

Linking Innovation and Sustainability for Regional Economic Development in Sri Lanka: A Systematic Review from a Geographical Perspective

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Abstract

Innovation and sustainability have emerged as pivotal forces driving regional economic progress, particularly within the evolving landscapes of emerging economies. As countries strive to nurture growth that is both inclusive and resilient, a nuanced understanding of the interplay between these two dynamics has never been more vital. This systematic review delves into the nexus of innovation and sustainability, exploring their combined impact on entrepreneurial ecosystems and regional development in Sri Lanka from a geographical lens. By analyzing peer-reviewed journal articles and institutional reports (2010–2025) and following PRISMA, this review screened 520 records and included 40 studies for synthesis, extracting key theoretical frameworks, essential concepts, significant empirical findings, and other relevant data. The analysis reveals that innovation serves as a key engine for enhancing regional competitiveness, fostering technological advancement, and generating new knowledge, whereas sustainability underpins efforts toward environmental protection, social justice, and enduring economic health. Despite Sri Lanka's strategic focus on innovation and sustainability at the national level, the reality on the ground is marred by regional inequalities, infrastructural deficiencies, and fragmented policies. Spatial dynamics such as the urban-rural divide, the benefits of agglomeration, and localized flows of knowledge are found to significantly shape entrepreneurial behavior and developmental trajectories. Notably, the review identifies critical gaps in research specific to Sri Lanka, particularly in areas such as localized innovation ecosystems, sustainable entrepreneurial initiatives, and the incorporation of sustainability principles into regional innovation strategies. In closing, the study advocates for more geographically sensitive, innovation-driven, and sustainability-focused approaches to boost entrepreneurial ecosystems and foster equitable regional growth. These insights aim to guide policymakers, scholars, and development practitioners in harnessing innovation and sustainability as levers for transformative regional advancement in Sri Lanka.

Keywords: Innovation, Sustainability, Entrepreneurial Ecosystems, Regional Economic Development, Sri Lanka

1. Introduction

Over the past few decades, innovation and sustainability have steadily taken center stage in discussions surrounding regional economic development. Innovation, long linked with technological breakthroughs and knowledge-driven expansion has been widely recognized as a fundamental engine of

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regional competitiveness and entrepreneurial vitality (Asheim, Boschma, & Cooke, 2011). At the same time, sustainability, which embraces environmental care, social inclusivity, and economic endurance, has risen in importance as a cornerstone for ensuring that development remains equitable and enduring (WCED, 1987; Sachs, 2015). Particularly in emerging economies like Sri Lanka, where regional disparities, shifting institutions, and aspirations for growth intersect, the synergy between innovation and sustainability plays a crucial, yet complex, role. Gaining a deeper understanding of how these forces jointly shape entrepreneurial ecosystems and regional development patterns is vital for crafting effective, place-sensitive policy initiatives.

Entrepreneurial ecosystems have garnered increasing attention from both scholars and policymakers as vital frameworks for nurturing innovation-led regional progress. These ecosystems highlight the intricate web of entrepreneurs, institutions, infrastructure, cultural forces, and financial resources that together fuel the birth of new ventures and economic transformation (Stam, 2015; Spigel, 2017). Viewed through a geographical lens, entrepreneurial ecosystems are deeply spatial phenomena, shaped by factors such as local knowledge flows, cluster formation, infrastructural connectivity, and regional governance (Mason & Brown, 2014). Adding sustainability into this model introduces another layer of complexity, emphasizing the urgent need for innovation pathways that not only boost economic results but also uphold environmental and social responsibility (Roundy, 2017).

Sri Lanka offers a particularly intriguing context to examine these dynamics. Situated strategically along vital maritime routes in the Indian Ocean, Sri Lanka has undergone notable political, economic, and infrastructural shifts over the last twenty years. National-level programs, including the National Innovation and Entrepreneurship Strategy (2018–2022) and the Sustainable Development Agenda 2030, signal a policy-driven commitment in promoting both innovation and sustainability. Yet, beneath this national ambition lies a stark reality of uneven regional development: while urban hubs like Colombo flourish, rural and peripheral areas continue to lag (World Bank, 2020). Regional differences in infrastructure quality, educational access, technological penetration, and institutional support lead to significant disparities in the ability to foster innovation and sustainable entrepreneurship across the country.

Although some studies have explored national innovation systems or sector-specific developments such as in sustainable tourism or agriculture (Institute of Policy Studies of Sri Lanka, 2016; World Bank, 2020) there

remains a noticeable gap in understanding how innovation and sustainability interact on a regional level. Research examining localized entrepreneurial ecosystems, the role of regional institutions, spatial distributions of innovative activity, or the incorporation of sustainability principles into regional development strategies remains sparse. Meanwhile, global scholarship increasingly stresses the necessity of adopting place-based and context-sensitive approaches to innovation and sustainable development (McCann & Ortega-Argilés, 2015), a perspective that has yet to gain significant traction in Sri Lanka's academic and policy narratives.

Against this backdrop, the present systematic review seeks to bridge these knowledge gaps. It aims to synthesize the existing global and local literature on innovation, sustainability, entrepreneurial ecosystems, and regional development, with a sharp focus on applicability within the Sri Lankan context. By critically engaging with international frameworks and empirical findings and situating them within Sri Lanka's distinctive geographical, economic, and institutional settings, this paper aspires to deliver a comprehensive view of how innovation and sustainability can collaboratively drive regional transformation. Furthermore, it identifies pressing areas for future research and outlines policy recommendations tailored to the spatial and developmental diversity within the nation.

Through this effort, the review not only advances academic understanding of the critical linkages among innovation, sustainability, and regional growth in emerging economies but also offers practical insights to strengthen entrepreneurial ecosystems and reduce regional inequalities in Sri Lanka.

2. Literature Review

2.1 Innovation and Regional Economic Development

Innovation has consistently been regarded as a cornerstone of regional economic advancement. The concept of Regional Innovation Systems (RIS) offers a valuable lens for examining how clusters of firms, academic institutions, governmental bodies, and intermediary organizations collaborate to generate, spread, and apply new knowledge (Cooke, 2001; Asheim & Gertler, 2005). Rather than viewing innovation as merely the outcome of individual firm capabilities, the RIS framework emphasizes that innovation is deeply rooted in a region's social structures and institutional landscapes. Regions that successfully cultivate innovation often exhibit strong, interconnected networks, supportive policy frameworks, and a thriving culture of information sharing.

Extensive empirical evidence from developed economies like the United States and nations across the European Union demonstrates that dynamic regional innovation systems correlate with higher levels of economic growth, job creation, and technological progress (Storper, 1997; Feldman & Audretsch, 1999). Silicon Valley, for example, stands as a testament to how a concentrated mix of innovative companies, venture capital, and research institutions can sustain economic vitality on a long-term basis. On the flip side, less-developed and peripheral regions frequently encounter "innovation gaps," characterized by fragile institutional networks, inadequate research infrastructure, and low entrepreneurial activity, all of which stifle economic progress (Rodríguez-Pose, 2013).

Emerging economies face an even steeper climb in building regional innovation capacity. Challenges such as underdeveloped infrastructure, a shortage of skilled labor, fragmented institutions, and minimal R&D spending, often obstruct the formation of vibrant innovation systems (Crescenzi & Rodríguez-Pose, 2012). Despite these hurdles, innovation remains a vital catalyst for regional transformation, presenting pathways for technological leapfrogging, economic diversification, and sustainable development.

In the case of Sri Lanka, national initiatives like the National Science, Technology and Innovation Strategy (2018–2022) underscore the government's recognition of innovation's role in boosting competitiveness. However, innovation capabilities are unevenly distributed across the country. Most knowledge-intensive activities and technological hubs are concentrated within the Western Province, notably around Colombo (World Bank, 2020). In contrast, rural and outlying regions often grapple with a lack of essential infrastructure such as research institutes, tech parks, and highly skilled labor which limits their potential for innovation-led development. This uneven distribution perpetuates regional economic disparities and poses significant challenges to achieving more balanced national growth.

Addressing these imbalances demands a multi-pronged approach. Beyond simply boosting investment in science and technology, there is a need to foster localized innovation networks, strengthen partnerships between universities and industries, and implement region-specific policies that align with the distinct capabilities and needs of each area.

2.2 Sustainability and Regional Development

Over time, the notion of sustainability has expanded beyond its original environmental focus, evolving into a comprehensive framework that encompasses environmental, economic, and social dimensions of development (WCED, 1987; Sachs, 2015). Within the context of regional

development, sustainability is not only conserving natural resources but also promoting fair economic opportunities, fostering social inclusion, and nurturing resilient communities (Elkington, 1997; D'Amato et al., 2017). Truly sustainable regional development demands a careful balancing act: advancing economic growth while safeguarding ecological health and ensuring societal well-being for present and future generations.

Viewed from a geographical standpoint, sustainability brings a spatial dimension to development planning. Environmental vulnerabilities, the availability of natural resources, economic disparities, and governance capabilities vary widely across regions, underscoring the need for localized and context-sensitive approaches (Gibbs, 2006). The "geographies of sustainability" literature highlights that sustainable initiatives must be tailored to the unique environmental, social, and economic characteristics of each place (Evans, 2012). As a result, strategies that succeed in one region cannot simply be transplanted to another without thoughtful adaptation.

One important concept emerging in this field is "sustainability transitions," which examines how regions can shift from unsustainable socio-technical systems such as dependence on fossil fuels or unsustainable agricultural practices toward more sustainable alternatives (Markard, Raven, & Truffer, 2012). These transitions are inherently spatial processes, shaped by the strength of regional innovation ecosystems, institutional settings, cultural attitudes, and policy environments. Research suggests that regions with robust governance frameworks, strong collaboration among stakeholders, and a culture that embraces innovation are generally better equipped to navigate these sustainability shifts (Hansen & Coenen, 2015).

Nonetheless, pursuing sustainability at the regional level is fraught with obstacles. Fragmented governance structures, financial constraints, competing stakeholder interests, and the short-term focus of political agendas often slow or derail progress (Meadowcroft, 2009). In developing nations, especially where institutional capacities are often limited and social inequalities pronounced, these challenges become even more pronounced (Murphy, 2012).

In Sri Lanka, sustainability principles have been embedded into national policy frameworks through initiatives such as the Sustainable Development Act (2017) and the country's commitment to the United Nations Sustainable Development Goals (UNSDGs). Sectors like tourism, agriculture, and energy have increasingly integrated sustainability objectives, as seen in the rise of eco-tourism ventures and renewable energy projects. However, the translation of these national aspirations into regionally specific development strategies has been uneven. Many regional plans continue to prioritize economic expansion while giving insufficient attention to environmental stewardship or

social inclusiveness, leading to skewed development outcomes (Hettige, 2017).

Environmental issues including deforestation, land degradation, water scarcity, and vulnerability to climate change disproportionately affect Sri Lanka's rural and peripheral areas, further entrenching regional inequalities and threatening long-term prosperity (Ministry of Environment, 2021). Meanwhile, rapid urbanization around Colombo has triggered environmental degradation, placing even the nation's primary economic centers at risk.

To address these challenges, a truly regionalized approach which builds local capacities for environmental governance, promotes sustainable livelihoods, invests in resilient infrastructure, and empowers communities to lead sustainability initiatives is needed. Integrating sustainability principles directly into regional innovation and entrepreneurship strategies offers a promising route for cultivating environmentally sound and socially resilient regional economies.

Ultimately, sustainability and regional development are tightly interwoven processes. Achieving genuine progress requires a deep understanding of local contexts, targeted policy interventions, and the active participation of regional stakeholders. For Sri Lanka, the key challenge lies in narrowing the gap between national sustainability ambitions and on-the-ground realities of diverse regional landscapes.

2.3 Entrepreneurial Ecosystems: Linking Innovation and Sustainability

In recent years, the idea of entrepreneurial ecosystems has gained significant traction within the field of regional economic development. Entrepreneurial ecosystems are viewed as dynamic and interconnected systems composed of entrepreneurs, institutional supports, financial infrastructures, universities, and cultural norms, all working together to foster entrepreneurial activity and innovation (Isenberg, 2010; Stam, 2015). Rather than isolating the achievements of individual entrepreneurs or startups, this framework underscores the systemic interactions between diverse actors, resources, and environmental conditions that sustain a vibrant culture of entrepreneurship.

At the heart of these ecosystems lies innovation, which fuels the creation of new products, services, and business models ultimately enhancing regional adaptability and competitiveness (Spigel, 2017). Regions endowed with rich innovation assets such as research institutions, skilled human capital, technology transfer networks, and active knowledge spillovers tend to generate a higher volume of high-growth ventures and maintain sustained

economic dynamism (Audretsch & Belitski, 2017). Strong innovation capabilities within ecosystems also promote economic diversification, reducing overreliance on traditional industries and strengthening resilience to external economic shocks.

More recently, scholars have increasingly argued for the need to weave sustainability into the fabric of entrepreneurial ecosystems (Cohen, 2006; Roundy, 2017). Sustainable entrepreneurship, which focuses on creating ventures that deliver environmental and social value alongside economic returns, represents an important evolution of the ecosystem concept. Sustainable entrepreneurial ecosystems are not solely measured by the volume of innovation or business growth, but by their ability to align entrepreneurial endeavors with broader sustainable development objectives (Shepherd & Patzelt, 2011).

Bringing sustainability into entrepreneurial ecosystems adds several critical dimensions. Firstly, it expands the notion of entrepreneurial success beyond conventional metrics like profitability or growth, to include social impact, environmental responsibility, and community well-being (Baldassarre et al., 2017). Secondly, it underscores the need for supportive institutional frameworks that champion responsible innovation. These may include green financing initiatives, incubators dedicated to sustainability-focused ventures, and regulatory mechanisms that incentivize eco-friendly business practices (Volkman et al., 2021).

Geography plays a decisive role in determining how innovation and sustainability are linked within entrepreneurial ecosystems. Environmental challenges, cultural values around sustainability, resource endowments, and institutional capacities vary widely across regions, making sustainable entrepreneurial ecosystems highly context-specific (Roundy & Bayer, 2019). For instance, regions grappling with ecological degradation may naturally gravitate toward fostering eco-innovation and green entrepreneurship, while areas facing social marginalization might prioritize inclusive innovation and social enterprise models.

In Sri Lanka, the entrepreneurial ecosystem remains in an early stage of development. According to the Global Entrepreneurship Monitor (GEM), entrepreneurial intentions are relatively strong; however, systemic weaknesses such as limited access to funding, fragmented support services, underdeveloped innovation infrastructure, and regulatory hurdles continue to pose significant challenges (Global Entrepreneurship Monitor, 2022). While initiatives like Hatch Works Colombo, the National Export Strategy (2018–2022), and the Sri Lanka Innovation and Entrepreneurship Strategy (2018–2022) have laid important groundwork for nurturing startups and innovation,

sustainability considerations within these frameworks are still limited.

There are encouraging signs of sustainable entrepreneurship emerging, particularly in fields like organic farming, eco-tourism, and renewable energy, often spearheaded by grassroots movements and NGOs (UNESCAP, 2022). However, these efforts tend to be fragmented and heavily concentrated in urban centers, with rural and peripheral regions remaining largely underserved.

Developing sustainable entrepreneurial ecosystems in Sri Lanka demands a concerted effort to build innovation capacity while embedding sustainability principles into the core structures and functions of these ecosystems. Critical actions include bolstering regional R&D infrastructure, encouraging green technology startups, providing targeted support for social enterprises, and enacting policy reforms that promote sustainable business practices across sectors. Importantly, such efforts must be sensitive to the regional disparities in infrastructure, resource availability, and socio-economic conditions.

By intentionally linking innovation and sustainability within entrepreneurial ecosystems, Sri Lanka can harness a powerful strategy for advancing balanced, inclusive, and resilient regional economic growth. In doing so, the country can make meaningful strides toward realizing its national development ambitions while also contributing to the global achievement of the United Nations Sustainable Development Goals.

2.4 Geographical Perspectives on Regional Development

Geography plays a pivotal role in shaping the patterns of innovation, entrepreneurship, and broader regional economic development. Regional disparities in performance are not merely byproducts of differences in infrastructure or resource availability; rather, they are deeply rooted in spatial, institutional, and socio-cultural contexts (Storper, 1997; Rodríguez-Pose, 2013). Taking a geographical perspective highlights that economic activities are unevenly distributed across space, and that local environments profoundly influence how innovation and entrepreneurship emerge, spread, and endure.

A key idea that connects geography and economic development is that of agglomeration economies. Early thinkers like Marshall (1890) and later scholars such as Krugman (1991) emphasized that firms and entrepreneurs often cluster in specific locations to capitalize on proximity to skilled labor markets, knowledge spillovers, specialized suppliers, and dense consumer bases. These clusters whether formal, like industrial or technology parks, or informal, like vibrant startup scenes create dynamic environments that

stimulate innovation and entrepreneurial growth (Porter, 1998). High-profile examples include Silicon Valley in the U.S., Bangalore's tech sector in India, and Shenzhen's innovation-driven transformation in China.

However, not all regions are equally positioned to benefit from clustering effects. Peripheral and rural areas frequently grapple with isolation from knowledge networks, weaker institutional backing, and infrastructure deficit challenges that fuel what some researchers have described as "the geography of discontent" (McCann, 2020). In such environments, regional policy interventions become essential for overcoming entrenched structural barriers and promoting inclusive growth.

Theories surrounding Regional Innovation Systems (RIS) further emphasize how localized networks and institutions underpin innovation-driven regional development (Cooke, 2001; Asheim & Gertler, 2005). A strong RIS is marked not just by innovative firms, but by the presence of universities, research centers, government bodies, financial entities, and intermediary organizations that collectively enable knowledge sharing, capability building, and the commercialization of new ideas. Critically, the health of an RIS hinges on the quality of regional governance, the strength of social capital, and the degree to which innovation activities are embedded in local realities.

Geographical approaches also shed light on the spatial dimensions of sustainability transitions. Environmental challenges such as climate change, biodiversity loss, and socio-economic inequality manifest differently across regions, necessitating place-specific strategies for sustainable innovation and development (Hansen & Coenen, 2015). Successful sustainability transitions depend on leveraging local assets, fostering community engagement, and crafting policy frameworks that are sensitive to the distinct environmental, economic, and social characteristics of each region.

In emerging economies like Sri Lanka, these geographical disparities are particularly stark. Urban centers such as Colombo, Gampaha, and Kandy have far greater levels of industrialization, infrastructure quality, and innovation capacity, while many rural and peripheral regions continue to lag behind (World Bank, 2020). Persistent gaps in infrastructure, education, and institutional support further widen the divide, limiting the potential for broad-based entrepreneurial activity.

Despite efforts like the Gamperaliya Program and various export promotion initiatives, the benefits of economic growth have not been evenly shared. Colombo and the Western Province still dominate, contributing close to 40% of Sri Lanka's GDP, whereas provinces like Uva, Northern, and Eastern remain economically marginalized (Department of Census and

Statistics, Sri Lanka, 2022).

Addressing these disparities demands a departure from one-size-fits-all policies. Instead, Sri Lanka needs place-based innovation strategies that recognize and build upon the unique assets and capabilities of each region. Approaches such as smart specialization which encourage regions to identify and invest in areas of competitive advantage offer a compelling framework (Foray, 2015). For example, promoting agricultural innovation in Uva, developing eco-tourism in the Central Highlands, and supporting renewable energy initiatives in the North and East could provide tailored pathways towards sustainable regional growth.

In addition, bridging regional gaps requires substantial investment in physical and digital infrastructure, education, and governance reforms that empower local communities to take charge of their development agendas. Establishing regional innovation hubs, supporting green technology incubators, and nurturing community-led entrepreneurship initiatives could serve as powerful catalysts for inclusive, geographically balanced development.

In short, geographical perspectives deepen our understanding of regional development by underscoring the uneven spatial distribution of innovation and entrepreneurship, while also highlighting the need for localized, sustainable, and context-aware policy solutions. In Sri Lanka's case, adopting a strong geographical lens is essential for crafting development strategies that bridge regional divides and promote innovation- and sustainability-driven economic transformation across the entire island.

2.5 Sri Lankan Context: Innovation, Sustainability, and Regional Disparities

Sri Lanka, strategically perched in the Indian Ocean, has experienced notable socio-economic transformations over the past few decades. Despite marked achievements in areas like literacy, human development, and export diversification, the nation continues to face persistent regional disparities and uneven economic growth patterns (World Bank, 2020). While innovation and sustainability have become increasingly prominent in national policy discussions, their consistent integration at the regional level remains limited and fragmented.

At the macro level, Sri Lanka has shown growing awareness of innovation's pivotal role in enhancing competitiveness and building economic resilience. The National Innovation and Entrepreneurship Strategy (2018–2022) set forth priorities such as strengthening R&D capabilities, forging

stronger university–industry linkages, and promoting entrepreneurship across sectors (National Innovation Agency, 2018). Institutions like the Sri Lanka Institute of Nanotechnology (SLINTEC) and the Information and Communication Technology Agency (ICTA) have contributed in fostering technological advancement and startup culture. However, innovation activities remain heavily concentrated around Colombo and its adjacent regions, exacerbating a widening innovation divide between urban and rural areas (Sakalasooriya, 2021).

A major hurdle to fostering balanced regional innovation lies in the stark unevenness of infrastructure, human capital, and institutional support. While the Western Province boasts relatively advanced transportation networks, higher education facilities, and venture capital access, provinces such as Uva, Northern, and Eastern struggle with inadequate infrastructure, outmigration of talent, limited financial services, and fragmented innovation ecosystems (Department of Census and Statistics, 2022). Although regional universities and vocational training institutes are growing, many still lack the resources, research capabilities, and industry linkages needed to nurture strong local innovation ecosystems.

On the sustainability front, Sri Lanka has made significant strides through international commitments such as the Sustainable Development Act (2017) and adoption of the UN Sustainable Development Goals (SDGs). Initiatives promoting renewable energy, organic farming, and eco-tourism have gained traction (UNESCAP, 2022). However, much of this momentum remains sectorally isolated and insufficiently embedded within broader regional development strategies.

Environmental challenges are distributed unevenly across the island. Rural and peripheral regions bear the brunt of climate vulnerability, land degradation, and resource depletion, while rapid urbanization around Colombo presents its own sustainability threats, including congestion, waste management issues, and the erosion of green spaces (Ministry of Environment, 2021). These regionally distinct pressures reinforce the need for spatially tailored sustainability strategies that align with local capacities and environmental conditions.

Similarly, entrepreneurial ecosystems in Sri Lanka reveal stark regional imbalances. While Colombo has seen the rise of startup incubators, co-working hubs, and venture capital ecosystems, rural entrepreneurship often remains necessity-driven, constrained by limited market access, technological gaps, and underdeveloped business services (Global Entrepreneurship Monitor, 2022). Sustainable entrepreneurship efforts seen in organic agriculture, eco-tourism, and artisanal handicrafts hold promise but often

remain small-scale and struggle to expand beyond local markets due to infrastructural and institutional barriers.

There are, however, pockets of success. Eco-tourism initiatives in the Central Highlands, renewable energy projects in the North and East, and sustainable agricultural programs in Uva Province illustrate the untapped potential for regionally grounded, sustainability-oriented entrepreneurship. Yet, these initiatives often rely heavily on external funding or NGO facilitation, lacking systematic integration into national innovation and development policies (Ministry of Environment, 2021; UNDP Sri Lanka, 2020).

A significant gap persists: the absence of a cohesive, regionally nuanced strategy that meaningfully weaves innovation and sustainability into entrepreneurial ecosystem development. Existing national innovation and entrepreneurship policies have tended to be urban-centric and sector-specific, while sustainability efforts have often been treated as supplementary rather than foundational to economic planning.

Adopting a smart specialization approach could offer a way forward. By encouraging regions to identify and build upon their unique strengths whether in agriculture, tourism, renewable energy, or niche manufacturing Sri Lanka can craft more tailored and effective regional innovation strategies (Foray, 2015). Developing sustainable entrepreneurial ecosystems across rural areas will require targeted interventions such as enhancing access to finance and infrastructure, cultivating local innovation cultures, expanding research capacities, and fostering stronger public-private-community partnerships.

Innovation inputs-SME capabilities, digital platforms, and green practices-activate transition mechanisms such as knowledge spillovers, network coordination, and local governance that, in turn, shape regional outcomes including productivity, inclusion, and spatial equity; these relationships are conditioned by context moderators (infrastructure, policy stability, regional disparities). The key gap is the rigorous empirical testing of the pathways linking inputs to mechanisms and mechanisms to outcomes in Sri Lankan regions, as well as identifying which moderators amplify or dampen these links.

In conclusion, while Sri Lanka's national policies increasingly acknowledge the critical roles of innovation and sustainability, significant challenges remain in translating these aspirations into regionally inclusive and sustainable development practices. Bridging the gap demands a deeper engagement with local contexts, deliberate investments in regional capacities, and an unwavering commitment to building entrepreneurial ecosystems that

are not only innovative but also deeply attuned to environmental and social sustainability. Such efforts are essential for unlocking the full potential of Sri Lanka's diverse regions and achieving a more equitable, resilient, and sustainable national future.

3. Methodology

This study employs a systematic review methodology to critically synthesize existing knowledge on the interplay between innovation, sustainability, entrepreneurial ecosystems, and regional economic development, with a particular emphasis on Sri Lanka. Adopting a systematic review ensures that the research process remains comprehensive, transparent, and replicable, providing a structured framework for selecting and analyzing relevant sources (Tranfield, Denyer, & Smart, 2003). A carefully outlined protocol guided the review, aiming to enhance rigor and minimize potential bias throughout the process.

The literature search was conducted across several major academic databases, including Scopus, Web of Science, Google Scholar and Research Gate. In addition, institutional repositories and policy portals were consulted to identify reputable policy reports and documents. The search targeted peer-reviewed journal articles, book chapters, and reputable policy reports published between 2010 and 2025, capturing contemporary developments in the field. To refine the search, a combination of keywords and Boolean operators was employed. Key terms such as "innovation" or "technological innovation" were paired with "regional development" or "regional economic growth," while "sustainability" or "sustainable development" was linked to "regional entrepreneurship" and "regional economic development." Searches specific to Sri Lanka combined terms like "Sri Lanka" with "innovation," "regional development," "sustainability," and "entrepreneurship."

Strict inclusion criteria were established to ensure the quality and relevance of the selected literature. Studies were included if they were published in English between 2010 and 2025, have directly addressed the intersections between innovation, sustainability, entrepreneurship, and regional development, and incorporated a spatial, geographical, or regional lens. Research with a focus on emerging economies, and particularly on Sri Lanka, was given preference.

The screening process unfolded in several stages. An initial pool of 520 articles was identified through database searches. After a preliminary review of titles and abstracts, 230 articles were shortlisted based on their relevance. Following a comprehensive full-text review, 40 articles were ultimately selected that met all the inclusion criteria. The entire selection process adhered

to the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines (Moher et al., 2009), ensuring methodological transparency and replicability.

During data extraction, key details were systematically recorded from each study, including authorship, publication year, theoretical frameworks applied, geographical focus, and primary findings relating to innovation, sustainability, entrepreneurship, and regional development. A thematic synthesis approach was then used to analyze the extracted data, allowing themes to emerge inductively based on recurring concepts and patterns across the studies (Thomas & Harden, 2008).

Through this analysis, four major thematic areas were identified:

- Innovation and regional economic development
- Sustainability and regional development
- The intersection of innovation and sustainability within entrepreneurial ecosystems
- Geographical and regional dimensions of development

These thematic categories form the foundation for the literature review and subsequent discussion presented in this paper.

4. Discussion

The findings from this systematic review illuminate a complex yet deeply interconnected relationship among innovation, sustainability, entrepreneurial ecosystems, and regional economic development. Across global studies, innovation consistently emerges as a driving force behind regional growth, technological advancement, and the diversification of economic activities. Sustainability, meanwhile, introduces critical dimensions of environmental responsibility, social inclusiveness, and long-term resilience, ensuring that economic expansion does not come at the expense of future generations. Entrepreneurial ecosystems, positioned at the intersection of innovation and sustainability, provide dynamic platforms for fostering new ventures that align economic performance with broader societal goals. Taking a geographical lens further reveals that spatial contexts shaped by variations in infrastructure, institutions, and social capital play a crucial role in influencing development outcomes.

In Sri Lanka's case, the nexus between innovation and sustainability is still at a formative stage. National-level policies, including the National Innovation and Entrepreneurship Strategy (2018–2022) and the Sustainable

Development Act (2017), reflect growing awareness of these twin imperatives. Yet, translating these ambitions into tangible, regionally balanced outcomes remain a significant challenge. Innovation activities remain heavily concentrated within the Western Province, particularly around Colombo, contributing to a pronounced urban bias in the development of

entrepreneurial ecosystems. Peripheral regions continue to struggle with inadequate infrastructure, weak institutional frameworks, and limited market access, constraining their ability to participate meaningfully in innovation-driven growth.

The review highlights that effective regional innovation systems are typically supported by strong, collaborative networks among universities, industries, government entities, and intermediary organizations. In Sri Lanka, although individual components of such systems are present, they often operate in isolation, especially outside of Colombo. Regional universities, while expanding, frequently lack the resources and partnerships necessary to serve as catalysts for localized innovation. Likewise, efforts to build university–industry linkages remain sporadic, limiting knowledge spillovers, curtailing entrepreneurial initiatives, and perpetuating regional disparities.

When it comes to integrating sustainability within entrepreneurial ecosystems, the progress appears even more limited. Although there are promising examples such as organic farming initiatives, eco-tourism ventures, and renewable energy startups, these remain isolated and heavily reliant on external donor support or NGO facilitation. Systemic support for sustainable entrepreneurship at the institutional and policy levels remains minimal. Startup incubators and entrepreneurial support schemes largely prioritize technological innovation and market growth, often relegating sustainability considerations to secondary status a trend common across many emerging economies (Volkman et al., 2021).

Adopting a geographical perspective further reveals that Sri Lanka's regional disparities are not solely economic; they are deeply tied to differences in innovation capacity, institutional robustness, and environmental vulnerability. Rural and peripheral regions, already disadvantaged by infrastructural and market access gaps, also face heightened exposure to environmental risks like droughts, floods, and land degradation, compounding barriers to sustainable entrepreneurship and innovation.

Addressing these multifaceted challenges necessitates a fundamental shift from centralized, one-size-fits-all policy frameworks towards place-based innovation and sustainability strategies. Smart specialization, as proposed by Foray (2015), offers a compelling approach for Sri Lanka. By

encouraging regions to identify and build upon their unique assets whether agricultural innovation in Uva Province, eco-tourism in the Central Highlands, or renewable energy in the Northern Province the country can foster regionally balanced growth that leverages both innovation and sustainability. However, such strategies must be accompanied by deliberate investments in regional R&D capacity, infrastructure development, digital connectivity, and human capital to create supportive environments where entrepreneurial ecosystems can truly thrive.

Moreover, it is imperative to integrate sustainability systematically into regional innovation and entrepreneurship policies. Practical measures could include establishing green financing options for sustainable startups, embedding sustainability criteria within incubator and accelerator programs, promoting education in sustainable business practices, and encouraging community-driven innovation initiatives that merge economic development with environmental stewardship and social equity.

Institutional strengthening is also vital. Robust collaboration among universities, industries, government agencies, and civil society organizations is key to constructing resilient regional innovation systems. Creating regional innovation hubs, fostering public-private-community partnerships, and decentralizing governance structures could facilitate the development of more inclusive, context-sensitive entrepreneurial ecosystems.

Finally, the review reveals a significant need for further empirical research focused on the regional dynamics of innovation and sustainability within Sri Lanka. While national-level studies offer valuable insights, they often overlook the rich diversity and specificity of regional experiences. Future research efforts should adopt place-based approaches to better capture how different regions engage with and adapt to innovation and sustainability challenges. Comparative studies between regions could also shed light on best practices and inform more tailored policy interventions.

In conclusion, the findings underscore both the vast potential and the substantial hurdles Sri Lanka faces in leveraging innovation and sustainability for regional economic development. While national frameworks have laid an important foundation, bridging the gap between policy and practice requires a more geographically sensitive, innovation-led, and sustainability-oriented approach. Only by embracing such strategies can Sri Lanka achieve a more inclusive, resilient, and equitable model of regional development that truly benefits all corners of the island.

5. Conclusion

This systematic review has explored the intricate relationships among innovation, sustainability, entrepreneurial ecosystems, and regional economic development, with a particular focus on the Sri Lankan context. The analysis makes clear that innovation and sustainability are not isolated forces; but are deeply interconnected drivers that, when strategically intertwined, have the potential to create resilient, inclusive, and environmentally sustainable regional economies. Entrepreneurial ecosystems serve as vital conduits through which innovation and sustainability can be harnessed to stimulate regional growth. However, their effectiveness is profoundly shaped by geographical, institutional, and socio-cultural contexts.

Internationally, regions that have successfully combined dynamic innovation systems, robust institutional frameworks, and sustainability-centered strategies have achieved competitive, sustainable development. In contrast, the Sri Lankan experience presents a more uneven landscape, while national policy frameworks such as the National Innovation and Entrepreneurship Strategy (2018–2022) and the Sustainable Development Act (2017) underscore an increasing recognition of innovation and sustainability. Translating these national ambitions into regionally balanced realities remains a significant challenge. Innovation activities are still largely concentrated in the Western Province, particularly around Colombo, deepening existing regional disparities. Peripheral regions continue to face serious infrastructural, institutional, and human capital deficiencies, limiting their engagement with innovation-led and sustainability-oriented growth trajectories.

Efforts to embed sustainability within Sri Lanka's entrepreneurial ecosystems are at a relatively early stage. Although emerging examples such as initiatives in organic agriculture, eco-tourism, and renewable energy offer encouraging signs, these ventures tend to be fragmented, localized, and heavily dependent on external support. There is an urgent need for coherent, regionally tailored policies that place sustainability at the core of entrepreneurial and innovation strategies, rather than treating it as a supplementary concern.

The geographical lens adopted in this review emphasizes that overcoming regional disparities in Sri Lanka requires more than generalized economic interventions. A deeper understanding of spatial dynamics and localized development contexts is essential. Place-based strategies, such as smart specialization, offer a promising framework for aligning regional assets with innovation and sustainability goals. By helping regions identify and develop their unique strengths, Sri Lanka can foster more diversified, resilient, and regionally balanced patterns of economic growth.

Several priorities emerge for future research, policy, and practice. First, there is a clear need for more granular, region-specific empirical research that captures the diverse realities, opportunities, and challenges faced by different parts of Sri Lanka. Comparative regional studies could also provide invaluable insights into effective models for building sustainable entrepreneurial ecosystems.

Second, policy frameworks must shift from their traditional urban-centric focus toward differentiated regional strategies that recognize and nurture the distinctive capacities of Sri Lanka's various regions. Key interventions include investing in regional innovation infrastructure, supporting sustainable entrepreneurship initiatives, strengthening university, industry and government linkages, and promoting community-based innovation.

Third, sustainability must be embedded systematically into all facets of regional development policy. The promotion of green financing instruments, sustainability-driven incubators, and educational initiatives focused on sustainable entrepreneurship is crucial for building ecosystems that prioritize environmental stewardship, social inclusiveness, and long-term economic resilience alongside growth.

In closing, leveraging the powerful synergies between innovation and sustainability offers both a formidable challenge and a transformative opportunity for Sri Lanka. By adopting geographically sensitive, innovation-driven, and sustainability-oriented development strategies, the country can forge a path towards a more inclusive, resilient, and equitable model of regional growth. The insights generated through this review contribute meaningfully to the growing discourse on regional innovation systems and sustainability transitions, offering valuable guidance for researchers, policymakers, and practitioners striving to shape the future of regional development not only in Sri Lanka but also across other emerging economies.

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