six major attributes of supply chain openness on organizational performance. These attributes of supply chain openness include cooperation among supply chain partners, integration/alignment, bilateral communication/information sharing, collective flexibility/adaptability, combined agility, and joint learning and knowledge creation. (Tipu & Fantazy, 2020).

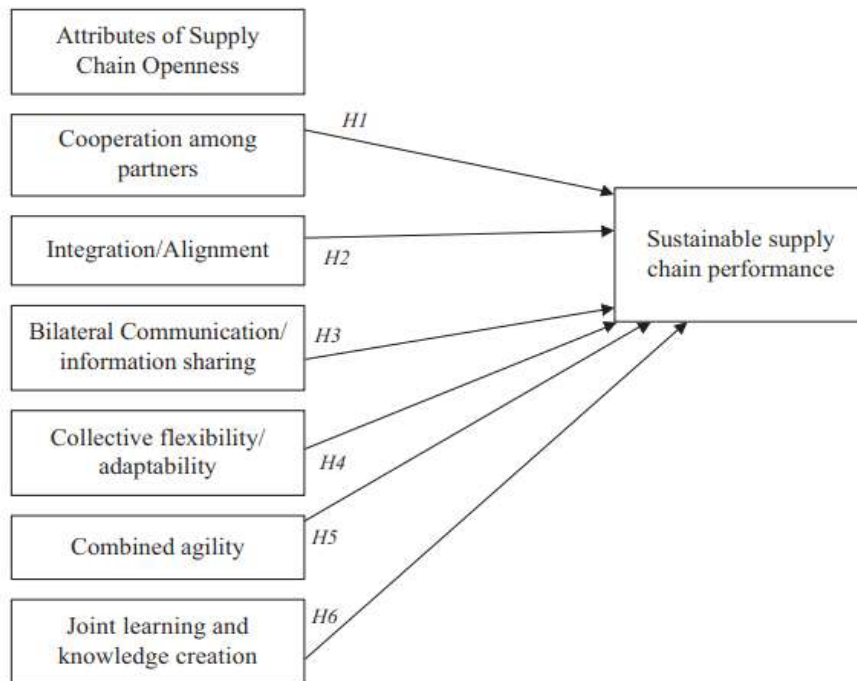


Figure 1: Sustainable Supply Chain Performance (SSCP)

Source: Conceptual Framework Adapted by Fantazy et al. (2020)

Sustainable supply chain management intends to minimize material flows, both in production and consumption process, reduce pollution and waste generation throughout the supply chain (Dong et al., 2016; Sarkis et al., 2011; Genovese et al., 2017). Waste management techniques including waste minimization, waste prevention, and waste treatment are indicators that the business is implementing sustainable supply chain management techniques. By promoting conscious consumption in the short term and reducing waste and emissions along the entire sustainable value chain in the midterm, the use of SSCM can benefit society in a number of ways on the social, environmental, and economic fronts (Nascimento et al., 2019). In relation to this, waste Management Theory (WMT) has been introduced to channel environmental sciences into engineering design. (Pongrácz et al., 2004). The waste management theories and typologies that follow are taken from a study by Nurminen and Pongrácz (2014). WMT is considered within the paradigm of Industrial Ecology, and built side-by-side with other relevant theories. (Pongrácz et al., 2004). Figure 2 shows the theory of waste management in illustration.

Resource-Based View (RBV) and Waste Management Theory (WMT)

The Resource-Based View (RBV) posits that firms can achieve and sustain competitive advantage through the strategic management of valuable, rare, inimitable, and non-substitutable resources (Carter, Kosmol, & Kaufmann, 2017). Within the supply chain context, RBV emphasizes both tangible resources—such as financial capital, technology, and infrastructure—and intangible resources, including knowledge, relationships, and organizational culture. When effectively combined, these resources enable firms to achieve superior performance, adaptability, and long-term sustainability (Malhotra et al., 2023). In the printing industry, managing waste efficiently can be viewed as a strategic resource in itself. Practices such as recycling and reusing paper not only reduce raw material costs but also enhance firms' reputations, creating intangible value that supports sustainable competitive advantage.

Waste Management Theory (WMT), by contrast, originates from environmental and engineering sciences and focuses on systemic approaches to minimize waste across production and consumption cycles. Pongrácz, Phillips, and Keiski (2004) and Nurminen and Pongrácz (2014) conceptualize WMT as a framework under industrial ecology that categorizes waste into avoidance, minimization, and treatment. Unlike RBV, which primarily focuses on internal capabilities, WMT provides a broader ecological perspective by treating waste as an integrated element of socio-economic systems rather than a by-product to be discarded. This alignment makes WMT particularly relevant for industries such as printing, where paper waste represents both an environmental burden and an opportunity for circular value creation (Eghbali, Arkat, & Tavakkoli-Moghaddam, 2022).

Integrating RBV with WMT provides a more comprehensive understanding of Sustainable Supply Chain Performance (SSCP). While RBV explains how internal resources and competencies can be leveraged to achieve competitive advantage, WMT ensures that sustainability outcomes also incorporate ecological accountability. For instance, Fantazy et al. (2020) identified cooperation, integration, and knowledge sharing as strategic resources within RBV, yet these attributes often neglect external stakeholder expectations and environmental imperatives (Ketchen & Hult, 2007). WMT complements this gap by embedding waste elimination and resource circularity as systemic goals, thereby broadening the scope of supply chain performance evaluation beyond operational efficiency to include environmental stewardship.

Recent studies have increasingly advocated for the combined application of RBV and WMT in supply chain research. Genovese et al. (2017) argue that circular economy practices require both the internal capabilities described by RBV and the systemic ecological frameworks offered by WMT. Similarly, Filho and Moori (2020) emphasize that firms which align their strategic resource management with waste minimization practices gain competitive advantage while also meeting sustainability demands from regulators, customers, and society at large. This dual perspective underscores the importance of viewing waste management not simply as a compliance activity but as a strategic enabler of sustainable supply chain performance in industries such as printing.

Empirical data from Al-Shboul et al. (2017) shows that improved supply chains and company performance can result from greater supply chain management performance levels. The SCMP

dimensions provide insight into how the integration of its components could have a notable impact on supply chain performance, considering the RBV supply chain theory, system model, and comprehensive model. An increasing number of research on supply chain management (SCM) has examined resources and their link to performance by drawing on the fundamental concepts of the resource-based view (RBV). (Carter et al., 2017). As cited in Malhotra et al., (2023), the RBV provides a framework for gaining a competitive advantage using a firm's resources and capabilities (Corbett and Claridge, 2002). Leveraging RBV's emphasis on internal resources and capability. To relate to the theoretical gap and the practical gap from this study, we understand from the context of the study that of integrating the dimensions between one factor to another by utilizing the resources of may contribute significantly towards SCMP.

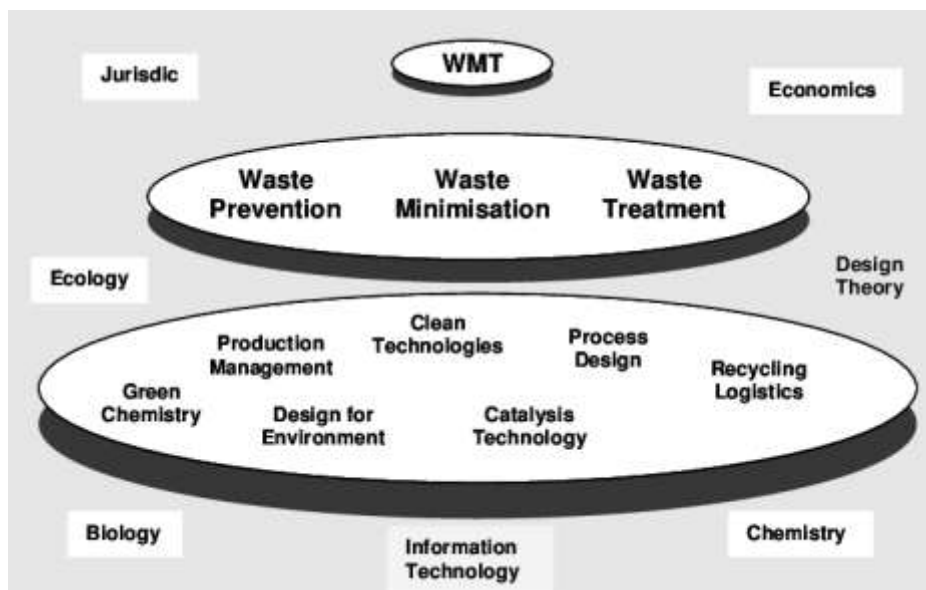


Figure 2: Theory of Waste Management

Source: Adapted from (Nurminen & Pongrácz, 2014)

According to the Resource-Based View (RBV) theory, gaining and maintaining a competitive advantage depends on a firm's internal resources and capabilities. The significance of both internal and external factors is emphasized by this method. By utilizing a company's distinct resources and competencies, supply chain performance can be enhanced, leading to increased productivity, responsiveness, and overall business success. In the printing business, efficient waste management is essential to improving a company's sustainable supply chain performance. Effective waste management techniques encourage recycling and reuse, which lowers the consumption of raw materials. In doing so, supply chain operations reduce their negative environmental effects and preserve natural resources. Furthermore, an increasing number of research on supply chain management (SCM) has examined resources and their link to performance by drawing on the fundamental concepts of the resource-based view (RBV) and its extensions, such as the relational view (RV). (Carter et al., 2017). SCM seeks to coordinate the major businesses in order to accomplish a tangible and intangible commodities flow that efficiently satisfies customers' demands and wants while providing benefits for the whole chain, as stated in Filho & Moori (2020) (Harrison et al., 2007). This is consistent with

the RBV theory, which integrates both tangible and intangible resources into supply chain operations.

RBV suggests that organizations can gain competitive advantage through strategic management of internal resources (Carter et al., 2017). Yet, critiques by Ketchen and Hult (2007) highlight that RBV alone may neglect external factors and stakeholder expectations critical in environmental issues. Thus, Waste Management Theory (WMT) complements RBV by focusing on systemic waste elimination, which aligns more directly with ecological concerns (Pongrácz et al., 2004). Recent studies emphasize integrating these theories to assess not only profitability but also resource circularity and socio-environmental accountability (Genovese et al., 2017).

Islamic Ethical Framework on Sustainability

Islamic perspectives on environmental ethics emphasize stewardship, accountability, and balance in resource use. Central to this worldview are the principles of *amanah* (trust), *khalifah* (stewardship), and *maslahah* (public interest), which collectively highlight humanity's responsibility to safeguard the environment for current and future generations (Khalid & Gari, 2022). These principles align strongly with modern sustainability objectives, particularly in promoting balanced consumption (*wasatiyyah*), responsible production, and intergenerational equity (Abidin & Haseeb, 2018). In the Qur'an and Hadith, environmental care and moderation are emphasized repeatedly, forming the basis of *fiqh al-bi'ah* (Islamic environmental jurisprudence), which provides a moral compass for environmental stewardship.

Integrating Islamic ethics into sustainability discourse is especially important in Muslim-majority contexts such as Malaysia, where religious and cultural norms significantly shape organizational behavior. Dusuki and Abdullah (2007) highlight that the *maqasid al-shariah* (higher objectives of Islamic law) inherently support environmental justice and corporate accountability, thereby offering a comprehensive framework that extends beyond profit maximization. Unlike many conventional SSCM frameworks, which primarily emphasize operational efficiency and compliance, an Islamic ethical lens embeds moral accountability into supply chain practices, ensuring that firms act not only as economic agents but also as custodians of the environment.

Empirical research further supports the link between Islamic ethics and sustainable practices. Chin, Tat, and Sulaiman (2015) found that firms guided by ethical or religious orientations are more inclined to implement green supply chain management, even in resource-constrained settings. Similarly, Abidin and Haseeb (2018) demonstrated that Islamic values in Malaysia contribute significantly to reducing environmental degradation, as firms guided by *amanah* and *maslahah* prioritize conservation and responsible consumption. These findings suggest that integrating Islamic ethics into waste management frameworks not only reinforces environmental outcomes but also enhances cultural legitimacy and stakeholder trust.

By embedding Islamic ethical principles within the broader frameworks of RBV and WMT, this study addresses a critical theoretical gap in the sustainability literature. While RBV provides a resource-driven perspective and WMT introduces systemic ecological considerations, Islamic ethics add a layer of moral stewardship that is often overlooked in conventional models. This integration ensures that sustainability frameworks are not limited to

technical or economic dimensions but also reflect the ethical and cultural values of society, making them more holistic and contextually relevant for Malaysia's printing industry.

Proposed Conceptual Framework

This paper proposes a conceptual model integrating Fantazy et al.'s (2020) six dimensions of SSCP with RBV and Islamic principles. In this model:

- i. Tangible & intangible resources (RBV) are aligned with ethical obligations (*amanah*, *khalifah*)
- ii. Supply chain adaptability includes moral adaptability in line with Islamic principles
- iii. Waste reduction strategies are guided by *istislah* (public good) and *wasatiyyah* (moderation)

Figure 3 below illustrates this conceptual integration, showing how the Resource-Based View, Islamic Ethical Principles, and Waste Management Theory jointly influence Sustainable Supply Chain Performance in the printing industry through the adoption of waste reduction practices. The framework positions these three pillars in parallel, each contributing uniquely yet complementarily to the overarching sustainability goal. RBV strengthens internal strategic capabilities, WMT contributes systemic waste-handling mechanisms, and Islamic ethics ground the approach in moral accountability and stewardship.

The proposed model is illustrated in the diagram below:



Figure 3: Proposed Conceptual Model

This alignment supports a culturally contextualized and environmentally responsible model for sustainability, particularly in Muslim-majority economies. It reflects a convergence of operational effectiveness, ethical governance, and ecological responsibility—providing a robust conceptual base for firms in the Malaysian printing industry aiming to reduce waste and enhance supply chain sustainability. Integrating Fantazy et al.'s (2020) six dimensions of SSCP with RBV and Islamic principles. In this model:

Empirical support for a multidimensional framework is evident in the work of Nascimento et al. (2019), who developed a sustainability model that incorporates digital innovation and circularity in manufacturing. Although their focus is on Industry 4.0, the structural integration of economic, social, and environmental pillars mirrors the ethical layering proposed here. For direct adaptation of visual models, Fantazy et al. (2020) provide a figure that visually maps the

six attributes of SSCP. Additionally, Govindan & Hasanagic (2018) offer a structured framework of enablers and barriers for circular economy adoption which could be adapted.

Policy and Practical Implications

The integration of Islamic ethics into waste management provides a culturally grounded strategy for Muslim-owned enterprises. Government policy could benefit from developing Islamic green certifications that promote waste minimization practices in line with Shariah principles. For the printing industry, this means adopting eco-friendly materials, investing in recycling infrastructure, and embedding sustainability in procurement processes.

Integrating Islamic ethics into waste management provides a culturally and religiously rooted strategy for Muslim-majority business environments. Empirical evidence suggests that ethical orientation significantly influences green supply chain adoption (Chin et al., 2015). For example, firms adhering to religious or ethical values are more inclined to implement sustainable practices, even in resource-constrained settings (Abidin & Haseeb, 2018).

Government policies could build upon this ethical foundation by developing Islamic green certifications, as proposed by Khalid and Gari (2022), to encourage environmentally responsible behavior among Muslim-owned SMEs. In practice, this implies that printing firms should prioritize procurement from halal-certified eco-friendly sources, invest in recycling infrastructure, and align operations with sharia-compliant sustainability indicators.

Conclusion

Sustainable Supply Chain Performance (SSCP) has become a critical strategic priority for industries that must balance competitiveness with environmental and social responsibility. In Malaysia's printing sector, the urgency is amplified by the high proportion of paper-based waste, which accounts for nearly 15% of total solid waste and contributes significantly to landfill dependency (Zainal, 2024; Department of Statistics Malaysia, 2022). While SSCM frameworks such as the Resource-Based View (RBV) and Waste Management Theory (WMT) provide valuable perspectives, they remain insufficient when applied in isolation. RBV emphasizes leveraging tangible and intangible resources for competitive advantage (Carter, Kosmol, & Kaufmann, 2017; Malhotra et al., 2023), while WMT stresses systemic waste minimization and ecological accountability (Pongrácz, Phillips, & Keiski, 2004; Nurminen & Pongrácz, 2014). However, both approaches tend to overlook the ethical and cultural dimensions of sustainability, particularly in Muslim-majority contexts such as Malaysia.

By integrating Islamic ethical principles—*amanah* (trust), *khalifah* (stewardship), and *maslahah* (public interest)—into existing SSCM frameworks, this study highlights the potential for a more holistic and contextually relevant conceptual model. Islamic sustainability perspectives emphasize moderation (*wasatiyyah*), intergenerational equity, and moral accountability before God (Abidin & Haseeb, 2018; Khalid & Gari, 2022; Dusuki & Abdullah, 2007). Embedding these principles alongside operational efficiency and ecological stewardship broadens the scope of SSCP beyond technical compliance, ensuring that sustainability strategies resonate with the socio-religious values of Malaysia's printing industry.

The conceptual framework proposed in this paper contributes to the literature by bridging theoretical and cultural gaps in SSCM research. It responds to calls for multi-theory integration

in advancing sustainable supply chain practices (Genovese et al., 2017; Govindan & Hasanagic, 2018) and provides a foundation for culturally grounded waste management strategies in Muslim-majority economies. Future research should empirically validate this framework through case studies or surveys of printing firms in Malaysia and comparable contexts. Such empirical work would strengthen evidence on how culturally embedded ethical principles can reinforce waste management practices, enhance supply chain performance, and contribute to the global sustainability agenda (Nascimento et al., 2019).

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