A Conceptual Framework for Green Entrepreneurial Orientation and Sustainable Business Performance in Emerging Asian Markets

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ABSTRACT
The rise of startups in Indonesia and Malaysia highlights their crucial role in fostering sustainability, innovation, and economic resilience. However, these startups face significant challenges, including resource constraints, complex regulatory environments, and limited access to green financing. Addressing these challenges is essential for achieving a competitive advantage and fostering long-term resilience. This conceptual paper develops a theoretical framework grounded in the Resource Advantage Theory of Competition (RAToC) to explain how Green Entrepreneurial Orientation (GEO) influences Sustainable Business Performance (SBP). The study integrates Green Innovation Capability (GIC) and Positional Advantage (PA) as mediators, while Strategic Green Marketing Orientation (SGMO) acts as a moderator. By focusing on Indonesia and Malaysia, this research bridges gaps in the literature and offers practical insights for policymakers, investors, and entrepreneurs in emerging economies.

KEYWORDS: Green Entrepreneurial Orientation, Sustainability Business Performance, Resource Advantage Theory of Competition (RAToC), Green Innovation Capability, Strategic Green Marketing Orientation.

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1. INTRODUCTION

Asian startups are crucial in driving innovation and economic development, particularly in addressing regional and global sustainability challenges (Kosorukova et al., 2023). However, startups in Indonesia and Malaysia face significant obstacles that hinder their ability to integrate sustainability into their business models. In Indonesia, the fragmented regulatory landscape creates uncertainties in compliance, as overlapping environmental policies between local and central governments complicate adherence to green entrepreneurship initiatives. Meanwhile, Malaysian startups struggle with limited access to green financing, which delays the adoption of sustainable technologies and restricts their ability to scale eco-friendly innovations. Overcoming these constraints requires strategic and innovative approaches that enable startups to balance competitiveness with sustainability goals (Zahra, 2021).

As climate awareness increases and environmental regulations become more stringent, the demand for eco-friendly products and services continues to rise (Nguyen & Dekhili, 2019; Bakri et al., 2024; Guan & Mohd Bakhir, 2024; Zhang et al., 2024b). Startups are under growing pressure to embed sustainability into their core strategies to remain relevant in rapidly evolving markets. In this context, Green Entrepreneurial Orientation (GEO) has emerged as a key enabler of sustainability-driven business practices. GEO, which is defined by its proactiveness, innovativeness, and risk-taking, allows startups to anticipate market trends, develop sustainable solutions, and navigate environmental challenges effectively (Ameer & Khan, 2023; Habib et al., 2020). For instance, integrating IoT and innovative farming technologies within green entrepreneurial strategies has enabled startups to enhance eco-friendly practices, optimise resource efficiency, and promote sustainable agricultural innovation (Jumbri et al., 2024).

Despite its recognised importance, the mechanisms through which GEO influences Sustainable Business

Performance (SBP) remain underexplored, particularly in emerging Asian economies. Existing research has predominantly examined GEO, innovation, and sustainability as separate constructs, but few studies have developed an integrated framework that explains their interconnections. Furthermore, contextual factors such as resource constraints, market dynamics, and regulatory pressures significantly shape the relationship between GEO and SBP, yet they remain insufficiently addressed in the literature. To bridge this gap, this study develops a conceptual framework based on the Resource Advantage Theory of Competition (RAToC), which explores how the interactions among GEO, Green Innovation Capability (GIC), Positional Advantage (PA), and SBP contribute to sustainable entrepreneurial success. Additionally, this model incorporates Strategic Green Marketing Orientation (SGMO) as a moderating factor, highlighting how marketing strategies enhance the impact of innovation-driven GEO. By focusing on the entrepreneurial ecosystems of Indonesia and Malaysia, this framework not only fills existing gaps in the literature but also provides practical insights for startups navigating resource-constrained environments.

Thus, this study examines how GEO fosters SBP, emphasising the mediating roles of GIC and PA and the moderating role of SGMO. The study contributes to the literature in two key ways. First, it extends RAToC by positioning GEO as a strategic resource, demonstrating how startups can leverage sustainability-driven entrepreneurship to achieve competitive differentiation. By introducing GIC and PA as mediators, the study clarifies how startups translate GEO into tangible sustainability outcomes. SGMO enhances the effectiveness of green innovations through strategic marketing initiatives. Second, this study provides practical recommendations for policymakers, investors, and entrepreneurs, offering a roadmap for fostering green entrepreneurship, supporting sustainable innovation, and promoting environmentally responsible business practices in emerging Asian markets.

Startups are essential for economic growth, job creation, and sustainability-driven innovation, particularly in emerging markets such as Indonesia and Malaysia. However, regulatory inconsistencies, financial limitations, and challenges in aligning business strategies with sustainability objectives continue to pose significant barriers. The lack of clear policies, inconsistent government incentives, and restricted access to funding limit the ability of startups to adopt green business models, affecting their long-term viability and competitive positioning (Kosorukova et al., 2023). Addressing these challenges requires a structured and strategic approach that allows startups to balance sustainability and competitiveness in complex business environments effectively.

Although GEO has emerged as a critical driver of sustainability, startups require additional mechanisms to translate entrepreneurial orientation into measurable sustainability outcomes. This study posits that GIC and PA serve as mediators that reinforce the impact of GEO on SBP. GIC enables startups to develop and commercialise innovative sustainability solutions, while PA helps startups differentiate themselves in the market by leveraging their green initiatives. Without these mediating mechanisms, the relationship between GEO and SBP may remain inconsistent, particularly in resource-constrained entrepreneurial ecosystems (Huang et al., 2020; Hyun & Kim, 2024).

Moreover, SGMO is introduced as a moderating factor that strengthens the effectiveness of green innovations in driving SBP. SGMO encompasses branding, advertising, and consumer education strategies that enhance the visibility, credibility, and market adoption of sustainable business initiatives. Startups with a well-developed SGMO framework are better positioned to commercialise their sustainability efforts, attract eco-conscious consumers, and strengthen stakeholder engagement (Casidy et al., 2024). By incorporating SGMO into the conceptual framework, this study clarifies how green entrepreneurship can effectively translate into business success through strategic market positioning.

This study contributes to both theory and practice in significant ways. From a theoretical perspective, it extends RAToC by integrating GEO as a strategic resource, illustrating how entrepreneurial orientation, innovation capability, and strategic marketing interact to drive SBP. By incorporating GIC and PA as mediators and SGMO as a moderator, the study provides a more comprehensive explanation of how startups achieve sustainability-driven competitive advantage. From a practical standpoint, the study offers actionable insights for entrepreneurs, policymakers, and investors, guiding them in developing green entrepreneurship ecosystems through policy support, funding initiatives, and effective market strategies.

By focusing on the startup ecosystems of Indonesia and Malaysia, this study fills a critical research gap and provides a strategic roadmap for achieving SBP. The proposed framework underscores integrating entrepreneurial orientation with green innovation, competitive differentiation, and marketing strategies to enhance sustainability outcomes. Future research should empirically validate this framework through comparative studies across other emerging economies to assess its applicability and effectiveness in diverse economic contexts.

2. LITERATURE REVIEW

2.1 Sustainable Business Performance (SBP)

Sustainable Business Performance (SBP) reflects a firm's capacity to integrate economic growth, environmental responsibility, and social impact (Abid et al., 2024). However, startups in Indonesia and Malaysia face significant challenges in achieving SBP due to resource limitations, unclear sustainability policies, and insufficient access to green financing, all of which hinder their ability to adopt sustainable business models (Mondal et al., 2024). Addressing these challenges requires a strategic and integrated approach that balances sustainability with competitiveness, allowing startups to thrive in dynamic business environments.

In emerging economies like Indonesia and Malaysia, achieving SBP is particularly critical as startups must navigate the dual pressures of economic expansion and environmental conservation. A sustainable business model must balance three key dimensions: economic, environmental, and social performance. Economic performance emphasises profitability, cost efficiency, and scalability—critical factors for startups in resource-constrained environments to maintain financial stability and attract investments (Widjajanti et al., 2023). On the other hand, environmental performance focuses on reducing carbon emissions, minimising waste, and adopting sustainable practices that align with national sustainability policies, such as Malaysia's National Green Technology Master Plan and Indonesia's Environmental Protection and Management Law. These initiatives aim to integrate sustainability into national economic strategies, reinforcing environmental stewardship at both regional and global levels.

The social dimension of SBP underscores the importance of community engagement, equitable employment, and contributions to societal well-being. A prominent example is Indonesia's eco-tourism sector, where startups integrate local community development into their business models, ensuring shared economic benefits while preserving cultural heritage and natural ecosystems (Desembrianita et al., 2024). Similarly, Malaysian startups in sustainable agriculture have incorporated precision farming and organic practices, contributing to food security while maintaining environmental balance. By harmonising these economic, environmental, and social dimensions, startups can adopt a holistic sustainability framework, ensuring long-term growth while upholding environmental and social responsibilities.

Beyond integrating sustainability principles, GEO and GIC are pivotal in driving SBP. Startups that strategically embed GEO into their business models are better equipped to identify sustainability opportunities, develop eco-friendly innovations, and take calculated risks in response to market uncertainties. For instance, in Indonesia, renewable energy startups tackle energy poverty by developing solar-powered solutions that mitigate greenhouse gas emissions and generate economic value (International Renewable Energy Agency, 2023). Meanwhile, sustainable agritech startups in Malaysia leverage green innovations to enhance yield efficiency while minimising environmental degradation (Abubacker & Raheem, 2024).

These approaches enable startups to comply with regulatory frameworks while strengthening their relationships with customers, investors, and government agencies. By embedding GEO and innovation into their strategies, startups transform sustainability from a regulatory burden into a competitive advantage. The effectiveness of their sustainability initiatives is measured through key performance indicators, including revenue growth, carbon footprint reduction, and social impact metrics. For example, Malaysian startups in green manufacturing actively monitor carbon emissions to align with sustainability goals, while Indonesian agritech startups assess their impact by tracking increased income for local farmers (Annamalah et al., 2024; Prihadyanti et al., 2024).

These metrics comprehensively evaluate how startups balance profitability with environmental and social responsibilities. In Asia's eco-conscious markets, achieving SBP is closely tied to long-term competitive advantage. Startups that successfully integrate sustainability into their core business models enhance their reputation as socially responsible enterprises, attracting consumers who prioritise environmentally friendly products and services. For example, Malaysian startups producing solar energy solutions have attracted foreign investments due to their commitment to sustainability. Meanwhile, Indonesian startups in sustainable tourism have differentiated themselves globally by showcasing innovative, eco-friendly travel experiences.

Sustainable startups also secure long-term partnerships with governments, multinational corporations, and non-governmental organisations (NGOs), gaining access to critical resources and growth opportunities. By achieving SBP, startups in Indonesia and Malaysia ensure resilience, scalability, and long-term success, establishing themselves as key players in Asia's transition toward a green economy. **Table 1** illustrates real-world examples of green initiatives undertaken by startups in Indonesia and Malaysia and their sustainable outcomes.

Table 1: *Green initiatives and business impact*

Initiative	Startup Example	Sustainable Outcome
A Solar-powered irrigation system	Agritech startups in rural Indonesia	Reduced water wastage and energy costs, promoting efficient farming.
Biodegradable food packaging	Malaysian green packaging startups	Lower landfill waste and adoption of sustainable consumer practices.
Eco-tourism with zero-waste practices	Indonesian eco-tourism ventures in Bali	Increased eco-conscious travel, reducing plastic waste in tourism hotspots.
Circular economic solutions for waste-to-product	Malaysian companies producing eco-bricks	Transformation of waste materials into valuable products, reducing environmental footprint.

2.2 Green Entrepreneurship Orientation (GEO)

Green Entrepreneurial Orientation (GEO) reflects a startup's proactive, innovative, and risk-taking approach to addressing environmental challenges while maintaining a competitive advantage (Frare & Beuren, 2022). Proactiveness enables startups to identify and capitalise on eco-conscious market opportunities—such as renewable energy and sustainable agriculture—before competitors. Innovativeness emphasises the development of unique, sustainable products and processes tailored to local and global market demands, such as biodegradable materials and eco-friendly tourism services (Neumann, 2023). Risk-taking involves a startup's willingness to invest in sustainability-driven initiatives—such as transitioning to green energy or adopting circular economy models—despite financial uncertainties (Hossain et al., 2024). These three dimensions collectively position GEO as a fundamental strategy for startups seeking to align their business operations with global sustainability objectives while enhancing competitiveness, particularly in dynamic Asian markets.

Startups in emerging economies like Indonesia and Malaysia operate in complex environments shaped by resource constraints, evolving regulatory frameworks, and increasing consumer demand for sustainability (Mortada & Chijioke, 2025). In this context, GEO provides startups with a strategic framework to navigate these challenges while fostering innovation and long-term sustainability. For example, Indonesian startups in waste-to-energy solutions and Malaysian startups specialising in solar panel manufacturing demonstrate how GEO enables businesses to anticipate environmental trends and adapt to shifting market dynamics. By integrating GEO, startups can align with national and international sustainability policies, positioning themselves as industry leaders in green business practices.

Previous studies by Frare & Beuren (2022) and Ameer & Khan (2023) have extensively examined the relationship between GEO and environmental performance, emphasising the role of GEO in driving eco-friendly innovation and operational efficiency. However, most of these studies primarily focus on direct relationships and do not fully consider the potential influence of moderating factors on these outcomes. While research has established a link between GEO and environmental performance, it often overlooks the role of SGMO in shaping market adoption and consumer engagement, particularly in emerging markets such as Indonesia and Malaysia. Given the dynamic nature of sustainability-driven markets, the integration of SGMO as a moderating factor may enhance the ability of GEO-driven startups to commercialise their innovations effectively.

Beyond market responsiveness, GEO plays a crucial role in regulatory compliance. Startups in Indonesia and Malaysia must adhere to environmental policies such as Indonesia's Environmental Protection and Management Law No. 32/2009 and Malaysia's National Green Technology Master Plan, which mandate sustainability-driven business practices. By embedding GEO into their operations, startups can ensure compliance and gain a competitive advantage by appealing to the growing segment of eco-conscious consumers (Zhang et al., 2024a). The increasing demand for sustainable products and services in these economies presents an opportunity for GEO-oriented startups to establish themselves as market pioneers while contributing to national sustainability goals.

Despite the benefits of GEO, adoption remains a challenge for many startups in Indonesia and Malaysia due to limited access to funding, infrastructure, and technical expertise (Nordin & Hassan, 2019; Rohendi et al., 2023). High upfront costs for sustainability-focused R&D and a shortage of expertise in green innovations hinder many startups from scaling their operations (Yang et al., 2021). For instance, small-scale renewable energy startups in Indonesia often struggle to secure financing, limiting their ability to expand production. Similarly, sustainable manufacturing startups in Malaysia face challenges in adopting advanced green technologies due to high capital investment requirements. Furthermore, market uncertainties, including fluctuating policy support and inconsistent consumer demand, create additional obstacles for GEO-driven startups.

However, several initiatives in Indonesia and Malaysia are helping mitigate these barriers. Public-private partnerships like Malaysia's Green Technology Financing Scheme provide startups with financial

resources to scale their sustainability-driven innovations. Similarly, collaborations between Indonesian startups, academic institutions, and NGOs facilitate knowledge transfer, mentorship programs, and technical support, addressing the expertise gap in sustainability-focused entrepreneurship. These collaborative efforts bridge financial and technical gaps, making GEO adoption more feasible and sustainable in the long term.

GEO is a foundational driver of GIC, particularly for startups in resource-constrained environments like Indonesia and Malaysia (Yu et al., 2022; Raihan et al., 2023). Startups with strong GEO orientations are more likely to integrate sustainability principles into their innovation processes, leading to advancements in renewable energy, biodegradable packaging, and efficient waste management systems. For instance, Indonesian startups focusing on sustainable aquaculture and Malaysian companies developing biodegradable food containers exemplify how GEO catalyses green innovation.

These innovations address pressing environmental challenges and strengthen market differentiation, allowing startups to discover unique value propositions in competitive markets. By leveraging GIC, startups in Indonesia and Malaysia enhance their contribution to environmental sustainability while simultaneously building profitable, future-ready business models. This underscores the importance of GEO as a strategic resource for fostering entrepreneurial sustainability and innovation in emerging markets.

2.3 Antecedents of Green Entrepreneurial Orientation (GEO)

While prior studies have established a strong link between GEO and SBP, relatively little attention has been given to the factors driving firms to adopt GEO. Understanding these antecedents, including regulatory pressure, market demand, and institutional support, provides deeper insight into the mechanisms that encourage sustainability-driven entrepreneurship. These factors play a crucial role in shaping entrepreneurial decision-making and determining the extent to which businesses integrate sustainability into their strategies.

In emerging economies like Indonesia and Malaysia, where industrialisation and economic expansion are accelerating, the role of antecedents becomes particularly critical. These factors incentivise startups to align with sustainability goals and help them navigate resource constraints, evolving regulatory landscapes, and shifting consumer expectations (Mondal et al., 2024). As a region characterised by diverse economies and rapid industrialisation, Asia faces mounting environmental challenges, including resource depletion, pollution, and climate change. Consequently, regulatory reforms, shifting market dynamics, and institutional interventions have emerged as key drivers of GEO adoption, influencing entrepreneurial behaviours and business strategies in sustainability-focused markets (Liu et al., 2022). The following sections explore the primary antecedents of GEO and their impact on sustainability-oriented entrepreneurship in Indonesia and Malaysia.

2.3.1 Regulatory Pressure

Regulatory pressure is a primary external driver compelling startup to adopt sustainable business practices. Government policies, legal mandates, and environmental standards create incentives and obligations for businesses to integrate sustainability into their operations. Countries such as Malaysia and Indonesia have established green economy policies and environmental regulations to accelerate sustainable business practices.

For instance, Malaysia's Green Technology Financing Scheme has facilitated the adoption of green technologies among startups by offering financial assistance, tax incentives, and policy support (Idris et al., 2024). Similarly, Indonesia's Environmental Protection and Management Law No. 32/2009 enforces strict guidelines on waste management, carbon emissions, and industrial sustainability, encouraging startups to innovate in renewable energy, circular economy models, and eco-friendly manufacturing (Yahman & Setyagama, 2023).

Empirical studies indicate that startups operating under strong regulatory frameworks are more likely to embrace GEO. Research in Southeast Asia highlights that firms complying with environmental regulations benefit from government incentives, enhanced market credibility, and access to sustainability-linked investment funds (Chu et al., 2022; Sudaryana et al., 2025). However, while regulatory pressure drives GEO adoption, inconsistent enforcement and bureaucratic inefficiencies often create challenges. In Indonesia, overlapping regulatory authority between central and local governments results in ambiguities in compliance requirements, leading to uncertainty for startups looking to implement sustainability initiatives (Choiruzzad et al., 2021; Keumala et al., 2025). Addressing these challenges requires greater policy coordination, transparent enforcement mechanisms, and improved regulatory clarity to enhance the effectiveness of green policies in fostering entrepreneurial sustainability.

2.3.2 Market Demand

Market demand is a crucial determinant of GEO adoption, as shifting consumer preferences toward eco-friendly products and services creates new business opportunities for startups integrating sustainability into their value propositions. Firms responding to these consumer preferences gain competitive advantages,

including enhanced brand loyalty, differentiation, and premium pricing power (Widjajanti et al., 2024).

Indonesia's rise in sustainable agriculture and eco-tourism demonstrates how consumer-driven green markets shape entrepreneurial decisions. Companies in organic farming and zero-waste tourism have experienced significant growth due to increased demand for environmentally responsible products and services. Similarly, in Malaysia, the demand for renewable energy solutions—such as solar panels and energy-efficient appliances—has surged, indicating a strong consumer-driven push toward sustainability.

Empirical evidence supports the link between market demand and GEO adoption. A study on Malaysian startups implementing eco-consumerism found that consumer-driven sustainability preferences significantly enhanced corporate performance, demonstrating the financial benefits of integrating green business practices (Ali et al., 2020). Despite the opportunities presented by market demand, higher production costs for eco-friendly products remain a key barrier for startups adopting GEO (Ameer & Khan, 2023). Many green startups struggle to balance cost competitiveness with sustainability investments, making government incentives, private sector collaborations, and impact-driven investments essential to mitigate financial burdens and support startups in transitioning toward green business models.

2.3.3 Institutional Support

Institutional support, including financial assistance, technical expertise, and advisory services, facilitates GEO adoption, particularly in resource-constrained environments where startups lack capital, technology, and sustainability expertise (Hakim et al., 2024). In Malaysia, government institutions such as GreenTech Malaysia provide funding, R&D support, and capacity-building programs to assist startups in developing and commercialising green technologies (Halmi & Abdul Rahman, 2021). Meanwhile, NGOs, government agencies, and international organisations collaborate with startups in Indonesia to promote sustainability-driven entrepreneurship, particularly in waste management, renewable energy, and eco-friendly product development (Raihan et al., 2023).

Research shows that institutional support significantly enhances the probability of GEO adoption. Malaysian startups receiving government grants demonstrated greater financial capacity to invest in sustainability-driven initiatives, improving their ability to scale green innovations (Ridzuan et al., 2023). Likewise, Indonesian startups collaborating with international partners showed higher success rates in implementing sustainability solutions, benefiting from global expertise, technology transfer, and impact investment opportunities (Widjajanti & Sugiyanto, 2023).

However, bureaucratic inefficiencies and administrative bottlenecks often hinder access to institutional support. Startups operating in remote areas of Indonesia face significant challenges in obtaining funding and technical support due to geographical constraints and complex eligibility criteria. Addressing these gaps requires streamlined grant applications, decentralised support mechanisms, and stronger public-private partnerships to enhance the accessibility of institutional resources for startups across all regions.

2.3.4 Interaction Between Antecedents

Regulatory pressure, market demand, and institutional support influence GEO adoption patterns in Indonesia and Malaysia. The regulatory frameworks set sustainability standards that enhance market demand for eco-friendly products, compelling firms to adopt green business models. Meanwhile, institutional support mitigates financial constraints, enabling startups to comply with regulations while responding to market expectations. For example, in Malaysia, a renewable energy startup leveraged government subsidies to comply with emission standards while addressing consumer demand for solar solutions (Vaka et al., 2020; Koerner et al., 2022). Similarly, an agricultural technology startup in Indonesia utilised international funding to develop sustainable farming practices aligned with regulatory mandates and market demand (Hara, 2023).

These interdependent relationships underscore the need for holistic policy frameworks, enhanced institutional support, and greater private-sector engagement to foster long-term sustainability-focused entrepreneurship. **Table 2** summarises the differences in how these antecedents shape GEO adoption in Indonesia and Malaysia.
The antecedents of GEO—regulatory pressure, market

Table 2: *GEO Antecedents in Indonesia and Malaysia*

Antecedent	Indonesia Example	Malaysia Example
Regulatory Pressure	Environmental Protection Law No. 32/2009 enforces strict waste management guidelines, pushing startups to adopt green practices.	The Green Technology Master Plan (GTMP) promotes the adoption of green technologies with government incentives.
Market Demand	Rising popularity of eco-tourism in Bali, where consumers demand zero-waste hospitality and nature-friendly activities.	Lower landfill waste and adoption of sustainable consumer practices.
Institutional Support	NGO-led funding and international collaborations for agritech startups in remote Indonesian regions.	GreenTech Malaysia offers funding and technical assistance for green innovation initiatives.

demand, and institutional support—are key drivers influencing how startups in Indonesia and Malaysia integrate sustainability into their business strategies. By understanding these factors, policymakers, industry leaders, and entrepreneurs can develop more effective strategies to promote green entrepreneurship in emerging Asian markets, ultimately fostering a resilient and sustainable startup ecosystem.

2.4 Green Innovation Capability (GIC) as a Mediator

While GEO fosters a sustainability-driven mindset, Green Innovation Capability (GIC) ensures that these ideas are translated into tangible solutions, such as renewable energy technologies, waste reduction strategies, and eco-friendly product designs (Huang et al., 2020). Startups with strong GIC are better positioned to adapt to environmental regulations, meet consumer demand for sustainable products, and gain a competitive edge in green markets. However, without sufficient GIC, startups may struggle to convert sustainability-focused entrepreneurial initiatives into measurable business outcomes. In emerging Asian economies, particularly in Indonesia and Malaysia, GIC is becoming increasingly vital as startups align their strategies with stricter environmental regulations, industry sustainability mandates, and shifting consumer preferences toward greener alternatives.

For instance, Malaysian startups specialising in solar panel technologies and Indonesian agritech startups focusing on sustainable farming practices illustrate how green innovation serves as a solution to region-specific sustainability challenges while aligning with global sustainability objectives. Startups in these economies face pressing environmental concerns, including deforestation, pollution, and energy inefficiencies. By leveraging GIC, startups can bridge the gap between economic growth and environmental conservation, enabling them to actively contribute to Sustainable Development Goals (SDGs) while fostering business scalability.

Startups with a strong GEO orientation are inherently more inclined to develop robust GIC, as proactiveness, innovativeness, and risk-taking drive them to explore new technologies, collaborate with environmentally conscious stakeholders, and implement sustainability-driven business models. For instance, Indonesian startups pioneering solar-powered irrigation systems address agricultural inefficiencies by integrating renewable energy solutions into traditional farming. Meanwhile, Malaysian startups operating in the circular economy are transforming waste into valuable products, such as eco-bricks and compostable materials, reducing landfill waste while fostering a sustainable manufacturing ecosystem.

Government and institutional support play a crucial role in strengthening GIC within startups. Roh et al. (2021) emphasise that financial backing and infrastructure development are essential catalysts for green innovation. Programs such as Malaysia's Green Technology Financing Scheme and Indonesia's environmental subsidies provide startups access to funding, research grants, and policy incentives, ensuring they can scale sustainable innovations. Furthermore, partnerships with multinational corporations, NGOs, and research institutions facilitate access to cutting-edge expertise and global market opportunities. For instance, eco-tourism initiatives in Indonesia have leveraged international collaborations to develop innovative resource utilisation strategies, simultaneously promoting local economic development and environmental conservation (Firman et al., 2023).

Implementing GIC enhances startups' ability to cater to the rapidly growing market of eco-conscious consumers, many of whom are willing to pay a premium for sustainable offerings. For example, Indonesian startups specialising in biodegradable food packaging and Malaysian startups innovating in energy-efficient appliances have successfully captured local and international market demand by aligning their products with sustainability expectations.

Beyond consumer appeal, GIC significantly improves operational efficiency by reducing resource consumption, minimising waste, and lowering production costs, leading to substantial financial benefits for startups (Bhatia, 2021). These efficiency gains enhance overall business resilience, making sustainability-driven startups more attractive to investors and strategic partners who prioritise long-term environmental and economic sustainability. Moreover, by establishing themselves as leaders in green innovation, startups in Indonesia and Malaysia strengthen their market positioning, enabling them to compete in global markets where sustainable solutions are increasingly prioritised.

The impact of GIC on SBP is particularly pronounced in startups due to their agility, adaptability, and responsiveness to evolving market conditions (Kiranantawat & Ahmad, 2023). Green innovations enable startups to achieve multi-dimensional sustainability outcomes, including:

I. Environmental Outcomes: Reduction of carbon emissions, resource waste, and environmental footprint, aligning with regional sustainability regulations such as Malaysia's SDGs targets and Indonesia's commitments under the Paris Agreement (Raihan et al., 2023).

II. Economic Outcomes: Startups enhance profitability through cost efficiencies, premium pricing for sustainable products, and increased investor interest.

Malaysian renewable energy startups exemplify how financial viability can align seamlessly with sustainability-driven strategies (Hossain et al., 2024).

III. Social Outcomes: Green innovations foster job creation, local community empowerment, and improved quality of life. For instance, Indonesian startups promoting sustainable aquaculture contribute to food security and livelihood improvements in rural areas (Riyantini et al., 2023).

These interconnected outcomes underscore how GIC is a key enabler of business profitability and environmental sustainability. Startups in Indonesia and Malaysia prioritising green innovation enhance their market positioning and contribute significantly to Asia's transition toward a more sustainable economy (Tjahjadi et al., 2020; Hossain et al., 2024).

2.5 Positional Advantage (PA) as Mediator

While GIC enables startups to develop sustainability-driven solutions, the ability to effectively capitalise on these innovations for competitive differentiation is equally essential. Simply adopting green innovations is not enough—startups must establish a strong PA that distinguishes them from competitors, enhances brand credibility, and strengthens their long-term market presence. In this regard, PA functions as a key mediating factor, translating the benefits of GIC into tangible business success by fostering brand differentiation, consumer trust, and market competitiveness.

PA refers to a startup's ability to secure superior market positioning by offering unique, high-value solutions that address market demands (Hyun & Kim, 2024). In sustainability-focused markets, this advantage is often derived from green innovations that align with the growing consumer preference for environmentally responsible products and services. In Indonesia and Malaysia, where eco-conscious consumerism is on the rise, startups that develop distinctive sustainability-driven business models can differentiate themselves, foster long-term customer loyalty, and strengthen their foothold in emerging green markets (Mudrika et al., 2024; Saddam et al., 2024; Yan et al., 2024). For instance, Indonesian startups specialising in biodegradable packaging and Malaysian startups excelling in solar energy solutions illustrate how green innovations enhance competitive positioning and market leadership.

GIC is a key enabler for startups seeking to establish a strong PA, particularly in Indonesia and Malaysia's fast-evolving and competitive markets. Startups that invest in eco-friendly products and services address unmet market needs and align with global sustainability trends and evolving regulatory frameworks (Aziz & Niazi, 2025). For example, Indonesian startups are pioneering renewable energy technologies for rural electrification, and Malaysian startups are developing zero-waste products that actively respond to the increasing consumer and regulatory demand for sustainable solutions. By leveraging GIC as a foundation for differentiation, these startups can enhance brand equity, build consumer trust, and position themselves as sustainability leaders in their respective industries.

The role of PA in driving market performance is particularly evident in the entrepreneurial ecosystems of Indonesia and Malaysia, where sustainability has emerged as a key competitive differentiator. Startups that successfully position themselves as leaders in sustainability-focused industries can expand market share, command premium pricing, and develop robust brand reputations. For instance, Malaysian startups developing sustainable palm oil alternatives and Indonesian startups promoting eco-tourism have leveraged sustainability as a branding and market positioning strategy, gaining more substantial consumer traction and competitive momentum (Firman et al., 2023; Lee et al., 2024). These examples highlight how startups utilising PA can thrive in dynamic economies by aligning their sustainability initiatives with evolving consumer expectations and policy frameworks.

In emerging Asian markets, PA is a crucial mediator between GIC and SBP. By leveraging green innovations to establish distinct market positioning, startups can translate technological and operational advancements into measurable business success. This includes higher profitability, reduced environmental impact, and stronger stakeholder engagement. For example, startups prioritising waste reduction and energy efficiency often achieve the dual objectives of economic growth and sustainability compliance, creating long-term value for their businesses and the broader sustainability ecosystem. Ultimately, startups that successfully integrate PA into their strategic framework contribute to their resilience and profitability and Asia's transition toward a more sustainable economy.

2.6 Strategic Green Marketing Orientation (SGMO) as Moderator

Although PA allows startups to differentiate themselves in sustainability-driven markets, its effectiveness in driving business success depends on how well key stakeholders communicate and perceive these advantages. A competitive edge in sustainability alone is insufficient unless startups can effectively convey their green value propositions, build consumer trust, and enhance stakeholder engagement. This is where the SGMO plays a crucial moderating role. SGMO strengthens the link between GIC and SBP by ensuring that green innovations are developed and effectively marketed, maximising their economic and environmental impact. Without a well-defined SGMO strategy, even the most

advanced green solutions may struggle with market adoption, limiting their contribution to long-term sustainability and business growth.

SGMO involves the integration of sustainability principles into marketing strategies, enabling startups to engage stakeholders and communicate their environmental commitments effectively. It encompasses three key components: green branding, which reinforces a startup's eco-friendly identity; eco-conscious advertising, which promotes the environmental benefits of products and services; and consumer education, which raises awareness about sustainable practices and the value of green innovations (Casidy et al., 2024). In the Asian context, particularly in Indonesia and Malaysia, SGMO has gained prominence as startups seek to differentiate themselves in markets increasingly driven by sustainability-conscious consumers.

Beyond its role in branding and awareness, SGMO aligns with regional and national sustainability initiatives. For instance, Malaysia's Green Technology Master Plan promotes green innovations, while Indonesia's focus on sustainable tourism encourages startups to adopt green marketing practices to highlight eco-friendly travel options (Ghosn et al., 2024; Lee & Hung, 2024). These strategic marketing efforts enhance visibility and position startups as leaders in sustainability-focused industries. For many Asian startups, SGMO has become a powerful differentiator, especially in highly competitive markets such as Indonesia and Malaysia. By leveraging SGMO, startups can effectively communicate their sustainability initiatives, attracting eco-conscious consumers willing to pay a premium for green products and services. For instance, Malaysian startups producing solar energy products have utilised green branding to establish themselves as key players in the renewable energy sector, appealing to domestic and international markets (Koerner et al., 2022). Similarly, Indonesian startups in eco-tourism employ eco-conscious advertisements to attract environmentally aware travellers, carving out a niche in an increasingly competitive industry (Rahmawati et al., 2021).

Furthermore, SGMO fosters trust with key stakeholders, including investors, government agencies, and non-governmental organisations (NGOs), by demonstrating a startup's long-term commitment to sustainability. This trust is particularly critical in emerging markets like Malaysia and Indonesia, where startups often face resource constraints and must depend on partnerships to scale operations and access broader markets. By effectively leveraging SGMO, startups can enhance their competitiveness, enabling them to compete with larger, well-established firms while overcoming financial and infrastructural challenges.

2.7 SGMO as a Moderator in the Relationship Between GIC and SBP

SGMO plays a pivotal moderating role in strengthening the relationship between GIC and SBP. It amplifies the impact of green innovations by ensuring that their environmental and economic benefits are effectively communicated to consumers and stakeholders. For example, Malaysian startups focusing on energy-efficient appliances have utilised eco-conscious advertising to highlight long-term cost savings and environmental benefits, fostering greater customer loyalty and improved market penetration (Cheah et al., 2024). Similarly, Indonesian startups developing biodegradable packaging have leveraged green branding to align their products with global sustainability trends, attracting partnerships with multinational corporations (Agustina et al., 2024). By strategically emphasising eco-friendly practices through SGMO, startups can forge stronger emotional connections with consumers, cultivate brand loyalty, and encourage repeat business. This enhanced consumer engagement ensures that the benefits of green innovations are fully realised, contributing simultaneously to sustainability goals and business profitability.

Despite its significance, the role of SGMO remains underexplored, particularly in the startup ecosystems of emerging markets such as Indonesia and Malaysia. Limited research exists on how startups can optimise SGMO to maximise sustainability impact and competitive positioning in resource-constrained environments. For instance, the effectiveness of green marketing strategies, including digital campaigns and localised messaging, has yet to be thoroughly examined in these markets. Given these research gaps, this study incorporates SGMO as a moderating factor to strengthen the relationship between GIC and SBP. Future research should focus on tailoring SGMO strategies to Indonesia and Malaysia's unique socio-economic and cultural landscapes, where startups face distinct challenges and market dynamics.

Moreover, additional studies could explore the long-term effects of SGMO on consumer behaviour, stakeholder engagement, and business sustainability. Understanding these dynamics would provide valuable insights for startups and policymakers, enabling them to harness SGMO's full potential in promoting sustainable entrepreneurship across Asia. By bridging these gaps, future research can contribute to developing more effective green marketing frameworks that enhance both business competitiveness and sustainability outcomes in emerging markets.

2.8 Resource Advantage Theory of Competition (RAToC) with GEO and Sustainability

While SGMO moderates the relationship between GIC and SBP, a broader theoretical foundation is needed to

explain how startups leverage sustainability as a strategic resource to gain a lasting competitive advantage. The Resource Advantage Theory of Competition (RAToC) provides a valuable framework for understanding how GEO-driven startups utilise green innovations to achieve long-term market differentiation and sustainability performance. This section explores RAToC's relevance in explaining the competitive dynamics of sustainability-driven entrepreneurship, particularly in emerging markets like Indonesia and Malaysia.

The RAToC offers a robust foundation for understanding how startups achieve competitive advantage by optimising valuable, rare, inimitable, and non-substitutable (VRIN) resources. This theory is particularly relevant to startups operating in resource-constrained environments, such as Indonesia and Malaysia, where innovation and strategic resource allocation are crucial for market success. RAToC posits that firms with superior resource configurations can differentiate themselves in the marketplace, allowing them to sustain long-term competitive positions (Situmorang et al., 2024). As sustainability gains prominence in global markets, RAToC provides an essential lens for examining the role of green entrepreneurial practices in achieving competitive advantage.

GEO aligns seamlessly with RAToC by serving as an intangible strategic resource that enables startups to navigate environmental and market challenges. With proactiveness, innovativeness, and risk-taking, GEO allows startups to identify and capitalise on sustainability-driven market opportunities. For instance, Malaysian startups focusing on renewable energy solutions leverage GEO to position themselves as leaders in eco-conscious markets. In contrast, Indonesian startups innovating in sustainable agriculture utilise GEO to address local environmental challenges and build competitive differentiation. The alignment of GEO with RAToC illustrates how entrepreneurial orientation serves as a VRIN resource, empowering startups to overcome market barriers, comply with environmental regulations, and align with global sustainability objectives.

The growing emphasis on sustainability as a business imperative aligns with global sustainability frameworks such as the United Nations SDGs. The United Nations promotes sustainability as a balance between economic growth, environmental protection, and social well-being, encouraging businesses to adopt responsible consumption, eco-friendly business models, and climate-conscious innovations (Jumbri & Managi, 2020). Startups, particularly in emerging markets, are increasingly pivotal in driving sustainable societal transformations, shaping consumer behaviour and industry norms toward greener alternatives.

2.8.1 Expanding RAToC with GIC and SGMO as Intangible Resources

This study extends RAToC by incorporating GIC and SGMO as essential intangible resources that enhance sustainability-driven competitive advantage. Traditionally, RAToC has been applied primarily to tangible assets. However, this study expands its scope by demonstrating how startups in Indonesia and Malaysia can leverage sustainability-oriented intangible resources to gain a strategic edge. GIC empowers startups to convert sustainability challenges into market opportunities. For example, Indonesian startups developing renewable energy solutions address urgent local environmental concerns while positioning themselves in global sustainability markets. This capability exemplifies RAToC's emphasis on VRIN resources, as these startups create innovative green solutions that competitors cannot easily replicate. Likewise, SGMO strengthens the impact of green innovations by enabling startups to effectively communicate their environmental and economic value to stakeholders and consumers. In Malaysia's green technology sector, startups integrating SGMO into their branding and marketing strategies successfully align their innovations with consumer demand, improving market positioning, stakeholder engagement, and business performance.

2.8.2 Regional Application of RaTOC in Indonesia and Malaysia

Applying RAToC to Indonesia and Malaysia provides deeper insights into how regional dynamics shape adopting and utilising sustainability-focused resources. In Indonesia, startups navigate significant resource constraints but leverage GEO as a mechanism for innovation and differentiation. For instance, eco-tourism startups in Indonesia integrate green entrepreneurial practices to align with global sustainability trends, addressing environmental and social challenges while establishing competitive market positioning. These initiatives underscore the role of GIC in unlocking new opportunities, allowing startups to overcome resource limitations and expand market reach.

Similarly, Malaysian startups benefit from strong institutional support, mainly through government initiatives such as the Green Technology Financing Scheme. These startups effectively integrate GIC with SGMO, ensuring their sustainability-driven solutions meet regulatory requirements and market expectations. By aligning technological advancements with structured marketing strategies, startups in Malaysia enhance their competitive standing in sustainability-focused industries.

By integrating GIC and SGMO into RAToC, this study underscores the transformative potential of intangible resources in fostering both sustainability and competitive advantage. Applying RAToC within Indonesia and

Malaysia highlights the importance of tailoring business strategies to regional dynamics, offering practical insights for startups, policymakers, and investors seeking to drive sustainable business growth in emerging economies.

This study contributes to the RAToC theory by positioning it as a dynamic model for sustainability-oriented competitive strategies, demonstrating its applicability to resource-constrained startups in developing markets. The practical implications include actionable recommendations for entrepreneurs, investors, and policymakers, such as:

I. Encouraging startups to integrate GEO, GIC, and SGMO to drive competitive differentiation and sustainability performance.
II. Leveraging government programs like Malaysia's Green Technology Financing Scheme to provide financial and technical support for sustainability-focused business models.
III. Strengthening institutional frameworks that support green entrepreneurship in Indonesia and Malaysia, ensuring better access to sustainability-driven resources and market incentives.

By situating RAToC within Indonesia and Malaysia's socio-economic and regulatory landscapes, this study underscores its value as a strategic framework for green entrepreneurship in emerging Asian economies. It provides a roadmap for startups to leverage entrepreneurial orientation and green innovation capability, achieve competitive differentiation, and drive long-term sustainability success. By embracing sustainability as a strategic asset, startups can contribute to regional and global sustainability goals while securing a resilient and profitable market position.

3. CONCEPTUAL FRAMEWORK AND THEORETICAL APPROACH

This study proposes a conceptual framework to examine the dynamic relationships among Antecedents, GEO, GIC, SGMO, PA, and SBP. The underpinning theoretical foundation is based on the RAToC, which posits that VRIN resources are strategic drivers of competitive advantage. Given Asia's dynamic and rapidly evolving business landscape, this study applies RAToC to explore how startups in Indonesia and Malaysia, which often operate in resource-constrained environments, leverage sustainability as a strategic advantage to enhance competitiveness and achieve long-term sustainable growth.

3.1 Theoretical Foundations

Entrepreneurship and sustainability have become deeply intertwined in Asia, where rising environmental awareness, expanding middle-class consumer markets, and evolving regulatory landscapes present both opportunities and challenges for startups. While countries like China and India have led global green innovation, Indonesia and Malaysia are progressively making strides through policy reforms, institutional support, and sustainability-driven market interventions. Despite these advancements, many startups in these emerging markets continue to face challenges related to resource limitations and fragmented regulatory environments, which add layers of complexity to integrating sustainability into their business models. These complexities necessitate a theoretical approach that identifies the key drivers of GEO adoption and explains how GEO influences sustainable business outcomes.

The RaTOC offers a robust theoretical lens for understanding how startups achieve long-term competitive advantage by leveraging VRIN resources. RAToC suggests that firms with superior resource configurations can differentiate and sustain their market positioning. Within this framework, GEO emerges as a strategic resource that allows startups to proactively respond to sustainability challenges while capitalising on new market opportunities. GEO, which is characterised by proactiveness, innovativeness, and risk-taking, closely aligns with the fundamental principles of RAToC. This alignment is particularly relevant in the Asian business ecosystem, where startups must navigate regulatory pressures, shifting consumer preferences, and institutional constraints. By adopting GEO as VRIN resources, startups can drive green innovation, foster competitive differentiation, and achieve sustainable business success.

3.2 Antecedents of GEO

The adoption of GEO does not occur in isolation but is shaped by several antecedents that provide the foundational pressures and incentives necessary for entrepreneurial strategies focused on sustainability. In Indonesia and Malaysia, three primary antecedents influence the adoption of GEO: regulatory pressure, market demand, and institutional support.

Regulatory frameworks are critical in shaping GEO by enforcing environmental compliance, resource management, and sustainability standards. Governments establish policies to ensure startups integrate sustainability into their operations, creating constraints and opportunities. In Malaysia, the Green Technology Financing Scheme incentivises startups to adopt green technologies by offering financial support and technical assistance, while in Indonesia, the Environmental Protection Law No. 32/2009 mandates strict waste management and emission reduction policies, compelling startups to comply with sustainability objectives. While these regulatory frameworks create compliance requirements that may pose challenges

for startups, they also serve as catalysts for innovation by encouraging firms to align their business models with sustainability goals.

Market demand is another crucial factor driving GEO adoption, as shifting consumer preferences toward sustainability creates strong incentives for businesses to integrate green practices. The expanding middle class in Asia is increasingly making purchasing decisions based on environmental considerations, leading to a higher demand for eco-conscious products and services. In Indonesia, startups operating in sustainable tourism and agritech have responded to the growing consumer demand for environmentally friendly solutions. In contrast, in Malaysia, firms specialising in renewable energy have demonstrated the viability of green innovations in an emerging market context. By aligning their business strategies with market demand, startups can enhance their competitive positioning and strengthen their long-term commitment to sustainability.

Institutional support further reinforces the adoption of GEO by providing financial, technical, and advisory assistance, which is particularly important for startups operating in resource-constrained environments. In Malaysia, GreenTech Malaysia plays a key role in financing and mentoring startups, ensuring that they have the necessary resources to develop and implement green innovations. Similarly, in Indonesia, collaborations between startups and NGOs, private-sector institutions, and international agencies facilitate access to funding, training, and technical expertise, enabling firms to address local environmental challenges more effectively. Institutional support reduces financial barriers, fosters innovation networks, and creates an ecosystem that facilitates green entrepreneurship, particularly in settings where resource limitations might otherwise hinder GEO adoption. The operationalisation of the key variables within this framework is outlined in **Table 3**, which presents the definitions and measurable indicators for each construct used in this study. **Table 3** ensures a structured approach to understand how each variable contributes to the theoretical model. By defining these variables and their corresponding indicators, this study provides a clear operational framework for analysing the role of GEO in shaping sustainable business outcomes.

3.3 Conceptual Model and Hypotheses

This study's conceptual framework integrates antecedents, GEO, GIC, PA, and SGMO to explain how startups achieve SBP. The model is grounded in RAToC, emphasising that VRIN resources give firms a competitive advantage. GEO is a strategic resource within this context, enabling startups to innovate and differentiate themselves in sustainability-driven markets.

Table 3: *Key Variables and Indicators*

Variable	Definition	Example Indicator
Regulatory Pressure	External policies, laws, and governmental regulations influence startups' adoption of green entrepreneurial practices.	Existence of green regulations, compliance with environmental laws, availability of green financial incentives.
Market Demand	The level of consumer interest and preference for sustainable and eco-friendly products and services.	Growth in green product sales, percentage of consumers willing to pay for sustainability, demand for renewable energy solutions.
Institutional Support	Financial, technical, and advisory support from governments, NGOs, and international organizations that facilitate green entrepreneurship.	Number of government grants received, presence of startup incubators for sustainability, participation in green entrepreneurship programs.
Green Entrepreneurship Orientation (GEO)	The firm's strategic posture toward sustainability, characterized by proactiveness, innovativeness, and risk-taking in green initiatives.	Percentage of budget allocated to green R&D, number of green patents filed, level of environmental risk-taking.
Green Innovation Capability (GIC)	The startup's ability to develop and implement innovative green solutions that enhance sustainability.	Implementation of renewable energy, adoption of biodegradable materials, investment in circular economy solutions.
Positional Advantage (PA)	The extent to which startups differentiate themselves in the market by leveraging green innovation.	Market share in green industries, sustainability-driven brand differentiation, competitive pricing of eco-friendly products.
Strategic Green Marketing Orientation (SGMO)	The integration of sustainability principles into marketing strategies to enhance consumer engagement and brand positioning.	Frequency of eco-friendly branding campaigns, level of consumer awareness of green initiatives, impact of sustainability marketing on brand loyalty.
Sustainable Business Performance (SBP)	The firm's ability to achieve long-term financial, environmental, and social sustainability.	Revenue growth from sustainable products, reduction in carbon emissions, job creation in sustainability sectors.

The framework proposes that GIC functions as a mediating factor, translating GEO into tangible sustainability outcomes, while PA acts as a pathway through which startups secure competitive differentiation. Moreover, SGMO plays a moderating role in amplifying the impact of GIC on SBP by enhancing the visibility and perceived value of startups' green initiatives. The relationships among these variables reflect the interconnected mechanisms through which entrepreneurial orientation, innovation capability, competitive positioning, and marketing strategies collectively contribute to sustainability-driven success.

Table 4 presents the hypotheses' development with the supporting literature. **Figure 1** presents the theoretical framework, highlighting the dynamic interrelationships among key constructs. It underscores how Regulatory Pressure, Market Demand, and Institutional Support serve as crucial antecedents that drive GEO as the central construct. By fostering GEO, startups enhance their capacity for green innovation through GIC, which in turn positively impacts SBP both directly and via PA. Additionally, SGMO functions as a moderating factor, amplifying the effectiveness of green innovations to optimize market traction and consumer adoption, ultimately reinforcing sustainable business performance.

By incorporating these hypotheses into the conceptual framework, this study seeks to contribute to the existing literature on sustainability-driven entrepreneurship in emerging markets. The framework explains how startups navigate resource constraints and regulatory complexities and offers practical insights for policymakers, entrepreneurs, and investors in sustainability-oriented ecosystems.

Table 4: *Hypotheses Development*

Hypotheses	Description	Supporting Literature
H1	Regulatory pressure positively influences GEO.	Choiruzzad et al., (2021); Chu et al. (2022); Yahman & Setyagama (2023); Idris et al. (2024); Sudaryana et al. (2025); Keumala et al., (2025)
H2	Market demand positively influences GEO.	Ali et al. (2020); Ameer & Khan (2023); Widjajanti et al., (2024); Mondal et al. (2024)
H3	Institutional support positively influences GEO.	Vaka et al. (2020); Halmi & Abdul Rahman (2021); Koerner et al. (2022); Raihan et al. (2023); Ridzuan et al. (2023); Widjajanti & Sugiyanto (2023); Hara (2023); Hakim et al. (2024)
H4	GEO positively affects the capability of GIC.	Nordin & Hassan (2019); Yang et al. (2021); Yu et al. (2022) Frare & Beuren (2022); Neumann (2023); Raihan et al. (2023); Rohendi et al. (2023); Ameer & Khan (2023); Zhang et al. (2024a); Hossain et al. (2024); Mortada & Chijioke (2025)
H5	GIC positively influences PA.	Tjahjadi et al. (2020); Huang et al. (2020); Bhatia (2021); Firman et al. (2023); Kiranantawat & Ahmad (2023); Raihan et al. (2023); Riyantini et al. (2023); Hossain et al. (2024)
H6	GIC positively influences SBP.	Huang et al. (2020); Desembrianita et al. (2024); Abubacker & Raheem (2024); Annamalah el. (2024); Prihadyanti et al. (2024)
H7	PA positively influence SBP.	Firman et al. (2023); Hyun & Kim (2024); Mudrika et al. (2024); Saddam et al. (2024); Yan et al. (2024); Aziz & Niazi (2025)
H8	SGMO moderates the relationship between GIC and SBP.	Koerner et al. (2022); Rahmawati et al. (2021); Casidy et al. (2024); Ghosn et al. (2024); Lee & Hung (2024); Cheah et al. (2024); Agustina et al. (2024)

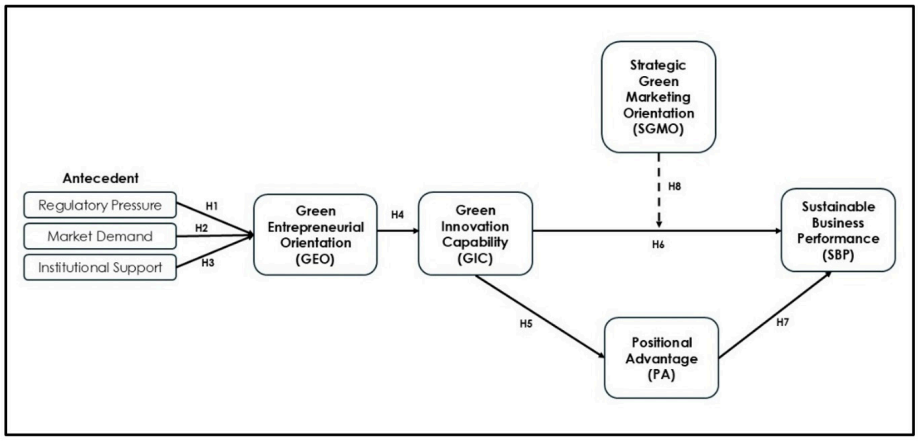

Figure 1: *Theoretical Framework*

Integrating GEO, GIC, PA, and SGMO within RAToC extends the traditional understanding of competitive advantage in sustainability-driven businesses. Startups that leverage green innovations and effectively position themselves in the market are better equipped to capitalise on sustainability opportunities, ensuring long-term profitability, environmental responsibility, and social impact. This study, therefore, provides a strategic roadmap for entrepreneurs and industry stakeholders, emphasising the transformative potential of sustainability-driven business models in Indonesia and Malaysia.

3.4 Theoretical Contribution and Implications

This study advances the literature on sustainability-driven entrepreneurship in emerging markets by offering a comprehensive theoretical framework integrating GEO, GIC, PA, and SGMO within the RAToC. By incorporating these constructs into a unified model, this study provides a novel perspective on how startups in resource-constrained environments leverage sustainability as a strategic asset to achieve competitive differentiation and long-term success.

A key theoretical contribution of this study lies in extending RAToC beyond its conventional focus on tangible resources to highlight the role of intangible, sustainability-driven capabilities in fostering competitive advantage. While RAToC traditionally emphasises VRIN resources as sources of market advantage, this study broadens its application by demonstrating that GEO and GIC function as strategic intangible resources that enable startups to innovate, differentiate, and respond proactively to sustainability challenges. This extension is particularly significant in emerging economies like Indonesia and Malaysia, where startups must navigate regulatory fragmentation, market volatility, and institutional constraints while striving for environmental and financial sustainability.

Additionally, this study contributes to the entrepreneurship and sustainability literature by establishing PA as a key mediating mechanism through which GEO influences SBP. While previous studies have primarily examined the direct relationship between GEO and firm performance, this research demonstrates that startups must strategically position themselves in the market to fully capitalise on the benefits of green innovations. By identifying PA as an essential pathway, this study refines the theoretical understanding of how startups translate green innovations into measurable business outcomes.

Furthermore, this study enhances the theoretical discourse on SGMO as a moderating factor in the relationship between GIC and SBP. Prior research has largely overlooked the role of green marketing strategies in strengthening the commercial viability of green innovations. This study fills this gap by demonstrating that SGMO amplifies the impact of GIC, ensuring that sustainability initiatives gain visibility, consumer trust, and stakeholder engagement. By incorporating SGMO within the RAToC framework, this study provides a more holistic understanding of the competitive dynamics in sustainability-driven markets.

Beyond its theoretical contributions, this study offers valuable practical insights for entrepreneurs, policymakers, and investors within sustainability-oriented ecosystems. The findings highlight the importance of developing an intense GEO, as it catalyses green innovation and competitive differentiation. Startups should focus on building GIC to drive sustainable product and process innovations while simultaneously leveraging PA to strengthen market positioning. Furthermore, adopting SGMO can enhance consumer engagement and brand perception, leading to tremendous business success in sustainability-driven industries. Entrepreneurs in Indonesia and Malaysia can benefit from this framework by integrating green marketing strategies with their innovation efforts to optimise their impact on economic and environmental performance.

The study underscores policymakers' need to strengthen regulatory frameworks and institutional support mechanisms that facilitate sustainability-driven entrepreneurship. Governments in emerging economies should focus on providing financial incentives, technical assistance, and market access opportunities to help startups overcome resource constraints. Policies such as Malaysia's Green Technology Financing Scheme and Indonesia's Environmental Protection Law are critical in encouraging green entrepreneurship. However, further refinements are needed to reduce bureaucratic complexities and enhance startup accessibility. The study suggests that collaborations between government agencies, NGOs, and private sector stakeholders can further bolster institutional support networks for sustainability-driven ventures.

For investors and venture capitalists, this study provides a strategic roadmap for identifying high-potential sustainability startups. The findings suggest that startups with a strong GEO, robust GIC, and effective market positioning through PA are more likely to achieve long-term profitability while maintaining environmental and social responsibility. Investors should prioritise ventures that integrate green innovation with strategic branding efforts, as these startups demonstrate higher resilience and scalability in sustainability-driven markets. Additionally, financial institutions can align their investment strategies with sustainability objectives by supporting startups that incorporate SGMO into their business models, as this enhances their ability to attract eco-conscious consumers and long-term business partnerships.

By integrating sustainability-driven resources into the RAToC framework, this study provides a strategic roadmap for entrepreneurs, industry stakeholders, and policymakers seeking to navigate the complexities of sustainability-driven business models in emerging markets. The insights derived from Indonesia's and Malaysia's startup ecosystems can be replicated in other emerging economies, thereby contributing to broader global efforts toward sustainable entrepreneurship and economic development.

By framing sustainability as a strategic resource, this study demonstrates that startups can achieve regulatory compliance and gain long-term competitive advantages by integrating GEO, GIC, PA, and SGMO into their business models. This research offers a foundation for future studies to explore further the evolving role of sustainability in shaping market competitiveness, investment strategies, and policy interventions in emerging economies. Ultimately, by leveraging sustainability as a core business strategy, startups in Indonesia and Malaysia can position themselves as leaders in the transition toward a greener, more resilient global economy.

4. FUTURE RESEARCH DIRECTIONS

This study provides a foundational framework for understanding the role of GEO in driving SBP, particularly in the context of startups in emerging Asian markets such as Indonesia and Malaysia. Although the findings provide valuable insights into the interrelationship between GEO, antecedents, GIC, PA, and SGMO, several future research avenues may extend and enrich such understanding. Addressing these gaps will contribute to theoretical, methodological, and practical developments in green entrepreneurship and sustainability.

4.1 Contextual Variability Across Emerging Asian Markets

Although the current study has focused on Indonesia and Malaysia, additional research is required to establish how the proposed framework can be generalised across other emerging Asian economies such as Vietnam, the Philippines, and Thailand. Although these countries share similar resource constraints, regulatory environments, and market dynamics, each also maintains unique cultural, economic, and institutional characteristics. Comparative studies investigating GEO adoption in various contexts add significantly to an in-depth understanding of how regional and country-specific factors relate to eventual sustainability outcomes.

4.2 Longitudinal Studies of GEO Adoption

Longitudinal studies could reveal how GEO impacts startup performance over time and the evolved impact on their SBP. An analytical approach at the level of dynamics concerning drivers of GEO diffusion and its long-term consequences would yield richer insights regarding the lifecycle of green entrepreneurial ventures, especially in navigating regulatory shifts, changing market landscapes, and technological evolution.

4.3 Quantitative Framework Validation

While this study develops a conceptual framework, future research should empirically test the proposed relationships using quantitative methods. Strong statistical techniques like SEM may validate the hypothesised linkages among GEO, GIC, PA, and SBP antecedents. Datasets collected from startups across Asia would allow the researchers to identify the key drivers and mediators with statistical significance.

4.4 Additional Antecedents Exploratory Study

This study considers regulatory pressure, market demand, and institutional support stimulating GEO antecedents. The authors also suggest that further research should focus on other antecedents, such as technological development, cultural context, and entrepreneurial ecosystems, which may explain the adoption of GEO. Such a study could investigate how digital transformation can foster green entrepreneurship by showing how startups draw on technologies as levers to magnify their efforts in sustainability.

4.5 Strategic Green Marketing Orientation (SGMO)

SGMO is positioned as a moderator in the relationship between GIC and SBP. Future research would be interesting to find out how the sub-elements of SGMO, namely, customer education, green branding, and eco-friendly advertising, impact this relationship. How SGMO works in different industries, such as agritech, renewable energy, and eco-tourism, would add nuanced insights into its strategic role.

4.6 Impact of External Shocks on GEO and Sustainability

Such a shock can include an economic crisis, pandemics, or climatic disasters that could affect GEO adaption and its consequences. How startups maintain commitments to sustainability through potential disruptions is unexplored and thus requires attention. This would enrich the framework of the ability to practice in real-life situations.

4.7 Policy and Institutional Interventions

Further research might investigate the role of policy and institutional interventions that enhance GEO adoption. For example, the effects of government subsidies, tax incentives, and public-private partnership arrangements on green entrepreneurship could be tested to yield helpful information for policy. Again, the role played by academic and research institutions through knowledge sharing and capacity building among startups would add weight to institutional support mechanisms.

4.8 Multi-Stakeholder Perspectives

The unit of analysis for the proposed framework will also be the startups. Further research, including other stakeholder perspectives, such as those of consumers, investors, policymakers, and suppliers, would provide a more complete view of the factors affecting GEO and SBP. A multi-stakeholder approach will also lead to the uncovering of possible synergies and conflicts in pursuing sustainability objectives.

4.9 Cross-Disciplinary Approaches

The latter might be the application of cross-disciplinary approaches where economics, sociology, psychology, and environmental science could help build the theoretical and empirical underpinning and increase GEO studies' practical relevance. Examples include analyses of psychological drivers that force entrepreneurs to go green or socio-economic impacts of green entrepreneurship at the local community level; such may comprise new key directions for research in this area.

The above future research directions indicate that GEO can continue to increase its theoretical and empirical scope, furthering its role in driving sustainability in emerging Asian markets. By addressing these areas, scholars can go beyond advancing academic discourse to providing practical recommendations for startups, policymakers, and stakeholders in pursuit of sustainable development within dynamic and resource-constrained environments.

5. CONCLUSION

This study presents a comprehensive conceptual framework to examine the interplay between GEO, its antecedents, and sustainability outcomes within the dynamic entrepreneurial ecosystems of emerging Asian markets. This research bridges the gap between traditional resource-based views and sustainability-focused strategies by introducing a dynamic framework that integrates GEO, GIC, and SGMO. This integration provides a nuanced understanding of how startups can leverage green entrepreneurial orientation and innovation capabilities to achieve SBP.

Key antecedents such as regulatory pressure, market demand, and institutional support are pivotal in shaping the adoption of GEO. These factors enable startups to innovate, adapt, and excel in sustainability-oriented markets by responding to external demands and capitalising on emerging opportunities. The study also underscores the critical role of GIC as a mediator, connecting GEO with enhanced PA and improved sustainability outcomes. Startups that excel in eco-friendly innovations can effectively differentiate themselves, foster customer loyalty, and gain the trust of key stakeholders.

Additionally, including SGMO as a moderating variable amplifies the impact of GIC on SBP. By aligning marketing strategies with sustainability principles, SGMO helps startups effectively communicate the value of their innovations, driving market adoption and strengthening stakeholder engagement. This integrated approach underscores the importance of combining innovation, market positioning, and targeted communication to achieve environmental and economic objectives.

Theoretically, this study extends RAToC into sustainability and green entrepreneurship, bridging traditional competition theories with the evolving landscape of sustainable business practices. By situating the analysis within the broader context of emerging Asian markets, particularly Indonesia and Malaysia, it demonstrates the transformative potential of green entrepreneurship in addressing global sustainability challenges.

This study also bridges the gap between traditional resource-based views and sustainability-focused strategies by introducing a dynamic framework that integrates GEO, GIC, and SGMO into the entrepreneurial ecosystems of emerging Asian markets. By incorporating antecedents such as regulatory pressure, market demand, and institutional support, the framework embeds the RAToC within these regions' specific socio-economic and regulatory contexts. By achieving competitive differentiation through SGMO, startups improve sustainability outcomes and establish themselves as pioneers in Asia's green market transformation.

The research provides actionable insights for fostering green entrepreneurship, advancing innovation, and enhancing market positioning. It demonstrates how startups can leverage sustainability-oriented strategies to overcome resource constraints and achieve competitive differentiation. Policymakers are encouraged to create supportive environments, such as financial incentives and streamlined regulations, to facilitate GEO adoption. Similarly, investors can identify high-potential startups that effectively align GEO with GIC and SGMO to deliver environmental and economic value. Future research should validate this framework through longitudinal studies and comparative analyses across other emerging markets, such as Vietnam and the Philippines, to assess its broader applicability and long-term impact on sustainability outcomes.

Practically, the study offers valuable recommendations for startups, policymakers, and investors. Startups are encouraged to embrace GEO as a strategic tool to navigate market complexities, drive green innovation, and ensure long-term sustainability. Policymakers should establish streamlined grant systems to mitigate startup resource constraints. For example, Malaysia's Green Technology Financing Scheme could expand to include

decentralised micro-financing for rural green startups. For investors, the study identifies startups adhering to sustainability principles as promising opportunities, offering avenues for supporting ventures that deliver economic and environmental value.

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