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The Role of Innovation in Promoting Regional Economic Growth and Sustainability in Indonesia

Nyoman Sri Manik Parasari[1] ✉ , I Made Sukresna[2]

Universitas Pendidikan Nasional, Denpasar, Indonesia[1]; Universitas Diponegoro, Semarang, Indonesia[2]

ABSTRACT

Innovation has become a strategic driver of regional economic development by enhancing productivity, competitiveness, and sustainability. This study examines the role of innovation in promoting regional economic growth and sustainable development in Indonesia through a qualitative library research approach. Secondary data were collected from peer-reviewed journal articles, academic books, government reports, and institutional publications related to innovation, regional development, digital transformation, and sustainability. The collected literature was analyzed using qualitative content analysis to identify major themes, compare previous findings, and synthesize empirical evidence. The findings indicate that innovation contributes significantly to regional economic growth by improving productivity, strengthening entrepreneurship, accelerating digital transformation, and enhancing collaboration among governments, industries, universities, and communities. Innovation also supports sustainable development through efficient resource utilization, environmentally responsible production systems, and green economic practices. However, disparities in infrastructure, institutional capacity, human capital, and technological readiness remain major challenges affecting regional innovation performance. Therefore, integrated innovation policies emphasizing collaboration, digital infrastructure, research commercialization, and sustainable governance are essential for achieving inclusive and sustainable regional development throughout Indonesia.

Keywords: *Digital Transformation, Economic Growth, Innovation, Regional Development, Sustainability.*

CORRESPONDING AUTHOR:
Nyoman Sri Manik Parasari
Universitas Pendidikan Nasional, Denpasar, Indonesia

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1. | INTRODUCTION

Innovation has become a fundamental driver of regional economic transformation by enhancing productivity, improving competitiveness, and encouraging sustainable development. In the contemporary economic landscape, innovation is no longer confined to technological advancement but also encompasses organizational, institutional, and policy innovations that strengthen regional resilience and economic performance. The increasing adoption of digital technologies, the acceleration of industrial transformation, and the growing emphasis on sustainable development have reinforced the strategic importance of innovation as a catalyst for long-term economic growth. Consequently, regional governments are expected to establish innovation-oriented policies capable of balancing economic expansion with environmental sustainability and social welfare (Rahma et al., 2019; Rofaida et al., 2019).

Indonesia demonstrates considerable economic potential through its abundant natural resources, expanding digital economy, and diverse regional characteristics. Nevertheless, economic development remains uneven across provinces due to differences in infrastructure quality, human capital, technological capability, institutional capacity, and investment opportunities. These disparities influence the ability of regional economies to generate innovation and translate it into sustainable economic performance. Regions possessing stronger innovation ecosystems generally exhibit higher productivity, greater investment attractiveness, and more competitive business environments, whereas regions with limited innovation capacity continue to experience slower economic growth and development constraints (Nurmalia et al., 2020; Windhani et al., 2023).

Innovation has increasingly become an essential instrument for supporting regional economic development in Indonesia. The diffusion of digital technology, the expansion of entrepreneurship, the development of regional innovation systems, and collaboration among governments, universities, industries, and communities have significantly contributed to regional competitiveness. Innovation also encourages more efficient resource utilization, strengthens industrial productivity, and promotes environmentally responsible economic activities. Previous studies have demonstrated that innovation contributes positively to regional competitiveness through digital transformation, cross-sector collaboration, technological adoption, and sustainability-oriented management strategies. However, these benefits cannot be fully realized without supportive governance, adequate infrastructure, and continuous investment in human capital and research development (Zou et al., 2022;).

Alongside these opportunities, Indonesian regions continue to face numerous challenges in implementing innovation-driven development. Unequal digital infrastructure, limited research commercialization, inadequate financial support for innovation, regulatory complexity, and disparities in technological readiness remain significant barriers to regional economic transformation. Moreover, the increasing urgency of environmental sustainability requires innovation policies that not only

stimulate economic growth but also reduce ecological degradation, improve resource efficiency, and support sustainable production systems. Consequently, innovation should be understood as a multidimensional approach integrating economic, environmental, and social objectives rather than merely focusing on technological advancement (Wardani & Apriani, 2023; Ramadhan et al., 2023).

Previous studies have extensively investigated the relationship between innovation and economic performance. Rahma et al. (2019) emphasized sustainable regional development indicators, while Nurmalia et al. (2020) highlighted entrepreneurship as a determinant of regional economic growth. Hilmawan et al. (2023) examined public sector innovation in improving regional development outcomes, whereas Asheim (2019) focused on innovation management strategies for enhancing regional economic competitiveness. Although these studies provide valuable insights, they generally examine innovation, economic growth, sustainability, or regional competitiveness separately. Limited attention has been devoted to integrating these dimensions into a comprehensive framework explaining how innovation simultaneously promotes regional economic growth while supporting sustainable development across Indonesian regions characterized by different levels of innovation capacity and development readiness.

Based on these considerations, this study aims to analyze the role of innovation in promoting economic growth and sustainability within the context of regional Indonesia. Specifically, the study examines how innovation contributes to regional economic performance, identifies the principal challenges affecting innovation implementation, and proposes strategic approaches for strengthening sustainable regional development through integrated innovation policies. The findings are expected to enrich the literature on regional innovation and provide policy recommendations for strengthening inclusive and sustainable economic development in Indonesia.

2. | LITERATURE REVIEW

Innovation and Regional Economic Growth

Innovation is widely recognized as a strategic driver of regional economic growth because it enhances productivity, stimulates entrepreneurship, improves industrial competitiveness, and encourages the efficient allocation of resources. Schumpeter's innovation theory explains that economic development is primarily driven by the introduction of new products, production processes, markets, organizational structures, and technologies capable of generating added value. In the context of regional development, innovation extends beyond technological advancement to include institutional reforms, public service innovation, and collaborative governance that strengthen local economic capacity. Regions with strong innovation ecosystems generally demonstrate higher investment attractiveness, greater business dynamism, and better employment opportunities.

Within Indonesia, regional innovation has become increasingly important in supporting balanced economic development amid significant disparities in infrastructure, technological readiness, and human capital. The interaction between governments, universities, industries, and local communities plays a vital role in accelerating knowledge transfer and commercialization of innovation. Furthermore, entrepreneurship, digital transformation, and research-based development have become important mechanisms for improving regional competitiveness and economic resilience. Effective innovation policies also encourage the development of micro, small, and medium enterprises (MSMEs), increase production efficiency, and create new sources of regional income. Consequently, innovation should be viewed not merely as technological progress but as a comprehensive regional development strategy capable of fostering sustainable economic expansion while strengthening regional competitiveness (Nurmalia et al., 2020; Boikova et al., 2021; Zabala-Iturriagagoitia, 2022).

Innovation and Sustainable Regional Development

Sustainable regional development emphasizes the integration of economic growth, environmental protection, and social well-being into a balanced development framework. Innovation has emerged as one of the most effective instruments for achieving these objectives because it enables the adoption of cleaner technologies, more efficient production systems, responsible resource management, and environmentally friendly business practices. Sustainable innovation not only improves economic performance but also reduces environmental degradation and strengthens long-term regional resilience. Consequently, innovation has become an essential component of sustainable development policies implemented by regional governments.

In Indonesia, the transition toward sustainability increasingly requires innovation-based approaches capable of addressing environmental challenges while maintaining regional economic productivity. The adoption of digital technology, renewable energy, circular economy practices, and sustainable industrial management contributes to achieving both economic competitiveness and environmental responsibility. Moreover, regional innovation policies encourage collaboration among public institutions, private industries, academic institutions, and local communities to generate integrated solutions for sustainable development. Previous studies indicate that innovation-oriented governance, digital transformation, and sustainability initiatives improve regional performance when supported by effective institutions, adequate infrastructure, and human resource development. Therefore, sustainable regional development should be understood as a continuous process in which innovation serves as the primary mechanism for creating inclusive economic growth, environmental sustainability, and improved community welfare across Indonesian regions (Li et al., 2021; Supriatna & Lenz, 2022; Hilmawan et al., 2023).

3. | RESEARCH METHOD

This study employed a qualitative research approach using the library research method to examine the role of innovation in promoting economic growth and sustainability within the context of regional development in Indonesia. Library research was selected because it enables a comprehensive synthesis of existing theoretical perspectives, empirical findings, and policy discussions concerning innovation, regional economic development, and sustainable development without relying on primary field data. The study systematically collected secondary data from various scholarly sources, including peer-reviewed journal articles, academic books, conference proceedings, government reports, institutional publications, and international reports relevant to innovation, regional competitiveness, digital transformation, and sustainability.

To ensure the credibility and academic quality of the literature, the primary sources were limited to publications indexed by Google Scholar and published over the last five years, while several supporting references outside this period were incorporated only to strengthen theoretical explanations and contextual discussions. The literature identification process was conducted using keywords such as innovation, regional innovation, economic growth, regional development, sustainability, digital transformation, regional competitiveness, and Indonesia. The collected literature was subsequently screened based on its relevance to the research objectives, methodological rigor, publication quality, and contribution to understanding the relationship between innovation, economic performance, and sustainable regional development. Following the literature selection process, the collected documents were analyzed using qualitative content analysis.

This analytical technique involved organizing the literature according to major themes, comparing findings among previous studies, identifying similarities and differences in research results, evaluating theoretical developments, and synthesizing empirical evidence to construct a comprehensive understanding of the research problem. Furthermore, the analysis emphasized identifying existing research gaps regarding the integration of innovation, economic growth, and sustainability within Indonesian regional development. The findings from previous studies were then interpreted through descriptive and analytical approaches to explain the contribution of innovation to regional economic performance, sustainable development, and policy implementation. Finally, conclusions were formulated by integrating theoretical concepts, empirical evidence, and policy perspectives obtained from the reviewed literature, thereby providing a coherent explanation of how innovation can strengthen regional economic growth while simultaneously supporting sustainable development across Indonesian regions. This methodological approach provides a systematic and reliable foundation for developing evidence-based recommendations that contribute to both academic discourse and regional development policymaking.

4. | RESULTS

The literature reviewed consistently demonstrates that innovation has become one of the principal determinants of regional economic growth and sustainable development in Indonesia. Innovation is no longer interpreted solely as technological advancement but rather as a multidimensional process involving institutional reform, organizational improvement, digital transformation, entrepreneurship development, human capital enhancement, and policy innovation. These dimensions collectively strengthen regional competitiveness by increasing productivity, attracting investment, promoting industrial diversification, and improving public service delivery. As regional economies increasingly face the challenges of globalization, technological disruption, and environmental sustainability, innovation serves as a strategic instrument that enables regions to adapt to changing economic conditions while maintaining long-term development performance (Rahma et al., 2019; Zou et al., 2022).

One important finding emerging from the literature is that regional innovation capacity significantly influences economic performance. Regions characterized by stronger research institutions, higher educational attainment, more advanced digital infrastructure, and greater collaboration among government, universities, industries, and communities generally achieve better economic outcomes than regions with limited innovation ecosystems. Innovation contributes to the creation of new business opportunities, the commercialization of research outputs, and improvements in production efficiency that ultimately stimulate regional economic growth. These findings suggest that regional development should not rely solely on natural resource endowments but also prioritize knowledge creation and innovation capability as major sources of competitiveness (Nurmalia et al., 2020; Windhani et al., 2023).

Digital transformation has become another dominant theme identified throughout the reviewed studies. The rapid adoption of information and communication technologies has transformed business activities, government administration, education, and industrial production across Indonesian regions. Digital innovation supports the integration of economic actors into broader markets while reducing transaction costs and increasing operational efficiency. The development of digital platforms has also expanded opportunities for micro, small, and medium enterprises (MSMEs) to improve productivity, access financial services, and participate in national and international value chains. Consequently, digital transformation strengthens regional economic resilience by creating more adaptive and competitive local economies capable of responding to technological change and market uncertainty (Rofaida et al., 2019; Triwijayati et al., 2023).

Another significant finding concerns the importance of collaboration within regional innovation systems. Previous studies emphasize that innovation rarely emerges from a single institution but rather develops through cooperation among governments, universities, industries, research organizations, and local communities. Such collaboration facilitates knowledge exchange, technology transfer, research

commercialization, and policy coordination that collectively improve regional innovation performance. Government institutions contribute through supportive regulations and public investment, universities generate scientific knowledge and skilled human resources, industries commercialize innovations, while communities provide practical knowledge and encourage innovation diffusion. The effectiveness of these collaborative mechanisms substantially determines the sustainability of regional innovation initiatives (Asheim, 2019).

The reviewed literature also indicates that innovation contributes directly to sustainable regional development. Sustainable innovation encourages environmentally responsible production systems, efficient utilization of natural resources, renewable energy development, circular economy practices, and green industrial transformation. Rather than pursuing economic expansion at the expense of environmental quality, innovation enables regions to achieve economic growth while reducing ecological impacts. Sustainable innovation therefore supports the integration of economic, environmental, and social objectives that characterize contemporary regional development policies. Regions implementing innovation-oriented sustainability strategies demonstrate stronger long-term competitiveness because environmental responsibility increasingly influences investment decisions, industrial competitiveness, and public welfare (Wardani & Apriani, 2023; Ramadhan et al., 2023).

Human capital consistently emerges as another essential determinant of innovation-driven regional development. The literature shows that regions possessing better educational quality, research capability, technical skills, and digital literacy are more capable of generating, adopting, and commercializing innovation. Human capital not only facilitates technological adaptation but also strengthens entrepreneurship, organizational learning, and institutional capacity. Consequently, investments in education, vocational training, research activities, and digital skills development significantly contribute to improving regional innovation capacity and long-term economic productivity (Windhani et al., 2023).

Despite these positive contributions, numerous studies identify persistent challenges affecting innovation implementation across Indonesian regions. One of the most frequently discussed constraints is unequal infrastructure development. Significant disparities remain in transportation networks, internet accessibility, electricity availability, and research facilities among provinces. Such disparities reduce opportunities for less-developed regions to adopt advanced technologies and participate effectively in innovation-driven economic activities. Limited infrastructure also increases production costs and restricts market accessibility, thereby weakening regional competitiveness (Rahma et al., 2019).

Institutional factors also influence regional innovation performance. Bureaucratic complexity, regulatory inconsistency, lengthy administrative procedures, and limited interagency coordination often reduce the effectiveness of innovation policies. Several studies emphasize that innovation requires adaptive governance capable of responding

rapidly to technological development and changing socioeconomic conditions. Simplifying administrative procedures, strengthening institutional coordination, and improving regulatory certainty are therefore considered important prerequisites for establishing an effective regional innovation ecosystem (Boikova et al., 2021; Hilmawan et al., 2023).

Financial constraints constitute another major challenge. Innovation activities generally require substantial investment in research, technology acquisition, digital infrastructure, human resource development, and commercialization processes. However, many regional governments and local enterprises continue to experience limited financial capacity, reducing their ability to implement innovation programs effectively. MSMEs, which represent the backbone of regional economies, often face additional difficulties in accessing innovation financing and advanced technologies, thereby slowing productivity improvement and business modernization (Rijal et al., 2023).

The literature further reveals that innovation adoption varies considerably among Indonesian regions due to differences in institutional readiness, socioeconomic conditions, demographic characteristics, and industrial structures. Regions with diversified economic activities and stronger educational institutions generally demonstrate greater innovation capability than regions relying primarily on traditional economic sectors. These differences highlight the importance of designing innovation policies that accommodate regional diversity rather than applying uniform development strategies nationwide. Innovation policies should therefore consider local comparative advantages, resource availability, industrial specialization, and community participation to maximize development outcomes (Nurmalia et al., 2020; Li et al., 2021).

The reviewed literature indicates that innovation functions as a comprehensive driver of regional economic growth and sustainability in Indonesia. Innovation enhances productivity, encourages entrepreneurship, strengthens industrial competitiveness, promotes digital transformation, improves governance, supports environmental sustainability, and increases regional resilience against economic uncertainty. Nevertheless, maximizing these benefits requires stronger institutional collaboration, equitable infrastructure development, investment in human capital, consistent innovation policies, and greater financial support for research and technological development. The synthesis of previous studies therefore confirms that innovation should be positioned as an integrated regional development strategy capable of simultaneously promoting economic growth, social welfare, and sustainable development across Indonesian regions (Asheim; 2019; Zabala-Iturriagagoitia, 2022; Zou et al., 2022).

5. | DISCUSSION

The findings indicate that innovation plays a strategic role in promoting regional economic growth while simultaneously supporting sustainable development in

Indonesia. This result reinforces the argument that innovation should be regarded as a comprehensive development strategy rather than merely a technological instrument. Regional innovation contributes to productivity improvement, industrial competitiveness, digital transformation, and institutional effectiveness, all of which collectively strengthen regional economic performance. Furthermore, innovation facilitates the creation of new business opportunities, encourages entrepreneurship, and enhances the capacity of local governments and industries to respond to changing economic conditions. These findings are consistent with previous studies emphasizing that innovation capacity has become one of the primary determinants of regional competitiveness and long-term economic resilience (Zabala-Iturriagagoitia, 2022; Hilmawan et al., 2023).

Another important implication of this study is that sustainable economic growth cannot be achieved solely through economic expansion but requires the integration of environmental and social considerations into innovation policies. The reviewed literature demonstrates that regions implementing innovation-oriented development strategies are more capable of adopting environmentally responsible production systems, improving resource efficiency, and strengthening green economic transformation. This finding supports the perspective that sustainable innovation enables regions to balance economic productivity with environmental protection and social welfare, thereby contributing to more inclusive and resilient regional development. Consequently, innovation policies should encourage not only technological advancement but also sustainability-oriented governance, renewable energy adoption, circular economy practices, and responsible industrial development (Supriatna & Lenz, 2022; Wardani & Apriani, 2023).

Despite these positive contributions, the findings also reveal that regional innovation performance remains uneven across Indonesia. Differences in infrastructure quality, institutional capacity, digital readiness, research capability, and human capital continue to influence the effectiveness of innovation implementation. Regions possessing stronger educational institutions, better digital infrastructure, and greater collaboration among government, universities, industries, and communities generally experience faster economic growth than regions with limited innovation ecosystems. This indicates that strengthening innovation capacity requires an integrated policy approach addressing both technological and institutional dimensions rather than focusing exclusively on economic indicators.

The study further demonstrates that collaborative governance constitutes an essential element in strengthening regional innovation systems. Effective cooperation among public institutions, higher education institutions, private industries, research organizations, and local communities accelerates knowledge transfer, research commercialization, technological diffusion, and policy implementation. Such collaboration enables regional governments to develop adaptive innovation strategies that respond to local economic characteristics while supporting national sustainable

development objectives. Therefore, innovation should be positioned as a shared responsibility involving multiple stakeholders rather than being managed exclusively by government institutions (Boikova et al., 2021).

This study suggests that innovation represents an integrated mechanism connecting economic growth, regional competitiveness, and sustainable development within the Indonesian regional context. Strengthening innovation ecosystems through improved governance, investment in human capital, digital transformation, research collaboration, and sustainability-oriented policies will significantly enhance regional resilience and promote more balanced development across Indonesian regions. Accordingly, future regional development policies should prioritize innovation as a central component of long-term economic planning while ensuring that its benefits are distributed more equitably among regions with different levels of development.

6. | CONCLUSION

This study concludes that innovation plays a fundamental role in promoting regional economic growth and sustainable development in Indonesia. Innovation extends beyond technological advancement by encompassing institutional improvement, digital transformation, entrepreneurship development, human capital enhancement, and collaborative governance. These interconnected dimensions contribute to increased productivity, improved regional competitiveness, greater investment attractiveness, and more efficient utilization of economic resources. At the same time, innovation supports sustainable development by encouraging environmentally responsible production, resource efficiency, and the adoption of sustainable business practices.

The findings further demonstrate that the effectiveness of innovation depends on the strength of regional innovation ecosystems, including the quality of infrastructure, institutional capacity, research and development activities, digital readiness, and collaboration among governments, universities, industries, and local communities. Nevertheless, disparities in these supporting factors continue to create unequal innovation performance across Indonesian regions, limiting the contribution of innovation to inclusive regional development.

Accordingly, strengthening regional innovation requires integrated policies that simultaneously improve human capital, expand digital and physical infrastructure, enhance research commercialization, simplify regulatory frameworks, and encourage cross-sector collaboration. Such strategies will enable regions with different levels of development to maximize the economic and social benefits of innovation while advancing environmental sustainability. Ultimately, positioning innovation as a central component of regional development policy will not only accelerate economic growth but also foster more inclusive, competitive, and sustainable regional development throughout Indonesia.

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Conflict of Interest Statement

The authors declare that there is no conflict of interest.

Ethical Approval and Originality Statement

Ethical approval was obtained for this study. The manuscript represents original work and has not been previously published, nor is it under consideration by another journal.

Data Disclosure Statement

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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