

Innovation and Sustainable Entrepreneurship: A Global Benchmarking**الابتكار وريادة الأعمال المستدامة: دراسة مقارنة عبر العالم****Chiraz MEROUANI¹, Moussa MAAMRI², Hocine IFOURAH³**¹ PhD in Financial Sciences and Accounting, University of Bejaia, Research Laboratory in Management and Quantitative Techniques (RMTQ) (Algeria) vchiraz.merouani@univ-bejaia.dz² PhD in Economic Sciences, University of Bejaia, Research Laboratory in Management and Quantitative Techniques (RMTQ) (Algeria) moussa.maamri@univ-bejaia.dz³ Professor of Management Sciences, University of Bejaia, Research Laboratory in Management and Quantitative Techniques (RMTQ) (Algeria) hocine.ifourah@univ-bejaia.dz**Received:** 14/04/2025**Accepted:** 30/06/2025**Published:** 30/06/2025**Abstract:**

Sustainable entrepreneurship emerges as a vital response to today's economic, social, and environmental challenges. By placing innovation at the core of their activities, sustainable entrepreneurs develop novel solutions that adhere to sustainability principles while generating added value. To remain competitive in this rapidly evolving field, benchmarking plays a key role. This article explores innovations and best practices in sustainable entrepreneurship, focusing on regions including Europe, North America, Asia, and Africa. Using benchmarking as a tool, the study compares the approaches and outcomes of each region, highlighting successes as well as the challenges faced. Through this comparative analysis, Europe stands out as a leader, driven by strong policy initiatives, while North America, Asia, and Africa are making significant efforts to foster sustainable entrepreneurship, despite ongoing obstacles. International cooperation, the sharing of best practices and the engagement of both public and private stakeholders will be essential to catalyze positive global change.

Keywords: Sustainable entrepreneurship, Green innovation, Economic development, Benchmarking

JEL Classification Codes : L26, O31, F63, O55.

ملخص:

تُعد ريادة الأعمال المستدامة استجابة حيوية للتحديات الاقتصادية والاجتماعية والبيئية التي يواجهها العالم. من خلال وضع الابتكار في صميم أنشطتهم، يقوم رواد الأعمال المستدامون بتطوير حلول جديدة تلزم بمبادئ الاستدامة وتُحقق في الوقت نفسه قيمة مضافة. ولضمان القدرة التنافسية في هذا المجال سريع التطور، يلعب التقييم المقارن (Benchmarking) دورًا محوريًا.

يستكشف هذا المقال الابتكارات وأفضل الممارسات في مجال ريادة الأعمال المستدامة، مع التركيز على مناطق تشمل أوروبا وأمريكا الشمالية وآسيا وأفريقيا. من خلال استخدام التقييم المقارن كأداة، يقارن هذا البحث بين المقاربات والنتائج في كل منطقة، مبرزًا النجاحات وكذلك التحديات التي تمت مواجهتها. ومن خلال هذا التحليل المقارن، تبرز أوروبا كقائد في هذا المجال بفضل المبادرات السياسية القوية، في حين تبذل أمريكا الشمالية وآسيا وأفريقيا جهودًا كبيرة لتعزيز ريادة الأعمال المستدامة، رغم العقبات المستمرة. سيكون التعاون الدولي، وتبادل أفضل الممارسات، ومشاركة أصحاب المصلحة من القطاعين العام والخاص ضروريًا لتحفيز التغيير الإيجابي على مستوى العالم.

الكلمات المفتاحية: ريادة الأعمال المستدامة، الابتكار الأخضر، التنمية الاقتصادية، التقييم المقارن

تصنيفات JEL: L26, O31, F63, O55

INTRODUCTION

As the world faces an unprecedented climate crisis and rising inequalities, how can entrepreneurs play a key role in transforming our society? Sustainable entrepreneurship is defined as a business approach that combines economic profitability with social and environmental responsibility, aiming to generate positive impact while addressing current needs. In the face of growing challenges such as climate change, biodiversity loss, and social inequality, it is imperative for businesses to adopt sustainable models. To meet these challenges, sustainable entrepreneurship leverages innovative strategies such as the use of green energy, circular economy practices, and stakeholder collaboration (Pricopoaia et al., 2024). Hybrid models—such as eco-social enterprises and circular economy frameworks—strike a balance between economic growth and environmental responsibility (Sanyal, 2024). For instance, startups like *Too Good To Go*, which combats food waste by connecting consumers with retailers to sell surplus food, exemplify how innovation can address social issues while remaining economically viable (Kothari, 2024). Such companies also shape market trends and consumer expectations, encouraging established businesses to adopt similar sustainable practices (Kothari, 2024).

Sustainable leadership is also crucial in inspiring responsible business practices and generating positive social and environmental outcomes (Ribeiro & Leitão, 2024). However, despite these opportunities for innovation, sustainable entrepreneurship faces challenges such as regulatory barriers and market competition. These factors can hinder the adoption of sustainable models and require ongoing attention to develop appropriate solutions. This paper offers an in-depth analysis of innovations and best practices in sustainable entrepreneurship, with a focus on Europe, North America, Asia, and Africa. By applying benchmarking, the study compares regional approaches and outcomes, highlighting both achievements and challenges, in order to draw lessons on success and failure factors. The data used comes from academic sources and international reports, providing a robust foundation for analyzing how sustainable entrepreneurship can contribute to an ethical future. Initiatives such as the circular economy and green technologies are emerging as viable solutions to meet current needs while preserving resources for future generations. In this way, sustainable entrepreneurship positions itself not only as a response to global challenges but also as a driver of innovation.

1- The Global Context of Sustainable Entrepreneurship

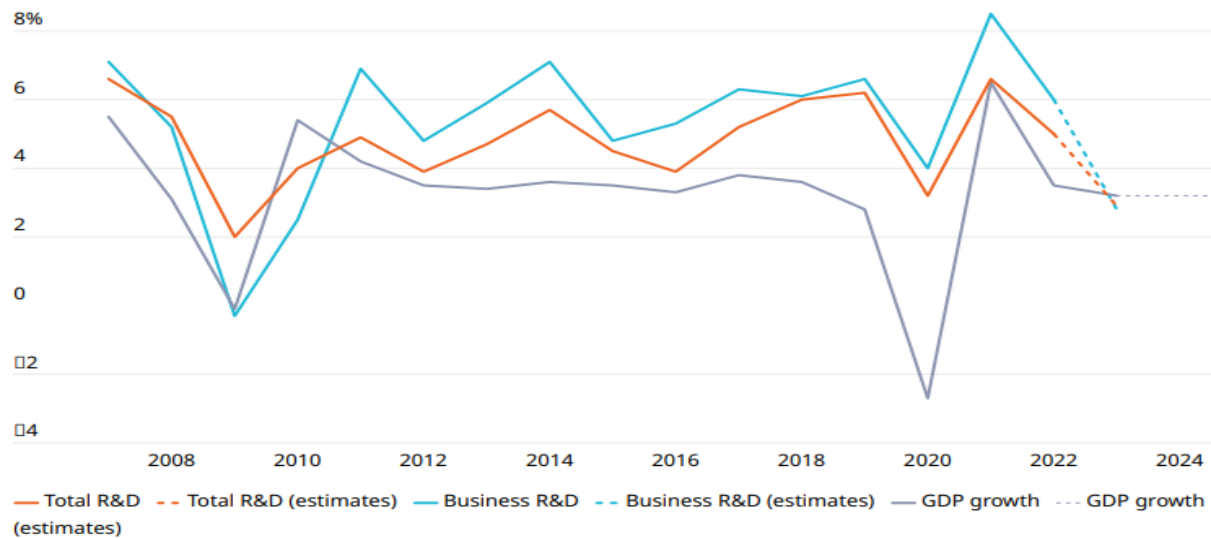
To fully grasp this dynamic, it is essential to understand the concept of sustainable entrepreneurship and to examine its growth, which has emerged as a key response to current environmental challenges.

1-1- Sustainable Entrepreneurship: A Multifaceted Concept

According to Gahlam (2019), sustainable entrepreneurship aligns with the goals of the Triple Bottom Line—a concept introduced by John Elkington in the early 1990s, referring to “Profit, People, Planet.” In a sustainable entrepreneurship context, equal attention must be paid to all three dimensions. Over the past decade, sustainable entrepreneurship has gained increasing recognition as a crucial response to environmental challenges such as climate change and biodiversity loss. According to an OECD report (2023), the number of businesses engaged in sustainable practices grew by 50% between 2015 and 2022. In 2022, global investments in startups focused on sustainable solutions reached \$120 billion, marking a 25% increase from

the previous year (Global Impact Investing Network, 2023). This approach integrates economic, environmental, and social objectives, placing entrepreneurs at the forefront of advancing societal well-being.

Fig(1): Economic Growth and Corporate R&D Growth Rate (Global Data)

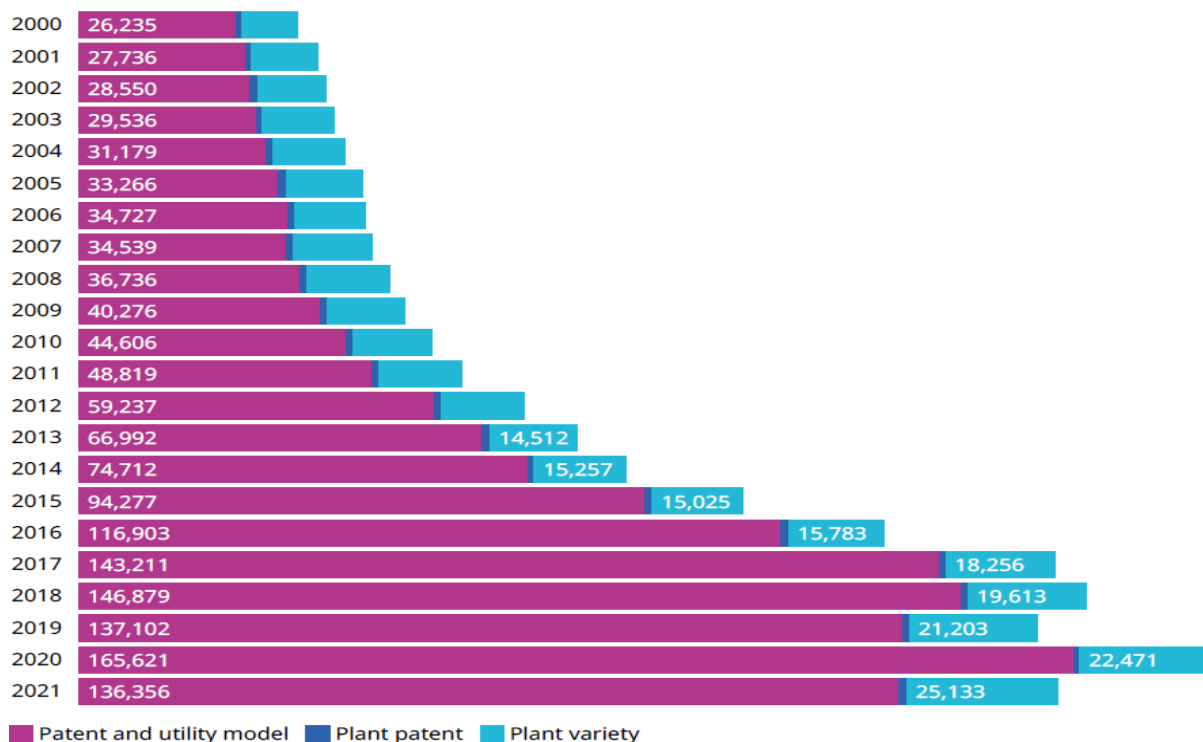


Source: WIPO. Global Innovation Index 2024 (2024, p30)

Regarding investments in Research & Development, projections for 2023—based on expected GDP growth—paint a potentially unfavorable scenario, with global R&D growth slowing to below 3% in 2023. This would represent the lowest growth rate recorded since 2010. Furthermore, it implies that the growth rate of corporate R&D would align with the growth rate of total gross domestic R&D expenditure (including both corporate and private sector spending). This trend confirms the strong correlation between R&D spending and global R&D growth (WIPO, 2024).

In the context of climate, demographic, and profitability concerns, investments in agricultural innovation are known to be long-term. This is due to the time required for research to be commercialized and for technologies to be adapted to meet the needs of various regions, all while complying with national regulations before being adopted and used in farmers' fields. Additionally, agricultural innovation tailored to specific local agro-ecological conditions must be easily transferable and applicable in other regions with different agro-ecological characteristics. Some of these adaptations are reflected in the steady increase in the number of patents for protected plant varieties.

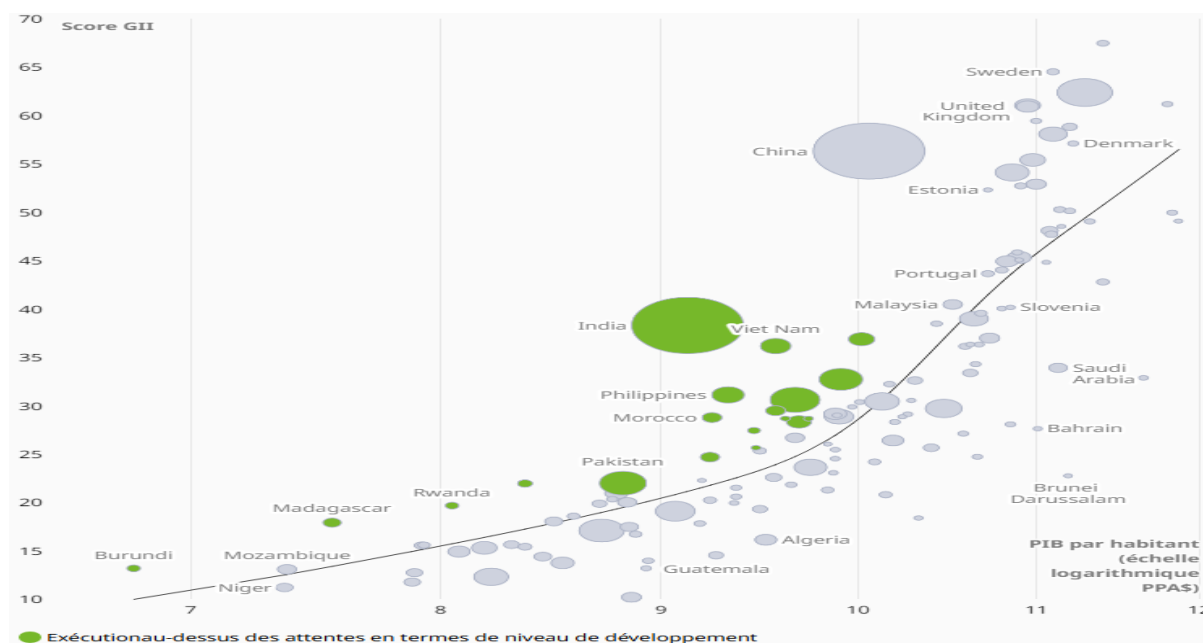
Fig(2): Total Number of Applications Filed under Patent, Utility Model, and Plant Variety Protection Systems, 2000–2021



Source: WIPO. Making Innovation Policy Work for Development (2024, p70)

Figure 2 illustrates how innovators are increasingly relying on intellectual property (IP) protection for their inventions, as evidenced by the total number of patents, utility models, and equivalent plant variety protection systems filed globally for agricultural innovations.

Fig(3): Top Performing Countries in Innovation Relative to Their Level of Economic Development



Source: WIPO (2024, p60)

According to Figure 3, India, the Republic of Moldova, and Vietnam have consistently ranked as top over performing economies in innovation since 2011, marking the 14th consecutive year. Indonesia, Pakistan, and Uzbekistan have also maintained their status as innovation over performers for the third consecutive year (WIPO, 2024). Vietnam (ranked 44th) stands out by outperforming its income level across all pillars of the Global Innovation Index (GII), except for human capital and research, and even exceeding the performance of the upper-middle-income group. The Philippines (ranked 53rd) also continues to hold its position as an innovation over performer.

1-2- Key Factors Contributing to the Development of Sustainable Entrepreneurship

The first essential factor lies in the integration of economic, environmental, and social objectives. According to Kothari (2024), sustainable entrepreneurship aims to balance economic performance, environmental stewardship, and social well-being. This approach is often captured by the "Triple Bottom Line" concept, which includes economy, society, and the environment. A study by McKinsey & Company (2023) revealed that businesses incorporating sustainable practices into their business models experienced a 15% increase in revenue compared to those that did not.

The second key factor is innovation and societal impact. Sustainable entrepreneurs leverage innovation to address environmental and social needs. They introduce products, services, and processes that reduce environmental impact while meeting market demands (Geetha et al., 2024).

A supportive ecosystem also plays a vital role in the growth of sustainable entrepreneurship. Collaboration among policymakers, businesses, and investors is essential for creating an environment conducive to sustainable enterprises. This includes regulations, subsidies, and incentives that support sustainability-oriented startups and SMEs (Ribeiro & Leitão, 2024). A survey by the World Bank (2023) found that 70% of entrepreneurs believe government support is essential for the growth of their sustainable business. This finding is echoed by Deloitte (2023), which observed that 60% of sustainable businesses reported that access to tailored government-backed financing was a key success factor.

In addition, the adoption of Circular Economy principles, which aim to minimize waste and resource depletion by designing products to be reused, recycled, or remanufactured, contributes to reducing the ecological footprint of businesses while promoting sustainable economic growth (Geetha et al., 2024). According to the Ellen MacArthur Foundation, adopting the circular economy could generate \$4.5 trillion in economic benefits by 2030 (Ellen MacArthur Foundation, 2022).

As for entrepreneurial commitment, it plays a crucial role in embedding sustainable development principles into business operations. Entrepreneurs must prioritize the social and environmental impact of their businesses, even if this requires adjustments in their commercial strategies (Ribeiro & Leitão, 2024).

Finally, public and entrepreneurial awareness of environmental and social challenges is essential to promote the adoption of sustainable practices. This may include training initiatives and awareness campaigns to encourage businesses to adopt sustainable models (Stoica, 2024). A study by the European Commission (2023) found that 65% of entrepreneurs reported that

sustainability training programs had a positive impact on their ability to innovate and implement sustainable practices.

1-3- Key Stakeholders

Sustainable entrepreneurship involves a wide range of stakeholders, each making a unique contribution to the ecosystem. Startups, established companies, NGOs, governments, and financial institutions all play a central role, while incubators and accelerators provide crucial support to innovative solutions. The interaction between these entities creates an enabling environment for sustainable practices.

Startups are often at the forefront of sustainable innovation. They leverage disruptive technologies and agile business models to address environmental challenges such as reducing carbon footprints and improving resource efficiency. However, these practices are not exclusive to startups and can be adopted by SMEs (Kothari, 2024). Innovations in sustainable entrepreneurship are essential to meeting contemporary environmental challenges. Technological innovation is at the heart of this transformation, with companies investing in green technologies such as renewable energy—like solar and wind power—which are vital for reducing carbon emissions (Priya et al., 2024). These technologies help reduce dependence on fossil fuels and promote cleaner and more sustainable energy production.

Innovations in energy efficiency and waste management also play an important role. For example, startups in Europe and North America are developing smart waste management systems that optimize recycling and reduce pollution (Bari et al., 2024). These systems help optimize resource use and minimize negative environmental impacts. Finally, process innovations that promote the circular economy encourage rethinking the product life cycle. Companies such as *Patagonia* are exemplary in promoting material sustainability and recycling (Sanyal, 2024). This model improves both resource efficiency and financial performance, thereby demonstrating its viability in the renewable energy sectors (Bari et al., 2024).

According to Stoica (2024), NGOs and governments play a crucial role by facilitating policy frameworks and offering incentives to support sustainable entrepreneurship. They also help overcome the regulatory challenges faced by startups. Financial institutions, for their part, provide essential funding and investment opportunities, which are often necessary to overcome the high initial costs associated with sustainable businesses (Stoica, 2024). Finally, incubators and accelerators offer mentorship, resources, and networking opportunities that are vital for the development of sustainable startups. An analysis conducted by the Kauffman Foundation showed that startups supported by incubators are 30% more likely to succeed than those that are not (Kauffman Foundation, 2023).

2- International Benchmarking

Sustainable development and sustainable entrepreneurship are increasingly important topics in the contemporary world. These concepts aim to combine economic, social, and environmental goals to create lasting value for future generations. This section examines different regions of the world in terms of their performance in these areas, using indicators such as the Global Innovation Index (GII), sustainable entrepreneurship, social impact, regulatory frameworks, and technological infrastructures.

2-1- In Europe

Europe is at the forefront of sustainable entrepreneurship, as evidenced by the European Green Deal (EGD), which aims to make the European Union climate-neutral by 2050. In Europe, sustainable development is supported by initiatives such as the European Green Deal and the Social Economy Action Plan. These policies aim to encourage green innovation and promote sustainable entrepreneurial practices. Europe generally ranks high in global innovation rankings, with a GII of 65. Technological infrastructures are advanced, and the regulatory framework is favorable to sustainable entrepreneurship. Countries such as the Netherlands and Sweden implement robust policies in favor of sustainable innovation, with numerous green business incubators and grants for environmentally-friendly projects (Štreimikienė et al., 2024). This framework encourages businesses to adopt sustainable practices in line with the Sustainable Development Goals (SDGs) (Grzybowska, 2023). Although Europe is a leader in this field, challenges remain, particularly in addressing social inequalities and ensuring equitable growth across all regions (Koundouri et al., 2024). Looking ahead, Europe plans to expand its Green Deal to include more economic sectors and foster green innovation in new industries (Štreimikienė et al., 2024). The Green Deal and incentive policies have had a significant impact on promoting sustainable practices, reducing carbon emissions by 10% since their implementation (Koundouri et al., 2024).

2-2- In North America

North America, with a GII of 60, also has a strong presence in the field of sustainable entrepreneurship. The United States and Canada are leaders in this area. Cities such as San Francisco and Toronto are implementing sustainability policies that encourage innovation and the creation of social enterprises (Egieya et al., 2023). These policies aim to promote B Corps and meet the growing consumer demand for social responsibility. Urban sustainability thus becomes a driver of economic growth and community engagement, strengthening the resilience of businesses in the face of environmental challenges. In comparison, Europe focuses on sustainability policies integrated at the EU level, while North America is distinguished by its local and municipal initiatives (Egieya et al., 2023). Looking ahead, growth potential in North America is bolstered by initiatives such as tax credits for renewable energy, which have stimulated the adoption of green technologies in the private sector (Egieya et al., 2023).

2-3- In Asia

Asia, with a GII of 55, is developing its capacities in sustainable entrepreneurship. The Asian region, particularly China and India, is experiencing strong growth in sustainable entrepreneurship. In China, government initiatives support renewable energy projects, while in India, startups are developing innovative solutions for access to clean water and energy (Egieya et al., 2023). Government support in these countries is crucial to advancing sustainable entrepreneurship and meeting the pressing needs of populations for essential services. In Asia, rapidly developing technological infrastructures contrast with those in Africa, where they are still in the early stages. However, both regions benefit from government support for specific projects such as renewable energy. Continued government support for renewable energy projects in China and innovative solutions for access to water and energy in India show promising prospects for sustainable entrepreneurship in the region (Egieya et al., 2023).

2-4- In Africa

Africa, with a GII of 40, faces significant challenges in sustainable development and entrepreneurship. The continent holds immense potential for sustainable entrepreneurship, particularly in the sectors of sustainable agriculture and clean technologies. Initiatives such as regenerative agriculture businesses and micro-financing solutions for renewable energy are emerging across the region (Egieya et al., 2023). These efforts aim not only to improve the living conditions of local populations but also to promote environmentally respectful economic growth. However, the regulatory framework is weak, and technological infrastructures are still in the early stages. The growth of these emerging sectors is crucial to addressing the environmental and socio-economic challenges the continent faces. Political and economic challenges, such as corruption and political instability, often hinder sustainable development in Africa. A stronger regulatory framework and better governance are essential to overcoming these obstacles. The growth potential in Africa is immense with the increase in investments in clean technologies and renewable energy, which could transform the continent's economic landscape (Egieya et al., 2023).

While Europe leads in sustainable entrepreneurship, each region of the world is developing its own initiatives and solutions tailored to its specific challenges. The interconnection of these efforts will contribute to a more sustainable future on a global scale. The comparative table below provides an overview of key initiatives and strategies, best practices, challenges, as well as future prospects and policy impact across the regions of Europe, North America, Asia, and Africa.

Table 1: Comparative of Sustainable Entrepreneurship in relation to the GII Index by Region

Region	Global Innovation Index (GII)	Key Initiatives and Strategies	Sustainable Entrepreneurship	Social Impact	Regulatory Framework	Technological Infrastructure	References
Europe	65	- European Green Deal (EGD), European Green Deal, Social Economy Action Plan - Robust policies supporting sustainable innovation (Netherlands, Sweden) - Grants for environmentally-friendly projects	High	Strong	Favorable	Advanced	(WIPO GII, 2024; Štreimikienė et al., 2024; Koundouri et al., 2024)
North America	60	- Sustainability policies in cities like San Francisco and Toronto - Promotion of B Corporations and social responsibility.	Medium	Moderate	Medium	Developed	(WIPO GII, 2024; Egieya et al., 2023)
Asia	55	- Government initiatives for renewable energy in China - Innovative solutions for access to water in India.	Medium	Moderate	Medium	Developed	(WIPO GII, 2024; Egieya et al., 2023)
Africa	40	- Regenerative agriculture and micro-financing for renewable energy.	Low	Low	Low	Early-stage	(WIPO GII, 2024; Egieya et al., 2023)

Source: Summary of Authors

Conclusion

Sustainable entrepreneurship focused on innovation emerges as a transformative force at a time when the world faces unprecedented environmental and social crises. Entrepreneurs play a key role in creating economic models that combine profitability with responsibility, addressing critical challenges such as climate change, biodiversity loss, and social inequalities. Through innovation and collaboration among various stakeholders, such as startups, established companies, NGOs, and governments, it is possible to develop viable and sustainable solutions. Success stories, such as Too Good to go and companies focused on the circular economy, illustrate that sustainable entrepreneurship is not only a response to current issues but also a driver of innovation that can redefine consumer expectations and influence traditional business practices. However, it is crucial to acknowledge the persistent challenges, including financing, regulation, and public awareness that hinder the full potential of this approach.

Through the comparative analysis of different regions, it is clear that Europe leads with robust political initiatives, while North America, Asia, and Africa are making significant efforts to promote sustainable entrepreneurship, though obstacles remain. International cooperation, sharing best practices and the involvement of both public and private actors will be crucial in catalyzing positive change on a global scale.

That being said, the future of sustainable entrepreneurship depends on the ability of businesses to innovate, adapt, and collaborate to create solutions that not only generate profits but also contribute to an ethical and sustainable future for generations to come. Entrepreneurs, as drivers of this change, have both the responsibility and the opportunity to shape a more equitable and environmentally respectful world.

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