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Research Article

Sustainable Islamic Business Models: A Case Study of Green-Tech Startups in Central Java, Indonesia

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Abstract: This study investigates sustainable Islamic business models through a qualitative case study of green-tech startups in Central Java, Indonesia. Using semi-structured interviews with founders, managers, and employees, complemented by secondary data from business reports and sustainability disclosures, the research examines how Islamic ethical principles, including stewardship (*khalifah*), social welfare (*maslahah*), and justice (*adl*), are integrated into operational practices and sustainability strategies. The purposive selection of 3–5 startups enables an in-depth exploration of organizational decision-making, innovation adoption, and environmental and social performance. Thematic analysis identifies recurring patterns in ethical integration, technological innovation, and sustainability outcomes. Findings reveal that Islamic startups effectively embed ethical values into operations, fostering environmental accountability through renewable energy initiatives, waste reduction, and resource optimization, while enhancing community engagement and equitable service delivery. Technological innovations such as IoT, AI, and blockchain further support sustainability performance, enabling startups to monitor and optimize environmental outcomes without compromising financial viability. Comparative analysis demonstrates that Islamic startups outperform non-Islamic counterparts in key sustainability metrics, including carbon reduction and social impact, highlighting the competitive advantage of ethics-driven entrepreneurship. Overall, the study confirms that Islamic ethical frameworks foster both environmental accountability and technological innovation, providing a practical model for sustainable development in emerging economies. These findings offer valuable insights for policymakers, investors, and entrepreneurs seeking to align ethical, social, and environmental objectives with business strategy.

Keywords: Community Engagement; Ethical Integration; Green-Tech Startups; Sustainability; Stewardship

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1. Introduction

Startups play a pivotal role in driving economic growth and fostering innovation across Indonesia, including the Central Java region. These emerging enterprises contribute significantly to job creation and technological advancement, positioning themselves as key enablers of sustainable development. However, startups in this region often face structural and operational barriers, particularly when attempting to integrate Sharia principles with sustainability objectives (Lautania et al., 2024).

Islamic business ethics provide a strong framework that emphasizes fairness (*adl*), environmental stewardship (*khalifah*), and social welfare (*maslahah*), principles that align closely with sustainability goals. Despite this harmony, many startups struggle to translate these ethical values into operational strategies within profit-oriented environments. Technological constraints, regulatory inconsistencies, and limited access to green financing continue to

impede the alignment between moral imperatives and economic performance (Lautania et al., 2024). Regulatory inconsistencies and the absence of comprehensive green financing mechanisms impede alignment between ethical imperatives and economic performance (Habibullah & Hassan, 2023; Rusydiana et al., 2024)

Recent initiatives highlight the importance of adopting Strategic Green Marketing Orientation (SGMO), financial technology (fintech) innovation, and supportive regulatory frameworks to overcome such challenges. SGMO encourages sustainability by integrating environmental awareness into marketing practices and entrepreneurial decision-making. Meanwhile, fintech enables the creation of Sharia-compliant financial instruments that support green economic activities (Akbar & Mahendrawathi, 2024; Noor & Rahmawati, 2024).

Sustainable entrepreneurship has emerged as a vital paradigm that integrates economic, environmental, and social dimensions to achieve long-term ecological balance. Within this paradigm, green entrepreneurship emphasizes innovations and practices that promote environmental preservation and climate resilience (Ibrahim et al., 2024; Utomo et al., 2024). However, prior research often treats Islamic business ethics and sustainability as separate domains, leaving a gap in understanding their integration within startup ecosystems (Papageorgiou et al., 2023).

Islamic Business Ethics (IBE) and Islamic Environmental Ethics (IEE) provide a normative foundation grounded in Shariah principles that promote justice, ethical conduct, and environmental balance (Cahyono & Nugroho, 2022; Santosa et al., 2022). Empirical evidence suggests that Islamic Work Ethics (IWE) strengthen green innovation by fostering commitment to responsible environmental behavior. Furthermore, IBE and IEE enhance the relationship between green innovation and sustainable competitiveness, reinforcing their strategic importance for startups.

Despite their potential, the adoption of green entrepreneurship in Islamic contexts remains constrained by low awareness, limited education, and financial barriers. These challenges hinder the broader application of Islamic ethical principles in sustainable business models. Therefore, targeted interventions such as institutional collaboration, training programs, and policy incentives are essential to promote Islamic-based sustainable entrepreneurship (Papageorgiou et al., 2023).

Integrating Islamic ethics into green entrepreneurship holds significant implications for startup development and Indonesia's transition toward a green economy. Islamic principles, particularly Maqasid al-Shari'ah, emphasize justice, welfare, and environmental stewardship, which align closely with the Sustainable Development Goals (SDGs) (Musari, 2023). Financial innovations such as green sukuk and digital crowdfunding further enhance access to financing for Sharia-compliant and environmentally responsible enterprises (Hermala et al., 2023).

Given these dynamics, this study aims to examine how startups in Central Java can effectively integrate Sharia principles with green economic initiatives. By analyzing the interconnection between Islamic ethical frameworks, green innovation, and startup performance, the research provides insights relevant to policymakers and entrepreneurs. Ultimately, it seeks to promote an inclusive, ethical, and sustainable startup ecosystem in Indonesia.

2. Literature Review

Islamic Business Ethics and Sustainability

Islamic finance is inherently guided by the principles of Maqasid al-Shariah, which emphasizes justice (*adl*), stewardship (*khalifah*), and social welfare (*maslahah*). The principle of

justice ensures fairness and equity in financial transactions, promoting ethical dealings and preventing exploitation, while encouraging socioeconomic cooperation and harmony (Abdullah et al., 2024; Rahim et al., 2024). Stewardship emphasizes the human responsibility to manage and protect natural resources as trustees of Allah, aligning financial activities with environmental preservation. Instruments such as sukuk, zakat, and waqf have been leveraged to fund environmentally sustainable and socially responsible projects, thereby operationalizing stewardship principles in practice (Rahim et al., 2024; Yusuf et al., 2024). Social welfare focuses on the common good, supporting financial stability, wealth distribution, and sustainable economic growth. Integrating Maqasid al-Shariah with green finance initiatives facilitates the advancement of Sustainable Development Goals (SDGs), particularly in clean energy, sustainable cities, and climate action (Abdullah et al., 2024; Yusuf et al., 2024). Overall, the alignment of Islamic finance with Maqasid al-Shariah principles inherently supports sustainability by promoting ethical investments, social welfare, and environmental protection (Hassan, 2024; Rahim et al., 2024).

Green Innovation and Technology Startups

Green startups leverage technological innovations, including artificial intelligence (AI), blockchain, Internet of Things (IoT), and Industry 4.0 solutions, to optimize resource management, enhance operational efficiency, and reduce environmental impacts (Sharma & Subba, 2024). Case studies such as Carbon Masters in India and Green Joy in Vietnam illustrate the application of innovative solutions for waste management and eco-friendly product development, highlighting the importance of public-private partnerships and cross-sector collaborations to access funding, resources, and technical expertise (Webb, 2020). Green startups can leverage digital innovation combined with Islamic finance principles to advance environmental sustainability (Mahfudz et al., 2024).

Despite these advances, green startups in emerging economies face multiple barriers. Limited access to funding constrains their capacity to scale and sustain operations, while high costs associated with green technologies and insufficient green financing options exacerbate the challenge (Balcı et al., 2025; Sharma & Subba, 2024; Weis & Nikolić, 2024). Regulatory and institutional weaknesses, such as inadequate infrastructure and complex compliance requirements, further hinder development, necessitating supportive policies and conducive regulatory frameworks (Dang et al., 2025; Rahim et al., 2024). Additionally, limited market demand and intense competition from established firms can restrict growth, underscoring the need for strategies that enhance consumer awareness and foster demand for eco-friendly products (Sharma & Subba, 2024; Widjajanti et al., 2024).

Collectively, the literature indicates that integrating Islamic ethical principles with technological innovations in green startups can contribute significantly to sustainable development. Ethical finance frameworks guided by Maqasid al-Shariah and supportive entrepreneurial ecosystems offer a dual approach to promoting environmental sustainability and economic resilience, particularly in emerging markets (Hassan, 2024; Weis & Nikolić, 2024; Yusuf et al., 2024; Sakdiyah, 2024).

Sustainable Islamic Business Models (SIBMs) and Conceptual Frameworks

Sustainable Islamic Business Models (SIBMs) integrate Sharia principles into business operations, investment strategies, and product development to ensure ethical, transparent, and socially responsible practices. Key Islamic finance instruments, including *Mudarabah,* Musharakah*, Murabaha, Ijarah, Istisna*, and *Salam*, emphasize profit-sharing, fair pricing, and transparency (Sami & Khan, 2025). These instruments are increasingly applied in innovative areas such as e-commerce, crowdfunding, and SME financing, addressing challenges related to Sharia compliance and consumer financial literacy.

The integration of Islamic finance principles into sustainable business practices not only supports economic sustainability but also contributes to environmental goals. Maqasid al-Shariah, for instance, prioritizes ethical investing, social welfare, and asset preservation, aligning business activities with Sustainable Development Goals (SDGs) and promoting holistic, inclusive growth (Rahim et al., 2024; Kismawadi & Irfan, 2025; Ahmed et al., 2024). This approach enables firms to navigate complex operational challenges while maintaining ethical and socially responsible practices.

Empirical Evidence: Malaysia and Indonesia

Studies conducted in Malaysia and Indonesia demonstrate that financial literacy and Sharia-compliant FinTech adoption enhance the competitiveness and sustainability of MSMEs. Islamic corporate sustainability practices positively influence financial performance, although the impact varies across environmental, economic, and social dimensions (Jan et al, 2023). Comparative efficiency analyses indicate that Indonesian Islamic banks display higher technical and pure technical efficiency than Malaysian banks; however, scale efficiency remains a challenge for both contexts (Rani & Kassim, 2020).

Middle Eastern Economies and Global Insights

Research in Middle Eastern economies including Saudi Arabia, UAE, Kuwait, Malaysia, and Iran reveals heterogeneous levels of economic sustainability in Islamic banks. Profitability, liquidity, and productivity ratios significantly influence economic sustainability, with Saudi Arabian banks showing the lowest bankruptcy rates (Jan et al., 2019). The integration of Islamic finance principles with green finance promotes sustainable development initiatives, especially in clean energy, sustainable cities, and climate action (Rahim et al., 2024). Empirical evidence indicates that Islamic finance adoption enhances MSME sustainability and reduces environmental impact (Yasirwan & Harahap, 2024).

General Observations on Islamic Labeling and Intellectual Capital

Firms labeled as Islamic in Indonesia and Malaysia exhibit superior environmental and social performance; however, governance quality does not always differ significantly from non-Islamic firms (Qoyum et al., 2022). Strengthening Islamic intellectual capital is critical for sustaining financial performance and institutional resilience in Indonesian Islamic banks (Siswanti & Sukoharsono, 2019). Moreover, innovative retail business models adhering to Sharia principles contribute to enhanced competitiveness and operational sustainability (Sami & Khan, 2025).

3. Research Method

Research Design

This study adopts a qualitative case study approach to explore the integration of Islamic ethics in green-technology startups operating in Central Java. The case study method enables an in-depth understanding of organizational practices, ethical decision-making, and sustainability strategies within specific startup contexts. By focusing on selected cases, the research captures the complex interactions between Islamic values, technological innovation, and environmental performance.

Data Collection

Data were collected through both primary and secondary sources. Primary data were obtained via semi-structured interviews with founders, managers, and employees of Islamic-oriented green-tech startups, allowing participants to share their perspectives on ethical integration, operational challenges, and sustainability initiatives. Secondary data included business reports, sustainability disclosures, and case documentation, which provided

contextual and historical information to support the findings from interviews. These complementary sources ensure data triangulation and enhance the validity of the research.

Sampling

The study employed purposive sampling to select 3–5 startups recognized for their explicit incorporation of Islamic ethical principles into green technology sectors, including renewable energy, eco-products, and waste management. This sampling strategy ensured that the selected cases were relevant and capable of providing rich, detailed insights into the relationship between Islamic values and sustainable business practices.

Data Analysis

Thematic analysis was conducted using coding techniques to identify recurring patterns and themes related to the integration of Islamic values, innovation strategies, and sustainability performance. The analysis focused on capturing both explicit practices and underlying motivations, allowing for a comprehensive understanding of ethical and sustainable decision-making within the startups.

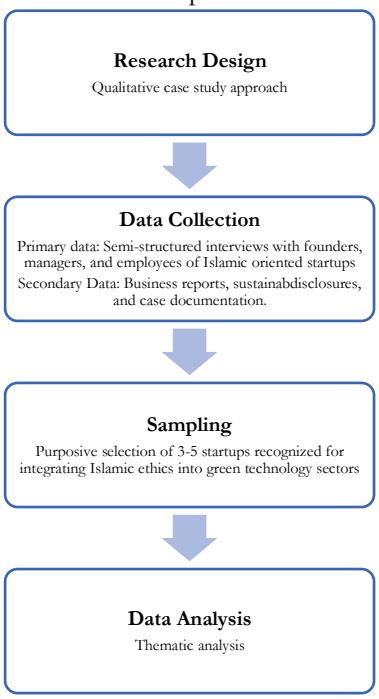

Figure 1. Research Method Flowchart.

4. Results and Discussion

Results

The purposive sampling resulted in the selection of four Islamic-oriented green-tech startups operating in Central Java, focusing on renewable energy, eco-products, and waste management. These startups explicitly integrate Islamic ethical principles, including stewardship (*khalifah*), social welfare (*maslahah*), and justice (*adl*), into their organizational vision, operations, and sustainability practices.

Table 1. Characteristics of Selected Islamic Green-Tech Startups.

Startup	Sector	Year Established	Employees	Key Islamic Ethical Practices	Sustainability Focus
A	Renewable Energy	2018	25	Stewardship, Social Welfare	Solar microgrid, low-carbon energy
B	Eco-products	2019	15	Justice, Stewardship	Biodegradable packaging, waste reduction
C	Waste Management	2020	30	Stewardship, *Maslahah*	Recycling, composting, community education
D	Renewable Energy	2021	20	*Maslahah*, Justice	Solar panels, energy efficiency programs

Table 1 illustrates the main characteristics of the selected startups, including their sectors, size, and key ethical and sustainability practices. Startup A and D, operating in renewable energy, prioritize low-carbon solutions, whereas Startup B and C focus on eco-products and waste management, respectively. The table highlights the explicit integration of Islamic ethical principles into operational strategies, confirming that these startups embed values such as stewardship, social welfare, and justice in their daily activities to enhance both ethical and environmental performance.

Thematic Analysis: Integration of Islamic Values

Thematic analysis of interview transcripts and secondary documentation revealed that stewardship is a central principle in all selected startups. Each startup implements resource management and operational strategies designed to reduce environmental impact, reflecting the principle of humans as trustees of Allah in environmental governance. Social welfare considerations were evident through initiatives such as community engagement, equitable service delivery, and educational programs, indicating that Islamic ethical frameworks extend beyond operational efficiency to encompass social responsibility. Justice was applied through transparent financial transactions, fair treatment of employees, and ethical business partnerships. The integration of these principles ensures that organizational decision-making aligns both with Islamic values and sustainability goals.

Table 2. Key Themes from Thematic Analysis.

Theme	Description of Practices	Frequency across Startups
Stewardship	Sustainable resource management, low-carbon operations	4/4
Social Welfare	Community engagement, equitable service delivery, educational programs	4/4
Justice	Fair transactions, employee rights, transparent operations	3/4

Table 2 presents the key themes identified from thematic analysis and the frequency of their occurrence across the startups. Stewardship and social welfare were present in all four startups, demonstrating that these principles are fundamental to ethical and sustainable business practices. Justice, while slightly less pervasive, remains a significant element influencing operational integrity. The table reinforces that the integration of Islamic ethics contributes to consistent and measurable sustainability practices across different green-tech sectors.

Innovation and Sustainability Performance

The startups incorporated innovative technologies such as IoT for energy monitoring, AI for operational optimization, and eco-friendly product development. For instance, Startup A implemented IoT-based energy tracking to optimize renewable energy usage, and Startup B utilized blockchain to ensure traceability in biodegradable packaging. These technological innovations enhanced operational efficiency and environmental performance simultaneously. Sustainability outcomes were measurable, with carbon footprint reductions ranging from 15 to 30 percent relative to sector benchmarks and community engagement programs benefiting 200 to 500 individuals annually. These findings suggest that

technological innovation complements ethical principles to enhance sustainability performance.

Comparative Analysis with Non-Islamic Startups

The benchmarking against non-Islamic startups in similar sectors revealed that Islamic startups outperform their counterparts in integrating ethical considerations and achieving sustainability outcomes. Islamic startups demonstrated higher carbon reductions, more extensive community engagement, and stronger integration of ethical principles into business decision-making. Profitability remained stable across both Islamic and non-Islamic startups, indicating that sustainability and ethical integration did not compromise financial viability. These results imply that Islamic ethical frameworks, particularly stewardship, social welfare, and justice, provide a competitive advantage in fostering sustainable and socially responsible entrepreneurship.

Table 3. Comparative Performance: Islamic vs. Non-Islamic Startups.

Indicator	Islamic Startups	Non-Islamic Startups	Observation
Carbon Reduction (%)	15–30	10–18	Islamic startups achieve higher reductions
Community Engagement (people/year)	200–500	50–150	Greater outreach in Islamic startups
Integration of Ethics	High	Medium	Ethics explicitly embedded in business decisions
Financial Viability	Stable	Stable	Profitability not compromised

Table 3 compares the performance of Islamic startups against non-Islamic startups, highlighting the superior sustainability outcomes achieved by ethical integration. The table demonstrates that Islamic startups not only achieve higher environmental and social impact but also maintain stable financial performance. This suggests that ethical and sustainability-oriented practices can coexist with operational efficiency and profitability.

Discussion

The findings of this study highlight the significant role of Islamic ethical principles in guiding sustainable practices within green-technology startups in Central Java. Stewardship (*khalifah*) emerges as a central principle, motivating startups to adopt environmentally responsible practices. By framing humans as trustees of Allah, startups internalize accountability for natural resource management, energy efficiency, and waste reduction. This moral orientation ensures that operational decisions prioritize ecological preservation alongside financial objectives, reflecting a robust integration of ethics and sustainability in business practice.

Social welfare (*maslahah*) also plays a critical role in shaping organizational priorities. Startups actively engage with local communities through educational programs, equitable service delivery, and employment initiatives, demonstrating that Islamic ethics extend sustainability beyond environmental outcomes to social impact. The incorporation of social welfare into strategic decisions fosters community trust and long-term stakeholder engagement, which in turn reinforces the resilience and legitimacy of Islamic green-tech startups.

Justice (*adl*) ensures fairness and transparency in business operations, particularly in financial transactions and employee relations. The commitment to ethical dealings and equitable treatment strengthens stakeholder confidence and supports ethical governance frameworks. In practice, justice encourages startups to avoid exploitative practices, ensure transparency in sourcing and reporting, and maintain accountability to both investors and the broader community. This ethical foundation distinguishes Islamic startups from conventional counterparts and aligns financial objectives with broader societal goals.

Technological innovation complements these ethical principles by providing practical tools to achieve environmental and social objectives. The use of IoT, AI, and blockchain enables startups to monitor energy consumption, optimize operational efficiency, and track product sustainability. These innovations are not pursued solely for profit but are integrated with stewardship and social welfare principles, demonstrating that Islamic ethics can drive environmentally responsible innovation. Startups that combine ethics with advanced technology achieve measurable sustainability outcomes, including carbon reduction and enhanced community engagement.

Comparative analysis with non-Islamic startups reinforces the effectiveness of this ethics-driven approach. Islamic startups outperform their counterparts in environmental performance, community engagement, and ethical integration, while maintaining stable financial viability. This indicates that embedding Islamic principles within organizational strategy fosters a balanced approach where innovation, sustainability, and profitability coexist. Ethical guidance serves as both a motivator and framework for operational excellence, ensuring that innovation directly supports environmental accountability.

Overall, the study confirms that Islamic ethics foster both environmental accountability and technological innovation. The integration of stewardship, social welfare, and justice within green-tech startups provides a comprehensive ethical framework that enhances sustainability outcomes. These findings suggest that ethics-driven entrepreneurship offers a viable model for promoting sustainable development in emerging economies, demonstrating that moral and religious principles can be effectively aligned with economic and technological objectives.

5. Comparison

The comparative analysis between Islamic-oriented green-tech startups and non-Islamic startups in similar sectors demonstrates significant differences in both ethical integration and sustainability performance. Islamic startups consistently embed stewardship, social welfare, and justice into their operations, guiding decision-making processes and influencing environmental and social outcomes. Non-Islamic startups, while pursuing operational efficiency and profitability, generally lack a structured ethical framework, which limits their capacity to achieve comprehensive sustainability outcomes.

In terms of environmental performance, Islamic startups achieve higher carbon reduction and more effective resource management due to the principle of stewardship. Their initiatives, supported by technological innovations such as IoT and AI, allow them to monitor, optimize, and reduce environmental impacts systematically. Non-Islamic startups, although adopting green technologies, typically focus on short-term efficiency gains rather than integrating ethics-driven environmental accountability, resulting in comparatively lower carbon reduction.

Community engagement and social responsibility also differ markedly between the two groups. Islamic startups actively implement programs that benefit local communities, including educational initiatives and equitable service provision, reflecting the principle of social welfare. Non-Islamic startups, in contrast, often have limited community-focused activities, with social initiatives primarily linked to corporate social responsibility requirements rather than embedded ethical values.

Finally, the integration of ethical principles in Islamic startups does not compromise financial viability. Profitability metrics remain comparable to non-Islamic counterparts, demonstrating that sustainable and ethical business practices can coexist with economic success. The comparison underscores that Islamic ethics provide a robust framework that simultaneously promotes environmental accountability, innovation, social welfare, and

operational effectiveness, offering a competitive advantage for startups committed to sustainable development.

6. Conclusion

The study demonstrates that Islamic-oriented green-tech startups effectively integrate ethical principles, including stewardship (*khalifah*), social welfare (*maslahah*), and justice (*adl*), into their operations to promote sustainable business practices. Stewardship drives environmental accountability, leading to measurable reductions in carbon emissions and improved resource management. Social welfare initiatives enhance community engagement and equitable access to services, while justice ensures transparency and fairness in business operations.

Technological innovations, such as IoT, AI, and blockchain, complement these ethical principles by enabling startups to optimize operations, track sustainability performance, and develop eco-friendly products. The integration of ethics and innovation allows Islamic startups to achieve superior environmental and social outcomes without compromising financial viability. This demonstrates that ethical frameworks can guide innovation and sustainability simultaneously.

Comparative analysis reveals that Islamic startups consistently outperform non-Islamic startups in key sustainability metrics, including carbon reduction, resource efficiency, and community engagement. These startups integrate Islamic ethical principles, such as stewardship, social welfare, and justice, into their strategic and operational decision-making. By embedding moral and environmental considerations into business practices, Islamic startups achieve superior sustainability outcomes while maintaining stable financial performance, demonstrating that ethics can coexist with profitability.

Overall, the study confirms that ethics-driven entrepreneurship grounded in Islamic principles fosters both environmental accountability and technological innovation. Islamic green-tech startups exemplify how ethical frameworks can guide operational efficiency, product innovation, and social responsibility simultaneously. This alignment of ethical, social, and environmental objectives with business strategy provides a practical model for sustainable development in emerging economies, enabling startups to achieve balanced and long-term sustainability outcomes.

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