



Ecopedagogy-Based Halal Value Chain Transformation: Advancing Economic Independence and Sustainable Development

Sunarso^{1*}, Risang Ayu Cahaya Kirani²

^{1, 2} Universitas Slamet Riyadi, Indonesia

Article Info	Abstract
Article history: Received March 10, 2026 Revised April 13, 2026 Accepted June 27, 2026 Available online August 15, 2026 *Corresponding author email: sunarso66@gmail.com Keywords: Ecopedagogy, Halal-Thayyib, Halal Value Chain, Quadruple Helix, Sustainable Development Goals (SDGs).	Introduction/Main Objectives: This study develops a sustainable Halal Value Chain (HVC) transformation model by integrating halal compliance, thayyib principles, ecological sustainability, and critical ecopedagogy. Research Methods: A descriptive qualitative conceptual approach was used to examine ecopedagogy as a catalyst for shifting producer and consumer behavior from linear production toward a circular, anti-israf model. Finding/Results: The proposed model supports SDGs 8, 12, and 13 through a Quadruple Helix framework involving government, academia, industry/MSMEs, and civil society. Key solutions include Islamic social finance instruments such as Ziswaf and Micro-Green Sukuk, alongside an Integrative Single Halal-Thayyib Certification to address green transition costs and cultural resistance. Conclusion: A sustainable and independent HVC requires fundamental ecological awareness and coordinated action among all stakeholders. AICIE with CC BY license. Copyright © 2026, the author(s)
Page: 447-457	

INTRODUCTION

In the contemporary global economic landscape, the world faces a highly complex dual challenge: geopolitical economic fragmentation that triggers global supply chain instability, and an increasingly alarming escalation of the climate crisis. The traditional linear economic model has caused massive environmental degradation and is no longer relevant to the demands of sustainable development. This condition forces global industry players to radically reorient their business models toward greener, circular, and ecologically resilient practices (Sarkis, 2021; World Economic Forum, 2025). Amidst this global uncertainty, Islamic economics is required not only to present itself as an alternative financial system but also to serve as a driving force for ethical and sustainable business transformation.

One of the most dynamic pillars of the global Islamic economy is the halal industry ecosystem, as evidenced by the strengthening of the Halal Value Chain (HVC). As a new economic driver, HVC has significant potential to stimulate the real sector, spanning agriculture, food processing, and logistics, as well as sectors such as cosmetics and pharmaceuticals (Khan et al., 2021). This expansive growth of HVC still harbors a fundamental critique. In practice, the majority of actors in the halal value chain remain trapped in purely legalistic-formal reductionism, focusing merely on compliance with Sharia law certification centered on the absence of prohibited substances (Ali et al., 2020). Aspects of environmental sustainability and social justice are frequently neglected, a concern supported by growing empirical evidence. For instance, the global food industry—which accounts for a significant share of the halal sector—is responsible for approximately 26% of global greenhouse gas emissions, with logistics and cold-chain transportation contributing significantly to its carbon footprint (Poore & Nemecek, 2018). Furthermore, food waste remains a critical issue; one-third of all food produced globally for human consumption is wasted, contributing to roughly 8-10% of global greenhouse gas emissions (UNEP, 2021). Within the halal supply chain, inefficient waste management and excessive packaging continue to undermine the industry's ethical promise (Tieman, 2021).

This real-world gap triggers the urgency for a paradigm shift (Aisyah, 2024). The global halal industry must transform radically from merely pursuing "Halal" status to implementing a holistic concept, namely "Halal-Thayyib." The concept of thayyib in Islamic economics essentially mandates that a product not only be free of prohibited substances but also be produced through processes that are ethical, healthy, safe, and environmentally friendly. Integrating the thayyib dimension into HVC relies on the principles of Maqashid Sharia, particularly Hifzh al-Bi'ah (protection of the environment), which positions humans as caliphs responsible for environmental sustainability (Hassan et al., 2023). Reconstructing an environmentally conscious HVC is no longer just an ethical choice but a strategic necessity for Islamic economics in responding to fragmentation and global ecological crises to achieve sustainable development.

Although the paradigm shift toward a Halal-Thayyib ecosystem has been conceptually agreed upon, its field implementation still hits a thick wall due to low ecological literacy among

economic actors. This gap arises because instruments to strengthen the halal value chain have so far been dominated by technocratic approaches and administrative regulations, while ignoring the critical educational dimension that touches the moral consciousness of its actors. Ecopedagogy emerges as a crucial transformative approach. Ecopedagogy is not merely an ordinary transfer of environmental knowledge, but a critical educational praxis that reorients human perspectives toward nature, dismantles exploitative behavior, and fosters a deep ethic of care for the biosphere (Misiaszek, 2020; Kahn, 2010). Integrating ecopedagogy into HVC becomes an absolute urgency to internalize Thayyiban values directly into the cognitive consciousness and behavior of supply chain actors.

In the upstream and processor (producer) sectors, ecopedagogy catalyzes a shift in business orientation from merely pursuing cost efficiency to adopting an eco-efficiency outlook. Through an ecopedagogical understanding, informed by Islamic values, producers are encouraged to recognize that environmental pollution or excessive exploitation of natural resources constitutes a form of ecological tyranny that invalidates the essence of halality itself (Nasr, 2023). In the midstream sector (distributors and logistics), this approach urges the adoption of green logistics—such as route optimization to reduce carbon emissions and the reduction of single-use plastic in packaging—not merely for regulatory compliance, but as a form of moral responsibility to protect the earth (Tieman & Darun, 2025).

Behavioral intervention in the downstream sector (consumers) reinforces the urgency of applying this ecopedagogy. Until now, the global Muslim consumer market still faces a major paradox: the high demand for halal commodities is not accompanied by awareness of the need to minimize environmental impacts, as evidenced by the widespread phenomenon of food waste and excessive consumption (*israf*), which the Qur'an prohibits (Amalia et al., 2024). Through an ecopedagogical approach, Muslim consumers are critically educated to transform their consumption behavior into ethical and green consumerism. This new awareness helps them understand that choosing environmentally friendly, exploitation-free products is an inseparable part of worship and a tangible manifestation of ecological piety (*eco-taqwa*). Comprehensive internalization across producers, distributors, and consumers positions ecopedagogy as a living bridge that unifies Islamic spiritual consciousness with real action for environmental preservation within the halal value chain ecosystem.

The above explanation clearly reveals a crucial theoretical and practical gap in the current landscape of Islamic economics. Theoretically, the literature on sustainable development and HVC still operates separately and with limited integration, with the ecological dimension isolated from formal Sharia compliance. In practice, the global halal industry ecosystem has not been able to mitigate the negative environmental impacts of its operations due to low and uneven ecological awareness among producers, distributors, and consumers. This paper offers a novel conceptual model, termed "Ecopedagogy-Based Halal Value Chain Transformation," to bridge

this gap. This approach integrates critical ecological education into every line of the supply chain to reconstruct the meaning of halal compliance into a holistic Halal-Thayyib ecosystem.

This paper aims to formulate an integration model of ecopedagogy into the structure of the halal value chain from upstream to downstream, analyze how this transformation can drive economic independence through the circular utilization of local resources, and map the strategic contribution of this model toward achieving the Sustainable Development Goals (SDGs) agenda amidst a fragmented global economic reality.

METHOD

This study employs a descriptive-qualitative method with a conceptual approach to analyze, formulate, and explicate the integration of ecopedagogy into the Halal Value Chain (HVC). To address the need for empirical grounding, this research utilizes a systematic review of secondary empirical data, including international reports on greenhouse gas emissions, waste management statistics, and existing industrial sustainability assessments. By synthesizing this empirical evidence with critical ecopedagogy theory (Kahn, 2010; Misiaszek, 2020), this study moves beyond mere theoretical discourse, providing a concrete evaluation of the environmental challenges within the halal industry and offering an actionable transformation model for stakeholders.

RESULT AND DISCUSSION

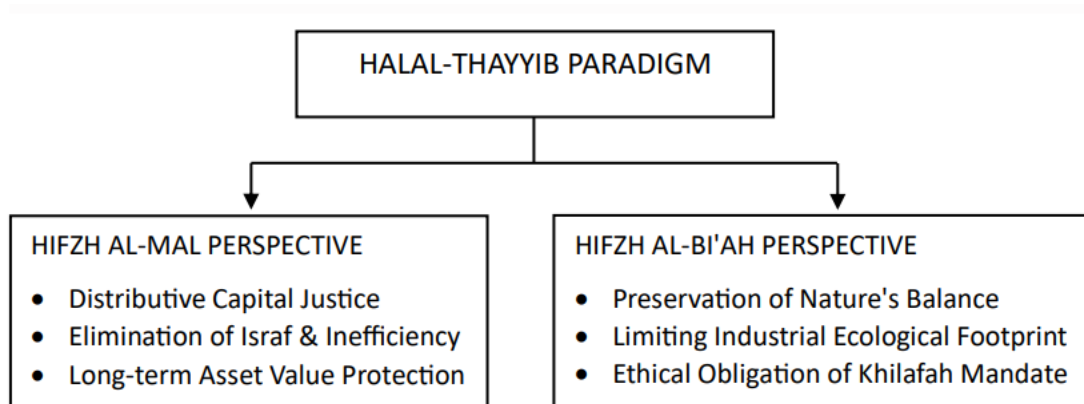
Integrating the Halal-Thayyib Paradigm Toward Contemporary Maqashid Shariah Resonance

The paradigm shift in evaluating a contemporary Islamic economic commodity demands a major transformation from the initial formal, legalistic approach to an integrative, substantive one. Sacred religious texts never separate the words halal and thayyib when speaking about consumption. The separation of these two dimensions in modern industrial realities has degraded the noble values of Sharia into mere compliance with administrative requirements of being free from pork and alcohol. The Thayyib criterion encompasses a much broader set of quality indicators, including hygiene, nutritional adequacy, biological safety, business ethics, and the absence of negative externalities on the global ecosystem. This theoretical integration positions business operations as a ritual of worship that directly affects the earth's socio-ecological order.

The analytical framework of Maqashid Sharia positions the intertwining of halal and thayyib as a primary instrument for maintaining the universal public interest (maslahah) while stemming potential harm (mafsadah). The reconstruction of modern Islamic legal thought expands the scope of protection for the five basic elements (al-daruriyyat al-khamsah) to address the environmental crises of this century. The operationalization of a halal industrial value chain aligned with thayyib values possesses a strong doctrinal link with two main pillars of Maqashid Sharia, namely the Protection of Wealth (Hifzh al-Mal) and the Protection of the Environment

(Hifzh al-Bi'ah). These two must not be viewed dichotomously but rather as two sides of a coin that mutually reinforce each other within a circular economic ecosystem.

Figure 1. Halal – Thayyib Paradigm



Manifestation of Circular Justice Through the Hifzh al-Mal Perspective

Hifzh al-Mal transcends narrow limitations regarding individual property rights guarantees or unlimited capital accumulation (Figure 1). The concept of wealth protection within the scope of Sharia obligates asset management to be productive, ethical, just, and long-term oriented. Internalizing those values ensures that capital flows within the supply chain do not originate from or produce exploitative practices that harm any party, especially upstream laborers or communities affected by waste.

The application of economic circularity principles within the industry becomes a concrete manifestation of efforts to avoid waste (israf), which is strictly forbidden theologically. Raw material utilization efficiency, recycling optimization, and the conversion of waste into useful products directly protect the economic value of capital from depreciation due to environmental regulatory fines. Robust financial sustainability is achieved when wealth accumulation is aligned with distributive justice that is equitable for all value chain actors.

Responsibility of Khilafah Through the Hifzh al-Bi'ah Perspective

The Anthropocene crisis, in the form of global warming and biodiversity loss, places Hifzh al-Bi'ah as the highest priority in contemporary Maqashid Sharia expansions. The universe has been designed in a blueprint of perfect balance (mizan). At the same time, humans bear the trust as managers of the earth (khalifah fi al-ardh) who carry the moral responsibility to prevent destruction (fasad).

The thayyib aspect in the halal industry demands strict calculation of the ecological carrying capacity throughout the product life cycle. The validity of a commodity's halal status is subject to an ethical substance flaw if its production chain leaves a trail of severe damage, such as massive deforestation, reckless water exploitation, or toxic pollution in rivers. Preserving the

environment is justified as an integral expression of faith that guarantees the right to sustainable living for future generations.

Anatomy of Halal Value Chain Deconstruction and Ecological Blind Spot Mapping

The Halal Value Chain (HVC) operates as a systemic web connecting upstream input procurement, manufacturing, logistics, distribution, and, ultimately, final consumption at the market level. The traditional function of HVC is to provide comprehensive protection, ensuring that commodities avoid cross-contamination with forbidden substances at every critical point. This rigid protection system frequently overlooks the natural degradation impacts arising from industrial operational activities themselves. An absolute focus on formal compliance creates a blind spot that masks environmental destruction under the guise of sacred-labeled products.

Upstream Sector: Agricultural Industrialization and Thayyiban Violations

Production acceleration in the upstream sector to meet the surging demand of the global halal market often leads to the adoption of conventional, exploitative methods. The agricultural and livestock sectors, as primary providers of raw materials, experience over-commercialization that sacrifices ecosystem quality. Empirically, global agri-food systems account for approximately 26% of anthropogenic greenhouse gas emissions, with livestock production and intensive fertilizer application serving as major drivers of climate degradation. The uncontrolled use of pesticides and synthetic chemical fertilizers has degraded soil fertility structures and contaminated groundwater reserves.

Violations of the Thayyiban aspect also occur due to the neglect of animal welfare principles in the halal meat supply chain, ranging from cramped cage conditions to stressful animal transportation methods. This destructive industrial agricultural practice accelerates the loss of germplasm, damages biodiversity, and threatens long-term human food security.

Midstream Sector: The Paradox of Manufacturing Sterility and Exclusive Logistics Emissions

The processing and distribution phase within HVC presents ecological contradictions stemming from Sharia hygiene standards. The processing and manufacturing industries of halal food and pharmaceuticals consume fossil energy on a massive scale to maintain sterile production spaces. The biggest dilemma arises in the halal logistics sector, which requires an absolute separation of transportation modes between halal and non-halal commodities.

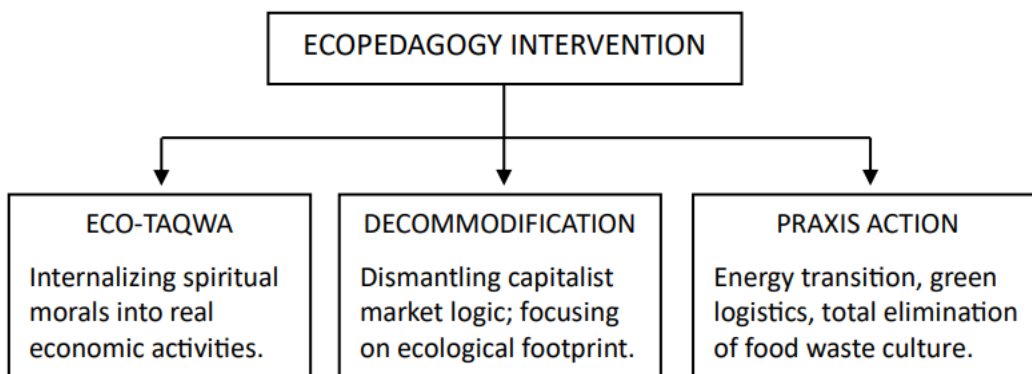
This separation policy leads to transport space inefficiency, resulting in more distribution fleet journeys and higher carbon emissions per product unit. Furthermore, cold-chain transport utilized in perishable halal food logistics significantly elevates energy consumption and carbon dioxide emissions. Single-use plastic packaging is used extensively to mitigate cross-contamination risks during delivery. These exclusive operational characteristics visibly accelerate global warming if not immediately addressed through green logistics management.

Downstream Sector: Spiritual Alienation of the Market and the Cultural Crisis of Wasteful Behavior

The endpoint of the halal value chain, at the level of global Muslim consumers, reveals a major anomaly between formal religiosity and environmental responsibility. The halal label on cosmetics or food products frequently triggers a false psychological satisfaction that legitimizes hyper-consumptive patterns (israf).

Empirically, global reports estimate that one-third of all food produced for human consumption is wasted, contributing to roughly 8%-10% of global greenhouse gas emissions. The phenomenon of food waste accumulation in various Muslim-majority countries serves as an empirical indicator of a disconnect in ethical consciousness. Accumulations of organic waste in landfills release large volumes of methane, accelerating damage to Earth's atmosphere. Management failure at the level of downstream consumer behavior proves that expanding industrial capacity without accompanying improvements in moral consciousness will only accelerate the destruction of the global ecosystem.

Figure 2. Ecopedagogy Intervention



Ecopedagogical Praxis as a Catalyst for Restructuring Economic Actor Behavior

Resolving the ecological crisis along the HVC cannot be left entirely to administrative technocratic instruments such as state regulations or periodic certification audits. Formal legal approaches have proven unsuccessful in touching the deepest roots of human motivation to act. Interventions must be directed radically toward restructuring the critical consciousness of economic actors through the adoption of an ecopedagogical framework integrated with Islamic spiritual values. Ecopedagogy operates beyond the boundaries of conventional environmental education, which tends to teach only surface-level scientific theories or standard recycling instructions without addressing systemic root causes.

Ecopedagogy is a form of critical educational praxis designed to dismantle the acute anthropocentric perspective rooted in linear capitalist economic systems. This erroneous view

positions the universe merely as an object of exploitation for limitless economic growth. Ecopedagogy opens reflective spaces for producers, distributors, and consumers to understand the interconnected web among social justice, biosphere preservation, and business sustainability. Dismantling this consciousness reorients the viewpoint of economic actors. Hence, they understand that destroying nature for material gain is a form of structural tyranny that breaks the harmony of God's creation.

Implementing ecopedagogy operationally drives tangible behavioral changes across three main intertwining domains (Figure 2):

- **Internalization of Eco-Taqwa Ethics:** This dimension transforms passive religious doctrines into active ecological action. An individual's spiritual compliance is no longer measured narrowly through personal worship rituals, but is calculated based on real contributions to suppressing the level of earth destruction. This collective awareness encourages the adoption of eco-efficiency principles as a concrete manifestation of social worship.
- **Decommodification of Life:** This approach trains economic actors not to appraise commodities limited to market price indicators or short-term material utility. Consumers and producers are invited to consider the "hidden footprint" associated with every item, stemming from extraction processes and distribution emissions. This new awareness shifts producer orientation toward circular economy principles and drives consumers to practice ethical and green consumerism.
- **Sustainable Praxis Action:** Ecopedagogy encourages the creation of measurable, real movements in the field. The producer sector is being pushed to transition to renewable energy and to use non-destructive local raw materials. The distribution sector is required to develop efficient delivery routes to minimize transport-related carbon emissions. The consumer sector is driven to eliminate the culture of food waste.

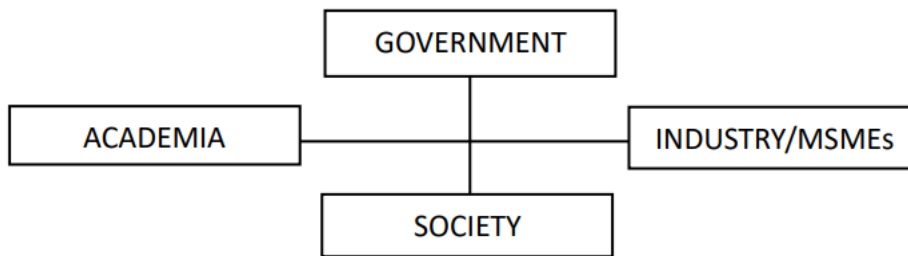
The conceptual structure of ecopedagogy provides a robust theoretical bridge to assimilate global Sustainable Development Goals (SDGs) targets. Strengthening this awareness serves as a strategic instrument for integrating the achievements of SDG 12 on Responsible Consumption and Production and SDG 13 on Climate Action organically into a holistic halal value chain operation.

IMPLEMENTATION STRATEGY AND GOVERNANCE

Stakeholder Synergy Based on the Quadruple Helix Approach

The successful reconstruction of an ecopedagogy-based Halal Value Chain (HVC) requires an integrative governance orchestration. The Quadruple Helix framework provides a strategic foundation for driving this transformation through functional synergy among government, academia, industry, and society (Sarkis, 2021). This multidimensional collaboration maps specific roles to ensure that the transition toward a Halal-Thayyib ecosystem proceeds at scale (Figure 3).

Figure 3. Multidimensional Collaboration Maps of Halal-Thayyib Ecosystem



The government holds crucial authority as the ecosystem regulator. Halal certification policies need to be extended by incorporating environmental care indicators (*eco-certified halal*). The government can draft regulations that provide fiscal incentives or green technology subsidies for halal MSMEs that apply renewable energy mix principles and zero-waste systems (Khan et al., 2021).

Academia serves as a driving force for literacy in the field by preparing an ecopedagogical curriculum tailored to the real needs of Islamic economic actors (Aisyah, 2024). Critical ecopedagogical training modules are standardized for factory workers, farmers, and logistics professionals so that the spiritual awareness of Hifzh al-Bi'ah can be understood and applied.

Halal industry players and MSMEs serve as real articulators by adopting eco-efficiency principles in their daily operations. The integration of plastic-free product packaging and circular waste processing is viewed as a long-term investment to enhance product value in the global market (Tieman & Darun, 2025).

Society stands at the downstream end, as a determinant of ecosystem success through its market-demand power. Consumers with critical ecopedagogical education will become green and ethical consumers. Civil society communities can impose social sanctions by prioritizing purchases of halal-certified products from the halal industry that are proven to be environmentally friendly (Amalia et al., 2024).

Implementation Challenges and Solutions

The operationalization of an ecopedagogy-based HVC faces several structural challenges that require adaptive solutions for MSME actors.

Green Technology Transition Costs

High initial investment costs to adopt environmentally friendly technology constitute a primary financial challenge. Halal MSMEs frequently face capital constraints in purchasing energy-saving devices or eco-friendly packaging, whose prices remain high (Khan et al., 2021). Islamic financial institutions can integrate commercial and Islamic social finance instruments (*social-finance linkage*). Funding for green projects at the MSME scale can be supported by productive zakat, infak, and waqf (Ziswaf) funds, or through the issuance of Micro-Green Sukuk (Hassan et al., 2023).

Halal-Green Certification Standardization

Industry players face overlapping regulations due to the separation of authority between halal certification bodies and environmental certification agencies (Tieman & Darun, 2025). Halal assurance authorities, alongside the Ministry of Environment, need to establish an Integrated Single Halal-Thayyib Certification. Environmental sustainability audit indicators are merged directly into the halal product assurance system to cut administrative time and costs.

Behavioral Change Resistance of Small Business Players

A fundamental challenge at the grassroots level is cultural resistance among business actors who consider climate change issues unrelated to daily profits (Amalia et al., 2024). The academic sector must promote assistance grounded in Sustainable Ecopedagogical Praxis by providing concrete examples (*best practices*) of raw material efficiency. Evidence of real economic profits will dismantle this resistance voluntarily.

CONCLUSION

The transformation of the Halal Value Chain (HVC) toward a sustainable ecosystem will not be optimal if it relies solely on technological interventions and regulatory updates. A fundamental change in the ecological perspective of economic actors is an absolute prerequisite for system success. The integration of the contemporary halal value chain and critical ecopedagogy has proven capable of creating a paradigm shift in Islamic economics.

Ecopedagogy plays a vital role in reconstructing the normative understanding of halal into a substantive understanding of *thayyib*. This critical awareness drives industrial governance from an exploitative, conventional linear model to a circular model responsive to Earth's carrying capacity limits. The synergy between Sharia compliance and ecological responsibility gives rise to an Islamic economic ecosystem that is independent, resilient, and sustainable for future generations.

Recommendations of this research are that regulatory authorities immediately draft a blueprint for an Integrative Single Halal-Thayyib Certification that merges halal product audits with environmental sustainability, accompanied by fiscal incentives for green MSMEs. The Islamic social finance sector must expand the availability of capital for technology transitions through productive zakat, waqf schemes, and the issuance of Micro-Green Sukuk. Researchers are required to disseminate relevant ecopedagogical praxis modules to erode cultural resistance among business players while advancing the commercialization of green technology research.

REFERENCES

Aisyah, S. (2024). Transforming Halal Industry into Halal-Thayyib Eco-System: A Maqashid Shariah Approach. *Journal of Islamic Economic and Business Review*, 13(1), 45–58.

- Ali, M. H., Tan, K. H., & Ismail, M. D. (2020). A structural equation model on halal food supply chain integrity and customer satisfaction. *Supply Chain Management: An International Journal*, 25(5), 591–605.
- Amalia, R., Sukmana, R., & Ratnasari, R. T. (2024). Muslim Consumer Behavior and Food Waste: Assessing the Gap Between Religious Values and Ecological Actions. *Journal of Islamic Marketing*, 15(3), 712–730.
- Auda, J. (2008). *Maqasid al-Shariah as Philosophy of Islamic Law: A Systems Approach*. International Institute of Islamic Thought (IIOT).
- Dusuki, A. W., & Bouheraoua, S. (2011). The framework of Maqasid al-Shari'ah and its implications for Islamic finance. *ISRA International Journal of Islamic Finance*, 3(2), 7–17.
- Hassan, R., Anwar, S., & Al-Anshori, M. (2023). Maqashid al-Shari'ah and Environmental Sustainability: Reconstructing the Halal Supply Chain Concept. *International Journal of Green Economics*, 17(2), 112–130.
- Kahn, R. (2010). *Critical Ecopedagogy: Education for Environmental Sustainability and Social Justice*. Peter Lang.
- Khan, S. A., Kavilal, E. G., & Jabbour, C. J. C. (2021). Designing a halal sustainable supply chain: An integrated approach for the circular economy. *Annals of Operations Research*, 296(1), 415–442.
- Laldin, M. A., & Furqani, H. (2013). Developing Islamic finance in the framework of Maqasid al-Shari'ah. *International Journal of Islamic and Middle Eastern Finance and Management*, 6(4), 278–289.
- Misiaszek, G. W. (2020). *Ecopedagogy: Essential Conversations for Social and Environmental Justice*. Routledge.
- Nasr, S. H. (2023). *Man and Nature: The Spiritual Crisis of Modern Man in Islamic Perspective*. ABC International Group.
- Sarkis, J. (2021). Supply chain sustainability: learning from the past and envisioning the future. *International Journal of Operations & Production Management*, 41(2), 69–107.
- Tieman, M., & Darun, M. R. (2025). Green Halal Logistics: Operationalizing Thayyib in Supply Chain Management. *International Journal of Halal System and Sustainability*, 5(1), 18–34.