

GREEN ECONOMY: THE ROLE OF THE UNIVERSITY IN GUIDING AND SUPPORTING STUDENTS TO ESTABLISH GREEN START-UPS

Kernaf Toufik¹

University of Tlemcen
kernaftoufik21@gmail.com

Boudia Mohammed Fouzi²

University of Tlemcen
fboudia@yahoo.fr

Abstract

As a necessary orientation toward achieving sustainable development, this article aims to highlight the importance of the transition toward a green economy. It addresses the concept of the green economy and the various mechanisms supporting it by highlighting the role of green innovation in developing environmentally friendly solutions and technologies, and the importance of green growth in achieving a balance between economic performance and environmental protection. It also highlights the role of green start-ups in providing innovative products and services that contribute to addressing environmental challenges and creating new economic opportunities. The article further discusses the importance of green taxes in directing economic behavior toward more sustainable activities, as well as green finance in supporting environmental investments and projects. The article concludes that achieving a sustainable economy requires concerted efforts by various stakeholders, particularly universities, through supporting scientific research and innovation, promoting a culture of sustainability, and educating and supporting students in transforming their ideas into green projects and start-ups that contribute to sustainable development.

Keywords: green economy; green innovation; green growth; green start-ups; green taxes; green finance.

¹ Received: March 07, 2026; Accepted: August 04, 2026; Published: September 3, 2026

© 2026 The Author. Published by AVADA. This is an open-access article distributed under the terms of the Creative Commons Attribution 4.0 International License (CC BY 4.0), which permits unrestricted use, distribution, adaptation, and reproduction in any medium, provided that the original author and source are properly credited.

<https://creativecommons.org/licenses/by/4.0/>



1. Introduction

Many regions of the world suffer from shortages of stable and secure energy sources, which constrain economic growth, while environmental degradation caused by energy use hinders long-term development in other regions. Consequently, there is a need to adopt environmentally friendly business practices that provide new opportunities for green entrepreneurs.

Many developing countries are working to rapidly expand their energy supplies through green business infrastructure, amid growing recognition among policymakers and investors worldwide that energy is an essential factor in raising living standards and maintaining economic growth (Amankwah, 2021).

Some studies have shown that economic growth has a negative effect on environmental protection. Economic strength is therefore viewed as a factor contributing to environmental degradation, particularly in the early stages of economic growth, when economies depend heavily on oil and gas. This relationship has been documented in studies covering Bangladesh, the Middle East and North Africa, major natural-gas suppliers in Africa, Pakistan, Egypt and the United States and Europe, South Asia, and developing countries.

On the other hand, other studies indicate that sustainable development can depend on green economic growth. Greater reliance on environmentally friendly and energy-efficient innovations, dissemination of environmental knowledge and expertise, encouragement of sustainable energy production, and diversification of the energy mix through expanded use of renewable energy sources can all contribute to green economic growth. This has been demonstrated in studies covering seven case studies, the G7 countries, Africa, the 20 largest countries in green innovation, and the BRICS countries (Houssam, 2023).

There is growing political consensus on the need to green the economy and decouple economic growth from environmental impacts (OECD, 2011). Greening the economy requires a strategy for sustainable transitions and fundamental changes in patterns of production and consumption (UNEP, 2011).

One key element is facilitating and managing the multilevel challenge of sustainable transitions (Geels, 2010) through the development, implementation, and diffusion of radically new or significantly improved products, whether goods or services, together with processes or practices that reduce the use of natural resources and the release of harmful substances throughout their entire life cycle (EIO, 2013; Bergset, 2015, p. 2).

According to Rosen and Dincer (2005), green energy resources and innovation are essential components of sustainable development because of their lower environmental impact compared with other forms of energy. Green energy services also take diverse forms, allowing a wide range of applications and uses (Amankwah, 2021).

Accordingly, sustainable innovation and its diffusion are essential components of any strategy aimed at bringing about societal transformation toward sustainable development and a green economy (Bergset, 2015).

There is therefore no longer any doubt that environmental protection and sustainable development have a substantial and positive influence on one another. While the world seeks to achieve sustainable economic growth, it faces numerous environmental problems that have gained global recognition, and countries have begun taking effective measures to address them and achieve sustainability, not only from the perspective of economic growth but also from an environmental perspective.

This study aims to examine the concept of the green economy and the role of the university in encouraging the establishment of green start-ups.

2. Green Economy

The green economy (GE) is a complex and ambiguous system consisting of many interconnected systems and their associated systemic elements (Alsmadi et al., 2023). Although numerous definitions of the green economy have been proposed, most tend toward a conception based on four fundamental pillars: environmental resource scarcity, justice, human well-being, and environmental risks (Saum-Merino et al., 2020).

Some researchers explicitly link the green economy to the concept of sustainable development (SD), which emerged and evolved at earlier stages, whereas others regard the green economy as a component that depends on the natural environment and simultaneously forms part of the global ecosystem (Saum-Merino et al., 2020; Telukdarie, 2024).

Within the framework of the fundamental principles of the Rio Declaration and Agenda 21, the United Nations Conference on Environment and Development held in 1992 emphasized the importance of developing national strategies for sustainable development. Despite the efforts made by numerous governments around the world to implement such strategies, as well as international cooperation to assist these countries, many concerns and challenges related to environmental sustainability and economic prosperity remain.

These challenges include recent fuel and food crises and the financial crisis, in addition to the effects of climate change, depletion of natural resources, ecosystem degradation, and biodiversity loss. Governments around the world have made numerous attempts to identify effective means of helping their countries overcome these interconnected crises, while taking into account biodiversity problems and the ecological limits imposed by natural systems.

Hence, there emerged a need for a new concept capable of bringing together these issues and addressing them in an integrated manner. Since the emergence of the concept of the Green Economy in 2008, it has attracted considerable global attention, particularly because it was used as a tool to help address the global financial crisis, and it gained further importance during the United Nations Conference on Sustainable Development (Rio+20) in 2012.

The green economy reshapes both production methods and the sectoral composition of the workforce. The shift toward low-carbon technologies leads to contraction in many traditional sectors while contributing to the emergence of new occupations centered on environmental sustainability. A

comprehensive analysis conducted by the UK Energy Research Centre showed that investments in renewable energy generate more jobs than investments in fossil-fuel sectors and produce positive local economic effects (Hanna et al., 2022). Emerging employment areas include solar energy, electric-vehicle systems, building insulation, and carbon accounting (Erdemir, 2025).

The concept of the green economy has also become widely recognized according to the definition of the United Nations Environment Programme (UNEP), which views it as an approach that harmonizes three fundamental elements: human capital, the environment, and social justice.

According to the UNEP report (2011), macroeconomic model projections showed that the transition toward a green economy can, after several years, lead to greater economic growth, more employment opportunities, and poverty reduction.

Under a green economy system, growth in per-capita income and employment levels should rely on new green investments, whether public or private, that are less dependent on the exploitation of natural resources and environmental assets. Such investments also reduce carbon emissions, promote efficient energy use, and limit environmental degradation, thereby enabling countries to achieve more sustainable economic growth.

The transition toward a green economy should be consistent with the principles of environmental sustainability and social justice. The concept of a just transition is central to achieving this balance and refers to a set of social policy measures designed to prevent job losses and reduce inequalities and regional disparities resulting from the phase-out of fossil-fuel sectors. The International Labour Organization defines it as an inclusive, people-centered process that ensures that no one is left behind while environmental objectives are achieved (International Labour Organization, 2023; Erdemir, 2025).

The green economy contributes to the creation of many new investments and sectors, such as green technology, green transport, and green cities in countries such as China, India, Egypt, Malaysia, and others. This contributes to the creation of green jobs, strengthens the economy, reduces environmental degradation, and supports adaptation to and mitigation of climate-warming effects, in addition to addressing other challenges facing developing countries.

In parallel with the ambitions of the green economy, one of the fundamental objectives of sustainable development is to promote economic progress while maintaining environmental quality. Consequently, recent decades have witnessed extensive debate over the environmental effects of economic growth, particularly in developing countries.

Given the level of development achieved by developing countries, which is expected to continue over the coming decades, these findings are highly significant for them. The literature also indicates that studying this relationship addresses an important research problem in developing-country economies.

The green economy has attracted substantial attention from researchers because of its multiple effects, particularly on employment and the labor market. According to UNEP, the green economy promotes social justice and creates employment opportunities, indicating a positive effect on the labor market.

The International Labour Organization (ILO) agrees, arguing that the green economy has the potential to create millions of new jobs. Accordingly, numerous studies have examined the relationship between the green economy and employment levels by studying the relationship between environmentally friendly innovation and the creation of new jobs, as well as the relationship between green jobs and the green economy, which contributes to generating new investments with positive outcomes (Houssam, 2023).

The relationship between economic progress and the environment has received extensive attention in economic literature. Environmental protection is a fundamental issue in the debate on the economic relationship between the environment and economic growth. According to traditional economic theory, there is an accepted trade-off between environmental protection and economic growth.

In addition to traditional economic theory, Malthus also attempted to study the relationship between environmental resources and population growth. His study showed that incorporating environmental constraints into the economic model demonstrates that growth in food production cannot simultaneously continue to support population growth indefinitely. This can be interpreted as a set of issues related to the environmental carrying capacity, whose roots can be traced to the early origins of the idea of the green economy (Houssam, 2023).

Environmental ethics are defined as a set of ethical principles relating to the environment that provide guidelines for practical human behavior aimed at achieving environmental values and ethics (Hudha & Rahardjanto, 2018; Sadma, 2021).

The essence of the necessary environmental ethical system, which can constitute a basis for sustainable development, lies in three fundamental principles (Sadma, 2021):

1. Believing that the natural resources available on Earth are limited.
2. Considering human beings as part of nature rather than separate from it.
3. Not considering human beings superior to nature with respect to environmental elements, including biotic, abiotic, and socio-cultural components (Neolaka, 2008; Febriana, 2017).

Effective community participation in environmental protection and management consists of:

1. Raising awareness of the importance of environmental protection and management.
2. Promoting independence, community empowerment, and partnerships.
3. Developing community capacities and community leadership.
4. Strengthening the community's response to social monitoring.
5. Developing and preserving local culture and knowledge within the framework of maintaining ecological functions.

Environmental resilience is one of the dimensions determining national resilience and the capacity of a state to withstand shocks. Environmental problems cannot be solved solely through traditional problem-solving methods; innovative solutions based on technological approaches are needed to accelerate problem-solving and scale up such solutions.

The development of environment-based start-ups is one approach that the private sector can adopt as a form of commitment to environmental sustainability (Sadma, 2021).

3. Green Enterprises

According to the World Economic Forum's Future of Jobs Report 2025, the sectoral impact of green jobs involves both quantitative and qualitative changes. Fast-growing occupations within the green transition include wind and solar energy technicians, sustainability consultants, environmental impact assessment specialists, and circular-design engineers (World Economic Forum [WEF], 2025). These occupations combine technical expertise with environmental and social awareness, reflecting not only sectoral diversification but also a qualitative redefinition of occupational structures (Erdemir, 2025).

The expansion of green jobs brings about sectoral transformation while reshaping workforce skill profiles. This transformation requires the development of a new skills structure based on multidimensional competencies, including technical expertise, environmental awareness, systems thinking, and digital literacy (Erdemir, 2025).

Recent OECD research emphasizes the importance of these competencies not only for emerging green occupations but also for redefining existing occupational roles. In particular, workers in manufacturing sectors face substantial reskilling needs to enable effective transitions into green jobs (OECD, 2023; Erdemir, 2025).

3.1. Green Start-ups

Competency-based green entrepreneurship aims to reduce environmental impacts and resource consumption throughout the product life cycle while providing products and services that meet human needs, contribute to improving quality of life, and are competitively priced (Iqbal et al., 2025).

Start-ups and new firms are among the most prominent market actors in developing and commercializing radical sustainable innovations, whereas established firms often dominate innovation markets in general. This highlights the need for environmental policies and regulations to give special attention to green start-ups that develop and deliver products or services contributing to green-economy objectives (Sreenivasan, 2023).

Green entrepreneurship has currently become a growing practice aimed at developing new business opportunities and is also regarded as a means of addressing social and environmental issues (Mondal et al., 2023). Green entrepreneurship has been defined as a business activity that combines environmental awareness with entrepreneurial action, representing an important dimension in the transition toward sustainable business models (Gibbs & O'Neill, 2014).

Green entrepreneurial behavior refers to the ability or knowledge that enables an individual to take actions beneficial to the environment while simultaneously generating profit. This acquired capability motivates the entrepreneur to move toward planning and seeking to establish an environmentally friendly venture (Qazi et al., 2020; Mawardi, 2025).

Recent empirical findings emphasize the need to distinguish between the types of organizations that develop and implement sustainable product or service innovations. Start-ups and new firms are clearly the principal market actors in developing and commercializing radical sustainable innovations, whereas incremental innovations tend to be more closely associated with established firms (Fichter & Weiß, 2013).

Accordingly, green start-ups that develop and implement products or services contributing to green-economy objectives, such as reducing greenhouse-gas emissions, improving energy-use efficiency, and adopting a circular-economy approach, should receive substantial attention in innovation and environmental policies.

Sustainable entrepreneurship is an innovative, market-oriented, and personality-based form of entrepreneurship aimed at creating economic and societal value through market or institutional breakthrough innovations that benefit the environment or society (Wagner & Schaltegger, 2011).

Sustainable entrepreneurship creates economic value through market activity and societal value through positive externalities or by reducing negative externalities. Unlike public, charitable, or NGO activities that have societal effects, sustainable entrepreneurship, because it operates in a business context, needs to be financially sustainable in the medium and long term (Patzelt & Shepherd, 2011; Thompson et al., 2011).

Based on the preceding definition of sustainable entrepreneurship, research in this field intersects with a broad range of theories and research related to sustainable business practices, such as environmental management, business ethics, stakeholder theory, and corporate social responsibility (CSR).

The distinction between sustainable entrepreneurship and other similar forms of entrepreneurship, such as social entrepreneurship and environmental entrepreneurship/ecopreneurship, remains a subject of debate (Wagner & Schaltegger, 2011; Thompson et al., 2011).

In this context, sustainable entrepreneurship is viewed as a specific form of entrepreneurship that achieves the triple bottom line, namely the creation of economic, environmental, and social value through sustainable innovation.

Sustainable entrepreneurship can occur in established and stable firms (incumbents) as well as in start-ups and new firms. While established firms generally improve radical innovations through investment in incremental innovation processes, radical innovations arise to a greater extent in smaller, newer, and more entrepreneurial firms (Baumol, 2010).

The development of modern technology and information and communication technologies has facilitated people's ability to innovate solutions to existing problems. Today, the use of technology to address such problems is translated into a business model managed by start-ups.

A start-up is defined as an entity created to develop new and innovative products or services under conditions characterized by a high degree of uncertainty (Bukhori, 2021).

Similar findings have also been reached concerning sustainable innovation (Weiß & Fichter, 2013), suggesting that start-ups may have a greater impact on the transition toward a sustainable or green economy.

3.2. Characteristics of Green Start-ups

The green characteristics of start-ups can, in particular, be associated with three aspects of their business activity (Bergset, 2015).

Product-related characteristics: Are the products—goods or services—provided by the start-up green or not? Although researchers and practitioners often prefer to speak of a green sector or clean-technology sector, green goods and services can be offered in most, if not all, sectors. It is therefore reasonable to consider the potential environmental impact of products and assess their degree of greenness on the basis of these characteristics.

A useful sectoral classification in this regard is the Environmental Goods and Services Sector classification developed by Eurostat (2009). This classification focuses both on end-of-pipe pollution-control solutions, classified under the Classification of Environmental Protection Activities, and on resource-management approaches, classified under the Classification of Resource Management Activities.

These classifications include all business-related activities contributing to seven main environmental objectives:

1. Renewable energy.
2. Energy efficiency.
3. Renewable resources.
4. Resource efficiency.
5. Circular economy.
6. Waste management, emission reduction, and climate protection.
7. Biodiversity and ecosystems.

Thus, determining whether a start-up is green does not necessarily depend on the sector to which it belongs, but rather on the extent to which its products or services contribute to achieving environmental objectives and reducing negative environmental impacts.

Entrepreneur-related characteristics: How do entrepreneurs contribute to strengthening the green character of their start-ups? Many researchers in the sustainable entrepreneurship literature focus on the influence of entrepreneurs' motivations and values (Gray & Balmer, 2004; Schlange, 2006; Schaltegger & Wagner, 2011; Parrish, 2010), as well as their attitudes and orientations toward sustainability issues within the firm (Wagner & Kuckertz, 2010).

In addition, an entrepreneur's technical, business, and sustainability-related qualifications and knowledge can be regarded as important factors (Choi & Gray, 2008; Nicholls & Pharoah, 2008; Patzelt & Shepherd, 2011). These elements affect how the start-up is managed and developed over time.

Strategy-related characteristics: How can strategy strengthen or weaken the sustainability of a firm? Although these characteristics are clearly related to the entrepreneur, the strategy of a start-up is not determined solely by the founder's values and desires. Rather, it develops through continuous interaction between the firm's founders and managers on the one hand and external stakeholders on the other, such as investors, suppliers, and customers.

Although the importance and impact of these factors have been identified, research still needs to explore the full range of additional challenges and potential new opportunities that green start-ups may face compared with other start-ups, and how these challenges and opportunities may affect their interactions with investors and other market actors, such as customers, employees, suppliers, competitors, and support organizations.

When start-ups develop green goods or services, they seek market-based solutions to environmental problems that, until recently, were largely considered the responsibility of public policy and non-profit organizations (Venkataraman & York, 2010). This process may require considerable effort and time (Freimann, 2005).

Because entrepreneurs in this field have more diverse motivations, knowledge, and backgrounds, and are often less commercially oriented than entrepreneurs in traditional start-ups, they may encounter difficulties obtaining support and financing from traditionally business-oriented actors (Linnanen, 2002; Shepherd & Patzelt, 2011).

4. Green Innovation

Innovation can play a pivotal role because it can transform knowledge into ideas and ideas into green products that can be used across different sectors of the economy, such as industry, agriculture, and services, thereby contributing to green economic prosperity. In the green-economy literature, Takalo et al. (2021) emphasize the importance of innovation in supporting the transition toward a more sustainable economy (Sun, 2023).

Studies of innovation and technology related to sustainability have received increasing attention over the past ten to fifteen years (Markard et al., 2012, p. 955). The importance of sustainable innovation management has also increased both in practice and in academic circles (Schiederig et al., 2012).

But what exactly is meant by sustainable innovation? Several terms have been widely used in academic circles to describe similar phenomena. Among the most prominent terms used since the mid-1990s are (Bergset, 2015):

- Environmental innovation / Eco-innovation (Fussler, 1996; Rennings, 2000; Kemp & Pearson, 2007; OECD, 2009; Horbach et al., 2012).
- Sustainability Innovation (Fichter & Pfriem, 2007; Arnold & Hockerts, 2010).
- Sustainable Innovation (Wüstenhagen et al., 2008; Nill & Kemp, 2009; Hockerts & Wüstenhagen, 2010).
- Sustainability-oriented Innovation (Klewitz & Hansen, 2014).
- Green Innovation (Schiederig et al., 2012).

Although a distinction is often made between environmental and social issues associated with innovation, it is very difficult to draw clear boundaries between them.

A recent analysis of 8,516 publications in scientific journals found that 40.7% (3,469) used the term environmental innovation, 31.9% (2,716) used sustainable innovation, 17.6% (1,495) used eco-innovation, and 9.8% (836) used green innovation. More than 80% of the publications appeared to use only one term, indicating that these terms are used consistently within individual publications (Schiederig et al., 2012, p. 183).

The analysis also shows that three different concepts—green innovation, eco-innovation, and environmental innovation—are largely used as synonyms, whereas sustainable innovation broadens the concept to include the social dimension (Bergset, 2015).

Solving environmental problems requires business practices that do not focus solely on profit generation but also consider social impacts and environmental sustainability. Companies should therefore adhere to the triple-bottom-line principle, focusing their business activities on developing products or services with positive environmental impacts that contribute to the environmental objectives of the green economy (Fichter & Bergset, 2015).

Green strategies primarily help firms make decisions that have positive effects on the environment (Olson, 2008).

Generating profits through activity in the environmental sector is not easy for start-up developers because environmental issues are closely connected to social and political aspects (Sadma, 2021).

Green innovation is increasingly recognized as a multidimensional concept encompassing product, process, and system innovations, with priority given to environmental sustainability. Guinot et al. (2022) define it as the development of environmentally friendly, non-harmful, sustainability-oriented products and services. Green innovation is not limited to reducing environmental impacts; it also functions as a strategic tool for strengthening firms' competitiveness (Erdemir, 2025).

Tseng et al. (2013) classified green innovation into four categories: managerial innovation, product innovation, process innovation, and technological innovation. This classification highlights that firms' environmental strategies extend beyond production to include organizational structures, management practices, and technology integration (Erdemir, 2025).

5. Green Energy

According to Stern (2011), the continuous increase in energy demand, together with sustained economic growth and the expansion of global markets, leads to greater dependence on non-renewable energy sources, resulting in higher levels of carbon emissions. Accordingly, an important relationship exists between energy demand and economic growth, as increased energy consumption is one of the factors driving emissions and thus negatively affects the environment (Li, 2023).

Green energy has emerged as a fundamental pillar of sustainable development. It encompasses energy-production methods based on low-carbon and environmentally friendly sources. This section adopts a multilevel approach to exploring the concept and definition of green energy, the technologies associated with it, relevant policy and financing mechanisms, and the principal methodological gaps identified in the scientific literature (Erdemir, 2025).

Green energy refers to energy-production methods that use natural resources while minimizing environmental impacts and aligning with sustainable-development objectives. Although it is often considered part of renewable energy, not all renewable energy sources are necessarily classified as green. For example, some biomass applications can produce significant carbon emissions, making their classification as environmentally green energy complex (Constellation Energy, 2022; International Renewable Energy Agency, 2022; Erdemir, 2025).

Aktar et al. (2020) define green energy as clean energy sources that have a lower environmental impact than conventional energy technologies, emphasizing their role in combating climate change and advancing sustainable economic and social transformation.

A recurring topic in the scientific literature is the distinction between green energy and renewable energy. While renewable energy generally refers to energy sources that naturally replenish themselves, green energy focuses on the net environmental impact resulting from energy production. Green energy is closely associated with low-carbon energy systems. The International Energy Agency's (IEA) Net Zero by 2050 roadmap projects that 90% of global electricity generation will come from renewable sources by 2050, with the aim of reducing carbon emissions to levels approaching zero (International Energy Agency, 2021). This transition affects not only energy production but also consumption patterns, infrastructure, and regulatory frameworks and policies (Erdemir, 2025).

The International Renewable Energy Agency (IRENA) also emphasizes that green energy is a strategic tool for achieving climate goals, expanding access to energy, creating jobs, and promoting social and economic development (International Renewable Energy Agency, 2023). Accordingly, green energy plays a multidimensional role within the broader sustainable-development agenda (Erdemir, 2025).

In conclusion, green energy represents a transformative tool integrating environmental sustainability, the transition toward low-carbon systems, and social inclusion. The multiplicity of its definitions reflects the interdisciplinary nature of the concept and its capacity to adapt to different contexts and applications.

6. Green Growth

The idea of green growth was introduced during the United Nations Conference on Sustainable Development (Rio+20), held in Rio de Janeiro in 2012 (Xu, 2022).

Green growth represents a comprehensive development model that seeks to reconcile economic progress with environmental sustainability. The Organisation for Economic Co-operation and Development (OECD) defines green growth as a strategy that promotes economic development while ensuring that natural assets continue to provide the resources and ecosystem services essential for human well-being (OECD, 2011).

By challenging the assumption that an inevitable trade-off exists between economic growth and environmental protection, green growth emphasizes the possibility of achieving both objectives simultaneously through appropriate policy instruments. The concept gained increasing importance as an exit strategy for both developed and developing countries following the global financial crisis of 2008.

UNEP also describes green growth as a low-carbon, resource-efficient, and socially inclusive transformation capable of reducing poverty, creating employment opportunities, and supporting sustainable development (United Nations Environment Programme [UNEP]).

Academic literature approaches green growth through three principal theoretical perspectives:

Neoliberal approach: This approach focuses on market mechanisms and technological innovation to address environmental challenges. Key policy instruments include carbon pricing, green taxes, and incentives directed toward private-sector investment (Hallegatte et al., 2012).

Ecological economics approach: This approach emphasizes that economic activity must operate within environmental and ecological limits. Daly and others advocate a development pattern that prioritizes qualitative improvements rather than quantitative expansion while recognizing the limitations of natural resources (Daly, 1997).

Post-growth approach: This approach questions the compatibility of conventional economic growth with sustainability objectives and advocates alternatives such as post-growth or degrowth economies

and Doughnut Economics, with the aim of redefining prosperity and human well-being (Bailey & Schulz, 2014; Raworth, 2018).

Despite the growing influence of the green-growth concept, it continues to suffer from definitional variations and methodological imbalances, particularly regarding the gap between theoretical concepts and available measurement tools, as noted by Georgeson et al. (2017). These gaps pose challenges for evaluating the effectiveness of green-growth policies and initiatives and for measuring their success in achieving economic, environmental, and social objectives.

7. Green Taxes

Green taxes refer to fiscal policy instruments designed to internalize environmental externalities within economic costs, redirect market behavior by pricing environmentally harmful activities, and promote sustainable development. In this framework, tax systems reflect the economic costs of environmental degradation, thereby contributing to increased public revenues while simultaneously directing behavior toward more environmentally responsible practices (United Nations Environment Programme [UNEP]).

From the perspective of basic economic theory, green taxes are based on the theory of externalities developed by the British economist Arthur C. Pigou. Pigou argued that social costs associated with activities generating negative externalities can be incorporated into private costs through appropriate taxation, thereby directing producers and consumers toward a socially optimal equilibrium (Pigou, 1920).

This principle forms the basis of the double-dividend hypothesis, which assumes that taxing emissions and environmentally harmful activities can simultaneously improve environmental quality and increase public revenues. Oates (1995) further strengthened this framework by emphasizing that green taxes serve both environmental and fiscal objectives, making them a key mechanism for integrating environmental considerations into fiscal policy.

In the scientific literature, green taxes encompass several related mechanisms, including:

- Carbon pricing.
- Environmental taxes.
- Energy taxes.
- Emissions trading systems (ETS).
- Fees imposed on resource use.

According to the World Bank report *State and Trends of Carbon Pricing* (World Bank, 2023a), 73 carbon-pricing instruments were in operation in 2023, covering approximately 23% of global greenhouse-gas emissions. These instruments include carbon taxes and emissions trading systems

(ETS) and aim to incorporate environmental costs into market mechanisms in order to stimulate behavioral change while simultaneously generating public revenues.

8. Green Finance

Green finance has gained increasing importance in recent years as a strategy for directing capital toward environmentally sustainable activities. However, the literature still lacks a clear consensus on its definition. The UNEP Inquiry into the Design of a Sustainable Financial System (2016) presents green finance as a set of policy and institutional mechanisms that direct capital toward areas such as environmental protection, energy efficiency, and clean energy.

In contrast, the OECD defines it more broadly as financial activities that support economic growth while reducing resource use and environmental harm (Organisation for Economic Co-operation and Development [OECD], 2024b).

These differences in definition blur the boundaries between green finance and related concepts. The International Finance Corporation (IFC) distinguishes green finance, which focuses on achieving environmental benefits, from sustainable finance, which encompasses broader development objectives (International Finance Corporation, 2023). In this context, green finance is not limited to climate-related investments but also includes instruments targeting biodiversity, water infrastructure, and pollution reduction.

The clearest forms of green finance are the financial instruments and mechanisms that direct capital toward environmentally sustainable investments. These instruments channel financing toward low-carbon projects and nature-supporting projects, with green bonds standing out as the most common example.

Sartzetakis defines green bonds as debt securities issued to finance projects with environmental benefits. This market has grown rapidly since its launch in 2007, led by institutions such as the European Investment Bank and the World Bank (Sartzetakis, 2021). In addition to green bonds, the principles established by the Loan Market Association state that green loans should finance activities that deliver measurable environmental benefits and should be accompanied by transparent reporting.

In the Asia-Pacific region in particular, green loans have played a central role in enabling small and medium-sized enterprises to access sustainability-oriented financing (Organisation for Economic Co-operation and Development [OECD], 2022).

Through its Green Financing for the Sustainable Development Goals (SDGs) strategy, UNEP seeks to align financial systems with the 2030 Sustainable Development Agenda. The strategy recommends reforms in financial regulation, stronger public-private partnerships (PPP), and the integration of inclusive mechanisms such as microfinance into the green transition (United Nations Environment Programme [UNEP]).

In parallel, the UNEP Finance Initiative promotes the adoption of sustainability principles in banking, insurance, and investment sectors.

The global development of green finance depends not only on market dynamics but also on institutional strategies and public policies. The OECD report entitled *Green Finance: Policies, Institutions, and Instruments and Governance* emphasizes the importance of a comprehensive policy approach and strong regulatory frameworks focused on environmental integrity as two fundamental conditions for effective green finance (Organisation for Economic Co-operation and Development [OECD]). This approach requires public financial institutions and regulatory authorities to play an active role in reshaping the financial system.

9. Conclusion

Higher-education institutions and universities play a crucial role in identifying environmental entrepreneurial opportunities, raising awareness, implementing environmental practices, disseminating environmental knowledge, creating an entrepreneurial ecosystem, and shaping students' entrepreneurial intentions toward engagement in green business projects (Risco-Alvarez et al., 2021; Amponsah et al., 2024).

University students possess high levels of self-efficacy and entrepreneurial intention toward establishing innovation-based business projects (Li et al., 2023; Mabkhot et al., 2024). To establish a green entrepreneurial venture, students need social support, enhanced individual motivation, entrepreneurship education, university support, green awareness and mindfulness, as well as cognitive self-efficacy and individual attitudes, all of which contribute significantly to strengthening orientation toward green entrepreneurship (Zhang et al., 2024).

Developing countries are promoting green entrepreneurship through government programs and regulatory frameworks to address multidimensional issues, including pollution, natural-resource scarcity, environmental degradation, carbon emissions, poor waste management, deforestation, and climate change (Mishra et al., 2024).

Prevailing cultural values associated with sustainability, together with the distinctive economic opportunities and barriers characterizing green entrepreneurship, make this form of entrepreneurship different from its counterpart in developed countries or in other developing countries (Mawardi, M. K., 2025).

Patzelt and Shepherd (2011) confirmed that green entrepreneurship can contribute to protecting ecosystems, improving environmental quality, and reducing deforestation. Therefore, building and strengthening green entrepreneurship is not a task that falls solely on business organizations; higher-education institutions should also participate by involving professors and students.

Previous studies have confirmed that institutional support, such as support provided by universities, can contribute to promoting entrepreneurship (Risco-Alvarez et al., 2021). Universities can achieve this by adopting green curricula that include lectures and seminars focusing on the green economy and green entrepreneurship, alongside providing financial support through competitive programs.

Given long-term global trends, such as those associated with education, health, and sanitation, universities are undergoing a transformation in entrepreneurship education. To adapt to the requirements of sustainable and socially and economically oriented development, green entrepreneurship represents a means of contributing to environmental protection and preventing environmental degradation (Amankwah, 2021).

This study was limited to concepts related to the green economy and the role of the university in guiding and supporting students in establishing green enterprises. This opens the way for future studies on the role of university curricula in guiding students toward establishing green enterprises.

References

- Amankwah, J. (2021). On the relation between green entrepreneurship intention and behavior. *Sustainability*, 13(13), 7474.
- Bergset, L. (2015). Green start-ups – a new typology for sustainable entrepreneurship and innovation research. *Journal of Innovation Management*, 3(3), 118–144.
- Colombelli, A. (2019). Green start-ups and local knowledge spillovers from clean and dirty technologies. *Small Business Economics*, 52(4), 773–792.
- Erdemir, N. A. (2025). Green economy in focus: A comprehensive review of its thematic dimensions. *Yildiz Social Science Review*, 11(2), 134–163.
- Freiha, S. S. (2025). Belief to action: The role of norms and resource perceptions in green entrepreneurship intentions. *Discover Sustainability*, 6(1), 1232.
- Houssam, N. I.-A. (2023). Assessing the role of green economy on sustainable development in developing countries. *Heliyon*, 9(6).
- Li, B. W. (2023). The future of green energy: A panel study on the role of renewable resources in the transition to a green economy. *Energy Economics*, 127, 107026.
- Mawardi, M. K. (2025). Green entrepreneurship in the era of sustainability: The relationship between intent, institutional support, and student behavior. *Cogent Business & Management*, 12(1), 2460625.
- Mawardi, M. K. (2025). Green entrepreneurship in the era of sustainability: The relationship between intent, institutional support, and student behavior. *Cogent Business & Management*, 12(1), 2460625.
- Sadma, O. (2021). The role of environmental-based “green startup” in reducing waste problem and its implication to environmental resilience. *Research Horizon*, 1(3), 106–114.
- Sreenivasan, A. (2023). Green start-ups: Start-ups accelerating sustainability. *International Journal of Global Business and Competitiveness*, 18(1), 80–89.

- Sun, Y. G. (2023). Green innovation for resource efficiency and sustainability: Empirical analysis and policy. *Resources Policy*, 81, 103369.
- Telukdarie, A. K. (2024). Exploring the green economy – A systems thinking modelling approach. *Journal of Cleaner Production*, 436, 140611.
- Xu, X. (2022). The impact of natural resources on green growth: The role of green trade. *Resources Policy*, 78, 102720.