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## **INNOVATIONS, ENTREPRENEURSHIP AND THE GREEN ECONOMY**

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**Abstract:** Green entrepreneurship, considered inherently innovative, along with the green economy, represents key components for sustainable development and environmental protection. The green economy, as an economic model, emphasizes reducing the negative impact of human activities on nature, while green entrepreneurship encourages entrepreneurs to develop innovative, environmentally responsible products and services.

“It is an economy that contributes to the common good and social equity while significantly reducing environmental risks and the exploitation of natural resources.” Both sectors have the potential to stimulate economic growth, create new jobs, and contribute to solving global challenges such as climate change, pollution, and biodiversity loss. The green economy is the result of efforts to make the economy more environmentally responsible and at the same time more advanced, creating a balanced and positive impact on society and the environment.

Green entrepreneurship is a business approach that combines economic goals with environmental responsibility. Entrepreneurs engaged in green entrepreneurship use innovations and technologies to develop products and services with a lower environmental impact, support circular processes, and ensure sustainable energy sources.

**Keywords:** *entrepreneurship, green economy, innovation, environmental protection.*

## 1. INTRODUCTION

Education, research, and innovation represent the fundamental drivers of development in a knowledge-based society. A progressive society is built upon proactive individuals and entrepreneurial activity, which is present globally and observable in both developing and developed countries.

Global economic trends, climate change, and shifts in the global economic environment have made the green economy a highly relevant topic and an operational imperative for developed economies. The green economy is defined as one whose outcomes lead to the improvement of human well-being and social equity with minimal environmental impact (United Nations Environment Programme [UNEP], 2011, p. 16). It aligns with the term "green growth," which focuses on the increased use of renewable resources, recycling, and energy efficiency. Green growth refers to economic growth with minimal environmental impact (Jacobs, 2012).

Given this, the green economy and green growth can be viewed as inseparable links functioning in the service of achieving sustainable growth and development. One of the assumptions of the green economy concept is the replacement of the conventional linear production model with a model of industrial ecology. Generally, the traditional model can be simplified into four steps: "take-make-use-dispose." In addition to goods and services, this model results in large amounts of waste that harm the environment.

Therefore, a transition to a circular model is necessary, one that implies a **zero waste** approach. To implement industrial ecology, changes are required at both the micro and macro levels. For instance, companies as basic economic entities need to redefine their goals – incorporating sustainability and environmental protection alongside economic maximization. This brings economic and ecological goals closer together, which were often considered mutually exclusive in the past.

The inclusion of all external costs reduces pressure on limited resources and contributes to improving the environmental landscape. Furthermore, changes in the product life cycle in an organizational sense, as well as a paradigm shift within companies, are required. Specifically, reducing energy consumption, CO<sub>2</sub> emissions, and operational costs in procurement, production, and logistics phases results in a more energy-efficient production process and products with minimal environmental impact.

The realization of circular economy goals is also supported by an increasing number of green business ideas that prioritize planetary health over profit through ecological entrepreneurship.

## 2. THE CONCEPT AND DEFINITION OF ENTREPRENEURSHIP AND INNOVATION

Humanity has come a long way from the primitive Stone Age to the post-industrial era. The 19th century is considered one of the key periods during which the quality of everyday life greatly improved. One of the major contributions of the 20th century was the creation of communication without limits or barriers. In the 21st century, that trend has continued at an even greater pace, but the terrain is challenging – opportunities are emerging, yet so are threats.

Moreover, most people today, when looking at the world around them, see only chaos. "They suffer from feelings of personal powerlessness and hopelessness" (Karavidić, Ivković, 2020:13).

There is no standard or universally accepted definition of entrepreneurship. Very often, entrepreneurship is equated with starting a new business, small business management, ownership, or self-employment. However, it should be noted that entrepreneurship is not limited to creating new small businesses.

Entrepreneurship implies a constant need for change, and the time required for change is becoming increasingly shorter. This means that innovation and entrepreneurial creativity must be applied. Entrepreneurial thinking is directed toward and encourages risk-taking, decision-making in critical moments, the belief in introducing innovations into all areas of activity, and a sense of stability in unstable environments.

### 2.1. The Concept of Innovation

The concept of innovativeness and innovation has significantly evolved over the past decade. In its 1995 **Green Paper on Innovation**, the European Commission defines innovation as:

*"the improvement and expansion of the range of products and related markets; the establishment of new methods of production, procurement, and distribution; and the introduction of changes in entrepreneurship, organization, and working conditions of employees."*

Innovation, as a specific form of change or novelty, is a very broad concept that can be defined across various fields. Schumpeter defined it as a fundamental element of technological progress, while **Drucker** defined it as a key element of entrepreneurship:

*"Innovation is the means by which entrepreneurs exploit change as an opportunity for a different business or service. Innovation can be presented as a discipline – it can be learned and practically applied."* (Drucker, 1996:199).

**Porter** defines one of the key elements of innovation as the **ability of an enterprise to implement successful innovation projects** (Porter, 1980:223).

Therefore, entrepreneurship is based on innovation processes – innovativeness represents the foundation of every entrepreneurial endeavor. A key criterion for the

success of entrepreneurial innovation is its impact on the development of competitiveness and capabilities that build competitive advantage and market superiority.

In the global economy, innovation is a strategic factor of development, where the innovativeness of enterprises should ensure strategic advantage at all socio-economic levels.

The term *innovation* originates from the Latin word *inovatio*, meaning "novelty" or "changing the existing." Innovation is often associated with creativity. However, as Professor **Theodore Levitt** noted, the difference between creativity and innovation is:

*"Creativity thinks up new things; innovation does them."* (Levitt, 1974:71).

There is no single, universal definition of innovation. It can be defined as a new way of putting new or existing ideas into practice or as the application of new methods to achieve beneficial goals.

Regardless of the definition, the essential characteristics of innovation are:

1. It is something **new**;
2. It is **applicable**;
3. It brings **benefit**.

### 3. GREEN ENTREPRENEURSHIP

Green entrepreneurship refers to starting and managing businesses that have minimal negative impact on the environment. These entrepreneurs aim to find innovative ways to address ecological challenges while also generating profit. Key areas of green entrepreneurship include the development of technologies for energy production from solar, wind, hydro, and other renewable sources, as well as the production of energy-efficient devices and technologies that reduce energy consumption in industries, households, and transportation.

Furthermore, innovations in recycling, reuse of materials, and waste reduction, along with the production of environmentally friendly products – from food to textiles – using sustainable methods and materials, are essential. Another very important segment is the development and production of energy-sustainable vehicles, bicycle lanes, and low CO<sub>2</sub> emission public transport systems.

Green entrepreneurs often combine economic goals with social responsibility, and one of the key aspects of green entrepreneurship is the social and ecological value that their products or services bring to the community. Entrepreneurs play an important role in implementing innovations by launching and managing businesses that promote green technologies and sustainable practices. They create new jobs and contribute to economic development while protecting the environment.

Green entrepreneurial solutions can be reflected in companies that produce eco-friendly products, offer services in the renewable energy sector, or develop platforms for waste and consumption reduction.

### 3.1. Defining Green Entrepreneurship

In recent years, there has been significant interest and research dedicated to understanding the determinants of green growth. However, one important and relevant question seems to have been overlooked by economists and policymakers: ultimately, green products and technologies must be brought to the market by *green entrepreneurs*. These are the economic actors who turn ideas into reality by transforming prototypes into commercially viable products.

Most policy mechanisms aimed at enabling green growth have focused on identifying technological innovations capable of mitigating human environmental impact and addressing global ecological issues – such as climate change, land degradation, and biodiversity loss. From a policy perspective, less attention has been paid to technology commercialization and the need to subsidize the “public good” component of green entrepreneurship.

From an analytical standpoint, several key questions remain open, such as: What are the characteristics of green entrepreneurs? In what kind of institutional environment do they thrive? Are the drivers of green entrepreneurship the same in industrialized and developing countries?

In fact, there is a fundamental difference in how green entrepreneurship is viewed in developed and developing countries. Developed countries and international organizations tend to emphasize the term “green” and market opportunities, whereas developing countries tend to focus more on “entrepreneurship” and market needs.

Chinese and Indian entrepreneurs, for example, are indeed transforming developing countries by creating affordable products that meet the needs of the poor, but they still need to become greener (Khanna, 2011). Developed countries often invest heavily in green innovation projects, only to face a missing link: entrepreneurs who can turn prototypes into commercially sustainable products (Macilwain, 2011).

Research literature on green entrepreneurship is still limited and lacks a broad empirical foundation. This may also be due to difficulties in drawing a clear line between green and non-green entrepreneurship. It wasn't until the 1990s that studies on green entrepreneurship began to emerge. Bennett (1991), Berle (1991), and Blue (1990) were the first to introduce the terms “environmental entrepreneur,” “green entrepreneur,” “eco-entrepreneur,” and “ecopreneur” in their studies.

Based on a review of such literature, the fundamental characteristics of green entrepreneurs are as follows:

- Green entrepreneurs explore new business opportunities and undertake ventures that typically carry high risks. The outcomes of these ventures are often unpredictable.
- They are intrinsically motivated. Their business activities have an overall positive effect on the natural environment and economic sustainability, with a conscious goal of providing a more sustainable future.

- Green entrepreneurs often struggle to survive due to unstable public sector commitment, whose support can be easily withdrawn in response to daily political shifts and lobbying efforts.

### **3.2. Encouraging Green Innovation**

The concept of "green innovation" is often associated with renewable energy (e.g., wind power and fuel cells). However, the transition to a post-carbon economy depends on much more than just technological improvements in energy-related technologies. It requires transformation on multiple levels – from lifestyle changes to innovations in investment and governance (Kemp, 2011).

Additionally, non-technological innovations are equally important, especially when considering new business models that develop innovative organizational approaches.

Before Prahalad (2004), most economists believed that markets consistently failed to meet the needs of the poor and were skeptical about any potential for growth at the base of the pyramid. Today, many green economy reports similarly doubt the market's ability to address environmental issues and provide sufficient incentives for green innovation (UNEP 2011, FAO 2011, OECD 2011a). Yet, there is evidence that green innovations have existed throughout the 20th century, even in the absence of government intervention (Silverthorne, 2011).

Successful green innovators were internally driven to improve through experimentation and managed to build thriving businesses. They reinvested most of their profits into improving their green product or technology, thereby generating significant social and environmental benefits while ensuring commercial sustainability (Aerni, 2010).

Despite limited progress made at major international forums and declining public funding, green businesses are creating new economic opportunities for both multinational corporations and small and medium-sized enterprises (SMEs). The private sector, by driving economic growth and development, increasingly plays a key role in addressing global sustainability challenges (ICC, 2012).

Green businesses are proving to shareholders and stakeholders that sustainability is not just a cost but also an opportunity to boost revenue and customer loyalty while protecting the environment. To strengthen sustainability at their core and promote a culture of innovation across all departments, companies are adopting comprehensive approaches – reducing water use, achieving carbon neutrality, minimizing solid waste, and implementing post-consumer recycling – while rigorously measuring the costs and benefits of each business unit.

In some cases, companies have even leveraged governments to improve standards, education, and workforce skills. Large corporations often associate green innovation with "green labels," corporate social responsibility (CSR), and private standards designed to avoid risk and enhance public image (Freidberg, 2007).

New market players, however, tend to focus more on investing in research and development to launch innovative and resource-efficient products with potential for increased returns (Shellenberger and Nordhaus, 2007; Lovins, 2011). International corporations, particularly service-oriented companies and major retailers, are increasingly committing to systemic improvements in internal management along their entire value chains, often directly involving suppliers.

Major companies such as Walmart (since 2005), Tesco, Migros, Coop, Woolworths, and IKEA have implemented green initiatives targeting truck fleet efficiency, energy-saving lighting and cooling, reduced packaging, use of recycled materials, micro-renewable energy systems, and cogeneration. These initiatives have resulted in substantial cost savings or even profits from waste reuse (Humes, 2011).

Similarly, leading global clothing and sportswear retailers (Nike, Puma, Adidas, H&M, etc.) have joined forces to eliminate nine classes of hazardous chemicals from their supply chains (“Zero Discharge of Hazardous Chemicals by 2020 – Ø ZDHC”).

At the Rio+20 Business Day, Carlos Busquets, Deputy Director of the ICC, emphasized the critical role SMEs can play in green growth and environmental responsibility, as key components of global value chains and as sources of innovation and employment.

Although Western-centric perspectives may have influenced discussions, portraying “green” as a luxury of wealthy nations or an agenda of industrialized countries, green enterprises are also emerging in developing markets. In BRICS countries (Brazil, Russia, India, China, South Africa) and rapidly developing economies like Turkey, Indonesia, and Mexico, businesses face infrastructure challenges rather than unreliable supply chains, limited access to finance, inefficient institutions, or burdensome regulations.

SMEs in these countries are increasingly required to meet the needs of new consumers without harming the local environment and to improve organizational and productive efficiency by reducing consumption of natural capital.

Many profitable companies from developing nations are turning environmental awareness into competitive advantage, showing that they can be just as green as their Western counterparts.

The World Economic Forum (WEF) and Boston Consulting Group (BCG) highlighted that these “new sustainability champions” adopt unique practices to operate in resource-constrained and population-stressed environments, turning constraints into opportunities through innovation.

For example:

- **China’s Zhangzidao Fishery Group** implemented integrated multi-trophic aquaculture (IMTA) to boost production and economic diversification while maintaining ecological balance and reducing waste.
- **India’s Shree Cement** achieved impressive energy efficiency using heat recovery systems and innovative waste and water reduction methods.

- **Brazil's Natura**, a cosmetics producer, promoted reuse, refilling, and recycling of packaging and used sugarcane-based plastics to cut greenhouse gas emissions.

To summarize, transitioning to a green economy requires a **bottom-up approach** supported by **top-down regulation and incentives**. A holistic vision that integrates economic, social, and environmental development (the "three pillars of sustainable development") and global, cross-sectoral value chains requires joint efforts from both the public and private sectors.

Governments must shape the context by building supportive infrastructure for R&D. According to the OECD's *Fostering Innovation for Green Growth*, governments should:

- Introduce appropriate regulatory incentives to strengthen markets for green innovations.
- Establish efficient intellectual property rights (IPR) systems to encourage private investment and the dissemination of green innovations.
- Promote entrepreneurship and increase public sector support for R&D to drive sustainable technological change (OECD, 2011b).

Ultimately, to foster green entrepreneurship and innovation, we must understand and clearly define green business patterns, distinguish levels of innovation, and evaluate which policy interventions work and which do not. Multilateral approaches across countries and sectors, combined with integrated management at all levels, are essential for enabling economic and social progress while protecting the planet.

The use of solar panels and battery systems reduces dependence on fossil fuels and lowers harmful gas emissions. In addition, Tesla has encouraged the global auto industry to accelerate the transition to electric vehicles, thereby driving innovation among other manufacturers as well. Although Tesla has achieved great success, it also faces challenges such as high battery production costs, limited raw material resources, and competition in the electric vehicle market. However, continued investments in research and development, as well as the expansion of production capacities, promise further growth and increasing influence. Tesla, Inc. is an example of how innovative entrepreneurship can bring revolutionary changes to industry while simultaneously preserving the environment and promoting the green economy.

## 4. CONCLUSION

Innovation and entrepreneurship represent the pillars of the green economy, without which sustainable development in the modern world is difficult to imagine. Through the application of new technologies and innovative business models, it is possible to achieve economic growth that does not endanger natural resources and the environment. To achieve these goals, synergy between the state, the private sector, and civil society is necessary.

“Green entrepreneurship” is an increasingly relevant phenomenon from a development perspective, but it remains largely under-researched. While global inequality and rising unemployment present major challenges for policymakers, the widespread destruction of wildlife and natural habitats, along with the new effects of climate change and the rapid loss of biodiversity, further worsen the vulnerability of already burdened social groups and ecosystems. The negative impacts that environmentally inefficient economic activities have on the environment, and thus on the economy, have prompted policymakers and scientists to emphasize the urgent need to transition to a more ecologically sustainable development path by encouraging the adoption of sustainable practices and cleaner technologies.

In this article, we have argued that encouraging the development of green enterprises and strengthening the resilience of economies and natural ecosystems requires a more detailed analysis of the conditions and factors influencing green entrepreneurship. This is also in line with the outcomes of the Rio+20 Conference. It is especially necessary to define the boundaries of “green entrepreneurship” and “green innovation,” to study the impact of systemic failures, and to better understand how formal and informal networks determine the performance of (green) small enterprises and SMEs. These are key to the economy because they significantly contribute to job creation, are drivers of change, and are responsible for introducing innovations, adapting to new ideas, and reacting faster, more flexibly, and more efficiently to changes than larger organizations.

Moreover, development patterns and technology adaptation are strongly influenced by the evolving nature of innovation and its determinants. Recent advancements in new information technologies and the globalization of economic processes have drastically changed the traditional methods businesses use to innovate. Although significant progress has been made in technological research and implementation, as well as in environmental accounting and reporting, the gap that needs to be filled to achieve sustainability remains substantial.

It is important to understand the preconditions for creating “green innovations,” the factors that act as obstacles and drivers, and how changes in access to information, new technologies, resources, and markets affect or alter the dynamics of innovation and governance. Systemic changes are needed to foster progress in the economy, accounting, and legal frameworks. As highlighted in Accenture’s research (UN Global Compact–Accenture, 2010), sustainability has become a central component of corporate business plans worldwide, with executives recognizing it as highly relevant to the future of their businesses (98% in the Asia-Pacific region compared to the global average of 93%). However, the global transition to a green economy is just beginning, and the world can no longer wait.

In the coming decades, there will be rapid growth in the global population, industrialization, and economic development. Resources are limited, and we must meet the needs of people. Green entrepreneurs fulfill their obligations to ensure efficient and safe operations while acting in an environmentally and socially responsible manner.

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